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ULNRC-2351

January 28, 1991

U.S. Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, DC 20555

10CFR50, Appendix J, Type A Test Report

Enclosed are twelve (12) copies of Union Electric's Reactor Containment Building Integrated Leak Rate Test Report. The test was started on October 29, 1990, and successfully completed on October 31, 1990.

A C Passwater
for Donald F. Schnell

DFS/WRC/cs
Enclosure

A017
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Distribution for ULNRC-2351
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UNION ELECTRIC COMPANY

CALLAWAY NUCLEAR PLANT

DOCKET No. STN-50483

PRIMARY REACTOR BUILDING INTEGRATED LEAKAGE RATE TEST

FINAL REPORT

Prepared by:
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INTRODUCTION

The second periodic Integrated Leakage Rate Test (Type "A") was successfully completed on Callaway's reactor containment building on October 30, 1990. This test was performed to demonstrate the containment building's ability to meet the Technical Specifications leakage criteria during a design bases accident. This test was performed using the plant's procedure, ESP-GP-01007 Revision 5, for the Integrated Leakage Rate Test. The procedure conforms to the requirements of Appendix J of 10CFR50.

SUMMARY

The reactor building leakage rate, using either Total Time or the 24 hour Mass Point method plus associated penalties, was below the allowable limits established in Callaway's Technical Specifications for the "As-Left" condition. Supplemental discussions with the Nuclear Regulatory Commission, Region III, indicated that their position is that the acceptance criterion is 0.15 Wt%/Day or 0.75 La for the "As-Found" condition. Union Electric understands that this position is based on the wording in Appendix J that includes only 0.75 La as an acceptance criterion for any test. The leakage rate using Mass Point method plus leakage savings exceeded this criterion for the "As-Found" but was below 1.0 La. Based on this, an exemption request is being submitted to the NRC to request the acceptance criterion of 1.0 La be used for the "As-Found" condition. In addition, because of this open issue, the supplemental report required by Appendix J is not included in this report. It should be noted however, that the data required by the supplemental report is included in this document, although not in the supplemental report format. If required, the supplemental report will be submitted upon resolution of the exemption request.

The calculated leakage rate was verified by imposing a known additional leakage on the building and verifying that the combined leakage rate fell within the tolerance band established in ESP-GP-01007. The test was conducted at a dry pressure of 63.671 psia for a duration of 24 hours. Test results and acceptance limits are listed below;

Summary Results	Wt%/Day
a. Mass Point Measured Leakage	0.0446
b. Total Time Calculated Leakage	0.0422
c. Upper 95% Confidence Limit for a.	0.0464
d. Upper 95% Confidence Limit for b.	0.0505
e. Leakage additions	0.0060
f. Sum of c + e	0.0524
g. Sum of d + e	0.0565
h. Acceptance Criteria, 0.75 La	0.1500
i. Verification Imposed Leakage	0.1990
j. Calculated Combined Leakage, i + a	0.2436
k. Calculated Combined Leakage, i + b	0.2412
l. Mass Point Verification Leakage	0.2441
m. Total Time Verification Leakage	0.2181

The Instrument Selection Guide was calculated to be 0.015 Wt.%/Day, well below the allowable limit of 0.05 Wt.%/Day. Table 1 describes general and technical information concerning the plant and the test.

CHRONOLOGY

The second periodic Integrated Leakage Rate Test at Callaway was performed at the end of the fourth refueling outage. The valve positioning, venting and draining of penetrations, and final line-up of systems and equipment were done several days prior to the start of pressurization. During final placement of the instrumentation; i.e. the RTDs in the Dome region of the containment building, an RTD failed. A decision was made to assign a volume fraction of zero to the failed RTD and revise the volume fractions of the neighboring RTDs. The revised volume fractions are shown in Table 2. A temperature survey and final walk down were successfully completed prior to pressurization. The temperature survey confirmed the proper volume fractions of the instruments based on the area survey's agreement to the test instrumentation readings. The final walk down and earlier walk downs concluded that the interior and exterior of the containment building and liner had not sustained any damage that would prevent the successful completion of the test. Pressurization commenced at 01:35 AM on October 29, 1990. Dates and times for the various phases are listed in the table below.

PHASE	START	END
Pressurization	Oct. 29, 01:35 AM	Oct. 29, 11:20 AM
Stabilization	Oct. 29, 11:35 AM	Oct. 29, 06:20 PM
Type A Test	Oct. 29, 06:35 PM	Oct. 30, 06:35 PM
Verification		
Stabilization	Oct. 30, 06:50 PM	Oct. 30, 07:35 PM
Verification Test	Oct. 30, 07:50 PM	Oct. 30, 11:50 PM
Depressurization	Oct. 31, 00:44 AM	Oct. 31, 12:32 PM

The containment building was pressurized to a total test pressure of 64.019 psia using 10 oil free, diesel driven, air compressors. The compressed air was cooled, dried and filtered prior to entering the containment. The pressurization took approximately 9 hours and 45 minutes. During pressurization, the containment coolers and hydrogen mixing fans were operated to aid in the mixing of the air and reduce stabilization time. During pressurization, leakage surveys were started on the outside of the containment to identify any significant leakage that might interfere with passing the test. No such leaks were identified. Once at test pressure the Essential Service Water to the containment coolers was isolated and the containment coolers were secured. Similarly, the hydrogen mixing fans were secured and the secondary side of the Steam Generators were opened to the atmosphere through their atmospheric reliefs.

Following the completion of pressurization of the containment, the air stabilized for 6 hours and 45 minutes. The ANSI 56.8 stabilization criteria was met after the first four hours of the test, during which time the average containment dry pressure changed less that 0.001 psi. The start of the test was declared at 6:35 PM on October 29, 1990. The test was successfully completed after 24 hours at 6:35 PM on October 30, 1990. At 6:50 PM on October 30,1990, an induced leakage of 15 scfm (0.199 Wt.%/Day) was introduced. The containment atmosphere was allowed to stabilize for approximately an hour prior to starting the verification test. The verification test was started at 7:50 PM on October 30, 1990 and successfully completed at 11:50 PM on October 30, 1990. Following the completion of the verification test, depressurization was started at 00:44 AM on October 31, 1990 and was completed at 12:32 PM on October 31, 1990. The containment was entered and a post test walk down completed. The post test walk down did not identify any significant damage.

INSTRUMENTATION

Callaway's instrumentation used for the Type A test was composed of 24 platinum RTD's, six chilled mirror hygrometers, two Mensor precision pressure gauges and two mass flowmeters. Specific details on the instruments are provided in Table 3. These instruments provide data to the Balance of Plant (BOP) computer where the data was collected and then transmitted to two PCs which along with the BOP perform the necessary data reduction programs for the ILRT.

The containment air mass was calculated using volume weighted averages from each of the instruments. A listing of the instruments original volume fractions is shown in Table 2 with the adjusted volume fractions. The volume fractions for RTD #5, #6 and RTD #7 had to be revised because of the failure of RTD #6. RTD #6 failed during the final positioning of the RTDs in the dome region of the containment building and was assigned a volume fraction of zero prior to the start of the test.

Based on the above changes in the volume fractions, the ISG was recalculated using the sensitivity, repeatability, and resolution described in Table 3. This calculation is shown in Table 4.

METHODOLOGY

Callaway's procedure provides the option for performing the Type A test in any of the following manners; a short duration test as defined by Bechtel in BN-TOP-1, or a 24 hour test using either the total time as described in ANSI N45.4-1972, or the mass point method as described in ANSI 56.8 - 1981. Data was gathered at 15 minute intervals during the entire test. The 23 RTD's provide a volume weighted containment average temperature. The 6 chilled mirror hygrometers provide a volume weighted containment average dewpoint which was used to determine the vapor pressure inside the containment. Two precision Mensor pressure gauges provided the volume weighted average total containment pressure.

- Using the ideal gas law and assuming the containment volume remains constant, the containment air mass was determined using the above volume weight averages. The pressure used for this was the total containment pressure minus the vapor pressure. This calculation was done every 15 minutes for the entire test. Minor adjustments to the results were made following the test to take into account minor changes in the containment volume that occurred during the test.

- The measured leakage rate was determined from the change in air mass over time.

- The calculated leakage rate was calculated by imposing a least square fit on the measured leakage rate over time.

- A 95% upper confidence limit for the calculated leakage was calculated.

Following the completion of the test, a known leakage was imposed on the containment building. The size of the imposed leakage was approximately equal to La. A verification test was performed to ensure that the instrumentation that was used during the test had the necessary sensitivity and repeatability to identify the imposed leak.

TEST RESULTS

Test results are shown in Summary Section. The calculated leakage rate for the 24 hour total time test was 0.0422 Wt.%/Day. The mass point equivalent for the 24 hour test was 0.0446 Wt.%/Day. The associated 95 % upper confidence limit for the 24 hour total time test was 0.0505 Wt.%/Day. The mass point equivalent for the 24 hour test was 0.0464 Wt.%/Day. These values were far enough below the acceptance criteria of 0.15 Wt.%/day to allow for additions from non-standard line-ups and volume changes during the test.

Several penetrations were not aligned per their post accident line-ups. These penetrations and reasons for their lineups are described in Table 5. Each penetration which was not aligned per their post accident line-ups had the associated minimum pathway leakage added to the 95% upper confidence limit. The amount of penalties associated with these non-standard lineups was equivalent to 0.0011 Wt.%/Day. This is shown in Table 6.

Changes in the containment volume are shown in Table 7. These changes were a reflection of the changes in net positive level changes inside the containment between the start and the end of the test. The amount of penalties associated with these changing in volume was equivalent to 0.0049 Wt.%/Day.

Following the completion of the 24 hour test a verification test was performed where a known leakage of 15 scfm was introduced. The leakage was allowed to stabilize for 1 hour prior to starting the verification test. The verification test lasted 4 hours and was completed at 11:50 PM on October 30, 1990. The measured Total Time composite leakage rate stabilized within the limits of the acceptance band. The limits on the combined leakage rate are equal to the original calculated leakage rate plus the imposed leakage rate +/- 25% of the allowable leakage rate, These limits are established below;

	Lam	+	Li	- .25La		
Lower Limit	0.0422	+	0.199	- 0.050	=	0.1912 Wt.%/Day

	Lam	+	Li	+ .25La		
Upper Limit	0.0422	+	0.199	+ 0.050	=	0.2912 Wt.%/Day

The measured composite leakage rate stabilized at approximately 0.2181 Wt.%/Day at the end of the verification phase.

All data recorded during the Type A test, verification test and stabilization periods are retained as permanent plant records.

Individual plots are shown in Figures 1 through 14 of various test data. A graph of each RTD versus the test time is enclosed. Each graph has with it the volume weighted average containment air temperature. Individual graphs of the various chilled mirror hygrometers are shown individually with the average volume weight containment dewpoint. The two Mensor precision pressure indicators are plotted versus time along with the volume weighted average containment pressure.

Various results graphs are provided. The weighted average containment temperature, dewpoint and pressure (dry and total) versus time are provided. The containment air mass versus time is provided for the entire test and is shown in figure 17. The containment leakage and the associated 95 % upper confidence limit for both the total time and mass point are provide in figures 18 and 19. Finally, the verification test versus time is plotted in figure 20.

TYPE "B" AND "C" TEST RESULTS

The results of all the Type "B" and "C" tests performed since the last Type "A" test are listed in Appendix 1.

REFERENCES

- Callaway Plant Technical Specifications.
- Callaway Plant Procedure ESP-GP-01007, Reactor Building Leakage Rate Test, Revision 5.
- Appendix J to 10 CFR 50, "Reactor Containment Leakage Testing for Water Cooled Reactors."
- ANSI/ANS 56.8 - 1981, "Containment System Leakage Testing Requirements."
- ANSI N45.4 - 1972, "Leakage Rate Testing of Containment Structures for Nuclear Reactors."
- Bechtel Topical Report BN-TOP-1, Revision 1, "Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants," November 1, 1972.

TABLE 1

PLANT INFORMATION AND TEST TECHNICAL DATA

Plant Information			
Owner	Union Electric Company		
Plant	Callaway Nuclear Plant		
Location	Fulton, Missouri		
Containment Type	Post-tensioned Concrete		
Date Test Completed	October 31, 1990		
Technical Data			
Containment Net free air volume	2.5×10^6 cubic feet		
Design Pressure	60 psig		
Test Pressure, Pa	48.1 psig (+2.0, -0.0)		
Containment ILRT average Temperature Limits	40 - 120 deg. F		
Test Results - Type A			
Test Method	Absolute		
Data Analysis Technique	Total Time (per ANSI N45.4 -1972) and Mass Point (per ANSI 56.8 - 1981)		
Maximum Allowable Leakage Rate, La	0.2 Wt.%/Day		
75 % of La	0.15 Wt.%/Day		
Integrated Leakage Rate	Calculated Leakage Rate, Lam Wt.%/Day	Upper 95% Confidence Wt.%/Day	
Total Time Method	0.0422	0.0505	
Mass Point Method	0.0446	0.0464	
Verification Test Results			
Verification Leakage Imposed	15.0 scfm		
Leakage Rate	0.199 Wt.%/Day		
Verification Leakage Rate	Leakage Rate, Wt.%/Day		
Total Time	0.2181		
Mass Point	0.2441		
Verification Test Limits	Upper Limit Wt.%/Day	Lower Limit Wt.%/Day	
Total Time	0.2912	0.1912	
Mass Point	0.2936	0.2136	
LLRT Adjustments and Other Penalties	0.006 Wt.%/Day		

TABLE 2

TEMPERATURE SENSOR LOCATIONS AND VOLUME FRACTIONS

DRYBULB TEMPERATURE SENSORS

Component	Elevation (ft)	Azimuth (Degree)	Distance from Rx (ft)	Original Volume Fraction	Revised Volume Fraction
GP-TE-01	2192	N/A	0	0.0257	0.0257
GP-TE-02	2181	N/A	0	0.0392	0.0392
GP-TE-03	2170	N/A	0	0.0476	0.0476
GP-TE-04	2160	270	50	0.0502	0.0502
GP-TE-05	2151	45	50	0.0518	0.0789*
GP-TE-06	2142	135	50	0.0541	0.0000*
GP-TE-07	2133	225	50	0.0544	0.0814*
GP-TE-08	2124	270	50	0.0544	0.0544
GP-TE-09	2115	0	50	0.0547	0.0547
GP-TE-10	2106	90	50	0.0547	0.0547
GP-TE-11	2097	180	50	0.0547	0.0547
GP-TE-12	2088	270	50	0.0534	0.0534
GP-TE-13	2079	60	50	0.0511	0.0511
GP-TE-14	2070	180	50	0.0497	0.0497
GP-TE-15	2061	335	45	0.0473	0.0473
GP-TE-16	2052	180	50	0.0473	0.0473
GP-TE-17	2029	180	22	0.0185	0.0185
GP-TE-18	2042	0	61	0.0314	0.0314
GP-TE-19	2030	120	59	0.0321	0.0321
GP-TE-20	2018	240	61	0.0325	0.0325
GP-TE-21	2037	0	27	0.0186	0.0186
GP-TE-22	2022	90	33	0.0212	0.0212
GP-TE-23	2007	270	22	0.0218	0.0218
GP-TE-24	2006	30	60	0.0326	0.0326
				1.0000	1.0000

* Volume fractions revised prior to the start of the test to compensate for failure on GP-TE-06.

DEWPOINT TEMPERATURE SENSORS

GP-ME-19	2180	N/A	0	0.1309
GP-ME-20	2140	N/A	0	0.2213
GP-ME-21	2100	N/A	0	0.2119
GP-ME-22	2060	N/A	0	0.2025
GP-ME-23	2030	115	66	0.1141
GP-ME-24	2010	0	27	0.1193
				1.0000

TABLE 3

INSTRUMENT SPECIFICATIONS

MODEL AND TYPE		
Absolute Pressure Precision Pressure Gauge Mensor Model 10100-001	Range: Accuracy: Sensitivity: Repeatability: Resolution: Calibr. Date:	0-100 psia +/-0.02% Rd. 0.001 psia 0.0005% FS 0.001% FS July 27,1990
Drybulb Temperature Resistance Temperature Detectors, PLatinum 100 ohm RTD's	Range: Accuracy: Sensitivity: Repeatability: Calibr. Date:	0-150 deg.F 0.1% FS 0.10 deg.F 0.10 deg.F July 27,1990
Dewpoint Temperature Dewpoint Detector Chilled Mirror EG&G Model 660-1	Range: Accuracy: Sensitivity: Repeatability: Calibr. Date:	(-58)-212 deg.F +/- 0.54 deg.F 0.1 deg.F 0.1 deg.F July 27,1990
Flow Mass Flowmeter Volumetrics Model W-096-7B	Range: Accuracy: Sensitivity: Repeatability: Calibr. Date:	0-20 scfm +/-1.% FS 0.1% FS 0.1 scfm July 27,1990

FS - Full Scale
Rd. - Reading

TABLE 4

INSTRUMENT SELECTION GUIDE, ISG

The instrument selection guide is defined and calculated in accordance with ANSI/ANS 56.8 -1981.

CALIBRATION DATA

		# OF SENSORS (S)	SENSITIVITY (E)	REPEATABILITY (R)
Temperature	($_t$)	23	0.04 deg. R	0.27 deg. R
Pressure	($_p$)	2	0.001 psia	0.001 psia
Vapor Pressure	($_v$)	6	0.08 deg. F	0.08 deg. F

PRESSURE INSTRUMENTATION ERROR

$$e_p = [(E_p)^2 + (R_p)^2]^{1/2} / (S)^{1/2}$$

e_p = 0.001 psia

TEMPERATURE INSTRUMENTATION ERROR

$$e_t = [(E_t)^2 + (R_t)^2]^{1/2} / (S)^{1/2}$$

e_t = 0.0569 deg. R

VAPOR PRESSURE INSTRUMENTATION ERROR

$$e_v = [(E_v * C)^2 + (R_v * C)^2]^{1/2} / (S)^{1/2}$$

where: C is the change in pressure due to a change in temperature at the average dewpoint temperature (51.9 deg. F), psia/deg. F

e_v = 0.00033 deg. R

CALCULATING THE INSTRUMENT SELECTION GUIDE

$$ISG = (2400/t) * (2)^{1/2} * [(e_p / P)^2 + (e_t / T)^2 + (e_v / P)^2]^{1/2}$$

where: t is the test duration in hours (24)
P is the containment total pressure in psia (64.021)
T is the containment drybulb temperature in deg. R (534.67)

ISG = 0.015 Wt.%/Day

ACCEPTANCE CRITERIA

ISG < 0.05 Wt.%/Day

TABLE 5

PENETRATIONS IN NON-STANDARD ALIGNMENT

P - 17 Fuel Transfer canal isolation penetration. Isolated but could not ensure open to atmosphere on outside of the penetration because of water filled canal.

P - 22 Seal water injection to the Reactor coolant system for protection of the Reactor Coolant pump seals and also a operable and available source for boron injection during the test.

P - 28 Essential Service Water to the containment coolers used during pressurization for air cooling and mixing. Isolated at start of stabilization.

P - 29 Essential Service Water from the containment coolers used during pressurization for air cooling and mixing. Isolated at start of stabilization.

P - 34 Integrated Leak Rate test pressurization penetration. Open for ability to pressurize the containment, normally closed penetration.

P - 39 Seal water injection to the Reactor coolant system for protection of the Reactor Coolant pump seals and also a operable and available source for boron injection during the test.

P - 40 Seal water injection to the Reactor coolant system for protection of the Reactor Coolant pump seals and also a operable and available source for boron injection during the test.

P - 41 Seal water injection to the Reactor coolant system for protection of the Reactor Coolant pump seals and also a operable and available source for boron injection during the test.

P - 51 Penetration used to measure the containment pressure and perform the verification test during the Integrated Leak Rate Test. Normally isolated penetration.

P - 67 Fire protection to the containment. Callaway Technical Specification to maintain available during all modes.

