REACTOR CONTAINMENT BUILDING INTEGRATED LEAKAGE RATE TEST

TYPES A, B, AND C PERIODIC TEST

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT PLANT
UNIT NO. 3

JUNE 1985

PREPARED BY
STONE & WEBSTER ENGINEERING CORPORATION
BOSTON, MASSACHUSETTS

TABLE OF CONTENTS

LIST OF ATTACHMENTS

REFERENCES

1. 10CFR50, Appendix J, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors, October 22, 1980.

2. Florida Power & Light Turkey Point Plant Operating Procedure 13100.1, Integrated Leakage Rate Test, and 13100.2, Valve Lineup for ILRT.

3. ANSI N45.4, American National Standard Leakage-Rate Testing of Containment Structures for Nuclear Reactors, March 16, 1982.

4. ANSI/ANS-56.8, Containment System Leakage Testing Requirements, February 19, 1981[1].

5. Bechtel Corporation Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants, BN-TOP-1, Revision 1, November 1, 1972.

[1]This document used only as a guideline and any reference to said document in no way implies compliance.

SECTION 1

PURPOSE

The purpose of this report is to present a description and analysis of the June 1985 Periodic Type A Containment Integrated Leakage Rate Test (ILRT), and a summary of the periodic Types B and C local leakage rate tests conducted since March 1982 on the Florida Power and Light Company's (FP&L) Turkey Point Plant, Unit No. 3.

Stone & Webster Engineering Corporation provided engineering consultation services to FP&L during the performance of this test.

This report is submitted as required by 10CFR50, Appendix J, Paragraph V.B (Reference 1).

SECTION 2

SUMMARY

2.1 TYPE A TEST

Pressurization for the ILRT began at 0207 hours on June 7, 1985. Investigations of all penetration areas for leakage were conducted during the pressurization period and throughout the Type A Test. Only minor leakage paths were identified.

Containment pressure was 67.92 psia when the pressurization equipment was secured at approximately 1102 hours. The temperature stabilization criteria was satisfied at 2015 hours on June 7, 1985. This is slightly longer than the traditional Turkey Point temperature stabilization period of approximately eight hours. The additional time in achieving the temperature stabilization is attributed to the first hour of pressurization when the cooling water to the compressor aftercoolers was found to be inadequate. When sufficient flow was established, the quality of the compressed air improved.

The one hour of inadequate cooling water flow also impacted the moisture stabilization. The moisture trend did not achieve an essentially straight line trend until 0200 hours on June 8, 1985. The start of the Type A was shifted to 0200 hours based on moisture stabilization.

Both the Mass Point and the Total Time leakage rates were well below the Turkey Point 0.75La limit of 0.1875 percent per day. The stability in the leakage trends was interrupted at approximately 0715 and 0830 when the Spent Fuel Pit Heat Exchanger (SFPHX) was put in service. This additional cooling load raised the component cooling water temperature which in turn raised the residual heat removal temperature. As shown on Attachment 2.1A, the impact on the containment air temperature was very subtle, however, the impact on the leakage trends, as shown on Attachment 2.1B, was dramatic. The start time of the Type A Test was shifted to 0830 based on the SFPHX temperature perturbation.

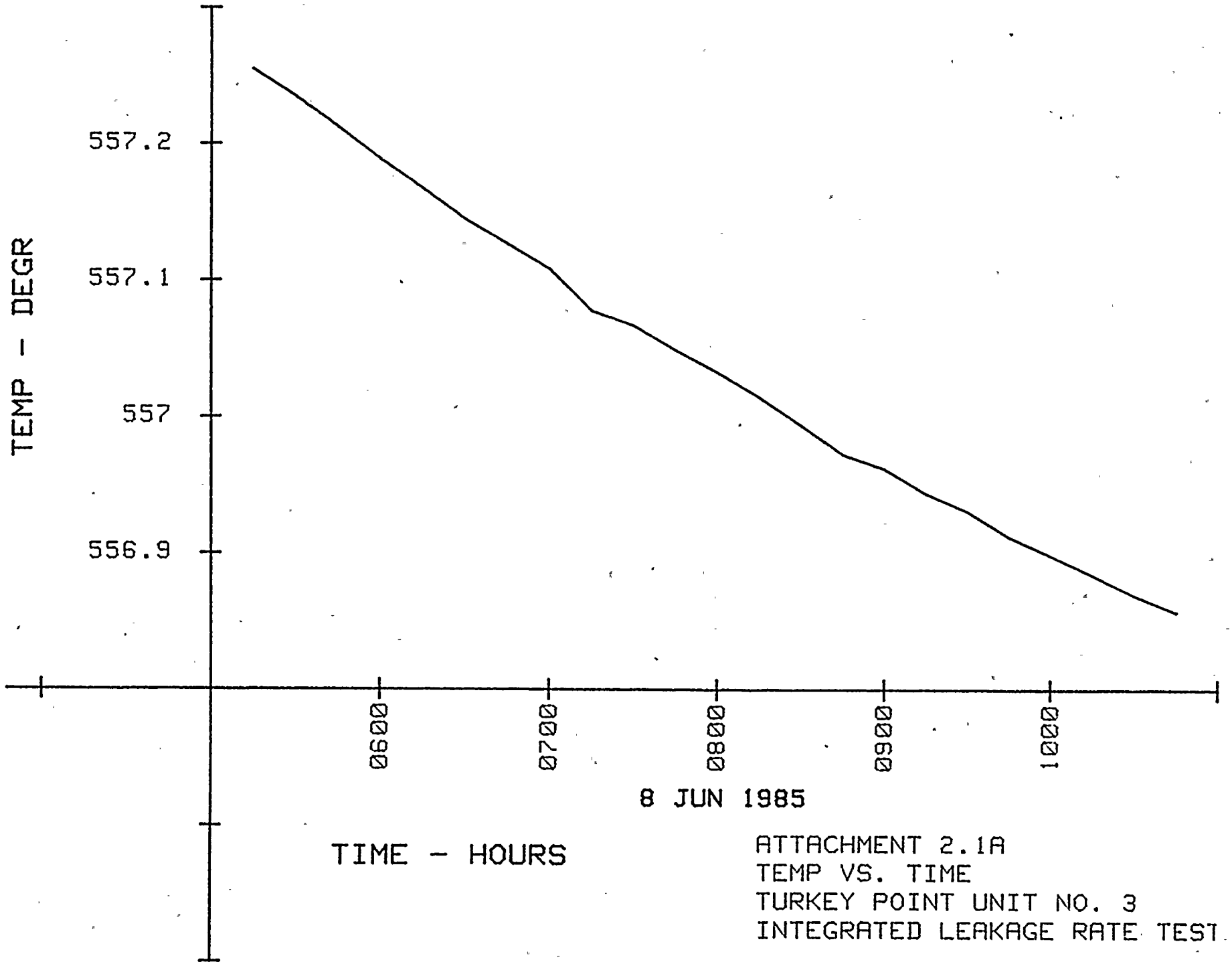
The temperature, humidity, and the pressure data were monitored at 15 minute intervals. The Type A Test was run from 0830 to 1630 hours on June 8, 1985, with a Mass Point Upper Confidence Limit (UCL-MP) of 0.069782 percent/day and a Total Time Upper Confidence Limit (UCL-TT) of 0.14049 percent per day (See Section 3.3, Test Results.) These rates are well below the 0.1875 percent day acceptance criteria.

The superimposed leakage verification test was started at 1730 hours and was sucessfully completed at 2130 hours on June 8, 1985. Depressurization of the containment was started at 2207 hours on June 8, 1985, and was completed at 0608 hours on June 9, 1985.

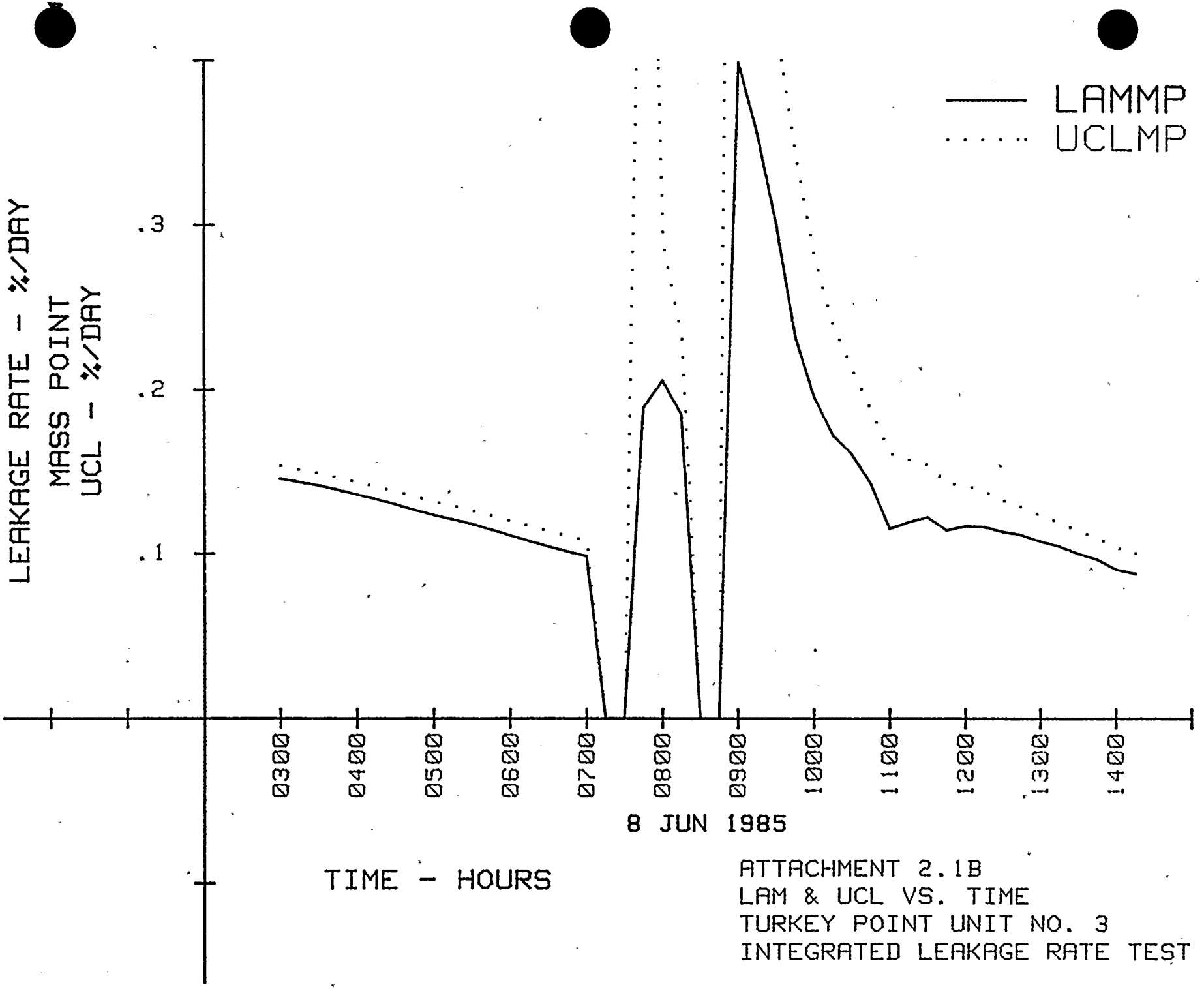
2.2 LOCAL LEAKAGE RATE TESTS (Types B and C)

The Local Leakage Rate Tests (LLRTs) of containment isolation valves and other primary containment penetrations were conducted as required by the methods described in FP&L's Operating Procedure No. 13404.1, "Containment Boundary Isolation Valves - Local Leakage Rate Tests" since the last Unit No. 3 Type A Test performed in March 1982.

