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OYSTER CREEK
NUCLEAR GENERATING STATION

SUMMARY TECHNICAL REPORT

PROVISIONAL OPERATING LICENSE NO. DPR-16

REACTOR CONTAINMENT BUILDING INTEGRATED

LEAK RATE TEST

JUNE 1980

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LEAK RATE TEST

JUNE 1980

Approved by:

for

J. T. Carroll, Jr.
Station Manager

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INTRODUCTION

The Primary Containment Integrated Leak Rate Test was performed during June 3-14, 1980. The test was conducted in accordance with 10 CFR 50, Appendix J, the Oyster Creek Technical Specifications, and Station Procedure 666.5.007, Revision 1, "Primary Containment Leak Rate Test". Specific deviations from the testing requirements of Appendix J were detailed in the "Oyster Creek appendix J Exemption Request" dated November 22, 1978.

Detailed descriptions of the Containment System and plant configuration were provided in two leak rate test reports dated February 1971 and May 1971. The leak rate detection system described in these two reports, however, was replaced with one of an improved design during 1978 and was utilized in the Primary Containment Integrated Leak Rate Test conducted at Oyster Creek that year. A description of the leak rate detection system, calculational methods, and test chronology are included herein.

Also included herein, in accordance with 10 CFR 50, Appendix J, is an analysis and interpretation of the type A and supplemental verification test data. Leakage rate data and the results of type B and C tests performed since the previous type A test are provided as attachments.

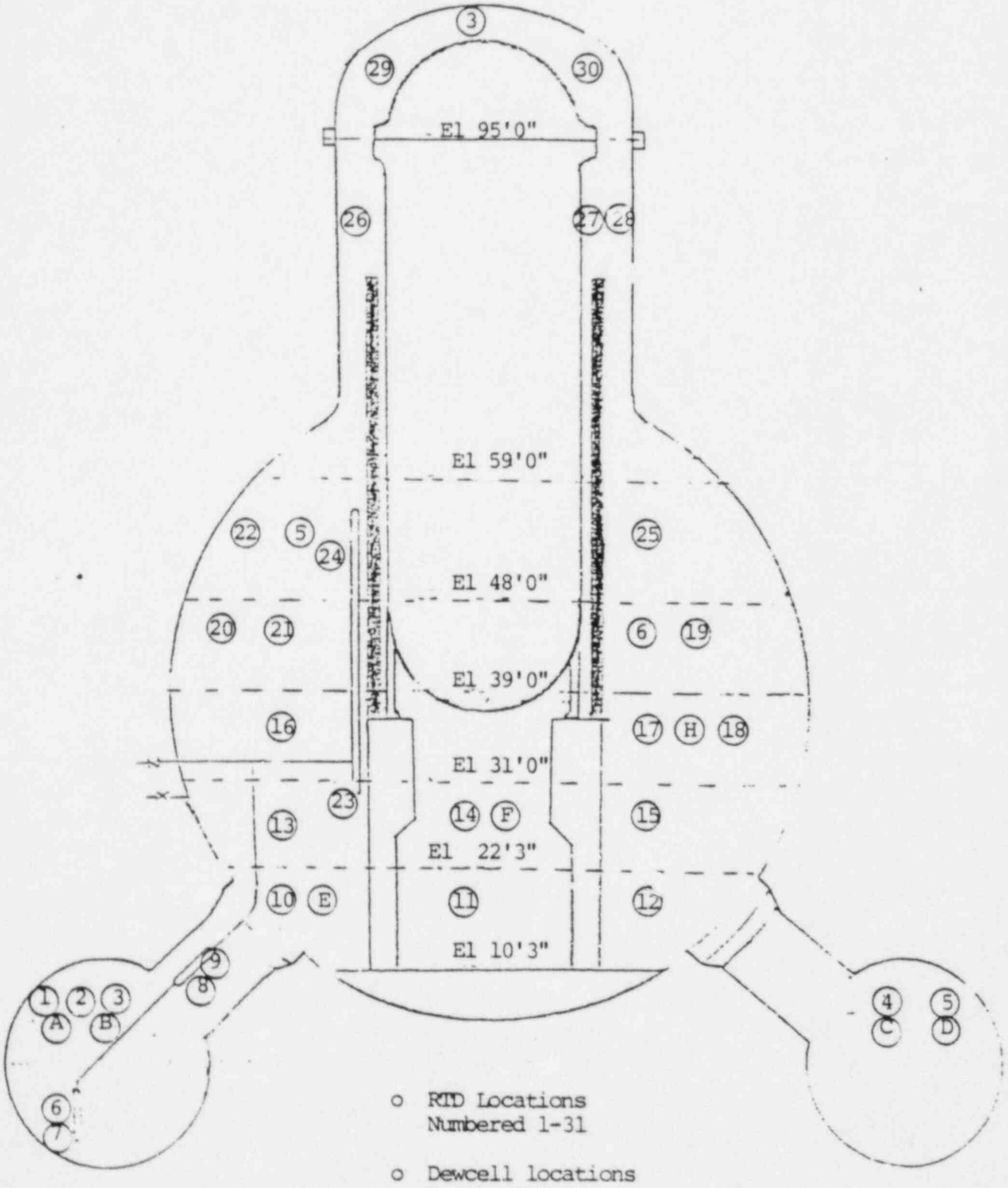
LEAK RATE DETECTION SYSTEM

The leakage rate detection system consists of thirty (30) four-wire platinum (RTD's) and ten (10) lithium chloride dew cells positioned in the containment structure as illustrated in Figure One. The analog signals from these sensors are input to a multiplexer scanner also positioned inside the containment. A data acquisition system located external to the containment interogates the scanner on demand for temperature and humidity information. Containment absolute pressure and reference vessel differential pressure information is input to the data acquisition system from a pair of fused quartz bourdon tube manometers which are externally connected to the containment and reference vessel. The analog signals are processed through an analog to digital converter and transmitter at present intervals to a PRIME 750 computer. A system sensitivity check is performed by introducing a calibrated leak through a mass flow transducer. The output from the transducer is also processed via the analog to digital converter and data acquisition system to the computer. In addition, the system reads and records the ambient temperature and pressure.

The computer operates in a real time mode to collect the transmitted information and calculate on demand the containment leakage rate. Figure Two is a detailed functional block diagram of the Leak Rate Detection System including individual appropriate component performance specifications.

FIGURE 1

(RTD and Dewcell Sensor Location)



- RTD Locations Numbered 1-31
- Dewcell locations lettered A-J

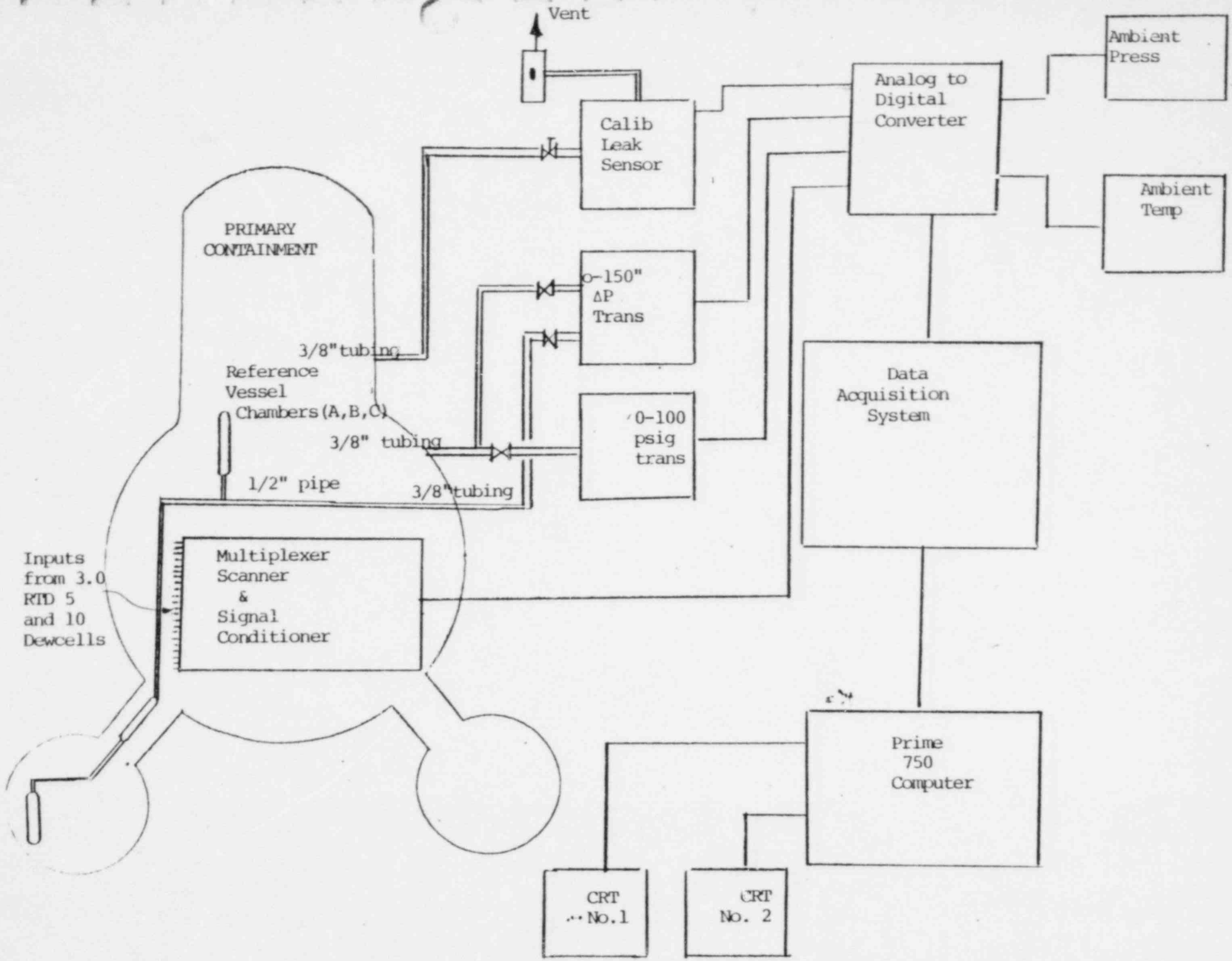

Vent
Ambient Press
Analog to Digital Converter
Calib Leak Sensor
PRIMARY CONTAINMENT
0-150" ΔP Trans
Ambient Temp
3/8"tubing
Reference Vessel Chambers(A,B,C)
3/8" tubing
0-100 psig trans
Data Acquisition System
1/2" pipe
3/8"tubing
Inputs from 3.0 RTD 5 and 10 Dewcells
Multiplexer Scanner & Signal Conditioner
Prime 750 Computer
CRT No.1
CRT No. 2

FIGURE 2

INSTRUMENTATION

Temperature

Configuration:	4 wire
Operating Range:	32-250°F
Accuracy:	60-120°F, ± 0.1°F
	32-250°F, ± 0.15°F
Repeatability:	± 0.1°F
Element:	Platinum
Quantity:	30

Dewpoint Temperature Measurement

Dewpoint Range:	0-200°F
Dewpoint Accuracy:	±1°F
Dewpoint Repeatability:	±0.5°F
Dewpoint Sensitivity:	±0.1°F
Type os Sensor:	Lithium Chloride
Quantity:	10

Pressure Measurement

Operating Range:	0-100 psia
	0-150 in. H20 (differential)
Accuracy:	±0.02% of reading
Repeatability:	±0.001% of full scale
Stability:	Less than 0.001% F.S. degree
	Fahrenheit ambient temperature range
Type of sensor:	Quartz Bourdon Tube
Quantity:	1 each of the above

Data Acquisition System

A/D	Dual slope integration
	V → F, constant scan rate
Display:	5 + digit, polarity, decimal and legend
Sampling Rate:	DC-180DB, 10000 ohm unbalance
	AC-180DB at 50-60 HZ
Normal Mode Rejection:	80DB
Input Impedance:	1000 megohms/volt
Ambient Temp. Range:	050°C
Zero Offset:	Recalibrate before each reading automatically
Voltage Temp:	±0.002% of reading (0.25 V/°C)
Accuracy:	±0.005: F.S., ±0.005% of reading at
	25°C with ±10% power variation
	At 67% F.S.: 0.012 F.S.
Repeatability:	±0.005% F.S.

CALCULATIONAL METHODS

References

1. ANSI N454-1972, Leakage - Rate testing of Containment Structures for Nuclear Reactors.
2. ANS N274 - 1978 (W.G. 56.8 - Draft #2), Containment System Leakage Testing Requirements

The containment leakage rate calculation was performed in accordance with the above standards and utilized the absolute system analysis method and mass plot calculational techniques. In addition, the reference vessel system analysis method was also performed for comparison to insure confidence in the test result. These analytical methods are described below.

ABSOLUTE METHOD

The absolute method of leakage rate determination consists of measuring the temperature and pressure of the containment atmosphere, with suitable correction for changes in humidity. This method assumes the temperature variations during the test will be insufficient to effect significant changes in the internal volume of the containment structure.

The percent leakage of air from the containment structure in terms of the original amount contained and that which escaped during each hourly test period is then calculated by the following formula:

$$\text{Leakage Rate (Wt \%/day)} = \left[1 - \frac{(T1)(P2)}{(T2)(P1)}\right](100)\ \frac{(24)}{h}$$

where:

T1 = mean absolute temperature of the containment structure air, at the start of each data collection period (point-to-point method) or at the beginning of the test (total time method).

T2 = mean absolute temperature of the containment structure air at the end of each data collection period (point to point method).

P1 = total absolute pressure in the containment structure at the start of each data collection period (point-to-point method), or at the beginning of the test (total time method).

P2 = total absolute pressure in the containment structure at the end of each data collection period (point to point method).

h = total length of test period (hours)

An upper one-sided 95% confidence limit for the leakage rate (total time) is then calculated using the mass point calculational technique.

REFERENCE VESSEL METHOD

The reference vessel method of leakage rate determination compares changes in the pressure of the containment atmosphere with the pressure in a hermetically closed reference vessel system. Due to its geometry and location in the containment structure, the reference vessel assumes the temperature of the containment atmosphere with a time lag that is compatible with the frequency of the data collection.

The leakage rate of air from the containment structure in terms of the original amount contained and that which would escape during a 24 hour period is then calculated in accordance with the following formula:

$$\text{Leakage Rate (WT\%/day)} = \frac{(24)}{h}\ (100)\left[\frac{T1\ (PR2-P2+PV2)}{T2\ (P1-PV1)} - \frac{PR1-P1+PV1}{P1-PV1}\right]$$

Where T1, T2, P1, P2 and h are defined above and

PR1 = absolute pressure of the reference vessel at the start of each data collection period.

PR2 = absolute pressure of the reference vessel at the completion of each data collection period.

PV1 = the partial pressure of water vapor at the start of each data collection period.

PV2 = the partial pressure of water vapor at the completion of each data collection period.

MASS POINT METHOD

The mass point calculational method utilizing the ideal gas law, determines the mass of air in the containment, at each time point during the test and performs a straight line least squares analysis to estimate the leakage rate. An exact upper one-sided limit of a 95% confidence level is then calculated on the leakage rate using the relationships identified below. The derivations and details for this calculational method can be found in reference 2.

The calculational methods employed in the computer code for mass point technique calculates a least squares analysis as follows:

NOTE: Symbols are defined at the end of this section.

The least squares line is given by

$$\overline{W} = At + B$$

where the slope (A) and intercept (B) are given, respectively by

$$A = \frac{N(\Sigma t_i W_i) - (\Sigma W_i)(\Sigma t_i)}{N(\Sigma t_i^2) - (\Sigma t_i)^2}$$

AND

$$B = \frac{(\Sigma W_i)(\Sigma t_i^2) - (\Sigma t_i W_i)(\Sigma t_i)}{N(\Sigma t_i 2) - (\Sigma t_i)^2}$$

Each t_i is the elapsed time between a clock time for the initial reading and the clock time at which the ith reading is taken. The formulas for A and B do not require equal time intervals.

The leakage rate is expressed as the ratio of the rate of change of the mass and the mass in the containment at time $t_1 = o$. The values of t_i have units of hours and since the leakage rate is desired in Wt%/day the estimated mass point leakage rate, expressed as a positive number, is calculated as follows:

$$L = (-2400)(A/B)$$

The uncertainty in the estimated value of leakage rate is assessed in terms of the standard derviations of A and B and their covariance followed by the computation of an upper limit of the 95th confidence level for the leakage.

The estimate of the common standard deviation of the masses with respects to the line is given by:

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

where

W_i is the measured mass at time t_i and

$\bar{W}_i$ is the estimated mass at time t_i from $\bar{W}_i = At_i + B$

In order to determine the standard deviation of the slope (S_a) let

$$K = \frac{S}{[N(\Sigma t_i^2) - (\Sigma t_i)^2]^{1/2}}$$

then

$$S_a = K[N]^{1/2}$$

To determine the standard derviation of the intercept (S_b)

$$S_b = K[\Sigma t_i^2]^{1/2}$$

and the covariance of the slope and intercept (SAB) is

$$S_{ab} = K^2 [-\Sigma t_i]$$

In order to calculate the exact upper one-sided limit of a 95% confidence level for the leakage rate, let

$$a = B^2 - t_{95}^2 \ (S_b 2)$$

$$b = AB - t_{95}^2 \ (S_{ab}) \text{and}$$

$$c = A^2 - t_{95}^2 \ S_a^2$$

then the exact upper one-sided limit of a 95% confidence level for the leakage rate is determined as follows:

$$UCL\ (+95) = -2400\ [b - (b^2 - ac)^{1/2}]/a$$

SYMBOLS AND SUBSCRIPTS

SYMBOLS

P - Total absolute pressure in the containment (psia)

T - Mean absolute temperature of the containment air (°R)

V - Internal free volume of the containment (assumed to remain constant for the duration of the test - ft^3)

R - Gas constant for air (53.35 ft-lbf/lbm-°R)

P_V - Partial pressure for water vapor (PSIA)

N - Number of pairs of measurement

W - Measured mass of contained air (lbm)

T - Time interval of measurement after initial measurement (hr)

$\overline{W}$ - At & B - Lease squares line relating measured masses to corresponding times of measurement

A - Slope of least squares line

B - Intercept of least squares line

S_a - Estimate of standard deviation of slope of least squares line

S_b - Estimate of standard deviation of intercept of least squares line

S_{ab} - Estimate of covariance between slope and intercept of least squares line

L - 2400A/B - Estimate of leakage rate, derived from least squares slope and interrupt, expressed as a positive number (%/day)

T_{95} - 95th percentile of student's distribution

UCL - Exact upper one-sided limit of a 95% confidence level for the leakage rate.

