

REACTOR CONTAINMENT BUILDING
INTEGRATED LEAK RATE TEST
(FEBRUARY 2 TO MARCH 5 1991)

BRAIDWOOD UNIT ONE
MARCH 8, 1991

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UNIT 1 ILRT FINAL REPORT

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1.0 ABSTRACT

This report describes the first Type A containment leakage rate test conducted after the initiation of commercial service for the Braidwood Nuclear Power Station Unit 1 containment building. This report is prepared pursuant to the requirements of 10 CFR 50 Appendix J, Section V.B.3. The test was conducted through the performance of Braidwood Procedure 1BwVS 6.1.2.a-1, "Unit 1 Primary Containment Type A Integrated Leakage Rate Test (ILRT)" between February 2 and March 5, 1991. Local Leakage Rate testing required to determine final values of containment leakage were performed between February 16 through February 20, 1991. Also included in this report is a summary analysis of all periodic Type B and Type C Local Leakage Rate Tests (LLRT) that were performed since the last Type A ILRT performed on May 21 to May 29, 1986.

The Type A test was performed at the beginning of the refueling outage to test the containment in an "As Found" condition without any repairs or adjustments.

The test was performed in accordance with 10 CFR 50 Appendix J, and the Braidwood Station Technical Specifications. The test method that was used was the Mass Plot Method.

During pressurization a number of leakage paths were identified. The magnitude of leakage from these paths could not be quantified by visual observation, although they appeared to be small. It was decided to continue pressurization and measure the total containment leakage rate once at pressure and stable. Those later computer calculated results showed that the total containment leakage rate exceeded 0.75La.

One by one, the leakage paths were isolated and the effects upon the total containment leakage rate were observed. The data shows that isolation of the first four leakage paths had a noticeable but small effect upon the total containment leakage. It was only after isolation of the fifth leakage path, the equipment airlock shaft seals, did the total leakage rate sharply drop to a value under 0.75La.

The test was then successfully continued until completion. The previously isolated pathways were left isolated during the entire test. A Minimum Pathway As Found penalty was later assessed for each of these.

It is CECO's policy to Type A test containments in as close to the Post LOCA condition as possible. The pathways were left isolated in this case for the following reasons.

For all cases, there were no direction dependency concerns. The leakages measured by the Type C tests performed after the Type A test can in all cases clearly be shown to yield results conservative relative to what would have been their actual contributions had they remained open during the Type A test.

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The cumulative effect of suddenly opening all of these pathways may have had the effect of destabilizing the containment atmosphere. This would have both extended the test duration and reduced the quality of the results.

It is always desirable to minimize the number of valve manipulations during ILRT's. This reduces the potential for line up errors and other unforeseen problems.

The airlock had been As Found tested following the start of the refueling outage, prior to performance of the Type A test. That test showed the leakage to be small. It should be noted that the Type A test was performed with the outer door open. This door is closed during the Type B test. The leakage found during the Type A test was all from the inner door. The Type B test results indicate that under Post LOCA conditions, any leakage past the inner door would be stopped by the outer door. Thus the minimum pathway leakage calculations of this pathway is not affected by the leak or the isolation of the leak from the inner door. Thus, no penalty is required to be added to the ILRT results as a result of this isolation.

The discrepancy between the results of the Type B test performed on the airlock prior to the Type A test and the results observed during the Type A test require explanation. The shaft seals may have been damaged following the Type B test at the start of the outage. Alternately, the Type B test may not adequately test the inner door due to possible direction dependency of leakage through the shaft seals.

It must be noted that the outer door was challenged in the proper direction by the Type B test performed prior to the Type A test. The problem of recurring inner airlock door shaft seal leakages is currently being investigated by CECO corporate maintenance staff, with the intent of preventing recurrence at any CECO station.

Using the Mass Plot Method the total primary containment leak rate was calculated to be less than the allowable leak rate of 0.075 wt%/day (0.75La). The leakage rate was calculated to be 0.05173 wt %/day at a test pressure greater than 44.4 psig (Pa). The associated 95% Upper Confidence Limit (UCL) was 0.05286 wt %/day.

The supplemental induced leakage test result was measured at 0.1631 wt %/day. This value compares with the sum of the measured leak rate phase result (0.05173 wt %/day) and the induced leak of 8.3 scfm (0.1076 wt %/day). The composite leakrate of 0.1631 wt %/day lies within the allowable tolerance band of 0.15933 wt %/day \pm 0.025 wt %/day.

After the ILRT, during the unit's refueling outage, LLRTs were performed. The results from several of these tests are added to the final ILRT total as the corrective leakrate. These are added for the systems that were not properly challenged during the ILRT. The "As Found" minpath leakage for all corrections was 13.18 scfh or .0028 wt %/day. Adding this leakage to the ILRT 95% UCL yields a total of .0557 wt %/day which is less than the 0.075 wt %/day acceptance criteria.

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2.0 TEST PREPARATION

2.1 TYPE A TEST PROCEDURE

The ILRT was performed in accordance with Braidwood Procedure 1BWVS 6.1.2.a-1, Revision 1. Temporary Procedure Change 91-1-5766 was written, approved and incorporated into the test. All changes were minor in that they corrected, added or modified steps to ensure proper execution of the test. The original intent of the surveillance was never changed.

The Computer code used for calculations during the ILRT was the CECO Generic ILRT Computer Code, Software Product ID# G405-00.

2.2 PRE-TEST CONTAINMENT STRUCTURAL EXAMINATION

Prior to the containment pressurization, a visual examination of all accessible interior and exterior surfaces was performed. The results of this inspection were compared to the findings of the Preoperational Structural Integrity Test. No degradation of the containment structure, since the previous inspection, was noted.