Section 4 of this report summarizes the data for the two surveillance periods (1983 and 1985) of LLRTs conducted since the last Type A Test in accordance with Appendix J, 10CFR50, Paragraph V.B.



ATTACHMENT 2.1A
TEMP VS. TIME
TURKEY POINT UNIT NO. 3
INTEGRATED LEAKAGE RATE TEST



ATTACHMENT 2.1B
LAM & UCL VS. TIME
TURKEY POINT UNIT NO. 3
INTEGRATED LEAKAGE RATE TEST

SECTION 3

TYPE A TEST

3.1 EDITED LOG OF EVENTS

This log was edited from information contained in the official Log of Events.

June 7, 1985

0207 - Containment pressurization was initiated. Pressurization rate was approximately 6.4 pounds per hour.

0508 - Performed leakage investigation of the penetration area. No leakage was noted.

0600 - Containment pressure was 38.46 psia. Performed leakage investigation. Minor leakage noted on penetration 10, Reactor Coolant Drain Tank (RCDT) and Pressurizer Relief Tank Vent, Nitrogen to RCDT, and on penetration 24, Seal Water Injection to A Reactor Coolant Pump.

1102 - Containment pressure was 67.92 psia. Compressors were secured, and the pressurization line was vented.

1500 - The pressure between the purge supply valves was increasing. Reading was about 11.5 psig

2015 - Personnel Hatch pressure increasing. Pressure was 8 psig. Satisfied the temperature stabilization criteria of the test procedure.

June 8, 1985

0000 - The pressure between the purge supply valves was 22 psig.

0400 - Leakage was identified on a steam trap drain off of "C" MSIV. Purge supply pressure was 26 psig.

0615 - Personnel Hatch pressure was 10 psig. Purge supply pressure was 37 psig.

0830 - Purge supply pressure was 51 psig. Personnel hatch pressure was 11.5 psig.

1100 - Declared 0830 on June 8, 1985, as the start of the Type A Test.

1400 - PORV-3-455C closed. This had been blocked open to satisfy a Technical Specification requirement. The RCS was vented for Type A purposes thru temporary modifications on valves 543A, B, and C.

1630 - Satisfied Type A criteria for a reduced duration test.

1645 - Superimposed leakage rate was started.

1730 - Superimposed leakage verification test was started.

2130 - Superimposed leakage rate criteria was satisfied.

2207 - Depressurization of the containment started.

June 9, 1985

0608 - Depressurization completed.

3.2 GENERAL TEST DESCRIPTION

3.2.1 Prerequisites

In accordance with the Turkey Point Plant Unit No. 3 ILRT Procedure 13100.1 (Reference 2), the following is a listing of the pertinent prerequisites that were completed and documented prior to containment pressurization:

a. General inspection of the accessible interior and exterior surfaces of the containment structures and components completed.

b. All equipment and instrumentation that could be damaged by test pressure removed or protected.

c. All instrumentation required for the test calibrated within six months of the test and functionally verified.

d. All required system valve lineups completed, including closure of containment isolation valves.

e. All required Types B and C local leakage rate testing completed.

f. The Official Log of Events established.

g. Site meteorological data recorded at least three days prior to and during the ILRT (Attachment 3.2A).

h. Temporary containment air recirculation fans installed and tested.

i. ILRT pressurization system properly installed and tested.

j. All ILRT computer software used for test calculations tested and operational.

3.2.2 Equipment and Instrumentation

Pressurization of the containment was achieved by the utilization of a temporary system consisting of ten air compressors manifolded to aftercoolers and refrigerant air dryers. The system included adequate instrumentation and valving to maintain proper monitoring and control of the compressed air quality throughout the pressurization sequence. The total capacity of the pressurization system was rated at approximately 10,000 standard cubic feet per minute (scfm).

The various containment parameters required to calculate containment leakage during the test were monitored using instrumentation which consisted of 22 resistance temperature detectors (RTDs), ten relative humidity detectors (RHDs), and two absolute pressure quartz manometers. Pertinent data for the test instrumentation is listed in Attachment 3.2B, and the general locations of the RTDs and RHDs are shown in Attachment 3.2C through 3.2F.

A rotometer was used to perform the superimposed leakage verification test.

3.2.3 Data Acquisition System

The Turkey Point Plant Unit No. 3 ILRT sensor data were recorded at approximately 15 minute intervals during the test. A programmable, multichannel data logger was used to scan and record data from 22 RTDs, 10 RHDs, and manometer signal inputs. Data readings of the flowmeter were manually recorded.

The ILRT utilized a portable programmable computer to average the test data. Periodically during the test period, weighted average temperature, weighted average relative humidity, absolute pressure, vapor pressure, and mass values were computed.

3.2.4 Data Resolution System

After the appropriate data had been acquired and averaged, the results were inputted to the Stone & Webster Engineering Corporation's (SWEC) portable computer for leakage rate calculations. For the Turkey Point Plant Unit No. 3 ILRT, both the Absolute Method of Mass Point Analysis and Absolute Method of Total Time Analysis were used to determine the leakage rate.

Absolute Method of Mass Point Analysis

The Absolute Method of Mass Point Analysis consists of calculating the air masses within the containment structure, over the test period, using pressure, temperature, and dewpoint observations made during the ILRT. The air masses are computed using the ideal gas law as follows:

$$M = \frac{144\ V\ (P-P_v)}{RT} \qquad \text{(Eq. 1)}$$

where: M = air mass, lb_m
P = total pressure, psia
P_v = average vapor pressure, psia
R^v = 53.35 ft-lb_f/lb_m °R (for air)
T = average containment temperature, °R
V = containment free volume, 1.55×10^6 ft^3

The leakage rate is then determined by plotting the air mass as a function of time, using a least-squares fit to determine the slope, A = dM/dT. The leakage rate is expressed as a percentage of the air mass lost in 24 hours or symbolically:

$$\text{Leakage rate} = A/B(-2400) \qquad \text{(Eq. 2)}$$

Where A is the slope of the least-squares curve and B is the y-intercept. The sign convention is such that the leakage out of the containment is positive, and the units are in percent/day.

The air mass is calculated and correlated as a function of time by means of a least-squares curve fit of the form:

$$M = At + B \qquad \text{(Eq. 3)}$$

The slope A and y-intercept B are used in Equation 2 to determine the leakage rate.

A confidence interval is calculated using a Student's T distribution. The sum of the leakage rate and the confidence interval is the upper confidence limit - mass point (UCL-MP).

Absolute Method of Total Time Analysis

The Absolute Method of Total Time Analysis consists of calculating air lost from the containment, using pressure, temperature, and dewpoint observations made during the ILRT.

The containment air mass is computed using Equation 1.

The measured leakage rate at any time (t) is determined by subtracting the mass at that time (Mt) from the initial mass (Mi) and dividing by the initial mass. The measured leakage rate is expressed as a percentage of containment mass lost in 24 hours or symbolically:

$$\text{Measured leakage rate} = \frac{Mi-Mt}{Mi(\Delta t)} \quad (2400) \qquad \text{(Eq. 4)}$$

The sign convention is such that leakage out of the containment is positive, and the units are in percent/day.

The calculated leakage rate is determined by plotting the measured leakage rate as a function of time and then performing a least-squares curve fit of the measured leakage rate values as follows:

$$\text{Calculated leakage rate} = At + B \qquad \text{(Eq. 5)}$$

A is the slope and B is the y-intercept of the least-squares curve.

The confidence interval is calculated using the equations in Reference 5. The sum of the calculated leakage rate and the confidence interval is the upper confidence limit - total time (UCL-TT).

This analysis method was used in conjunction with the procedure.

ATTACHMENT 3.2A

SITE METEOROLOGY

Date	Time	Ambient Temperature (°F)	Barometric Pressure (in. Hg)	Wind Velocity (mph)	Wind Direction (azimuth)
6-3-85	1300	93	30.0	7	0
	1700	91	29.93	8	155
	2100	86	29.93	8	245
6-4-85	0100	82	29.94	7	255
	0500	78	29.92	7	265
	0900	80	29.98	11	330
	1300	96	29.95	6	350
	1700	91	29.89	6	45
	2100	84	29.92	6	30
6-5-85	0100	82	29.92	8	45
	0500	78	29.92	3	0
	0900	86	29.93	9	45
	1300	89	29.95	9	35
	1700	86	29.91	14	30
	2100	82	29.93	9	40
6-6-85	0100	81	29.94	10	40
	0500	79	29.95	8	20
	0900	84	29.96	6	40
	1300	86	29.98	10	40
	1700	87	29.94	9	45
	2100	81	29.95	11	50
6-7-85	0100	81	30.00	5	110
	0200	80	29.97	7	120
	0300	80	29.95	9	90
	0400	80	29.95	10	120
	0500	80	29.96	7	120
	0600	78	29.97	6	130

ATTACHMENT 3.2A (Cont)

SITE METEOROLOGY

Date	Time	Ambient Temperature (°F)	Barometric Pressure (in. Hg)	Wind Velocity (mph)	Wind Direction (azimuth)
6-7-85 (Cont)	0700	80	29.99	5	90
	0800	82	30.00	7	120
	0900	83	30.02	7	120
	1000	86	30.03	8	100
	1100	86	30.03	6	100
	1200	87	30.02	5	90
	1300	88	30.00	6	100
	1400	88	29.98	5	60
	1500	88	29.96	5	65
	1600	87	29.95	6	80
	1700	86	29.94	7	60
	1800	86	29.93	8	75
	1900	85	29.93	7	75
	2000	84	29.95	6	80
	2100	82	29.96	8	60
	2200	81	29.97	7	70
	2300	81	29.98	6	95
6-8-85	0000	79	29.97	6	120
	0100	80	29.96	4	90
	0200	80	29.96	3	100
	0300	79	29.96	3	120
	0400	78	29.96	4	150
	0500	75	29.95	3	300
	0600	76	29.97	3	300
	0700	77	29.97	3	330
	0800	79	29.97	3	275
	0900	83	29.85	2	270
	1000	86	29.98	4	0

