REACTOR CONTAINMENT BUILDING
INTEGRATED LEAK RATE TEST REPORT

1991 Turkey Point Unit #4 ILRT

Date of Test Completion: October 20, 1991

Prepared by the Turkey Point Nuclear Plant
Test And Performance Group.
Florida Power And Light Co.

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I. INTRODUCTION AND PURPOSE

A periodic Type "A" Integrated Leakage Rate Test (ILRT) was successfully conducted on the primary containment structure of the Florida Power and Light's Turkey Point Nuclear Power Plant Unit No. 4 Pressurized Water Reactor. This test was performed in accordance with the Plant's Technical Specifications, and the Code of Federal Regulations, Title 10, Part 50, Appendix J, titled: "Primary Reactor Containment Leakage Testing for Water Cooled Power Reactors".

This report describes the test method used, and presents the results of the test, including the Supplemental Test (also known as the Controlled Leakage Rate Test, or CLRT), used for verification. Summaries of the types "B" and "C" Local Leakage Rate Tests (LLRT) performed since the last ILRT are also included.

Turkey Point Nuclear Plant Operating Procedures OP 13100.1, 13100.4 and 13404.1 provided necessary guidance during the performance of these Tests.

II. TEST DISCUSSION

A. Description of the Containment

The containment structure completely encloses the reactor and reactor coolant system. It is the last barrier between fission materials and the environment.

Containment pressure retention is achieved by concrete walls that are post tensioned by a steel tendon system. Leakage prevention is achieved by a 0.25 inch steel liner on the inside of the containment wall.

Under accident conditions, leakage out of containment is not expected to exceed a predetermined amount. A periodic Leak Testing Program of the containment penetrations and structural inspections help assure containment leakage will not exceed the expected amount.

Applicable Containment Specifications:

Inside diameter = 116 ft. Inside height = 169 ft.

Approximate free volume = 1,550,000 cubic feet

Calculated peak accident pressure = 49.9 psig

Analyzed Leakage = La = 0.25 % Per day of air mass inside Containment at 49.9 psi.

Acceptance Criteria for the ILRT = 0.75 * La
= 0.1875 % Per day of air mass inside Containment at 49.9 psi.

During the performance of the ILRT, the containment penetrations and isolation valves were aligned per OP-13100.4 to simulate as closely as possible the post Accident Containment Configuration. Adjustments to the test's results were made for any valve lineups not representative of post LOCA configuration, and for any level increases noted during the test for vessels located inside Containment.

B. Description of the ILRT Instrumentation

The Containment Building was instrumented to permit leakage rate determination in accordance with the Code of Federal Regulations, Title 10, Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water Cooled Power Reactors".

The ILRT instrumentation provided a sufficient quantity of sensors of each type to accommodate instrument failures during the test without jeopardizing acceptability of the test's results.

The instrumentation allowed leakage rate determination by the Mass Point Analysis. This method calculates the actual mass

of dry air within the Containment. The leakage rate becomes the time rate of change of the calculated air mass. Air Mass (M) is calculated according to the Ideal Gas Law as follows:

$$M = 144 * ((P-P_V)*V)/R*T$$

M = Containment Air Mass (Lbs)
P = Containment Total Absolute Pressure, Psia
T = Containment Absolute Temperature, Deg R
P_V = Containment Vapor Pressure, Psia, at Temp. T.
V = Containment Net Free Volume, Ft^3
R = Universal Gas Constant (Ft*Lbf/Lbm*Deg R)
(P_V and T are weighted average values.)

The primary measurement variables required for the calculation of Containment air mass are absolute pressure, relative humidity and temperature as a function of time. During the Supplemental Test, a controlled Containment bleed off flow is also a measured variable.

The average Containment absolute temperature is determined by measuring specific local temperatures throughout the Containment and applying a mass and volume weighted averaging technique. The volume fraction for each temperature sensor is determined based upon geometrical calculations.

Average Containment water vapor pressure is determined by measuring specific local relative humidities throughout the Containment. This is converted to local vapor pressure using local group temperatures, a steam table, and a mass and volume weighted averaging technique. The volume fractions for the relative humidity sensors are determined in the same manner as for the temperature sensors. Wherever possible, Temperature and Relative Humidity Sensors were placed adjacent to each other.

1. Temperature Instrumentation

Twenty One (21) Platinum Resistance Temperature Detectors (RTDs) located throughout the Containment allowed measurement of the weighted average air temperature. Figure 1A through 1E depict the location of the RTDs in the Containment. Each RTD sensor has a calibrated resistance versus temperature curve accurate to less than ± 0.5°F. The sensitivity and repeatability of each RTD sensor is less than ± 0.054 °F.

2. Humidity Instrumentation

Ten (10) Phys-Chem Relative Humidity Detectors (RHDs) located throughout the Containment allow measurement of the weighted average Containment vapor pressure. Figure 1A through 1E depicts the location of the RHDs in the Containment. The RHDs connect to two, five channel Humeter amplifiers located outside the Containment. The calibrated accuracy of the RHDs is ± 2.0 % °F, the repeatability of the RHDs is ± 0.25 % RH and the sensitivity of the RHDs is ± 0.5 % °F.

3. Pressure Instrumentation

Two direct read out, Texas Instruments precision pressure monitors measured Containment absolute pressure. Figure 2 depicts the arrangement of the tubing connections between the monitors and the Containment. Only one pressure monitor was used for leakage rate calculations, with the second monitor as back-up in the event of failure. The monitors had a repeatability of ±0.002 Psia.

4. Flow Instrumentation

A variable area float-type rotometer is used to superimpose a leakage during the Supplemental Test. Figure 5 depicts the piping configuration between the rotometer and the Containment. The rotometer has a ±1.0% accuracy, and a ±0.5% repeatability.

Two other instruments were used during the Supplemental Test. A local pressure gauge, and a PRTD were installed in the Containment vent piping, to allow for compensation in the event of substantial pressure or temperature deviation from the Rotometer's calibration point. The PRTD was connected to a Fluke 8520A/PRTD located in the same area as the test computer.

5. Atmospheric conditions

Ambient atmospheric conditions were monitored during the course of the test. Barometric pressure, temperature, wind speed and direction were obtained from Homestead Air Force Base Meteorological Facility. A summary of the information is contained in Appendix C.

6. Instrument Selection Guide (ISG) Calculation

The Instrument Selection Guide (ISG) compiled the instrument sensitivity and resolution for each process variable and evaluates the total instrumentation system's ability to detect leakage in the range required. The ISG for this test was calculated by the Computer Program used to compute the ILRT results. The calculated ISG for the instrumentation operable during this test (21 temperature sensors, 9 relative humidity sensors, and 1 pressure sensor) was 0.0054 % per day, which was verified to be less than .25 La as specified in ANSI 56.8.

C. Description of the Computer Program

Florida Power and Light utilized software developed by Ebasco Plant Services Inc. for leakage rate calculations during the course of the test. The Program is an interactive program written specifically for fast, easy utilization during all phases of the ILRT and Supplemental Test. The program is written in a high level, compiled, structured language and operates on a MS-DOS personal microcomputer. Besides providing extensive data verification routines, the program offers the flexibility of calculating leakage rates and the

95 % Upper Confidence Levels utilizing Total Time or Mass Point Methods.

A given instrument may be deleted from the calculations if a sensor malfunctions. The deletion of a given instrument is performed on all samples in the data base. Volume fractions for the remaining instruments of that type are then recalculated based upon the placement and the amount of Containment volume sensed by these instruments.

Data evaluations are enhanced by the flexible display of either sensor variables or various computed values in tabular or graphical form on the computer screen or printer. Data is recorded on magnetic media to prevent loss during the test. In addition, two hard copies of the data are also made throughout the test by a printer attached to the test computer, and by the Datalogger's built in printer. All data is stored on the computer system in use, with retrieval capability to any desired data base throughout the testing.

Ancillary portions of the computer program assist the user in determination of temperature stabilization, determining the ILRT termination criteria, performing ISG calculations, and determination of acceptable Supplemental Test leakage verifications. It also allows the user to monitor instrument repeatability error, to aid in the identification of any malfunctioning sensors.

During the test, temperature, pressure and humidity data was automatically transmitted from the ILRT instrumentation system to the computer at approximately 20 minute intervals. Figure 3 illustrates the connection between the ILRT instrumentation system and the computer analysis system.

D. Containment Pressurization equipment.

The equipment used to pressurize the Containment is shown in Figure 4. The eight oil-free industrial diesel driven air compressors had a total nominal capacity of 11,100 SCFM. The compressed air was processed by a water cooled after-cooler, a moisture separator and a refrigerant air dryer.

E. Description of the Testing Sequence.

Preparations to pressurize the Containment for the conduct of the ILRT included internal and external inspections of the Containment structure; installation and checkout of the temporary ILRT instrumentation system; Types "B" and "C" Local Leakage Rate Testing of the Containment penetrations; alignment of the necessary valves and breakers for test conditions; the installation and checkout of the temporary Containment pressurization facilities; removal of plant instrumentation that could be damaged by the test pressure; venting of any permanently installed tanks that could be damaged by the test pressure; and the removal or depressurization of any pressurized gas sources inside Containment.

Containment pressurization started at 17:40 Hrs, 10-17-91, and was secured at 05:03 Hrs on 10-18-91 at a peak Containment pressure of 67.583 psia. The average pressurization rate throughout this time period was approximately 4.4 psi per hour. Appendix A1 illustrates the testing sequence.

The temperature stabilization phase began at 05:04 Hrs on 10-18-91. External leakage surveys were initiated with no significant leakage found. The Mass Point temperature stabilization criteria was met at 10:04 Hrs on 10-18-91, and ILRT measurements were initiated. Appendix A2 contains the temperature stabilization results.

During the test, Containment vapor pressure and relative humidity were found to be higher than expected. This was attributed to a leak discovered, after the test, in a valve associated with the water cooled after-cooler. This higher than expected humidity caused fluctuations in containment pressure which in turn caused substantial deviations in calculated containment air mass. These deviations statistically would not support a short duration test as described in Bechtel Corporation's Topical Report BN-TOP-1, Revision 1, "Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants." At 10:04 Hrs, 10-19-91, all acceptance criteria for a 24 hour test was met, with Mass Point Upper Confidence Limit of 0.0540 % . The fitted Mass Point leakage rate was 0.0480 % per day. These values are well below the test acceptance criteria of 0.1875% per day. Appendix A3 contains the ILRT data and test results.

At 10:08 Hrs on 10-19-91, the Supplemental Test was started, and subsequently stopped due to condensation noted in the rotometer. The rotometer was disassembled for cleaning / drying, and the vent piping was insulated to allow the piping and Containment temperatures to equalize.

At 13:30 Hrs, 10-19-91, with the vent piping temperature stabilized, the Supplemental Test was re-started with an imposed leakage rate of 14 scfm. The fitted Supplemental Test leakage rate was 0.336 % per day. Appendix A4 contains the Supplemental Test data, results and acceptance criteria.

The Supplemental Test was completed at 17:35 Hrs on 10-19-91 with all acceptance criteria satisfied. Data analyses showed that RH Sensor #10 exceeded 100% relative humidity during the Supplemental Test. RH Sensor #10 was deleted, the remaining volume fractions recalculated, and all of the data for the ILRT and Supplemental Test re-analyzed. The other relative Humidity or temperature sensors in this group did not exhibit any unusual behavior and followed the expected process trend. The Data and the test results remained satisfactory for the recalculated values.

Containment de-pressurization was initiated at 18:04 Hrs on 10-19-91, and was completed at 02:45 Hrs on 10-20-91. Average de-pressurization rate was 6.75 psi per hour. Figure 6 illustrates the de-pressurization piping configuration.

Containment entry for post-test inspection was at 03:30 Hrs, 10-20-91. The post-test inspection detected no major anomalies or damage to the equipment or structures of the Containment.

III. TEST RESULTS

A. Temperature Stabilization Phase Summary.

Temperature Stabilization was met in approximately five hours. The results and acceptance criteria of the Temperature Stabilization phase are presented in Appendix A2.

B. Integrated Leakage Rate Test Summary.

At the start of the testing sequence, the intent was to use the short duration method contained in Bechtel's Topical Report BN-TOP-1. However, due to the humidity problem mentioned in Section II, the test was converted to a 24 hour Mass Point Test. Appendix A3 contains detailed ILRT data.

Correction of ILRT Results.

Corrections were made to the ILRT results to account for any penetrations that could not be aligned to simulate the post Accident Containment Configuration and for any level increases noted during the test for the vessels located inside Containment. The following is a summary of these corrections and the final ILRT results.

Penetrations in service during ILRT

The following penetration leakage is required to be added to the results of the ILRT since the penetrations were isolated or could not be vented or drained during the Type A Test. The leakage assigned is the recorded as left value using minimun pathway analysis.

		Leakage (CCM):
11	ALT RHR	40
15	Charging	18
16	PACV's	18
24A	RCP Seal Inj.	160
24B	RCP Seal Inj.	620
24C	RCP Seal Inj.	35
51	PACV's	18

Correction to ILRT results = 909 CC/MIN

Summary of Containment levels

The following is a tabulation of various levels throughout Containment for which any unexplained increase must be accounted for in the results of the ILRT.

	START	END	DELTA	CORRECTION
DATE:	10/18	10/19		
TIME:	10:00	17:30		
RCDT LEVEL (%)	32	31	-1	-1
PRT LEVEL (%)	76	76	0	0
PRESSURIZER LEVEL (%)	91	85	-6	-6
CONTAINMENT SUMP LEVEL (INCHES) .	9	9	0	0

(No credit will be taken for decrease in levels)

TOTAL CORRECTION = 0 %

ILRT Results - Mass Point Analysis

1.	Lam, Leakage Rate Calculated (Mass Point) .	0.048 % / Day
2.	UCL, Upper Confidence Level	0.006 % / Day
3.	Lam + UCL	0.054 % / Day
4.	Corrections for	
	a- Penetrations not isolated or drained, (Type B & C Tests)	0.003 % / Day
	b- Water Levels	0
5.	Total Reported Type A Leakage Rate, (Items 3 + 4a + 4b)	0.057 % / Day

Results were within the acceptable limit of
0.75 La or 0.1875 % per day

C. Supplemental Leakage Rate Test Summary.

Following the acceptance of the ILRT results, a four hours Supplemental Test was added to the existing Containment leakage rate using the variable area rotometer.

Results are presented in Appendix A4. The test met the acceptance criteria for the verification phase. A summary follows:

$$Lo + Lam - La/4 <= Lc <= Lo + Lam + La/4$$

Lo = Supplemental Test Leakage Rate = 0.289 % Per Day

Lc = Fitted Supplemental Test Leakage Rate = 0.336 % Per Day

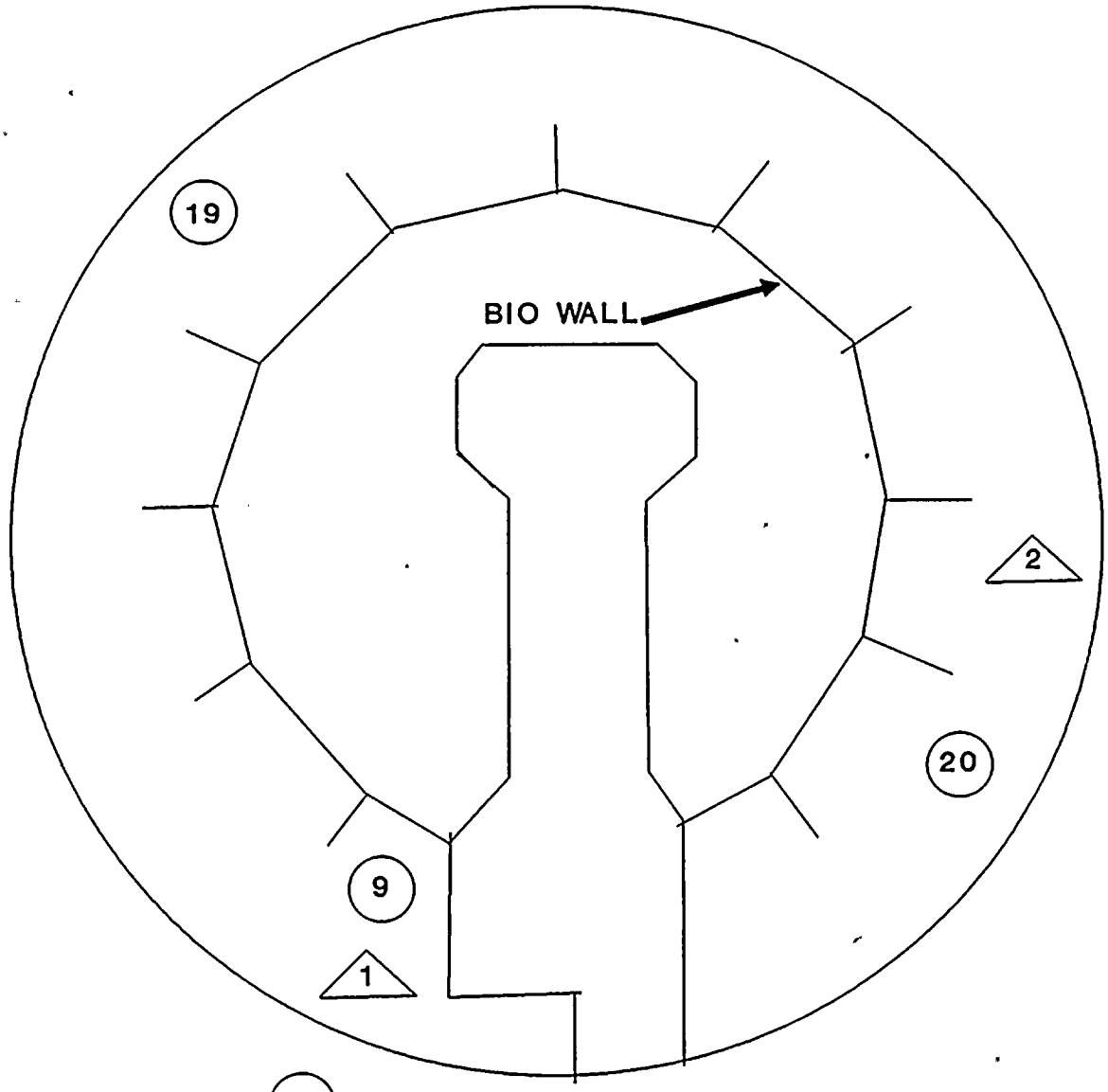
La = Containment Design Leakage Rate = 0.250 % Per Day

Lam = Fitted Mass Point ILRT Leakage Rate = 0.048 % Per Day

The acceptance criteria for this test is leakage between 0.2745 % (0.275 %) per day and 0.3995 % (0.400 %) per day.