SUBSCRIPTS

i - Indicates the ith data point

For all analytical methods described above, constant containment volume is assumed. The leakage rate is later corrected for changes in containment volume due to water leakage into the containment and changes in reactor vessel water level.

Data for temperature and dewpoint input is corrected for instrument error using three point calibration data provided by the equipment supplier. In addition, the pressure sensor readings are corrected using a similar technique. Weighting factors are assigned to the temperature and dewpoint sensors thus providing a single ambient and dewpoint temperature reading indicative of containment conditions.

COMPUTER CODE QUALIFICATION:

An independent audit was performed on the computer code prior to utilizing it in the 1978 Primary Containment Leak Rate Test at Oyster Creek. The audit consisted of an in-depth check of the equations used to confirm agreement with those recommended by the governing standards. In addition, the code was run using data obtained by contractors who performed leakage rate tests on other containment structures. The results of this check agreed favorably with the values obtained using the cognizant contractor's code.

TEST CHRONOLOGY AND HIGHLIGHTS

Type B and C local Leak Rate Tests were performed on all testable penetrations prior to initiation of the Type A Test. The results of the local leak rate testing as required by 10 CFR 50, Appendix J, are presented in attachment one and cover the period since the previous Type A test.

Presented in Attachments Two and Three is the calculated leakage rate data for the Type A test and suplimental test. Also included in Attachment Two are plots of the change in containment mass and weighted average containment temperature for the Type A test.

The chronology of significant events during the performance of the Type A test is as follows:

June 3, 1980

An inspection of the Primary Containment was conducted. No evidence of structural deterioration to the containment or containment components was observed. The reference vessel was leak tested and determined to be leak tight.

June 4, 1980

Trial checks were made of the leak rate detection and measuring system. During check-out of the Data Acquisition System, it was determined that RTD #29 had failed. Sensor RTD #26 was relocated in the vicinity of RTD #29 (drywell head area). The following sensors were out of service during the test: Dew-cell #5, RTD #6, RTD #9 and RTD #29.

June 5, 1980

System valve alignments were completed and the primary containment was pressurized to 37.011 psia at 11:30 a.m. following by the initiation of a four hour pressure stabilization period. During this "stabilization" period the following conditions were discovered:

The particulate monitor isolation valves were open; containment vent valves V-21-1 and V-27-2 were leaking and the containment head manhole cover gasket was leaking.

June 6, 1980

The drywell was depressurized and repairs to the discovered leakage paths were completed. Repressurization of the primary containment commenced.

June 7, 1980

Completed repressurization of the drywell at 4:03 a.m. and began collecting data for the test at 9:25 a.m. Calculations indicated that the primary containment leak rate was in excess of the allowable limit. A few minor leakage paths were found and corrected.

June 8, 1980

A significant packing leak at isolation condenser "A" inlet valve was found and corrected. Other minor leakage paths were found and repaired.

June 9, 1980

The primary containment head gasket was determined to be leaking significantly and the containment was depressurized to replace the gasket.

June 12, 1980

Replacement of the containment head gasket was completed and the containment was repressurized to 37.7 psia at 10:00 p.m. A four hour pressure stabilization period was initiated.

June 13, 1980

Began collecting data for the 24 hour primary containment integrated leak rate test at 2:25 a.m. Reactor water level input to the computer was not updated from 2:25 a.m. to 4:00 a.m. due to computer input downtime.

June 14, 1980

Completed the Primary Containment Integrated Leak Rate Test at 2:25 a.m. At 3:55 a.m. began collecting data for the six hour verification test.

Completed the six hour verification test satisfactorily at 9:55 a.m. At 10:00 began to depressurize the primary containment.

ANALYSIS

ACCEPTANCE CRITERIA

10 CFR 50 Appendix J requires that the leakage rate LTM at the upper 95% confidence level shall be less than .75 LT where:

$$LT = La\ (PT/Pa)^{1/2}$$

$$LT = 1A\ (20/35)^{1/2}$$

$$Lt = 1\ wt\%/Day\ (20\ psig/35\ psig)^{1/2}$$

$$LT = .75593$$

$$LTM = .75\ (LT) = .75\ (.75593)$$

$$LTM = .567\ wt\ \%/Day$$

EST RESULTS

The measured and calculated leakage rates for the mass plot, total time, and point to point analysis methods are presented in Table I. As indicated in Table I, both the absolute and reference vessel analysis methods demonstrated an unadjusted leakage rate well below the test criteria value. Also included in Table I are the test results from the suplimental leak check.

TABLE I

TEST RESULTS SUMMARY

Calculational Technique	Absolute Method		Reference Vessel	
	Calculated	Calculated & 95% UCL	Calculated	Calculated & 95% UCL
Mass Plot (Type A)	0.1362	0.1415	N/A	N/A
Point Point (Type A)	0.1919	/A	.2521	N/A
Total Time (Type A)	0.1854	0.4196	0.0896	0.3117
Mass Plot (Suplimental Test)	0.3980	0.4180	N/A	N/A
Point - Point (Suplimental Test)	0.7676	N/A	.4756	N/A
Total Time (Suplimental Test)	0.3912	0.4917	0.5547	0.6309

Test Validity

In accordance with 10 CFR 50, Appendix J, a supplemental test utilizing a calibrated leak was performed to insure the validity of the type A test. The calibrated leak was set to be 1.00 SCFH which is equivalent to a .19206 wt %/Day leak. This relationship is derived as follows:

A) Calculate the mass of air in the containment at the test pressure and temp using the ideal gas law.

Test pressure = 36.985 psia - .3459 psia = 36.634 psia

Test temperature = 79.848°F = 539.438°R (weight avg.)

Containment volume = 300,000 ft^2

$PV = MRT$

$M = \frac{PV}{RT}$

$$M = \frac{36.634\ LBf/in^2 \times \frac{144\ in^2}{ft^2} \times 300{,}000\ ft\ 3}{53.34\ ft - LBf/LBM\ °R \times 539.438\ °R}$$

M = 55001.28 LBM

B) Calculate the mass of 1 standard cubic ft. of air

$$M\ (1ft^3) = \frac{14.7\ LBf/in^2 \times 144\ \frac{in^2}{ft^2} \times 1\ ft^3}{53.34\ ft - LBf/LBm\ °R \times 536.59}$$

$M(1ft^3)$ = 0.073567 LBM

C) Assuming a calibrated leak of the magnituded derived in B which corresponds to 1 standard cubic ft. of air leaking at the rate of 1.00 SCF/minute the calibrated leak in wt%/Day is as follows:

$$\text{Calibrated leak} = \frac{\text{Mass removed from cont. x 100 in 24 hr. period}}{\text{Total containment air mass}}$$

$$= \frac{.073567\ LBM \times 60\ min/hr. \times 24\ hr/day \times 100}{55001.38\ LBM}$$

Calculated Leak = 0.192607 wt%/Day

In accordance with 10 CFR 50 Appendix J the calibrated leak must fall within the bandwith expressed by the following equation:

$$L_s + L_{tm} - .25\,(L_t) < L_{tms} < (L_s + L_{tm} + .25\,(L_t)$$

Where Lt = .7559 wt/%Day

Ltm = .1415 Wt/%Day at a UCL of 95% where Ltm = measure leakage rate using the mass plot methods.

Ltms = .4180 wt/%Day at UCL of 95% where Ltms = suplimental total leak rate using, mass plot analysis)

Ls = .192607

$$.192607 + .1415 - .1890 < .4180 < .192607 + .567 - .1890$$

$$.1451 < .4180 < .5706$$

Therefore it can be concluded that the leak rate test results are valid.

Adjusted Test Results

The calculated leakage rates were adjusted to include water leakage into the containment and reactor water level changes in accordance with the following equation.

$$L = L^1 + \frac{24.00\ (20.6208(WR_F - WR_I) + 0.1337\ (F_F - F_I)}{(300,000)DT}$$

Where:

L = Corrected leakage rate in wt% day.

L_1 = Uncorrected leakage rate in wt% day.

24.00 = 24.00 hours/day x 100%.

300,000 = Containment free air volume in ft^3

DT = Time interval in hours between

Initial and final reactor water vessel level and sump inteorator readings.

20.6708 = Cubic feet per inch water level change in the reactor vessel. No credit was taken for displacement of moisture separators.

WR_I, WR_F = Initial and final reactor vessel level readings in inches.

F_I, F_F = Initial and final sump integrator reacings in gallons.

.1337 = Conversion factor from gallon to cubic feet.

The corrected leakage rate is adjusted as follows:

$$L = .14154 \times \frac{24.00}{300{,}000\ (25.7)} \left(20{,}6208\ (63.84 - 62.10) + .1337\ (7296293 - 7293978)\right.$$

$$L = .1582 \text{ wt\%Day}$$

No penetrations were required to be isolated during the performance of the type A test. Therefore, the total of adjusted primary containment leak rate determined by the absolute and mass plot calculational technique is

total leak rate = 0.1582 wt%/Day

This leakage rate is well below the leakage rate criteria established in 10 CFR 50, Appendix J, and demonstrates that the Primary Containment leakage is within regulatory limits.

ATTACHMENT 1

LOCAL LEAK RATE TESTS

Double Gasketed Seals

	Test Date	Leak Rates (SCFH) 20 psig	35 psig
TIP Penetrations (4)	4/9/80	0.24	0.32
Torus Manhole Cover - North	6/4/80	0.13	0.18
	7/4/80	0.016	0.02
South	6/4/80	2.04	2.69
Drywell Head Seal	6/4/80	10.17	13.46
	6/12/80	0.016	0.02
Drywell Head Manhole Cover	6/4/80	0.016	0.02
Steam Dryer Penetration	4/15/80	0.05	0.06
Torus to Drywell Vacuum Breakers (14)	5/13/80	3.97	5.25
Reactor Building to Torus Vacuum Breakers (2) - Gaskets and O-rings	4/8/80	0.23	0.28
Biological Shield Stabilizer Manways (8)	4/9/80	21.83	28.88
	5/16/80	19.80	26.19
	5/20/80	4.07	5.41
Drywell Airlock Seal	4/24/80	0.05	0.07
Drywell Airlock	5/29/79	4.21	5.49
	7/19/80	4.21	5.49
Penetrations and Isolation Valves			
Electrical Penetrations (32)	5/20/80	4.97	6.57
Steam Dryer Penetrations (16)	4/15/80	0.94	1.24
Drywell Airlock Electrical Penetration	4/24/80	0.03	0.04
Demineralized Water System Penetration	6/4/80	0.17	0.22
Drywell Sump Discharge V-22-28 & 29	5/28/80	10.09	13.35
Drywell Equipment Drain Tank Discharge V-22-1 & 2	5/27/80	0.055	0.06
TIP Vall Valves (4)	5/1/80	2.43	3.22
Instrument Air & Nitrogen System V-6-393 & 395	6/2/80	0.96	1.27
Main Steam Isolation Valves NS03A & 4A	1/6/80	24.56	33.04
	6/12/80	1.04	1.38
NS03B & 4B	1/6/80	9.99	13.37
	6/2/80	1.44	1.90

Penetrations and Isolation Valves

	Test Date	Leak Rates (SCFH) 20 psig	35 psig
Main Steam Drain Valves V-1-106, 107, 110 & 111	1/6/80	36.98	49.40
	5/27/80	0.11	0.15
Isolation Condenser Vent Valves V-14-1 & 19	6/20/80	4.29	5.68
V-14-5 & 20	6/20/80	9.96	13.18
Feedwater Check Valves V-2-71 & 73	4/4/80	1.04	1.38
V-2-72 & 74	4/26/80	811.7	1073.8
	5/1/80	2.43	3.22
Drywell Vent V-27-1 & 2	4/16/80	0.45	0.59
	6/23/80	6.01	7.95
Drywell Purge V-27-3 & 4	1/10/80	19.46	25.74
	4/9/80	12.93	17.10
	5/11/80	10.8	14.3
	6/11/80	0.10	0.13
	6/30/80	6.01	7.95
Drywell N_2 Purge V-23-13 & 14	1/10/80	0.08	0.11
	6/22/80	0.27	0.36
Torus N_2 Purge V-23-15 & 16	1/17/80	1.51	1.99
	6/24/80	5.08	6.72
DW N_2 Makeup V-23-17 & 18	1/10/80	0.03	0.04
	4/9/80	0.90	1.19
Torus N_2 Makeup V-23-19 & 20	4/8/80	0.14	0.19
Drywell Vent Bypass V-23-21 & 22	4/16/80	0.08	0.11
Torus Vent V-28-17, 18 & 47	4/16/80	1.24	1.64
	6/24/80	1.17	1.55
Reactor Building to Torus Vacuum Breakers V-26-15 & 16	1/11/80	8.90	11.79
	5/16/80	0.79	1.04
V-26-17 & 18	1/11/80	0.31	0.41
	5/30/80	2.51	3.33
Drywell O_2 Analyzer & Particulate Monitor V-38-9 & 10	6/1/80	0.11	0.15
Torus Particulate Monitor V-38-16 & 17	6/1/80	0.56	0.74
Torus O_2 Analyzer V-38-22 & 23	6/1/80	6.55	8.67

Summary of Test Results

Total of all local leak rate tests (Latest results of each test)	84.83	112.00

Combined leak rate @ 35 psig = 112.0 SCFH
= 0.267 La
where La = 419.88 SCFH

ATTACHMENT 2

Calculated Leakage Rate Data (Type A Test)

JERSEY CENTRAL POWER & LIGHT CO.
OYSTER CREEK NUCLEAR GENERATING STATION

INTEGRATED CONTAINMENT LEAK RATE TEST *ABSOLUTE METHOD*

REPORT PREPARED SAT, JUN 14 1980 STARTING PRESSURE : 37.100 PSIA

DAY	TIME	PRESSURE (PSIA)	TEMP. (F)	DEWPOINT (F)	POINT-TO-POINT PPLA (MEAS.)	TTLA (MEAS.)	TOTAL TIME TTLA (CALC.)	TTLA (UCL+95)
164	2:40	37.097	80.099	69.167	-0.52459	-0.52459	0.10857	
164	2:55	37.095	80.046	69.067	-0.73496	-0.62979	0.10939	
164	3:10	37.092	80.004	69.066	0.03211	-0.40916	0.11022	
164	3:25	37.088	79.980	69.029	0.49802	-0.18235	0.11105	
164	3:40	37.085	79.943	68.927	-0.19988	-0.18586	0.11187	
164	3:55	37.081	79.936	68.888	0.80366	-0.02092	0.11270	
164	4:10	37.078	79.876	68.924	1.62339	0.21398	0.11352	
164	4:25	37.073	79.860	68.838	0.67400	0.27147	0.11435	
164	4:40	37.070	79.841	68.895	0.50539	0.29745	0.11518	
164	4:55	37.067	79.784	68.818	-0.52797	0.21492	0.11600	
164	5:10	37.064	79.768	68.731	0.38314	0.23621	0.11683	
164	5:25	37.061	79.732	68.708	0.43169	0.24699	0.11766	
164	5:40	37.058	79.682	68.714	0.34225	0.25431	0.11848	
164	5:55	37.055	79.663	68.596	0.42166	0.26625	0.11931	
164	6:10	37.053	79.608	68.601	-0.06556	0.24413	0.12014	
164	6:25	37.050	79.582	68.485	0.26585	0.24548	0.12096	
164	6:40	37.048	79.577	68.549	0.54776	0.26325	0.12179	
164	6:55	37.045	79.542	68.499	-0.19921	0.23756	0.12261	
164	7:10	37.043	79.523	68.481	0.07693	0.22911	0.12344	
164	7:25	37.041	79.508	68.421	-0.03171	0.21607	0.12427	
164	7:40	37.038	79.478	68.331	-0.04729	0.20353	0.12509	
164	7:55	37.037	79.467	68.347	0.48301	0.21622	0.12592	
164	8:10	37.037	79.458	68.307	0.18778	0.21498	0.12675	
164	8:25	37.035	79.398	68.301	-0.03462	0.20250	0.12757	
164	8:40	37.034	79.387	68.331	0.76328	0.22491	0.12840	
164	8:55	37.035	79.386	68.318	0.40353	0.23177	0.12922	
164	9:10	37.035	79.382	68.214	0.26354	0.23295	0.13005	
164	9:25	37.035	79.389	68.370	0.56348	0.24474	0.13088	
164	9:40	37.035	79.390	68.262	-0.44404	0.22160	0.13170	
164	9:55	37.036	79.399	69.605	1.85378	0.27538	0.13253	
164	10:10	37.037	79.442	68.431	-1.63419	0.21383	0.13336	
164	10:25	37.038	79.472	68.426	-0.05753	0.20535	0.13418	
164	10:40	37.039	79.480	68.513	-0.17762	0.19377	0.13501	
164	10:55	37.040	79.496	68.521	-0.36014	0.17924	0.13584	
164	11:10	37.042	79.538	68.568	0.69606	0.17637	0.13666	
164	11:25	37.044	79.617	68.592	0.60287	0.18569	0.13749	
164	11:40	37.047	79.650	68.734	-0.03129	0.18274	0.13831	
164	11:55	37.050	79.703	68.778	0.03014	0.17873	0.13914	
164	12:10	37.054	79.756	68.845	-0.22459	0.16839	0.13997	
164	12:25	37.056	79.797	68.968	0.34188	0.17272	0.14079	
164	12:40	37.060	79.839	68.987	-0.55666	0.15494	0.14162	
164	12:55	37.064	79.932	69.013	0.36983	0.16055	0.14245	
164	13:10	37.067	79.980	69.146	0.19561	0.16656	0.14327	
164	13:25	37.070	80.015	69.223	-0.18589	0.15293	0.14410	
164	13:40	37.072	80.093	69.243	0.62510	0.16347	0.14492	
164	13:55	37.074	80.124	69.285	-0.13903	0.15689	0.14575	
164	14:10	37.076	80.166	69.384	0.20574	0.15793	0.14658	
164	14:25	37.075	80.183	69.356	0.15955	0.15796	0.14740	
164	14:40	37.077	80.206	69.389	-0.26535	0.14933	0.14823	