P - 71 Essential Service Water to the containment coolers used during pressurization for air cooling and mixing. Isolated at start of stabilization.

P - 73 Essential Service Water from the containment coolers used during pressurization for air cooling and mixing. Isolated at start of stabilization.

TABLE 6

LEAKAGES PENALTIES FOR NON-STANDARD ALIGNMENTS

Penetrations	Leakage Rate, sccm
P - 17	2.0
P - 22	5.23
P - 28	2.0
P - 29	862.0
P - 34	171.3
P - 39	338.0
P - 40	9.54
P - 41	32.9
P - 51	5.86
P - 67	62.0
P - 71	594.4
P - 73	282.0
Summation of Leakage Penalties (sccm)	= 2367.23
Leakage Equivalent	= 0.0011 Wt.%/Day

TABLE 7

CONTAINMENT VOLUME CHANGES

Component	Start of test	End of Test	Change(gal.)
Volume Control Tank	32.8%	63.6%	660.
Pressurizer	59%	60.5%	181.5
Reactor Coolant Drain Tank	11%	20.5%	22.
Pressurizer Relief Tank	9.6%	9.7%	8.3
Containment Sumps	9.5 inches	12 inches	14.
Containment Sumps	10 inches	10.5 inches	2.8
Accumulator - A	46.35%	46.75%	3.5
Accumulator - B	66.35%	66.75%	3.5
Accumulator - C	67.65%	68.55%	8.0
	Total Net Positive Volume Change		903.6 gals.
	Equivalent Leakage Rate		0.0048 Wt.%/Day

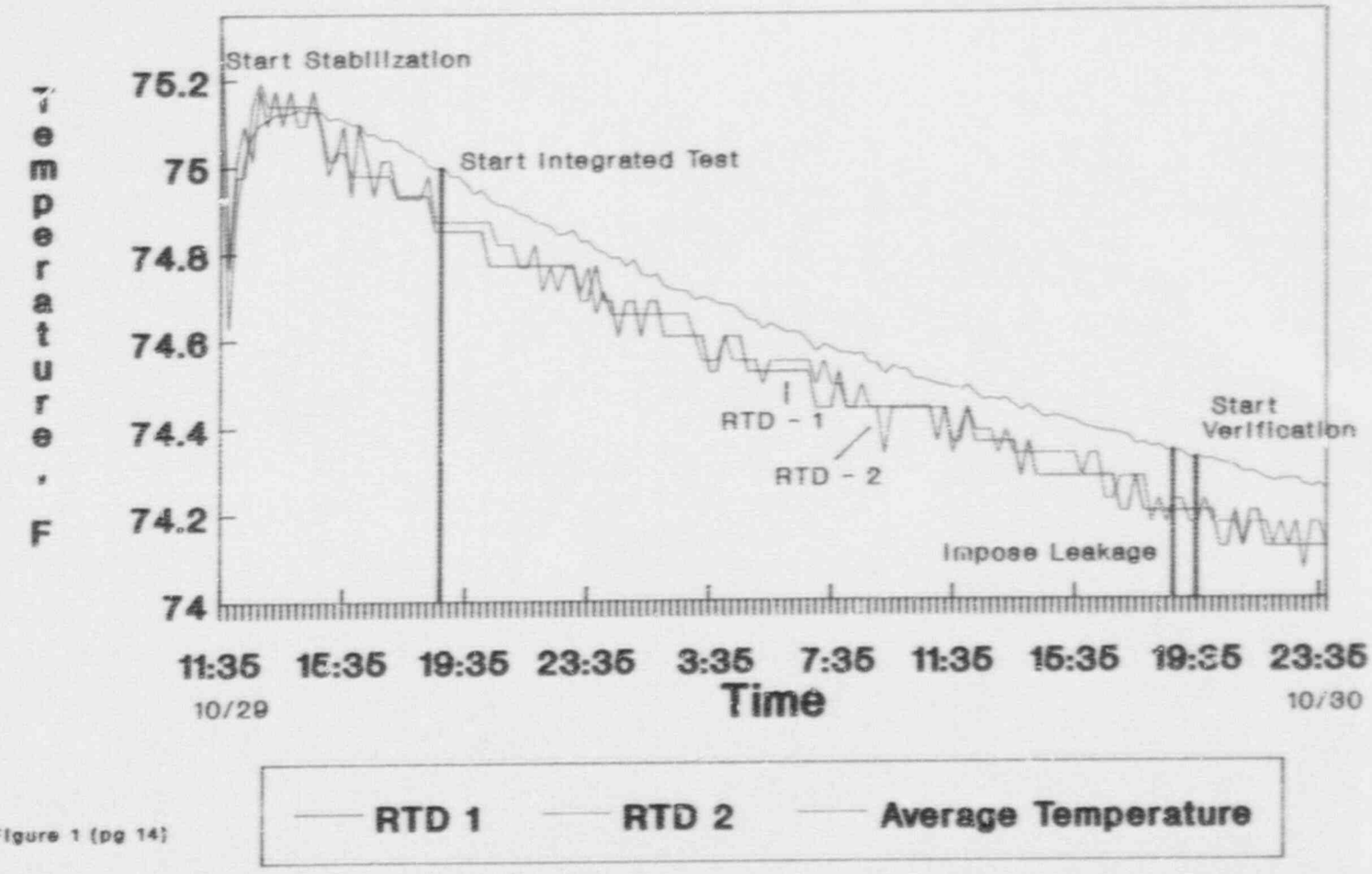

Figure 1 (pg 14)

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Containment Temperature vs Time

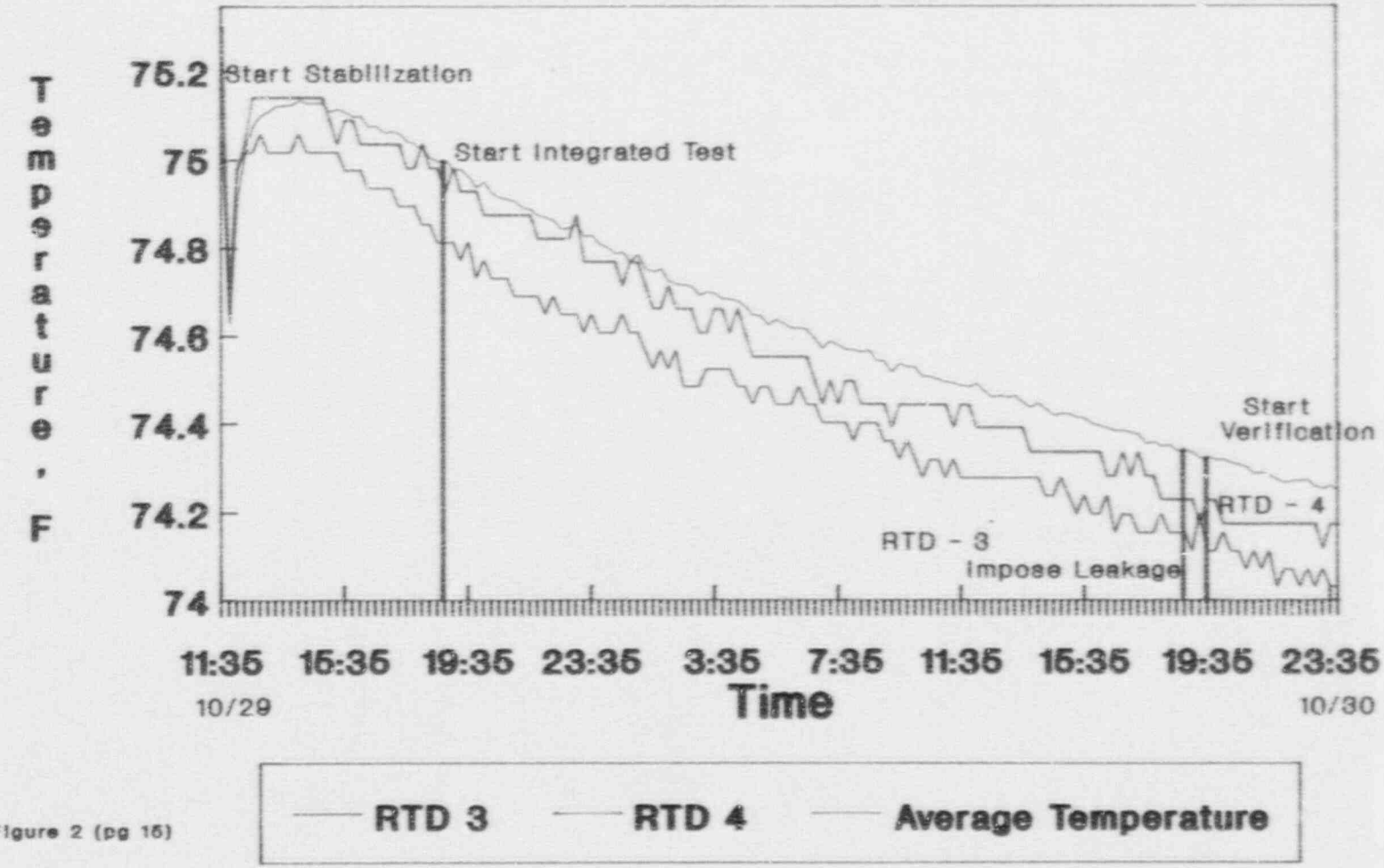


Figure 2 (pg 15)

Containment Temperature vs Time

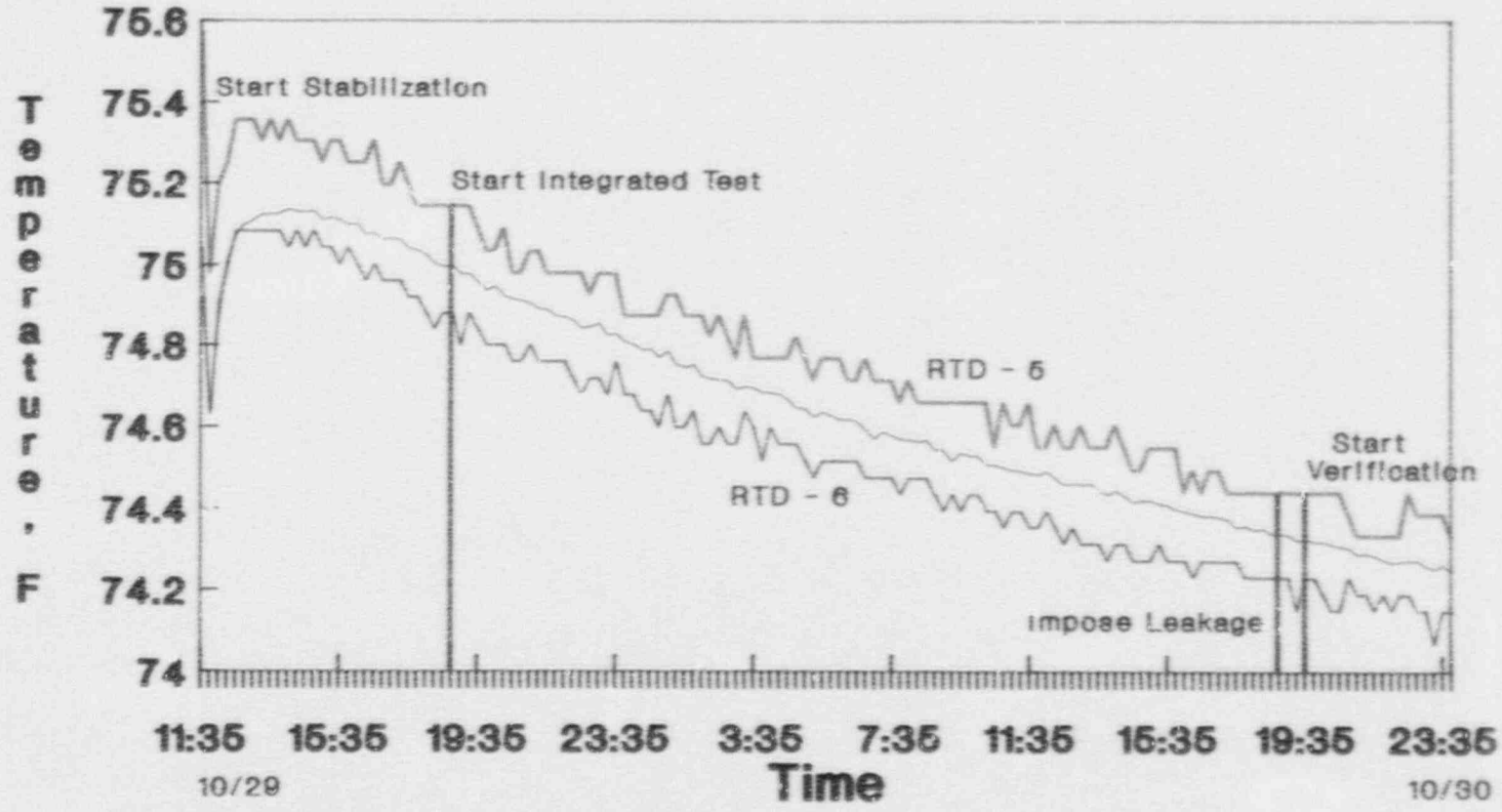


Figure 9 (pg 16)

Containment Temperature vs Time

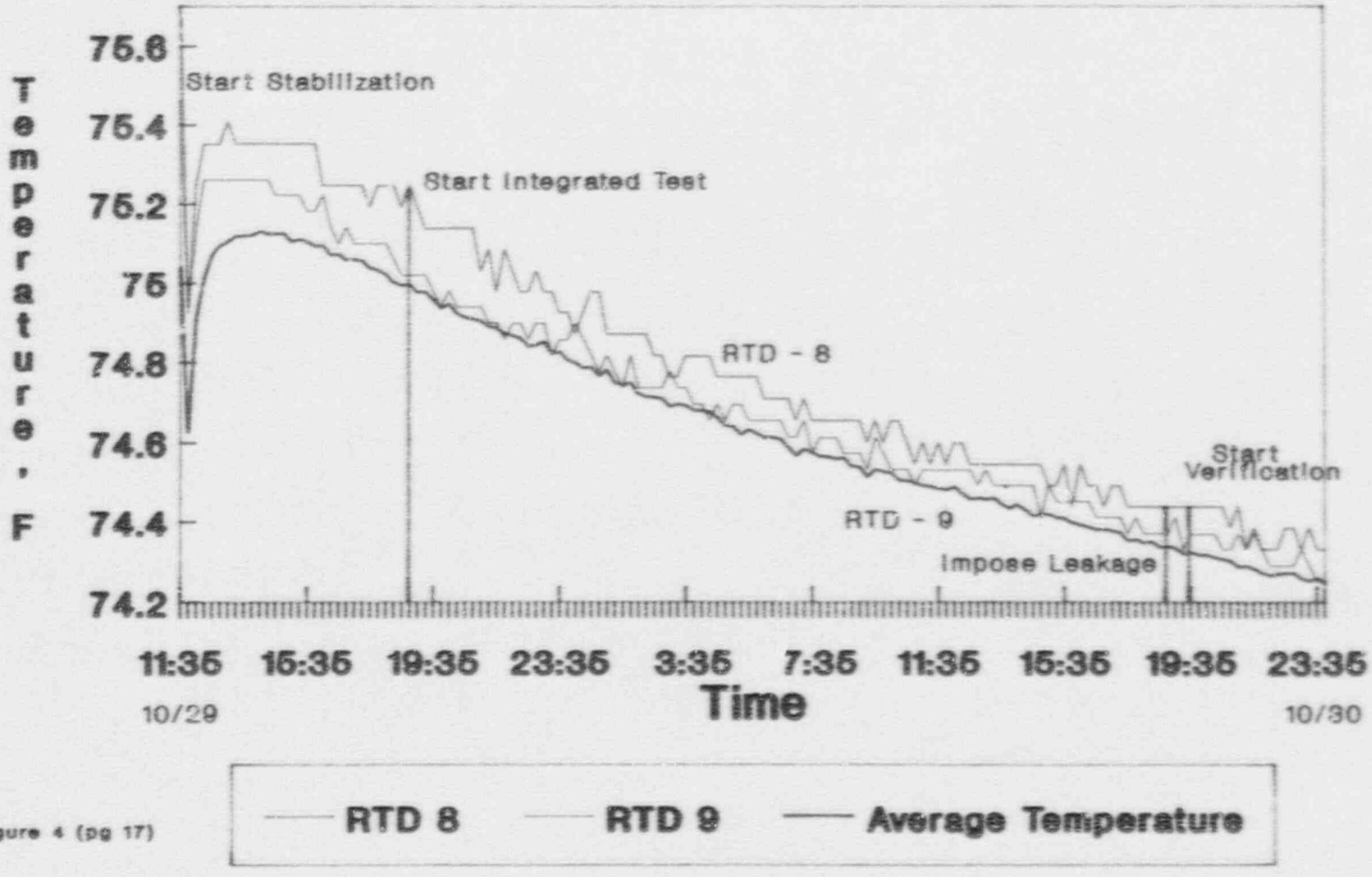


Figure 4 (pg 17)

Containment Temperature vs Time

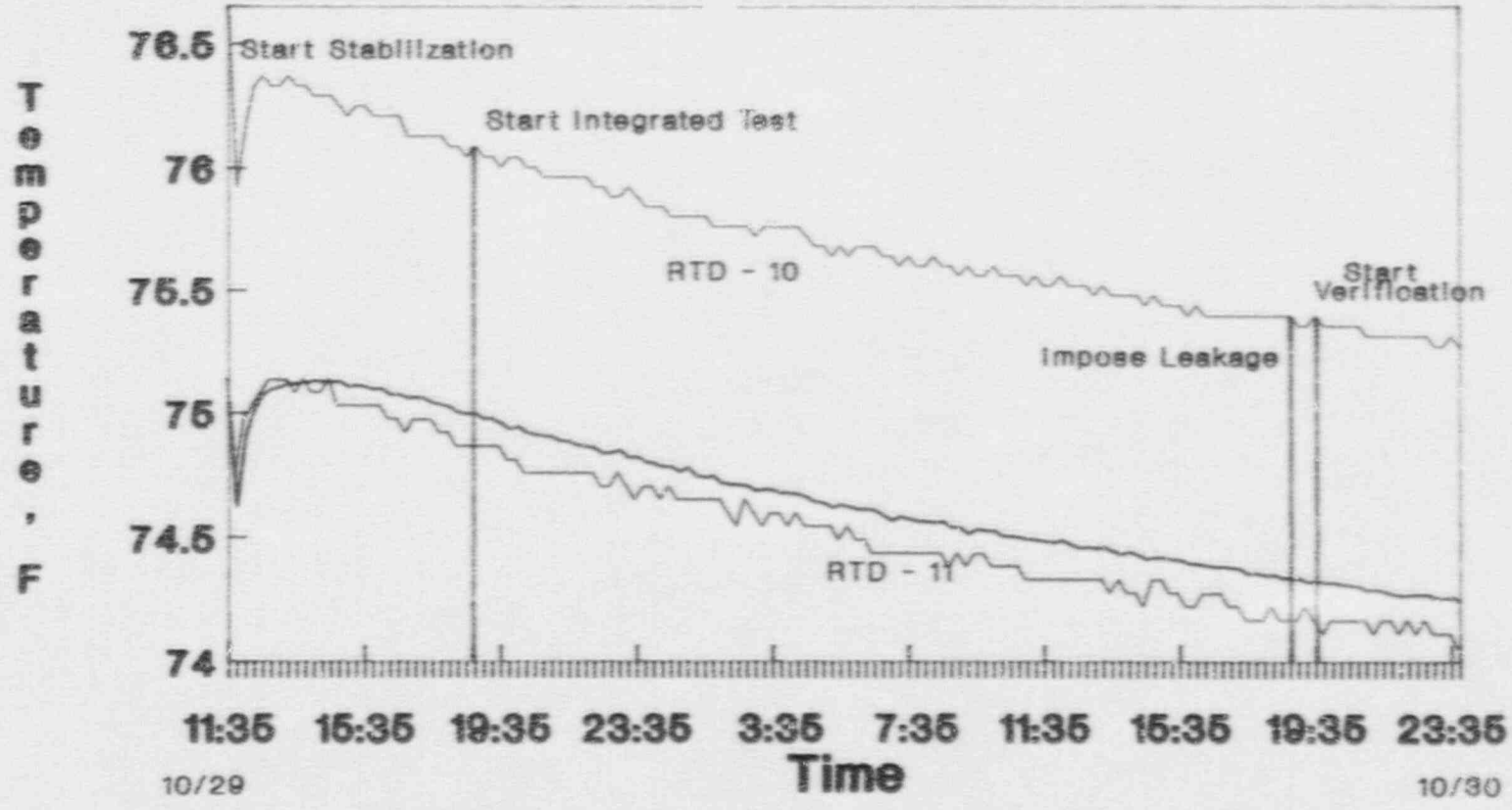


Figure 6 (pg 18)