2.3 TYPE A TEST INSTRUMENTATION

Twenty-five thermistors (THM's), ten dew cells (DEW's), and two absolute pressure gauges connected to the Volumetrics Dual Multiplexor Scanner and Data Acquisition System (DAS) were the main instrumentation used in the ILRT. Additional instrumentation used included ambient pressure and temperature gauges, and a flowmeter used to measure the induced leakage during the supplemental verification test. All instrumentation used was calibrated using standards traceable to the National Bureau of Standards (NBS).

Appendix A contains specifications for the test instrumentation including values for accuracy, repeatability, sensitivity and resolution for the THM's, dew cells and pressure sensors. The quality and quantity of sensors chosen were such that the Instrument Selection Guide (ISG as defined in ANSI 56.8-1981) would be less than 0.25La assuming failure of several THM's or dew cells and one pressure sensor.

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2.4 TYPE A TEST DATA PROCESSING

Containment parameters were acquired by the DAS every 10 minutes. This included time, Julian date, THM temperatures, dew cell temperatures, and absolute pressure sensor readings. The data was sent electronically to the Prime Computer through a RS232 serial port. The Prime Computer was loaded with the ILRT computer code, which stored the incoming raw data into a permanent file from which it drew one data set at a time to compute the leakage rate. The data transfer and calculations were monitored by plant personnel from a Prime Computer User Terminal. Data collection occurred every 10 minutes for the duration of the test with the exception of a 20-minute period on February 13, 1991. During this time the prime computer experienced a power loss as a result of a power surge of unknown origin. Leakage rates, pressures, temperatures and calculation summaries were plotted in both tabular and graphic forms at regular intervals. This facilitated the identification and real time analysis of trends as they developed.

2.5 TYPE A TEST SUBVOLUME DETERMINATION

The containment has been divided into 9 discrete subvolumes. Subvolume demarcation, size and weighting factors are indicated on Figures 2.5.1 through 2.5.3. The subvolume partitioning scheme was changed from the Pre-Operations ILRT, which had only 5 subvolumes. This added to the test's accuracy by better monitoring the thermal stratification in the containment.

Figures 2.5.1 through 2.5.3 also show sensor placement in each of the subvolumes. In addition to the THM's and dew cells, the Multiplexor Scanner was located inside containment. The two Precision Pressure Monitors, the flowmeter for the induced leakage test and the DAS were located outside containment inside the auxiliary building.

2.6 ILRT PLANT EQUIPMENT LINEUP

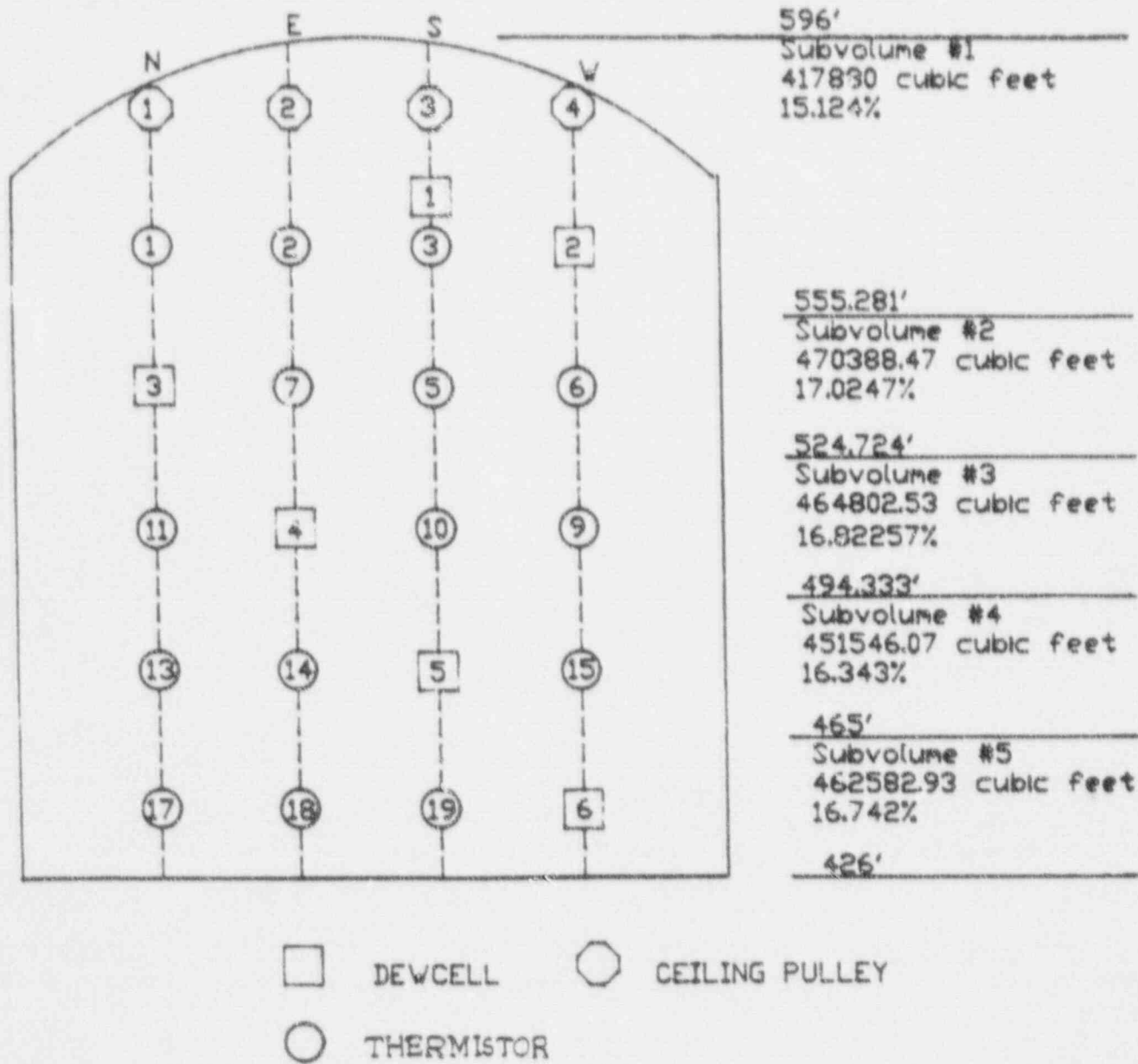
The valve and equipment lineups were detailed and specific, i.e. component by component with individual signoffs. This ensured containment integrity conditions as close as possible to those which would exist after a design basis Loss of Coolant Accident (LOCA). It also assured penetrations were properly drained and vented.