ATTACHMENT 3.2A (Cont)

SITE METEOROLOGY

Date	Time	Ambient Temperature (°F)	Barometric Pressure (in. Hg)	Wind Velocity (mph)	Wind Direction (azimuth)
6-8-85 (Cont)	1100	89	29.98	7	70
	1200	88	29.97	5	90
	1300	90	29.96	6	90
	1400	89	29.95	10	135
	1500	89	29.94	11	120
	1600	89	29.92	6	130
	1700	89	29.90	10	150
	1800	87	29.91	10	100
	1900	86	29.93	8	100
	2000	84	29.95	2	180
	2100	82	29.96	1	210

ATTACHMENT 3.2B

INSTRUMENTATION LIST

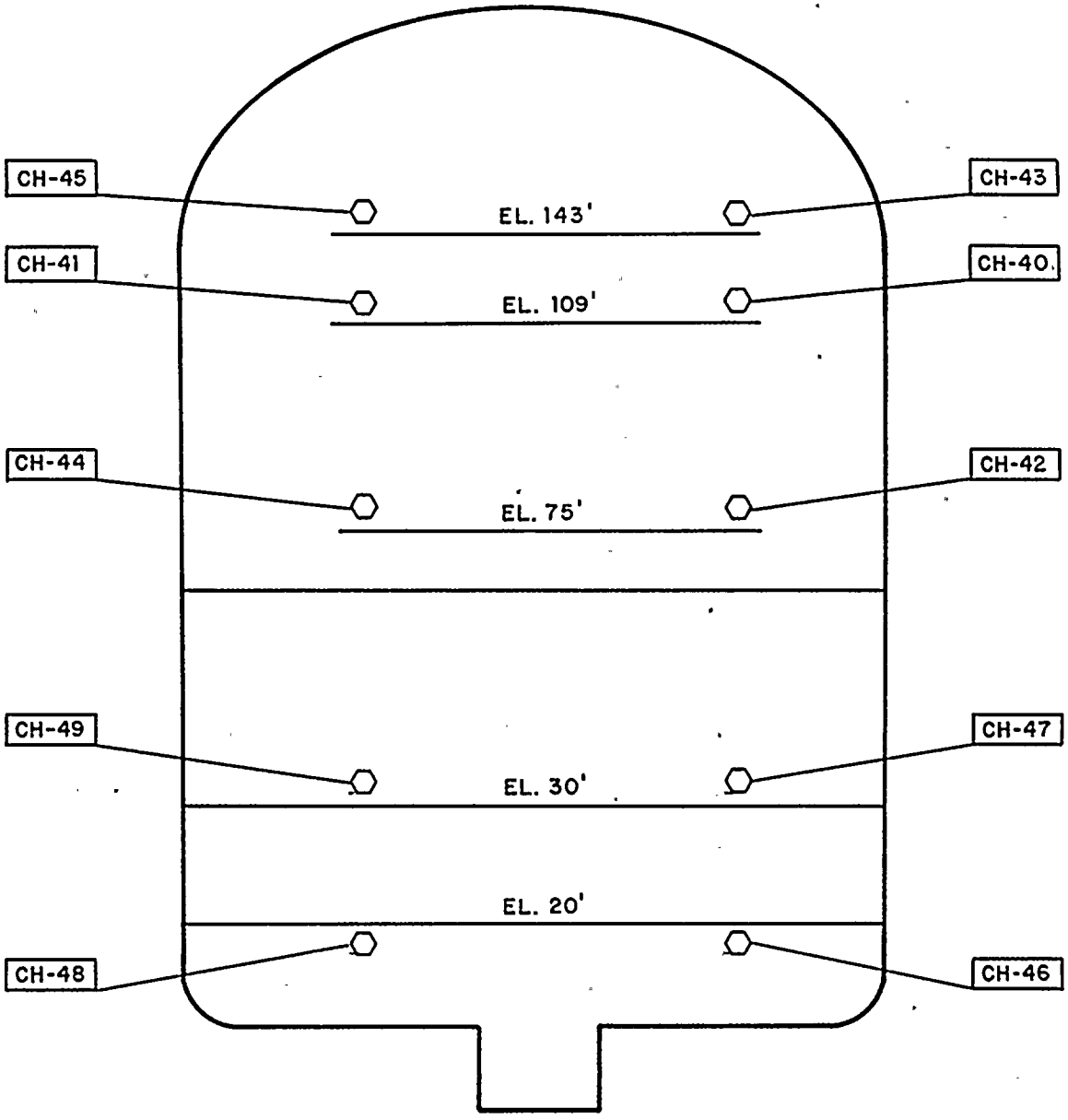
The following instruments were calibrated or functionally verified within 6 months prior to the performance of this test and in accordance with 10CFR50, Appendix J, using instrumentation traceable to the National Bureau of Standards.

Channel	Instrument	Weight Factor	Accuracy
CH-43	RHD	0.16	±2.5%RH
CH-45	RHD	0.16	±2.5%RH
CH-40	RHD	0.1205	±2.5%RH
CH-41	RHD	0.1205	±2.5%RH
CH-42	RHD	0.1205	±2.5%RH
CH-44	RHD	0.1205	±2.5%RH
CH-46	RHD	0.0495	±2.5%RH
CH-47	RHD	0.0495	±2.5%RH
CH-48	RHD	0.0495	±2.5%RH
CH-49	RHD	0.0495	±2.5%RH
CH-0	RTD	0.060334	±0.5°F
CH-1	RTD	0.060333	±0.5°F
CH-2	RTD	0.03	±0.5°F
CH-3	RTD	0.053334	±0.5°F
CH-4	RTD	0.03	±0.5°F
CH-5	RTD	0.060333	±0.5°F
CH-6	RTD	0.060333	±0.5°F
CH-7	RTD	0.060334	±0.5°F
CH-8	RTD	0.033	±0.5°F
CH-9	RTD	0.033	±0.5°F

ATTACHMENT 3.2B

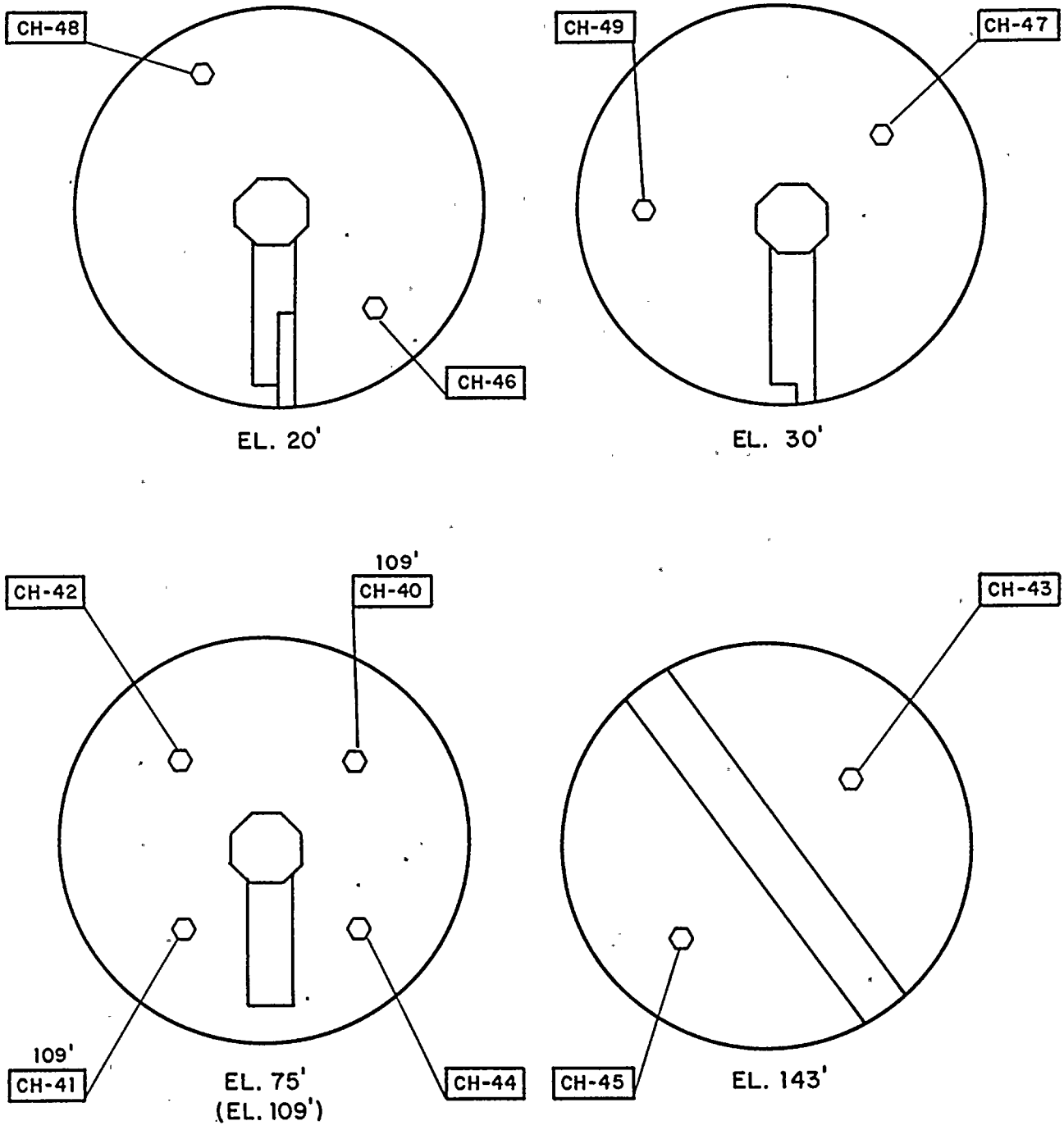
INSTRUMENTATION LIST

Channel	Instrument	Weight Factor	Accuracy
CH-10	RTD	0.060333	±0.5°F
CH-11	RTD	0.033	±0.5°F
CH-12	RTD	0.053333	±0.5°F
CH-13	RTD	0.033	±0.5°F
CH-14	RTD	0.053333	±0.5°F
CH-15	RTD	0.033	±0.5°F
CH-16	RTD	0.033	±0.5°F
CH-17	RTD	0.053334	±0.5°F
CH-18	RTD	0.053333	±0.5°F
CH-19	RTD	0.053333	±0.5°F
CH-20	RTD	0.03	±0.5°F
CH-21	RTD	0.03	±0.5°F
TI-145 0-100 psia Quartz	Manometer 1	1.0	±0.001% F.S.
TI-145 0-100 psia Quartz	Manometer 2	N/A	±0.001% F.S.
Rotameter	0-28 scfm at 50 psig		±1.0% F.S.