Containment Temperature vs Time

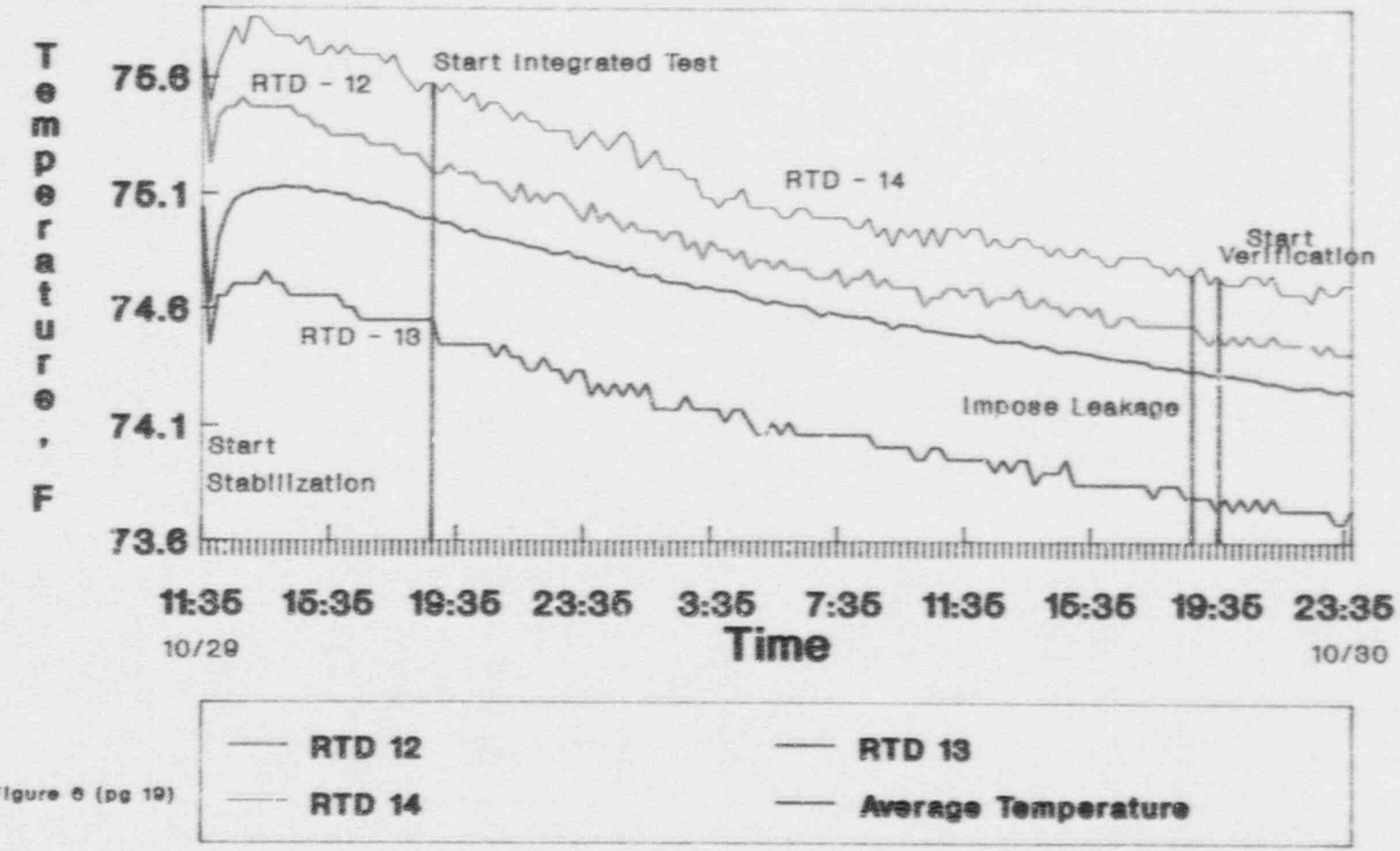


Figure 6 (pg 19)

Containment Temperature vs Time

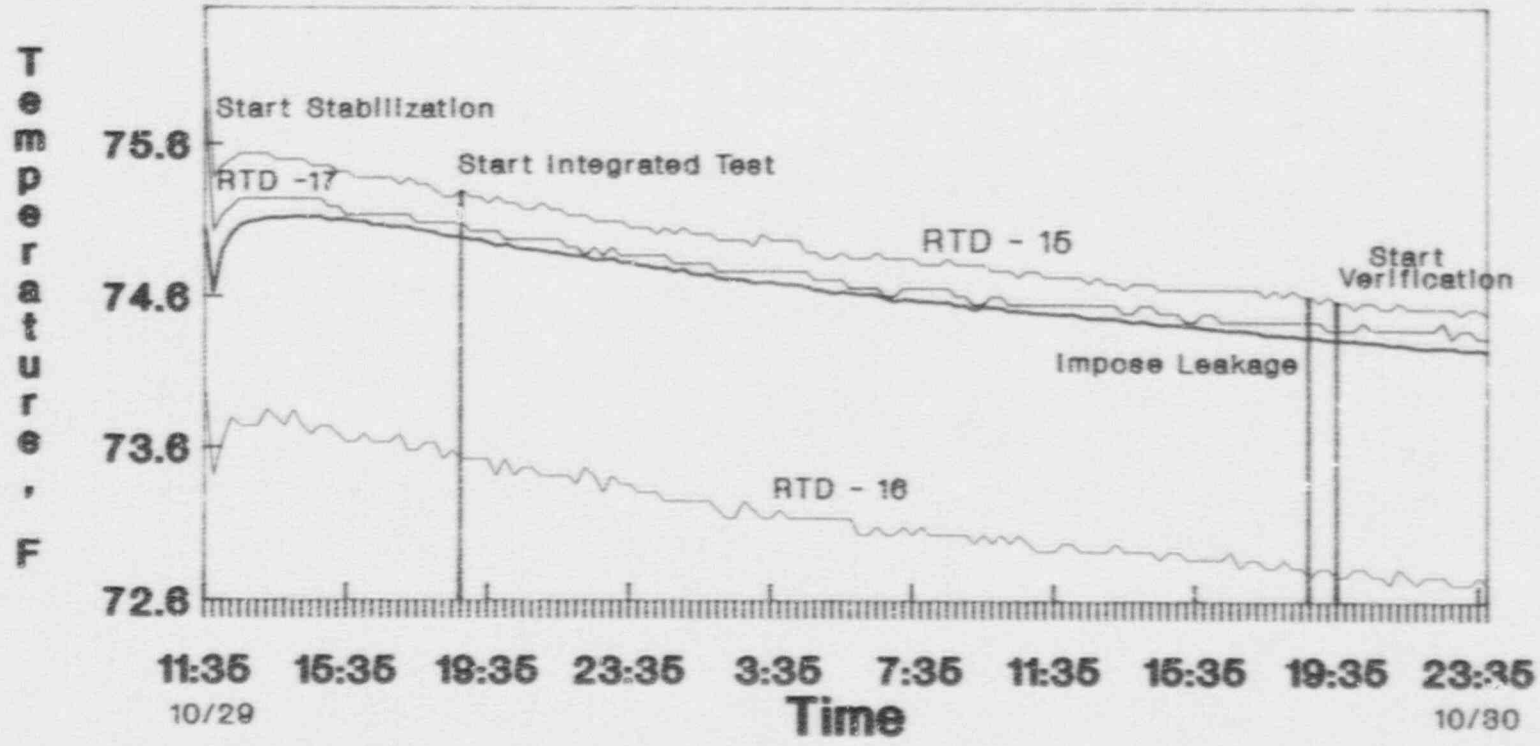


Figure 7 (pg 20)

Containment Temperature vs Time

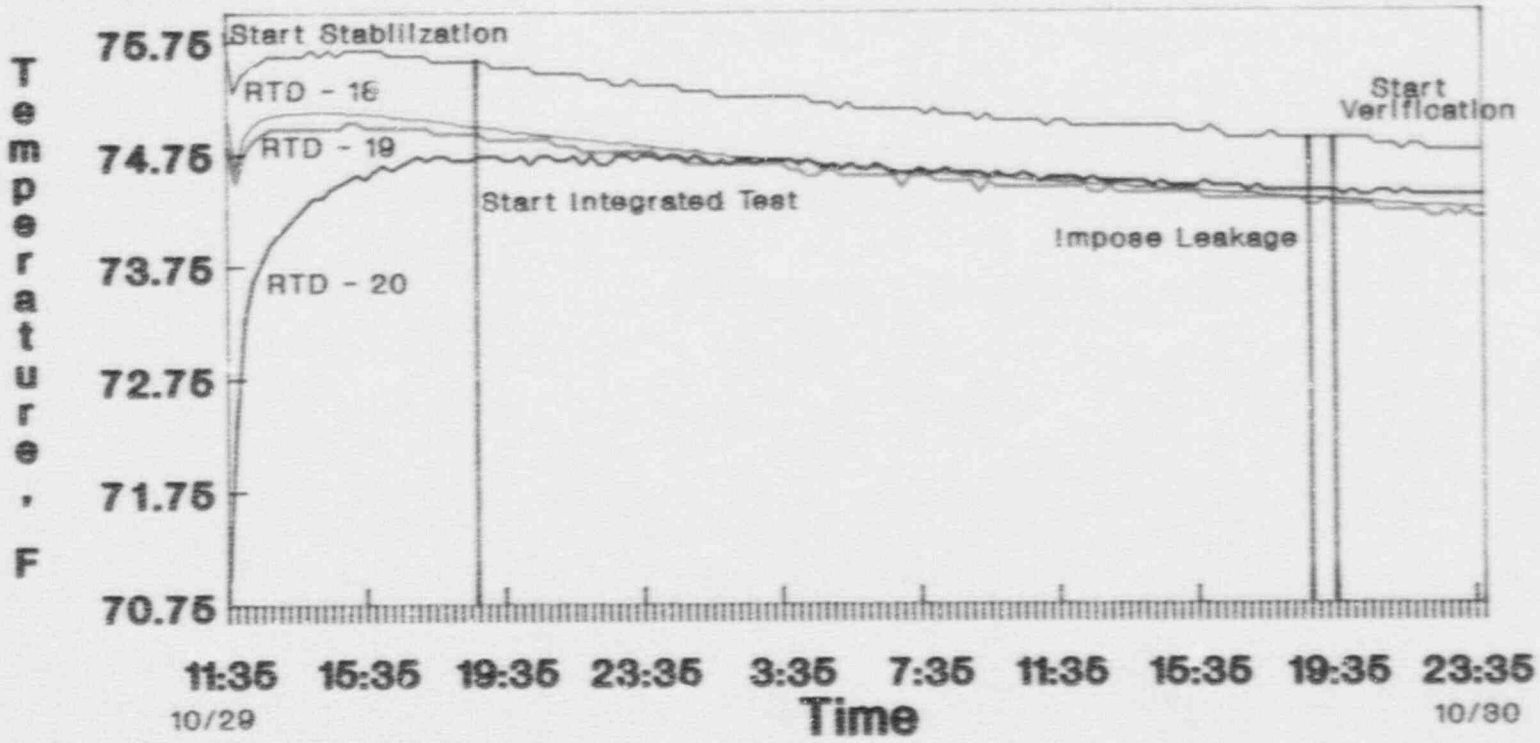


Figure 8 (pg 21)

Containment Temperature vs Time

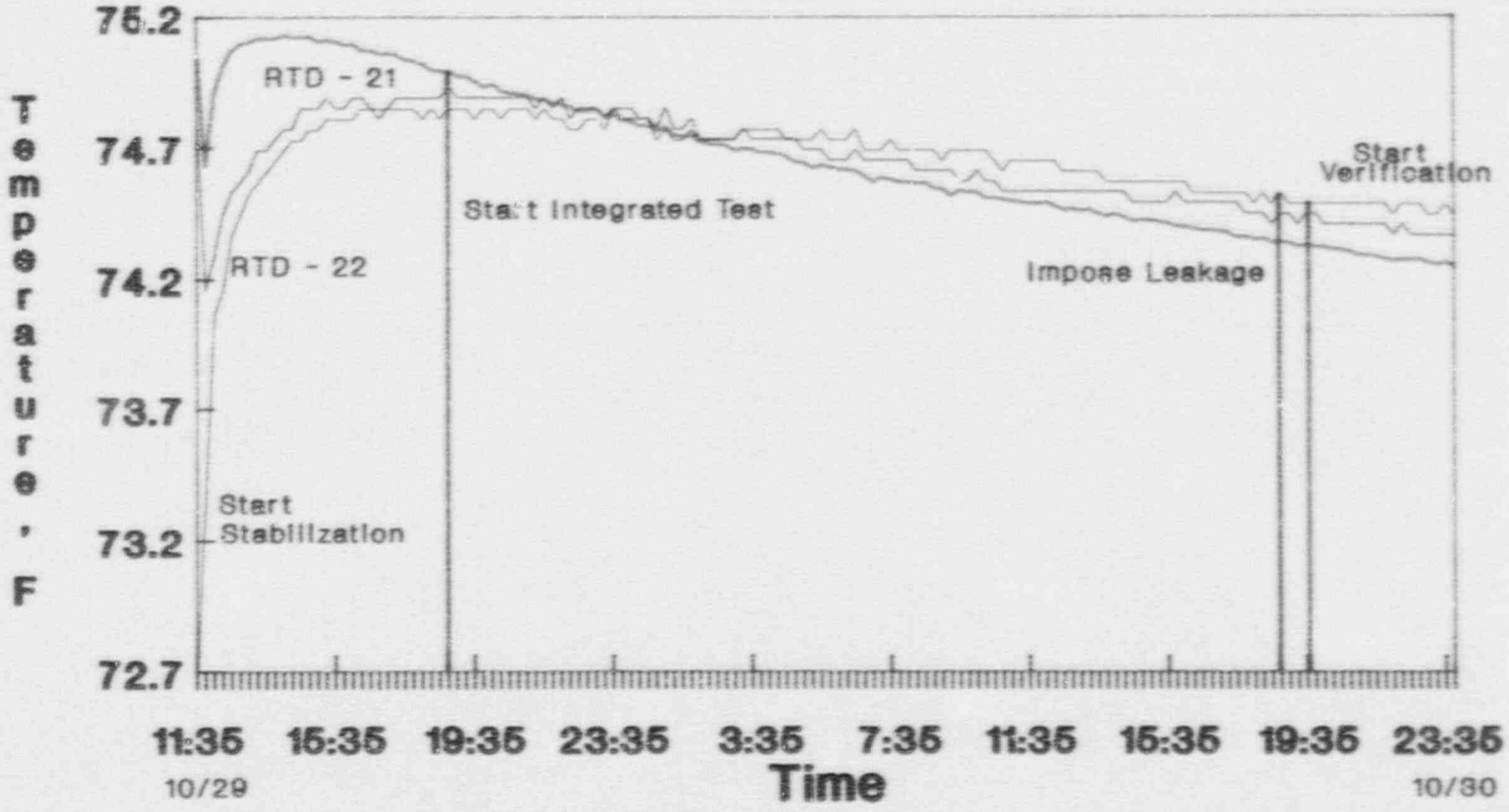
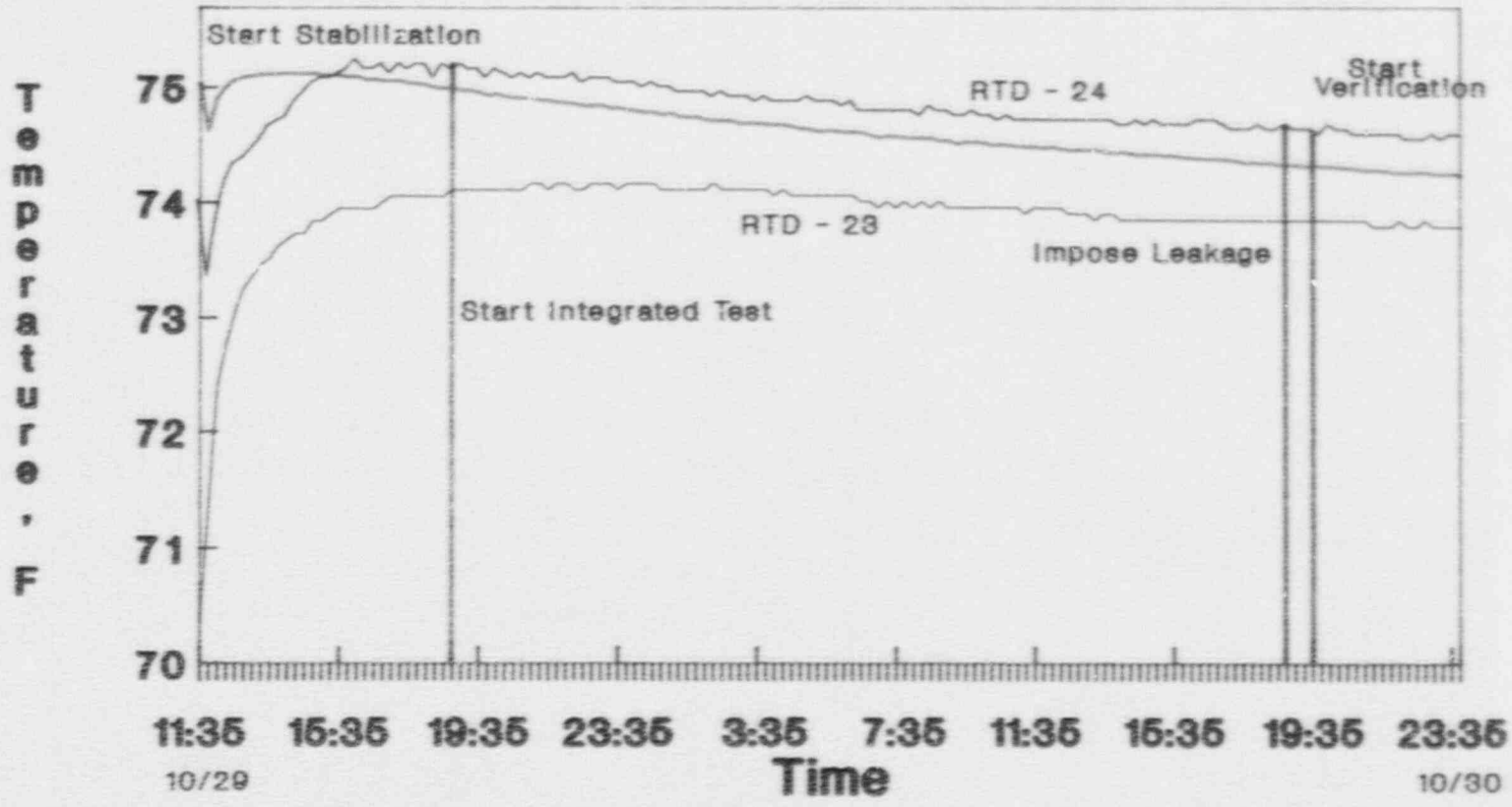