2.7 TYPE A TEST PRESSURIZATION

To pressurize containment to full test pressure, a system of 10 diesel driven, oil free compressors were used. The compressors were located outside on the northeast side of the containment building. Pressurization was accomplished through a six inch header which penetrates containment at penetration P-4. Once containment was pressurized, the pressurization header was isolated and vented.

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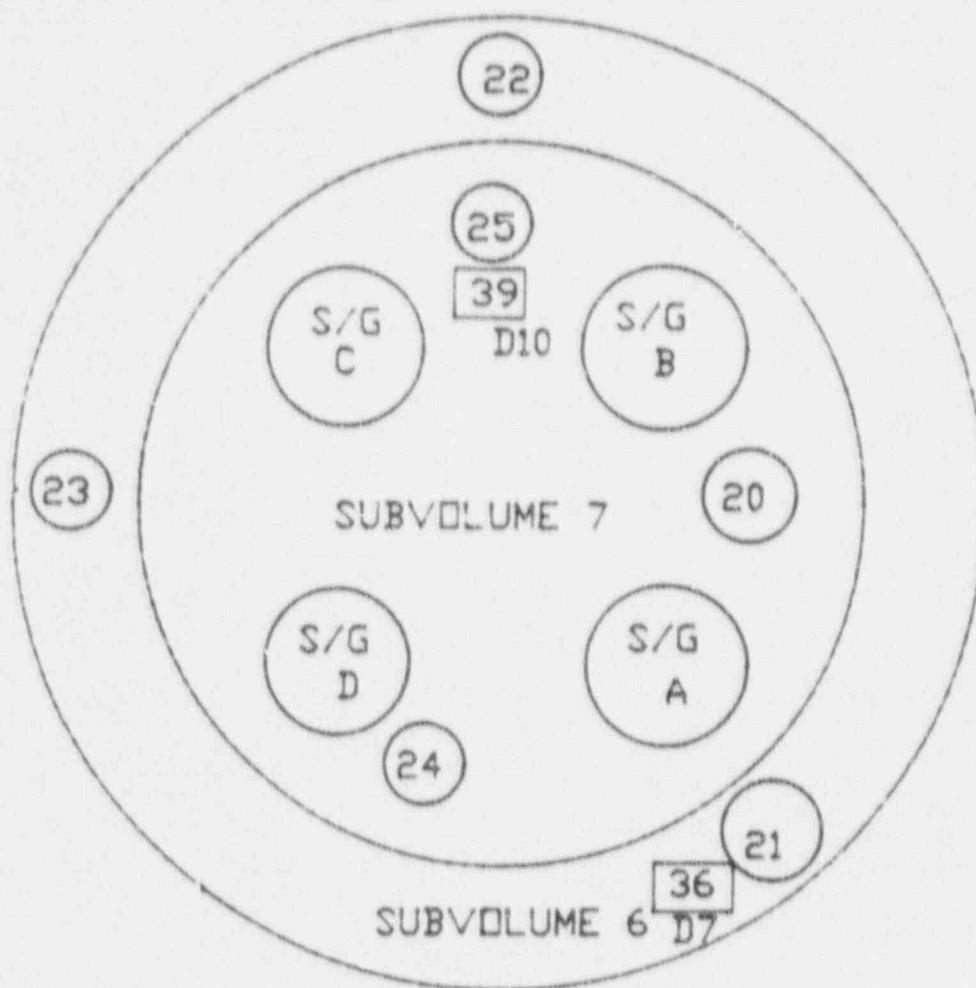
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2.5.1

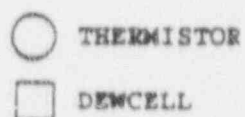
Containment Building Sensor Placement and Subvolume Identification (Elevation View)

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Subvolume 6: 154,567.28 ft³, 5.594%