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164	14:55	37.077	80.230	69.416	0.59712	0.15827	0.14906	
164	15:10	37.079	80.272	69.311	-0.67482	0.15370	0.14982	
164	15:25	37.080	80.300	69.445	0.56737	0.16165	0.15071	
164	15:40	37.082	80.347	69.478	0.37666	0.16570	0.15154	
164	15:55	37.083	80.337	69.525	-0.26977	0.15875	0.15236	
164	16:10	37.085	80.371	69.499	-0.63634	0.15530	0.15319	
164	16:25	37.085	80.406	69.533	0.72468	0.16546	0.15401	
164	16:40	37.087	80.417	69.527	-0.37873	0.15592	0.15484	
164	16:55	37.083	80.458	69.571	0.63473	0.16416	0.15567	
164	17:10	37.089	80.476	69.530	-0.67040	0.16019	0.15649	
164	17:25	37.089	80.453	69.637	0.26366	0.16091	0.15732	
164	17:40	37.089	80.480	69.560	0.16872	0.16104	0.15815	
164	17:55	37.089	80.474	69.571	-0.00377	0.15838	0.15897	
164	18:10	37.089	80.490	69.612	0.38334	0.16194	0.15980	
164	18:25	37.090	80.501	69.537	-0.31942	0.15443	0.16063	
164	18:40	37.091	80.535	69.628	0.65945	0.16219	0.16145	
164	18:55	37.091	80.542	69.544	-0.07812	0.15855	0.16228	
164	19:10	37.091	80.523	69.629	-0.65724	0.15533	0.16310	
164	19:25	37.090	80.536	69.589	0.33232	0.15792	0.16393	
164	19:40	37.090	80.536	69.635	0.23876	0.15962	0.16476	
164	19:55	37.090	80.561	69.570	0.15815	0.15960	0.16558	
164	20:10	37.090	80.543	69.563	-0.39733	0.15113	0.16641	
164	20:25	37.089	80.552	69.522	0.41763	0.15487	0.16724	
164	20:40	37.087	80.530	69.480	-0.09110	0.15150	0.16806	
164	20:55	37.087	80.520	69.443	-0.28686	0.14566	0.16889	
164	21:10	37.085	80.509	69.486	0.44502	0.14965	0.16971	
164	21:25	37.085	80.504	69.439	-0.17351	0.14540	0.17054	
164	21:40	37.085	80.499	69.452	-0.05968	0.14274	0.17137	
164	21:55	37.084	80.485	69.470	0.12290	0.14248	0.17219	
164	22:10	37.083	80.493	69.552	0.63155	0.14866	0.17302	
164	22:25	37.081	80.493	69.431	0.13638	0.14838	0.17385	
164	22:40	37.079	80.497	69.438	0.60770	0.15404	0.17467	
164	22:55	37.077	80.454	69.433	-0.25169	0.14910	0.17550	
164	23:10	37.076	80.450	69.386	0.06267	0.14855	0.17633	
164	23:25	37.075	80.437	69.344	-0.13836	0.14464	0.17715	
164	23:40	37.072	80.419	69.376	0.53532	0.14923	0.17798	
164	23:55	37.071	80.404	69.311	-0.17104	0.14550	0.17880	
165	0:10	37.069	80.407	69.348	0.69396	0.15179	0.17798	
165	0:25	37.068	80.366	69.272	-0.68458	0.14230	0.17880	
165	0:40	37.066	80.379	69.204	0.56102	0.14760	0.17963	
165	0:55	37.064	80.340	69.244	-0.03092	0.14503	0.18046	
165	1:10	37.063	80.322	69.044	-0.67425	0.13663	0.18128	
165	1:25	37.061	80.302	69.227	0.83165	0.14356	0.18211	
165	1:40	37.059	80.279	69.096	-0.23920	0.13947	0.18294	
165	1:55	37.057	80.272	69.098	0.47691	0.14306	0.18376	
165	2:10	37.056	80.264	69.061	0.09945	0.14252	0.18459	
165	2:25	37.054	80.232	69.110	0.19187	0.14363	0.18542	0.41957

JERSEY CENTRAL POWER & LIGHT CO.
OYSTER CREEK NUCLEAR GENERATING STATION

INTEGRATED CONTAINMENT LEAK RATE TEST *REFERENCE VESSEL METHOD*

REPORT PREPARED SAT, JUN 14 1980 STARTING PRESSURE : 37.100 PSIA

DAY	TIME	PRESSURE (PSIA)	DPRESS. (PSID)	TEMP. (F)	DEWPOINT (F)	POINT-TO-POINT PTLR (MEAS.)	TOTAL TIME TTLR (MEAS.)	TOTAL TIME TTLR (CALC.)	TTLR (UCL+95)
164	2:40	37.097	2.923	80.099	69.167	-0.33850	-0.33850	0.24639	
164	2:55	37.095	2.924	80.046	69.067	-0.38955	-0.36404	0.24471	
164	3:10	37.092	2.923	80.004	69.066	0.15485	-0.19107	0.24302	
164	3:25	37.088	2.922	79.980	69.629	0.38621	-0.04824	0.24133	
164	3:40	37.085	2.921	79.943	68.927	0.24750	0.01092	0.23965	
164	3:55	37.081	2.919	79.936	68.888	0.49089	0.09092	0.23796	
164	4:10	37.078	2.917	79.876	68.924	2.12655	0.38171	0.23628	
164	4:25	37.073	2.916	79.860	68.838	0.30193	0.37173	0.23459	
164	4:40	37.070	2.914	79.841	68.895	0.22567	0.35550	0.23290	
164	4:55	37.067	2.913	79.784	68.818	0.20076	0.34062	0.23122	
164	5:10	37.064	2.912	79.768	68.731	0.32660	0.33819	0.22953	
164	5:25	37.061	2.911	79.732	68.708	0.53281	0.35439	0.22784	
164	5:40	37.058	2.910	79.682	68.714	0.65076	0.37717	0.22616	
164	5:55	37.055	2.910	79.663	68.596	0.45260	0.38254	0.22447	
164	6:10	37.053	2.909	79.608	68.601	0.36425	0.38131	0.22278	
164	6:25	37.050	2.909	79.582	68.485	0.46489	0.38277	0.22110	
164	6:40	37.048	2.908	79.577	68.549	0.63166	0.39212	0.21941	
164	6:55	37.045	2.907	79.542	68.499	0.16728	0.35129	0.21772	
164	7:10	37.043	2.906	79.523	68.481	0.23490	0.34516	0.21604	
164	7:25	37.041	2.904	79.508	68.421	0.21652	0.33843	0.21435	
164	7:40	37.038	2.903	79.478	68.331	0.27896	0.33559	0.21267	
164	7:55	37.037	2.904	79.467	68.347	0.16894	0.32800	0.21098	
164	8:10	37.037	2.903	79.458	68.307	0.61800	0.34059	0.20929	
164	8:25	37.035	2.903	79.398	68.301	0.41269	0.34358	0.20761	
164	8:40	37.034	2.903	79.387	68.331	0.55816	0.35215	0.20592	
164	8:55	37.035	2.904	79.386	68.318	0.46841	0.35660	0.20423	
164	9:10	37.035	2.905	79.382	68.214	0.34377	0.35611	0.20255	
164	9:25	37.035	2.906	79.389	68.370	-0.22570	0.33533	0.20086	
164	9:40	37.035	2.905	79.390	68.262	0.03568	0.32560	0.19917	
164	9:55	37.036	2.905	79.399	69.665	-0.15892	0.30891	0.19749	
164	10:10	37.037	2.905	79.442	68.431	-0.25929	0.29059	0.19580	
164	10:25	37.038	2.904	79.472	68.426	-0.63698	0.28054	0.19411	
164	10:40	37.039	2.904	79.480	68.513	-0.28642	0.26337	0.19243	
164	10:55	37.040	2.903	79.496	68.521	-0.15694	0.25119	0.19074	
164	11:10	37.042	2.903	79.533	68.566	-0.29629	0.23601	0.18905	
164	11:25	37.044	2.904	79.617	68.592	-0.42356	0.21770	0.18737	
164	11:40	37.047	2.904	79.650	68.734	-0.22359	0.20578	0.18568	
164	11:55	37.050	2.905	79.703	68.778	-0.44342	0.18870	0.18400	
164	12:10	37.054	2.905	79.756	68.845	-0.32669	0.17549	0.18231	
164	12:25	37.056	2.905	79.797	68.968	-0.26759	0.16592	0.18062	
164	12:40	37.060	2.906	79.839	68.987	-0.41485	0.15176	0.17894	
164	12:55	37.064	2.906	79.932	69.013	-0.29458	0.14114	0.17725	
164	13:10	37.067	2.906	79.980	69.146	-0.24151	0.13224	0.17556	
164	13:25	37.070	2.906	80.015	69.223	-0.19447	0.12482	0.17388	
164	13:40	37.072	2.906	80.093	69.243	-0.19154	0.11779	0.17219	
164	13:55	37.074	2.906	80.124	69.285	-0.12273	0.11256	0.17050	
164	14:10	37.076	2.904	80.166	69.384	0.08746	0.11263	0.16882	
164	14:25	37.075	2.904	80.183	69.356	-0.15547	0.10646	0.16713	
164	14:40	37.077	2.903	80.206	69.389	-0.08479	0.10255	0.16544	

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164	14:55	37.077	2.903	80.230	69.4	0.23205	0.10516	0.16376	
164	15:10	37.079	2.902	80.272	69.5	0.14783	0.10599	0.16207	
164	15:25	37.080	2.903	80.300	69.445	-0.25225	0.09911	0.16639	
164	15:40	37.082	2.903	80.347	69.478	0.11127	0.09933	0.15870	
164	15:55	37.083	2.902	80.337	69.525	0.30769	0.10319	0.15701	
164	16:10	37.085	2.903	80.371	69.499	-0.30661	0.09574	0.15533	
164	16:25	37.085	2.903	80.406	69.533	0.04285	0.09480	0.15364	
164	16:40	37.087	2.903	80.417	69.527	0.06425	0.09426	0.15195	
164	16:55	37.088	2.903	80.458	69.571	-0.01168	0.09243	0.15027	
164	17:10	37.089	2.903	80.476	69.530	0.17417	0.09301	0.14858	
164	17:25	37.089	2.903	80.453	69.637	0.25738	0.09655	0.14689	
164	17:40	37.089	2.901	80.480	69.560	0.29703	0.09984	0.14521	
164	17:55	37.089	2.902	80.474	69.571	-0.09056	0.09677	0.14352	
164	18:10	37.089	2.902	80.490	69.612	0.07909	0.09649	0.14183	
164	18:25	37.090	2.901	80.501	69.537	0.16023	0.09855	0.14015	
164	18:40	37.091	2.901	80.535	69.628	0.05561	0.09592	0.13846	
164	18:55	37.091	2.901	80.542	69.544	0.18737	0.09730	0.13677	
164	19:10	37.091	2.900	80.523	69.629	0.30651	0.10033	0.13509	
164	19:25	37.090	2.899	80.536	69.539	0.10467	0.10033	0.13340	
164	19:40	37.090	2.900	80.536	69.635	0.00440	0.09899	0.13172	
164	19:55	37.090	2.899	80.561	69.570	0.19991	0.10043	0.13003	
164	20:10	37.090	2.898	80.543	69.563	0.09557	0.10036	0.12834	
164	20:25	37.089	2.897	80.552	69.522	0.37807	0.10421	0.12666	
164	20:40	37.087	2.896	80.530	69.460	0.19832	0.10551	0.12497	
164	20:55	37.087	2.896	80.520	69.440	0.07635	0.10503	0.12328	
164	21:10	37.085	2.895	80.509	69.486	0.13750	0.10546	0.12160	
164	21:25	37.085	2.894	80.504	69.439	0.15287	0.10653	0.11991	
164	21:40	37.085	2.894	80.499	69.452	-0.00882	0.10460	0.11822	
164	21:55	37.084	2.893	80.485	69.470	0.36272	0.10790	0.11654	
164	22:10	37.083	2.892	80.493	69.552	0.28876	0.11019	0.11485	
164	22:25	37.081	2.891	80.493	69.431	0.18455	0.11112	0.11316	
164	22:40	37.079	2.891	80.497	69.438	0.06237	0.11051	0.11148	
164	22:55	37.077	2.890	80.454	69.433	0.26384	0.11262	0.10979	
164	23:10	37.076	2.889	80.450	69.386	0.17062	0.11382	0.10811	
164	23:25	37.075	2.889	80.437	69.344	0.03617	0.11240	0.10642	
164	23:40	37.072	2.888	80.419	69.376	0.25356	0.11405	0.10473	
164	23:55	37.071	2.886	80.404	69.311	0.34970	0.11679	0.10305	
165	0:10	37.069	2.886	80.407	69.348	0.17315	0.11743	0.10473	
165	0:25	37.068	2.885	80.366	69.272	0.16264	0.11725	0.10305	
165	0:40	37.066	2.884	80.379	69.264	0.36083	0.11931	0.10136	
165	0:55	37.064	2.883	80.340	69.244	0.26483	0.13026	0.09967	
165	1:10	37.063	2.883	80.322	69.044	0.10480	0.12669	0.09799	
165	1:25	37.061	2.882	80.302	69.227	0.31510	0.12220	0.09630	
165	1:40	37.059	2.882	80.279	69.096	0.68493	0.12150	0.09461	
165	1:55	37.057	2.881	80.272	69.093	0.25145	0.12518	0.09293	
165	2:10	37.056	2.880	80.264	69.061	0.36310	0.12507	0.09124	
165	2:25	37.054	2.879	80.232	69.110	0.25212	0.12639	0.08955	0.31176

JERSEY CENTRAL POWER & LIGHT CO.
OYSTER CREEK NUCLEAR GENERATING STATION

INTEGRATED CONTAINMENT LEAK RATE TEST *ABSOLUTE METHOD*

****MASS PLOT ANALYSIS****

REPORT PREPARED SAT, JUN 14 1980 STARTING PRESSURE : 37.100 PSIA

DAY	TIME	PRESSURE (PSIA)	TEMP. (F)	DEWPOINT (F)	VPRESS. (PSIA)	AIR MASS (MEAS.)	AIR MASS (CALC.)	LEAK RATE	LEAK RATE (UCL+95)
164	2:25	37.100	80.147	69.315	0.3544	54927.9136	54921.2578		
164	2:40	37.097	80.099	69.167	0.3526	54930.9151	54920.4787		
164	2:55	37.095	80.046	69.067	0.3514	54935.1205	54919.6995		
164	3:10	37.092	80.004	69.066	0.3514	54934.9368	54918.9203		
164	3:25	37.088	79.980	69.029	0.3510	54932.0869	54918.1412		
164	3:40	37.085	79.943	68.927	0.3497	54933.2307	54917.3620		
164	3:55	37.081	79.936	68.888	0.3493	54928.6320	54916.5829		
164	4:10	37.078	79.876	68.924	0.3497	54919.3434	54915.8037		
164	4:25	37.073	79.860	68.838	0.3487	54915.4876	54915.0246		
164	4:40	37.070	79.841	68.895	0.3494	54912.5966	54914.2454		
164	4:55	37.067	79.784	68.818	0.3484	54915.6166	54913.4663		
164	5:10	37.064	79.768	68.731	0.3474	54913.4249	54912.6871		
164	5:25	37.061	79.732	68.708	0.5471	54910.9556	54911.9079		
164	5:40	37.058	79.682	68.714	0.3472	54908.9980	54911.1288		
164	5:55	37.055	79.663	68.596	0.3458	54906.5862	54910.3496		
164	6:10	37.053	79.608	68.601	0.3459	54906.9612	54909.5705		
164	6:25	37.050	79.582	68.485	0.3445	54905.4407	54908.7913		
164	6:40	37.048	79.577	68.549	0.3452	54902.3678	54908.0122		
164	6:55	37.045	79.542	68.499	0.3447	54903.4471	54907.2330		
164	7:10	37.043	79.523	68.481	0.3444	54903.6672	54906.4538		
164	7:25	37.041	79.508	68.421	0.3437	54903.1885	54905.6747		
164	7:40	37.038	79.478	68.331	0.3427	54903.4590	54904.8955		
164	7:55	37.037	79.467	68.347	0.3429	54900.6966	54904.1164		
164	8:10	37.037	79.458	68.307	0.3424	54899.6227	54903.3372		
164	8:25	37.035	79.398	68.301	0.3423	54900.1066	54902.5581		
164	8:40	37.034	79.387	68.331	0.3427	54895.7416	54901.7789		
164	8:55	37.035	79.386	68.318	0.3425	54893.4341	54900.9998		
164	9:10	37.035	79.362	68.214	0.3413	54891.9271	54900.2206		
164	9:25	37.035	79.389	68.370	0.3431	54888.7052	54899.4414		
164	9:40	37.035	79.390	68.262	0.3419	54891.2441	54898.6623		
164	9:55	37.036	79.399	69.005	0.3507	54880.6445	54897.8831		
164	10:10	37.037	79.442	68.431	0.3439	54889.9867	54897.1040		
164	10:25	37.038	79.472	68.425	0.3438	54890.3156	54896.3248		
164	10:40	37.039	79.480	68.513	0.3448	54891.3278	54895.5457		
164	10:55	37.040	79.496	68.521	0.3449	54893.6440	54894.7665		
164	11:10	37.042	79.538	68.568	0.3455	54892.4947	54893.9873		
164	11:25	37.044	79.617	68.592	0.3458	54889.6475	54893.2082		
164	11:40	37.047	79.650	68.734	0.3474	54889.2264	54892.4290		
164	11:55	37.050	79.703	68.778	0.3480	54889.0540	54891.6499		
164	12:10	37.054	79.756	68.845	0.3488	54890.3381	54890.8707		
164	12:25	37.056	79.797	68.968	0.3502	54888.3833	54890.0916		
164	12:40	37.060	79.839	68.987	0.3505	54891.5660	54889.3124		
164	12:55	37.064	79.932	69.013	0.3508	54889.4514	54888.5332		
164	13:10	37.067	79.980	69.146	0.3524	54888.3364	54887.7541		
164	13:25	37.070	80.015	69.223	0.3533	54889.3992	54886.9749		
164	13:40	37.072	80.093	69.243	0.3536	54885.8251	54886.1958		
164	13:55	37.074	80.124	69.285	0.3541	54886.6200	54885.4166		
164	14:10	37.076	80.166	69.384	0.3553	54885.4437	54884.6375		