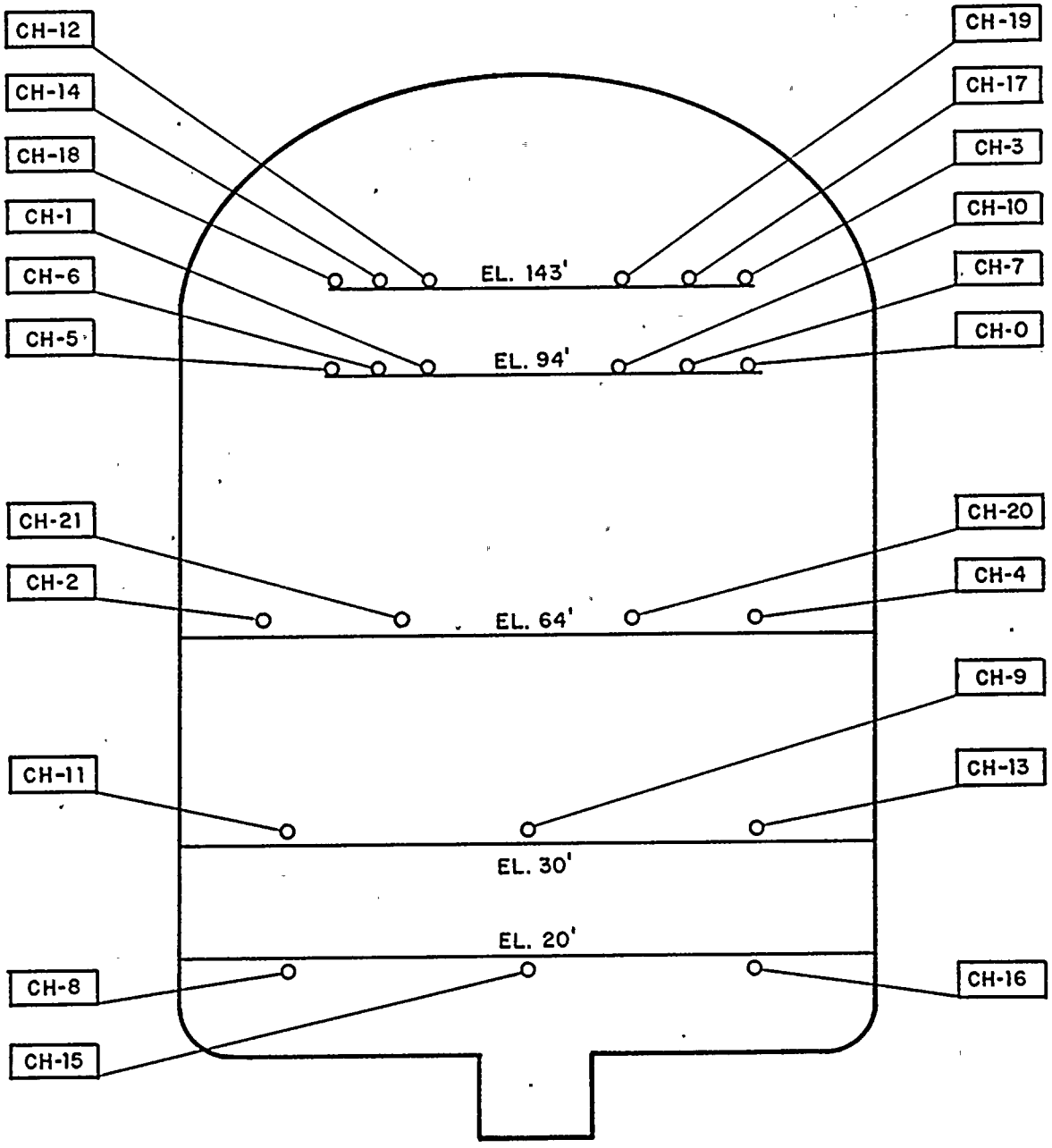
PROFILE VIEW

ATTACHMENT 3.2C
INSTRUMENTATION LOCATION
RELATIVE HUMIDITY
DETECTORS (RHD'S)
TURKEY POINT PLANT- UNIT 3



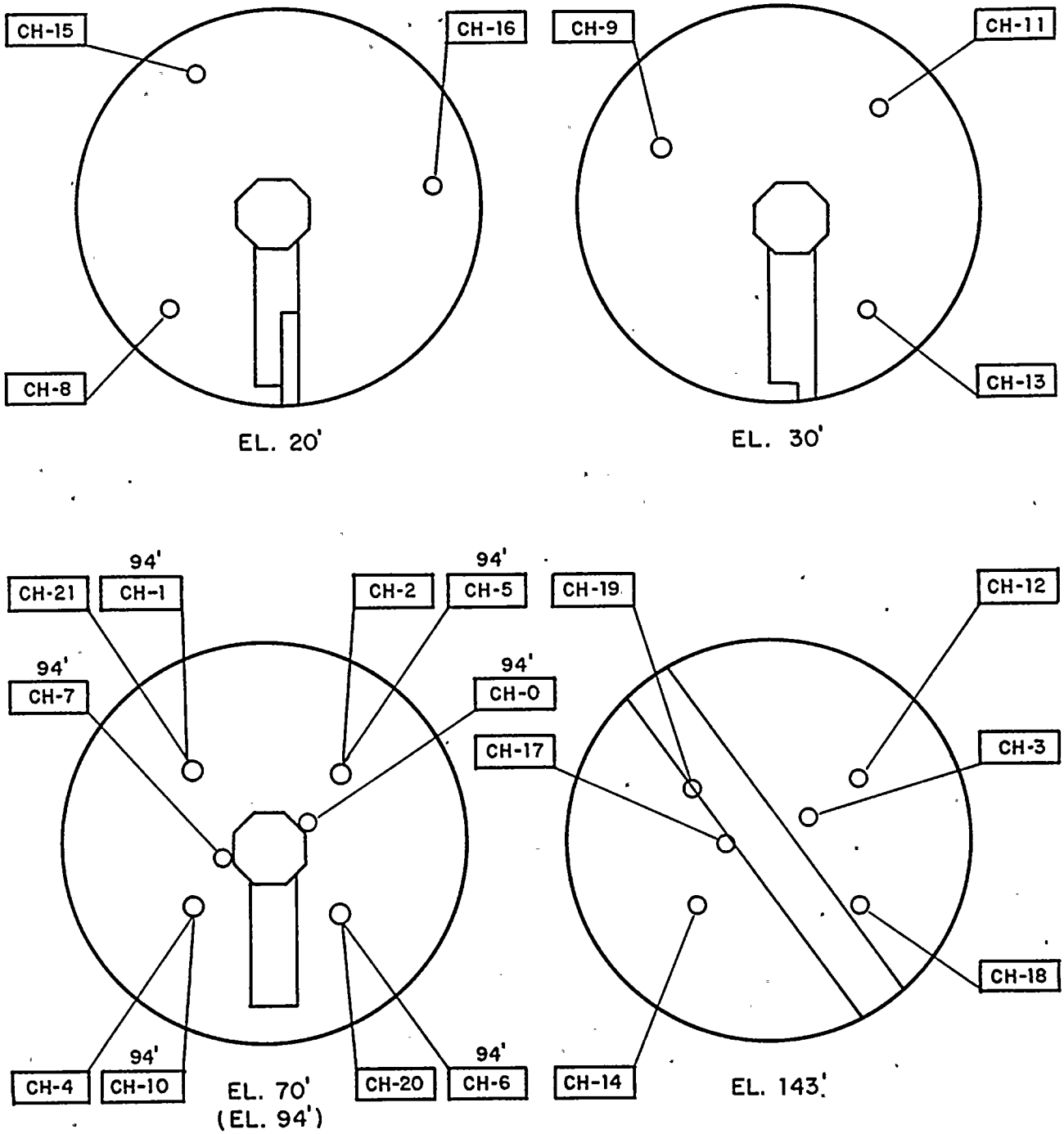
PLAN · VIEW

ATTACHMENT 3.2D
INSTRUMENTATION LOCATION
RELATIVE HUMIDITY
DETECTORS (RHD'S)
TURKEY POINT PLANT-UNIT 3



PROFILE VIEW

ATTACHMENT 3.2E
INSTRUMENTATION LOCATION
RESISTANCE TEMPERATURE
DETECTORS (RTD'S)
TURKEY POINT PLANT-UNIT 3



ATTACHMENT 3.2F
INSTRUMENTATION LOCATION
RESISTANCE TEMPERATURE
DETECTORS (RTD'S)
TURKEY POINT PLANT-UNIT 3

3.3 TEST RESULTS

3.3.1 Presentation of Test Results

The ILRT was conducted in accordance with the Turkey Point Plant Unit No. 3 operating test procedure 13100.1. The results for the ILRT and for the superimposed leakage verification test are shown below.

3.3.2 ILRT Results - Mass Point Method	Percent/day
1. Leakage rate calculated, L_{am}	0.060155
2. Upper confidence	0.009627
3. Type C Corrections (See 3.3.5)	0.001585
4. Total reported Type A Leakage rate	0.071367

Results were within the acceptable limit of 0.1875 percent/day.

3.3.3 ILRT Results - Total Time Method	Percent/day
1. Leakage rate calculated, L_{am}	0.044055
2. Upper confidence	0.096438
3. Type C Corrections (See 3.3.5)	0.001585
4. Total reported Type A Leakage rate	0.142077

Results were within the acceptable limit of 0.1875 percent/day.

3.3.4 Superimposed Leakage Verification Test Results

1. The Superimposed Leakage Verification Test is acceptable provided L_c falls within the following range:

$$(L_{am} + L_o - 0.25L_a) \leq L_c \leq (L_{am} + L_o + 0.25\ L_a)$$

where:
- L_{am} = total measured containment leakage rate from ILRT
- L_o = leakage rate imposed on containment using a flow measuring device (percent/day)
- L_a = maximum allowable leakage rate (0.25 percent/day)
- L_c = composite leakage rate calculated during the verification test.

a. Mass Point (See Attachment 3.3D, Page 2 of 3)

$$(.060155 + .255657 - 0.0625) \leq .357139 \leq (.060155 + .255657 + 0.0625)$$

$$.253313 \leq .357139 \leq .378313$$

b. Total Time (See Attachment 3.3D, Page 3 of 3)

$$(.044055 + .255657 - 0.0625) \leq .347813 \leq (.044055 + .255657 + 0.0625)$$

$$.237212 \leq .347813 \leq .362212$$

The Superimposed Leakage Verification Test met the requirements set forth in References 4 and 5.

c. Calculation of Lo, percent/day

L_o = 725.75 scfh

L_a = 709.687 scfh and 0.25 percent/day

$$L_o = (0 .25) \frac{(725. 75)}{(709.687)}$$

L_o = 0.255657 percent/day.