Subvolume 7: 123,668.76 ft³, 4.476%

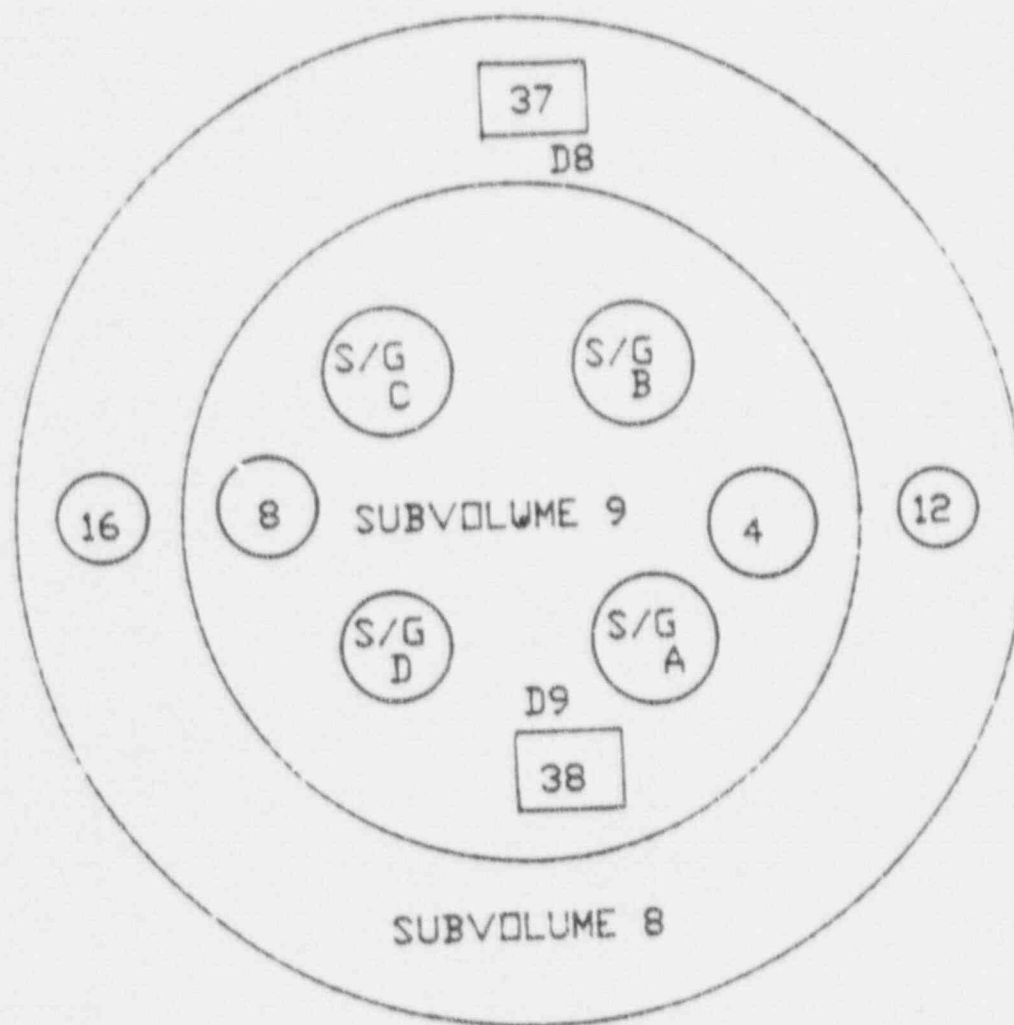


2.5.2

Containment Building Sensor Placement and Subvolume Identification for Elevations 398.5 to 426 (Plan View)

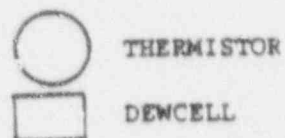
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Subvolume 8: 123,845.72 ft³, 4.37%

Subvolume 9: 96,688.24 ft³, 3.5%



2.5.3

Containment Building Sensor Placement and Subvolume Identification for Elevations 377 to 398.5 (Plan View)

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3.0 TEST METHOD

3.1 STATISTICAL ANALYSIS TECHNIQUE

The absolute method of leak rate determination was used. The absolute method uses the ideal gas laws to calculate the measured leak rate. The inputs to the measured leak rate calculation include subvolume weighted containment temperature and vapor pressure, and total absolute air pressure. Computational methods used the perfect gas law and equations of state for a twenty-four hour test period. A least squares regression line for the measured total time leak rates versus time since the start of the test is calculated after each new data set is scanned.

Associated with the statistically averaged leak rate was the upper confidence limit.

3.2 SUPPLEMENTAL VERIFICATION TEST

The supplemental verification test superimposes a known leak of approximately the same magnitude as L_a (7.72 SCFM or 0.1 wt %/day as defined in the Technical Specifications). The degree of detectability of the composite leak rate (containment calculated leak rate plus the superimposed, induced leak rate) provides the basis for determining the certainty associated with the measured leak rate phase of the test. As the Mass Plot Method was the official test method used, the induced leak rate test was performed in a period of time until the statistical leak rate was both stable and within the acceptable band. The acceptance criterion for the test is that the statistically averaged composite leak rate be within $\pm 0.25L_a$ of the sum of the statistically averaged ILRT leak rate and the flowmeter induced leak rate. The requirements are not to use the upper confidence limit to evaluate the acceptability of the induced leakage phase of the ILRT.

3.3 INSTRUMENT ERROR ANALYSIS

An instrument error analysis was performed prior to the test and at the end of the measured leak rate and induced leak rate phases of the test. The analysis was performed in accordance with the definition of the Instrument Selection Guide (ISG) referenced in ANSI/ANS-56.8-1987. The inputs to the calculation include sensor sensitivity, repeatability and resolution for the pressure sensors, THM's and dew cells. A mathematical formula employed to determine the ISG can be found in Appendix B.

The ISG was calculated prior to the start of the test using the existing instrumentation configuration and expected values for containment parameters. Based on an anticipated 24 hour duration test, the maximum expected value for the ISG was .0023 wt%/day. The calculated ISG was .00263 wt%/day at the end of the measured leak rate test, and .00257 wt%/day at the end of the induced leak rate test. These are all within the acceptance criterion of $0.25L_a$ specified in ANSI/ANS-56.8-1987.