164	14:25	37.075	80.183	69.356	0.[illegible]9	54884.5315	54883.6[illegible]		
164	14:40	37.077	80.206	69.389	0.[illegible]3	54886.0485	54883.6792		
164	14:55	37.077	80.230	69.416	0.3567	54882.6846	54882.3660		
164	15:10	37.079	80.272	69.311	0.3544	54883.6624	54881.5268		
164	15:25	37.080	80.300	69.445	0.3560	54879.8187	54880.7417		
164	15:40	37.082	80.347	69.478	0.3564	54877.6655	54879.9625		
164	15:55	37.083	80.337	69.525	0.3570	54878.8546	54879.1554		
164	16:10	37.085	80.371	69.499	0.3567	54879.0409	54878.4042		
164	16:25	37.085	80.406	69.533	0.3571	54874.8982	54877.6251		
164	16:40	37.087	80.417	69.527	0.3570	54877.0631	54876.8459		
164	16:55	37.088	80.458	69.571	0.3575	54873.4347	54876.0667		
164	17:10	37.089	80.476	69.530	0.3570	54873.8371	54875.2876		
164	17:25	37.089	80.453	69.637	0.3583	54872.6730	54874.5604		
164	17:40	37.089	80.480	69.560	0.3574	54871.7085	54873.7293		
164	17:55	37.089	80.474	69.571	0.3575	54871.7301	54872.9501		
164	18:10	37.089	80.490	69.612	0.3580	54869.5391	54872.1710		
164	18:25	37.090	80.501	69.537	0.3571	54871.3647	54871.3918		
164	18:40	37.091	80.535	69.628	0.3582	54867.5955	54870.6127		
164	18:55	37.091	80.542	69.544	0.3572	54868.0420	54869.8335		
164	19:10	37.091	80.523	69.629	0.3582	54868.3691	54869.0543		
164	19:25	37.090	80.536	69.589	0.3573	54866.4697	54868.2752		
164	19:40	37.090	80.536	69.635	0.3583	54865.1387	54867.4960		
164	19:55	37.090	80.561	69.570	0.3575	54864.2299	54866.7169		
164	20:10	37.090	80.543	69.563	0.3574	54866.5006	54865.9377		
164	20:25	37.089	80.552	69.522	0.3569	54864.1137	54865.1536		
164	20:40	37.087	80.530	69.480	0.3564	54864.6344	54864.3794		
164	20:55	37.087	80.520	69.443	0.3560	54866.2395	54863.6662		
164	21:10	37.085	80.569	69.486	0.3565	54863.6961	54862.8211		
164	21:25	37.085	80.504	69.439	0.3559	54864.6877	54862.6419		
164	21:40	37.085	80.499	69.452	0.3561	54865.0288	54861.2625		
164	21:55	37.084	80.485	69.470	0.3563	54864.3264	54860.4836		
164	22:10	37.083	80.493	69.552	0.3573	54860.7171	54859.7045		
164	22:25	37.081	80.493	69.431	0.3558	54859.9949	54858.9253		
164	22:40	37.079	80.497	69.433	0.3559	54856.5221	54858.1462		
164	22:55	37.077	80.454	69.433	0.3559	54857.9615	54857.3670		
164	23:10	37.076	80.450	69.385	0.3553	54857.6034	54856.5878		
164	23:25	37.075	80.437	69.344	0.3548	54858.3969	54855.8087		
164	23:40	37.072	80.419	69.376	0.3552	54855.3378	54855.0295		
164	23:55	37.071	80.404	69.311	0.3544	54856.3197	54854.2504		
165	0:10	37.069	80.407	69.348	0.3548	54852.3543	54853.4712		
165	0:25	37.068	80.366	69.272	0.3539	54856.2658	54852.6921		
165	0:40	37.066	80.379	69.264	0.3538	54853.0555	54851.9129		
165	0:55	37.064	80.340	69.244	0.3536	54853.2321	54851.1337		
165	1:10	37.063	80.322	69.044	0.3512	54857.0847	54850.3546		
165	1:25	37.061	80.302	69.227	0.3534	54852.3324	54849.5754		
165	1:40	37.059	80.279	69.096	0.3518	54853.6991	54848.7963		
165	1:55	37.057	80.272	69.093	0.3518	54850.9627	54848.0171		
165	2:10	37.056	80.264	69.061	0.3514	54850.4459	54847.2380		
165	2:25	37.054	80.232	69.110	0.3519	54849.3496	54846.4588	0.13619	0.14154

CALCULATED LEAK RATE PERCENT/DAY= 0.13619
UPPER CONFIDENCE LEVEL AT 95 PERCENT= 0.14154

THE ZERO TIME INTERCEPT IS 54921.3 ; LBS AND THE SLOPE -3.117 LBM/HR

2-006

3. C. LEAK RATE TEST

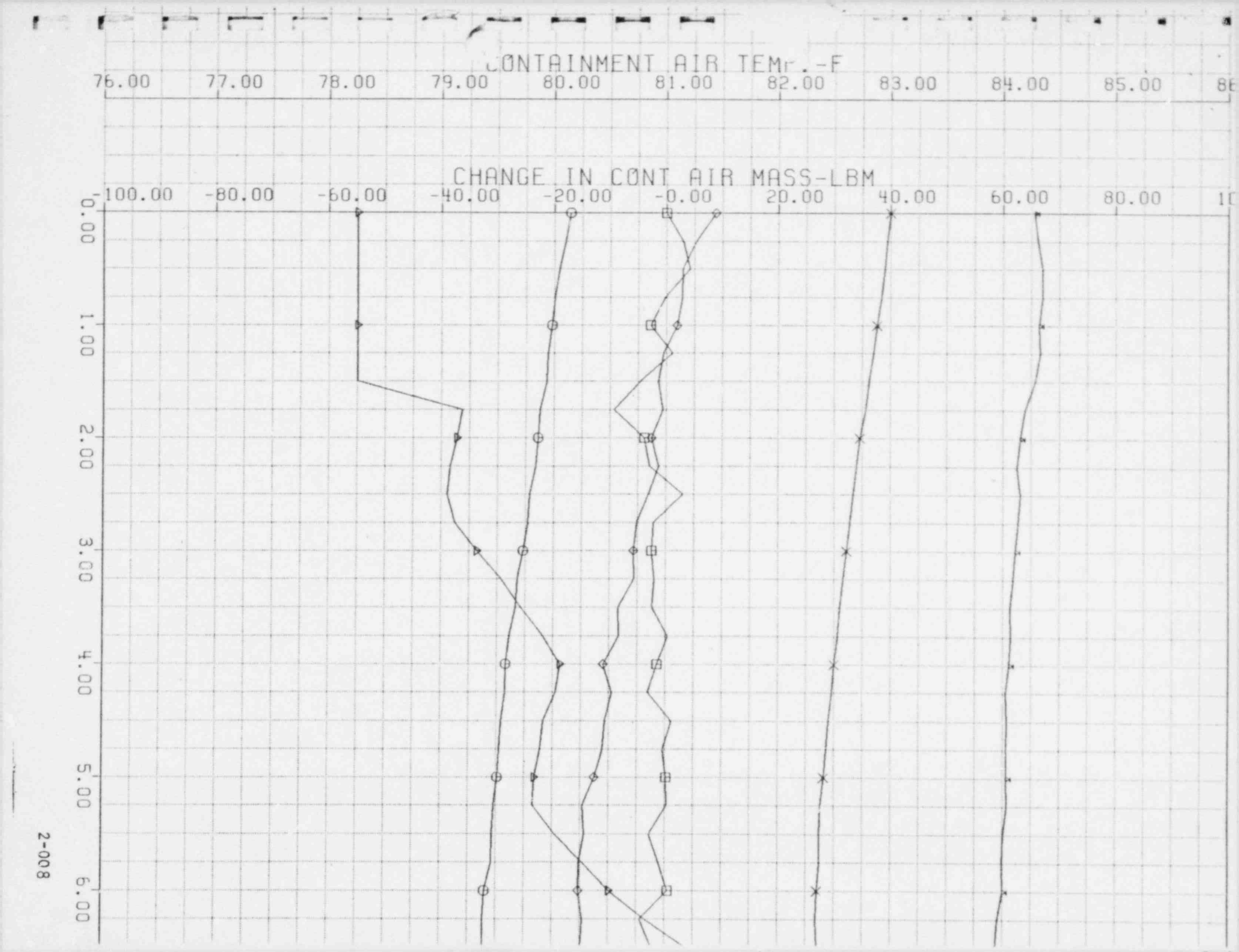
15 MIN DATA SET PLOT

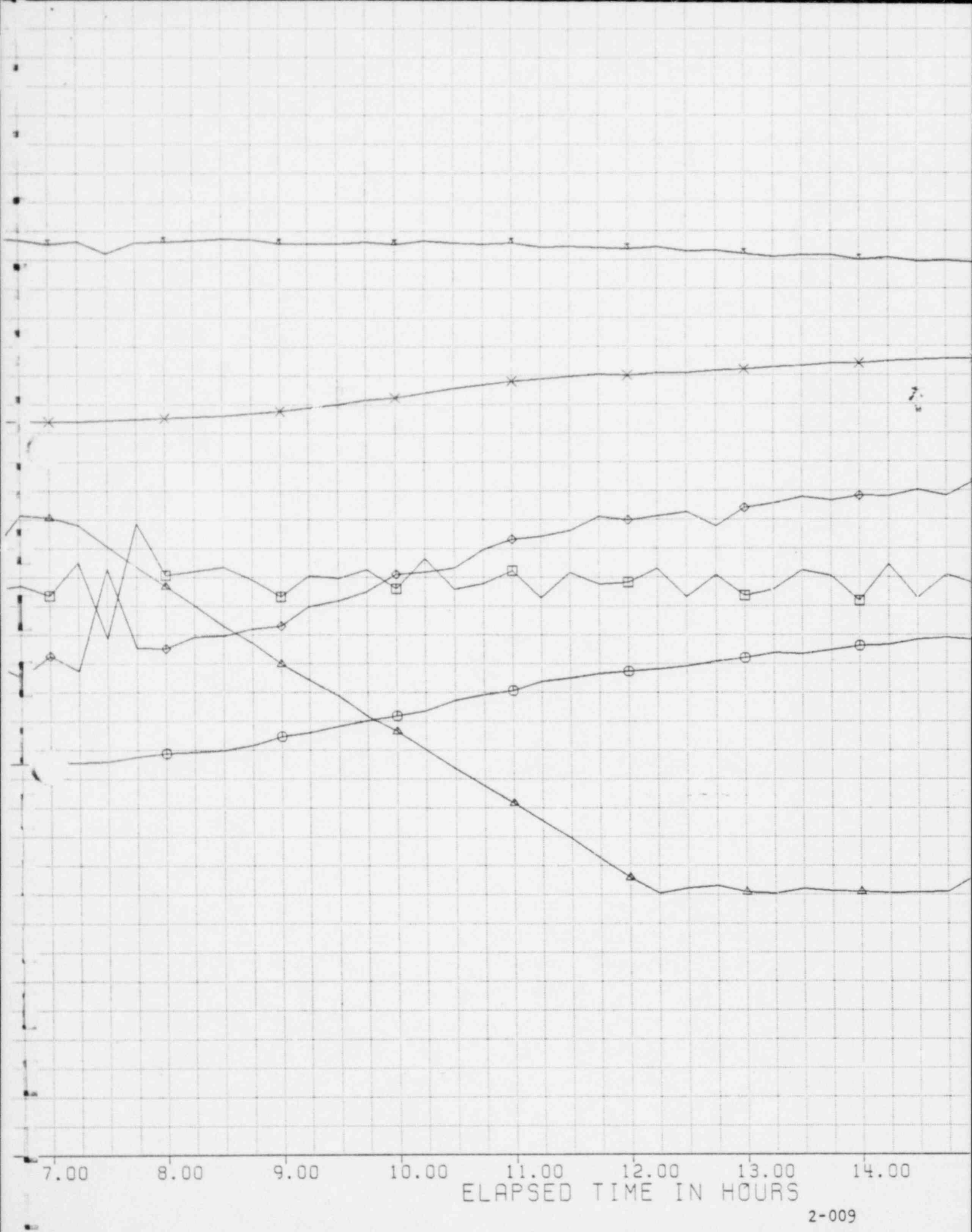
- ⊟ DELTA AIR MASS
- ⊖ AVERAGE CONT TEMP
- △ REACTOR H20 LEVEL
- ◇ WATER VAPOR PRESS
- × CONT ABS PRESSURE
- ⧈ CONT AIR MASS

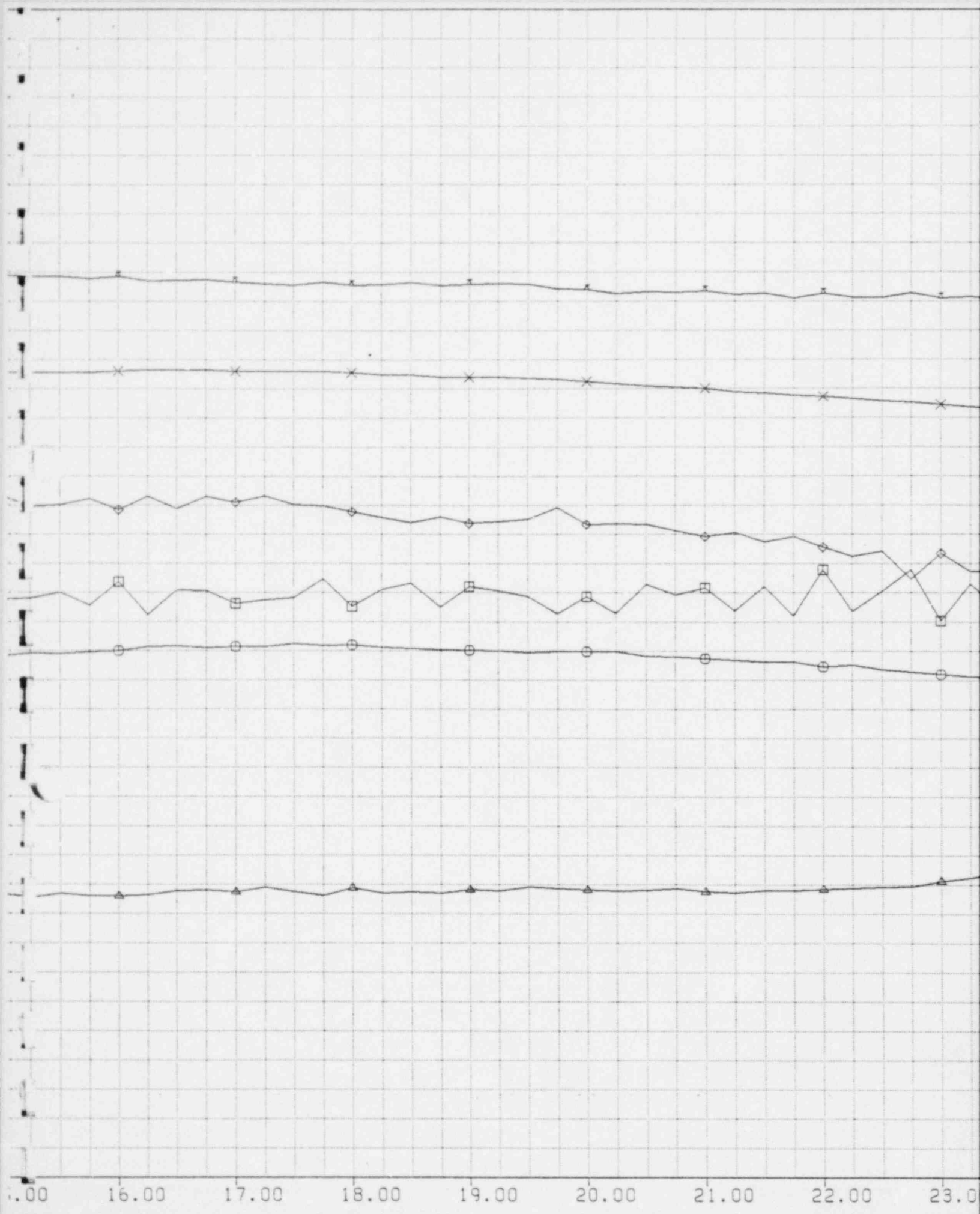
(EACH SYMBOL IS DRAWN EVERY 4 15 MINUTE DATA SETS)

START TIME 6 /12/80 225

END TIME 6 /13/80 225


CONTAINMENT AIR TEMP.-F
76.00
77.00
78.00
79.00
80.00
81.00
82.00
83.00
84.00
85.00
CHANGE IN CONT AIR MASS-LBM
-100.00
-80.00
-60.00
-40.00
-20.00
-0.00
20.00
40.00
60.00
80.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00


7.00
8.00
9.00
10.00
11.00
12.00
13.00
14.00
ELAPSED TIME IN HOURS


.00
16.00
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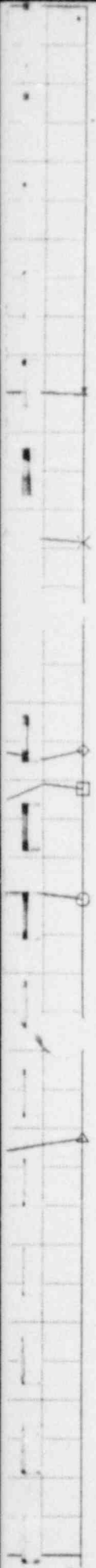
19.00
20.00
21.00
22.00
23.0