SECTION IV.
FIGURES

1991 TURKEY POINT UNIT 4 ILRT
RTD/ RH SENSORS LOCATIONS
INSIDE CONTAINMENT - TOP VIEW



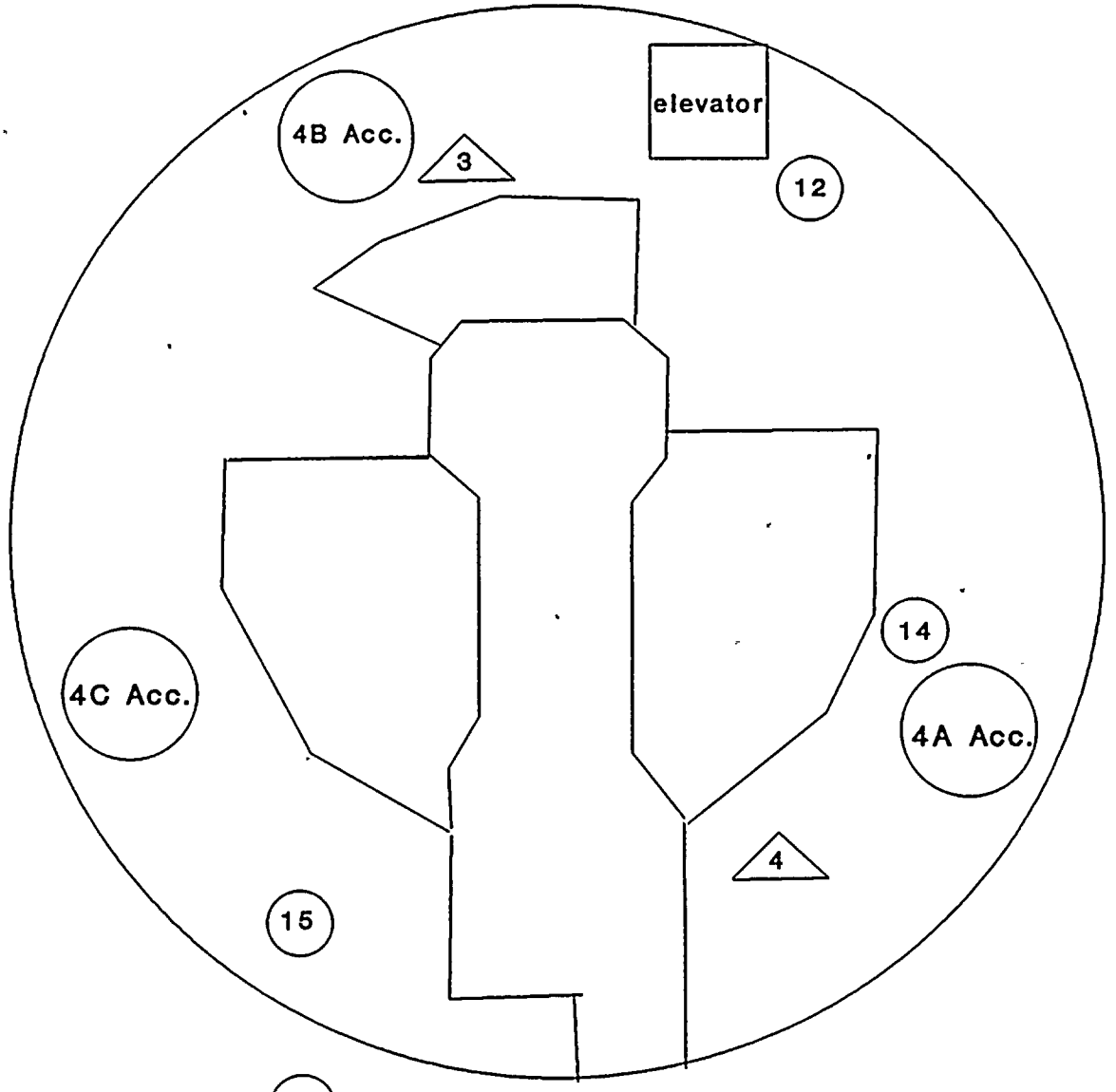
RTD LOCATIONS ○

RH LOCATIONS △

HQ\FIGURE1A

UNIT 4 - 19 Ft LEVEL
FIGURE 1A

1991 TURKEY POINT UNIT 4 ILRT
RTD/ RH SENSORS LOCATIONS
INSIDE CONTAINMENT - TOP VIEV



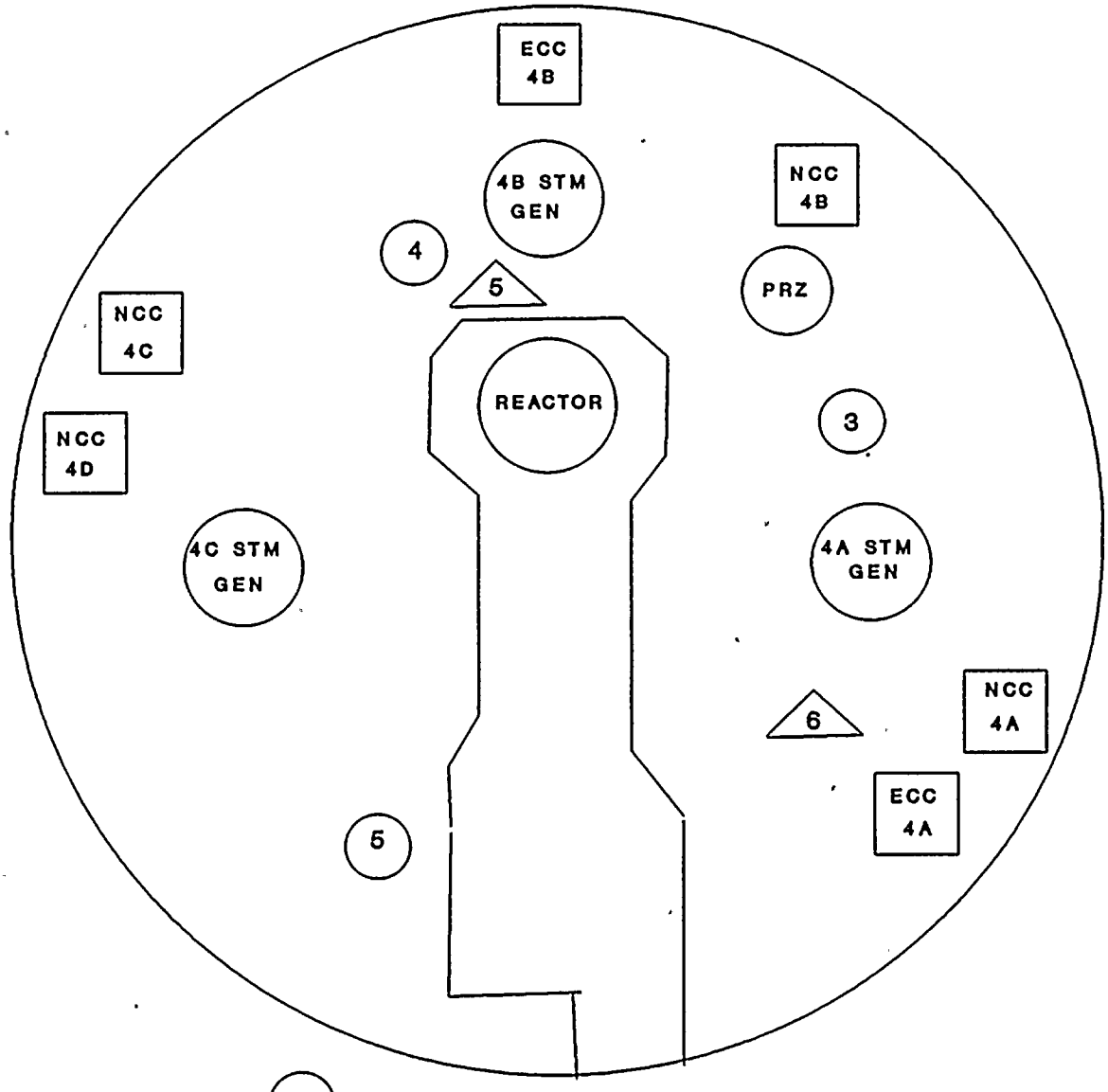
RTD LOCATIONS ○

RH LOCATIONS △

UNIT 4 - 34 Ft LEVEL
FIGURE 1B

HG\FIGURE1B

1991 TURKEY POINT UNIT 4 ILRT
RTD /RH SENSORS LOCATIONS
INSIDE CONTAINMENT - TOP VIEW



RTD LOCATIONS ○

RH LOCATIONS △

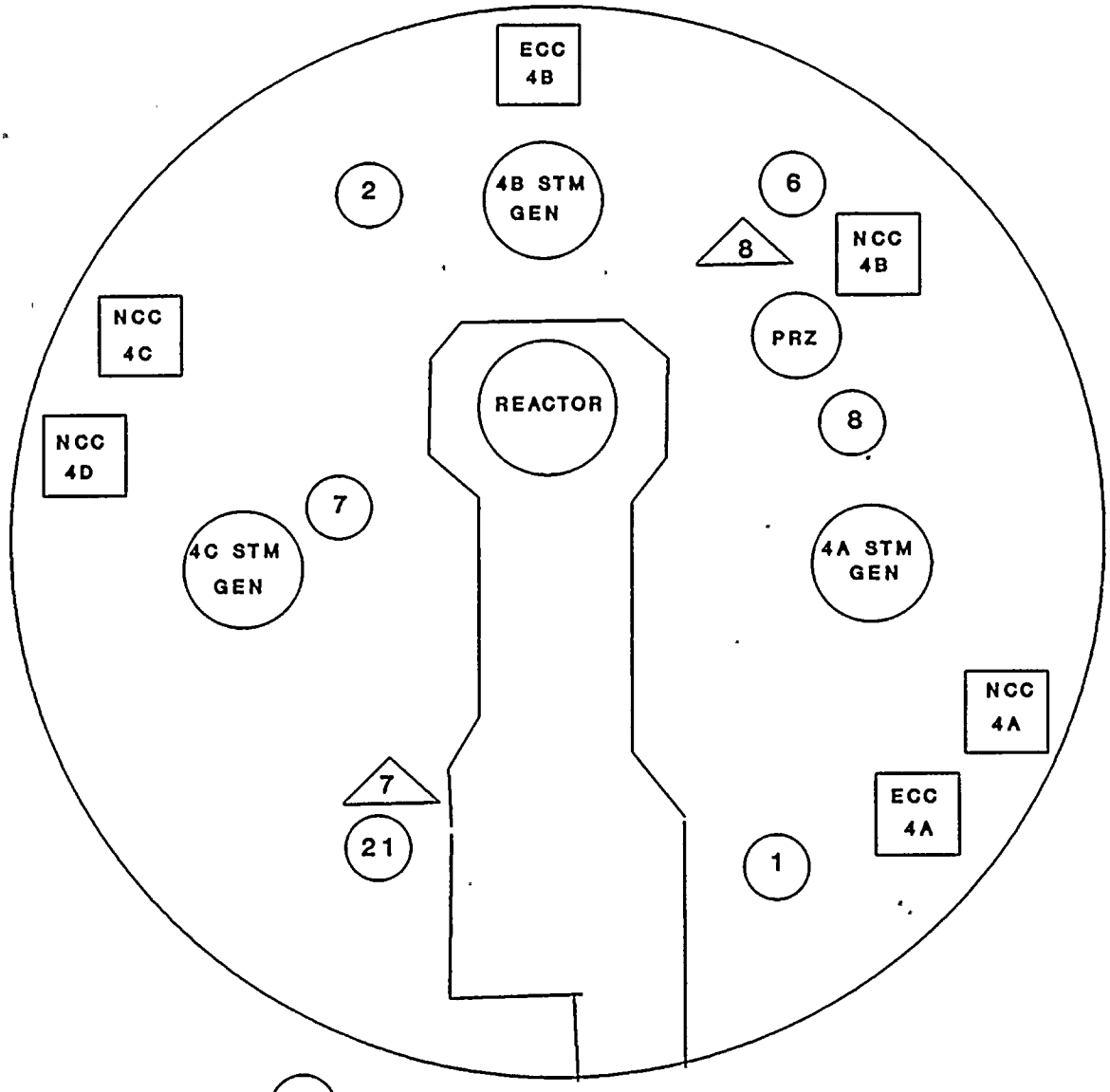
PRESSURIZER = PRZ

UNIT 4 - 70 Ft LEVEL

FIGURE 1C

HG\FIGURE1C

TURKEY POINT UNIT 4 ILRT
RTD / RH SENSORS LOCATIONS
INSIDE CONTAINMENT - TOP VIEW



RTD LOCATIONS ○

RH LOCATIONS △

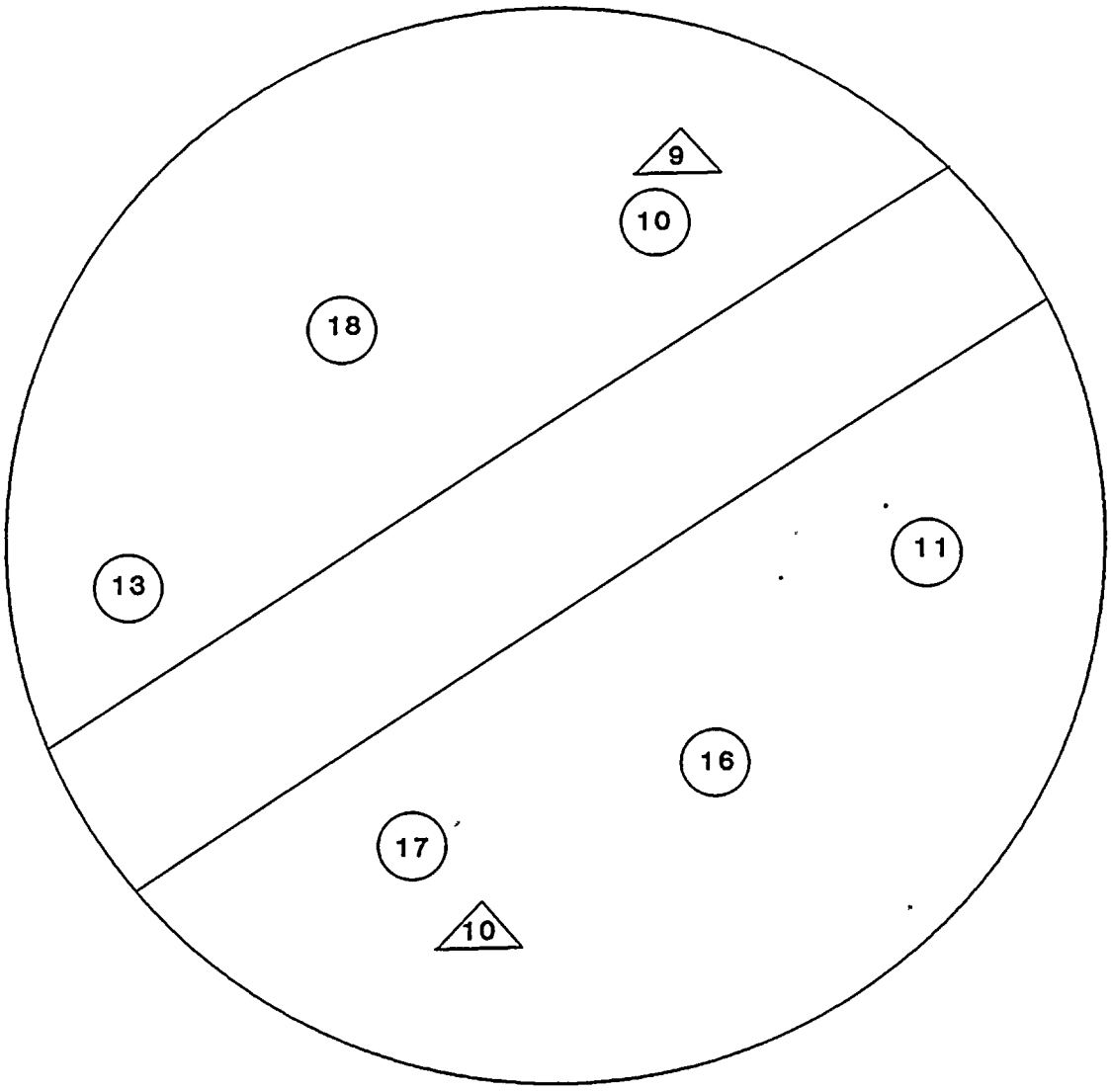
PRESSURIZER = PRZ

UNIT 4 - 94 Ft LEVEL

FIGURE 1D

HQ\FIGURE1D

1991 TURKEY POINT UNIT 4 ILRT
RTD /RH SENSORS LOCATIONS
INSIDE CONTAINMENT - TOP VIEW



RTD LOCATIONS ○

RH LOCATIONS △

UNIT 4 - 143 Ft LEVEL

FIGURE 1E

HG\FIGURE1E

ILRT CONTAINMENT PRESSURE SENSOR PIPING[11]