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The ISG is used only to demonstrate the system's ability to measure the required parameters to calculate the containment leak rate. The ISG is not based on a statistical analysis of the leak rate calculations, and does not affect these calculations. The computed ISG is not added to the value of the calculated leak rate.

One sensor (Dew #5, DAS Channel #45) was deleted from all calculations prior to the test due to erratic response characteristics. The locking out of the sensor did not cause the ISG to rise above the allowable value. The remaining eight dew cell sensors sufficiently modeled the containment for calculation of a volume weighted dew temperature.

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4.0 SEQUENCE OF EVENTS

The following narrative describes the sequence of events associated with the ILRT.

4.1 PRETEST PREPARATION

02/02/91

1400 Commenced 1BwVS 6.1.2.a-1, initiated sequence of events log. Activities include verifying prerequisites and hanging out-of-services associated with data sheets for Section F.1.0.

02/10/91

2000 Satisfactorily completed 1BwVS 6.1.6.3-1, "Visual inspection of the containment surfaces prior to the Type A Leak Test". No apparent changes have occurred in the visual appearance of the interior and exterior surfaces of the containment structure.

4.2 CONTAINMENT PRESSURIZATION

02/11/91

0953 Valve lineups completed, all pre-pressurization checks complete. Commenced pressurization of containment.

2100 Inspection of appropriate penetrations produced observed leakage from the following system vent paths:

- 1) 1 SI8817 (slight)
- 2) 1 CS014A (slight)
- 3) 1 CS014B (slight)
- 4) 1 IA269 (small leak)

2220 Containment pressurization complete, following are observed conditions:

DAS #1 Pressure = 60.4073 psia,

DAS #2 Pressure = 60.4074 psia,

Ambient pressure = 14.43 psia.

Resultant Containment pressure information:

P₁=45.9773 psig

P₂=45.9774 psig

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4.3 TEMPERATURE STABILIZATION

02/12/91

- 0001 Commenced start of temperature stabilization period.
- 0615 Closed IW052A and IIA-269 to isolate leaks from containment.
- 1215 Closed the open duct access door to isolate containment leak from 1VQ001A and 1VQ001B.
- 2330 Closed ISI8817 to isolate containment leak from ISI8880 and ISI8946.
Closed ICS14A to isolate containment leak from ICS007A and ICS0008A.

02/13/91

- 0840 Pressurized between 1VQ001A and 1VQ001B through the use of a calibrated local leak rate monitor.
- 0900 Equipment hatch airlock shaft seal leakage observed, leakage blocked.
- 0915 Pressurized between ICS007A and the auxiliary building boundary valves through the use of a calibrated local leak rate monitor.
- 1251 Opened IIA269 to unisolate previously observed leak from containment.
- 1410 Verified temperature stabilization phase complete. Calculated temperature deviation using the ANSI temperature stabilization criteria using data sets 288 through 312 is 0.01935 °F/hour.

4.4 STATISTICAL LEAKAGE RATE TEST/INDUCED LEAKAGE TEST

02/13/91

- 1410 Commenced statistical leak rate test with data set 321.
- 2010 Prime computer failure, apparently happened due to power surge. Computer did not collect 20:05 and 20:15 data sets. Resumed collecting data with data set 356 at 20:25:24. Reviewed trends of average temperature, average pressure and average dew temperatures for data sets 357 to 260, no adverse trends noted.

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02/14/91

- 1505 Completed statistical leak rate test with data set 468.
- 1505 Commenced induced leak rate stabilization period with data set 468.
- 1535 Completed induced leak rate stabilization period with data set 471.
- 1905 Completed induced leak rate test with data set 492.

4.5 DEPRESSURIZATION AND POST-TEST ACTIVITIES

02/14/91

- 2058 Commenced depressurization of the containment.

02/15/91

- 1200 Containment depressurized, inner door opened to facilitate post test containment inspection.
- 1900 Post test inspection satisfactory. No observable damage to equipment or containment structure has occurred, no abnormal conditions exist. ILRT instrumentation visually inspected, no abnormal conditions noted. Restoration of system valve lineups and local leakrate testing commencing.

03/05/91

- 1400 Completed 1BwVS 6.1.2.a-1.

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5.0 ILRT DATA

A temperature survey of the containment was performed prior to the pressurization of the containment. Each subvolume was surveyed in at least one location with a maximum of three temperatures taken per subvolume.

<u>SUBVOLUME NUMBER</u>	<u>OBSERVED TEMPERATURE</u>		
1	63.9	63.8	63.9
2	64.5		
3	65.6		
4	65.6		
5	65.9	65.9	66.0
6	65.9	65.4	65.6
7	64.5	64.2	65.0
8	67.6	67.9	67.8
9	64.5	64.2	65.0

The following report sections present computer data for the three main sections of the ILRT.

5.1 TEMPERATURE STABILIZATION PHASE DATA

The temperature stabilization phase demonstrated proper temperature stability prior to the beginning of the test. The thermal parameters are graphically shown in Figures 5.1.1 and 5.1.2. A summary of the computer data can be found in Appendix C.