3.3.5 Type C Corrections

1. Type C penalty for not venting or draining in standard cubic centimeters per minute

Pen 16	30	ccm
Pen 53	450	ccm
Total	480	ccm

$$\text{sccm} = 480 \text{ ccm} \times \frac{(49.9 + 14.696)}{14.696} = 2109.83 \text{ sccm}$$

2. Type C penalty in percent/day (See 3.3.2.3 and 3.3.3.3)

L_a = 11.828 scfm and 0.25 percent/day

2109.83 sccm = 0.07449 scfm

$$\text{Type C correction} = \frac{0.075 \text{ (scfm)}}{11.828 \text{ (scfm)}} (.25) = 0.001585$$

Type C correction = 0.001585 percent/day.

ATTACHMENT 3.3A

INTEGRATED LEAKAGE RATE TEST

FROM 0830 TO 1630 HOURS ON JUNE 7, 1985

REDUCED INPUT VARIABLES

Time (hr)	Abs. Pressure (psia)	Vap. Pressure (psia)	Temp (degR)	Relative Humidity (pct)	Mass (lbm)
0.0	66.561	.7134	556.99	81.490	494594.724
.25	66.557	.7130	556.97	81.500	494586.567
.50	66.552	.7136	556.96	81.594	494553.665
.75	66.548	.7130	556.94	81.562	494544.715
1.00	66.545	.7123	556.93	81.522	494538.353
1.25	66.543	.7121	556.91	81.543	494541.526
1.50	66.540	.7115	556.90	81.505	494535.669
1.75	66.537	.7108	556.88	81.463	494530.613
2.00	66.535	.7117	556.87	81.602	494522.130
2.25	66.533	.7107	556.86	81.518	494525.666
2.50	66.532	.7101	556.84	81.495	494538.071
2.75	66.527	.7102	556.83	81.526	494505.536
3.00	66.524	.7099	556.82	81.521	494498.550
3.25	66.523	.7099	556.80	81.582	494510.006
3.50	66.519	.7097	556.79	81.569	494488.264
3.75	66.517	.7089	556.78	81.510	494487.145
4.00	66.515	.7089	556.76	81.550	494488.407
4.25	66.513	.7085	556.76	81.523	494482.061
4.50	66.511	.7083	556.74	81.541	494484.050
4.75	66.509	.7081	556.73	81.538	494479.195
5.00	66.507	.7076	556.71	81.525	494482.396
5.25	66.505	.7071	556.70	81.496	494478.019
5.50	66.504	.7071	556.68	81.539	494473.146
5.75	66.502	.7074	556.68	81.587	494473.421
6.00	66.500	.7070	556.67	81.562	494469.793
6.25	66.498	.7058	556.66	81.450	494474.822

ATTACHMENT 3.3A (Cont)

INTEGRATED LEAKAGE RATE TEST

FROM 0830 TO 1630 HOURS ON JUNE 7, 1985

REDUCED INPUT VARIABLES

Time (hr)	Abs. Pressure (psia)	Vap. Pressure (psia)	Temp (degR)	Relative Humidity (pct)	Mass (lbm)
6.50	66.498	.7060	556.64	81.516	494488.641
6.75	66.495	.7055	556.62	81.497	494486.001
7.00	66.494	.7065	556.62	81.630	494472.502
7.25	66.493	.7056	556.61	81.545	494480.352
7.50	66.491	.7052	556.60	81.531	494480.358
7.75	66.490	.7058	556.59	81.626	494477.043
8.00	66.487	.7056	556.57	81.636	494469.302

ATTACHMENT 3.3B

INTEGRATED LEAKAGE RATE TEST

FROM 0830 TO 1630 HOURS ON JUNE 7, 1985

ABSOLUTE TEST METHOD, MASS POINT ANALYSIS

Time (hr)	Mass (lbm)	Leakage (pct./day)	95 Pct. Conf. (pct./day)	UCL (pct./day)
0.000	494594.72	0.000000	0.000000	0.000000
.250	494586.57	0.000000	0.000000	0.000000
.500	494553.67	.398464	1.186245	1.584709
.750	494544.72	.355056	.196775	.551830
1.000	494538.35	.300062	.117708	.417770
1.250	494541.53	.232687	.108374	.341061
1.500	494535.67	.195875	.084147	.280022
1.750	494530.61	.172392	.065973	.238365
2.000	494522.13	.160917	.051382	.212299
2.250	494525.67	.142555	.044802	.187357
2.500	494538.07	.115115	.046302	.161417
2.750	494505.54	.119145	.038324	.157470
3.000	494498.55	.122124	.032242	.154366
3.250	494510.01	.114154	.028602	.142756
3.500	494488.26	.116669	.024747	.141416
3.750	494487.15	.116259	.011527	.137785
4.000	494488.41	.113217	.019145	.132362
4.250	494482.06	.111257	.017056	.128313
4.500	494484.05	.107488	.015665	.123153
4.750	494479.19	.104553	.014353	.118906
5.000	494482.40	.100216	.013651	.113867
5.250	494478.02	.096778	.012841	.109618
5.500	494489.15	.090762	.013134	.103896
5.750	494473.42	.088275	.012262	.100537
6.000	494469.79	.086174	.011449	.097622
6.250	494474.82	.082951	.011018	.093969
6.500	494488.64	.077606	.011468	.089074

ATTACHMENT 3.3B (Cont)

INTEGRATED LEAKAGE RATE TEST

FROM 0830 TO 1630 HOURS ON JUNE 7, 1985

ABSOLUTE TEST METHOD, MASS POINT ANALYSIS

Time (hr)	Mass (lbm)	Leakage (pct./day)	95 Pct. Conf. (pct./day)	UCL (pct./day)
6.750	494486.00	.073133	.011509	.084641
7.000	494472.50	.070826	.010937	.081763
7.250	494480.35	.067511	.010702	.078212
7.500	494480.36	.064388	.010458	.074846
7.750	494477.04	.061815	.010112	.071927
8.000	494469.30	.060155	.009627	.069782

ATTACHMENT 3.3C

INTEGRATED LEAKAGE RATE TEST

FROM 0830 TO 1630 HOURS ON JUNE 7, 1985

ABSOLUTE TEST METHOD, TOTAL TIME ANALYSIS

Time (hr)	Mass (lbm)	Meas. Leakage (pct./day)	Mean of Meas. Leakage	Calc. Leakage (pct./day)	Confidence (pct./day)	UCL (pct./day)
0.000	494594.72	0.000000	0.000000	0.000000	0.000000	0.000000
.250	494586.57	.158318	0.000000	0.000000	0.000000	0.000000
.500	494553.67	.398467	0.000000	0.000000	0.000000	0.000000
.750	494544.72	.323551	0.000000	.376062	1.246061	1.62212
1.000	494538.35	.273535	0.000000	.329078	.581643	.91072
1.250	494541.53	.206510	0.000000	.266367	.423335	.68970
1.500	494535.67	.191041	0.000000	.225551	.329630	.55518
1.750	494530.61	.177768	0.000000	.196290	.271977	.46826
2.000	494522.13	.176129	0.000000	.178024	.233340	.41136
2.250	494525.67	.148932	0.000000	.156342	.206513	.36285
2.500	494538.07	.109961	0.000000	.128553	.187627	.31618
2.750	494505.54	.157374	0.000000	.124410	.175312	.29972
3.000	494498.55	.155559	0.000000	.121376	.165670	.28704
3.250	494510.01	.126488	0.000000	.111565	.155417	.26698
3.500	494488.26	.147597	0.000000	.109846	.149533	.25937
3.750	494487.15	.139205	0.000000	.106830	.143749	.25057
4.000	494488.41	.128974	0.000000	.102407	.138115	.24052
4.250	494482.06	.128633	0.000000	.099038	.133497	.23253
4.500	494484.05	.119341	0.000000	.094630	.128993	.22362
4.750	494479.19	.118021	0.000000	.090953	.125179	.21613
5.000	494482.40	.109013	.166401	.086415	.121439	.20785
5.250	494478.02	.107868	.171537	.082577	.118246	.20082
5.500	494489.15	.093147	.168434	.076990	.114874	.19183
5.750	494473.42	.102368	.154334	.073875	.112447	.18632
6.000	494469.79	.101037	.143738	.071135	.110351	.18148
6.250	494474.82	.093091	.135146	.067702	.108135	.17583
6.500	494488.64	.079194	.129083	.062821	.105667	.16848

ATTACHMENT 3.3C (Cont)

INTEGRATED LEAKAGE RATE TEST

FROM HOURS 0830 TO 1630 ON JUNE 7, 1985

ABSOLUTE TEST METHOD, TOTAL TIME ANALYSIS

Time (hr)	Mass (lbm)	Meas. Leakage (pct./day)	Mean of Meas. Leakage	Calc. Leakage (pct./day)	Confidence (pct./day)	UCL (pct./day)
6.750	494486.00	.078159	.123708	.058522	.103504	.16202
7.000	494472.50	.084725	.119277	.055744	.101969	.15771
7.250	494480.35	.076549	.114535	.052325	.100284	.15260
7.500	494480.36	.073994	.110967	.049067	.098743	.14781
7.750	494477.04	.073683	.109239	.046223	.097426	.14364
8.000	494469.30	.076075	.105368	.044055	.096438	.14049

ATTACHMENT 3.3D

SUPERIMPOSED LEAKAGE VERIFICATION TEST

FROM 1730 TO 2130 HOURS ON JUNE 7, 1985

REDUCED INPUT VARIABLES

Time (hr)	Abs. Pressure (psia)	Vap. Pressure (psia)	Temp (degR)	Relative Humidity (pct)	Mass (lbm)
0.0	66.473	.7041	556.52	81.592	494420.963
.25	66.469	.7036	556.52	81.541	494397.589
.50	66.466	.7034	556.51	81.542	494387.084
.75	66.463	.7027	556.50	81.495	494379.745
1.00	66.459	.7029	556.48	81.552	494358.965
1.25	66.454	.7028	556.47	81.560	494330.944
1.50	66.451	.7023	556.47	81.523	494319.930
1.75	66.447	.7024	556.45	81.561	494299.698
2.00	66.443	.7025	556.45	81.594	494273.826
2.25	66.440	.7022	556.44	81.578	494262.728
2.50	66.436	.7017	556.43	81.554	494247.650
2.75	66.432	.7016	556.42	81.558	494221.882
3.00	66.429	.7015	556.41	81.566	494207.495
3.25	66.425	.7016	556.40	81.589	494184.543
3.50	66.421	.7007	556.39	81.517	494171.038
3.75	66.417	.7004	556.39	81.499	494150.579
4.00	66.413	.7010	556.38	81.585	494122.384

ATTACHMENT 3.3D (Cont)

SUPERIMPOSED LEAKAGE VERIFICATION TEST

FROM 1730 TO 2130 HOURS ON JUNE 7, 1985

ABSOLUTE TEST METHOD, MASS POINT ANALYSIS

Time (hr)	Mass lbm	Leakage pct./day
0.000	494420.96	0.000000
.250	494397.59	0.000000
.500	494387.08	.328911
.750	494379.75	.260493
1.000	494358.96	.275409
1.250	494330.94	.318051
1.500	494319.93	.322116
1.750	494299.70	.329702
2.000	494273.83	.344752
2.250	494262.73	.345362
2.500	494247.65	.343305
2.750	494221.88	.348156
3.000	494207.49	.348821
3.250	494184.54	.352004
3.500	494171.04	.351829
3.750	494150.58	.352714
4.000	494122.38	.357139