Figure 9 (pg 22)

Containment Temperature vs Time



RTD 23 — RTD 24 — Average Temperature

Figure 10 (pg 28)

Dewpoint vs Time

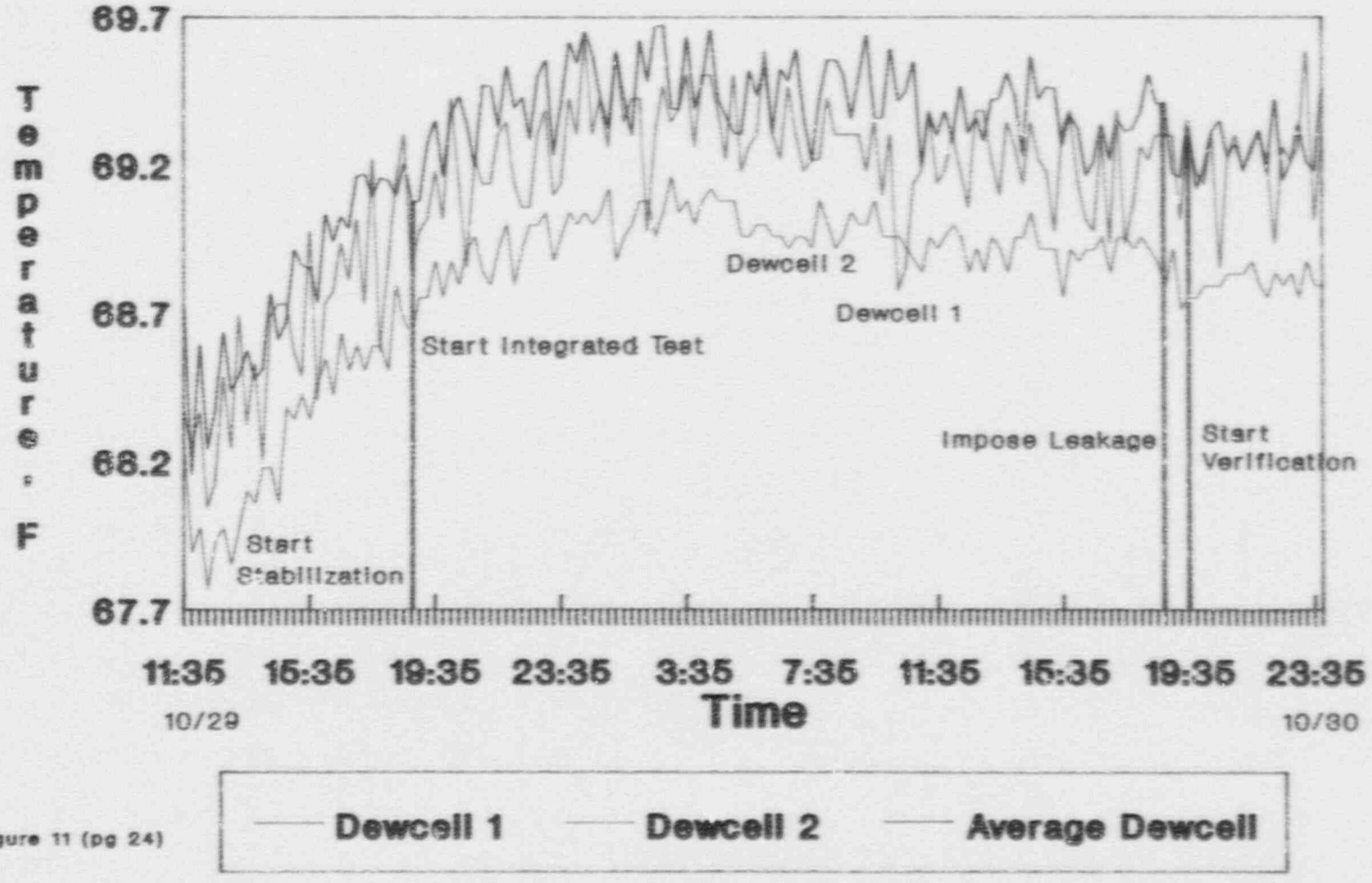


Figure 11 (pg 24)

Dewpoint vs Time

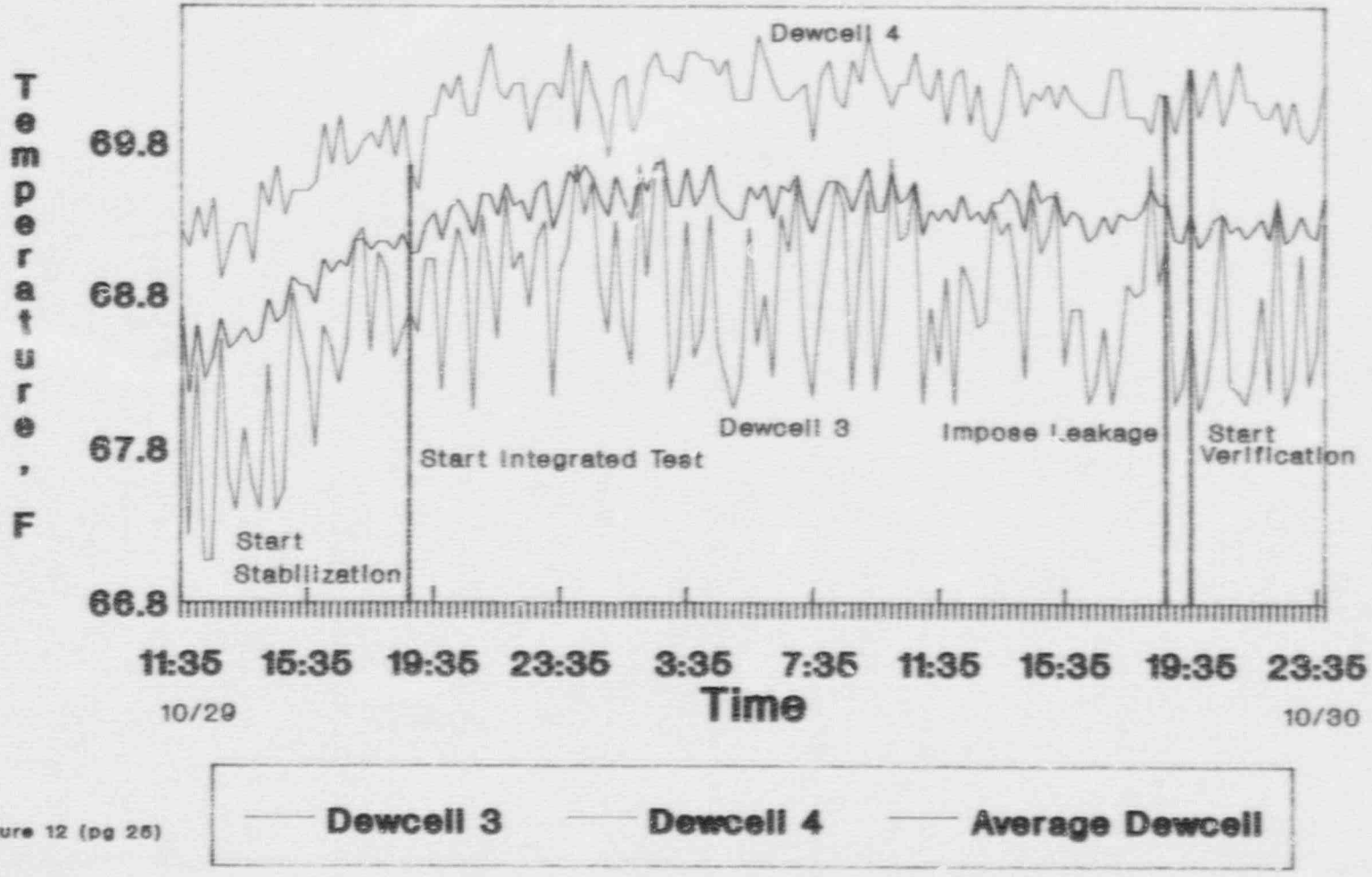


Figure 12 (pg 26)

Dewpoint vs Time

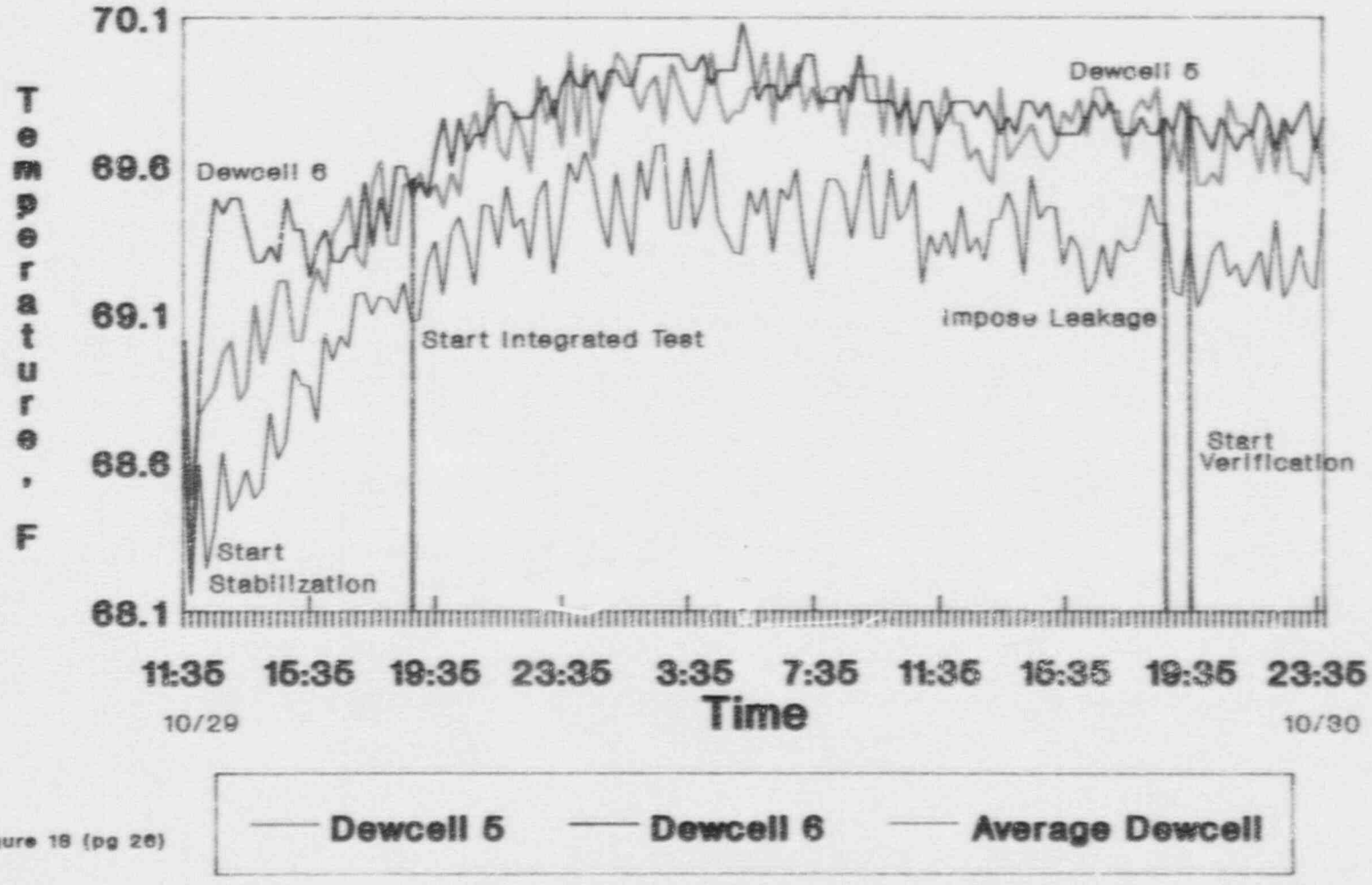


Figure 18 (pg 26)

Pressure vs Time

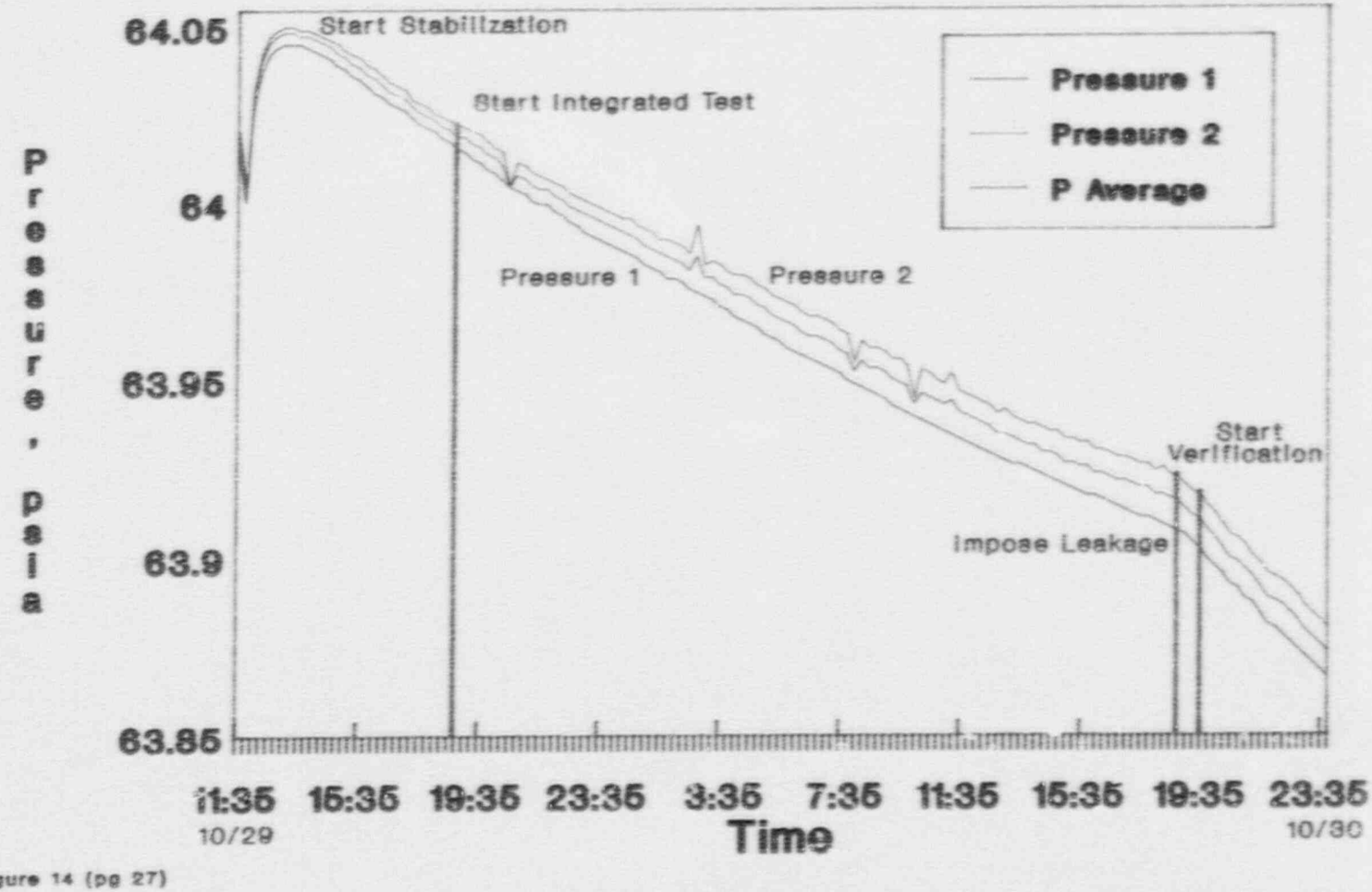


Figure 14 (pg 27)

Containment Temperature vs Time

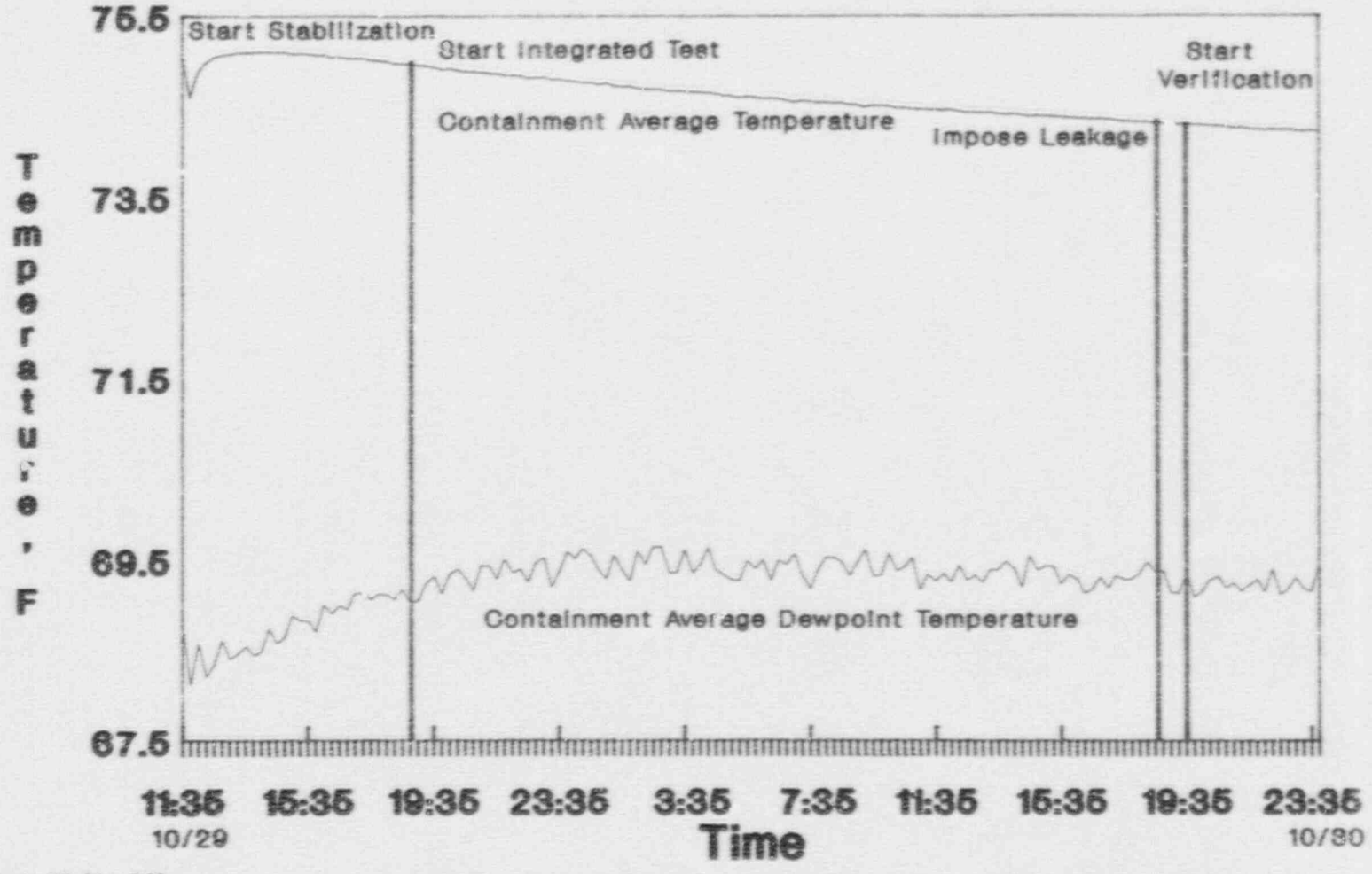


Figure 15 (pg 28)