5.2 MEASURED LEAK RATE PHASE DATA

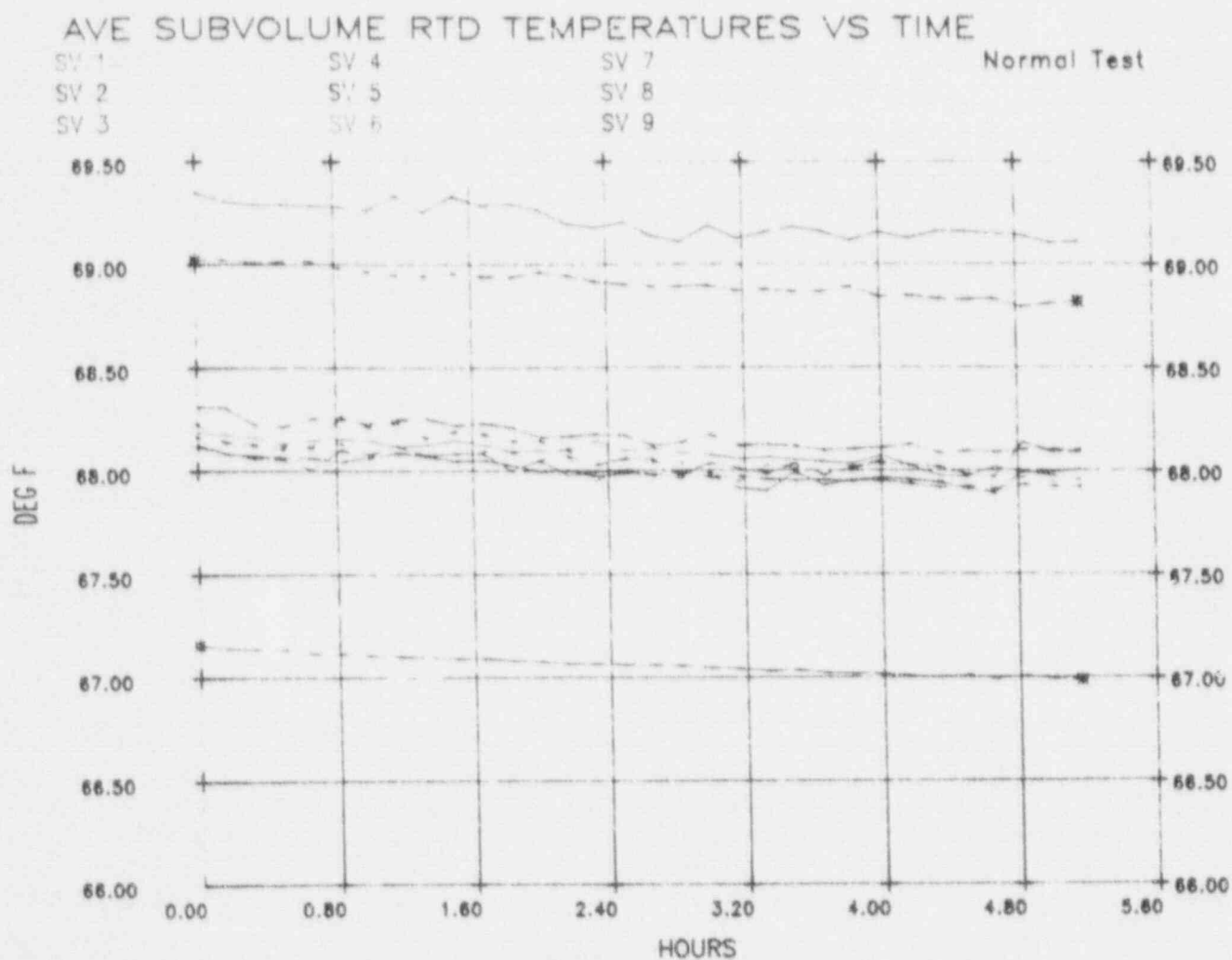
Graphic results of the measured leak rate test are found in Figures 5.2.1 through 5.2.7. A summary of the computed data using the Mass Plot Method can be found in Appendix D.

5.3 INDUCED LEAKAGE PHASE DATA

The calculated leakrate and target value leak rates associated with the induced leakage test are shown in Figure 5.3.1. Containment conditions during this phase of the test are shown in Figures 5.3.2 through 5.3.6. A summary of the Induced Leakage Phase data of the ILRT can be found in Appendix E.