1991 TURKEY POINT UNIT 4 ILRT

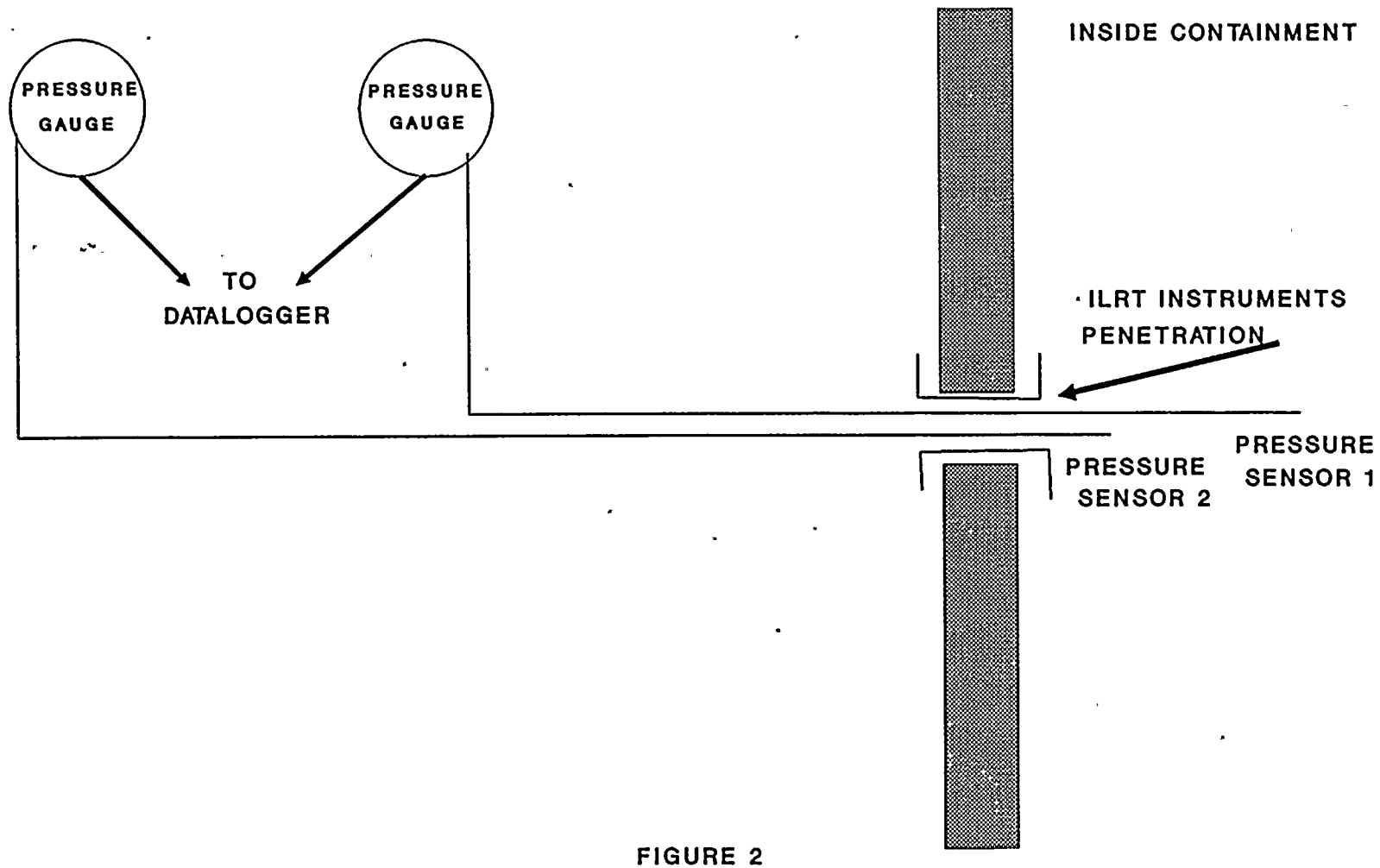


FIGURE 2

HQ\FIGURE8

DATA COLLECTION, STORAGE AND ANALYSIS
1991 TURKEY POINT UNIT 4 ILRT

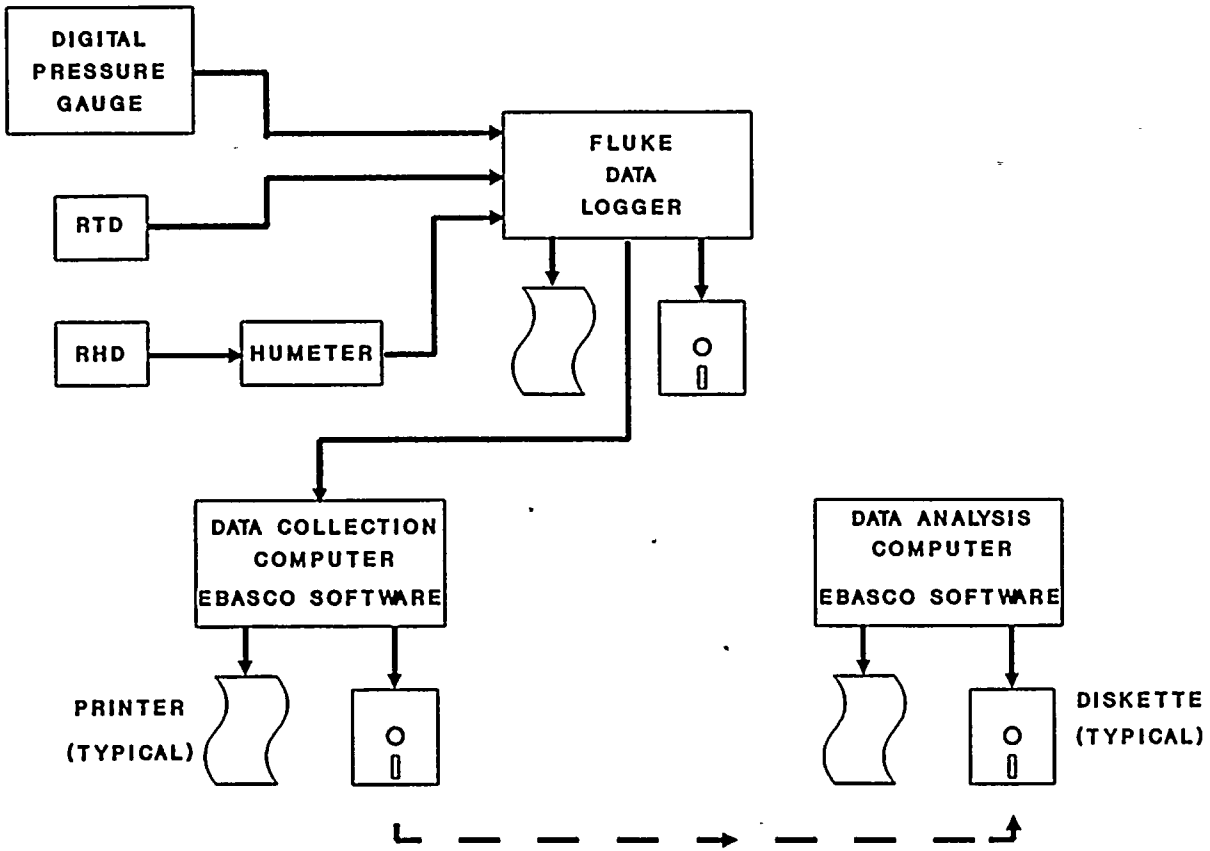


FIGURE 3

HG\FIGURE4A

CONTAINMENT PRESSURIZATION SYSTEM
1991 TURKEY POINT UNIT 4 ILRT

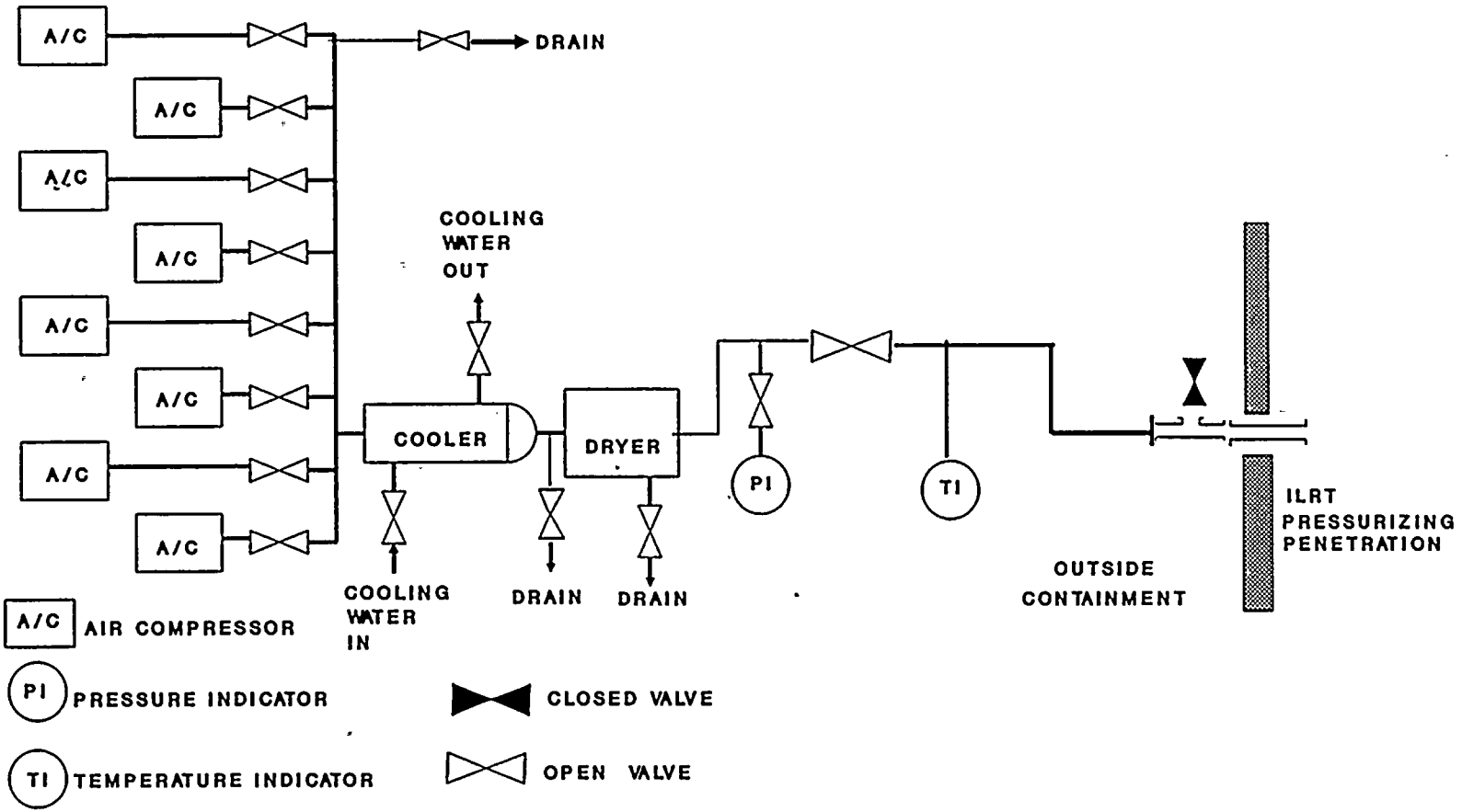


FIGURE 4

HG\FIGURE6B

CONTROLLED LEAKAGE TEST PIPING
1991 TURKEY POINT UNIT 4 ILRT

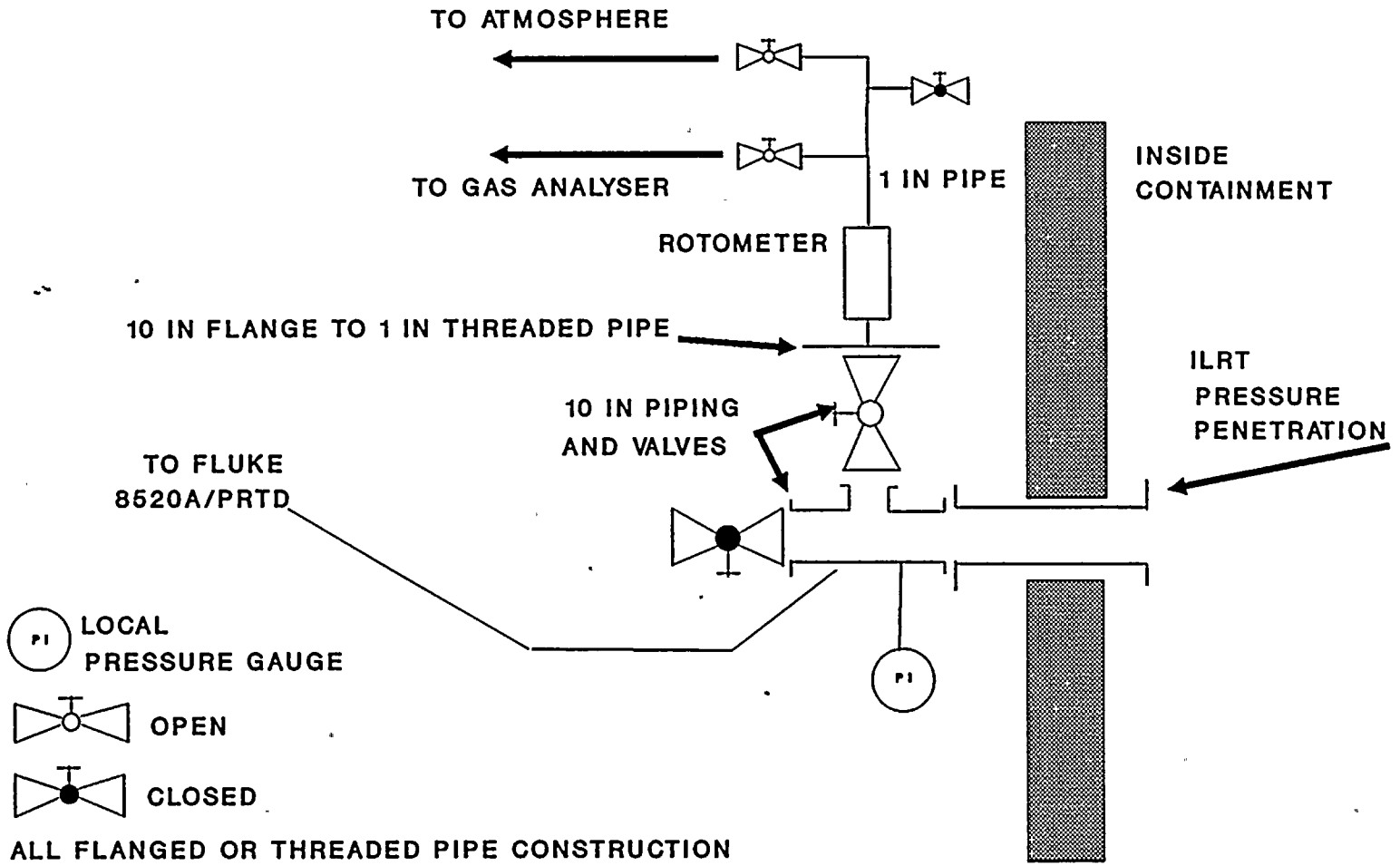


FIGURE 5

HQ\FIGURE6

ILRT VENT PIPING
1991 TURKEY POINT UNIT 4 ILRT

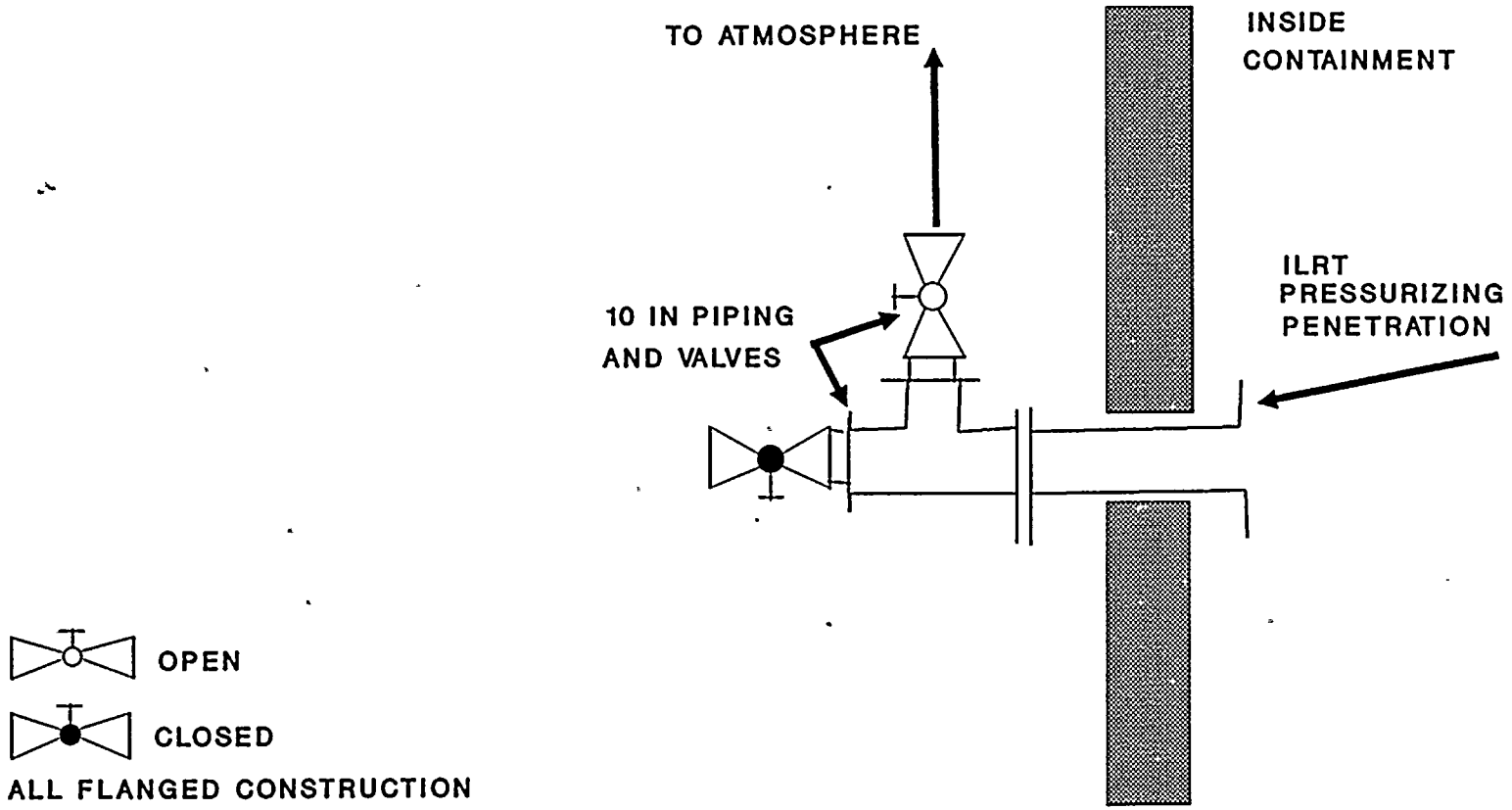


FIGURE 6
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HQ\FIGURE7

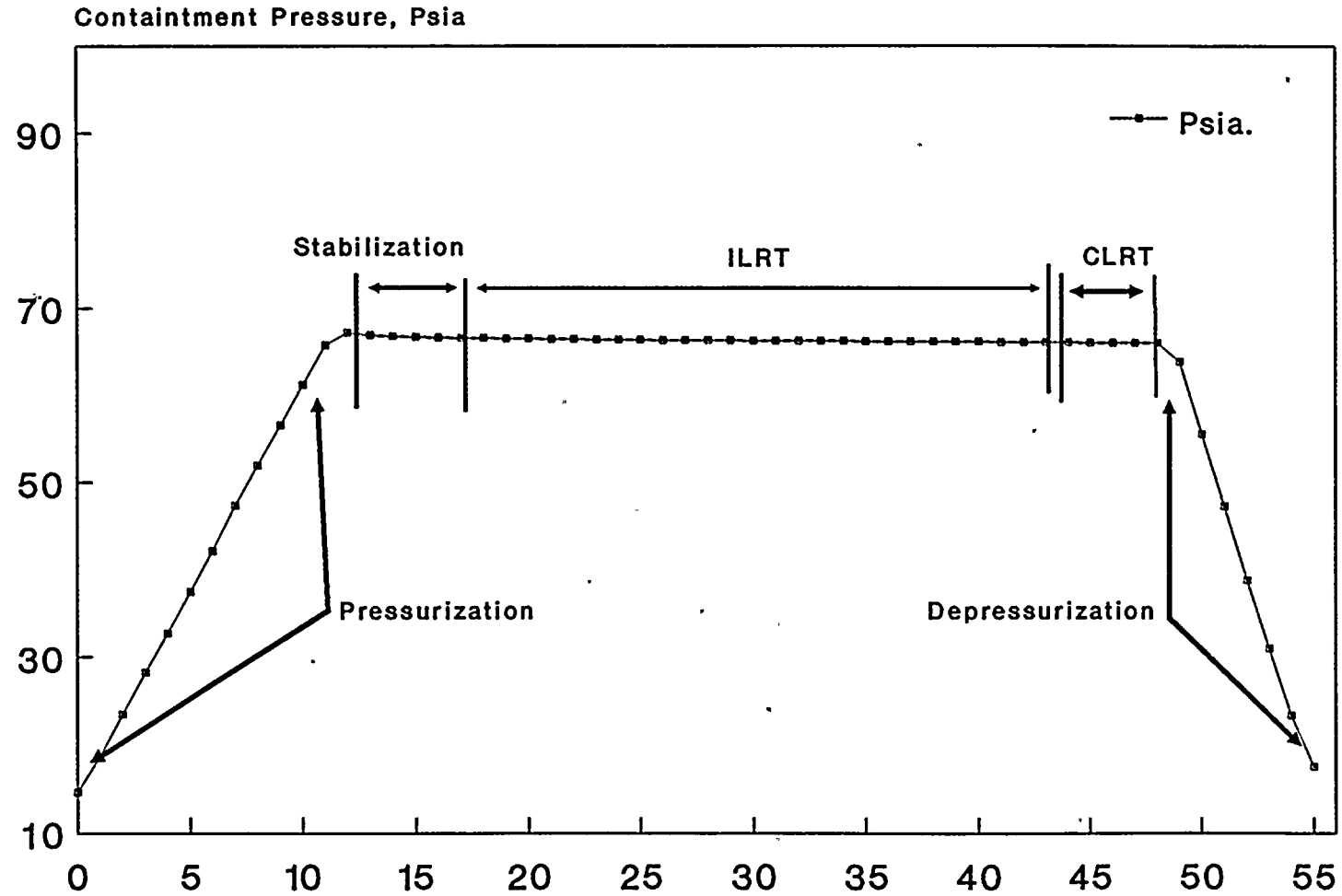
APPENDIX A1
TEST SEQUENCE

ILRT TEST SEQUENCE

1991 Turkey Point Unit 4 ILRT

Sequence Started 17:33 10/17/91
Sequence Ended 00:35 10/20/91

ILRT TESTING SEQUENCE
1991 TURKEY POINT UNIT 4 ILRT



ILRT30

APPENDIX A2
TEMPERATURE STABILIZATION

TEMPERATURE STABILIZATION MODE

1991 Turkey Point Unit 4 ILRT

Sequence Started 05:04 10/18/91
Sequence Ended 10:04 10/18/91

1991 Turkey Point Unit 4 ILRT

STABILIZATION PERIOD STARTED AT 05:04 ON 10/18/91

TEMPERATURE STABILIZATION

SAMPLE NUMBER	TIME HOURS	AVE TEMP DEG F	DELTA T/HR LAST 1 HR	DELTA T/HR LAST 4 HR	4 HR DELTA T - 1 HR DELTA T
1	0.00	98.998	0.000	0.000	0.000
2	0.33	97.716	0.000	0.000	0.000
3	0.67	96.512	0.000	0.000	0.000
4	1.00	95.682	-3.316	0.000	0.000
5	1.33	95.066	-2.650	0.000	0.000
6	1.67	94.595	-1.917	0.000	0.000
7	2.00	94.213	-1.469	0.000	0.000
8	2.33	93.888	-1.178	0.000	0.000
9	2.67	93.604	-0.990	0.000	0.000
10	3.00	93.364	-0.849	0.000	0.000
11	3.33	93.150	-0.738	0.000	0.000
12	3.67	92.956	-0.648	0.000	0.000
13	4.00	92.767	-0.598	-1.558	0.960
14	4.33	92.594	-0.556	-1.281	0.724
15	4.67	92.454	-0.502	-1.014	0.512
16	5.00	92.311	-0.456	-0.843	0.387 *

NOTES

1) THE 1 HOUR AND 4 HOUR DELTA TEMPERATURE VALUES ARE NOT VALID UNTIL 1 HOUR AND 4 HOURS, RESPECTIVELY, HAVE PASSED IN THE TEST

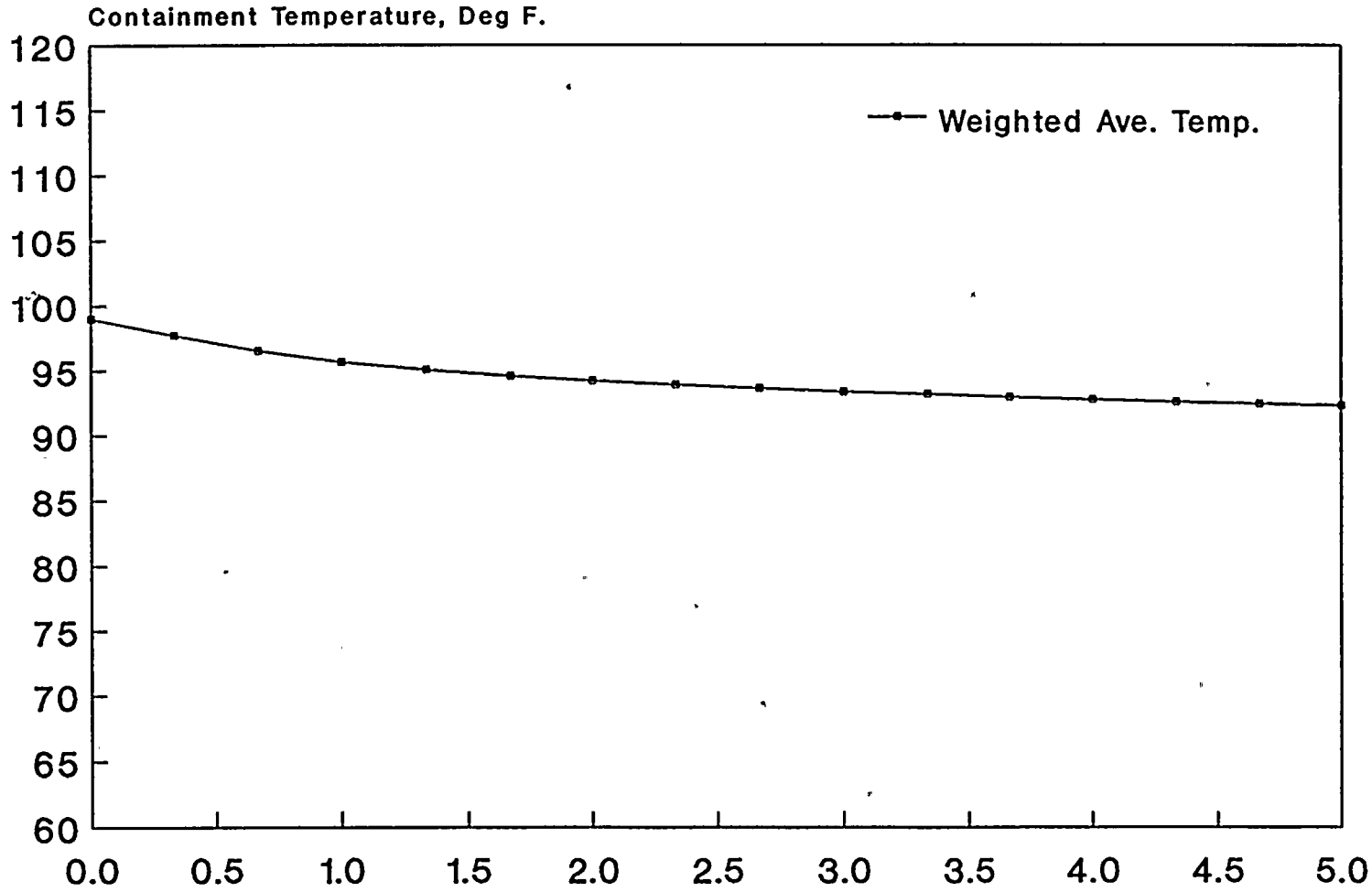
2) THE STABILIZATION CRITERIA IS MET WHEN:

-THE HOURLY AVERAGE DELTA T FOR THE PRECEDING HOUR DIFFERS FROM THE HOURLY AVERAGE DELTA T FOR THE PRECEDING 4 HOURS BY LESS THAN 0.5 DEGREES F.