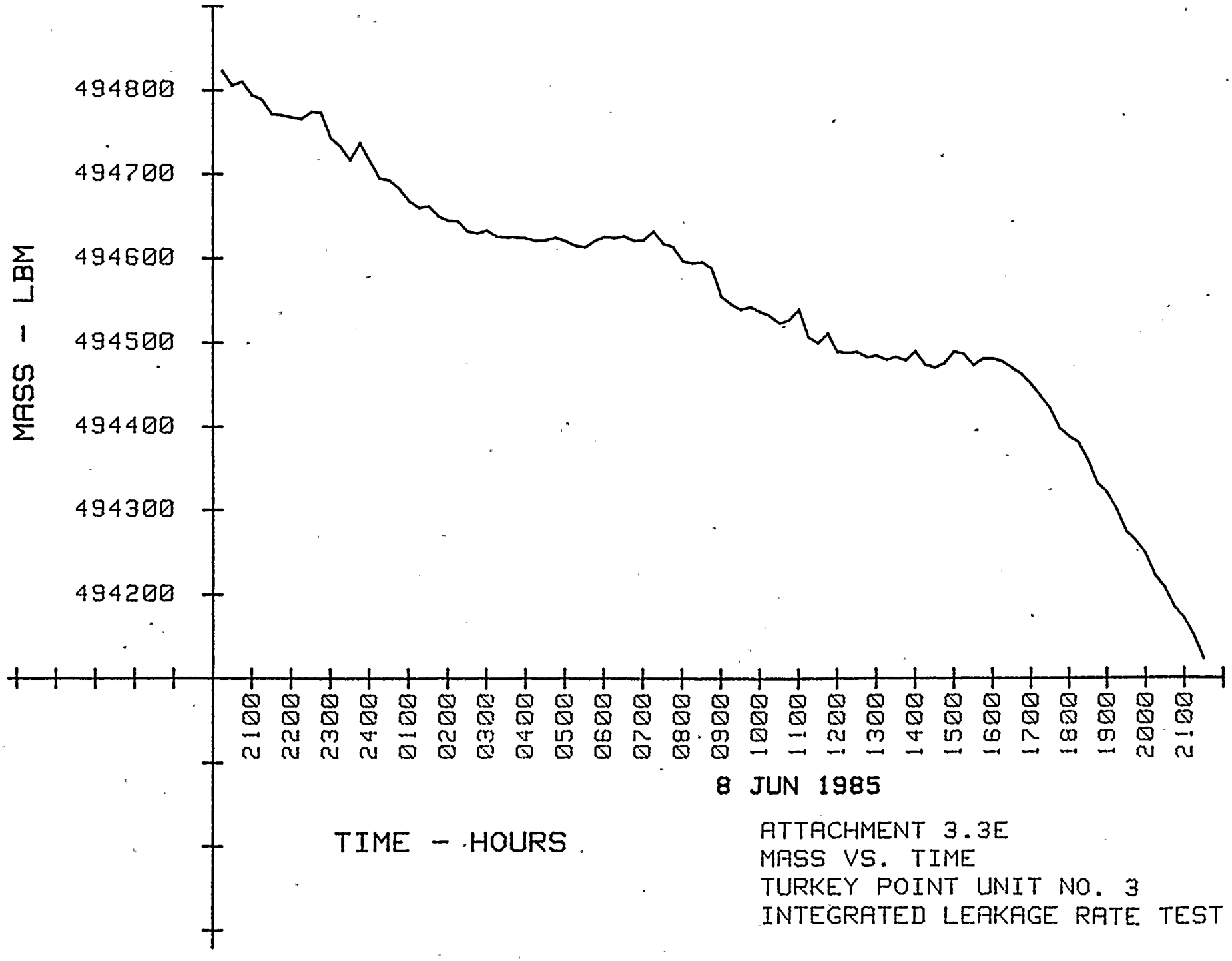
ATTACHMENT 3.3D (Cont)

SUPERIMPOSED LEAKAGE VERIFICATION TEST

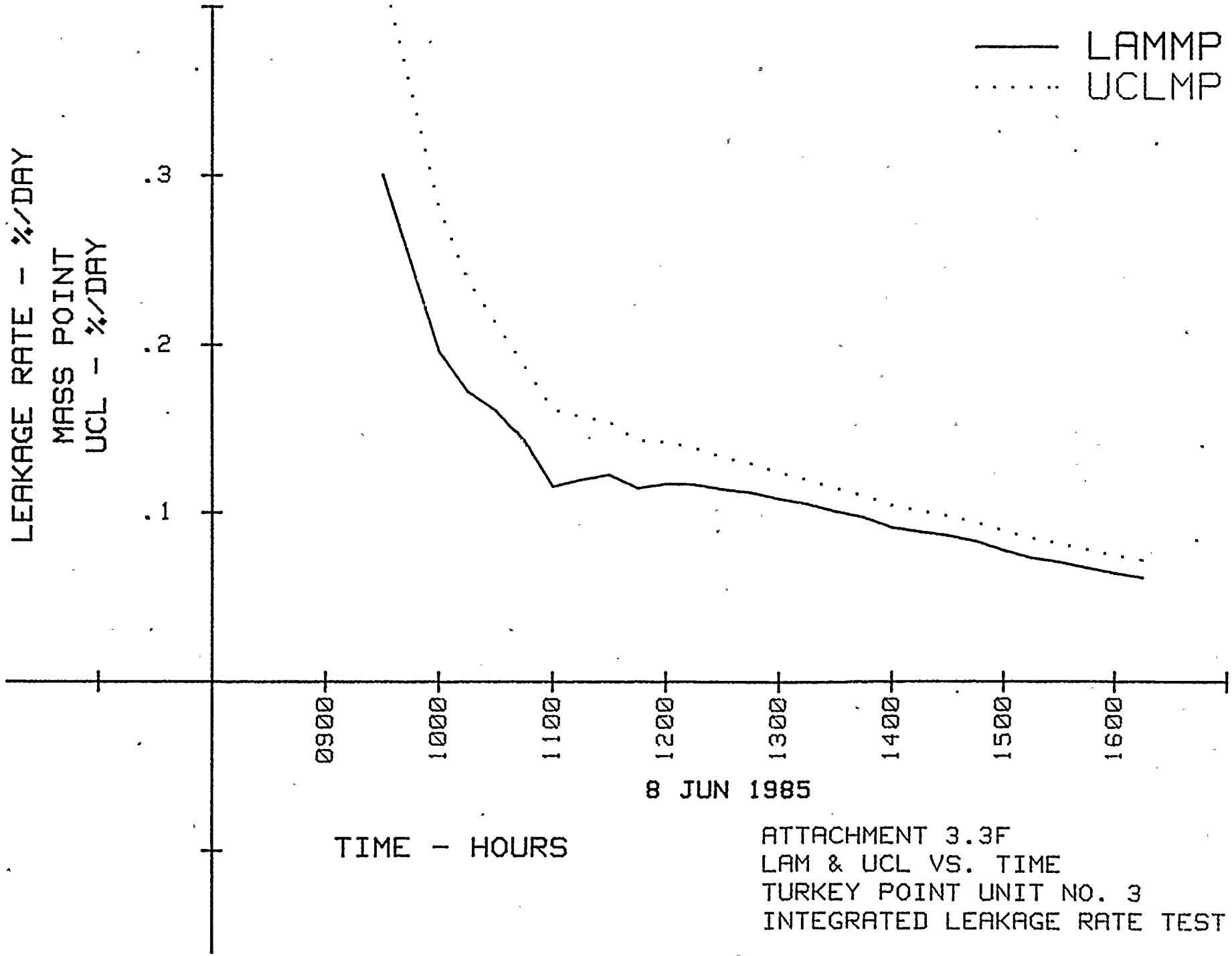
FROM 1730 TO 2130 HOURS ON JUNE 7, 1985

ABSOLUTE TEST METHOD, TOTAL TIME ANALYSIS

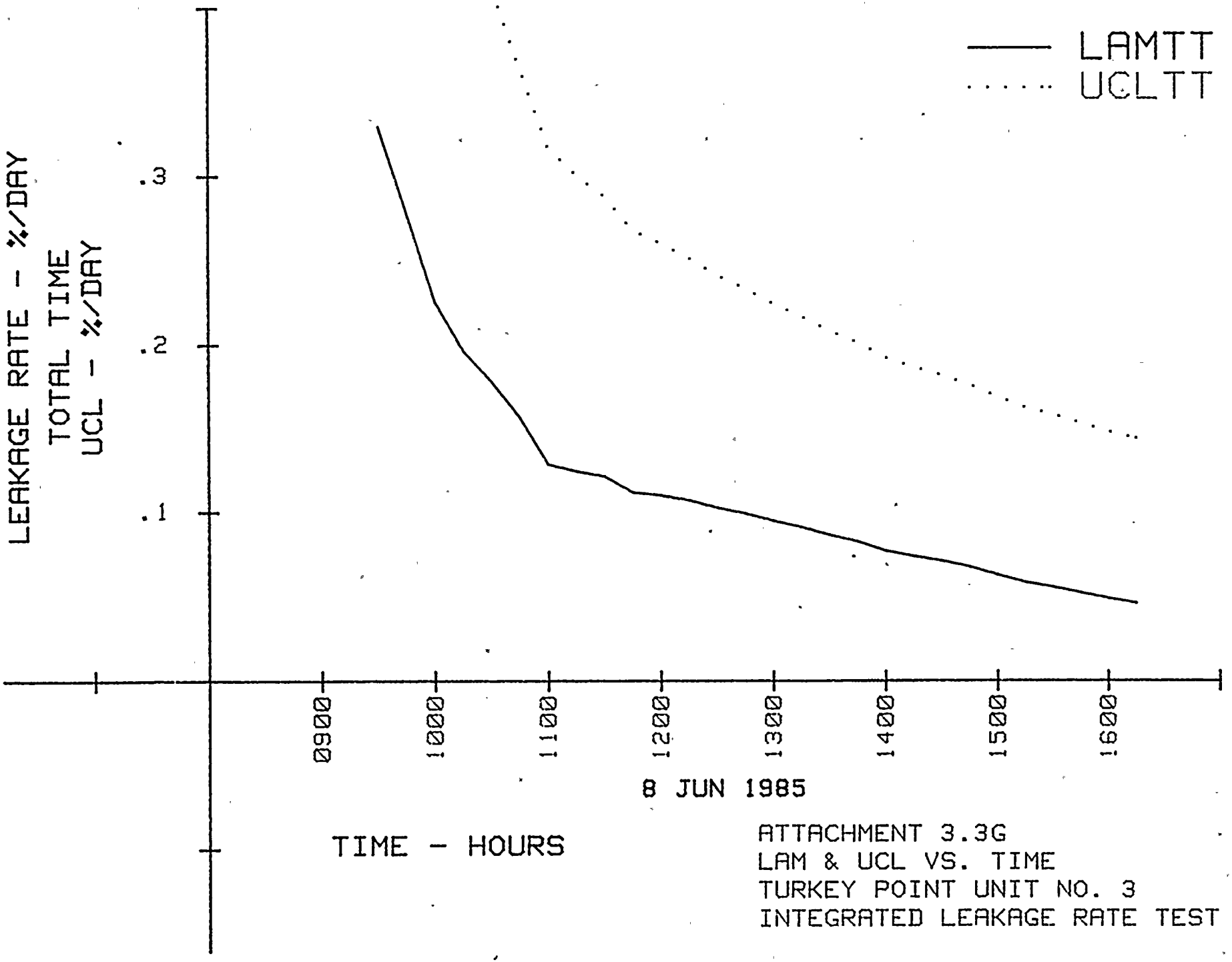
Time (hr)	Mass (lbm)	Meas. Leakage (pct./day)	Mean of Meas. Leakage	Calc. Leakage (pct./day)
0.000	494420.96	0.000000	0.000000	0.000000
.250	494397.59	.453833	0.000000	0.000000
.500	494387.08	.328910	0.000000	0.000000
.750	494379.75	.266769	0.000000	.256306
1.000	494358.96	.300949	0.000000	.259497
1.250	494330.94	.349575	0.000000	.292712
1.500	494319.93	.326954	0.000000	.299387
1.750	494299.70	.336366	0.000000	.308318
2.000	494273.83	.357114	0.000000	.322951
2.250	494262.73	.341376	0.000000	.326870
2.500	494247.65	.336516	0.000000	.328020
2.750	494221.88	.351407	0.000000	.333671
3.000	494207.49	.345403	0.000000	.336113
3.250	494184.54	.353114	0.000000	.340104
3.500	494171.04	.346622	0.000000	.341524
3.750	494150.58	.349997	0.000000	.343458
4.000	494122.38	.362338	0.000000	.347813