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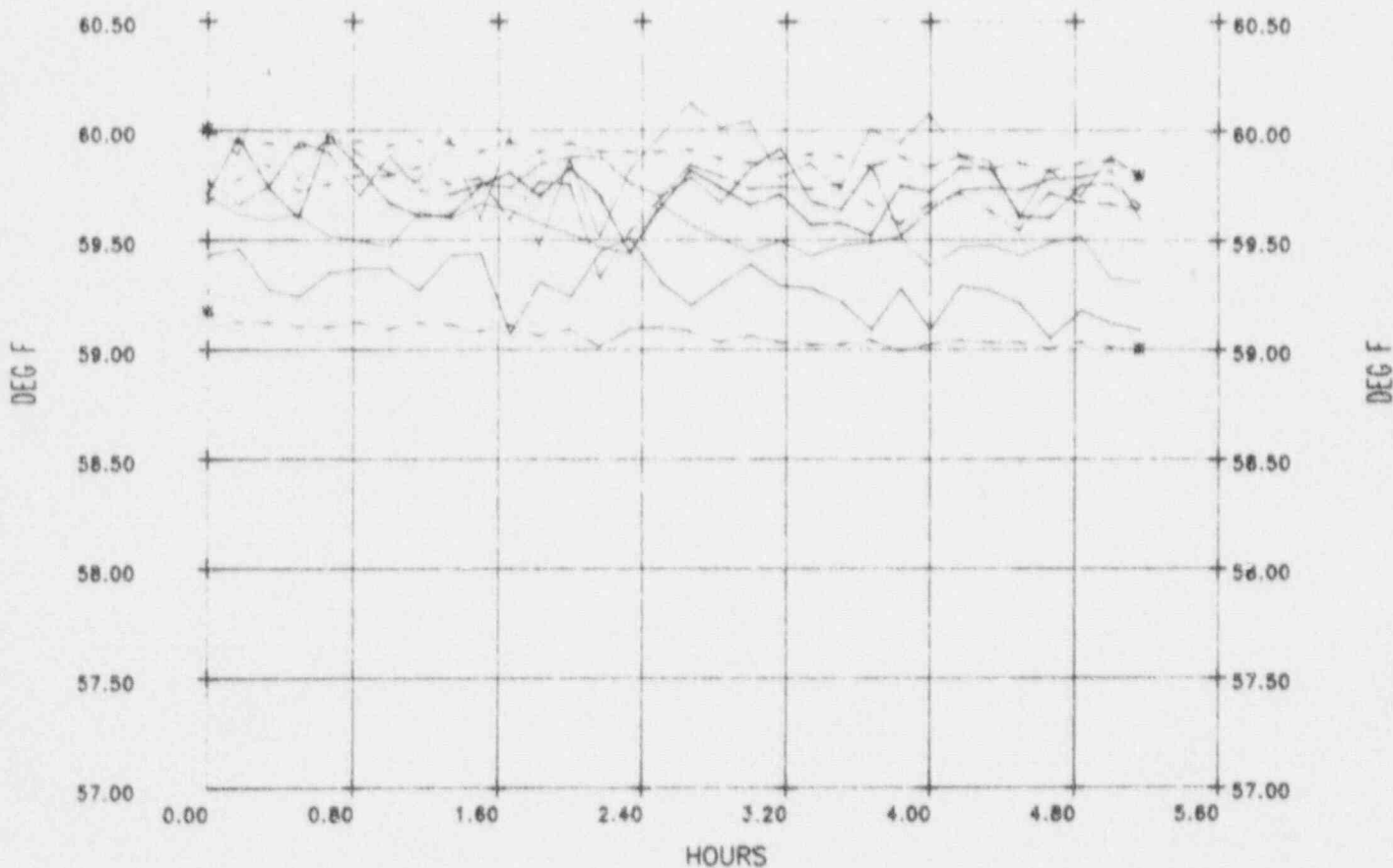
STARTING PLOT TIME: FEBRUARY 13 9:05

5.1.1 Average Subvolume Temperature, Stabilization

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AVE SUBVOLUME DEWCELL TEMPERATURES VS TIME

SV 1 SV 4 SV 7 Normal Test
SV 2 SV 5 SV 8
SV 3 SV 6 SV 9



STARTING PLOT TIME: FEBRUARY 13 9:05

5.1.2 Average Subvolume Dewcell Temperature, Stabilization

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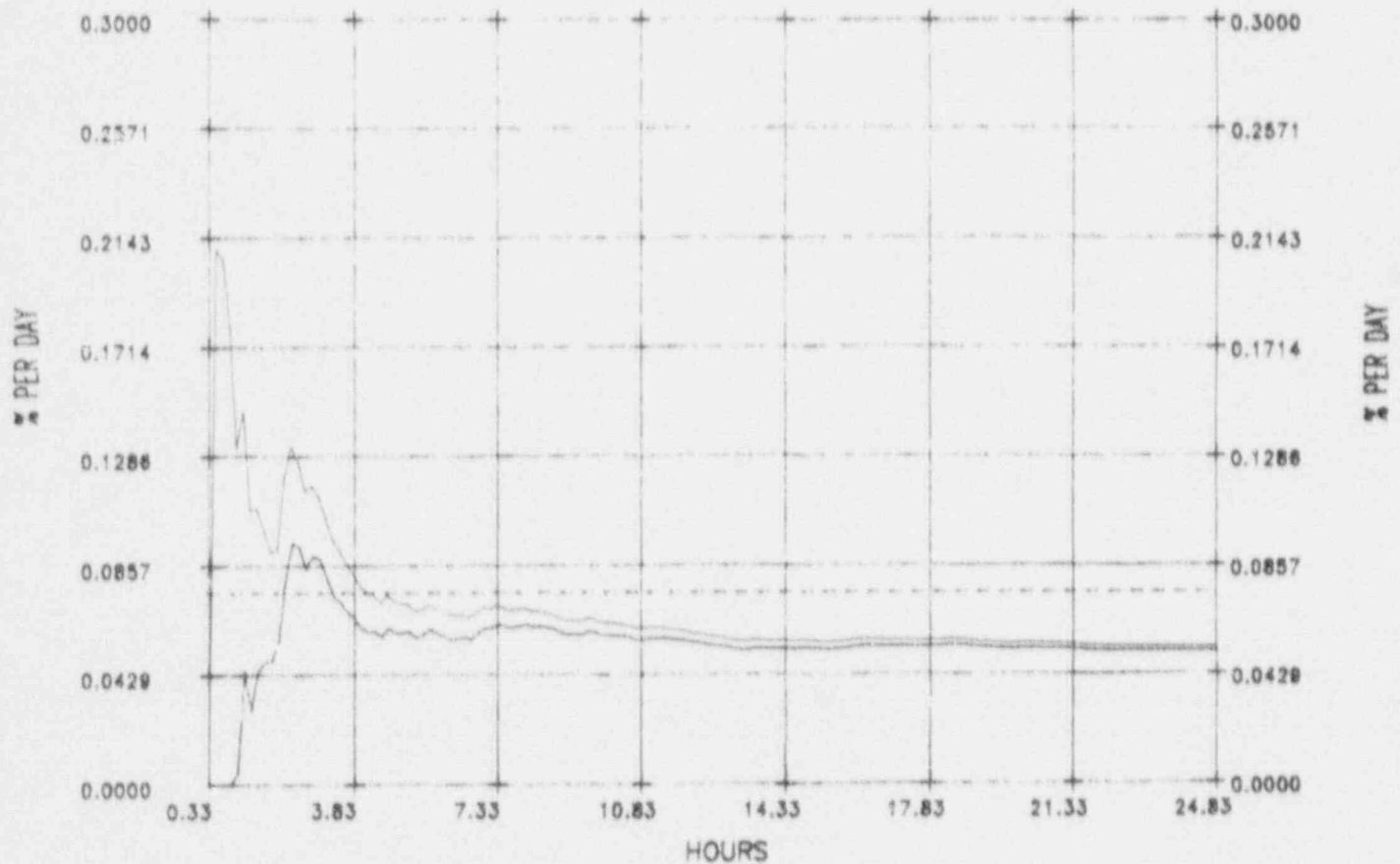
MASS PLOT LEAKRATES VS TIME