24.00

DAY	TIME	PRESSURE (PSIA)	DPRESSURE (INCHES)	RTD1 (F)	RTD2 (F)	RTD3 (F)	RTD4 (F)	RTD5 (F)	RTD6 (F)	RTD7 (F)	RTD8 (F)	RTD9 (F)
164	2:25	37.007	53.382	73.360	73.440	73.900	74.130	73.400	0.038	72.820	83.730	6.152
164	2:40	37.004	53.401	73.300	73.380	73.810	74.030	73.320	0.034	72.760	83.700	1.479
164	2:55	37.002	53.423	73.230	73.320	73.770	73.960	73.260	0.007	72.690	83.710	0.198
164	3:10	36.999	53.408	73.170	73.250	73.700	73.890	73.190	0.039	72.620	83.680	0.140
164	3:25	36.995	53.379	73.100	73.180	73.660	73.820	73.140	0.006	72.570	83.650	1.454
164	3:40	36.992	53.358	73.050	73.130	73.610	73.750	73.080	0.021	72.510	83.650	1.482
164	3:55	36.988	53.323	72.990	73.080	73.550	73.680	73.020	0.020	72.450	83.630	0.230
164	4:10	36.985	53.294	72.940	73.030	73.510	73.630	72.970	0.000	72.390	83.590	0.095
164	4:25	36.980	53.265	72.890	72.970	73.460	73.550	72.920	0.002	72.340	83.570	0.115
164	4:40	36.977	53.239	72.850	72.920	73.440	73.530	72.870	0.039	72.290	83.500	0.160
164	4:55	36.974	53.216	72.800	72.880	73.410	73.500	72.840	0.072	72.260	83.530	0.070
164	5:10	36.971	53.202	72.750	72.840	73.370	73.450	72.790	0.079	72.210	83.500	0.089
164	5:25	36.968	53.187	72.710	72.790	73.330	73.410	72.750	0.078	72.170	83.460	0.120
164	5:40	36.965	53.166	72.670	72.770	73.280	73.360	72.690	0.006	72.140	83.400	0.198
164	5:55	36.962	53.156	72.640	72.720	73.250	73.330	72.660	0.024	72.080	83.370	0.202
164	6:10	36.960	53.152	72.610	72.690	73.230	73.280	72.630	0.031	72.050	83.370	1.508
164	6:25	36.957	53.142	72.570	72.650	73.180	73.250	72.590	0.031	72.020	83.300	1.496
164	6:40	36.955	53.134	72.530	72.620	73.120	73.210	72.560	0.039	71.980	83.290	0.121
164	6:55	36.952	53.164	72.500	72.580	73.110	73.180	72.530	0.017	71.950	83.270	0.243
164	7:10	36.950	53.082	72.470	72.560	73.070	73.160	72.500	0.057	71.920	83.220	1.500
164	7:25	36.948	53.059	72.440	72.530	73.030	73.120	72.470	0.090	71.890	83.200	0.125
164	7:40	36.945	53.035	72.410	72.500	73.000	73.160	72.440	0.033	71.860	83.230	0.118
164	7:55	36.944	53.048	72.380	72.470	72.990	73.060	72.400	0.026	71.840	83.170	1.467
164	8:10	36.944	53.037	72.360	72.450	72.940	73.040	72.390	0.028	71.810	83.130	0.219
164	8:25	36.942	53.035	72.330	72.420	72.930	73.000	72.360	0.079	71.780	83.150	0.138
164	8:40	36.941	53.037	72.310	72.390	72.920	72.990	72.330	0.055	71.760	83.110	1.549
164	8:55	36.942	53.055	72.300	72.380	72.910	72.930	72.330	0.054	71.760	83.110	1.516
164	9:10	36.942	53.076	72.290	72.360	72.870	72.940	72.360	0.017	71.740	83.130	0.201
164	9:25	36.942	53.090	72.260	72.340	72.850	72.920	72.360	0.042	71.720	83.120	1.441
164	9:40	36.942	53.079	72.240	72.340	72.830	72.880	72.270	0.038	71.700	83.170	0.073
164	9:55	36.943	53.066	72.220	72.310	72.840	72.860	72.250	0.012	71.700	83.200	0.219
164	10:10	36.944	53.064	72.210	72.300	72.820	72.860	72.240	0.052	71.670	83.200	0.077
164	10:25	36.945	53.047	72.190	72.290	72.800	72.850	72.230	0.002	71.660	83.320	0.263
164	10:40	36.946	53.045	72.190	72.280	72.770	72.850	72.210	0.058	71.650	83.350	0.113
164	10:55	36.947	53.033	72.180	72.260	72.760	72.830	72.210	0.100	71.620	83.400	0.111
164	11:10	36.949	53.037	72.160	72.250	72.780	72.820	72.200	0.040	71.630	83.510	1.389
164	11:25	36.951	53.050	72.160	72.260	72.740	72.810	72.190	0.015	71.600	83.560	0.181
164	11:40	36.954	53.050	72.150	72.240	72.760	72.790	72.180	0.022	71.610	83.670	0.179
164	11:55	36.957	53.067	72.140	72.220	72.760	72.790	72.170	0.058	71.600	83 730	0.075
164	12:10	36.961	53.072	72.140	72.220	72.750	72.770	72.160	0.074	71.580	83.820	1.399
164	12:25	36.963	53.073	72.120	72.220	72.760	72.760	72.170	0.069	71.580	83.890	0.209
164	12:40	36.967	53.084	72.120	72.220	72.710	72.750	72.160	0.010	71.580	84.010	0.161
164	12:55	36.971	53.092	72.110	72.210	72.760	72.760	72.150	0.152	71.570	84.190	0.094
164	13:10	36.974	53.093	72.100	72.200	72.670	72.720	72.130	0.096	71.550	84.240	0.103
164	13:25	36.977	53.091	72.100	72.200	72.760	72.720	72.130	0.129	71.550	84.300	0.074
164	13:40	36.979	53.091	72.100	72.200	72.680	72.730	72.150	0.094	71.550	84.500	1.262
164	13:55	36.981	53.082	72.090	72.200	72.700	72.710	72.120	0.006	71.530	84.520	0.214
164	14:10	36.983	53.057	72.100	72.180	72.680	72.710	72.120	0.037	71.530	84.660	0.106
164	14:25	36.982	53.047	72.090	72.180	72.690	72.700	72.120	0.103	71.530	84.610	0.094
164	14:40	36.984	53.037	72.090	72.170	72.650	72.700	72.120	0.155	71.520	84.700	0.077
164	14:55	36.984	53.029	72.080	72.170	72.650	72.690	72.110	0.089	71.510	84.750	0.097
164	15:10	36.986	53.026	72.080	72.170	72.650	72.700	72.110	0.012	71.520	84.790	0.203
164	15:25	36.987	53.039	72.060	72.160	72.660	72.690	72.100	0.150	71.520	84.830	0.076
164	15:40	36.989	53.034	72.070	72.150	72.670	72.680	72.110	0.011	71.520	84.880	0.232
164	15:55	36.990	53.017	72.070	72.150	72.650	72.700	72.100	0.029	71.500	84.940	0.195
164	16:10	36.992	53.039	72.070	72.150	72.620	72.680	72.110	0.146	71.510	84.980	1.266
164	16:25	36.992	53.039	72.060	72.150	72.650	72.680	72.090	0.117	71.500	85.040	1.213

164	16:40	36.994	53.034	72.060	72.[illegible]9	72.660	72.680	72.100	[illegible]48	71.500	85.070	0.126
164	16:55	36.995	53.040	72.050	72.[illegible]8	72.650	72.630	72.100	819	71.500	85.050	0.211
164	17:10	36.996	53.030	72.060	72.130	72.640	72.660	72.100	0.042	71.510	85.140	1.171
164	17:25	36.996	53.029	72.050	72.140	72.670	72.680	72.100	0.030	71.500	85.150	0.191
164	17:40	36.996	53.006	72.050	72.120	72.640	72.670	72.080	0.156	71.480	85.140	0.143
164	17:55	36.996	53.017	72.030	72.120	72.640	72.650	72.070	0.038	71.480	85.210	1.136
164	18:10	36.996	53.010	72.030	72.120	72.600	72.650	72.090	0.077	71.480	85.250	0.102
164	18:25	36.997	53.004	72.020	72.130	72.630	72.680	72.080	0.024	71.480	85.240	0.190
164	18:40	36.998	53.005	72.040	72.120	72.620	72.660	72.070	0.160	71.480	85.280	0.096
164	18:55	36.998	52.997	72.030	72.120	72.630	72.660	72.080	0.012	71.480	85.280	0.225
164	19:10	36.998	52.975	72.020	72.110	72.620	72.680	72.070	0.155	71.470	85.270	0.086
164	19:25	36.997	52.967	72.020	72.100	72.620	72.660	72.060	0.028	71.470	85.280	0.182
164	19:40	36.997	52.972	72.010	72.110	72.610	72.650	72.060	0.158	71.470	85.280	0.132
164	19:55	36.997	52.955	72.010	72.110	72.570	72.650	72.050	0.024	71.450	85.320	0.175
164	20:10	36.997	52.943	72.000	72.100	72.590	72.660	72.050	0.021	71.450	85.290	0.171
164	20:25	36.996	52.926	72.000	72.110	72.560	72.640	72.040	0.109	71.440	85.280	0.119
164	20:40	36.994	52.904	72.000	72.080	72.590	72.640	72.030	0.108	71.430	85.280	0.121
164	20:55	36.994	52.899	71.980	72.080	72.550	72.640	72.030	0.148	71.430	85.240	0.080
164	21:10	36.992	52.887	71.980	72.080	72.540	72.630	72.020	0.015	71.430	85.240	0.250
164	21:25	36.992	52.880	71.980	72.070	72.540	72.630	72.020	0.110	71.410	85.240	1.220
164	21:40	36.992	52.879	71.960	72.070	72.510	72.590	72.010	0.063	71.410	85.270	0.230
164	21:55	36.991	52.857	71.970	72.060	72.540	72.600	72.050	0.025	71.400	85.180	0.182
164	22:10	36.990	52.835	71.960	72.050	72.530	72.600	72.000	0.144	71.400	85.180	1.240
164	22:25	36.988	52.821	71.950	72.050	72.520	72.590	72.000	0.121	71.380	85.220	1.270
164	22:40	36.986	52.816	71.950	72.030	72.520	72.580	71.980	0.009	71.380	85.210	0.185
164	22:55	36.984	52.792	71.930	72.040	72.500	72.540	71.970	0.003	71.390	85.200	0.182
164	23:10	36.983	52.782	71.930	72.040	72.470	72.550	71.980	0.013	71.380	85.110	0.170
164	23:25	36.982	52.775	71.910	72.010	72.460	72.550	71.960	0.104	71.370	85.120	1.222
164	23:40	36.979	52.754	71.920	72.030	72.480	72.540	71.960	0.113	71.360	85.120	0.085
164	23:55	36.978	52.731	71.900	72.010	72.460	72.540	71.960	0.001	71.350	85.070	1.206
165	0:10	36.976	52.719	71.900	72.000	72.460	72.530	71.950	0.129	71.340	85.070	0.066
165	0:25	36.975	52.709	71.890	71.990	72.430	72.530	71.940	0.038	71.330	85.050	0.138
165	0:40	36.973	52.691	71.880	71.990	72.430	72.510	71.930	0.003	71.320	85.060	0.169
165	0:55	36.971	52.674	71.870	71.990	72.410	72.510	71.920	0.151	71.320	85.030	0.097
165	1:10	36.970	52.666	71.860	71.980	72.400	72.510	71.910	0.158	71.310	84.980	0.086
165	1:25	36.968	52.648	71.860	71.960	72.410	72.500	71.900	0.105	71.300	84.900	0.691
165	1:40	36.966	52.644	71.850	71.960	72.400	72.510	71.890	0.052	71.300	84.900	0.167
165	1:55	36.964	52.631	71.830	71.950	72.380	72.470	71.880	0.020	71.290	84.860	0.252
165	2:10	36.963	52.615	71.830	71.950	72.380	72.450	71.870	0.023	71.280	84.880	0.186
165	2:25	36.961	52.600	71.830	71.940	72.370	72.460	71.870	0.048	71.260	84.840	1.245

DAY	TIME	RTD10 (F)	RTD11 (F)	RTD12 (F)	RTD13 (F)	RTD14 (F)	RTD15 (F)	RTD16 (F)	RTD17 (F)	RTD18 (F)	RTD19 (F)
164	2:25	73.580	80.970	79.240	81.550	79.930	91.290	87.600	81.220	81.130	82.640
164	2:40	73.500	80.870	79.260	81.460	79.960	91.450	87.580	81.150	81.150	82.610
164	2:55	73.400	80.810	79.110	81.340	79.910	91.080	87.530	81.120	80.970	82.580
164	3:10	73.350	80.880	78.980	81.410	79.920	90.990	87.420	81.080	81.020	82.530
164	3:25	73.250	80.810	79.120	81.340	79.890	91.640	87.390	81.070	81.020	82.500
164	3:40	73.200	80.800	79.080	81.380	79.920	91.110	87.300	81.040	80.870	82.490
164	3:55	73.140	80.740	79.090	81.350	79.900	91.680	87.280	81.020	80.950	82.500
164	4:10	73.060	80.700	79.040	81.260	79.900	90.990	87.220	81.010	80.980	82.490
164	4:25	72.990	80.740	78.930	81.240	79.880	91.420	87.120	80.970	81.050	82.340
164	4:40	72.930	80.660	79.040	81.250	79.870	91.720	87.120	80.980	80.840	82.410
164	4:55	72.890	80.670	78.900	81.320	79.880	90.890	87.010	80.920	80.880	82.340
164	5:10	72.820	80.660	78.820	81.230	79.870	91.240	87.080	80.880	80.800	82.370
164	5:25	72.800	80.570	78.810	81.170	79.830	91.120	86.940	80.860	80.840	82.280
164	5:40	72.740	80.550	78.720	81.080	79.860	90.990	86.990	80.820	80.800	82.360
164	5:55	72.690	80.470	78.720	81.030	79.840	91.610	86.840	80.800	80.690	82.240
164	6:10	72.620	80.470	78.680	80.980	79.820	90.710	86.790	80.770	80.670	82.170
164	6:25	72.580	80.390	78.670	80.910	79.820	90.990	86.860	80.730	80.530	82.260
164	6:40	72.560	80.400	78.630	80.920	79.780	91.570	86.710	80.690	80.550	82.120
164	6:55	72.520	80.440	78.670	80.950	79.790	90.990	86.680	80.650	80.650	82.130
164	7:10	72.480	80.420	78.670	80.920	79.780	91.620	86.690	80.670	80.490	82.080
164	7:25	72.440	80.330	78.550	80.930	79.770	91.430	86.570	80.640	80.640	82.050
164	7:40	72.420	80.310	78.480	80.960	79.760	91.090	86.580	80.610	80.480	82.070
164	7:55	72.360	80.340	78.620	80.770	79.760	91.230	86.480	80.620	80.380	82.040
164	8:10	72.330	80.270	78.610	80.830	79.760	91.610	86.560	80.540	80.510	82.030
164	8:25	72.290	80.260	78.510	80.760	79.730	90.680	86.400	80.540	80.450	81.970
164	8:40	72.280	80.260	78.470	80.700	79.730	90.860	86.500	80.510	80.410	81.960
164	8:55	72.260	80.210	78.530	80.720	79.700	90.950	86.490	80.490	80.430	81.960
164	9:10	72.220	80.220	78.420	80.750	79.710	90.890	86.470	80.530	80.460	81.970
164	9:25	72.260	80.220	78.590	80.810	79.710	90.910	86.450	80.600	80.480	81.960
164	9:40	72.170	80.290	78.480	80.870	79.700	90.940	86.530	80.570	80.430	82.030
164	9:55	72.160	80.320	78.530	80.840	79.720	90.730	86.590	80.650	80.470	82.100
164	10:10	72.140	80.430	78.740	80.990	79.740	90.970	86.660	80.760	80.560	82.170
164	10:25	72.110	80.400	78.670	81.170	79.760	91.020	86.580	80.730	80.650	82.220
164	10:40	72.110	80.490	78.740	81.160	79.750	90.840	86.760	80.810	80.680	82.300
164	10:55	72.090	80.590	78.810	81.140	79.760	90.660	86.630	80.840	80.710	82.260
164	11:10	72.030	80.640	78.860	81.270	79.740	90.410	86.790	80.880	80.920	82.360
164	11:25	72.050	80.670	79.070	81.560	79.780	91.090	86.940	81.010	80.980	82.480
164	11:40	72.050	80.800	79.030	81.570	79.880	91.160	86.890	81.100	81.040	82.550
164	11:55	72.040	80.880	79.330	81.660	79.820	91.160	87.050	81.210	81.130	82.670
164	12:10	72.030	81.020	79.270	81.790	79.830	91.310	87.260	81.270	81.240	82.780
164	12:25	72.020	81.090	79.350	81.880	79.840	91.340	87.290	81.330	81.350	82.850
164	12:40	72.020	81.210	79.510	82.000	79.880	91.160	87.340	81.490	81.490	82.930
164	12:55	72.010	81.320	79.690	82.230	79.890	91.290	87.480	81.610	81.610	83.080
164	13:10	72.000	81.410	79.840	82.220	79.880	91.670	87.670	81.690	81.610	83.220
164	13:25	72.000	81.530	79.960	82.460	79.910	90.890	87.700	81.780	81.780	83.300
164	13:40	71.990	81.610	80.020	82.580	79.920	91.960	87.870	81.960	81.850	83.380
164	13:55	71.980	81.650	80.120	82.570	79.920	91.650	87.840	81.910	82.040	83.430
164	14:10	72.000	81.700	80.120	82.720	79.960	91.760	87.860	82.010	82.010	83.440
164	14:25	71.970	81.700	80.160	82.710	79.950	92.060	87.930	82.010	82.070	83.500
164	14:40	71.970	81.840	80.340	82.690	79.980	91.690	88.170	82.090	82.130	83.680
164	14:55	71.960	81.870	80.260	82.810	79.990	91.850	87.990	82.080	82.170	83.580
164	15:10	71.960	81.950	80.240	82.830	80.010	92.190	88.220	82.130	82.170	83.720
164	15:25	71.960	81.970	80.400	82.830	80.010	92.150	88.160	82.160	82.300	83.750
164	15:40	71.960	82.010	80.530	83.060	80.030	92.770	88.050	82.200	82.260	83.700
164	15:55	71.970	82.060	80.540	82.990	80.040	91.960	88.180	82.330	82.360	83.770
164	16:10	71.960	82.090	80.410	83.110	80.040	92.240	88.150	82.340	82.410	83.860
164	16:25	71.950	82.140	80.580	83.160	80.060	92.420	88.290	82.370	82.500	83.840