ATTACHMENT 3.3E
MASS VS. TIME
TURKEY POINT UNIT NO. 3
INTEGRATED LEAKAGE RATE TEST



ATTACHMENT 3.3F
LAM & UCL VS. TIME
TURKEY POINT UNIT NO. 3
INTEGRATED LEAKAGE RATE TEST



ATTACHMENT 3.3G
LAM & UCL VS. TIME
TURKEY POINT UNIT NO. 3
INTEGRATED LEAKAGE RATE TEST

SECTION 4

LOCAL LEAKAGE RATE TESTS (TYPES B and C)

Section 4 summarizes the LLRT data which has been obtained from periodic testing performed since the March 1982 Type A test. Pre-repair data are provided for surveillance testing performed in 1983 and 1985. These LLRTs were performed by pressurizing the listed penetrations with air and either measuring leakage across the containment isolation valves (Type C) or across the resilient seals (Type B). Each penetration's leakage rate can be obtained from site reference material.

If the pre-repair and post-repair leakages are the same or, in some cases, if the post-repair leakage is greater than the pre-repair leakage, then no repair was performed. Also, it should be noted that certain penetrations had multiple LLRT's performed as described in Attachments 4A and 4B.

The acceptance criteria for Types B and C testing are in accordance with 10CFR50, Appendix J. The combined "as-left" leakage rate for all penetrations and valves subject to Types B and C tests in 1983 and 1985 were well below the acceptance criteria of less than 0.60 La.

The data contained in this section are summarized below:

Attachment Title	Title
4A	1985 LLRT Data
4B	1983 LLRT Data

ATTACHMENT 4A

1985 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
1 To RHR from Loop C Hot Leg	C	MOV-751 (ISC) MOV-750 (ISC)	NA	NA	Removed from Type C Program
5 PRT to Gas Analyzer	C	CV-516 (OSC) SV-6385 (OSC)	<30 165	<30 165	
6 Nitrogen to PRT	C	CK-518 (ISC) CK-519 (ISC)	490 510	490 510	
7 PW to PRT and RCP Standpipes	C	CV-519A (OSC) CV-519B (ISC) CV-522A (ISC) CV-522B (ISC) CV-522C (ISC)	<30 Combination	<30 Combination	
8 PRZ Steam Samples	C	CV-951 (ISC) CV-956A (OSC)	5600 <30	670 <30	CV-951 Seat cleaned and lapped
9 PRZ Liquid Samples	C	CV-953 (ISC) CV-956B (OSC)	<20 <30	<20 <30	
10 RCDT and PRT Vent and Nitrogen to RCDT	C	CV-4658B (OSC) PCV-3-1014 (OSC) CV-4658A (OSC)	<30 13000 <30	<30 <30 <30	PCV-3-1014 Tightened set screws
11 Alternate Low Head SI to Loops	C	MOV-872 (OSC)	<30	<30	

1985 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
14 Letdown to Nonregenerative Heat Exchanger	C	CV-200A (ISC) CV-200B (ISC) CV-200C (ISC) CV-204 (OSC)	<30 Combination <30	<30 Combination <30	
15 Charging to Regenerative Heat Exchanger	C	CK-312C (ISC) HCV-121 (OSC) V-333 (OSC)	175 >52000 Combination	175 <30 Combination	HCV-121 New internals
16 PACVS, Hydrogen Removal	C	HV-3-2 (OSC) HV-3-1 (OSC) PAHM-002A (OSC)	<30 Combination	<30 Combination	
17 SI Test Line	C	V-895V (OSC)	<30	<30	
19A Containment Spray A	C	CK-890A (OSC) MOV-880A (OSC)	100 60	80 60	CK-890A Inspected internals, no repair
19B Containment Spray B	C	CK-890B (OSC) MOV880B (OSC)	400 60	<30 60	CK-890B Inspected internals, no repair
20 A and B Hot Leg Sample	C	SV-6427A (ISC) SV-6427A (ISC) SV-6428 (OSC)	<20 <20 50	<20 <20 50	
23 Containment Sump to WHT	C	CV-2822 (OSC) CV-2821 (OSC)	100 >52000	100 <30	CV-2821 Valve cycled and air blown
24A Seal Water Injection to A RCP	C	CK-298A (ISC)	40	40	

1985 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
24B Seal Water Injection to B RCP	C	CK-298B (ISC)	45	45	
24C Seal Water Injection to C RCP	C	CK-298C (ISC)	45	45	
25 RCP Seal Water Return	C	MOV-381 (OSC)	<30	<30	
		MOV-6386 (ISC)	500	500	
29 Instrument Air Supply	C	CK-336 (ISC)	9000	1600	Note 1
		CV-3-2803 (OSC)	NA	NA	CK-336 Cleaned
		CK-340A (ISC)	650	650	and lapped
30 Breathing Air	C	CK-201 (ISC)	<30	<30	
		CV-6165 (OSC)	850	850	
31 RCDT to Gas Analyzer	C	CV-4659B (OSC)	<30	<30	
		CV-4659A (OSC)	Combination	Combination	
32 Containment Air Sample Return	C	CK-11-003 (ISC)	200	200	
		SV-2912 (OSC)	300	300	
		PAHM-001A, B (OSC)	Combination	Combination	
33 Containment Air Sample	C	SV-2913 (OSC)	<30	<30	
		SV-2911 (OSC)	360	360	
34 Service Air	C	CK-205 (ISC)	1500	170	CK-205 Cleaned
		V-204 (OSC)	<30	<30	and lapped.
		HV-17 (OSC)	Combination	Combination	
35 Containment Purge Inlet	C	PV-2600 (OSC)	27000	6000	Note 2
		PV-2601 (ISC)	Combination	Combination	PV-2601 Seats and seals replaced.
36 Containment Purge Outlet	C	PV-2602 (OSC)	2000	2400	Note 3
		PV-2603 (ISC)	Combination	Combination	Seats and seals replaced.

1985 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
38 Electrical Cannisters	B	Cannisters	3000	<320	Note 4
39 Fuel Transfer Tube Flange	B	O-Ring and Body	<20	185	
40 Equipment Access Hatch	B	O-Ring and Body	<30	<30	Note 5
41 Personnel Air Lock	B	O-Ring and Body	4400	4700	Note 6
42 Nitrogen to Accumulators	C	ST-CK-945E (ISC) CV-855 (OSC)	3900 <30	<30 65	CK-945E Cleaned and lapped.
47 Primary Water Supply to Wash Header	C	CK-10-567 (OSC) V-582 (ISC)	75 65	75 65	
49 Emergency Air Lock	B	O-Ring and Body	150	150	
52 RCDT Pump Discharge	C	CV-4668B (OSC) CV-4668A (OSC)	50 Combination	50 Combination	
53 PACVS	C	HV-3-3,4 (OSC) PAHM-3-002B	450 Combination	450 Combination	
54A Containment Recirc Sump to RHR Pump A	C	MOV-861A (OSC) MOV-860A (OSC)	<30 Combination	<30 Combination	
54B Containment Recirc. Sump to RHR Pump B	C	MOV-861B (OSC) MOV-860B (OSC)	<30 Combination	<30 Combination	
55 Accumulator Sampling	C	CV-955C (ISC) CV-955D (ISC) CV-955E (ISC) CV-956D (OSC)	16000 12000 25000 1200	850 180 240 <30	Valves cleaned and lapped

1985 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
61B Deadweight Tester to PT	C	V-2023 (ISC) V-2024 (OSC)	25 55	25 55	
63 Instrument Air Bleed	C	CV-2819 (ISC) CV-2826 (OSC)	65 10250	<30 740	Note 6 Valves cleaned and lapped
65A Containment Air Test Air In-Out	B	Flange 'E' (OSC)	<20	40	Note 7
65B Containment Air Test Pressure	B, C	V-2025 (OSC) Flange (ISC)	7000 Combination	<30 Combination	Note 8
65C Containment Air Test Leakage Flow	B, C	V-2026 (OSC) Flange (ISC)	<20 Combination	310 Combination	

Notes

1. Penetration 29 CV-3-2803 was removed from the Type C Test Program.

2. Penetration 35 tested 4/1/85, 27000 cc/min (combination)
   4/1/85, 17000 cc/min (combination)
   4/5/85, >180000 cc/min (combination)
   4/5/85, 1800 cc/min (combination)
   6/5/85, 5700 cc/min (combination)
   6/13/85, 6000 cc/min (combination)

3. Penetration 36 tested 4/1/85, 2000 cc/min (combination)
   4/30/85, 3000 cc/min (combination)
   6/6/85, 8500 cc/min (combination)
   6/6/85, 11000 cc/min (combination)
   6/13/85, 150,000 cc/min (combination)
   6/18/85, 675 cc/min (combination)
   7/10/85, 1600 cc/min (combination)
   7/11/85, 2400 cc/min (combination)

1985 LOCAL LEAKAGE RATE TEST DATA

Notes (Cont)

4. The post-repair value is the total of all electrical penetrations. Only the electrical penetration for "C" RCP 4KV was repaired. The ceramic bushing was replaced. As found for "C" RCP 4KV was 3000 cc/min.