-THE STABILIZATION PERIOD IS A MINIMUM OF 4 HOURS

3) THE "*" INDICATES THAT THE STABILIZATION CRITERIA HAS BEEN MET.

TEMPERATURE STABILIZATION
1991 TURKEY POINT UNIT 4 ILRT



ILRT7822

APPENDIX A3
INTEGRATED LEAKAGE RATE TEST

ILRT TEST MODE

1991 Turkey Point Unit 4 ILRT

Sequence Started 10:04 10/18/91
Sequence Ended 10:20 10/19/91

CONTAINMENT INTEGRATED LEAKAGE RATE TEST

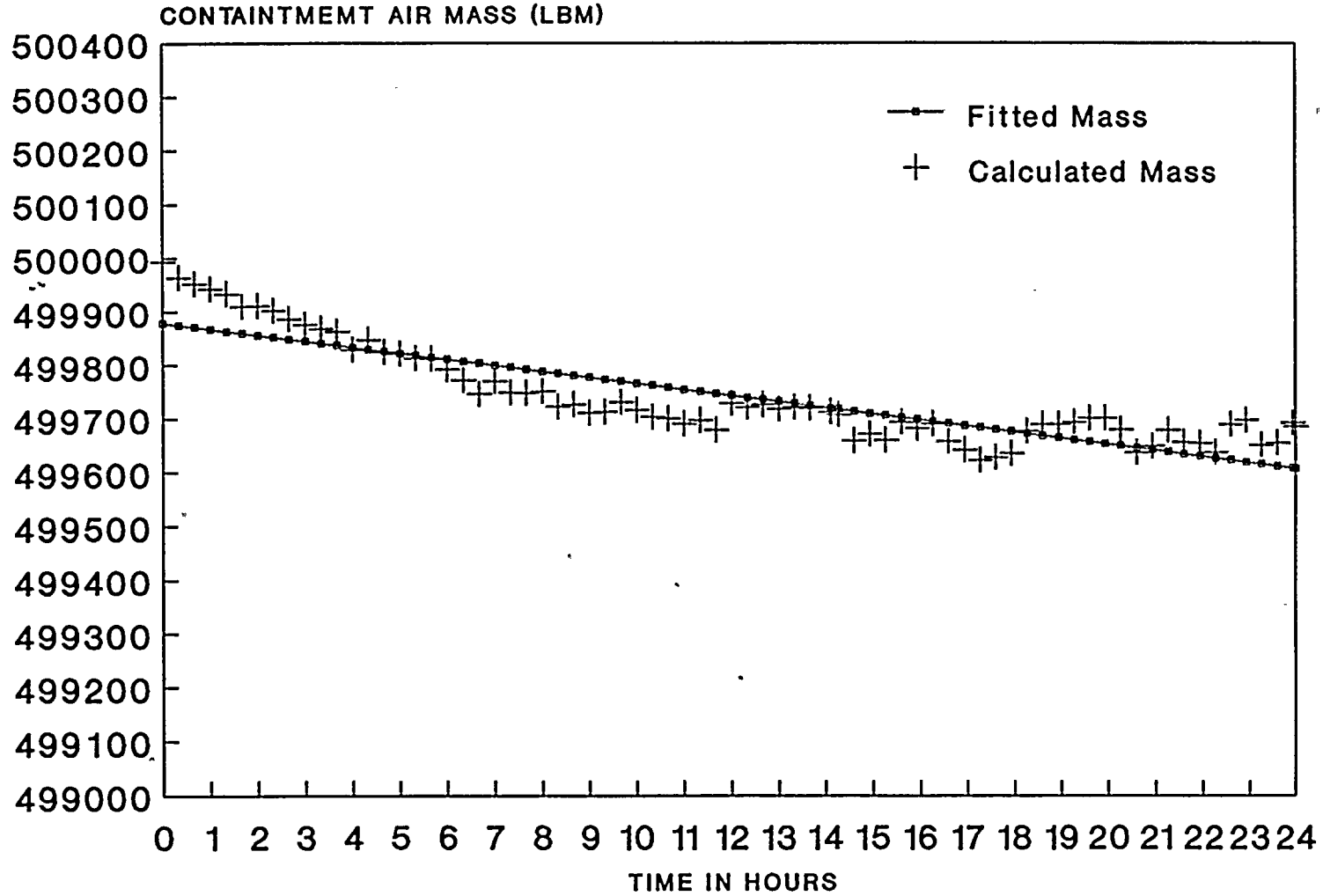
LEAKAGE RATE IS MEASURED USING THE ABSOLUTE METHOD AND IS COMPUTED USING THE MASS POINT METHOD IN STRICT ACCORDANCE WITH AMERICAN NATIONAL STANDARD ANSI/ANS 56.8-1987

TEST PERIOD STARTED AT 10:04 HOURS ON 10/18/91
TEST CONDUCTED FOR 24.18 HOURS

FREESPACE VOLUME OF CONTAINMENT IS 1550000 CU FT
CONTAINMENT WAS PRESSURIZED TO 66.63 PSIA

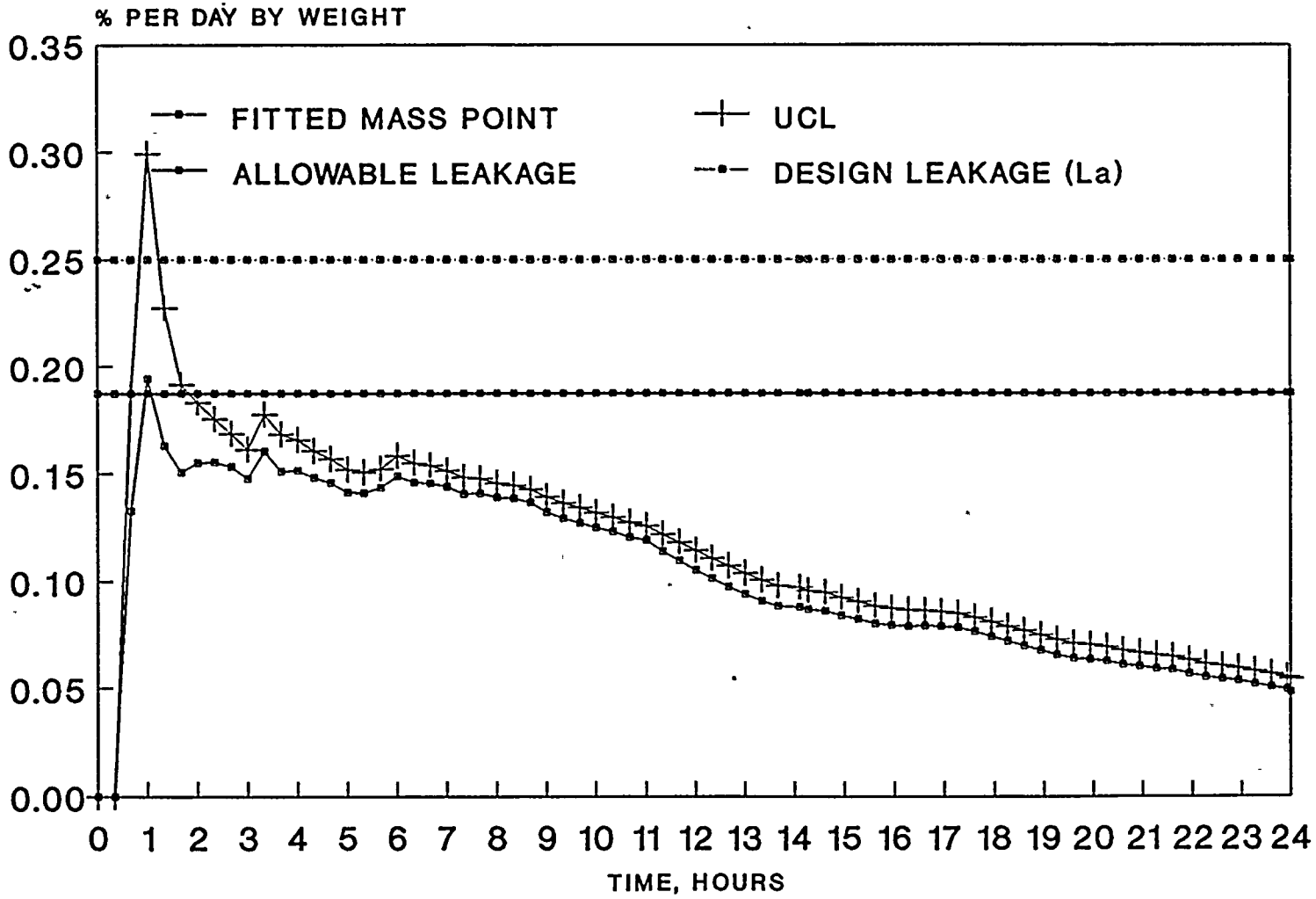
FITTED MASS POINT ILRT LEAKAGE RATE	Lam	= 0.048 % /DAY
UPPER LIMIT OF 95% CONFIDENCE LEVEL	UCL	= 0.054 % /DAY
CONTAINMENT DESIGN LEAKAGE RATE	La	= 0.250 % /DAY
ILRT ACCEPTANCE CRITERIA	75% La	= 0.1875% /DAY

ILRT AIR MASS
1991 TURKEY POINT UNIT 4 ILRT



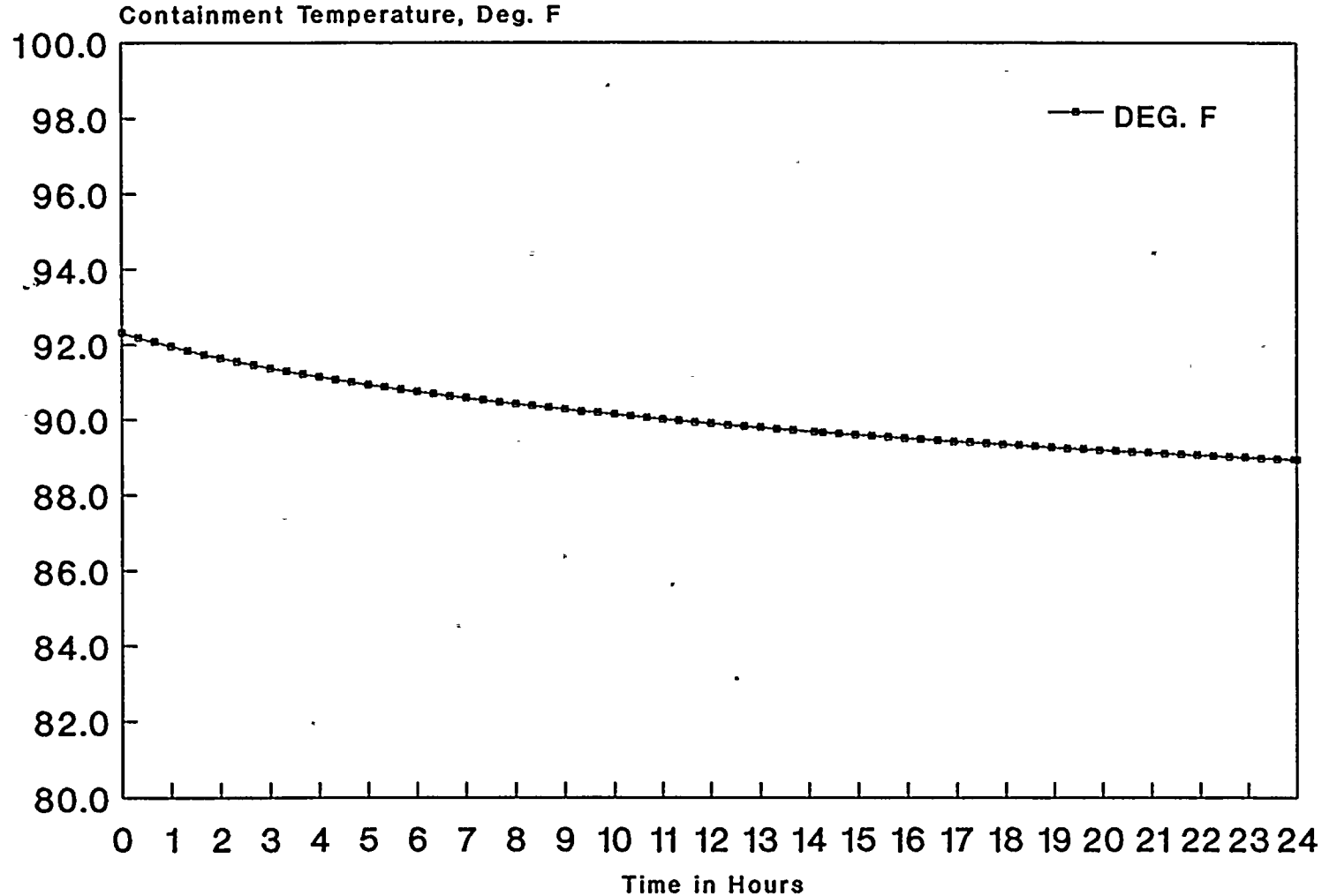
HQ\ILRT1

ILRT LEAKAGE RATES RELATIVE TO LIMITS
1991 TURKEY POINT UNIT 4 ILRT



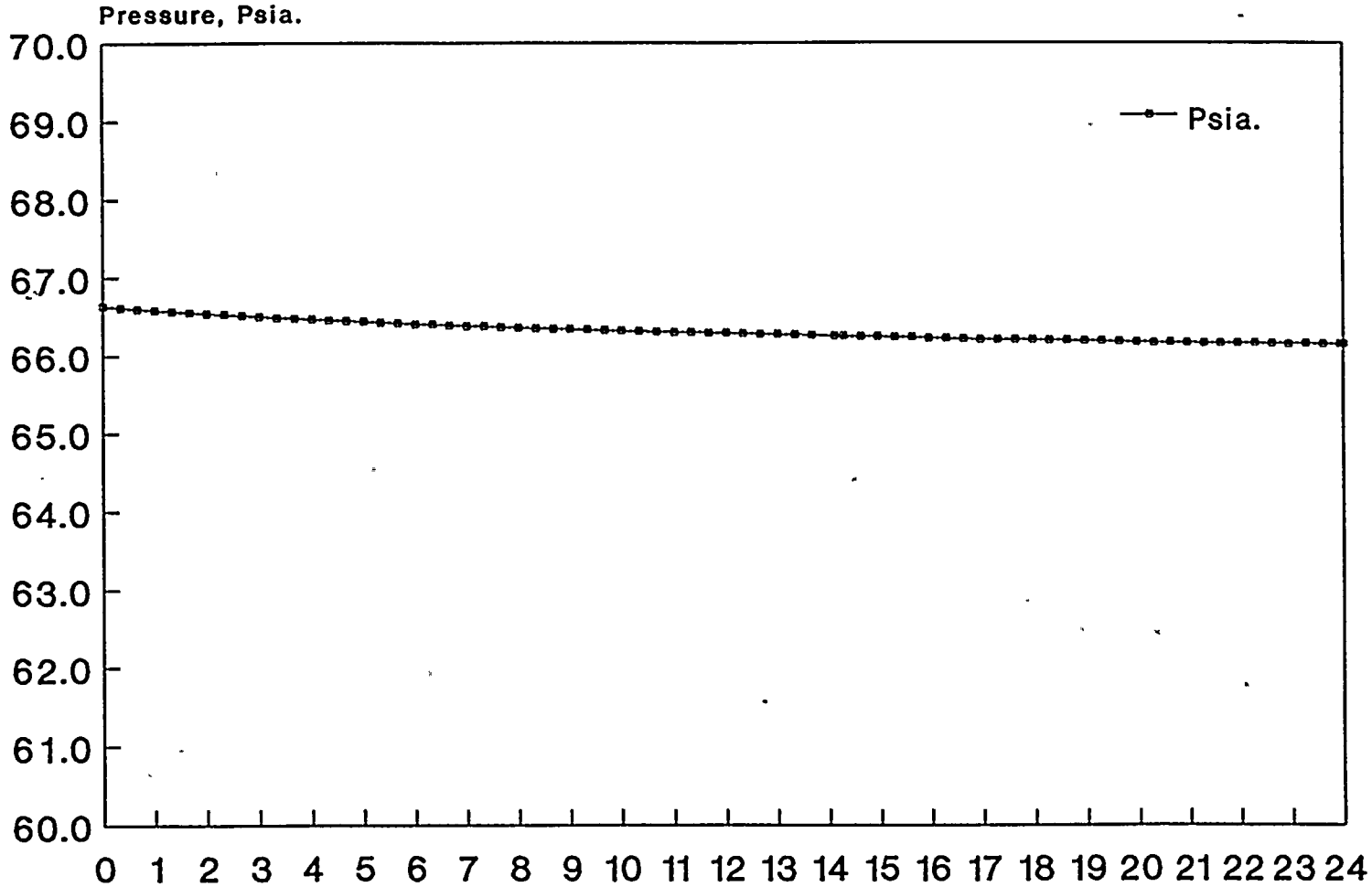
HG\ILRT3

ILRT WEIGHTED AVERAGE TEMPERATURE
1991 TURKEY POINT UNIT 4 ILRT



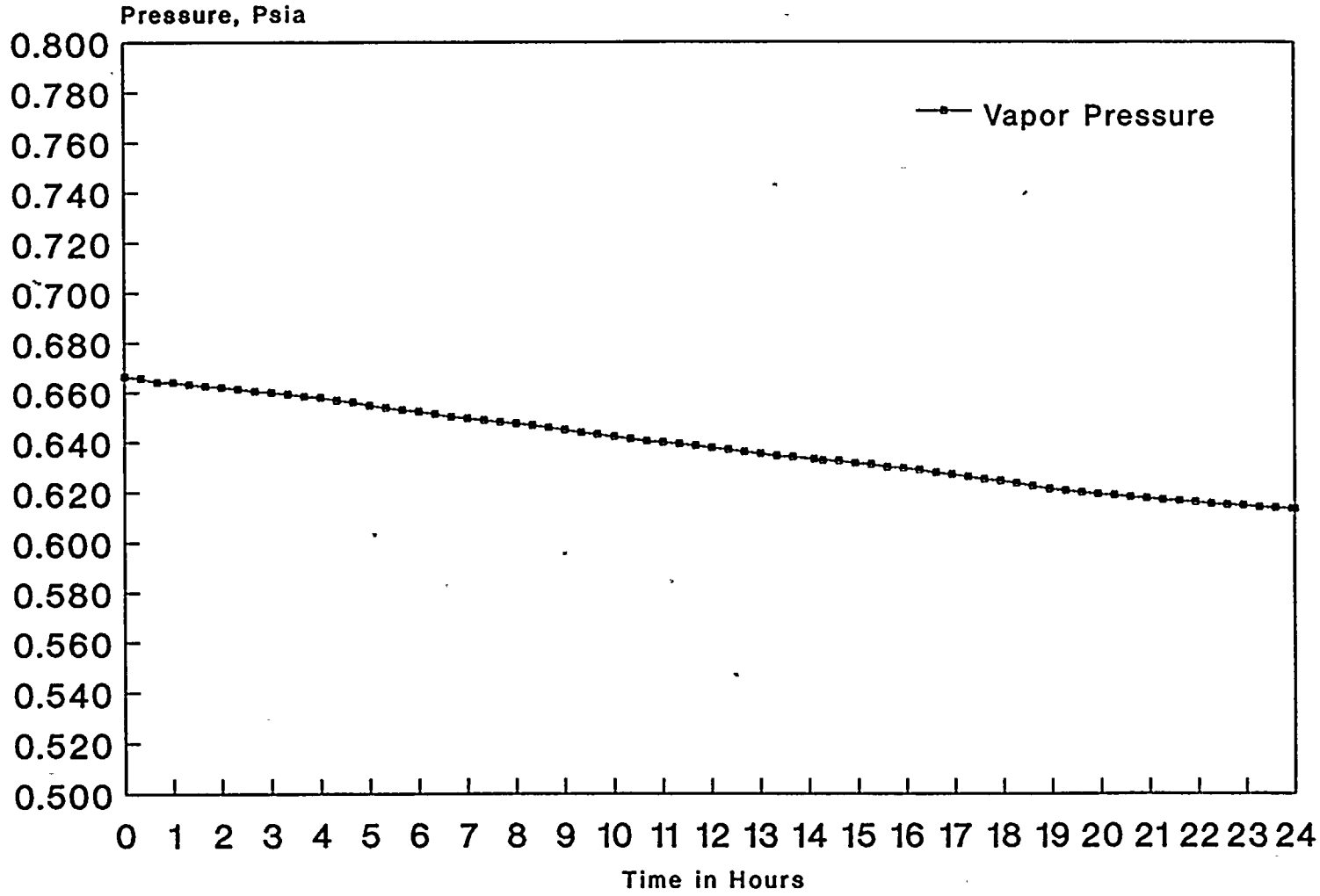
H0\ILRT4

ILRT CONTAINMENT ABSOLUTE PRESSURE
1991 TURKEY POINT UNIT 4 ILRT



H0\ILRT6

ILRT WEIGHTED AVERAGE VAPOR PRESSURE
1991 TURKEY POINT UNIT 4 ILRT



HO\ILRT8

DESCRIPTION OF VARIABLES

AVE TEMP - CONTAINMENT MEAN TEMPERATURE CALCULATED FROM VOLUMETRICALLY WEIGHTED RTD SENSOR INDICATIONS.