Containment Pressure vs Time

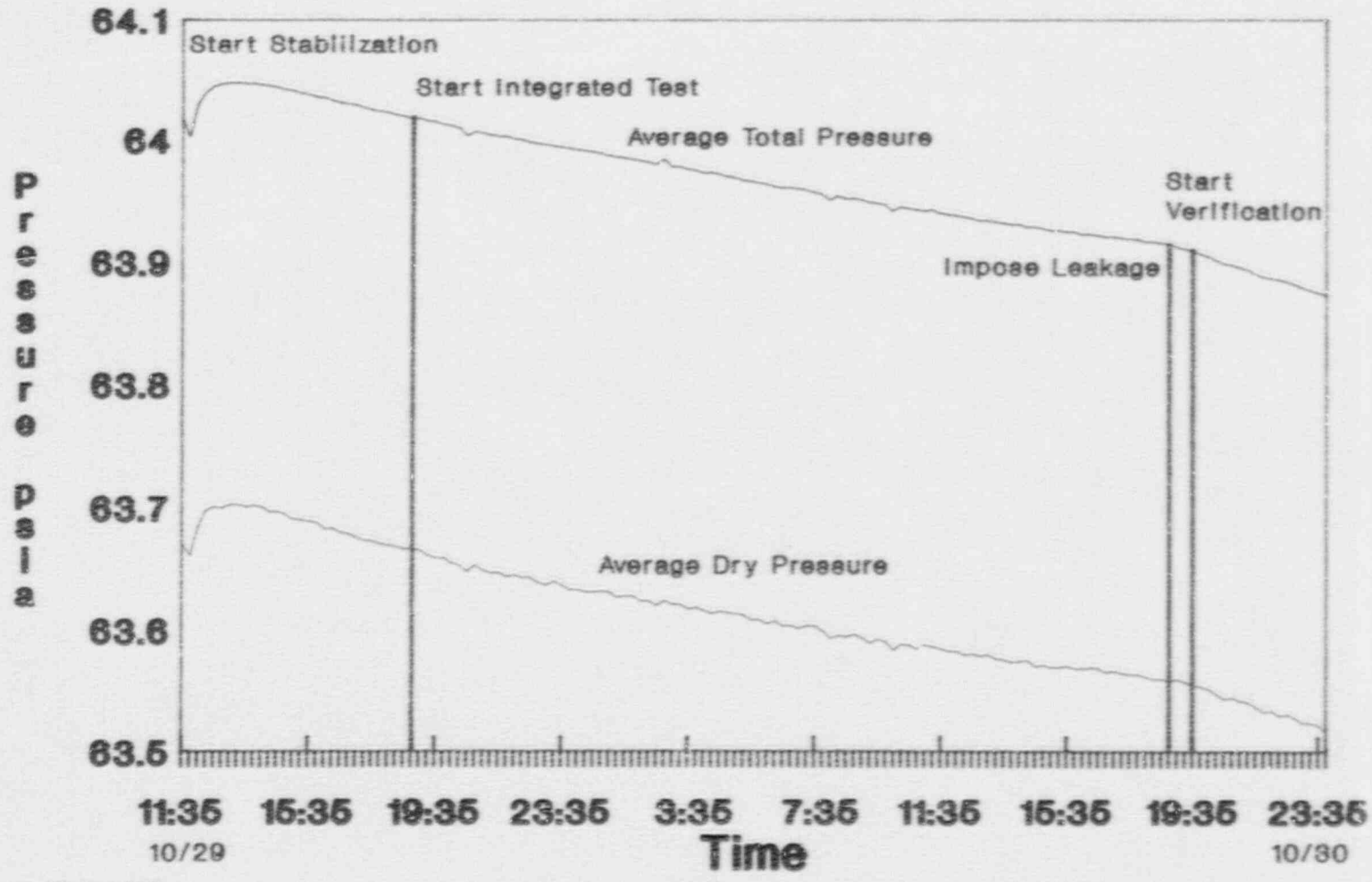


Figure 16 (pg 29)

Containment Air Mass vs Time

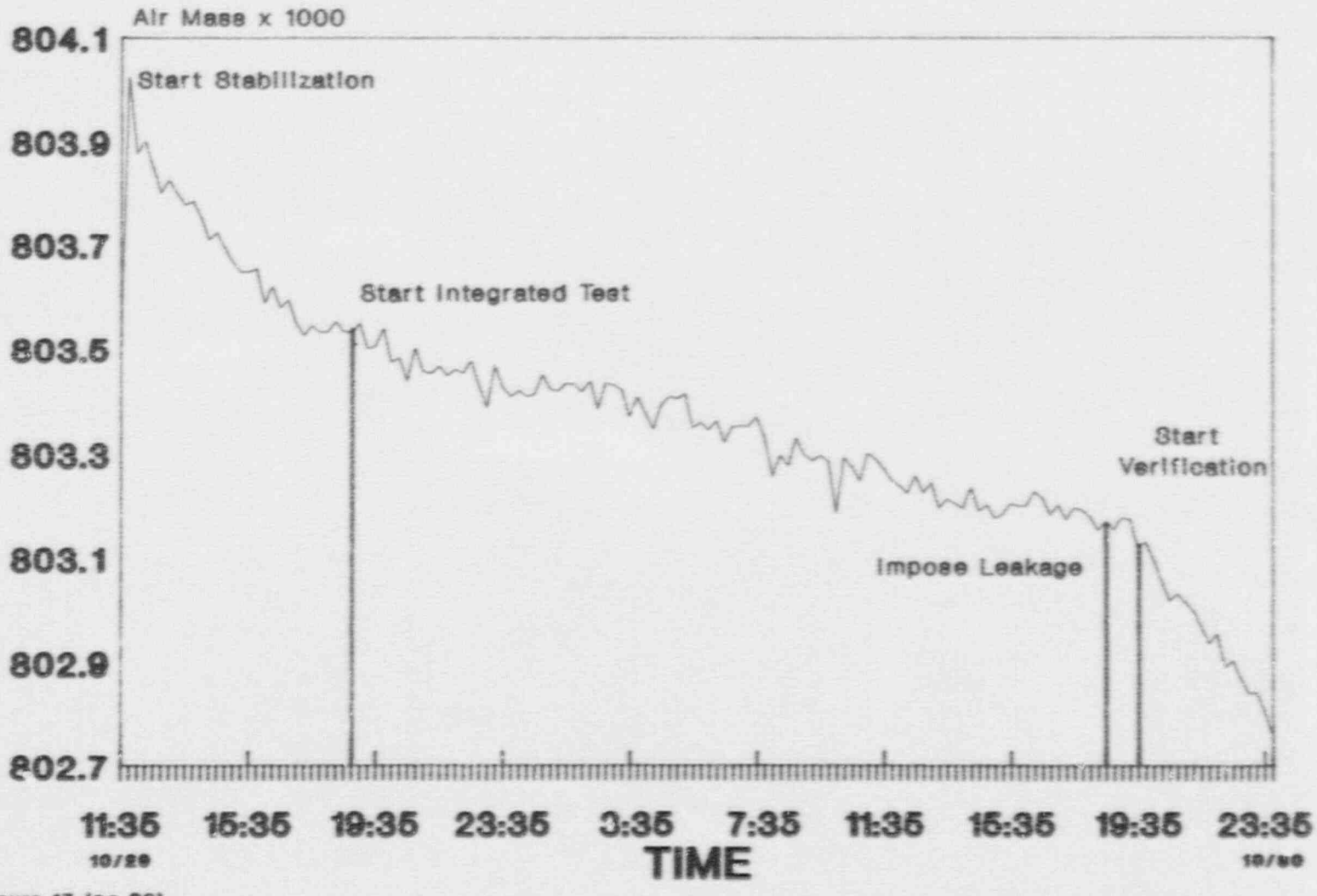


Figure 17 (pg 80)

Leakage vs Time

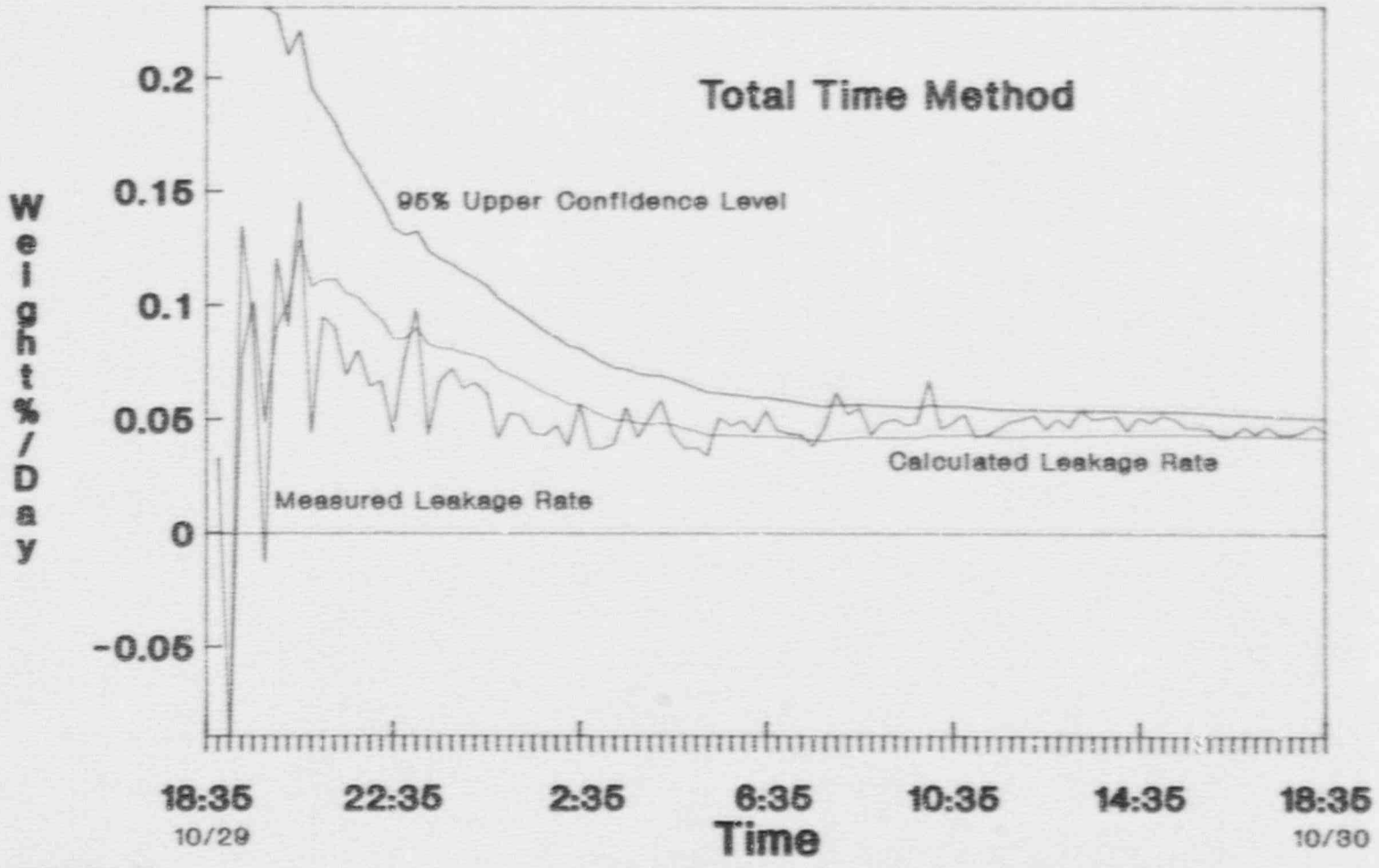


Figure 18 (pg 81)

Leakage vs Time

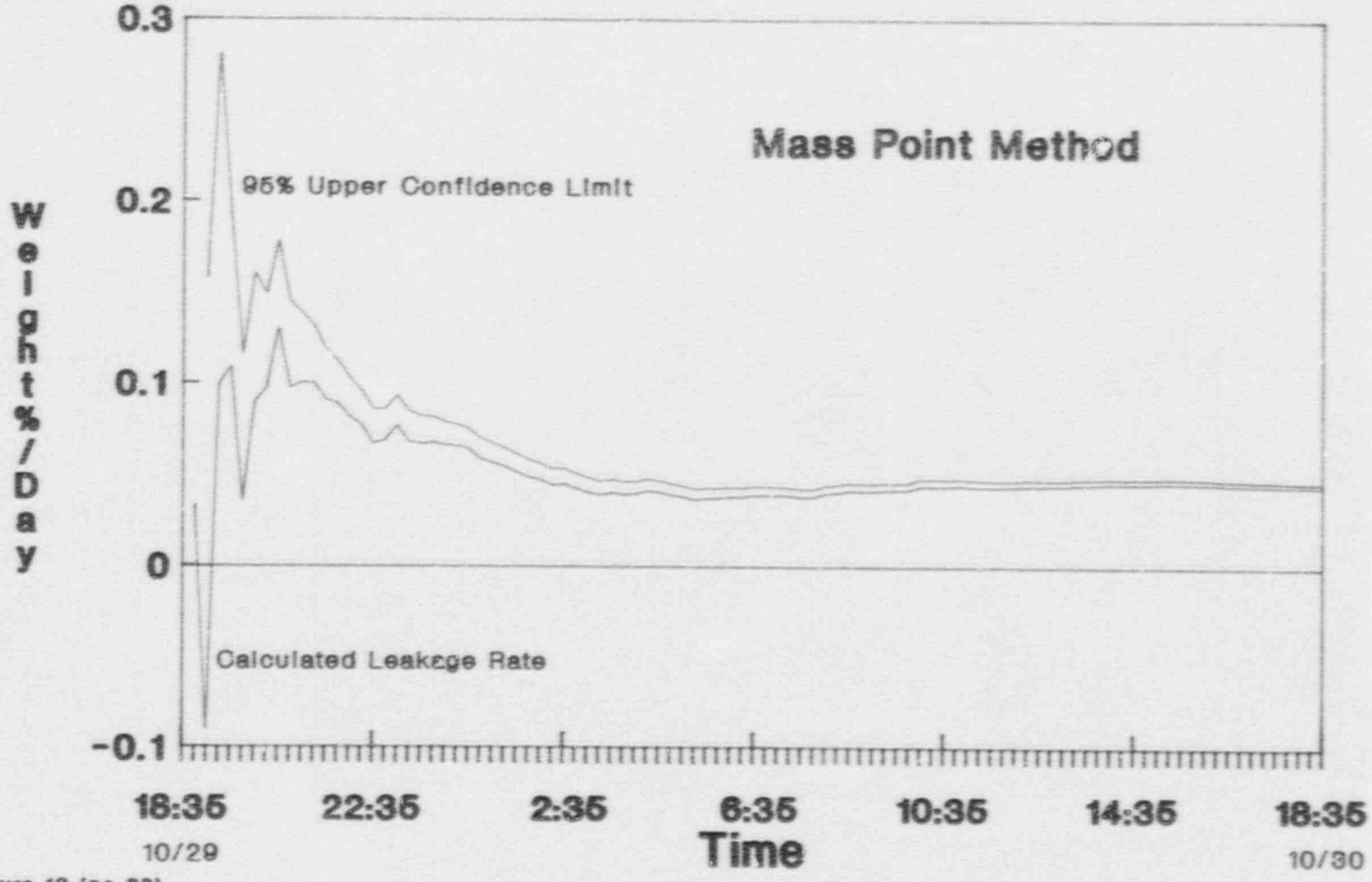


Figure 19 (pg 82)

Verification Leakage vs Time

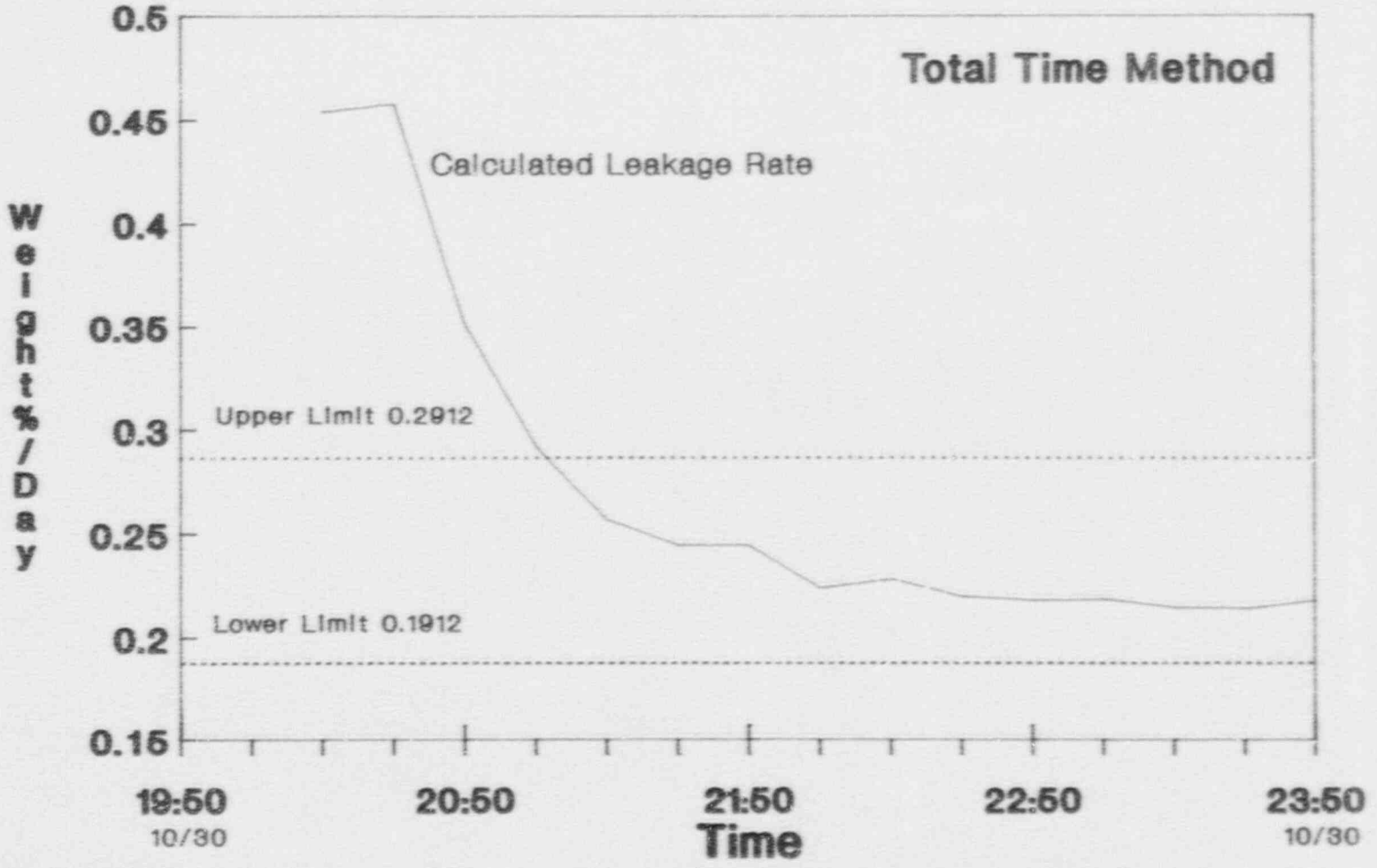


Figure 20 (pg 88)