5. Penetration 40 tested 4/15/85, <30 (o-ring and body)
5/12/85, <30 (o-ring and body)
6/6/85, <30 (o-ring and body)
6/19/85, <30 (o-ring and body)

6. Penetration 63 (CV-2826) tested 4/30/85, 10250 cc/min
5/27/85, 7000 cc/min
6/1/85, 4400 cc/min
6/1/85, 3200 cc/min
6/2/85, 35000 cc/min
6/2/85, 740 cc/min

7. Penetration 65A tested 4/1/85, <20 cc/min
6/3/85, 950 cc/min
6/11/85, 40 cc/min

8. Penetration 65B tested 5/7/85, 7000 cc/min (combination)
5/16/85, 120 cc/min (combination)
6/11/85, <30 cc/min (combination)

ATTACHMENT 4B

1983 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
1 To RHR from Loop C Hot Leg	C	MOV-751 (ISC) MOV-750 (ISC)	150 Combination	150 Combination	
5 PRT to Gas Analyzer	C	CV-516 (OSC) SV-6385 (OSC)	1100 <30	1100 <30	
6 Nitrogen to PRT	C	CK-518 (ISC) CK-519 (ISC)	120 1400	120 1400	
7 PW to PRT and RCP Standpipes	C	CV-519A (OSC) CV-519B (ISC) CV-522A (ISC) CV-522B (ISC) CV-522C (ISC)	<30 Combination	<30 Combination	
8 PRZ Steam Samples	C	CV-951 (ISC) CV-956A (OSC)	<35 <30	275 <30	
9 PRZ Liquid Samples	C	CV-953 (ISC) CV-956B (OSC)	<35 <30	<35 <30	
10 RCDT and PRT Vent and Nitrogen to RCDT	C	CV-4658B (OSC) PCV-3-1014 (OSC) CV-4658A (OSC)	<30 <30 Combination	<30 <30 Combination	
11 Alternate Low Head SI to Loops	C	MOV-872 (OSC)	<30	<30	

ATTACHMENT 4B (Cont)

1983 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
14 Letdown to Nonregenerative Heat Exchanger	C	CV-200A (ISC) CV-200B (ISC) CV-200C (ISC) CV-204 (OSC)	400 Combination <30	400 Combination <30	CV-200A,B,C, tested together
15 Charging to Regenerative Heat Exchanger	C	CK-312C (ISC) HCV-121 (OSC) V-333 (OSC)	600 >52000 Combination	600 50 Combination	Note 1 HCV-121 Replaced the plug cage, cleaned seat new gaskets
16 PACVS, Hydrogen Removal	C	HV-3-2 (OSC) HV-3-1 (OSC) PAHM-002A (OSC)	<30 Combination	<30 Combination	
17 SI Test Line	C	V-895V (OSC)	<30	<30	
19A Containment Spray A	C	CK-890A (OSC) MOV-880A (OSC)	1100 <35	<30 <35	CK-890A Cleaned and lapped
19B Containment Spray B	C	CK-890B (OSC) MOV-880B (OSC)	200 <35	<30 <35	CK-890B, Inspected internals, no repair
20 A and B Hot Leg Sample	C	SV-6427A (ISC) SV-6427B (ISC) SV-6428 (OSC)	<35 <35 <30	<35 <35 <30	

ATTACHMENT 4B (Cont)

1983 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
23 Containment Sump to WHT	C	CV-2822 (OSC)	25000	450	CV-2822 Replaced seat, ring, gasket, packing.
		CV-2821 (OSC)	<35	<35	
24A Seal Water Injection to A RCP	C	CK-298A (ISC)	<35	<35	
24B Seal Water Injection to B RCP	C	CK-298B (ISC)	90	90	
24C Seal Water Injection to C RCP	C	CK-298C (ISC)	<35	<35	
25 RCP Seal Water Return	C	MOV-381 (OSC)	<30	<30	
		MOV-6386 (ISC)	<35	<35	
29 Instrument Air Supply	C	CK-336 (ISC)	60	60	
		CV-3-2803 (OSC)	360	360	
		CK-340A (ISC)	400	400	
30 Breathing Air	C	CK-201 (ISC)	<35	<35	
		CV-6165 (OSC)	<35	<35	
31 RCDT to Gas Analyzer	C	CV-4659B (OSC)	<30	<30	
		CV-4659A (OSC)	Combination	Combination	
32 Containment Air Sample Return	C	CK-11-003 (ISC)	610	610	SV-2912 replaced
		SV-2912 (OSC)	4500	700	
		PAHM-001A, B (OSC)	Combination	Combination	
33 Containment Air Sample	C	SV-2913 (OSC)	3800	<30	SV-2913 replaced
		SV-2911 (OSC)	600	1000	

ATTACHMENT 4B (Cont)

1983 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
34 Service Air	C	CK-205 (ISC) V-204 (OSC) HV-17 (OSC)	20000 <30 Combination	1250 <30 Combination	Note 2 CK-205 cleaned seat
35 Containment Purge Inlet	C	PV-2600 (OSC) PV-2601 (ISC)	3000 Combination	3500 Combination	Note 3
36 Containment Purge Outlet	C	PV-2602 (OSC) PV-2603 (ISC)	>52000 Combination	6200 Combination	Note 4
38 Electrical Cannisters	B	Cannisters	<490	<490	Total for all Electrical Pen.
39 Fuel Transfer Tube Flange	B	O-Ring and Body	<35	<35	
40 Equipment Access Hatch	B	O-Ring and Body	<35	<30	Note 5
41 Personnel Air Lock	B	O-Ring and Body	60	1160	Note 6
42 Nitrogen to Accumulators	C	ST-CK-945E (ISC) CV-855 (OSC)	10000 4000	2900 <30	Note 7 Cleaned and lapped seats
47 Primary Water Supply to Wash Header	C	CK-10-567 (OSC) V-582 (ISC)	70 Combination	70 Combination	
49 Emergency Air Lock	B	O-Ring and Body	8000	1500	Note 8
52 RCDT Pump Discharge	C	CV-4668B (OSC) CV-4668A (OSC)	<35 Combination	<35 Combination	

ATTACHMENT 4B (Cont)

1983 LOCAL LEAKAGE RATE TEST DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (cc/min)	Post-Repair Leakage (cc/min)	Repair/Notes
53 PACVS	C	HV-3-3,4 (OSC) PAHM-3-002B (OSC)	700 Combination	180 Combination	
54A Containment Recirc. Sump to RHR Pump A	C	MOV-861A (OSC) MOV-860A (OSC)	70 Combination	70 Combination	
54B Containment Recirc. Sump to RHR Pump B	C	MOV-861B (OSC) MOV-860B (OSC)	<30 Combination	<30 Combination	
55 Accumulator Sampling	C	CV-955C (ISC) CV-955D (ISC) CV-955E (ISC) CV-956D (OSC)	<35 <35 <35 <30	<35 <35 <35 <30	
61B Deadweight Tester to PT	C	V-2023 (ISC) V-2024 (OSC)	145 Combination	200 Combination	
63 Instrument Air Bleed	C	CV-2819 (ISC) CV-2826 (OSC)	400 >50,000	120 85	Note 9 Seat cleaned lapped
65A Containment Air Test Air In-Out	B	Flange 'E' (OSC)	<40	90	Note 10
65B Containment Air Test Pressure	B, C	V-2025 (OSC) Flange (ISC)	90 Combination	90 Combination	
65C Containment Air Test Leakage Flow	B, C	V-2026 (OSC) Flange (ISC)	<35 <35 Combination	Combination	

ATTACHMENT 4B (Cont)

1983 LOCAL LEAKAGE RATE TEST DATA

Notes

1. Penetration 15 (HCV-121) tested 12/11/83, >52,000 cc/min (combination)
   12/12/83, >52,000 cc/min (combination)
   12/13/83, 36,000 cc/min (combination)
   12/13/83, 50 cc/min (combination)

2. Penetration 34 (CK-205) tested 10/11/83, 20,000 cc/min
   10/12/83, 8000 cc/min
   11/2/83, 1250 cc/min

3. Penetration 35 tested 11/9/83, 3000 cc/min (combination)
   12/8/83, 600 cc/min (combination)
   5/8/84, 3500 cc/min (combination)

4. Penetration 36 tested 12/8/83, >52,000 cc/min (combination)
   12/8/83, 1900 cc/min (combination)
   5/8/84, 6200 cc/min (combination)

5. Penetration 40 tested 10/17/83, <35 cc/min (o-ring)
   11/18/83, <30 cc/min (o-ring)
   11/24/83, <30 cc/min (o-ring)
   12/16/83, <30 cc/min (o-ring)
   5/10/84, <30 cc/min (o-ring)

1983 LOCAL LEAKAGE RATE TEST DATA

Notes (Cont)

6. Penetration 41 tested 9/1/82, 60 cc/min (o-ring and body)
9/23/82, 15,400 cc/min (o-ring and body)
2/15/83, 8500 cc/min (o-ring and body)
7/19/83, 5200 cc/min (o-ring and body)
11/13/83, 38,000 cc/min (o-ring and body)
11/21/83, 5900 cc/min (o-ring and body)
12/4/83, 49,000 cc/min (o-ring and body)
12/13/83, 3200 cc/min (o-ring and body)
6/6/84, 5800 cc/min (o-ring and body)
12/7/84, 1160 cc/min (o-ring and body)

   Repair performed on page 4 involved "airlock to atmosphere" valve.

7. Penetration 42 (ST-CK-945E) tested 11/17/83, 10,000 cc/min
12/7/83, 12,000 cc/min
12/10/83, 28,000 cc/min
12/11/83, 2900 cc/min

8. Penetration 49 tested 1/18/83, 8000 cc/min (o-ring and body)
4/26/83, <35 cc/min (o-ring and body)
7/5/83, 16000 cc/min (o-ring and body)
11/30/83, 850 cc/min (o-ring and body)
5/17/84, 300 cc/min (o-ring and body)
11/14/84, 1500 cc/min (o-ring and body)

9. Penetration 63 (CV-2826) tested 10/14/83, >50,000 cc/min
11/19/83, 4000 cc/min
11/21/83, 85 cc/min
(CV-2819) tested 10/14/83, 400 cc/min
11/19/83, 2800 cc/min
11/23/83, 120 cc/min

1983 LOCAL LEAKAGE RATE TEST DATA

Notes (Cont)

10. Penetration 65A tested 10/3/83, <40 cc/min
10/15/83, 11000 cc/min
12/13/83, 90 cc/min