PRESSURE - PRIMARY CONTAINMENT PRESSURE INDICATION.

VAPOR PRES - CONTAINMENT VAPOR PRESSURE CALCULATED FROM VOLUMETRICALLY WEIGHTED HUMIDITY/DEWPOINT SENSOR INDICATIONS.

LEAK SIM - SIMPLE TOTAL TIME MEASURED LEAKAGE RATE.

LEAK FIT - LEAKAGE RATE CALCULATED FROM FIRST ORDER REGRESSION OF AIR MASS DATA.

95% UCL - UPPER LIMIT OF THE 95% CONFIDENCE LEVEL OF FITTED LEAKAGE RATE DATA.

AIR MASS - CONTAINMENT AIR MASS.

NOTES FOR TABULAR DATA -

1. TABLE VALUES OF ZERO SIGNIFY THE DATA IS NOT APPLICABLE TO THE CALCULATION.
2. "DELETED" SIGNIFIES THE SENSOR WAS DELETED.
3. "REJECTED" SIGNIFIES THE SAMPLE WAS REJECTED.

ILRT VARIABLE TABLE SUMMARY

SAM NO	TIME HOURS	AVE TEMP DEG F	PRESSURE PSIA	VAP PRES PSIA	LEAK SIM %/DAY	LEAK FIT %/DAY	UCL %/DAY	AIR MASS LBS
1	0.00	92.311	66.632	0.6662	0.000	0.000	0.000	499952
2	0.33	92.183	66.615	0.6656	0.122	0.000	0.000	499943
3	0.67	92.064	66.598	0.6641	0.133	0.133	0.187	499933
4	1.00	91.947	66.581	0.6641	0.200	0.194	0.299	499910
5	1.33	91.836	66.567	0.6632	0.144	0.163	0.227	499911
6	1.67	91.728	66.552	0.6624	0.143	0.150	0.192	499902
7	2.00	91.633	66.538	0.6619	0.158	0.155	0.183	499886
8	2.33	91.539	66.525	0.6613	0.155	0.155	0.175	499876
9	2.67	91.448	66.512	0.6604	0.151	0.153	0.169	499868
10	3.00	91.364	66.501	0.6600	0.142	0.148	0.161	499863
11	3.33	91.283	66.486	0.6592	0.177	0.160	0.178	499829
12	3.67	91.202	66.478	0.6584	0.137	0.151	0.168	499847
13	4.00	91.131	66.466	0.6578	0.152	0.151	0.166	499825
14	4.33	91.060	66.456	0.6567	0.143	0.148	0.161	499822
15	4.67	90.993	66.446	0.6560	0.143	0.146	0.157	499813
16	5.00	90.920	66.436	0.6548	0.134	0.141	0.152	499812
17	5.33	90.857	66.425	0.6539	0.144	0.141	0.150	499792
18	5.67	90.794	66.414	0.6530	0.152	0.143	0.152	499772
19	6.00	90.738	66.403	0.6522	0.165	0.149	0.158	499746
20	6.33	90.678	66.398	0.6512	0.138	0.146	0.155	499770
21	6.67	90.620	66.387	0.6501	0.147	0.146	0.154	499748
22	7.00	90.567	66.380	0.6494	0.140	0.144	0.151	499747
23	7.33	90.511	66.373	0.6487	0.131	0.140	0.148	499751
24	7.67	90.456	66.362	0.6481	0.144	0.141	0.148	499722
25	8.00	90.406	66.356	0.6474	0.135	0.139	0.146	499726
26	8.33	90.355	66.347	0.6467	0.139	0.138	0.144	499710
27	8.67	90.309	66.341	0.6459	0.133	0.136	0.142	499712
28	9.00	90.263	66.337	0.6449	0.118	0.132	0.139	499731
29	9.33	90.214	66.328	0.6438	0.121	0.129	0.136	499716
30	9.67	90.175	66.321	0.6431	0.124	0.127	0.134	499703
31	10.00	90.128	66.314	0.6421	0.121	0.125	0.132	499700
32	10.33	90.087	66.307	0.6414	0.121	0.123	0.130	499690
33	10.67	90.044	66.302	0.6405	0.114	0.120	0.127	499697
34	11.00	90.002	66.294	0.6399	0.119	0.119	0.125	499679
35	11.33	89.963	66.295	0.6392	0.095	0.114	0.122	499728
36	11.67	89.926	66.289	0.6385	0.095	0.109	0.118	499721
37	12.00	89.885	66.284	0.6377	0.090	0.105	0.114	499726
38	12.33	89.851	66.278	0.6369	0.091	0.101	0.111	499718
39	12.67	89.812	66.273	0.6360	0.087	0.097	0.107	499721
40	13.00	89.778	66.268	0.6353	0.086	0.094	0.104	499720
41	13.33	89.742	66.262	0.6345	0.086	0.091	0.101	499712
42	13.67	89.711	66.257	0.6340	0.086	0.088	0.098	499707
43	14.10	89.664	66.244	0.6331	0.100	0.088	0.097	499658
44	14.27	89.652	66.244	0.6327	0.094	0.087	0.096	499671
45	14.60	89.618	66.238	0.6324	0.096	0.086	0.094	499659
46	14.93	89.588	66.238	0.6315	0.083	0.084	0.092	499693
47	15.27	89.562	66.233	0.6311	0.085	0.082	0.090	499682
48	15.60	89.529	66.229	0.6300	0.080	0.080	0.088	499690
49	15.93	89.495	66.220	0.6294	0.089	0.079	0.087	499657

ILRT VARIABLE TABLE SUMMARY

SAM NO	TIME HOURS	AVE TEMP DEG F	PRESSURE PSIA	VAP PRES PSIA	LEAK SIM %/DAY	LEAK FIT %/DAY	UCL %/DAY	AIR MASS LBS
50	16.27	89.468	66.214	0.6287	0.092	0.079	0.086	499641
51	16.60	89.438	66.207	0.6277	0.095	0.079	0.086	499622
52	16.93	89.412	66.204	0.6270	0.092	0.079	0.086	499628
53	17.27	89.388	66.201	0.6261	0.088	0.078	0.085	499635
54	17.60	89.359	66.202	0.6252	0.075	0.076	0.083	499676
55	17.93	89.335	66.200	0.6244	0.070	0.074	0.081	499689
56	18.27	89.308	66.196	0.6236	0.069	0.072	0.079	499689
57	18.60	89.279	66.192	0.6225	0.067	0.070	0.077	499693
58	18.93	89.254	66.189	0.6214	0.064	0.067	0.075	499701
59	19.27	89.226	66.185	0.6207	0.062	0.065	0.072	499701
60	19.60	89.204	66.179	0.6200	0.066	0.064	0.071	499680
61	19.93	89.183	66.170	0.6193	0.076	0.063	0.070	499637
62	20.27	89.158	66.168	0.6187	0.072	0.062	0.069	499649
63	20.60	89.137	66.169	0.6182	0.063	0.061	0.068	499679
64	20.93	89.116	66.163	0.6177	0.068	0.060	0.066	499656
65	21.27	89.092	66.159	0.6170	0.067	0.059	0.065	499654
66	21.60	89.072	66.154	0.6165	0.070	0.058	0.065	499637
67	21.93	89.053	66.158	0.6160	0.057	0.057	0.063	499689
68	22.27	89.031	66.156	0.6155	0.055	0.055	0.061	499698
69	22.60	89.011	66.147	0.6149	0.064	0.054	0.060	499651
70	22.93	88.993	66.145	0.6146	0.062	0.053	0.059	499655
71	23.27	88.973	66.147	0.6141	0.054	0.052	0.058	499692
72	23.60	88.956	66.144	0.6139	0.054	0.051	0.057	499686
73	23.93	88.936	66.141	0.6134	0.053	0.049	0.055	499685
74	24.00	88.933	66.140	0.6133	0.054	0.048	0.054	499681
75	24.27	88.920	66.128	0.6131	0.069	0.048	0.054	499604

SENSOR VOLUME FRACTIONS

TEMPERATURE SENSORS

1 to 5	0.060333	0.060333	0.040000	0.040000	0.040000
6 to 10	0.060333	0.060333	0.060333	0.033000	0.053333
11 to 15	0.053333	0.033000	0.053333	0.033000	0.033000
16 to 20	0.053333	0.053333	0.053333	0.033000	0.033000
21 to 21	0.060333				

HUMIDITY/DP SENSORS

1 to 5	0.049500	0.049500	0.049500	0.049500	0.060000
6 to 10	0.060000	0.181000	0.181000	0.320000	0.000000

NOTE: VALUE OF ZERO INDICATES A DELETED SENSOR.

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 1 DEG F	TEMP 2 DEG F	TEMP 3 DEG F	TEMP 4 DEG F	TEMP 5 DEG F	TEMP 6 DEG F
1	0.00	93.116	92.961	91.360	91.518	91.563	93.177
2	0.33	92.944	92.786	91.306	91.464	91.499	93.014
3	0.67	92.803	92.646	91.252	91.409	91.422	92.851
4	1.00	92.651	92.506	91.166	91.335	91.324	92.721
5	1.33	92.501	92.390	91.094	91.251	91.251	92.561
6	1.67	92.360	92.259	91.028	91.174	91.176	92.431
7	2.00	92.252	92.142	90.965	91.110	91.110	92.311
8	2.33	92.140	92.028	90.897	91.063	91.051	92.178
9	2.67	92.000	91.920	90.852	91.008	90.988	92.080
10	3.00	91.891	91.845	90.788	90.954	90.933	91.974
11	3.33	91.796	91.750	90.736	90.904	90.881	91.867
12	3.67	91.707	91.662	90.691	90.845	90.824	91.779
13	4.00	91.612	91.578	90.650	90.818	90.774	91.695
14	4.33	91.535	91.492	90.596	90.764	90.728	91.607
15	4.67	91.448	91.404	90.553	90.698	90.685	91.532
16	5.00	91.380	91.336	90.505	90.630	90.628	91.430
17	5.33	91.305	91.239	90.463	90.607	90.597	91.355
18	5.67	91.228	91.184	90.420	90.564	90.551	91.278
19	6.00	91.167	91.112	90.379	90.535	90.513	91.206
20	6.33	91.101	91.046	90.347	90.480	90.469	91.143
21	6.67	91.033	90.979	90.300	90.455	90.433	91.075
22	7.00	90.981	90.906	90.261	90.417	90.392	91.011
23	7.33	90.913	90.838	90.225	90.381	90.356	90.943
24	7.67	90.850	90.784	90.193	90.337	90.324	90.889
25	8.00	90.795	90.741	90.159	90.292	90.292	90.826
26	8.33	90.729	90.675	90.139	90.260	90.258	90.780
27	8.67	90.686	90.632	90.105	90.217	90.226	90.717
28	9.00	90.625	90.583	90.067	90.188	90.197	90.653
29	9.33	90.577	90.524	90.042	90.152	90.160	90.597
30	9.67	90.527	90.474	90.012	90.134	90.142	90.567
31	10.00	90.468	90.438	89.988	90.109	90.106	90.511
32	10.33	90.403	90.384	89.954	90.077	90.074	90.468
33	10.67	90.351	90.352	89.922	90.043	90.042	90.413
34	11.00	90.328	90.309	89.899	90.011	90.020	90.370
35	11.33	90.285	90.266	89.868	89.991	89.988	90.325
36	11.67	90.242	90.221	89.847	89.968	89.965	90.282
37	12.00	90.187	90.178	89.825	89.925	89.933	90.250
38	12.33	90.146	90.148	89.795	89.907	89.892	90.210
39	12.67	90.101	90.103	89.770	89.882	89.867	90.176
40	13.00	90.056	90.069	89.750	89.839	89.847	90.142
41	13.33	90.024	90.037	89.727	89.816	89.813	90.087
42	13.67	89.992	90.006	89.696	89.785	89.781	90.076
43	14.10	89.938	89.963	89.673	89.751	89.738	90.024
44	14.27	89.926	89.951	89.662	89.751	89.726	90.013
45	14.60	89.895	89.908	89.630	89.708	89.704	89.970
46	14.93	89.852	89.886	89.599	89.696	89.672	89.947
47	15.27	89.822	89.856	89.569	89.667	89.654	89.917
48	15.60	89.797	89.820	89.533	89.653	89.629	89.881
49	15.93	89.752	89.800	89.510	89.621	89.595	89.838

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 1 DEG F	TEMP 2 DEG F	TEMP 3 DEG F	TEMP 4 DEG F	TEMP 5 DEG F	TEMP 6 DEG F
50	16.27	89.731	89.768	89.490	89.590	89.574	89.806
51	16.60	89.700	89.734	89.456	89.567	89.542	89.763
52	16.93	89.677	89.714	89.447	89.556	89.520	89.741
53	17.27	89.645	89.680	89.424	89.535	89.497	89.709
54	17.60	89.611	89.648	89.402	89.513	89.476	89.686
55	17.93	89.579	89.626	89.370	89.490	89.454	89.666
56	18.27	89.548	89.605	89.350	89.458	89.433	89.632
57	18.60	89.514	89.571	89.339	89.447	89.411	89.612
58	18.93	89.493	89.551	89.316	89.427	89.390	89.569
59	19.27	89.471	89.528	89.296	89.404	89.367	89.546
60	19.60	89.439	89.497	89.273	89.383	89.356	89.526
61	19.93	89.450	89.474	89.250	89.361	89.336	89.492
62	20.27	89.416	89.454	89.230	89.340	89.313	89.471
63	20.60	89.384	89.431	89.219	89.329	89.302	89.449
64	20.93	89.373	89.400	89.198	89.295	89.281	89.426
65	21.27	89.350	89.377	89.176	89.286	89.258	89.417
66	21.60	89.319	89.368	89.164	89.252	89.238	89.383
67	21.93	89.298	89.345	89.144	89.241	89.227	89.363
68	22.27	89.276	89.323	89.133	89.232	89.204	89.340
69	22.60	89.264	89.302	89.110	89.220	89.183	89.329
70	22.93	89.244	89.291	89.099	89.198	89.172	89.286
71	23.27	89.221	89.268	89.078	89.177	89.149	89.286
72	23.60	89.198	89.248	89.067	89.155	89.140	89.265
73	23.93	89.167	89.237	89.047	89.143	89.118	89.254
74	24.00	89.167	89.225	89.047	89.143	89.118	89.243
75	24.27	89.146	89.216	89.035	89.134	89.106	89.231

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 7 DEG F	TEMP 8 DEG F	TEMP 9 DEG F	TEMP 10 DEG F	TEMP 11 DEG F	TEMP 12 DEG F
1	0.00	92.810	92.901	87.434	94.445	94.806	88.195
2	0.33	92.703	92.760	87.434	94.261	94.611	88.183
3	0.67	92.551	92.620	87.445	94.078	94.436	88.183
4	1.00	92.399	92.499	87.445	93.903	94.263	88.172
5	1.33	92.283	92.374	87.448	93.733	94.093	88.165
6	1.67	92.151	92.254	87.436	93.582	93.930	88.165
7	2.00	92.030	92.156	87.436	93.430	93.778	88.165
8	2.33	91.930	92.077	87.434	93.276	93.632	88.161
9	2.67	91.821	91.968	87.434	93.135	93.480	88.152
10	3.00	91.703	91.870	87.434	93.015	93.351	88.161
11	3.33	91.596	91.786	87.436	92.900	93.224	88.142
12	3.67	91.528	91.706	87.434	92.777	93.090	88.140
13	4.00	91.444	91.622	87.427	92.662	92.974	88.142
14	4.33	91.346	91.547	87.427	92.542	92.865	88.142
15	4.67	91.292	91.482	87.416	92.444	92.757	88.133
16	5.00	91.201	91.413	87.423	92.333	92.634	88.129
17	5.33	91.137	91.348	87.411	92.234	92.536	88.129
18	5.67	91.048	91.273	87.411	92.147	92.428	88.129
19	6.00	90.987	91.211	87.416	92.064	92.335	88.122
20	6.33	90.923	91.157	87.416	91.946	92.248	88.122
21	6.67	90.853	91.077	87.411	91.887	92.135	88.118
22	7.00	90.780	91.016	87.416	91.826	92.042	88.122
23	7.33	90.723	90.957	87.411	91.735	91.951	88.118
24	7.67	90.669	90.902	87.411	91.660	91.874	88.118
25	8.00	90.614	90.848	87.402	91.583	91.788	88.118
26	8.33	90.548	90.793	87.411	91.497	91.713	88.108
27	8.67	90.505	90.741	87.402	91.411	91.636	88.108
28	9.00	90.455	90.700	87.405	91.339	91.563	88.099
29	9.33	90.396	90.641	87.402	91.271	91.484	88.097
30	9.67	90.369	90.591	87.405	91.207	91.423	88.099
31	10.00	90.310	90.534	87.402	91.139	91.343	88.086
32	10.33	90.267	90.491	87.402	91.085	91.277	88.086
33	10.67	90.212	90.446	87.391	91.042	91.214	88.075
34	11.00	90.169	90.382	87.391	90.979	91.148	88.063
35	11.33	90.126	90.360	87.380	90.913	91.094	88.063
36	11.67	90.094	90.305	87.380	90.870	91.039	88.054
37	12.00	90.039	90.262	87.380	90.804	90.964	88.043
38	12.33	90.010	90.232	87.382	90.743	90.901	88.045
39	12.67	89.962	90.187	87.368	90.696	90.833	88.032
40	13.00	89.919	90.153	87.368	90.641	90.790	88.032
41	13.33	89.887	90.133	87.368	90.598	90.724	88.020
42	13.67	89.853	90.089	87.368	90.555	90.692	88.020
43	14.10	89.798	90.035	87.357	90.489	90.626	88.009
44	14.27	89.778	90.035	87.357	90.469	90.595	88.009
45	14.60	89.744	90.001	87.348	90.426	90.540	88.009
46	14.93	89.712	89.980	87.348	90.372	90.497	88.000
47	15.27	89.694	89.940	87.350	90.342	90.467	88.002
48	15.60	89.658	89.892	87.348	90.295	90.411	87.989
49	15.93	89.626	89.849	87.337	90.240	90.365	87.977