164	16:40	71.950	82.190	80.660	83		80.070	92.280	88.270	82.370	82.350	83.950
164	16:55	71.950	82.250	80.730	83		80.080	92.800	88.410	82.450	82.520	84.000
164	17:10	71.950	82.250	80.770	83.650		80.090	93.630	88.460	82.460	82.490	84.050
164	17:25	71.930	82.220	80.670	83.160		80.090	92.410	88.300	82.460	82.520	83.930
164	17:40	71.940	82.260	80.700	83.220		80.110	92.790	88.340	82.450	82.500	83.980
164	17:55	71.950	82.280	80.690	83.220		80.110	92.330	88.360	82.460	82.610	84.020
164	18:10	71.930	82.240	80.790	83.270		80.130	92.290	88.420	82.510	82.550	84.070
164	18:25	71.940	82.320	80.710	83.250		80.130	92.210	88.440	82.560	82.510	84.060
164	18:40	71.930	82.340	80.740	83.210		80.140	93.110	88.510	82.510	82.590	84.190
164	18:55	71.930	82.360	80.770	83.280		80.160	92.620	88.520	82.540	82.690	84.150
164	19:10	71.920	82.360	80.800	83.290		80.170	92.460	88.450	82.520	82.590	84.080
164	19:25	71.920	82.320	80.710	83.270		80.170	92.930	88.420	82.560	82.660	84.060
164	19:40	71.920	82.400	80.740	83.290		80.180	92.480	88.490	82.530	82.730	84.160
164	19:55	71.910	82.350	80.690	83.240		80.200	93.410	88.550	82.550	82.620	84.150
164	20:10	71.910	82.310	80.690	83.210		80.200	92.980	88.590	82.560	82.710	84.180
164	20:25	71.910	82.350	80.700	83.210		80.210	93.430	88.480	82.540	82.580	84.180
164	20:40	71.900	82.290	80.610	83.190		80.210	93.260	88.440	82.480	82.630	84.110
164	20:55	71.890	82.320	80.780	83.090		80.220	92.870	88.530	82.500	82.520	84.140
164	21:10	71.890	82.290	80.600	83.200		80.220	92.750	88.410	82.490	82.470	84.070
164	21:25	71.890	82.320	80.590	83.170		80.220	92.760	88.460	82.560	82.630	84.080
164	21:40	71.880	82.330	80.610	83.120		80.230	92.690	88.410	82.500	82.600	84.130
164	21:55	71.870	82.280	80.640	83.070		80.230	92.680	88.440	82.480	82.540	84.160
164	22:10	71.870	82.320	80.630	83.190		80.230	93.340	88.320	82.560	82.560	83.990
164	22:25	71.860	82.260	80.490	83.120		80.240	93.090	88.380	82.450	82.490	84.050
164	22:40	71.850	82.260	80.680	83.100		80.230	93.640	88.330	82.470	82.520	84.030
164	22:55	71.860	82.220	80.640	83.040		80.240	92.750	88.340	82.410	82.440	84.050
164	23:10	71.840	82.240	80.600	82.980		80.240	93.190	88.310	82.400	82.500	83.960
164	23:25	71.840	82.170	80.460	82.960		80.240	92.890	88.340	82.350	82.500	84.050
164	23:40	71.840	82.170	80.430	82.970		80.240	92.930	88.230	82.390	82.330	83.950
164	23:55	71.820	82.120	80.460	82.870		80.250	92.760	88.230	82.290	82.450	83.930
165	0:10	71.820	82.120	80.410	82.820		80.250	93.310	88.280	82.290	82.370	83.960
165	0:25	71.800	82.070	80.290	82.840		80.250	92.660	88.260	82.290	82.280	83.910
165	0:40	71.790	82.060	80.240	82.850		80.240	93.110	88.350	82.270	82.450	84.010
165	0:55	71.790	82.090	80.230	82.860		80.250	92.660	88.160	82.240	82.240	83.830
165	1:10	71.770	81.970	80.250	82.760		80.230	92.550	88.220	82.180	82.250	83.820
165	1:25	71.770	81.950	80.250	82.620		80.260	92.760	88.260	82.160	82.250	83.770
165	1:40	71.760	81.960	80.110	82.640		80.250	92.310	88.160	82.220	82.310	83.810
165	1:55	71.760	81.960	80.110	82.650		80.250	92.480	88.030	82.110	82.230	83.760
165	2:10	71.740	81.890	80.120	82.630		80.270	92.860	88.090	82.130	82.100	83.750
165	2:25	71.740	81.870	80.040	82.670		80.260	92.350	88.060	82.040	82.160	83.740

DAY	TIME	RTD20 (F)	RTD21 (F)	RTD22 (F)	RTD23 (F)	RTD24 (F)	RTD25 (F)	RTD26 (F)	RTD27 (F)	RTD28 (F)	RTD29 (F)	RTD30 (F)
164	2:25	86.430	81.730	82.860	80.740	83.420	82.780	0.154	84.910	84.940	88.250	86.380
164	2:40	86.520	81.700	82.860	80.640	83.370	82.710	0.050	84.850	84.870	88.170	86.260
164	2:55	86.580	81.720	82.750	80.590	83.350	82.660	0.092	84.830	84.860	88.250	86.250
164	3:10	86.250	81.760	82.720	80.670	83.310	82.750	0.106	84.830	84.830	88.160	86.210
164	3:25	86.390	81.650	82.710	80.600	83.300	82.689	0.062	84.790	84.870	88.230	86.280
164	3:40	86.290	81.630	82.700	80.460	83.290	82.650	0.020	84.760	84.860	88.170	86.260
164	3:55	86.430	81.540	82.680	80.560	83.260	82.580	0.048	84.790	84.870	88.180	86.230
164	4:10	86.310	81.520	82.640	80.500	83.240	82.610	0.038	84.770	84.810	88.160	86.180
164	4:25	86.470	81.470	82.620	80.420	83.240	82.690	0.067	84.740	84.750	88.160	86.230
164	4:40	86.260	81.500	82.590	80.440	83.210	82.580	0.141	84.750	84.890	88.160	86.270
164	4:55	86.110	81.490	82.590	80.350	83.170	82.560	0.034	84.740	84.750	88.110	86.180
164	5:10	86.220	81.420	82.560	80.310	83.170	82.570	0.058	84.710	84.770	88.100	86.220
164	5:25	86.240	81.370	82.510	80.320	83.120	82.650	0.080	84.650	84.770	88.050	86.200
164	5:40	86.110	81.360	82.500	80.290	83.090	82.550	0.089	84.683	84.590	88.040	85.980
164	5:55	86.060	81.400	82.460	80.190	83.040	82.430	0.063	84.650	84.610	88.020	86.210
164	6:10	86.000	81.310	82.440	80.210	83.020	82.460	0.010	84.620	84.610	88.010	86.040
164	6:25	85.960	81.340	82.380	80.180	82.980	82.460	0.029	84.610	84.570	87.990	86.110
164	6:40	86.110	81.370	82.380	80.210	82.980	82.350	0.107	84.580	84.483	87.940	86.140
164	6:55	85.980	81.330	82.380	80.150	82.940	82.340	0.086	84.5[illegible]	84.500	87.940	86.060
164	7:10	86.080	81.280	82.350	80.110	82.930	82.290	0.057	84.570	84.520	87.960	86.110
164	7:25	86.070	81.220	82.310	80.050	82.920	82.370	0.031	84.560	84.460	87.950	86.040
164	7:40	86.180	81.200	82.310	80.030	82.890	82.310	0.067	84.540	84.440	87.950	85.910
164	7:55	86.250	81.260	82.280	80.050	82.880	82.300	0.068	84.520	84.463	87.960	86.050
164	8:10	86.070	81.220	82.250	80.040	82.840	82.260	0.087	84.520	84.480	87.960	86.050
164	8:25	85.940	81.140	82.230	80.050	82.830	82.260	0.012	84.470	84.400	87.950	86.120
164	8:40	85.950	81.170	82.210	80.020	82.820	82.250	0.042	84.470	84.400	87.930	85.980
164	8:55	86.130	81.170	82.210	79.950	82.780	82.190	0.051	84.480	84.350	87.960	86.090
164	9:10	86.070	81.070	82.210	79.950	82.790	82.360	0.068	84.480	84.550	87.790	86.050
164	9:25	85.920	81.090	82.220	80.070	82.830	82.230	0.124	84.560	84.550	87.890	86.130
164	9:40	85.950	81.130	82.250	80.050	82.840	82.280	0.035	84.500	84.450	88.000	86.050
164	9:55	85.890	81.130	82.300	80.080	82.870	82.320	0.037	84.550	84.460	87.970	86.130
164	10:10	85.760	81.180	82.330	80.210	82.920	82.390	0.053	84.580	84.520	88.060	86.220
164	10:25	86.080	81.220	82.410	80.290	82.960	82.450	0.056	84.580	84.590	88.140	86.260
164	10:40	86.040	81.210	82.420	80.360	83.000	82.410	0.031	84.630	84.650	88.090	86.190
164	10:55	86.080	81.180	82.430	80.370	83.040	82.570	0.020	84.650	84.730	88.190	86.280
164	11:10	86.220	81.260	82.550	80.520	83.110	82.580	0.050	84.690	84.790	88.180	86.400
164	11:25	86.380	81.380	82.620	80.580	83.170	82.770	0.129	84.750	84.960	88.230	86.420
164	11:40	86.480	81.430	82.680	80.620	83.240	82.730	0.066	84.850	84.970	88.260	86.480
164	11:55	86.480	81.460	82.820	80.710	83.330	82.840	0.094	84.860	85.070	88.390	86.500
164	12:10	86.560	81.560	82.890	80.890	83.430	82.900	0.021	84.910	85.100	88.490	86.540
164	12:25	86.690	81.620	82.970	81.060	83.500	82.980	0.052	84.980	85.160	88.450	86.630
164	12:40	86.450	81.710	83.080	81.060	83.580	83.120	0.150	85.040	85.150	88.580	86.640
164	12:55	86.860	81.760	83.180	81.210	83.710	83.150	0.064	85.110	85.400	88.640	86.750
164	13:10	86.910	81.840	83.290	81.270	83.790	83.250	0.017	85.180	85.470	88.710	86.750
164	13:25	87.070	81.940	83.370	81.430	83.960	83.340	0.018	85.230	85.540	88.740	86.760
164	13:40	86.910	82.010	83.490	81.340	83.990	83.430	0.038	85.290	85.520	88.830	86.840
164	13:55	87.180	82.050	83.520	81.530	84.040	83.520	0.142	85.350	85.710	88.810	86.900
164	14:10	87.260	82.180	83.580	81.630	84.120	83.520	0.098	85.400	85.840	88.830	86.950
164	14:25	87.240	82.170	83.630	81.740	84.140	83.590	0.092	85.430	85.740	88.920	86.920
164	14:40	87.190	82.220	83.700	81.690	84.220	83.560	0.039	85.460	85.680	88.950	86.940
164	14:55	87.240	82.310	83.740	81.720	84.260	83.690	0.064	85.500	85.960	88.890	87.010
164	15:10	87.420	82.340	83.780	81.730	84.320	83.720	0.052	85.550	85.860	89.000	86.950
164	15:25	87.500	82.360	83.820	81.850	84.370	83.760	0.008	85.580	86.000	88.980	87.020
164	15:40	87.740	82.370	83.870	81.860	84.380	83.840	0.192	85.620	86.000	89.020	87.100
164	15:55	87.340	82.430	83.920	81.910	84.440	83.860	0.180	85.610	86.090	89.070	87.080
164	16:10	87.560	82.510	83.950	82.050	84.490	83.930	0.073	85.640	86.110	89.130	87.060
164	16:25	87.550	82.540	84.000	82.160	84.560	83.940	0.024	85.670	86.110	89.150	87.170

164	16:40	87.580	82.580	84.010	82	84.580	84.670	0.165	85.710	86.150	89.160	87.190
164	16:55	87.660	82.630	84.060	82	84.620	84.060	0.147	85.770	86.210	89.150	87.210
164	17:10	87.640	82.630	84.110	82	84.640	84.660	0.144	85.790	86.290	89.180	87.210
164	17:25	87.670	82.650	84.120	82.000	84.650	84.620	0.197	85.800	86.150	89.220	87.260
164	17:40	87.960	82.670	84.110	82.120	84.670	84.140	0.170	85.850	86.230	89.200	87.230
164	17:55	87.750	82.680	84.140	82.140	84.690	84.640	0.032	85.810	86.280	89.210	87.200
164	18:10	87.910	82.720	84.140	82.220	84.690	84.010	0.134	85.820	86.230	89.270	87.270
164	18:25	87.780	82.730	84.150	82.240	84.720	84.190	0.173	85.870	86.350	89.210	87.400
164	18:40	87.760	82.760	84.210	82.230	84.770	84.130	0.137	85.880	86.290	89.270	87.280
164	18:55	87.980	82.790	84.230	82.330	84.780	84.120	0.293	85.900	86.370	89.290	87.230
164	19:10	87.950	82.780	84.190	82.190	84.770	84.690	0.061	85.890	86.360	89.270	87.310
164	19:25	87.930	82.780	84.190	82.140	84.790	84.230	0.050	85.890	86.370	89.240	87.340
164	19:40	88.630	82.750	84.250	82.240	84.800	84.150	0.113	85.960	86.330	89.330	87.310
164	19:55	88.990	82.790	84.250	82.170	84.860	84.210	0.020	85.920	86.300	89.310	87.390
164	20:10	87.950	82.840	84.230	82.080	84.800	84.130	0.695	85.940	86.380	89.300	87.300
164	20:25	87.940	82.810	84.240	82.280	84.810	84.210	0.141	85.900	86.360	89.270	87.370
164	20:40	88.050	82.800	84.190	82.210	84.780	84.140	0.155	85.910	86.310	89.250	87.370
164	20:55	88.020	82.770	84.220	82.190	84.760	84.170	0.013	85.920	86.340	89.360	87.370
164	21:10	87.900	82.780	84.210	82.260	84.780	84.140	0.201	85.930	86.350	89.360	87.470
164	21:25	87.940	82.770	84.210	82.260	84.760	84.130	0.015	85.890	86.370	89.260	87.410
164	21:40	87.810	82.760	84.220	82.160	84.770	84.180	0.168	85.900	86.360	89.250	87.460
164	21:55	87.880	82.720	84.190	82.160	84.750	84.120	0.197	85.930	86.340	89.300	87.410
164	22:10	87.740	82.720	84.170	82.140	84.740	84.100	0.149	85.900	86.340	89.300	87.370
164	22:25	87.950	82.760	84.200	82.280	84.740	84.620	0.017	85.920	86.390	89.250	87.490
164	22:40	87.890	82.780	84.190	82.090	84.730	84.120	0.159	85.900	86.250	89.270	87.440
164	22:55	87.830	82.740	84.150	82.130	84.720	84.040	0.100	85.890	86.250	89.260	87.400
164	23:10	87.920	82.740	84.120	82.000	84.680	84.040	0.189	85.880	86.190	89.250	87.510
164	23:25	87.960	82.680	84.120	82.130	84.670	83.990	0.025	85.890	86.290	89.330	87.430
164	23:40	87.740	82.680	84.090	82.040	84.680	84.000	0.169	85.870	86.260	89.290	87.440
164	23:55	88.010	82.670	84.080	81.950	84.630	84.010	0.183	85.860	86.280	89.230	87.420
165	0:10	87.890	82.660	84.030	81.960	84.660	84.140	0.195	85.830	86.120	89.210	87.470
165	0:25	87.760	82.600	84.030	82.020	84.610	83.940	0.201	85.840	86.110	89.310	87.500
165	0:40	87.590	82.610	84.030	81.970	84.600	83.980	0.163	85.820	86.190	89.220	87.470
165	0:55	87.740	82.600	83.990	81.890	84.560	83.930	0.132	85.790	86.200	89.150	87.500
165	1:10	87.840	82.550	83.960	81.940	84.560	83.940	0.062	85.780	86.060	89.240	87.460
165	1:25	87.770	82.510	83.920	81.880	84.500	83.880	0.122	85.770	86.070	89.200	87.450
165	1:40	87.590	82.510	83.910	81.880	84.520	83.860	0.156	85.780	86.060	89.120	87.410
165	1:55	87.790	82.490	83.890	81.770	84.480	83.830	0.165	85.760	86.170	89.260	87.480
165	2:10	87.730	82.480	83.860	81.760	84.430	83.810	0.164	85.750	86.010	89.260	87.360
165	2:25	87.690	82.480	83.870	81.680	84.460	83.850	0.027	85.740	85.940	89.110	87.390