Verification Leakage vs Time

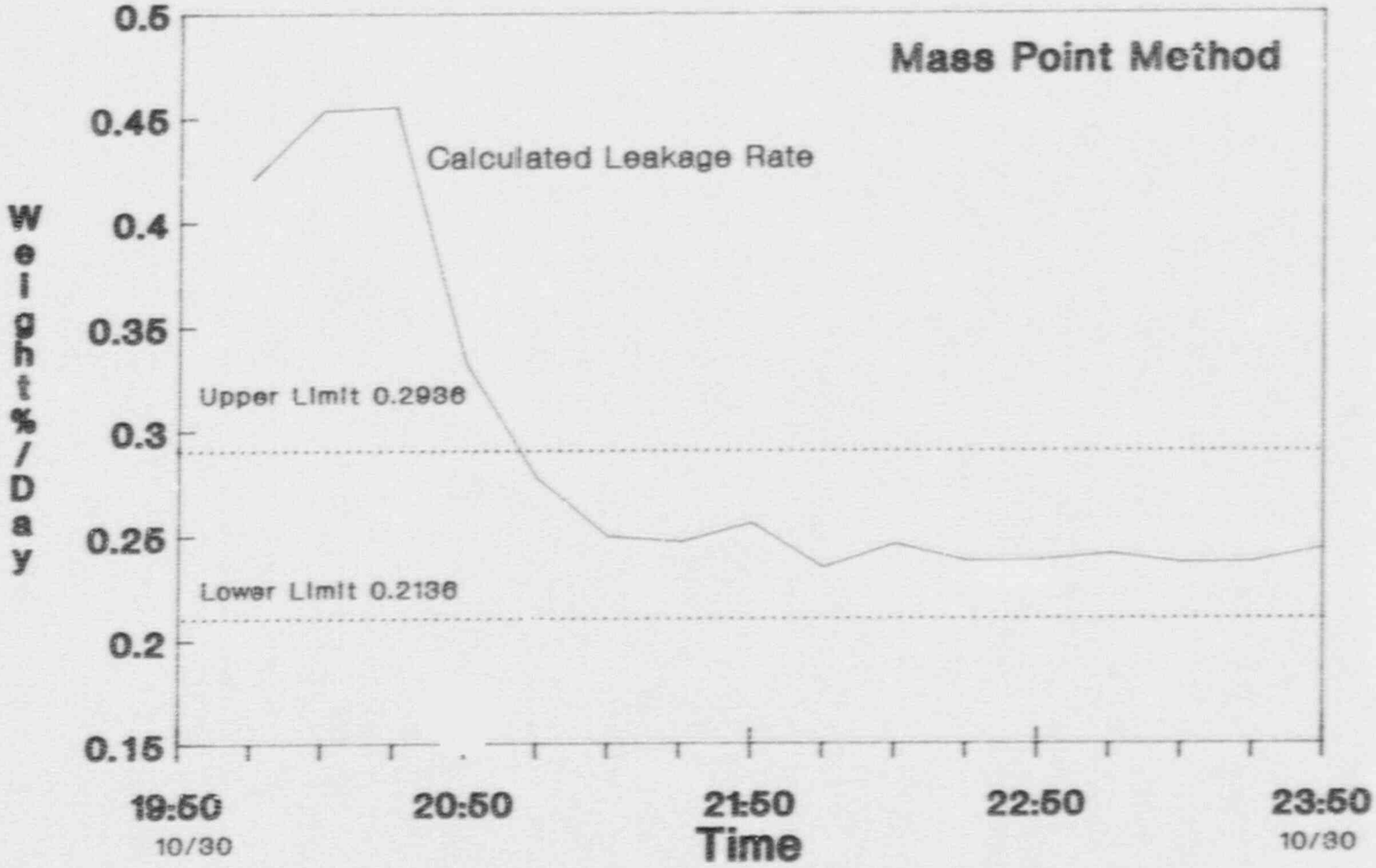


Figure 21 (pg 84)

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =L-001

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BARREL	30OCT87	174.20	2.00	4.00	
BARREL	18AUG88	20.00	2.00	4.00	
BARREL	19AUG88	20.00	2.00	4.00	
BARREL	28DEC88	116.92	2.00	4.00	
BARREL	24OCT89	927.26	20.00	400.00	
BARREL	14MAR90	9.03	0.20	0.04	
BARREL	14AUG90	2406.50	200.00	40000.00	
INNER DR	30OCT87	2.00	0.20	0.04	
INNER DR	16FEB88	62.80	2.00	4.00	
INNER DR	28DEC88	2.00	0.20	0.04	
INNER DR	15MAY89	2.00	0.20	0.04	
INNER DR	23JUN89	2.00	0.20	0.04	
INNER DR	24OCT89	2.70	0.20	0.04	
INNER DR	14MAR90	34.64	2.00	4.00	
INNER DR	14AUG90	2.00	0.20	0.04	
INNER DR	18SEP90	2.00	0.20	0.04	
INNER DR	28OCT90	0.76	2.00	4.00	
OUTER DR	31OCT87	81.40	2.00	4.00	
OUTER DR	16FEB88	997.00	20.00	400.00	
OUTER DR	19AUG88	2.00	0.20	0.04	
OUTER DR	28DEC88	114.80	2.00	4.00	
OUTER DR	15MAY89	17.85	0.20	0.04	
OUTER DR	23JUN89	8.86	0.20	0.04	
OUTER DR	24OCT89	24.26	2.00	4.00	
OUTER DR	14AUG90	2.00	0.20	0.04	
OUTER DR	18SEP90	3.63	0.20	0.04	
OUTER DR	28OCT90	4.54	2.00	4.00	

PENETRATION =L-002

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
O-RINGS	31OCT87	20.00	2.00	4.00	
O-RINGS	14MAY89	10.93	0.20	0.04	
O-RINGS	20SEP90	2.82	2.00	4.00	
O-RINGS	27OCT90	129.34	2.00	4.00	

********** LOCAL LEAK RATE TEST HISTORY **********
********** FROM 4/28/87 TO 10/29/9[illegible]

PENETRATION =L-[illegible]

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ARED (SCCM)	NOTES
BARREL	08MAY87	917.00	20.00	400.00	
BARREL	30OCT87	4167.80	200.00	40000.00	
BARREL	09DEC87	9079.80	200.00	40000.00	
BARREL	17APR88	230.00	20.00	400.00	
BARREL	22SEP88	910.00	20.00	400.00	
BARREL	27NOV88	12944.00	200.00	40000.00	
BARREL	15MAY89	4952.54	200.00	40000.00	
BARREL	23JUN89	11.45	0.20	0.04	
BARREL	16JUL89	473.00	20.00	400.00	
BARREL	15FEB90	6366.45	200.00	40000.00	
BARREL	19JUL90	856.48	20.00	400.00	
INNER DR	08MAY87	7.20	0.20	0.04	
INNER DR	11MAY87	2.25	0.20	0.04	
INNER DR	14MAY8[illegible]	2.00	0.20	0.04	
INNER DR	03JUN87	2.00	0.20	0.04	
INNER DR	19JUN87	2.00	0.20	0.04	
INNER DR	24JUN87	2.00	0.20	0.04	
INNER DR	16JUL87	2.00	0.20	0.04	
INNER DR	25JUL87	2.00	0.20	0.04	
INNER DR	07AUG87	2.00	0.20	0.04	
INNER DR	25AUG87	2.00	0.20	0.04	
INNER DR	30OCT87	2.00	0.20	0.04	
INNER DR	08NOV87	6.73	0.20	0.04	
INNER DR	15NOV87	3.49	0.20	0.04	
INNER DR	17NOV87	4.17	0.20	0.04	
INNER DR	24NOV87	2.00	0.20	0.04	
INNER DR	29NOV87	2.00	0.20	0.04	
INNER DR	02DEC87	2.00	0.20	0.04	
INNER DR	11DEC87	2.00	0.20	0.04	
INNER DR	15DEC87	2.00	0.20	0.04	
INNER DR	06JAN88	2.00	0.20	0.04	
INNER DR	17JAN88	2.00	0.20	0.04	
INNER DR	28JAN88	2.00	0.20	0.04	
INNER DR	02FEB88	2.00	0.20	0.04	
INNER DR	05FEB88	2.00	0.20	0.04	
INNER DR	10FEB88	2.00	0.20	0.04	
INNER DR	16FEB88	2.00	0.20	0.04	
INNER DR	19FEB88	2.00	0.20	0.04	
INNER DR	17MAR88	2.00	0.20	0.04	
INNER DR	25MAR88	3.25	0.20	0.04	
INNER DR	10APR88	2.00	0.00	0.00	
INNER DR	17APR88	2.00	0.20	0.04	
INNER DR	29APR88	11.15	0.20	0.04	
INNER DR	01MAY88	2.00	0.20	0.04	
INNER DR	20MAY8[illegible]	2.00	0.20	0.04	
INNER DR	10JUN88	4.29	0.20	0.04	
INNER DR	26JUL88	2.00	0.20	0.04	
INNER DR	18AUG88	2.00	0.20	0.04	
INNER DR	12SEP88	2.00	0.20	0.04	
INNER DR	22SEP88	20.00	2.00	4.00	

APPENDIX 1

********** LOCAL LEAK RATE TEST HISTORY *********

********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =L-003

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
INNER DR	26SEP88	2.00	0.20	0.04	
INNER DR	01OCT88	3.45	0.20	0.04	
INNER DR	09OCT88	2.00	0.20	0.04	
INNER DR	15OCT88	2.00	0.20	0.04	
INNER DR	21OCT88	2.00	0.20	0.04	
INNER DR	31OCT88	2.00	0.20	0.04	
INNER DR	04NOV88	2.00	0.20	0.04	
INNER DR	12NOV88	2.00	0.20	0.04	
INNER DR	12NOV88	2.00	0.20	0.04	
INNER DR	27NOV88	20.00	2.00	4.00	
INNER DR	04DEC88	2.00	0.20	0.04	
INNER DR	10DEC88	2.00	0.20	0.04	
INNER DR	13DEC88	2.00	0.20	0.04	
INNER DR	15DEC88	2.00	0.20	0.04	
INNER DR	18DEC88	2.00	0.20	0.04	
INNER DR	21DEC88	2.00	0.20	0.04	
INNER DR	25DEC88	2.00	0.20	0.04	
INNER DR	17JAN89	2.00	0.20	0.04	
INNER DR	01MAR89	2.00	0.20	0.04	
INNER DR	29MAR89	2.00	0.20	0.04	
INNER DR	15MAY89	3.52	0.20	0.04	
INNER DR	21MAY89	20.00	2.00	4.00	
INNER DR	24MAY89	5.07	0.20	0.04	
INNER DR	28MAY89	2.00	0.20	0.04	
INNER DR	30MAY89	2.00	0.20	0.04	
INNER DR	10JUN89	2.00	0.20	0.04	
INNER DR	23JUN89	2.08	0.20	0.04	
INNER DR	01JUL89	3.29	0.20	0.04	
INNER DR	16JUL89	2.03	0.20	0.04	
INNER DR	21JUL89	2.31	0.20	0.04	
INNER DR	04AUG89	2.00	0.20	0.04	
INNER DR	09SEP89	5.97	0.20	0.04	
INNER DR	16SEP89	2.00	0.20	0.04	
INNER DR	20OCT89	2.00	0.20	0.04	
INNER DR	04NOV89	2.00	0.20	0.04	
INNER DR	17NOV89	2.00	0.20	0.04	
INNER DR	22DEC89	2.30	0.20	0.04	
INNER DR	19JAN90	2.00	0.20	0.04	
INNER DR	09FEB90	2.00	0.20	0.04	
INNER DR	15FEB90	3.18	0.20	0.04	
INNER DR	25FEB90	2.00	0.20	0.04	
INNER DR	09MAR90	2.00	0.20	0.04	
INNER DR	12APR90	2.00	0.20	0.04	
INNER DR	18APR90	2.00	0.20	0.04	
INNER DR	04MAY90	2.00	0.20	0.04	
INNER DR	10MAY90	2.00	0.20	0.04	
INNER DR	14JUN90	2.00	0.20	0.04	
INNER DR	06JUL90	2.00	0.20	0.04	
INNER DR	19JUL90	2.14	0.20	0.04	
INNER DR	16AUG90	2.00	0.20	0.04	

APPENDIX 1 14:17 WEDNESDAY, JANUARY 9, 1991

********** LOCAL LEAK RATE TEST HISTORY **********

********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =L-003

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
INNER DR	15SEP90	2.00	0.20	0.04	
INNER DR	28OCT90	82.76	2.00	4.00	
OUTER DR	08MAY87	2.00	0.20	0.04	
OUTER DR	11MAY87	13.67	0.20	0.04	
OUTER DR	14MAY87	2.00	0.20	0.04	
OUTER DR	03JUN87	2.00	0.20	0.04	
OUTER DR	19JUN87	2.00	0.20	0.04	
OUTER DR	24JUN87	2.00	0.20	0.04	
OUTER DR	16JUL87	2.00	0.20	0.04	
OUTER DR	25JUL87	2.00	0.20	0.04	
OUTER DR	07AUG87	2.00	0.20	0.04	
OUTER DR	25AUG87	2.00	0.20	0.04	
OUTER DR	30OCT87	2.00	0.20	0.04	
OUTER DR	08NOV87	4.31	0.20	0.04	
OUTER DR	15NOV87	2.50	0.20	0.04	
OUTER DR	17NOV87	2.40	0.20	0.04	
OUTER DR	24NOV87	6.10	0.20	0.04	
OUTER DR	29NOV87	2.90	0.20	0.04	
OUTER DR	02DEC87	5.80	0.20	0.04	
OUTER DR	11DEC87	27.84	2.00	4.00	
OUTER DR	15DEC87	35.60	2.00	4.00	
OUTER DR	06JAN88	34.14	2.00	4.00	
OUTER DR	17JAN88	2.00	0.20	0.04	
OUTER DR	28JAN88	2.00	0.20	0.04	
OUTER DR	02FEB88	2.00	0.20	0.04	
OUTER DR	05FEB88	4.56	0.20	0.04	
OUTER DR	10FEB88	2.00	0.20	0.04	
OUTER DR	16FEB88	2.00	0.20	0.04	
OUTER DR	19FEB88	2.00	0.20	0.04	
OUTER DR	17MAR88	2.00	0.20	0.04	
OUTER DR	25MAR88	4.09	0.20	0.04	
OUTER DR	10APR88	11.21	0.20	0.04	
OUTER DR	17APR88	2.00	0.20	0.04	
OUTER DR	29APR88	16.24	0.20	0.04	
OUTER DR	01MAY88	2.00	0.20	0.04	
OUTER DR	20MAY88	2.65	0.20	0.04	
OUTER DR	10JUN88	2.00	0.20	0.04	
OUTER DR	26JUL88	2.00	0.20	0.04	
OUTER DR	18AUG88	2.00	0.20	0.04	
OUTER DR	12SEP88	2.00	0.20	0.04	
OUTER DR	22SEP88	20.00	2.00	4.00	
OUTER DR	26SEP88	2.00	0.20	0.04	
OUTER DR	01OCT88	2.00	0.20	0.04	
OUTER DR	09OCT88	2.00	0.20	0.04	
OUTER DR	15OCT88	2.69	0.20	0.04	
OUTER DR	21OCT88	2.00	0.20	0.04	
OUTER DR	31OCT88	2.00	0.20	0.04	
OUTER DR	04NOV88	2.00	0.20	0.04	
OUTER DR	27NOV88	20.00	2.00	4.00	
OUTER DR	04DEC88	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =L-003

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
OUTER DR	10DEC88	2.00	0.20	0.04	
OUTER DR	13DEC88	2.00	0.20	0.04	
OUTER DR	15DEC88	2.00	0.20	0.04	
OUTER DR	18DEC88	2.00	0.20	0.04	
OUTER DR	21DEC88	2.00	0.20	0.04	
OUTER DR	25DEC88	2.00	0.20	0.04	
OUTER DR	17JAN89	2.00	0.20	0.04	
OUTER DR	01MAR89	2.00	0.20	0.04	
OUTER DR	29MAR89	2.00	0.20	0.04	
OUTER DR	21MAY89	20.00	2.00	4.00	
OUTER DR	24MAY89	43.84	2.00	4.00	
OUTER DR	28MAY89	65.70	2.00	4.00	
OUTER DR	30MAY89	41.58	2.00	4.00	
OUTER DR	10JUN89	2.00	0.20	0.04	
OUTER DR	23JUN89	2.00	0.20	0.04	
OUTER DR	01JUL89	14.47	0.20	0.04	
OUTER DR	16JUL89	2.00	0.20	0.04	
OUTER DR	21JUL89	2.00	0.20	0.04	
OUTER DR	04AUG89	2.00	0.20	0.04	
OUTER DR	09SEP89	5.95	0.20	0.04	
OUTER DR	16SEP89	2.00	0.20	0.04	
OUTER DR	20OCT89	2.00	0.20	0.04	
OUTER DR	04NOV89	2.00	0.20	0.04	
OUTER DR	17NOV89	2.00	0.20	0.04	
OUTER DR	22DEC89	2.00	0.20	0.04	
OUTER DR	19JAN90	2.00	0.20	0.04	
OUTER DR	09FEB90	2.00	0.20	0.04	
OUTER DR	15FEB90	2.50	0.20	0.04	
OUTER DR	25FEB90	2.00	0.20	0.04	
OUTER DR	09MAR90	2.00	0.20	0.04	
OUTER DR	14MAR90	15.84	0.20	0.04	
OUTER DR	12APR90	2.00	0.20	0.04	
OUTER DR	18APR90	2.00	0.20	0.04	
OUTER DR	04MAY90	2.00	0.20	0.04	
OUTER DR	10MAY90	2.00	0.20	0.04	
OUTER DR	14JUN90	2.00	0.20	0.04	
OUTER DR	06JUL90	2.14	0.20	0.04	
OUTER DR	19JUL90	2.00	0.20	0.04	
OUTER DR	16AUG90	2.00	0.20	0.04	
OUTER DR	15SEP90	2.00	0.20	0.04	
OUTER DR	28OCT90	107.30	2.00	4.00	

********** LOCAL LEAK RATE TEST HISTORY ********
********** FROM 4/28/87 TO 10/29/90 ********

PENETRATION =ZSE253

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	16AUG88	2.00	0.20	0.04	
E-PEN	07FEB90	2.00	0.20	0.04	

PENETRATION =ZSE254

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	22JUL88	2.00	0.20	0.04	
E-PEN	12JAN90	2.00	0.20	0.04	

PENETRATION =ZSE255

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	22JUL88	2.00	0.20	0.04	
E-PEN	12JAN90	2.00	0.20	0.04	

PENETRATION =ZSE258

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	22JUL88	2.00	0.20	0.04	
E-PEN	12JAN90	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY **********
********** FROM 4/28/87 TO 10/29/90 **********

PENETRATION =P-014

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EJHV0024	04APR89	21.30	2.00	4.00	
EJHV0024	05OCT90	100.22	2.00	4.00	
EJHV0026	04APR89	2.00	0.20	0.04	
EJHV0026	05OCT90	17.24	0.20	0.04	

PENETRATION =P-015

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EJHV0023	03APR89	78.50	2.00	4.00	
EJHV0023	05OCT90	364.40	20.00	400.00	
EJHV0025	03APR89	60.70	2.00	4.00	
EJHV0025	05OCT90	550.00	20.00	400.00	

PENETRATION =P-017

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
FUEL TUBE	27OCT87	5.32	0.20	0.04	
FUEL TUBE	11MAY89	6.36	0.20	0.04	
FUEL TUBE	21SEP90	17.34	0.20	0.04	
FUEL TUBE	27OCT90	2.00	0.20	0.04	

PENETRATION =P-022

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BBHV8351B	20OCT87	20.00	2.00	4.00	
BBHV8351B	22APR89	15.16	0.20	0.04	
BBHV8351B	11OCT90	14.78	0.20	0.04	
BBHV8351B	14OCT90	5.23	0.20	0.04	
BBV0148	20OCT87	123.40	2.00	4.00	
BBV0148	22APR89	20.00	2.00	4.00	
BBV0148	11OCT90	21.10	2.00	4.00	

APPENDIX 1
********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/20/90 *******

PENETRATION =P-023

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BGHV8152	09OCT87	761.40	20.00	400.00	
BGHV8152	04MAY89	38.52	2.00	4.00	
BGHV8152	26SEP90	685.00	20.00	400.00	
BGHV8160	09OCT87	236.20	20.00	400.00	
BGHV8160	04MAY89	69.26	2.00	4.00	
BGHV8160	26SEP90	687.00	20.00	400.00	