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 7 DEG F	TEMP 8 DEG F	TEMP 9 DEG F	TEMP 10 DEG F	TEMP 11 DEG F	TEMP 12 DEG F
50	16.27	89.592	89.828	87.337	90.209	90.322	87.977
51	16.60	89.560	89.806	87.337	90.154	90.279	87.966
52	16.93	89.539	89.794	87.325	90.123	90.225	87.957
53	17.27	89.517	89.785	87.325	90.080	90.182	87.957
54	17.60	89.485	89.762	87.314	90.046	90.139	87.957
55	17.93	89.451	89.751	87.314	90.003	90.107	87.946
56	18.27	89.430	89.708	87.314	89.971	90.052	87.946
57	18.60	89.396	89.676	87.305	89.928	90.009	87.946
58	18.93	89.376	89.633	87.305	89.894	89.975	87.934
59	19.27	89.353	89.588	87.305	89.862	89.921	87.923
60	19.60	89.333	89.579	87.294	89.831	89.889	87.923
61	19.93	89.310	89.544	87.294	89.797	89.857	87.923
62	20.27	89.290	89.524	87.294	89.765	89.814	87.912
63	20.60	89.267	89.501	87.294	89.742	89.780	87.903
64	20.93	89.244	89.490	87.282	89.699	89.737	87.903
65	21.27	89.212	89.470	87.282	89.667	89.705	87.903
66	21.60	89.201	89.458	87.271	89.645	89.662	87.891
67	21.93	89.180	89.438	87.271	89.613	89.628	87.891
68	22.27	89.158	89.415	87.271	89.579	89.597	87.880
69	22.60	89.137	89.404	87.271	89.547	89.553	87.880
70	22.93	89.126	89.383	87.260	89.527	89.519	87.880
71	23.27	89.103	89.349	87.260	89.493	89.488	87.869
72	23.60	89.092	89.338	87.260	89.473	89.456	87.869
73	23.93	89.060	89.338	87.260	89.439	89.422	87.869
74	24.00	89.060	89.329	87.251	89.430	89.422	87.869
75	24.27	89.049	89.317	87.251	89.430	89.402	87.859

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 13 DEG F	TEMP 14 DEG F	TEMP 15 DEG F	TEMP 16 DEG F	TEMP 17 DEG F	TEMP 18 DEG F
1	0.00	94.539	87.888	88.237	94.764	95.094	94.646
2	0.33	94.332	87.877	88.237	94.569	94.877	94.440
3	0.67	94.148	87.866	88.237	94.386	94.693	94.266
4	1.00	93.974	87.866	88.226	94.200	94.530	94.083
5	1.33	93.804	87.859	88.219	94.042	94.360	93.924
6	1.67	93.652	87.859	88.219	93.867	94.197	93.761
7	2.00	93.500	87.859	88.242	93.716	94.035	93.632
8	2.33	93.334	87.855	88.260	93.584	93.881	93.487
9	2.67	93.203	87.855	88.271	93.442	93.749	93.347
10	3.00	93.085	87.855	88.314	93.301	93.609	93.227
11	3.33	92.947	87.859	88.317	93.174	93.482	93.111
12	3.67	92.824	87.855	88.303	93.052	93.328	92.966
13	4.00	92.720	87.859	88.305	92.937	93.222	92.873
14	4.33	92.622	87.859	88.317	92.839	93.125	92.742
15	4.67	92.514	87.848	88.317	92.719	93.018	92.667
16	5.00	92.357	87.843	88.303	92.620	92.885	92.577
17	5.33	92.271	87.843	88.303	92.500	92.787	92.479
18	5.67	92.217	87.834	88.292	92.391	92.690	92.371
19	6.00	92.133	87.836	88.285	92.309	92.584	92.298
20	6.33	92.024	87.836	88.285	92.221	92.498	92.212
21	6.67	91.967	87.834	88.271	92.122	92.396	92.122
22	7.00	91.895	87.836	88.274	92.038	92.314	92.029
23	7.33	91.784	87.834	88.249	91.947	92.235	91.950
24	7.67	91.695	87.834	88.237	91.850	92.126	91.873
25	8.00	91.620	87.823	88.217	91.775	92.061	91.787
26	8.33	91.534	87.834	88.194	91.698	91.964	91.710
27	8.67	91.469	87.823	88.172	91.644	91.889	91.646
28	9.00	91.407	87.836	88.154	91.540	91.848	91.583
29	9.33	91.328	87.823	88.129	91.483	91.746	91.504
30	9.67	91.244	87.836	88.133	91.420	91.674	91.454
31	10.00	91.176	87.834	88.108	91.340	91.595	91.375
32	10.33	91.110	87.823	88.097	91.277	91.563	91.309
33	10.67	91.036	87.812	88.086	91.200	91.488	91.255
34	11.00	90.990	87.812	88.054	91.134	91.411	91.191
35	11.33	90.904	87.812	88.032	91.071	91.357	91.126
36	11.67	90.850	87.800	88.020	91.028	91.303	91.060
37	12.00	90.807	87.800	88.011	90.951	91.239	90.997
38	12.33	90.757	87.805	88.002	90.901	91.187	90.945
39	12.67	90.689	87.791	87.989	90.854	91.131	90.888
40	13.00	90.623	87.791	87.989	90.788	91.097	90.845
41	13.33	90.557	87.791	87.977	90.734	91.022	90.791
42	13.67	90.492	87.780	87.968	90.702	90.968	90.725
43	14.10	90.417	87.780	87.957	90.616	90.914	90.628
44	14.27	90.428	87.780	87.946	90.605	90.893	90.596
45	14.60	90.394	87.780	87.934	90.539	90.839	90.530
46	14.93	90.331	87.769	87.934	90.507	90.794	90.476
47	15.27	90.322	87.771	87.928	90.446	90.744	90.447
48	15.60	90.254	87.769	87.923	90.399	90.687	90.401
49	15.93	90.199	87.757	87.914	90.367	90.633	90.347

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 13 DEG F	TEMP 14 DEG F	TEMP 15 DEG F	TEMP 16 DEG F	TEMP 17 DEG F	TEMP 18 DEG F
50	16.27	90.156	87.757	87.903	90.313	90.599	90.313
51	16.60	90.102	87.757	87.891	90.270	90.556	90.270
52	16.93	90.038	87.746	87.891	90.227	90.513	90.227
53	17.27	90.016	87.746	87.880	90.182	90.470	90.196
54	17.60	89.984	87.737	87.860	90.139	90.427	90.141
55	17.93	89.950	87.737	87.871	90.096	90.384	90.098
56	18.27	89.896	87.737	87.860	90.064	90.350	90.076
57	18.60	89.853	87.726	87.848	90.010	90.296	90.021
58	18.93	89.821	87.726	87.848	89.967	90.264	89.990
59	19.27	89.744	87.714	87.848	89.933	90.221	89.967
60	19.60	89.744	87.714	87.837	89.890	90.190	89.913
61	19.93	89.712	87.714	87.837	89.847	90.144	89.892
62	20.27	89.669	87.703	87.826	89.815	90.113	89.838
63	20.60	89.626	87.703	87.826	89.783	90.081	89.795
64	20.93	89.626	87.703	87.817	89.749	90.047	89.772
65	21.27	89.560	87.692	87.805	89.695	90.004	89.741
66	21.60	89.506	87.692	87.805	89.684	89.972	89.741
67	21.93	89.474	87.683	87.794	89.641	89.941	89.729
68	22.27	89.440	87.692	87.794	89.598	89.907	89.686
69	22.60	89.408	87.683	87.794	89.566	89.864	89.652
70	22.93	89.377	87.683	87.794	89.532	89.832	89.643
71	23.27	89.354	87.683	87.794	89.500	89.809	89.621
72	23.60	89.334	87.671	87.794	89.469	89.778	89.589
73	23.93	89.300	87.671	87.783	89.435	89.744	89.566
74	24.00	89.300	87.660	87.783	89.426	89.735	89.566
75	24.27	89.288	87.660	87.772	89.403	89.701	89.546

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 19 DEG F	TEMP 20 DEG F	TEMP 21 DEG F
1	0.00	87.263	87.538	92.923
2	0.33	87.263	87.531	92.744
3	0.67	87.263	87.529	92.587
4	1.00	87.263	87.529	92.447
5	1.33	87.265	87.529	92.306
6	1.67	87.254	87.518	92.177
7	2.00	87.265	87.518	92.057
8	2.33	87.263	87.518	91.949
9	2.67	87.252	87.518	91.840
10	3.00	87.252	87.500	91.726
11	3.33	87.245	87.500	91.638
12	3.67	87.240	87.506	91.538
13	4.00	87.245	87.500	91.443
14	4.33	87.245	87.488	91.357
15	4.67	87.245	87.482	91.276
16	5.00	87.240	87.500	91.205
17	5.33	87.240	87.506	91.138
18	5.67	87.240	87.506	91.061
19	6.00	87.245	87.495	90.986
20	6.33	87.245	87.488	90.913
21	6.67	87.240	87.488	90.839
22	7.00	87.245	87.488	90.784
23	7.33	87.252	87.495	90.725
24	7.67	87.240	87.488	90.653
25	8.00	87.240	87.488	90.601
26	8.33	87.240	87.495	90.553
27	8.67	87.240	87.495	90.499
28	9.00	87.245	87.488	90.438
29	9.33	87.240	87.488	90.395
30	9.67	87.245	87.488	90.340
31	10.00	87.240	87.495	90.304
32	10.33	87.229	87.488	90.254
33	10.67	87.240	87.486	90.207
34	11.00	87.229	87.479	90.157
35	11.33	87.220	87.486	90.118
36	11.67	87.229	87.468	90.068
37	12.00	87.220	87.468	90.037
38	12.33	87.222	87.457	89.994
39	12.67	87.220	87.457	89.951
40	13.00	87.209	87.457	89.908
41	13.33	87.209	87.445	89.874
42	13.67	87.209	87.445	89.842
43	14.10	87.209	87.445	89.788
44	14.27	87.197	87.434	89.776
45	14.60	87.197	87.434	89.745
46	14.93	87.197	87.425	89.713
47	15.27	87.190	87.432	89.674
48	15.60	87.186	87.425	89.647
49	15.93	87.186	87.414	89.616

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 19 DEG F	TEMP 20 DEG F	TEMP 21 DEG F
50	16.27	87.175	87.402	89.593
51	16.60	87.175	87.409	89.577
52	16.93	87.175	87.402	89.539
53	17.27	87.166	87.398	89.514
54	17.60	87.154	87.398	89.480
55	17.93	87.154	87.386	89.459
56	18.27	87.154	87.382	89.421
57	18.60	87.143	87.377	89.405
58	18.93	87.143	87.377	89.373
59	19.27	87.143	87.359	89.344
60	19.60	87.132	87.359	89.323
61	19.93	87.132	87.359	89.301
62	20.27	87.132	87.355	89.276
63	20.60	87.132	87.348	89.258
64	20.93	87.123	87.337	89.235
65	21.27	87.123	87.337	89.215
66	21.60	87.111	87.328	89.192
67	21.93	87.111	87.328	89.181
68	22.27	87.100	87.328	89.160
69	22.60	87.100	87.335	89.145
70	22.93	87.100	87.316	89.129
71	23.27	87.089	87.305	89.106
72	23.60	87.089	87.305	89.095
73	23.93	87.077	87.305	89.074
74	24.00	87.089	87.305	89.074
75	24.27	87.089	87.305	89.052

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	PRES 1 PSIA	PRES 2 PSIA	HUM 1 % RH	HUM 2 % RH	HUM 3 % RH	HUM 4 % RH
1	0.00	66.628	66.632	91.345	86.305	89.220	86.718
2	0.33	66.609	66.615	91.628	86.757	89.678	87.128
3	0.67	66.593	66.598	91.844	87.275	90.121	87.560
4	1.00	66.577	66.581	92.075	87.650	90.409	87.860
5	1.33	66.563	66.567	92.330	88.046	90.710	88.248
6	1.67	66.549	66.552	92.529	88.499	90.897	88.395
7	2.00	66.535	66.538	92.695	88.864	91.006	88.765
8	2.33	66.522	66.525	92.936	89.185	91.182	89.092
9	2.67	66.511	66.512	93.085	89.346	91.238	89.351
10	3.00	66.500	66.501	93.271	89.543	91.523	89.846
11	3.33	66.489	66.486	93.434	89.625	91.675	90.089
12	3.67	66.478	66.478	93.591	89.857	91.843	90.380
13	4.00	66.467	66.466	93.760	90.009	92.064	90.647
14	4.33	66.455	66.456	93.905	90.112	92.180	90.874
15	4.67	66.446	66.446	94.061	90.253	92.407	91.072
16	5.00	66.436	66.436	94.194	90.472	92.488	91.268
17	5.33	66.422	66.425	94.288	90.676	92.604	91.401
18	5.67	66.413	66.414	94.373	90.831	92.747	91.556
19	6.00	66.399	66.403	94.480	91.106	92.900	91.710
20	6.33	66.396	66.398	94.573	91.100	93.057	91.854
21	6.67	66.385	66.387	94.630	91.285	93.109	92.035
22	7.00	66.375	66.380	94.694	91.431	93.219	92.134
23	7.33	66.368	66.373	94.775	91.512	93.347	92.279
24	7.67	66.355	66.362	94.839	91.639	93.452	92.360
25	8.00	66.352	66.356	94.868	91.721	93.539	92.435
26	8.33	66.340	66.347	94.933	91.862	93.591	92.500
27	8.67	66.335	66.341	94.945	91.995	93.638	92.557
28	9.00	66.332	66.337	94.991	92.070	93.673	92.610
29	9.33	66.324	66.328	95.013	92.197	93.695	92.621
30	9.67	66.315	66.321	95.072	92.220	93.777	92.709
31	10.00	66.310	66.314	95.095	92.338	93.783	92.738
32	10.33	66.302	66.307	95.103	92.339	93.895	92.815
33	10.67	66.297	66.302	95.148	92.545	93.939	92.877
34	11.00	66.288	66.294	95.153	92.587	94.067	92.917
35	11.33	66.291	66.295	95.165	92.581	94.171	92.964
36	11.67	66.285	66.289	95.157	92.607	94.199	92.986
37	12.00	66.278	66.284	95.142	92.633	94.242	93.005
38	12.33	66.273	66.278	95.162	92.677	94.269	93.003
39	12.67	66.269	66.273	95.134	92.666	94.275	93.009
40	13.00	66.264	66.268	95.134	92.666	94.210	93.014
41	13.33	66.259	66.262	95.118	92.715	94.265	93.029
42	13.67	66.255	66.257	95.087	92.765	94.210	93.009
43	14.10	66.244	66.244	95.062	92.751	94.215	92.985
44	14.27	66.243	66.244	95.062	92.728	94.186	92.990
45	14.60	66.237	66.238	95.037	92.766	94.177	92.981
46	14.93	66.237	66.238	95.020	92.760	94.148	92.964
47	15.27	66.233	66.233	95.004	92.762	94.110	92.965
48	15.60	66.228	66.229	94.961	92.766	94.102	92.928
49	15.93	66.218	66.220	94.939	92.749	94.073	92.936

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	PRES 1 PSIA	PRES 2 PSIA	HUM 1 % RH	HUM 2 % RH	HUM 3 % RH	HUM 4 % RH
50	16.27	66.214	66.214	94.915	92.726	94.125	92.917
51	16.60	66.207	66.207	94.886	92.715	94.086	92.894
52	16.93	66.202	66.204	94.855	92.706	94.071	92.887
53	17.27	66.200	66.201	94.828	92.703	94.055	92.877
54	17.60	66.200	66.202	94.805	92.673	94.061	92.871
55	17.93	66.199	66.200	94.764	92.675	94.015	92.854
56	18.27	66.195	66.196	94.718	92.656	94.004	92.831
57	18.60	66.191	66.192	94.683	92.656	93.981	92.814
58	18.93	66.187	66.189	94.640	92.631	93.943	92.776
59	19.27	66.184	66.185	94.590	92.645	93.934	92.772
60	19.60	66.180	66.179	94.561	92.610	93.922	92.755
61	19.93	66.171	66.170	94.515	92.605	93.876	92.726
62	20.27	66.167	66.168	94.478	92.590	93.845	92.706
63	20.60	66.169	66.169	94.437	92.607	93.862	92.695
64	20.93	66.162	66.163	94.404	92.593	93.840	92.679
65	21.27	66.158	66.159	94.386	92.563	93.811	92.667
66	21.60	66.153	66.154	94.343	92.549	93.796	92.629
67	21.93	66.158	66.158	94.326	92.567	93.774	92.614
68	22.27	66.156	66.156	94.290	92.543	93.744	92.589
69	22.60	66.146	66.147	94.279	92.520	93.716	92.572
70	22.93	66.144	66.145	94.240	92.544	93.711	92.561
71	23.27	66.146	66.147	94.246	92.567	93.671	92.544
72	23.60	66.143	66.144	94.224	92.563	93.661	92.528
73	23.93	66.140	66.141	94.193	92.584	93.641	92.515
74	24.00	66.139	66.140	94.199	92.550	93.654	92.527
75	24.27	66.124	66.128	94.193	92.532	93.647	92.504

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	HUM 5 % RH	HUM 6 % RH	HUM 7 % RH	HUM 8 % RH	HUM 9 % RH	HUM 10 % RH
1	0.00	71.527	72.770	88.698	91.758	92.443	DELETED
2	0.33	72.542	73.586	89.050	91.635	92.662	DELETED
3	0.67	73.414	74.476	89.401	90.909	92.773	DELETED
4	1.00	74.156	75.265	89.758	91.355	92.941	DELETED
5	1.33	74.905	75.985	89.927	91.407	92.975	DELETED
6	1.67	75.435	77.054	90.137	91.396	93.063	DELETED
7	2.00	76.049	78.052	90.326	91.423	93.177	DELETED
8	2.33	76.752	78.837	90.480	91.483	93.214	DELETED
9	2.67	77.523	79.701	90.616	91.517	93.177	DELETED
10	3.00	78.267	80.596	90.746	91.512	93.260	DELETED
11	3.33	78.860	81.327	90.798	91.471	93.318	DELETED
12	3.67	79.446	81.722	90.822	91.489	93.370	DELETED
13	4.00	80.027	82.268	90.909	91.460	93.412	DELETED
14	4.33	80.549	82.582	90.955	91.443	93.330	DELETED
15	4.67	81.136	82.994	91.030	91.414	93.313	DELETED
16	5.00	81.670	83.302	91.036	91.420	93.231	DELETED
17	5.33	81.971	83.690	91.100	91.378	93.208	DELETED
18	5.67	82.341	83.950	91.086	91.337	93.224	DELETED
19	6.00	82.611	84.197	91.083	91.274	93.250	DELETED
20	6.33	83.011	84.469	91.112	91.245	93.156	DELETED
21	6.67	83.134	84.614	91.100	91.158	93.132	DELETED
22	7.00	83.475	84.777	91.064	91.106	93.237	DELETED
23	7.33	83.644	84.899	91.117	91.100	93.284	DELETED
24	7.67	83.951	85.055	91.106	91.053	93.394	DELETED
25	8.00	84.161	85.200	91.100	91.013	93.463	DELETED
26	8.33	84.393	85.381	91.060	91.019	93.505	DELETED
27	8.67	84.557	85.463	91.095	90.973	93.511	DELETED
28	9.00	84.753	85.579	91.060	90.920	93.464	DELETED
29	9.33	84.905	85.764	90.984	90.874	93.394	DELETED
30	9.67	85.067	85.914	91.007	90.862	93.347	DELETED
31	10.00	85.189	86.089	90.933	90.834	93.307	DELETED
32	10.33	85.323	86.229	90.898	90.806	93.325	DELETED
33	10.67	85.525	86.390	90.839	90.775	93.284	DELETED
34	11.00	85.706	86.530	90.902	90.734	93.271	DELETED
35	11.33	85.908	86.647	90.862	90.699	93.265	DELETED
36	11.67	86.093	86.772	90.837	90.627	93.281	DELETED
37	12.00	86.339	86.948	90.735	90.590	93.290	DELETED
38	12.33	86.494	87.086	90.674	90.564	93.206	DELETED
39	12.67	86.726	87.231	90.703	90.535	93.130	DELETED
40	13.00	86.836	87.400	90.680	90.547	93.083	DELETED
41	13.33	87.076	87.565	90.653	90.520	92.999	DELETED
42	13.67	87.341	87.708	90.627	90.494	93.009	DELETED
43	14.10	87.736	87.863	90.598	90.499	92.949	DELETED
44	14.27	87.770	87.921	90.546	90.447	92.937	DELETED
45	14.60	88.151	88.022	90.583	90.479	92.975	DELETED
46	14.93	88.406	88.104	90.479	90.438	92.871	DELETED
47	15.27	88.582	88.204	90.515	90.387	92.872	DELETED
48	15.60	88.650	88.237	90.386	90.356	92.766	DELETED
49	15.93	88.784	88.313	90.415	90.363	92.749	DELETED

ILRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	HUM 5 % RH	HUM 6 % RH	HUM 7 % RH	HUM 8 % RH	HUM 9 % RH	HUM 10 % RH
50	16.27	88.870	88.370	90.327	90.304	92.755	DELETED
51	16.60	88.947	88.418	90.316	90.328	92.540	DELETED
52	16.93	88.961	88.456	90.332	90.337	92.468	DELETED
53	17.27	89.038	88.458	90.374	90.333	92.220	DELETED
54	17.60	89.080	88.505	90.374	90.287	92.087	DELETED
55	17.93	89.086	88.511	90.381	90.299	91.948	DELETED
56	18.27	89.097	88.505	90.421	90.288	91.826	DELETED
57	18.60	89.097	88.494	90.409	90.282	91.617	DELETED
58	18.93	89.066	88.479	90.372	90.267	91.417	DELETED
59	19.27	89.045	88.481	90.398	90.276	91.350	DELETED
60	19.60	89.050	88.469	90.374	90.264	91.274	DELETED
61	19.93	89.039	88.475	90.392	90.270	91.129	DELETED
62	20.27	89.054	88.479	90.385	90.286	91.075	DELETED
63	20.60	89.020	88.474	90.396	90.262	91.063	DELETED
64	20.93	89.044	88.469	90.409	90.293	91.024	DELETED
65	21.27	89.073	88.475	90.403	90.304	90.914	DELETED
66	21.60	89.076	88.478	90.400	90.284	90.894	DELETED
67	21.93	89.089	88.474	90.408	90.286	90.825	DELETED
68	22.27	89.076	88.478	90.399	90.289	90.812	DELETED
69	22.60	89.071	88.490	90.371	90.284	90.742	DELETED
70	22.93	89.077	88.497	90.389	90.297	90.739	DELETED
71	23.27	89.083	88.521	90.402	90.332	90.703	DELETED
72	23.60	89.084	88.522	90.472	90.350	90.699	DELETED
73	23.93	89.119	88.544	90.408	90.355	90.686	DELETED
74	24.00	89.124	88.549	90.425	90.349	90.669	DELETED
75	24.27	89.124	88.567	90.431	90.332	90.686	DELETED

APPENDIX A4
SUPPLEMENTAL LEAKAGE RATE TEST

CLRT TEST MODE

1991 Turkey Point Unit 4 ILRT

Sequence Started 13:28 10/19/91
Sequence Ended 17:28 10/19/91

CONTAINMENT INTEGRATED LEAKAGE RATE TEST
SUPPLEMENTAL VERIFICATION TEST

LEAKAGE RATE IS MEASURED USING THE ABSOLUTE METHOD AND IS COMPUTED USING THE MASS POINT METHOD IN STRICT ACCORDANCE WITH AMERICAN NATIONAL STANDARD ANSI/ANS 56.8-1987

TEST PERIOD STARTED AT 13:28 HOURS ON 10/19/91
TEST CONDUCTED FOR 4.00 HOURS

FREESPACE VOLUME OF CONTAINMENT IS 1550000 CU FT
CONTAINMENT WAS PRESSURIZED TO 66.08 PSIA

FITTED MASS POINT ILRT LEAKAGE RATE	Lam	= 0.048 % /DAY
CONTAINMENT DESIGN LEAKAGE RATE	La	= 0.250 % /DAY
SUPERIMPOSED CLRT LEAKAGE RATE	Lo	= 0.289 % /DAY
FITTED CLRT TOTAL TIME LEAKAGE RATE	Lc	= 0.336 % /DAY

$$Lo + Lam - La/4 <= Lc <= Lo + Lam + La/4$$

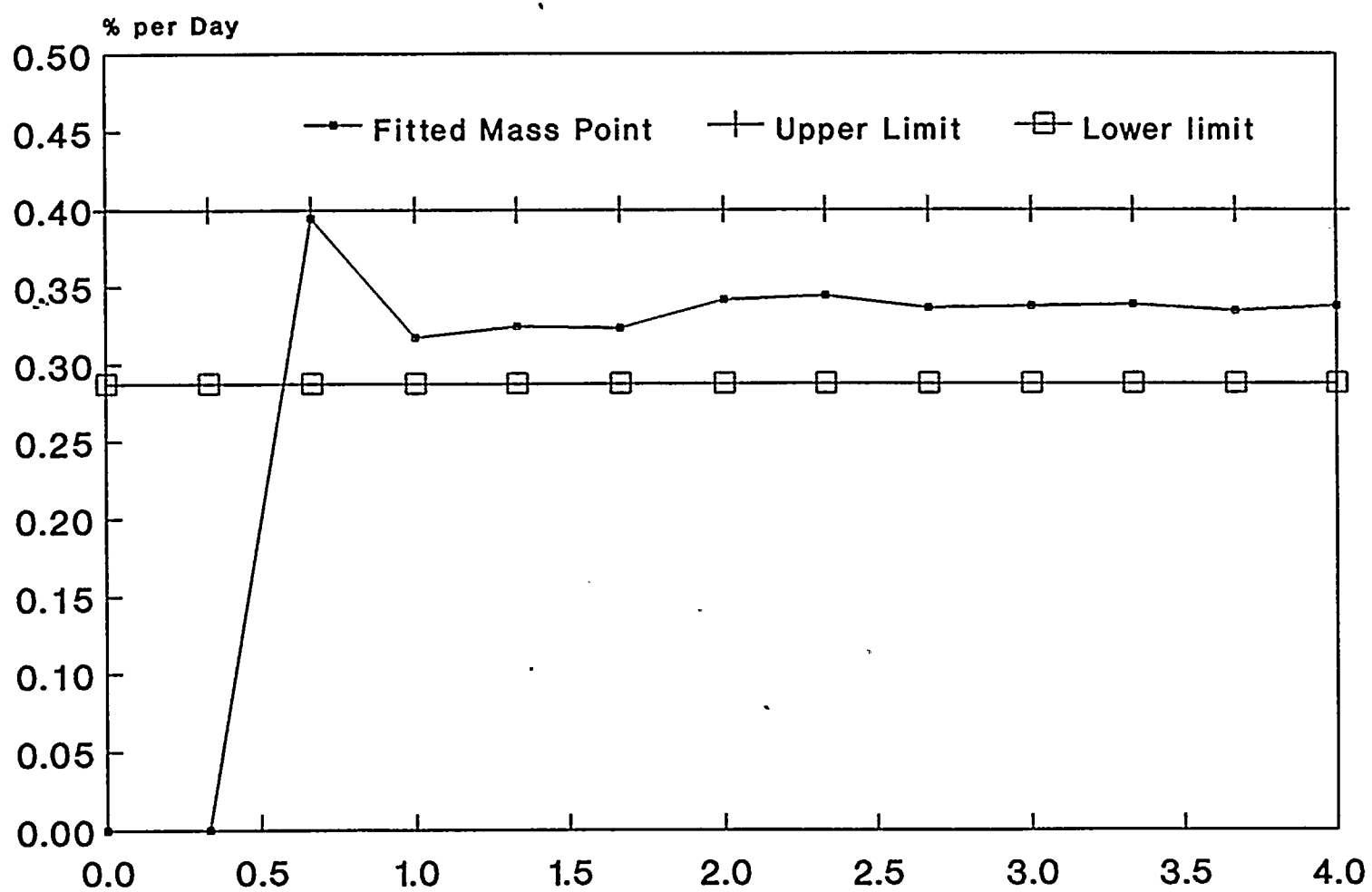
$$0.289 + 0.048 - 0.063 <= 0.336 <= 0.289 + 0.048 + 0.063$$

$$0.275 <= 0.336 <= 0.400$$

THE ACCEPTANCE CRITERIA FOR THIS TEST IS LEAKAGE BETWEEN 0.2745 % (0.275 %) PER DAY AND 0.3995 % (0.400 %) PER DAY.

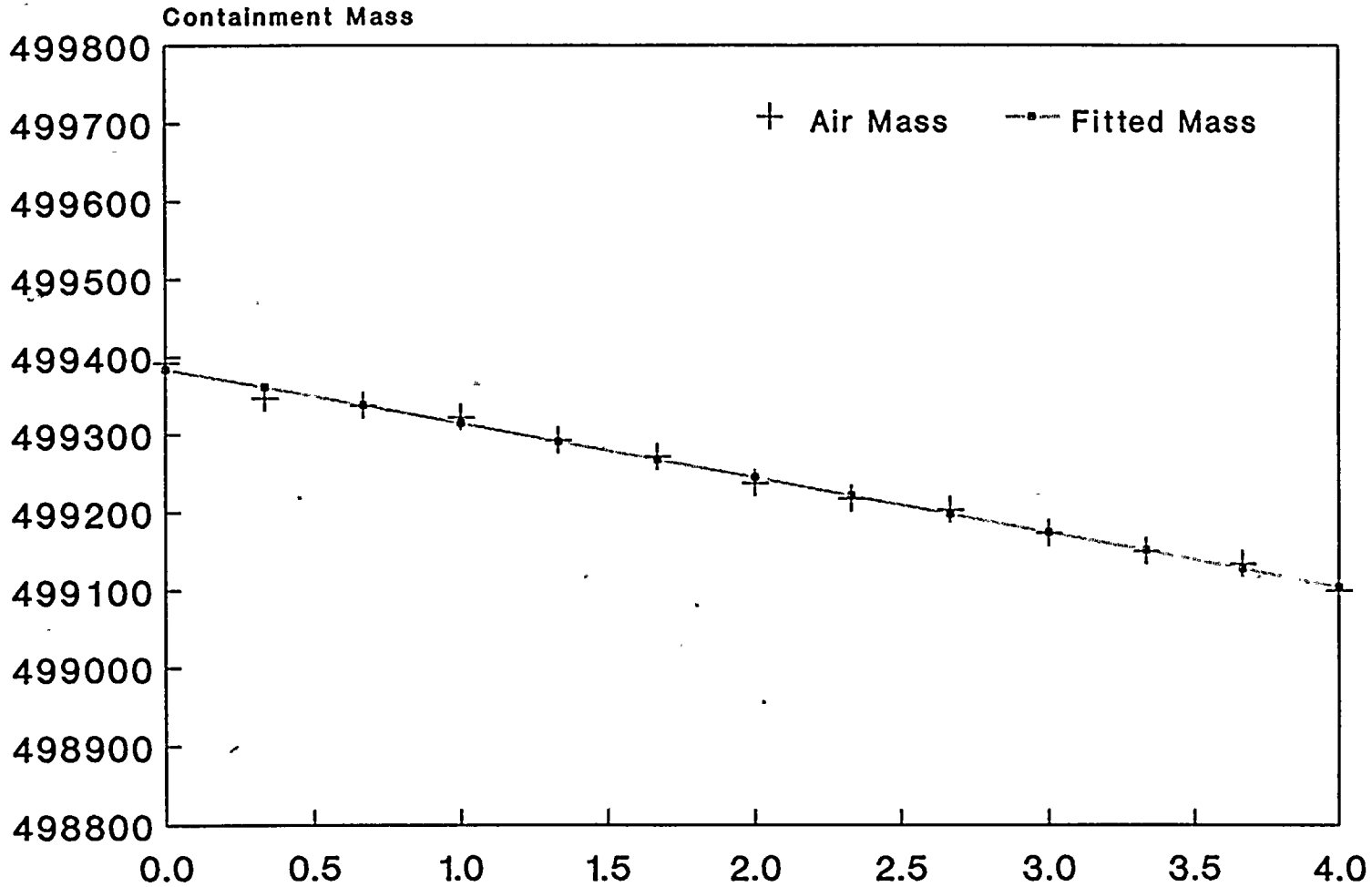
THE SUPPLEMENTAL VERIFICATION TEST MET THE ACCEPTANCE CRITERIA AS SHOWN ABOVE AND AS GRAPHICALLY DEPICTED ON THE FOLLOWING PAGE.

CLRT LEAKAGE RATES RELATIVE TO LIMITS
1991 TURKEY POINT UNIT 4 ILRT



H:\CLRT3

CLRT AIR MASS
1991 TURKEY POINT UNIT 4 ILRT



H0\CLRT1

DESCRIPTION OF VARIABLES

AVE TEMP - CONTAINMENT MEAN TEMPERATURE CALCULATED FROM VOLUMETRICALLY WEIGHTED RTD SENSOR INDICATIONS.

PRESSURE - PRIMARY CONTAINMENT PRESSURE INDICATION.

VAPOR PRES - CONTAINMENT VAPOR PRESSURE CALCULATED FROM VOLUMETRICALLY WEIGHTED HUMIDITY/DEWPOINT SENSOR INDICATIONS.

LEAK SIM - SIMPLE TOTAL TIME MEASURED LEAKAGE RATE.

LEAK FIT - LEAKAGE RATE CALCULATED FROM FIRST ORDER REGRESSION OF AIR MASS DATA.

95% UCL - UPPER LIMIT OF THE 95% CONFIDENCE LEVEL OF FITTED LEAKAGE RATE DATA.

AIR MASS - CONTAINMENT AIR MASS.

NOTES FOR TABULAR DATA -

1. TABLE VALUES OF ZERO SIGNIFY THE DATA IS NOT APPLICABLE TO THE CALCULATION.
2. "DELETED" SIGNIFIES THE SENSOR WAS DELETED.
3. "REJECTED" SIGNIFIES THE SAMPLE WAS REJECTED.

CLRT VARIABLE TABLE SUMMARY

SAM NO	TIME HOURS	AVE TEMP DEG F	PRESSURE PSIA	VAP PRES PSIA	LEAK SIM %/DAY	LEAK FIT %/DAY	UCL %/DAY	AIR MASS LBS
1	0.00	88.756	66.078	0.6103	0.000	0.000	0.000	499392
2	0.33	88.741	66.070	0.6101	0.656	0.000	0.000	499347
3	0.67	88.727	66.067	0.6099	0.394	0.394	1.690	499337
4	1.00	88.712	66.063	0.6098	0.338	0.317	0.556	499322
5	1.33	88.696	66.057	0.6096	0.361	0.324	0.435	499292
6	1.67	88.679	66.052	0.6094	0.349	0.323	0.389	499271
7	2.00	88.667	66.046	0.6093	0.373	0.341	0.389	499237
8	2.33	88.649	66.041	0.6091	0.362	0.344	0.379	499217
9	2.67	88.632	66.037	0.6089	0.341	0.336	0.364	499203
10	3.00	88.616	66.031	0.6088	0.352	0.337	0.359	499173
11	3.33	88.600	66.026	0.6087	0.349	0.338	0.355	499150
12	3.67	88.585	66.022	0.6085	0.338	0.334	0.349	499134
13	4.00	88.573	66.016	0.6085	0.351	0.336	0.349	499100

SENSOR VOLUME FRACTIONS

TEMPERATURE SENSORS

1 to 5	0.060333	0.060333	0.040000	0.040000	0.040000
6 to 10	0.060333	0.060333	0.060333	0.033000	0.053333
11 to 15	0.053333	0.033000	0.053333	0.033000	0.033000
16 to 20	0.053333	0.053333	0.053333	0.033000	0.033000
21 to 21	0.060333				

HUMIDITY/DP SENSORS

1 to 5	0.049500	0.049500	0.049500	0.049500	0.060000
6 to 10	0.060000	0.181000	0.181000	0.320000	0.000000

NOTE: VALUE OF ZERO INDICATES A DELETED SENSOR.

CLRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 1 DEG F	TEMP 2 DEG F	TEMP 3 DEG F	TEMP 4 DEG F	TEMP 5 DEG F	TEMP 6 DEG F
1	0.00	88.994	89.042	88.873	88.982	88.943	89.091
2	0.33	88.972	89.020	88.861	88.971	88.934	89.071
3	0.67	88.972	89.011	88.850	88.960	88.922	89.059
4	1.00	88.949	88.999	88.830	88.948	88.911	89.048
5	1.33	88.940	88.977	88.819	88.928	88.899	89.025
6	1.67	88.929	88.968	88.807	88.917	88.879	89.016
7	2.00	88.906	88.956	88.798	88.905	88.868	89.005
8	2.33	88.897	88.945	88.776	88.894	88.845	88.982
9	2.67	88.886	88.934	88.764	88.885	88.836	88.973
10	3.00	88.874	88.922	88.753	88.874	88.824	88.962
11	3.33	88.851	88.913	88.733	88.862	88.824	88.939
12	3.67	88.831	88.902	88.721	88.840	88.802	88.919
13	4.00	88.831	88.879	88.710	88.831	88.790	88.908

CLRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 7 DEG F	TEMP 8 DEG F	TEMP 9 DEG F	TEMP 10 DEG F	TEMP 11 DEG F	TEMP 12 DEG F
1	0.00	88.876	89.165	87.260	89.178	89.086	87.837
2	0.33	88.853	89.154	87.271	89.169	89.055	87.837
3	0.67	88.842	89.143	87.260	89.158	89.021	87.837
4	1.00	88.821	89.134	87.260	89.135	89.000	87.826
5	1.33	88.810	89.111	87.260	89.115	88.966	87.826
6	1.67	88.799	89.088	87.260	89.092	88.934	87.837
7	2.00	88.787	89.088	87.260	89.072	88.903	87.826
8	2.33	88.778	89.079	87.251	89.049	88.860	87.826
9	2.67	88.755	89.045	87.260	89.038	88.826	87.826
10	3.00	88.735	89.045	87.251	89.018	88.771	87.826
11	3.33	88.735	89.045	87.251	88.995	88.771	87.826
12	3.67	88.712	89.025	87.251	88.984	88.728	87.826
13	4.00	88.701	89.025	87.251	88.963	88.708	87.814

CLRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 13 DEG F	TEMP 14 DEG F	TEMP 15 DEG F	TEMP 16 DEG F	TEMP 17 DEG F	TEMP 18 DEG F
1	0.00	89.062	87.649	87.826	89.089	89.420	89.317
2	0.33	89.050	87.649	87.848	89.057	89.377	89.297
3	0.67	89.030	87.649	87.837	89.025	89.344	89.274
4	1.00	89.007	87.649	87.848	89.002	89.312	89.252
5	1.33	88.987	87.649	87.860	88.982	89.269	89.231
6	1.67	88.964	87.649	87.871	88.948	89.194	89.209
7	2.00	88.942	87.649	87.880	88.917	89.194	89.188
8	2.33	88.921	87.649	87.880	88.883	89.129	89.166
9	2.67	88.899	87.649	87.880	88.851	89.086	89.146
10	3.00	88.887	87.649	87.891	88.754	89.074	89.123
11	3.33	88.856	87.649	87.880	88.699	89.020	89.100
12	3.67	88.844	87.649	87.871	88.688	88.997	89.080
13	4.00	88.824	87.649	87.871	88.731	88.900	89.069

CLRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 19 DEG F	TEMP 20 DEG F	TEMP 21 DEG F
1	0.00	87.068	87.285	88.880
2	0.33	87.068	87.285	88.857
3	0.67	87.068	87.273	88.857
4	1.00	87.068	87.285	88.834
5	1.33	87.068	87.273	88.814
6	1.67	87.068	87.273	88.803
7	2.00	87.068	87.285	88.791
8	2.33	87.068	87.273	88.782
9	2.67	87.068	87.273	88.748
10	3.00	87.068	87.273	88.748
11	3.33	87.068	87.285	88.728
12	3.67	87.077	87.285	88.717
13	4.00	87.068	87.285	88.694

CLRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	PRES 1 PSIA	PRES 2 PSIA	HUM 1 % RH	HUM 2 % RH	HUM 3 % RH	HUM 4 % RH
1	0.00	66.076	66.078	94.108	92.482	93.545	92.505
2	0.33	66.070	66.070	94.108	92.494	93.539	92.494
3	0.67	66.069	66.067	94.110	92.484	93.535	92.489
4	1.00	66.064	66.063	94.126	92.477	93.551	92.500
5	1.33	66.059	66.057	94.125	92.488	93.550	92.494
6	1.67	66.054	66.052	94.117	92.462	93.549	92.491
7	2.00	66.050	66.046	94.131	92.482	93.585	92.494
8	2.33	66.046	66.041	94.131	92.476	93.573	92.499
9	2.67	66.041	66.037	94.137	92.458	93.579	92.505
10	3.00	66.037	66.031	94.166	92.482	93.602	92.517
11	3.33	66.031	66.026	94.177	92.471	93.608	92.522
12	3.67	66.024	66.022	94.181	92.485	93.618	92.544
13	4.00	66.020	66.016	94.207	92.471	93.627	92.540

CLRT VARIABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	HUM 5 % RH	HUM 6 % RH	HUM 7 % RH	HUM 8 % RH	HUM 9 % RH	HUM 10 % RH
1	0.00	89.352	88.882	90.583	90.461	90.653	DELETED
2	0.33	89.393	88.916	90.624	90.472	90.653	DELETED
3	0.67	89.401	88.936	90.614	90.480	90.667	DELETED
4	1.00	89.429	88.987	90.642	90.503	90.676	DELETED
5	1.33	89.497	89.080	90.641	90.531	90.723	DELETED
6	1.67	89.513	89.106	90.657	90.564	90.715	DELETED
7	2.00	89.550	89.166	90.682	90.594	90.710	DELETED
8	2.33	89.602	89.225	90.717	90.635	90.740	DELETED
9	2.67	89.625	89.288	90.752	90.659	90.746	DELETED
10	3.00	89.683	89.335	90.798	90.717	90.769	DELETED
11	3.33	89.724	89.393	90.809	90.710	90.809	DELETED
12	3.67	89.757	89.449	90.842	90.767	90.802	DELETED
13	4.00	89.823	89.526	90.874	90.792	90.868	DELETED