DAY	TIME	DC1 (F)	DC2 (F)	DC3 (F)	DC4 (F)	DC5 (F)	DC6 (F)	DC7 (F)	DC8 (F)	DC9 (F)	DC10 (F)
164	2:25	68.560	67.520	67.050	70.700	0.071	70.150	69.750	69.670	70.980	70.810
164	2:40	68.420	67.440	66.980	70.610	0.069	70.010	69.440	69.710	70.570	70.570
164	2:55	68.370	67.380	66.860	70.580	0.036	70.000	69.530	69.170	70.330	70.560
164	3:10	68.300	67.340	66.820	70.520	0.030	69.970	69.260	69.690	70.300	70.600
164	3:25	68.240	67.270	66.750	70.420	0.067	69.850	69.200	69.620	70.570	70.400
164	3:40	68.180	67.250	66.660	70.370	0.044	69.820	69.060	69.710	69.930	70.600
164	3:55	68.130	67.170	66.600	70.350	0.073	69.880	69.220	69.160	70.260	70.370
164	4:10	68.100	67.140	66.570	70.280	0.028	69.840	69.120	69.360	70.730	70.390
164	4:25	68.030	67.090	66.530	70.240	0.069	69.860	68.990	69.310	70.410	70.220
164	4:40	68.030	67.050	66.490	70.200	0.058	69.720	69.390	69.310	70.530	70.560
164	4:55	67.960	66.990	66.420	70.160	0.023	69.760	69.250	69.240	70.180	70.610
164	5:10	67.920	66.970	66.350	70.110	0.082	69.760	69.120	69.190	70.110	70.180
164	5:25	67.880	66.960	66.340	70.080	0.018	69.820	68.790	69.230	70.260	70.160
164	5:40	67.880	66.920	66.310	70.020	0.067	69.680	69.120	69.730	69.830	70.060
164	5:55	67.810	66.860	66.260	69.960	0.067	69.640	68.770	69.280	69.820	70.070
164	6:10	67.860	66.800	66.240	69.900	0.038	69.590	68.670	69.260	70.110	70.140
164	6:25	67.820	66.760	66.190	69.960	0.077	69.420	68.750	68.850	69.810	70.010
164	6:40	67.750	66.700	66.180	69.840	0.029	69.480	68.880	69.330	69.920	70.060
164	6:55	67.710	66.670	66.180	69.810	0.005	69.510	68.860	68.970	69.590	70.400
164	7:10	67.670	66.610	66.150	69.740	0.033	69.370	68.780	68.980	70.390	69.860
164	7:25	67.630	66.600	66.120	69.730	0.049	69.390	68.590	69.090	69.730	70.070
164	7:40	67.600	66.600	66.100	69.720	0.014	69.390	68.520	68.510	69.730	69.889
164	7:55	67.580	66.540	66.060	69.700	0.018	69.290	68.630	68.940	69.530	70.010
164	8:10	67.530	66.470	66.070	69.650	0.030	69.260	68.550	68.970	69.640	69.790
164	8:25	67.590	66.550	66.090	69.680	0.091	69.440	68.500	68.880	69.410	69.610
164	8:40	67.550	66.530	66.050	69.630	0.010	69.260	68.580	68.880	69.820	69.840
164	8:55	67.540	66.490	66.020	69.630	0.059	69.330	68.260	68.780	69.990	70.020
164	9:10	67.500	66.440	66.040	69.590	0.064	69.360	68.340	68.740	69.150	69.810
164	9:25	67.490	66.450	66.010	69.600	0.014	69.380	68.550	69.660	70.010	70.020
164	9:40	67.470	66.390	66.000	69.560	0.042	69.310	68.600	68.710	69.760	69.690
164	9:55	73.830	66.380	65.980	69.550	0.034	69.390	68.650	69.330	69.780	70.160
164	10:10	67.520	66.400	65.980	69.530	0.054	69.440	68.880	68.960	70.260	70.200
164	10:25	67.470	66.350	65.980	69.540	0.066	69.470	68.960	69.450	69.690	70.220
164	10:40	67.430	66.350	65.940	69.510	0.096	69.600	68.960	69.540	70.320	70.220
164	10:55	67.360	66.330	65.950	69.520	0.094	69.660	69.050	69.160	70.660	70.240
164	11:10	67.490	66.360	65.970	69.550	0.097	69.860	68.860	69.440	70.200	70.720
164	11:25	67.440	66.350	65.960	69.510	0.014	69.870	69.460	69.150	70.210	70.590
164	11:40	67.420	66.320	65.950	69.490	0.090	69.940	69.580	69.740	70.830	70.660
164	11:55	67.400	66.330	65.960	69.510	0.010	70.030	69.720	70.130	70.340	70.960
164	12:10	67.390	66.350	65.950	69.510	0.134	70.190	69.660	69.950	70.820	71.090
164	12:25	67.380	66.330	65.950	69.490	0.090	70.350	69.960	70.300	71.170	71.140
164	12:40	67.310	66.270	65.910	69.490	0.007	70.520	69.830	70.220	71.250	71.400
164	12:55	67.330	66.260	65.900	69.490	0.075	70.470	70.160	70.520	71.060	71.360
164	13:10	67.300	66.210	65.920	69.460	0.148	70.630	70.420	70.720	71.640	71.470
164	13:25	67.280	66.220	65.890	69.450	0.153	70.710	70.560	70.990	71.620	71.770
164	13:40	67.270	66.210	65.880	69.440	0.161	70.570	70.650	70.810	72.110	71.820
164	13:55	67.280	66.220	65.880	69.456	0.043	70.890	70.660	70.660	72.160	71.820
164	14:10	67.260	66.200	65.890	69.430	0.164	70.960	70.720	71.430	72.190	72.060
164	14:25	67.260	66.240	65.890	69.440	0.093	71.030	70.720	71.110	71.920	72.050
164	14:40	67.250	66.220	65.880	69.450	0.132	71.140	70.780	71.180	71.840	72.200
164	14:55	67.240	66.200	65.880	69.440	0.136	71.030	70.960	71.240	71.910	72.300
164	15:10	67.200	66.110	65.850	69.390	0.207	71.040	70.750	71.010	71.650	72.260
164	15:25	67.260	66.210	65.880	69.410	0.215	71.110	71.010	70.920	72.510	72.210
164	15:40	67.290	66.270	65.910	69.430	0.120	71.350	71.140	71.060	72.030	72.230
164	15:55	67.270	66.270	65.910	69.420	0.085	71.380	70.990	71.250	72.320	72.350
164	16:10	67.260	66.210	65.880	69.370	0.152	71.320	70.970	71.310	72.240	72.400
164	16:25	67.280	66.220	65.880	69.380	0.235	71.370	70.990	71.250	72.480	72.420
164	16:40	67.250	66.230	65.890	69.390	0.054	71.430	71.070	71.400	71.910	72.610
164	16:55	67.250	66.210	65.900	69.460	0.150	71.390	71.030	71.440	72.500	72.520
164	17:10	67.250	66.210	65.870	69.360	0.135	71.470	71.110	71.520	71.910	72.560
164	17:25	67.230	66.190	65.860	69.360	0.058	71.450	71.260	71.850	72.170	72.910
164	17:40	67.250	66.210	65.890	69.350	0.061	71.540	71.160	71.350	72.690	72.680

164	17:55	67.250	66.210	65.900	69.410	0.	71.370	71.170	71.560	72.13	2.710	
164	18:10	67.250	66.200	65.900	69.400	0.	71.560	71.510	71.540	72.20	72.420	
164	18:25	67.250	66.180	65.870	69.350	0.1x7	71.360	71.640	71.660	72.650	72.570	
164	18:40	67.230	66.210	65.890	69.370	0.057	71.560	71.310	71.590	72.470	72.500	
164	18:55	67.250	66.210	65.890	69.400	0.163	71.440	70.940	71.630	71.890	72.760	
164	19:10	67.230	66.170	65.850	69.350	0.132	71.620	71.140	71.490	72.790	72.490	
164	19:25	67.230	66.160	65.870	69.370	0.261	71.590	70.980	71.360	72.780	72.410	
164	19:40	67.230	66.140	65.840	69.330	0.691	71.620	71.330	71.520	72.560	72.650	
164	19:55	67.230	66.160	65.870	69.390	0.259	71.640	71.020	71.550	72.670	72.610	
164	20:10	67.220	66.150	65.860	69.370	0.241	71.650	71.210	71.680	72.440	72.490	
164	20:25	67.220	66.150	65.870	69.340	0.035	71.700	70.890	71.460	72.630	72.300	
164	20:40	67.200	66.080	65.830	69.320	0.654	71.480	70.860	71.230	72.530	72.220	
164	20:55	67.200	66.100	65.800	69.310	0.229	71.450	71.110	71.280	72.240	71.960	
164	21:10	67.220	66.090	65.790	69.310	0.132	71.440	70.910	71.140	72.550	72.380	
164	21:25	67.210	66.060	65.790	69.300	0.217	71.390	70.980	71.130	72.100	72.430	
164	21:40	67.190	66.070	65.810	69.290	0.143	71.520	70.970	71.640	72.030	72.540	
164	21:55	67.190	66.080	65.820	69.270	0.112	71.450	70.960	71.460	71.930	72.560	
164	22:10	67.210	66.110	65.820	69.250	0.064	71.600	70.880	71.560	72.530	72.440	
164	22:25	67.210	66.110	65.800	69.280	0.228	71.650	70.910	70.630	72.010	72.370	
164	22:40	67.210	66.110	65.840	69.290	0.171	71.470	70.870	71.320	72.090	72.120	
164	22:55	67.200	66.100	65.810	69.280	0.197	71.400	70.810	71.120	72.440	72.150	
164	23:10	67.200	66.090	65.800	69.240	0.034	71.460	70.760	71.630	72.140	72.100	
164	23:25	67.190	66.080	65.810	69.230	0.223	71.420	70.760	70.840	71.930	72.160	
164	23:40	67.180	66.060	65.810	69.220	0.223	71.320	70.700	71.170	72.240	72.160	
164	23:55	67.180	66.080	65.800	69.250	0.128	71.480	70.470	70.840	71.930	72.630	
165	0:10	67.170	66.030	65.790	69.250	0.138	71.380	70.780	71.390	71.630	72.080	
165	0:25	67.150	66.030	65.790	69.230	0.098	71.340	70.520	70.920	71.620	72.160	
165	0:40	67.110	65.970	65.740	69.290	0.210	71.340	70.580	70.780	71.420	71.880	
165	0:55	67.110	65.960	65.750	69.260	0.034	71.310	70.340	71.110	71.660	72.070	
165	1:10	67.080	65.960	65.740	69.250	0.108	71.670	70.380	70.290	71.220	71.660	
165	1:25	67.080	65.950	65.730	69.260	0.045	71.230	70.430	70.920	71.930	71.870	
165	1:40	67.070	65.940	65.720	69.250	0.029	71.050	70.240	70.850	71.410	71.650	
165	1:55	67.100	65.920	65.710	69.240	0.140	71.080	70.260	70.550	71.710	71.630	
165	2:10	67.070	65.950	65.720	69.230	0.076	71.180	70.380	70.720	70.860	71.660	
165	2:25	67.070	65.950	65.710	69.230	0.133	71.170	70.310	70.920	71.090	71.810	

ATTACHMENT 3

Calculated Leakage Rate Data (Suplimental Test)

JERSEY CENTRAL POWER & LIGHT CO.
OYSTER CREEK NUCLEAR GENERATING STATION

INTEGRATED CONTAINMENT LEAK RATE TEST *ABSOLUTE METHOD*

REPORT PREPARED SAT, JUN 14 1980 STARTING PRESSURE : 37.043 PSIA

DAY	TIME	PRESSURE (PSIA)	TEMP. (F)	DEWPOINT (F)	POINT-TO-POINT PPLA (MEAS.)	TOTAL TIME TTLA (MEAS.)	TTLA (CALC.)	TTLA (UCL+95)
165	4:10	37.039	80.103	68.902	0.45688	0.45688	0.60074	
165	4:25	37.037	80.075	68.978	0.81841	0.63763	0.59163	
165	4:40	37.034	80.076	68.951	0.85524	0.71012	0.58252	
165	4:55	37.032	80.055	68.959	0.23179	0.59653	0.57341	
165	5:10	37.029	80.026	68.934	0.26841	0.52609	0.56429	
165	5:25	37.026	80.029	68.949	0.88860	0.58647	0.55518	
165	5:40	37.023	80.022	69.021	0.85307	0.62451	0.54607	
165	5:55	37.021	79.989	68.934	-0.31031	0.50768	0.53696	
165	6:10	37.017	80.004	68.895	1.26879	0.59218	0.52785	
165	6:25	37.014	79.951	68.789	-0.47545	0.48545	0.51874	
165	6:40	37.012	79.943	68.797	0.41016	0.47858	0.50963	
165	6:55	37.008	79.934	68.759	0.76150	0.50213	0.50052	
165	7:10	37.004	79.882	68.687	-0.06315	0.45865	0.49140	
165	7:25	37.001	79.872	68.611	0.37454	0.45262	0.48229	
165	7:40	37.000	79.853	68.642	0.01441	0.42341	0.47318	
165	7:55	36.998	79.851	68.641	0.52411	0.42968	0.46407	
165	8:10	36.997	79.845	68.642	0.22569	0.41767	0.45496	
165	8:25	36.996	79.867	68.662	0.75766	0.43653	0.44585	
165	8:40	36.994	79.869	68.664	0.52819	0.44133	0.43674	
165	8:55	36.993	79.865	68.637	0.13079	0.42580	0.42763	
165	9:10	36.991	79.865	68.688	0.62791	0.43539	0.41851	
165	9:25	36.988	79.863	68.671	0.73350	0.44891	0.40940	
165	9:40	36.986	79.834	68.507	-0.44716	0.40997	0.40029	
165	9:55	36.985	79.848	68.601	0.76759	0.42484	0.39118	0.49174

3-001

JERSEY CENTRAL POWER & LIGHT CO.
OYSTER CREEK NUCLEAR GENERATING STATION

INTEGRATED CONTAINMENT LEAK RATE TEST *REFERENCE VESSEL METHOD*

REPORT PREPARED SAT, JUN 14 1980 STARTING PRESSURE : 37.043 PSIA

DAY	TIME	PRESSURE (PSIA)	DPRESS. (PSID)	TEMP. (F)	DEWPOINT (F)	POINT-TO-POINT PPLR (MEAS.)	TOTAL TIME TTLR (MEAS.)	TOTAL TIME TTLR (CALC.)	TTLR (UCL+95)
165	4:10	37.039	2.869	80.103	68.902	0.47596	0.47596	0.61676	
165	4:25	37.037	2.868	80.075	68.978	0.90298	0.68945	0.61447	
165	4:40	37.034	2.866	80.076	68.951	0.53766	0.63883	0.61218	
165	4:55	37.032	2.865	80.055	68.959	0.50669	0.60576	0.60989	
165	5:10	37.029	2.862	80.026	68.934	0.67424	0.61943	0.60760	
165	5:25	37.026	2.860	80.029	68.949	0.53804	0.60584	0.60530	
165	5:40	37.023	2.858	80.022	69.021	0.58687	0.60310	0.60301	
165	5:55	37.021	2.856	79.989	68.934	0.53339	0.59435	0.60072	
165	6:10	37.017	2.853	80.004	68.895	0.66970	0.60269	0.59843	
165	6:25	37.014	2.851	79.951	68.789	0.68260	0.61065	0.59614	
165	6:40	37.012	2.848	79.943	68.797	0.62942	0.61232	0.59385	
165	6:55	37.008	2.845	79.934	68.759	0.67216	0.61728	0.59156	
165	7:10	37.004	2.843	79.882	68.687	0.57189	0.61376	0.58927	
165	7:25	37.001	2.842	79.872	68.611	0.36830	0.59621	0.58698	
165	7:40	37.000	2.840	79.853	68.642	0.46937	0.58374	0.58469	
165	7:55	36.998	2.838	79.851	68.641	0.53679	0.58078	0.58239	
165	8:10	36.997	2.836	79.845	68.642	0.56642	0.57991	0.58010	
165	8:25	36.996	2.835	79.867	68.662	0.42119	0.57107	0.57781	
165	8:40	36.994	2.833	79.869	68.664	0.49047	0.56681	0.57552	
165	8:55	36.993	2.831	79.865	68.637	0.40114	0.55851	0.57323	
165	9:10	36.991	2.829	79.865	68.688	0.65595	0.56312	0.57094	
165	9:25	36.988	2.826	79.863	68.671	0.66058	0.56752	0.56865	
165	9:40	36.986	2.825	79.834	68.567	0.35222	0.55815	0.56636	
165	9:55	36.985	2.823	79.848	68.601	0.47556	0.55469	0.56407	0.63091

JERSEY CENTRAL POWER & LIGHT CO.
OYSTER CREEK NUCLEAR GENERATING STATION

INTEGRATED CONTAINMENT LEAK RATE TEST *ABSOLUTE METHOD*

****MASS PLOT ANALYSIS****

REPORT PREPARED SAT, JUN 14 1980 STARTING PRESSURE : 37.043 PSIA

DAY	TIME	PRESSURE (PSIA)	TEMP. (F)	DEWPOINT (F)	VPRESS. (PSIA)	AIR MASS (MEAS.)	AIR MASS (CALC.)	LEAK RATE	LEAK RATE (UCL+95)
165	3:55	37.043	80.106	68.993	0.3505	54854.4304	54850.1056		
165	4:10	37.039	80.103	68.902	0.3494	54851.8198	54847.8316		
165	4:25	37.037	80.075	68.978	0.3504	54847.1436	54845.5577		
165	4:40	37.034	80.076	68.951	0.3500	54842.2574	54843.2837		
165	4:55	37.032	80.055	68.959	0.3501	54840.9333	54841.0098		
165	5:10	37.029	80.026	68.934	0.3498	54839.3999	54838.7358		
165	5:25	37.026	80.029	68.949	0.3500	54634.3238	54836.4619		
165	5:40	37.023	80.022	69.021	0.3509	54829.4512	54834.1879		
165	5:55	37.021	79.989	68.934	0.3498	54831.2235	54831.9140		
165	6:10	37.017	80.004	68.895	0.3494	54823.9767	54829.6460		
165	6:25	37.014	79.951	68.789	0.3481	54826.6919	54827.3661		
165	6:40	37.012	79.943	68.797	0.3482	54824.3495	54825.6921		
165	6:55	37.008	79.934	68.759	0.3477	54820.0006	54822.8182		
165	7:10	37.004	79.882	68.687	0.3469	54820.3612	54820.5443		
165	7:25	37.001	79.872	68.611	0.3460	54818.2224	54818.2703		
165	7:40	37.000	79.853	68.642	0.3464	54818.1401	54815.9964		
165	7:55	36.998	79.851	68.641	0.3463	54815.1473	54813.7224		
165	8:10	36.997	79.845	68.642	0.3463	54813.8587	54811.4485		
165	8:25	36.996	79.867	68.662	0.3466	54809.5326	54809.1745		
165	8:40	36.994	79.869	68.664	0.3466	54806.5170	54806.9606		
165	8:55	36.993	79.865	68.637	0.3463	54805.7703	54804.6266		
165	9:10	36.991	79.865	68.688	0.3469	54802.1856	54802.3527		
165	9:25	36.988	79.863	68.671	0.3467	54797.9983	54800.0787		
165	9:40	36.986	79.834	68.507	0.3448	54800.5508	54797.8048		
165	9:55	36.985	79.848	68.601	0.3459	54796.1691	54795.5363	0.39799	0.41802