PENETRATION =P-024

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BGHV8100	22OCT87	26.10	2.00	4.00	
BGHV8100	29APR89	20.00	2.00	4.00	
BGHV8100	23SEP90	2.81	0.20	0.04	
BGHV8100	27SEP90	40.70	2.00	4.00	
BGHV8112	22OCT87	20.00	2.00	4.00	
BGHV8112	29APR89	20.00	2.00	4.00	
BGHV8112	23SEP90	2.00	0.20	0.04	
BGHV8112	27SEP90	38.80	2.00	4.00	
BGV0135	22OCT87	20.00	2.00	4.00	
BGV0135	29APR89	29.80	2.00	4.00	
BGV0135	27SEP90	90.30	2.00	4.00	

PENETRATION =P-025

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BLHV8047	26OCT87	17.50	2.00	4.00	
BLHV8047	07MAY89	3.29	0.20	0.04	
BLHV8047	12OCT90	0.33	0.20	0.04	
BL8046	26OCT87	9.90	0.02	0.00	
BL8046	07MAY89	5.99	0.20	0.04	
BL8046	12OCT90	3.01	0.20	0.04	
BL8046	12OCT90	3.01	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-026

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
HBHV7136	25OCT87	20.00	2.00	4.00	
HBHV7136	30APR89	59.80	2.00	4.00	
HBHV7136	05MAY89	20.00	2.00	4.00	
HBHV7136	08OCT90	11.10	0.20	0.04	
HBHV7176	25OCT87	20.00	2.00	4.00	
HBHV7176	30APR89	74.80	2.00	4.00	
HBHV7176	05MAY89	20.00	2.00	4.00	
HBHV7176	08OCT90	12.20	0.20	0.04	

PENETRATION =P-028

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EFHV0032	05OCT87	35.50	2.00	4.00	TESTED WITH EFHV0034
EFHV0032	29APR89	10.20	0.20	0.04	
EFHV0032	27SEP90	0.00	0.20	0.04	
EFHV0034	05OCT87	35.50	2.00	4.00	TESTED WITH EFHV0032
EFHV0034	29APR89	22.00	2.00	4.00	
EFHV0034	12OCT90	151.00	2.00	4.00	

PENETRATION =P-029

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EFHV0046	05OCT87	541.60	20.00	400.00	TESTED WITH EFHV0048 & 50
EFHV0046	26APR89	19.00	0.20	0.04	
EFHV0046	12OCT90	862.00	20.00	400.00	
EFHV0048	05OCT87	541.60	20.00	400.00	TESTED WITH EFHV0046 & 50
EFHV0048	28APR89	4780.00	200.00	40000.00	TESTED WITH EFHV0050
EFHV0048	12MAY89	12666.00	200.00	40000.00	TESTED WITH EFHV0050
EFHV0048	27SEP90	3214.00	200.00	40000.00	TESTED WITH EFHV0050
EFHV0048	12OCT90	2090.00	200.00	40000.00	TESTED WITH EFHV0050
EFHV0050	05OCT87	541.60	20.00	400.00	TESTED WITH EFHV0046 & 47
EFHV0050	28APR89	4780.00	200.00	40000.00	TESTED WITH EFHV0048
EFHV0050	12MAY89	12666.00	200.00	40000.00	TESTED WITH EFHV0048
EFHV0050	27SEP90	3214.00	200.00	40000.00	TESTED WITH EFHV0048
EFHV0050	12OCT90	2090.00	200.00	40000.00	TESTED WITH EFHV0048

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-030

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
KAFV0029	08OCT87	775.20	20.00	400.00	
KAFV0029	14MAY89	477.60	20.00	400.00	
KAFV0029	15OCT90	307.25	20.00	400.00	
KAFV0029	28OCT90	1215.20	20.00	400.00	
KAV0204	08OCT87	126000.00	200.00	40000.00	PREWORK TEST
KAV0204	23OCT87	20.00	2.00	4.00	
KAV0204	14MAY89	58.54	2.00	4.00	
KAV0204	23OCT90	432.60	20.00	400.00	
KAV0204	28OCT90	115.00	2.00	4.00	

PENETRATION =P-032

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
LFFV0095	25OCT87	11.20	2.00	4.00	
LFFV0095	20APR89	2.00	0.20	0.04	
LFFV0095	26OCT90	4.85	0.20	0.04	
LFFV0096	25OCT87	632.80	20.00	400.00	
LFFV0096	20APR89	420.00	20.00	400.00	
LFFV0096	25OCT90	1175.00	20.00	400.00	
LFFV0096	26OCT90	1136.40	20.00	400.00	

PENETRATION =P-034

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
FLANGES	06MAY87	82.10	2.00	4.00	
FLANGES	26OCT87	49.50	2.00	4.00	
FLANGES	02MAY89	184.98	2.00	4.00	
FLANGES	09SEP90	171.13	2.00	4.00	

********** LOCAL LEAK RATE TEST HISTORY **********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-039

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BBHV8351C	19SEP87	6.32	2.00	4.00	
BBHV8351C	26APR89	4.90	0.20	0.04	
BBHV8351C	06OCT90	6.57	0.20	0.04	
BBHV8351C	10OCT90	338.00	20.00	400.00	
BBV0178	19SEP87	20.00	2.00	4.00	
BBV0178	03OCT87	7.40	0.20	0.04	
BBV0178	27APR89	2000.00	200.00	40000.00	
BBV0178	09MAY89	243.80	20.00	400.00	
BBV0178	10OCT90	349.00	20.00	400.00	

PENETRATION =P-040

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BBHV8351D	03OCT87	2.00	0.20	0.04	
BBHV8351D	22APR89	2.70	0.20	0.04	
BBHV8351D	06OCT90	29.36	2.00	4.00	
BBHV8351D	11OCT90	9.54	0.20	0.04	
BBV0208	03OCT87	85.90	2.00	4.00	
BBV0208	22APR89	75.00	2.00	4.00	
BBV0208	11OCT90	58.12	2.00	4.00	

PENETRATION =P-041

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BBHV8351A	20OCT87	20.00	2.00	4.00	
BBHV8351A	27APR89	7.29	0.20	0.04	
BBHV8351A	06OCT90	44.04	2.00	4.00	
BBHV8351A	11OCT90	32.90	2.00	4.00	
BBV0118	20OCT87	20.00	2.00	4.00	
BBV0118	04MAY89	289.80	20.00	400.00	
BBV0118	11OCT90	187.80	2.00	4.00	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-043

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
HDV0016	18SEP87	528.80	20.00	400.00	
HDV0016	06APR89	15.50	0.20	0.04	
HDV0016	25SEP90	16.33	0.20	0.04	
HDV0017	18SEP87	647.00	20.00	400.00	
HDV0017	06APR89	46.96	2.00	4.00	
HDV0017	23SEP90	15.04	0.20	0.04	

PENETRATION =P-044

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
HBHV7126	05MAY89	125400.00	2000.00	4000000.00	PREWORK TEST
HBHV7126	06MAY89	2.00	0.20	0.04	
HBHV7126	08OCT90	8.68	0.20	0.04	
HBHV7150	05MAY89	20.00	2.00	4.00	
HBHV7150	08OCT90	9.57	0.20	0.04	

PENETRATION =P-045

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EPHV8880	20OCT87	347.60	20.00	400.00	
EPHV8880	20APR89	33.00	2.00	4.00	
EPHV8880	28SEP90	72.50	2.00	4.00	
EPV0046	20OCT87	20.00	2.00	4.00	
EPV0046	20APR89	107.80	2.00	4.00	
EPV0046	28SEP90	0.50	0.20	0.04	

PENETRATION =P-051

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
003HBB01	04MAY87	2.00	0.20	0.04	
003HBB01	07APR89	2.00	0.20	0.04	
003HBB01	10SEP90	3.10	0.20	0.04	
005HBB01	04MAY87	2.00	0.20	0.04	
005HBB01	07APR89	2.00	0.20	0.04	
005HBB01	10SEP90	2.76	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY **********
********** FROM 4/28/87 TO 10/29/90 ********

PENETRATION =P-053

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
ECV0083	08OCT87	475.60	20.00	400.00	
ECV0083	06APR89	20.00	2.00	4.00	
ECV0083	10OCT90	0.32	0.20	0.04	
ECV0084	08OCT87	20.00	2.00	4.00	
ECV0084	06APR89	20.00	2.00	4.00	
ECV0084	10OCT90	0.47	0.20	0.04	

PENETRATION =P-054

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
ECV0087	20OCT87	140.00	2.00	4.00	
ECV0087	07APR89	180.10	2.00	4.00	
ECV0087	10OCT90	77.20	2.00	4.00	
ECV0088	20OCT87	99.90	2.00	4.00	
ECV0088	07APR89	104.20	2.00	4.00	
ECV0088	10OCT90	46.40	2.00	4.00	

PENETRATION =P-055

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
ECV0095	08OCT87	20.00	2.00	4.00	
ECV0095	07APR89	20.00	2.00	4.00	
ECV0095	10OCT90	0.13	0.20	0.04	
ECV0096	08OCT87	20.00	2.00	4.00	
ECV0096	07APR89	20.00	2.00	4.00	
ECV0096	10OCT90	15.58	0.20	0.04	

PENETRATION =P-056

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GSHV0008	07OCT87	319.60	20.00	400.00	
GSHV0008	16APR89	1336.00	20.00	400.00	
GSHV0008	22SEP90	98.16	2.00	4.00	
GSHV0009	07OCT87	382.20	20.00	400.00	
GSHV0009	16APR89	1339.00	20.00	400.00	
GSHV0009	22SEP90	152.08	2.00	4.00	
GSHV0038	07OCT87	57.20	2.00	4.00	
GSHV0038	16APR89	630.00	20.00	400.00	

APPENDIX 1

********** LOCAL LEAK RATE TEST HISTORY **********

********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-056

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GSHV0038	07OCT90	129.30	2.00	4.00	
GSHV0039	07OCT87	28.50	2.00	4.00	
GSHV0039	16APR89	519.00	20.00	400.00	
GSHV0039	07OCT90	130.00	2.00	4.00	

PENETRATION =P-057

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
SJHV0131	17SEP87	82.20	2.00	4.00	TESTED WITH SJHV0132
SJHV0131	06APR89	26.82	2.00	4.00	TESTED WITH SJHV0132
SJHV0131	07OCT90	22.50	2.00	4.00	TESTED WITH SJHV0132
SJHV0132	17SEP87	82.20	2.00	4.00	TESTED WITH SJHV0131
SJHV0132	06APR89	26.83	2.00	4.00	TESTED WITH SJHV0131
SJHV0132	07OCT90	22.50	2.00	4.00	TESTED WITH SJHV0131
SJV0111	17SEP87	47.80	2.00	4.00	
SJV0111	06APR89	20.00	2.00	4.00	
SJV0111	07OCT90	9.10	0.20	0.04	

PENETRATION =P-058

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EMHV8888	04OCT87	2.78	0.20	0.04	
EMHV8888	05APR89	2.43	0.20	0.04	
EMHV8888	07OCT90	100.10	2.00	4.00	
EMV0006	04OCT87	2.60	0.20	0.04	
EMV0006	05APR89	3.36	0.20	0.04	
EMV0006	07OCT90	89.30	2.00	4.00	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/25/90 *******

PENETRATION =P-062

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BBHV8026	17SEP87	2.00	0.20	0.04	
BBHV8026	01MAY89	20000.00	2000.00	4000000.00	PREWORK TEST
BBHV8026	10MAY89	2.00	0.20	0.04	
BBHV8026	25OCT90	0.74	0.20	0.04	
BBHV8027	17SEP87	2.00	0.20	0.04	
BBHV8027	30APR89	821.00	20.00	400.00	
BBHV8027	10MAY89	2.00	0.20	0.04	
BBHV8027	25OCT90	2.55	0.20	0.04	

PENETRATION =P-063

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
KAV0039	24OCT87	895.40	20.00	400.00	
KAV0039	12MAY89	146.44	2.00	4.00	
KAV0039	22OCT90	129800.00	2000.00	4000000.00	AS-FOUND
KAV0039	26OCT90	816.20	20.00	400.00	
KAV0118	24OCT87	9430.00	20.00	400.00	
KAV0118	12MAY89	134.52	2.00	4.00	
KAV0118	22OCT90	360.60	20.00	400.00	

PENETRATION =P-064

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
SJHV0128	21OCT87	1657.80	20.00	400.00	
SJHV0128	22APR89	20.00	2.00	4.00	
SJHV0128	07OCT90	28.60	2.00	4.00	
SJHV0129	09AUG87	1506.60	20.00	400.00	TESTED WITH SJHV0130
SJHV0129	21OCT87	1928.00	20.00	400.00	TESTED WITH SJHV0130
SJHV0129	22APR89	98.00	2.00	4.00	TESTED WITH SJHV0130
SJHV0129	07OCT90	60.50	2.00	4.00	TESTED WITH SJHV0130
SJHV0130	09AUG87	1501.60	20.00	400.00	TESTED WITH SJHV0129
SJHV0130	21OCT87	1928.00	20.00	400.00	TESTED WITH SJHV0129
SJHV0130	22APR89	98.00	2.00	4.00	TESTED WITH SJHV0129
SJHV0130	07OCT90	60.50	2.00	4.00	TESTED WITH SJHV0129
SJHV0130	07OCT90	60.50	2.00	4.00	TESTED WITH SJHV0129

APPENDIX 1
********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-065

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GSHV0020	23OCT87	627.20	20.00	400.00	
GSHV0020	16APR89	770.00	20.00	400.00	TESTED WITH GSHV0021
GSHV0020	14SEP90	508.60	20.00	400.00	TESTED WITH GSHV0021
GSHV0020	06OCT90	988.80	20.00	400.00	TESTED WITH GSHV0021
GSHV0020	27OCT90	724.20	20.00	400.00	TESTED WITH GSHV0021
GSHV0021	19SEP87	1060.00	20.00	400.00	
GSHV0021	16APR89	770.00	20.00	400.00	TESTED WITH GSHV0020
GSHV0021	14SEP90	508.60	20.00	400.00	TESTED WITH GSHV0020
GSHV0021	06OCT90	988.80	20.00	400.00	TESTED WITH GSHV0020
GSHV0021	27OCT90	724.20	20.00	400.00	TESTED WITH GSHV0020

PENETRATION =P-067

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
KCHV0253	30OCT87	68.26	2.00	4.00	
KCHV0253	29APR89	210.80	20.00	400.00	
KCHV0253	10OCT90	4410.0	200.00	40000.00	
KCHV0253	28OCT90	62.00	2.00	4.00	
KCV0478	30OCT87	21.90	20.00	400.00	
KCV0478	31OCT87	805.80	20.00	400.00	
KCV0478	29APR89	2000.00	200.00	40000.00	
KCV0478	10OCT90	875.00	20.00	400.00	

PENETRATION =P-069

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
SJHV0012	12MAY87	20.00	2.00	4.00	
SJHV0012	28OCT87	69.80	2.00	4.00	
SJHV0012	06APR89	1169.00	20.00	400.00	
SJHV0012	24SEP90	498.33	20.00	400.00	
SJHV0013	28OCT87	60.60	2.00	4.00	
SJHV0013	06APR89	320.00	20.00	400.00	
SJHV0013	24SEP90	458.80	20.00	400.00	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-071

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EFHV0031	21OCT87	2160.00	20.00	400.00	TESTED WITH EFHV0033
EFHV0031	13MAY89	2272.00	200.00	40000.00	
EFHV0031	21OCT90	-	-	-	AS-FOUND, UNABLE TO PRESSURIZE
EFHV0031	28OCT90	594.40	20.00	400.00	
EFHV0033	21OCT87	2160.00	20.00	400.00	TESTED WITH EFHV0031
EFHV0033	13MAY89	1044.20	20.00	400.00	
EFHV0033	21OCT90	117380.00	2000.00	4000000.00	AS-FOUND
EFHV0033	28OCT90	7870.00	200.00	40000.00	

PENETRATION =P-073

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EFHV0045	21OCT87	780.80	20.00	400.00	TESTED WITH EFHV0047 & 49
EFHV0045	14MAY89	9980.00	200.00	40000.00	
EFHV0045	21OCT90	-	-	-	AS-FOUND, UNABLE TO PRESSURIZE
EFHV0045	28OCT90	11360.00	200.00	40000.00	
EFHV0047	21OCT87	780.80	20.00	400.00	TESTED WITH EFHV0045 & 49
EFHV0047	14MAY89	740.40	20.00	400.00	TESTED WITH EFHV0049
EFHV0047	21OCT90	185760.00	2000.00	4000000.00	TESTED WITH EFHV0049, AS-FOUND
EFHV0047	28OCT90	282.00	20.00	400.00	TESTED WITH EFHV0049
EFHV0049	21OCT87	780.80	20.00	400.00	TESTED WITH EFHV0045 & 47
EFHV0049	14MAY89	740.40	20.00	400.00	TESTED WITH EFHV0047
EFHV0049	21OCT90	185760.00	2000.00	4000000.00	TESTED WITH EFHV0047, AS-FOUND
EFHV0049	28OCT90	282.00	20.00	400.00	TESTED WITH EFHV0047

PENETRATION =P-074

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EGHV0058	15SEP87	630.40	20.00	400.00	TESTED WITH EGHV0127
EGHV0058	08MAY89	6750.00	200.00	40000.00	TESTED WITH EGHV0127
EGHV0058	23SEP90	1597.80	20.00	400.00	TESTED WITH EGHV0127
EGHV0058	13OCT90	9.74	0.20	0.04	TESTED WITH EGHV0127
EGHV0127	15SEP87	630.40	20.00	400.00	TESTED WITH EGHV0058
EGHV0127	08MAY89	6750.00	200.00	40000.00	TESTED WITH EGHV0058
EGHV0127	23SEP90	1597.80	20.00	400.00	TESTED WITH EGHV0058
EGHV0127	13OCT90	9.74	0.20	0.04	TESTED WITH EFHV0058
EGV0204	15OCT87	355.20	20.00	400.00	
EGV0204	08MAY89	5380.00	200.00	40000.00	
EGV0204	23SEP90	2222.00	200.00	40000.00	

APPENDIX 1

********** LOCAL LEAK RATE TEST HISTORY *********

********** FROM 4/28/87 TO 10/29/90 *******

---------- PENETRATION =P-075 ----------

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EGHV0059	19OCT87	2566.00	20.00	400.00	TESTED WITH EGHV0131
EGHV0059	08MAY89	896.00	20.00	400.00	TESTED WITH EGHV0131
EGHV0059	23SEP90	886.80	20.00	400.00	TESTED WITH EGHV0131
EGHV0059	13OCT90	103.98	2.00	4.00	TESTED WITH EGHV0131
EGHV0060	19OCT87	1623.60	20.00	400.00	TESTED WITH EGHV0130
EGHV0060	08MAY89	1800.00	20.00	400.00	TESTED WITH EGHV0130
EGHV0060	23SEP90	1594.60	20.00	400.00	TESTED WITH EGHV0130
EGHV0060	13OCT90	887.80	20.00	400.00	TESTED WITH EGHV0130
EGHV0060	28OCT90	743.20	20.00	400.00	TESTED WITH EGHV0130
EGHV0130	19OCT87	1623.60	20.00	400.00	TESTED WITH EGHV0060
EGHV0130	08MAY89	1800.00	20.00	400.00	TESTED WITH EGHV0060
EGHV0130	23SEP90	1594.60	20.00	400.00	TESTED WITH EGHV0060
EGHV0130	13OCT90	887.80	20.00	400.00	TESTED WITH EGHV0060
EGHV0130	28OCT90	743.20	20.00	400.00	TESTED WITH EGHV0060
EGHV0131	19OCT87	2566.00	20.00	400.00	TESTED WITH EGHV0059
EGHV0131	08MAY89	896.00	20.00	400.00	TESTED WITH EGHV0059
EGHV0131	23SEP90	886.80	20.00	400.00	TESTED WITH EGHV0059
EGHV0131	13OCT90	103.98	2.00	4.00	TESTED WITH EGHV0059