APPENDIX B
LOCAL LEAKAGE RATE TESTING
CONDUCTED SINCE THE LAST ILRT

Appendix J Type 'B' and 'C' Leakage Summary

PEN NUM	FUNCTION	TEST TYPE	EQUIPMENT/ VALVES	AS FOUND LEAKAGE(CCM)	DATE	AS LEFT LEAKAGE(CCM)	DATE	REMARKS
5	PRT TO GAS ANALYZER	C	CV-516	18	07/23/90	18	07/23/90	
				18	12/20/90	75	06/19/91	
			SV-6385	18	07/23/90	18	07/23/90	
				18	12/20/90	18	06/19/91	
6	NITROGEN TO PRT	C	CK-518	380	12/19/90	18	07/20/91	
			CK-519	2000	12/19/90	225	07/20/91	NOTE 1
7	PRIMARY WATER TO RCP/PRT	C	CV-519A CV-519B CV-522A CV-522B CV-522C	18 COMBINATION TEST	01/15/91	18	07/11/91	
8	PZR STEAM SAMPLE	C	CV-951	220	01/15/91	215	07/13/91	
			CV-956A	18	01/18/90	18	01/18/90	
				18	01/16/91	100	07/13/91	
9	PZR LIQUID SAMPLE	C	CV-953	1300	01/15/91	18	09/08/91	NOTE 2
			CV-956B	18	01/16/91	18	07/19/91	
10	RCDT AND PRT VENT	C	CV-4658A	18	01/15/91	18	10/08/91	NOTE 3
			CV-4658B	18	12/26/90	18	07/07/91	
			PCV-1014	1500	12/26/90	1150	10/13/91	NOTE 4
			V-4656	80	01/14/91	18	10/08/91	NOTE 5
11	ALT RHR	C	MOV-872	170	01/08/91	40	09/25/91	NOTE 6
14	LETDOWN	C	CV-200A CV-200B CV-200C	100 COMBINATION TEST	12/28/90	60	07/14/91	NOTE 7
			CV-204	18	12/27/90	18	07/08/91	

Appendix J Type 'B' and 'C' Leakage Summary

PEN NUM	FUNCTION	TEST TYPE	EQUIPMENT/ VALVES	AS FOUND LEAKAGE(CCM)	AS FOUND DATE	AS LEFT LEAKAGE(CCM)	AS LEFT DATE	REMARKS
15	CHARGING	C	HCV-121	18	12/27/90	18	07/31/91	NOTE 8
			V-333	COMBINATION TEST				
			CK-312C	60	12/27/90	130	07/02/91	
16	PACV/PAHM	C	HV-4-1	75	05/01/91	18	07/09/91	
			HV-4-2	COMBINATION TEST				
			PAHM-002A					
17	ACCUM TEST	C	V-895V	18	01/09/91	18	07/10/91	
19A	CONT SPRAY	C	CK-890A	18	12/28/90	1500	07/07/91	NOTE 9
			MOV-880A	18	12/28/90	18	07/08/91	NOTE 10
19B	CONT SPRAY	C	CK-890B	10000	12/28/90	700	07/14/91	NOTE 11
			MOV-880B	18	12/28/90	35	07/14/91	NOTE 12
20	RCS SAMPLE	C	SV-6427A	4100	04/19/91	18	07/05/91	NOTE 13
			SV-6427B	25	04/23/91	18	07/05/91	
			SV-6428	400	07/31/90	400	07/31/90	
				85	04/23/91	55	07/05/91	
23	CONT SUMP DISCHARGE	C	CV-2821	625	10/09/91	625	10/09/91	
			CV-2822	30000	10/09/91	25	10/15/91	NOTE 14
24	RCP SEAL INJECTION	C	CK-298A	70	01/03/91	160	09/26/91	NOTE 15
			CK-298B	900	01/03/91	620	09/26/91	NOTE 16
			CK-298C	18	01/04/91	35	08/27/91	
25	RCP SEAL RETURN	C	MOV-6386	1220	07/22/90	50	07/26/90	NOTE 17
				330	01/07/91	50	07/12/91	NOTE 17
			MOV-381	30	01/07/91	25	07/13/91	NOTE 18

Appendix J Type 'B' and 'C' Leakage Summary

PEN NUM	FUNCTION	TEST TYPE	EQUIPMENT/ VALVES	AS FOUND LEAKAGE(CCM)	AS FOUND DATE	AS LEFT LEAKAGE(CCM)	AS LEFT DATE	REMARKS
29	INSTRUMENT AIR	C	CK-40-340A	950	02/04/91	330	07/11/91	
			CK-40-336	8025	02/04/91	910	07/01/91	NOTE 19
30	BREATHING AIR	C	BA-201	18	11/28/90	18	07/04/91	
			CV-6165	75	11/28/90	55	07/04/91	
31	RCDT TO GAS ANALYZER	C	CV-4659A	18	07/23/90	18	07/23/90	
			CV-4659B	18	02/04/91	18	06/19/91	
				COMBINATION TEST				
32	CONTAINMENT AIR SAMPLE	C	CK-11-003	500	07/22/90	500	07/22/90	
				810	12/15/90	500	07/16/91	
			SV-2912	900	07/22/90	900	07/22/90	
			PAHM-001A	300	12/14/90	18	07/16/91	
			PAHM-001B	COMBINATION TEST				
33	CONTAINMENT AIR SAMPLE	C	SV-2911	110	07/22/90	110	07/22/90	
				80	12/14/90	725	07/16/91	
			SV-2913	280	07/22/90	280	07/22/90	
				200	12/14/90	450	08/18/91	
34	SERVICE AIR	C	CK-40-205	980	12/17/90	425	08/15/91	NOTE 20
			V-40-204	1000	12/17/90	90	07/11/91	NOTE 21
			HV-17	COMBINATION TEST				
35	CONT PURGE SUPPLY	C	POV-2600	2200	07/22/90	2200	07/22/90	NOTE 22
			POV-2601	11700	12/15/90	780	10/06/91	
				COMBINATION TEST				
36	CONT PURGE EXHAUST	C	POV-2602	530	07/22/90	530	07/22/90	NOTE 23
			POV-2603	10500	12/15/90	500	10/15/91	
				COMBINATION TEST				

Appendix J Type 'B' and 'C' Leakage Summary

PEN NUM	FUNCTION	TEST TYPE	EQUIPMENT/ VALVES	AS FOUND LEAKAGE(CCM)	AS FOUND DATE	AS LEFT LEAKAGE(CCM)	AS LEFT DATE	REMARKS
37	SPARE	C	V-10-879	18	07/23/90	18	07/23/90	
				18	02/07/91	18	10/07/91	NOTE 24
			CAP	18	07/23/90	18	07/23/90	
				18	02/07/91	18	10/08/91	
38	ELECTRICAL	B	CANISTERS	185	07/21/90	185	07/21/90	
				108	06/21/91	108	06/21/91	
39	FUEL X-FER	B	O-RINGS	18	11/27/90	70	10/11/91	
40	EQUIP HATCH	B	O-RINGS	18	04/12/90	18	04/12/90	
				18	08/01/90	18	10/16/91	
41	PERS HATCH	B	ANNULUS	460	08/15/90	460	08/15/90	NOTE 25
				1000	02/17/91	400	09/29/91	
42	NITROGEN TO ACCUMULATOR	C	CK-945E	85000	09/26/89	1400	09/27/89	NOTE 26
				740	12/19/90	250	06/20/91	
			CV-855	310	09/27/89	310	09/27/89	
				400	12/19/90	145	06/20/91	
46A	CONT PRESS SWITCHES	B	PS-2008	18	07/22/90	18	07/22/90	
			PS-2057	18	02/20/91	18	10/07/91	
				COMBINATION TEST				
46B	CONT PRESS SWITCHES	B	PS-2009	18	07/23/90	18	07/23/90	
			PS-2058	18	02/21/91	18	10/06/91	
				COMBINATION TEST				
46C	CONT PRESS SWITCHES	B	PS-2007	25	07/23/90	25	07/23/90	
			PS-2056	18	02/21/91	18	09/27/91	
				COMBINATION TEST				

Appendix J Type 'B' and 'C' Leakage Summary

PEN NUM	FUNCTION	TEST TYPE	EQUIPMENT/ VALVES	AS FOUND LEAKAGE(CCM)	AS FOUND DATE	AS LEFT LEAKAGE(CCM)	AS LEFT DATE	REMARKS
47	PRIMARY WATER	C	V-10-582	3800	01/15/91	25	08/06/91	NOTE 27
			CK-567	COMBINATION TEST				
48	RCP ELECT	B	CANISTERS	36	07/23/90	36	07/23/90	
				48	12/05/90	36	06/18/91	
49	EMERG HATCH	B	ANNULUS	900	07/18/90	900	07/18/90	
				900	03/16/91	1600	09/04/91	
51	PACV/PAHM	C	HV-4-3	80	07/24/90	80	07/24/90	
			HV-4-4	18	01/09/91	18	07/13/91	
			PAHM-002B	COMBINATION TEST				
52	RCDT PUMP DISCHARGE	C	CV-4668A	18	12/03/90	18	06/20/91	
			CV-4668B	COMBINATION TEST				
54A	RECIRC SUMP SUCTION	C	MOV-860A	1100	01/09/91	120	07/11/91	NOTE 28
			MOV-861A	COMBINATION TEST				
54B	RECIRC SUMP SUCTION	C	MOV-860B	360	01/09/91	105	07/11/91	NOTE 29
			MOV-861B	COMBINATION TEST				
55	ACCUMULATOR SAMPLE	C	CV-955C	80	04/23/91	18	08/01/91	
			CV-955D	100	04/19/91	18	08/01/91	
			CV-955E	65	04/19/91	18	08/01/91	
			CV-956D	750	04/24/91	18	08/01/91	NOTE 30
56	SPARE	C	CAP	18	07/26/90	18	07/26/90	
				18	11/28/90	18	10/15/91	

Appendix J Type 'B' and 'C' Leakage Summary

PEN NUM	FUNCTION	TEST TYPE	EQUIPMENT/ VALVES	AS FOUND LEAKAGE(CCM)	DATE	AS LEFT LEAKAGE(CCM)	DATE	REMARKS
61A	SPARE	C	CAP	18	07/23/90	18	07/23/90	
				18	11/28/90	18	07/15/91	
61B	DEAD WEIGHT TESTER	C	V-2024	18	07/22/90	18	07/22/90	
			CAP	18	12/29/90	18	09/03/91	
				COMBINATION TEST				
63	INST AIR BLEED	C	CV-2819	67	07/21/90	67	07/21/90	
				90	01/02/91	95	06/29/91	
			CV-2826	800	07/21/90	800	07/21/90	
				420	01/02/91	400	06/29/91	
65A	ILRT TEST LINE	B	FLANGES	45	11/27/90	18	10/20/91	
65B	ILRT TEST LINE	B/C	V-2025	18	01/28/91	18	10/20/91	
			FLANGE	COMBINATION TEST				
65C	ILRT TEST LINE	B/C	V-2026	18	01/28/91	18	10/20/91	
			FLANGE	COMBINATION TEST				

Appendix J Type 'B' and 'C' Leakage Summary

NOTES:

1. CHECK VALVE 519 REPLACED
2. REPLACED VALVE BODY AND LAPPED SEAT FOR CV-953
3. REPLACED DIAPHRAGM FOR CV-4658A
4. PCV-1014 OVERHAULED
5. REPLACED DIAPHRAGM AND ADJUSTED VALVE STROKE FOR V-4656
6. MOV-872 DISASSEMBLED AND DISK DRILLED TO PREVENT THERMAL BINDING
7. CV-200A PACKING ADJUSTED
8. HCV-121 OVERHAULED TO REPAIR BONNET LEAK
9. CK-890A DISASSEMBLED, INSPECTED AND REASSEMBLED
10. MOTOR OPERATOR FOR MOV-880A OVERHAULED
11. CK-890B DISASSEMBLED, INSPECTED AND REASSEMBLED
12. MOTOR OPERATOR FOR MOV-880B OVERHAULED
13. SV-6427A REPLACED
14. CV-2822 OVERHAULED
15. CK-298A REPLACED
16. CK-298B REPLACED
17. MOTOR OPERATOR FOR MOV-6386 OVERHAULED
18. MOTOR OPERATOR FOR MOV-381 OVERHAULED
19. CK-40-336 REPLACED
20. CK-40-205 REPLACED
21. V-40-204 SEAT LAPPED AND PACKING FOR HV-17 REPLACED
22. REPLACED PACKING ON POV-2601; CLEANED SEATS FOR BOTH POV-2600,2601
23. REPLACED PACKING ON POV-2603; CLEANED AND ADJUSTED SEATS FOR BOTH POV-2602, 2603
24. V-10-879 REPLACED
25. PERSONNEL HATCH OVERHAULED
26. CLEANED AND LAPPED VALVE INTERNALS FOR CK-945E
27. SEATS FOR V-10-582 AND CK-567 LAPPED
28. MOTOR OPERATORS FOR MOV-860A, 861A OVERHAULED
29. MOTOR OPERATORS FOR MOV-860B, 861B OVERHAULED
30. CV-956D OVERHAULED

1990-1991 LOCAL LEAKAGE RATE SUMMARY ANALYSIS

The as found ILRT, by analysis, is used to show what the results of performing an ILRT at the beginning of the outage would have been, before any repairs or adjustments were made to the penetrations. The as found minimum pathway leakage, the repairs performed and the as left minimum pathway leakage for each boundary or penetration were reviewed. The net leakage contribution for each penetration was determined utilizing the following criteria:

1. A leakage rate add-on equivalent to the repair improvement is assigned to each penetration.

2. The net equivalent leakage assigned to the penetration is the lowest leakage of the valve grouping (e.g. simulates minimum pathway leakage).

3. If a repair was not performed on a containment isolation valve, and a reduction in leakage is noted between the as found and as left test, no penalty is required to be assessed.

4. No leakage credit is taken if the as left leakage rate is higher than the as found leakage rate. Only those penetrations where repairs were made to the isolation valves are included in this attachment.

5. For series isolation valves tested together (i.e. combination tests), the penetration net equivalent leakage is half the difference between the as found and the as left leakage rates when both valves are repaired at the same time. If only one valve is repaired or both valves are repaired at different times, subsequent analysis of test results may be performed to determine the penalty to be assessed.

6. When the summation of the leakage equivalent and the leakage measured during a successful Type A test is greater than L_a, the penetration(s) with excessive leakage(s) will be analyzed to determine the cause of the failure and/or corrective action taken to prevent recurrence.

7. All measured leakage rate values are in units of cubic centimeters per minute (CCM) at 50 psig.

Based on the above criteria and the values tabulated on the next page, the net equivalent leakage of 0.036 percent/day, when added to the results of this ILRT (0.057 percent/day mass point UCL plus corrections), indicates that the as found ILRT test result, determined by analysis (0.093 percent/day) is below the plant's maximum allowable leakage rate of 0.25 percent/day.

1990-1991 LOCAL LEAKAGE RATE SUMMARY ANALYSIS

PEN. NUM.	SYSTEM	AS FOUND LEAKRATE	AS LEFT LEAKRATE	PENALTY ASSESSED	REMARKS (NOTE 1)
6	PRT TO GAS ANAL.	380	18	0	CRITERIA 3
10	NITROGEN TO PRT/RCDT	98	36	62	
11	ALTERNATE LHSI	170	40	130	
19B	CONT SPRAY DISCH	18	35	0	CRITERIA 4
20	RCS SAMPLE	85	18	67	
23	CONT SUMP DISCHARGE	625	25	600	
24A	RCP SEAL INJECTION	70	160	0	CRITERIA 4
24B	RCP SEAL INJECTION	900	620	280	
25	RCP SEAL RETURN	30	25	5	
29	INSTRUMENT AIR	950	330	620	
33	CONT AIR SAMPLE	80	450	0	CRITERIA 4
34	SERVICE AIR	980	180	800	
35	CONT PURGE SUPPLY	11700	780	360	CRITERIA 5, NOTE 2
36	CONT PURGE EXHAUST	10500	500	5000	CRITERIA 5
41	PERSONNEL HATCH	1000	400	300	CRITERIA 5
42	NITROGEN TO ACCUM	400	145	255	
47	PRIMARY WATER	3800	25	1888	CRITERIA 5
54A	CONT RECIRC SUMP	1100	120	490	CRITERIA 5
54B	CONT RECIRC SUMP	360	105	128	CRITERIA 5
55	ACCUMULATOR SAMPLE	245	18	227	
65A	ILRT PRESSURIZATION	45	18	14	CRITERIA 5

TOTAL 11226 CCM

NOTE 1: CRITERIA REFERED TO IN THE REMARKS COLUMN ARE THOSE SHOWN ON THE PREVIOUS PAGE.

NOTE 2: PENETRATION 35 WAS RETESTED FOLLOWING REPACK OF POV-2601 WITH A RECORDED LEAKAGE OF 1500 CCM, NO WORK WAS PERFORMED ON POV-2600.

APPENDIX C
METEOROLOGICAL DATA

1991 TURKEY POINT UNIT 4 ILRT
METEOROLOGICAL DATA

DATE 1991	TIME	PRESSURE IN. HG	TEMP °F	WIND DIRECTION	WIND SPEED KNOTS
10/15	1900	29.826	73	110	4
10/15	2007	29.831	73	170	3
10/15	2101	29.836	74	120	2
10/15	2211	29.840	74	calm	calm
10/15	2310	29.845	74	90	2
10/16	0011	29.830	74	calm	calm
10/16	0108	29.820	74	calm	calm
10/16	0206	29.805	74	calm	calm
10/16	0311	29.785	73	060	2
10/16	0404	29.770	73	030	4
10/16	0515	29.770	74	080	2
10/16	0600	29.770	74	020	20
10/16	0807	28.785	74	340	6
10/16	1210	29.870	82	360	13
10/16	1600	29.845	82	360	13
10/16	2000	29.885	77	350	3
10/17	0002	29.950	70	360	4
10/17	0400	29.950	64	330	2
10/17	0805	30.030	66	360	5
10/17	1240	30.065	82	058	10
10/17	1542	30.015	80	060	10
10/17	1658	30.010	80	070	11
10/17	1759	30.025	78	060	8
10/17	1924	30.050	75	060	6
10/17	2000	30.065	75	060	6

1991 TURKEY POINT UNIT 4 ILRT METEOROLOGICAL DATA

DATE 1991	TIME	PRESSURE IN. HG	TEMP °F	WIND DIRECTION	WIND SPEED KNOTS
10/17	2120	30.085	76	060	5
10/17	2155	30.095	73	050	3
10/17	2304	30.100	73	360	2
10/17	2358	30.100	73	360	4
10/18	0101	30.085	72	calm	calm
10/18	0201	30.075	74	360	4
10/18	0258	30.065	74	360	2
10/18	0405	30.060	74	010	3
10/18	0501	30.060	75	030	6
10/18	0550	30.074	74	020	3
10/18	0702	30.080	74	010	3
10/18	0801	30.115	75	010	3
10/18	0859	30.124	79	020	5
10/18	0955	30.145	81	040	12
10/18	1058	30.151	82	050	12
10/18	1200	30.130	84	050	15
10/18	1305	30.100	84	060	14
10/18	1405	30.082	84	050	14
10/18	1500	30.055	85	050	15
10/18	1600	30.035	85	050	13
10/18	1728	30.035	82	050	13
10/18	1800	30.045	81	060	12
10/18	1915	30.060	78	040	12
10/18	2010	30.075	78	040	8
10/18	2106	30.090	78	080	5

1991 TURKEY POINT UNIT 4 ILRT
METEOROLOGICAL DATA

DATE 1991	TIME	PRESSURE IN. HG	TEMP °F	WIND DIRECTION	WIND SPEED KNOTS
10/18	2204	30.085	79	040	8
10/18	2310	30.075	78	080	4
10/18	2358	30.075	78	050	8
10/19	0158	30.045	78	030	2
10/19	0307	30.015	75	020	4
10/19	0402	30.005	74	360	4
10/19	0500	30.010	76	050	6
10/19	0558	30.000	74	calm	calm
10/19	0900	30.040	76	350	6
10/19	1011	30.070	77	040	6
10/19	1111	30.075	77	090	5
10/19	1215	30.020	85	calm	calm
10/19	1330	30.000	86	120	3
10/19	1430	29.997	83	070	3
10/19	1530	29.950	85	090	5
10/19	1630	29.95	84	090	4
10/19	1726	29.955	82	080	5