CALCULATED LEAK RATE PERCENT/DAY= 0.39799
UPPER CONFIDENCE LEVEL AT 95 PERCENT= 0.41802

THE ZERO TIME INTERCEPT IS 54850.1 LBS AND THE SLOPE -9.096 LBM/HR

J. C. LEAK RATE TEST

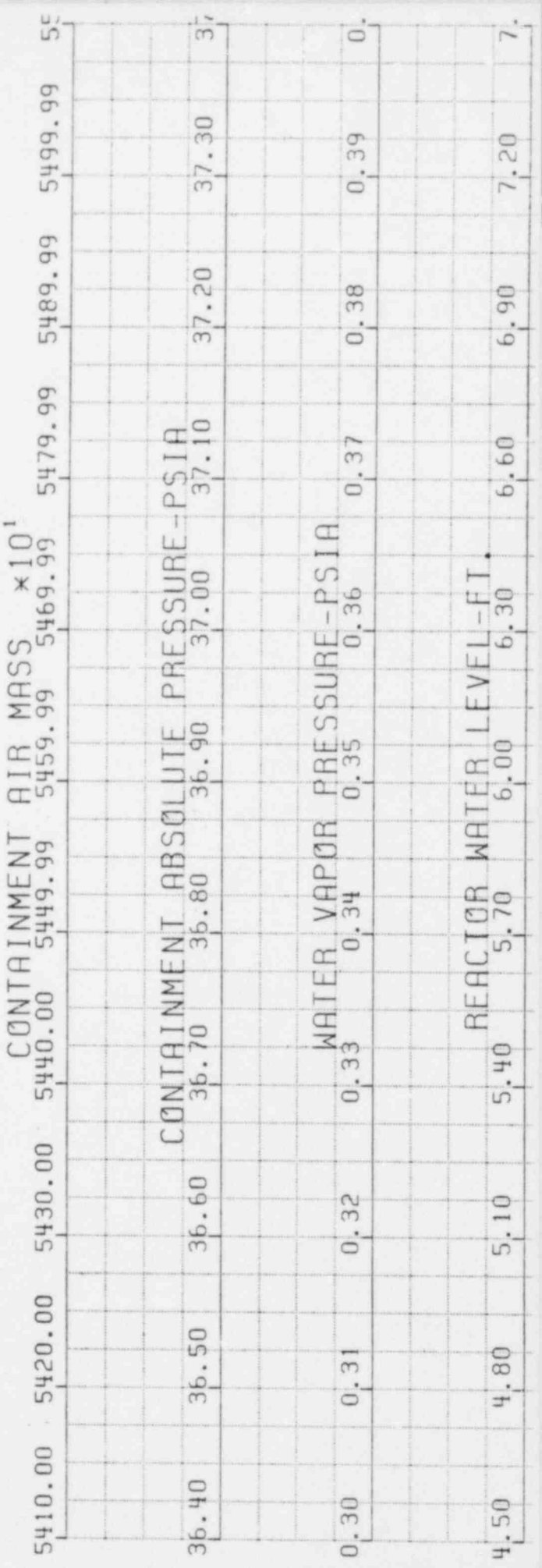
15 MIN DATA SET PLOT

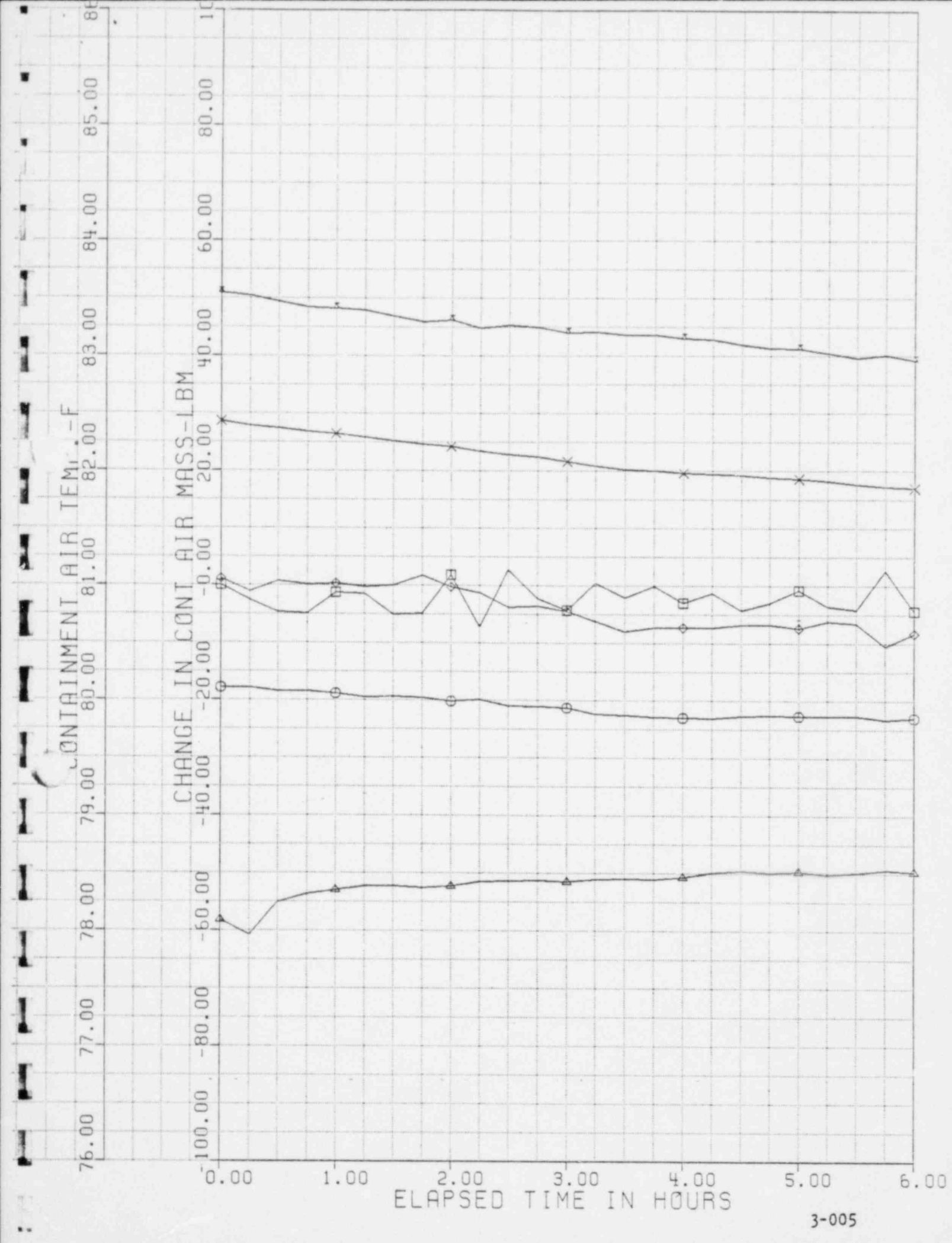
- ⊟ DELTA AIR MASS
- ⊖ AVERAGE CONT TEMP
- △ REACTOR H20 LEVEL
- ◇ WATER VAPOR PRESS
- × CONT ABS PRESSURE
- ⧖ CONT AIR MASS

(EACH SYMBOL IS DRAWN EVERY 4 15 MINUTE DATA SETS)

START TIME 6 /13/80 355

END TIME 6 /13/80 955




CONTAINMENT AIR TEMP.-F
CHANGE IN CONT AIR MASS-LBM
ELAPSED TIME IN HOURS
76.00
77.00
78.00
79.00
80.00
81.00
82.00
83.00
84.00
85.00
-100.00
-80.00
-60.00
-40.00
-20.00
-0.00
20.00
40.00
60.00
80.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00

3-005

DAY	TIME	PRESSURE (PSIA)	DPRESSURE (INCHES)	RTD1 (F)	RTD2 (F)	RTD3 (F)	RTD4 (F)	RTD5 (F)	RTD6 (F)	RTD7 (F)	RTD8 (F)	RTD9 (F)
165	3:55	36.950	52.472	71.770	71.880	72.320	72.360	71.820	0.141	71.210	84.700	0.084
165	4:10	36.946	52.421	71.760	71.880	72.300	72.350	71.810	0.063	71.190	84.680	0.114
165	4:25	36.944	52.394	71.760	71.860	72.290	72.340	71.790	0.019	71.190	84.650	0.180
165	4:40	36.941	52.366	71.740	71.880	72.290	72.350	71.790	0.122	71.190	84.670	1.428
165	4:55	36.939	52.333	71.750	71.860	72.280	72.350	71.780	0.068	71.180	84.640	0.201
165	5:10	36.936	52.288	71.740	71.860	72.280	72.340	71.780	0.064	71.170	84.570	1.362
165	5:25	36.933	52.251	71.730	71.850	72.280	72.330	71.760	0.068	71.170	84.620	0.191
165	5:40	36.930	52.207	71.710	71.850	72.260	72.330	71.760	0.052	71.150	84.580	0.117
165	5:55	36.928	52.169	71.710	71.840	72.250	72.320	71.750	0.128	71.140	84.520	0.070
165	6:10	36.924	52.129	71.700	71.830	72.230	72.300	71.740	0.011	71.140	84.510	0.259
165	6:25	36.921	52.077	71.690	71.800	72.230	72.290	71.730	0.006	71.140	84.470	0.213
165	6:40	36.919	52.033	71.700	71.820	72.220	72.290	71.730	0.013	71.120	84.470	0.191
165	6:55	36.915	51.984	71.680	71.790	72.220	72.280	71.720	0.133	71.110	84.420	0.056
165	7:10	36.911	51.942	71.670	71.780	72.220	72.280	71.710	0.050	71.120	84.350	0.134
165	7:25	36.908	51.916	71.670	71.780	72.210	72.280	71.710	0.116	71.100	84.370	0.107
165	7:40	36.907	51.885	71.670	71.780	72.210	72.260	71.700	0.007	71.100	84.300	0.190
165	7:55	36.905	51.850	71.660	71.770	72.210	72.260	71.710	0.071	71.090	84.330	0.099
165	8:10	36.904	51.815	71.650	71.770	72.200	72.250	71.690	0.129	71.080	84.310	0.052
165	8:25	36.903	51.790	71.650	71.760	72.200	72.250	71.690	0.042	71.090	84.340	0.106
165	8:40	36.901	51.754	71.640	71.760	72.200	72.220	71.690	0.096	71.080	84.330	0.116
165	8:55	36.900	51.727	71.630	71.750	72.180	72.220	71.680	0.008	71.090	84.350	0.191
165	9:10	36.898	51.678	71.640	71.750	72.190	72.230	71.680	0.132	71.080	84.310	0.057
165	9:25	36.895	51.634	71.640	71.760	72.200	72.220	71.670	0.042	71.080	84.330	0.093
165	9:40	36.893	51.610	71.640	71.740	72.180	72.240	71.680	0.122	71.080	84.350	0.067
165	9:55	36.892	51.576	71.640	71.740	72.190	72.240	71.670	0.168	71.080	84.350	1.398

DAY	TIME	RTD10 (F)	RTD11 (F)	RTD12 (F)	RTD13 (F)	RTD14 (F)	RTD15 (F)	RTD16 (F)	RTD17 (F)	RTD18 (F)	RTD19 (F)
165	3:55	71.680	81.730	79.880	82.390	80.250	92.030	87.860	81.970	82.040	83.610
165	4:10	71.670	81.760	79.960	82.370	80.260	92.330	87.840	81.930	82.040	83.640
165	4:25	71.670	81.720	79.810	82.380	80.240	92.550	87.820	81.900	82.000	83.540
165	4:40	71.640	81.690	79.930	82.330	80.250	92.610	87.730	81.930	81.920	83.490
165	4:55	71.660	81.660	79.850	82.350	80.270	92.280	87.720	81.910	81.880	83.480
165	5:10	71.640	81.640	79.880	82.210	80.250	91.600	87.750	81.890	81.960	83.510
165	5:25	71.640	81.630	79.800	82.170	80.240	92.320	87.750	81.860	81.880	83.490
165	5:40	71.620	81.610	79.820	82.340	80.230	92.550	87.670	81.820	81.870	83.430
165	5:55	71.610	81.590	79.780	82.170	80.240	92.140	87.750	81.770	81.820	83.420
165	6:10	71.610	81.460	79.830	82.230	80.240	93.030	87.670	81.730	81.860	83.430
165	6:25	71.610	81.510	79.720	82.210	80.220	92.120	87.630	81.780	81.720	83.390
165	6:40	71.590	81.520	79.660	82.140	80.230	92.070	87.550	81.740	81.710	83.320
165	6:55	71.580	81.460	79.760	82.130	80.220	92.460	87.480	81.640	81.730	83.250
165	7:10	71.560	81.420	79.600	82.160	80.230	91.960	87.490	81.630	81.690	83.290
165	7:25	71.550	81.360	79.640	82.000	80.220	91.900	87.460	81.630	81.680	83.220
165	7:40	71.560	81.380	79.500	82.040	80.230	91.350	87.450	81.610	81.740	83.260
165	7:55	71.540	81.320	79.590	82.100	80.220	91.540	87.550	81.570	81.540	83.310
165	8:10	71.530	81.350	79.570	82.030	80.220	91.810	87.410	81.580	81.680	83.180
165	8:25	71.530	81.370	79.650	81.940	80.230	92.380	87.440	81.660	81.550	83.220
165	8:40	71.520	81.430	79.590	82.020	80.220	92.020	87.390	81.600	81.740	83.270
165	8:55	71.520	81.400	79.530	82.080	80.230	91.800	87.440	81.640	81.740	83.270
165	9:10	71.510	81.320	79.480	82.020	80.200	92.290	87.480	81.610	81.590	83.250
165	9:25	71.520	81.300	79.460	82.060	80.230	92.450	87.520	81.600	81.560	83.260
165	9:40	71.510	81.300	79.560	81.970	80.220	91.740	87.500	81.580	81.660	83.240
165	9:55	71.510	81.320	79.570	82.120	80.210	91.890	87.390	81.530	81.630	83.170

DAY	TIME	RTD20 (F)	RTD21 (F)	RTD22 (F)	RTD23 (F)	RTD24 (F)	RTD25 (F)	RTD26 (F)	RTD27 (F)	RTD28 (F)	RTD29 (F)	RTD30 (F)
165	3:55	87.690	80.940	83.740	81.780	84.310	83.720	0.040	85.650	86.020	89.080	87.440
165	4:10	87.590	80.960	83.740	81.740	84.310	83.720	0.160	85.670	85.950	89.670	87.380
165	4:25	87.440	80.900	83.710	81.600	84.270	83.650	0.067	85.660	85.880	89.060	87.370
165	4:40	87.510	80.830	83.670	81.600	84.250	83.680	0.027	85.620	85.930	89.070	87.440
165	4:55	87.380	80.980	83.680	81.540	84.230	83.650	0.055	85.640	85.910	89.020	87.460
165	5:10	87.550	80.840	83.640	81.510	84.220	83.740	0.029	85.650	85.880	89.030	87.450
165	5:25	87.540	80.770	83.640	81.540	84.200	83.640	0.179	85.600	85.850	88.970	87.370
165	5:40	87.580	80.820	83.600	81.570	84.190	83.550	0.181	85.600	85.740	88.980	87.370
165	5:55	87.430	80.840	83.580	81.530	84.150	83.530	0.040	85.550	85.810	89.020	87.380
165	6:10	87.540	80.780	83.590	81.450	84.130	83.510	0.164	85.580	85.790	88.970	87.340
165	6:25	87.310	80.790	83.540	81.430	84.130	83.550	0.686	85.520	85.700	88.880	87.400
165	6:40	87.440	80.730	83.500	81.420	84.120	83.480	0.177	85.520	85.680	89.030	87.400
165	6:55	87.440	80.740	83.440	81.400	84.070	83.440	0.650	85.510	85.840	88.880	87.360
165	7:10	87.230	80.640	83.450	81.300	84.030	83.430	0.118	85.490	85.600	88.880	87.290
165	7:25	87.340	80.650	83.410	81.360	84.030	83.450	0.625	85.460	85.510	88.910	87.360
165	7:40	87.450	80.570	83.400	81.300	84.010	83.460	0.168	85.460	85.670	88.900	87.330
165	7:55	87.420	80.640	83.430	81.310	83.980	83.390	0.036	85.470	85.460	88.880	87.330
165	8:10	87.130	80.580	83.420	81.350	83.960	83.410	0.115	85.440	85.580	88.940	87.330
165	8:25	87.270	80.540	83.420	81.340	83.980	83.400	0.059	85.460	85.740	88.780	87.240
165	8:40	87.430	80.610	83.410	81.310	83.970	83.460	0.033	85.460	85.680	88.870	87.290
165	8:55	87.140	80.710	83.410	81.360	83.990	83.450	0.158	85.460	85.690	88.890	87.380
165	9:10	87.130	80.810	83.410	81.290	84.000	83.510	0.110	85.460	85.600	88.920	87.400
165	9:25	87.250	80.590	83.380	81.350	83.960	83.400	0.034	85.450	85.610	88.920	87.280
165	9:40	86.990	80.640	83.400	81.300	83.960	83.390	0.062	85.440	85.580	88.830	87.320
165	9:55	87.360	80.540	83.380	81.250	83.960	83.460	0.686	85.440	85.600	88.880	87.390

DAY	TIME	DC1 (F)	DC2 (F)	DC3 (F)	DC4 (F)	DC5 (F)	DC6 (F)	DC7 (F)	DC8 (F)	DC9 (F)	DC10 (F)
165	3:55	67.050	65.890	65.700	69.170	0.120	70.980	70.020	70.800	71.080	71.520
165	4:10	67.060	65.900	65.700	69.180	0.029	71.010	69.970	70.450	70.570	71.440
165	4:25	67.030	65.880	65.670	69.170	0.196	70.960	70.350	70.470	70.900	71.640
165	4:40	67.010	65.860	65.650	69.190	0.052	70.850	70.160	70.500	71.220	71.430
165	4:55	67.030	65.870	65.680	69.170	0.189	70.950	70.260	70.210	71.150	71.570
165	5:10	67.030	65.860	65.650	69.180	0.173	70.850	70.100	70.560	71.220	71.310
165	5:25	67.040	65.910	65.700	69.190	0.100	70.880	70.170	70.570	71.090	71.260
165	5:40	67.050	65.910	65.680	69.190	0.022	70.950	69.910	70.550	71.650	71.600
165	5:55	67.050	65.890	65.670	69.200	0.084	70.910	69.960	70.230	71.310	71.430
165	6:10	66.990	65.830	65.650	69.160	0.018	70.890	69.990	70.130	71.430	71.180
165	6:25	66.940	65.750	65.630	69.110	0.169	70.630	69.560	70.600	71.020	71.220
165	6:40	66.930	65.750	65.610	69.110	0.008	70.560	69.920	70.340	71.110	71.180
165	6:55	66.930	65.750	65.610	69.080	0.146	70.610	69.510	70.160	71.220	71.240
165	7:10	66.920	65.740	65.600	69.160	0.048	70.530	69.820	69.740	70.770	71.210
165	7:25	66.910	65.680	65.600	69.090	0.132	70.560	69.480	69.660	70.590	71.120
165	7:40	66.900	65.700	65.580	69.060	0.018	70.470	69.790	69.750	70.800	70.980
165	7:55	66.900	65.690	65.580	69.050	0.126	70.320	69.900	69.750	70.940	70.970
165	8:10	66.900	65.710	65.560	69.020	0.025	70.260	69.650	70.210	70.990	70.820
165	8:25	66.880	65.680	65.560	69.010	0.132	70.410	69.840	70.040	70.530	71.320
165	8:40	66.880	65.700	65.550	69.010	0.166	70.390	69.590	70.270	71.060	70.900
165	8:55	66.860	65.640	65.520	68.990	0.054	70.380	69.820	70.140	70.730	70.970
165	9:10	66.880	65.720	65.540	69.010	0.022	70.440	69.590	70.150	71.140	71.020
165	9:25	66.860	65.670	65.560	68.980	0.151	70.350	69.630	70.430	70.890	71.020
165	9:40	66.840	65.630	65.530	68.970	0.137	70.330	69.490	69.860	70.240	70.890
165	9:55	66.830	65.660	65.510	68.970	0.146	70.250	69.390	70.160	70.920	71.050