---------- PENETRATION =P-076 ----------

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EGHV0061	19OCT87	243.80	20.00	400.00	TESTED WITH EGHV0133
EGHV0061	08MAY89	84.20	2.00	4.00	TESTED WITH EGHV0133
EGHV0061	07SEP89	790.00	20.00	400.00	TESTED WITH EGHV0133
EGHV0061	24SEP90	574.00	20.00	400.00	TESTED WITH EGHV0133
EGHV0061	28OCT90	16.80	0.20	0.04	TESTED WITH EGHV0133
EGHV0062	19OCT87	151.70	2.00	4.00	TESTED WITH EGHV0132
EGHV0062	08MAY89	139.00	2.00	4.00	TESTED WITH EGHV0132
EGHV0062	24SEP90	982.80	20.00	400.00	TESTED WITH EGHV0132
EGHV0062	28OCT90	31.00	2.00	4.00	TESTED WITH EGHV0132
EGHV0132	19OCT87	151.70	2.00	4.00	TESTED WITH EGHV0062
EGHV0132	08MAY89	139.60	2.00	4.00	TESTED WITH EGHV0062
EGHV0132	24SEP90	982.80	20.00	400.00	TESTED WITH EGHV0062
EGHV0132	28OCT90	31.00	2.00	4.00	TESTED WITH EGHV0062
EGHV0133	19OCT87	243.80	20.00	400.00	TESTED WITH EGHV0061
EGHV0133	08MAY89	84.20	2.00	4.00	TESTED WITH EGHV0061
EGHV0133	07SEP89	790.00	20.00	400.00	TESTED WITH EGHV0061
EGHV0133	24SEP90	574.00	20.00	400.00	TESTED WITH EGHV0061
EGHV0133	28OCT90	16.80	0.20	0.04	TESTED WITH EGHV0061

APPENDIX 1

********** LOCAL LEAK RATE TEST HISTORY *********

********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-078

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BMV0045	15SEP87	37.70	2.00	4.00	
BMV0045	10MAY89	2.00	0.20	0.04	
BMV0045	28SEP90	4.18	0.20	0.04	
BMV0046	15SEP87	11.50	0.20	0.04	
BMV0046	10MAY89	2.00	0.20	0.04	
BMV0046	28SEP90	0.12	0.20	0.04	

PENETRATION =P-080

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
BGHV8105	23OCT87	1246.60	20.00	400.00	
BGHV8105	24APR89	20.00	2.00	4.00	
BGHV8105	06OCT90	166.80	2.00	4.00	
BGV8381	23OCT87	768.20	20.00	400.00	
BGV8381	24APR89	200.60	20.00	400.00	
BGV8381	06OCT90	243.80	20.00	400.00	
BGV8381	06OCT90	243.80	20.00	400.00	

PENETRATION =P-092

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
EMHV8871	27APR89	374.00	20.00	400.00	
EMHV8871	08OCT90	0.85	0.20	0.04	
EMHV8964	27APR89	320.00	20.00	400.00	
EMHV8964	08OCT90	1.59	0.20	0.04	

PENETRATION =P-093

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
SJHV0005	07APR89	572.00	20.00	400.00	
SJHV0005	06OCT90	.	.	.	AS-FOUND, UNABLE TO PRESSURIZE
SJHV0005	23OCT90	62.12	2.00	4.00	
SJHV0006	07APR89	656.00	20.00	400.00	TESTED WITH SJHV0127
SJHV0006	06OCT90	902.80	20.00	400.00	TESTED WITH SJHV0127
SJHV0127	07APR89	656.00	20.00	400.00	TESTED WITH SJHV0006
SJHV0127	06OCT90	902.80	20.00	400.00	TESTED WITH SJHV0006

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-095

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
SJHV0018	15SEP87	126.00	2.00	4.00	
SJHV0018	23APR89	20.00	2.00	4.00	
SJHV0018	08OCT90	13.40	0.20	0.04	
SJHV0019	15SEP87	73.10	2.00	4.00	
SJHV0019	24APR89	60.00	2.00	4.00	
SJHV0019	08OCT90	627.80	20.00	400.00	

PENETRATION =P-097

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GSHV0017	06OCT87	5.00	0.20	0.04	
GSHV0017	17APR89	5.74	0.20	0.04	
GSHV0017	25SEP90	2.00	0.20	0.04	
GSHV0018	06OCT87	2.00	0.20	0.04	
GSHV0018	17APR89	4.15	0.20	0.04	
GSHV0018	25SEP90	0.79	0.20	0.04	
GSHV0033	07OCT87	28.40	2.00	4.00	
GSHV0033	17APR89	457.20	20.00	400.00	
GSHV0033	25SEP90	11.91	0.20	0.04	
GSHV0034	07OCT87	7.44	0.20	0.04	
GSHV0034	17APR89	422.80	20.00	400.00	
GSHV0034	25SEP90	11.94	0.20	0.04	

PENETRATION =P-098

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
KBV0001	24OCT87	20.00	2.00	4.00	
KBV0001	06MAY89	554.00	20.00	400.00	
KBV0001	15OCT90	2.17	0.20	0.04	
KBV0002	24OCT87	20.00	2.00	4.00	
KBV0002	06MAY89	315.00	20.00	400.00	
KBV0002	15OCT90	2.99	0.20	0.04	

APPENDIX I

14:17 WEDNESDAY, JANUARY 9, 1991

********** LOCAL LEAK RATE TEST HISTORY **********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-09C

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GSHV0003	07OCT87	490.80	20.00	400.00	
GSHV0003	15APR89	1552.40	20.00	400.00	
GSHV0003	22SEP90	190.70	2.00	4.00	
GSHV0004	07OCT87	123.60	2.00	4.00	
GSHV0004	15APR89	21.00	2.00	4.00	
GSHV0004	22SEP90	6.84	2.00	4.00	
GSHV0005	07OCT87	431.20	20.00	400.00	
GSHV0005	15APR89	131.40	2.00	4.00	
GSHV0005	22SEP90	48.04	2.00	4.00	
GSHV0036	07OCT87	804.20	20.00	400.00	
GSHV0036	16APR89	1026.20	20.00	400.00	
GSHV0036	22SEP90	574.00	2.00	4.00	
GSHV0036	08OCT90	268.00	20.00	400.00	
GSHV0037	07OCT87	230.20	20.00	400.00	
GSHV0037	16APR89	147.60	2.00	4.00	
GSHV0037	08OCT90	268.00	20.00	400.00	

PENETRATION =P-101

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GSHV0012	06OCT87	24.50	2.00	4.00	
GSHV0012	16APR89	222.60	20.00	400.00	
GSHV0012	25SEP90	134.00	2.00	4.00	
GSHV0013	05OCT87	11.32	0.20	0.04	
GSHV0013	16APR89	30.50	2.00	4.00	
GSHV0013	25SEP90	16.73	0.20	0.04	
GSHV0014	06OCT87	5680.00	200.00	40000.00	
GSHV0014	07OCT87	28.30	2.00	4.00	
GSHV0014	16APR89	39.67	2.00	4.00	
GSHV0014	25SEP90	23.68	2.00	4.00	
GSHV0031	06OCT87	185.96	2.00	4.00	
GSHV0031	16APR89	230.00	20.00	400.00	
GSHV0031	25SEP90	642.40	20.00	400.00	
GSHV0032	06OCT87	202.80	20.00	400.00	
GSHV0032	16APR89	150.60	2.00	4.00	
GSHV0032	25SEP90	209.80	20.00	400.00	

ULNRC-2351

APPENDIX 1 14:17 WEDNESDAY, JANUARY 9, 1991

********** LOCAL LEAK RATE TEST HISTORY **********

********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-160

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GTHZ0008	18AUG87	103220.00	2000.00	4000000.00	PREWORK TEST
GTHZ0008	28OCT87	395.00	20.00	400.00	
GTHZ0008	15MAY89	464.80	20.00	400.00	
GTHZ0009	17AUG87	507.00	20.00	400.00	
GTHZ0009	28OCT87	1550.20	20.00	400.00	
GTHZ0009	15MAY89	3016.00	200.00	40000.00	
GTHZ0011	07MAY87	4530.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	07MAY87	37700.00	2000.00	4000000.00	TESTED WITH GTHZ0012, PREWORK TEST
GTHZ0011	24JUL87	7280.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	30OCT87	10504.00	20.00	400.00	TESTED WITH GTHZ0012
GTHZ0011	14JAN88	5740.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	07APR88	8100.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	29JUN88	15580.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	23SEP88	730.00	20.00	400.00	TESTED WITH GTHZ0012
GTHZ0011	29DEC88	13176.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	08MAR89	17720.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	15MAY89	18452.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	15MAY89	18462.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	23AUG89	18250.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	14NOV89	5352.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	24JAN90	19652.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	04MAY90	5996.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	27JUL90	8160.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0011	12SEP90	6266.00	200.00	40000.00	TESTED WITH GTHZ0012
GTHZ0012	07MAY87	4530.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	07MAY87	37700.00	2000.00	4000000.00	TESTED WITH GTHZ0011, PREWORK TEST
GTHZ0012	24JUL87	7280.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	30OCT87	10504.00	20.00	400.00	TESTED WITH GTHZ0011
GTHZ0012	07APR88	8100.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	14APR88	5740.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	29JUN88	15580.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	23SEP88	730.00	20.00	400.00	TESTED WITH GTHZ0011
GTHZ0012	29DEC88	13176.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	08MAR89	17720.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	15MAY89	18452.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	23AUG89	18250.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	14NOV89	5352.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	24JAN90	19652.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	04MAY90	5996.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	27JUL90	8160.00	200.00	40000.00	TESTED WITH GTHZ0011
GTHZ0012	12SEP90	6266.00	200.00	40000.00	TESTED WITH GTHZ0011

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =P-161

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
GTHZ0004	07MAY87	11890.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	27OCT87	32.60	2.00	4.00	TESTED WITH GTHZ0005
GTHZ0004	14JAN88	121360.00	20.00	400.00	TESTED WITH GTHZ0005, PRE-WORK
GTHZ0004	15JAN88	53.90	2.00	4.00	TESTED WITH GTHZ0005
GTHZ0004	07APR88	5740.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	29MAY88	9910.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	29JUN88	9.91	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	23SEP88	12870.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	14DEC88	10192.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	08MAR89	1717.80	20.00	400.00	TESTED WITH GTHZ0005
GTHZ0004	14MAY89	6886.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	23AUG89	12144.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	14NOV89	90.80	2.00	4.00	TESTED WITH GTHZ0005
GTHZ0004	24JAN90	3880.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	04MAY90	5704.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	27JUL90	9060.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0004	12SEP90	4480.00	200.00	40000.00	TESTED WITH GTHZ0005
GTHZ0005	07MAY87	11890.00	20.00	400.00	TESTED WITH GTHZ0004
GTHZ0005	27OCT87	32.60	2.00	4.00	TESTED WITH GTHZ0004
GTHZ0005	14JAN88	121360.00	20.00	400.00	TESTED WITH GTHZ0004, PRE-WORK
GTHZ0005	15JAN88	53.90	2.00	4.00	TESTED WITH GTHZ0004
GTHZ0005	07APR88	5740.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	29JUN88	9910.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	23SEP88	12870.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	14DEC88	10192.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	08MAR89	1717.80	20.00	400.00	TESTED WITH GTHZ0004
GTHZ0005	14MAY89	6886.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	14MAY89	6886.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	23AUG89	12144.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	14NOV89	90.80	2.00	4.00	TESTED WITH GTHZ0004
GTHZ0005	24JAN90	3880.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	04MAY90	5704.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	27JUL90	9060.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0005	12SEP90	4480.00	200.00	40000.00	TESTED WITH GTHZ0004
GTHZ0006	17AUG87	482.20	20.00	400.00	
GTHZ0006	28OCT87	473.00	20.00	400.00	
GTHZ0006	15MAY89	163.40	2.00	4.00	
GTHZ0007	18AUG87	748.20	20.00	400.00	
GTHZ0007	28OCT87	74.60	2.00	4.00	
GTHZ0007	15MAY89	162.40	2.00	4.00	

PENETRATION =ZNE264

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	13MAY88	2.00	0.20	0.04	
E-PEN	21NOV89	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZNE265

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	13MAY88	2.00	0.20	0.04	
E-PEN	21NOV89	2.00	0.20	0.04	

PENETRATION =ZNE267

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	13MAY88	2.00	0.20	0.04	
E-PEN	21NOV89	2.00	0.20	0.04	

PENETRATION =ZNE268

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	13MAY88	2.00	0.20	0.04	
E-PEN	21NOV89	2.00	0.20	0.04	

PENETRATION =ZNE269

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	13MAY88	54.36	2.00	4.00	
E-PEN	21NOV89	59.90	2.00	4.00	

PENETRATION =ZNE271

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	13MAY88	2.00	0.20	0.04	
E-PEN	10NOV89	2.00	0.20	0.04	

APPENDIX I

********** LOCAL LEAK RATE TEST HISTORY *********

********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZNE272

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	18MAY88	2.00	0.20	0.04	
E-PEN	10NOV89	2.00	0.20	0.04	

PENETRATION =ZNE274

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	18MAY88	2.00	0.20	0.04	
E-PEN	10NOV89	2.00	0.20	0.04	

PENETRATION =ZNE275

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	28APR88	2.00	0.20	0.04	
E-PEN	18MAY88	2.00	0.20	0.04	
E-PEN	10NOV89	2.00	0.20	0.04	

PENETRATION =ZNE276

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	26MAY88	2.00	0.20	0.04	
E-PEN	17NOV89	2.00	0.20	0.04	

PENETRATION =ZNE277

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	26MAY88	2.00	0.20	0.04	
E-PEN	17NOV89	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZNE278

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
'EN	26MAY88	2.00	0.20	0.04	
EN	17NOV89	2.00	0.20	0.04	

PENETRATION =ZNE279

VALVE MBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	01JUN88	2.00	0.20	0.04	
E-PEN	24NOV89	2.00	0.20	0.04	

PENETRATION =ZNE280

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	01JUN88	2.00	0.20	0.04	
E-PEN	24NOV89	2.00	0.20	0.04	

PENETRATION =ZNE281

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	01JUN88	2.00	0.20	0.04	
E-PEN	24NOV89	2.00	0.20	0.04	

PENETRATION =ZNE282

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	01JUN88	2.00	0.20	0.04	
E-PEN	24NOV89	2.00	0.20	0.04	

APPENDIX 1
********** LOCAL LEAK RATE TEST HISTORY **********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZNE283

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	07JUN88	2.00	0.20	0.04	
E-PEN	29NOV89	2.00	0.20	0.04	

PENETRATION =ZNE284

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	07JUN88	2.00	0.20	0.04	
E-PEN	29NOV89	2.00	0.20	0.04	

PENETRATION =ZNE285

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	07JUN88	2.00	0.20	0.04	
E-PEN	29NOV89	2.00	0.20	0.04	

PENETRATION =ZNE287

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	07JUN88	2.00	0.20	0.04	
E-PEN	29NOV89	2.00	0.20	0.04	

PENETRATION =ZNE288

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	24AUG88	2.10	0.20	0.04	
E-PEN	14FEB90	2.46	0.20	0.04	

APPENDIX 1
********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZNE289

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	27JUL88	2.00	0.20	0.04	
E-PEN	18JAN90	2.00	0.20	0.04	

PENETRATION =ZNE290

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	27JUL88	2.00	0.20	0.04	
E-PEN	18JAN90	2.00	0.20	0.04	

PENETRATION =ZNE291

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	13MAY88	2.00	0.20	0.04	
E-PEN	18JAN90	2.00	0.20	0.04	

PENETRATION =ZNE292

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	24AUG88	2.00	0.20	0.04	
E-PEN	14FEB90	2.00	0.20	0.04	

PENETRATION =ZNE293

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	28APR88	2.00	0.20	0.04	
E-PEN	27JUL88	2.00	0.20	0.04	
E-PEN	18JAN90	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/25/90 *******

PENETRATION =ZNL294

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	24AUG88	2.00	0.20	0.04	
E-PEN	14FEB90	2.00	0.20	0.04	

PENETRATION =ZNE29

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	24AUG88	8.42	0.20	0.04	
E-PEN	14FEB90	7.87	0.20	0.04	

PENETRATION =ZNE296

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	09AUG88	2.00	0.20	0.04	
E-PEN	25JAN90	2.00	0.20	0.04	
E-PEN	28OCT90	2.00	0.20	0.04	

PENETRATION =ZNE297

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	09AUG88	2.00	0.20	0.04	
E-PEN	25JAN90	2.00	0.20	0.04	

PENETRATION =ZNE298

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	09AUG88	2.00	0.20	0.04	
E-PEN	25JAN90	2.00	0.20	0.04	

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********** LOCAL LEAK RATE TEST HISTORY *********

********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZSE207

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	29JUN88	2.00	0.20	0.04	
E-PEN	13FEB90	2.00	0.20	0.04	

PENETRATION =ZSE208

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	29JUN88	2.00	0.20	0.04	
E-PEN	13FEB90	2.00	0.20	0.04	

PENETRATION =ZSE210

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	29JUN88	2.00	0.20	0.04	
E-PEN	13FEB90	2.00	0.20	0.04	

PENETRATION =ZSE215

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	09AUG88	2.00	0.20	0.04	
E-PEN	25JAN90	2.00	0.20	0.04	

PENETRATION =ZSE216

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	09AUG88	2.00	0.20	0.04	
E-PEN	25JAN90	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 1/29/87 TO 10/29/90 *******

PENETRATION =ZSE217

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	09AUG88	2.00	0.20	0.04	
E-PEN	25JAN90	2.00	0.20	0.04	

PENETRATION =ZSE218

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	16AUG88	2.00	0.20	0.04	
E-PEN	07FEB90	2.00	0.20	0.04	

PENETRATION =ZSE219

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	16AUG88	2.00	0.20	0.04	
E-PEN	07FEB90	2.00	0.20	0.04	

PENETRATION =ZSE222

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	05JUL88	2.00	0.20	0.04	
E-PEN	12FEB90	2.00	0.20	0.04	

PENETRATION =ZSE223

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	05JUL88	2.00	0.20	0.04	
E-PEN	12FEB90	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZSE224

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	05JUL88	2.00	0.20	0.04	
E-PEN	12FEB90	2.00	0.20	0.04	

PENETRATION =ZSE225

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	05JUL88	5.53	0.20	0.04	
E-PEN	12FEB90	2.16	0.20	0.04	

PENETRATION =ZSE226

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	16AUG88	2.00	0.20	0.04	
E-PEN	12FEB90	2.00	0.20	0.04	

PENETRATION =ZSE233

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	16AUG88	2.00	0.20	0.04	
E-PEN	07FEB90	2.00	0.20	0.04	

PENETRATION =ZSE234

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	16AUG88	2.35	0.20	0.04	
E-PEN	07FEB90	2.00	0.20	0.04	

********** LOCAL LEAK RATE TEST HISTORY *********
********** FROM 4/28/87 TO 10/29/90 *******

PENETRATION =ZSE240

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	15JUL88	2.00	0.20	0.04	
E-PEN	05JAN90	2.00	0.20	0.04	

PENETRATION =ZSE243

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	15JUL88	2.00	0.20	0.04	
E-PEN	05JAN90	2.00	0.20	0.04	

PENETRATION =ZSE249

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	16AUG88	2.00	0.20	0.04	
E-PEN	07FEB90	2.09	0.20	0.04	

PENETRATION =ZSE250

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	17SEP87	5.22	0.20	0.04	
E-PEN	08JAN90	2.00	0.20	0.04	

PENETRATION =ZSE252

VALVE NUMBER	DATE	LEAKRATE (SCCM)	ERROR (SCCM)	ERROR SQUARED (SCCM)	NOTES
E-PEN	15JUL88	2.00	0.20	0.04	
E-PEN	05JAN90	2.00	0.20	0.04	