CALCULATED LEAK RATE

95 % UPPER CONFIDENCE LIMIT

Normal Test

Allowed Leak Rate



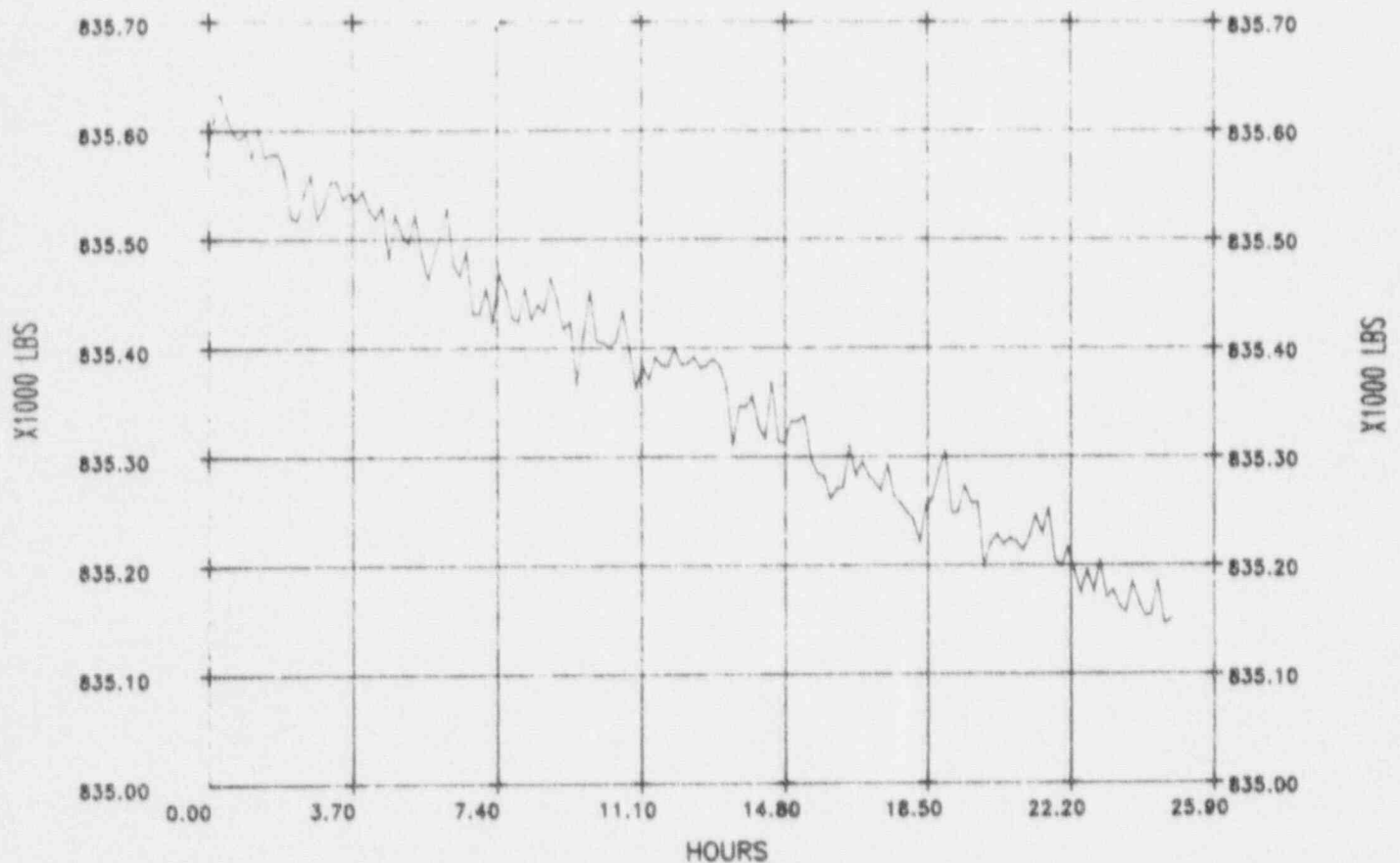
STARTING PLOT TIME: FEBRUARY 13 14:15

5.2.1 Mass Plot Leakrate-Statistical Test

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CONTAINMENT DRY AIR MASS VS TIME

Normal Test



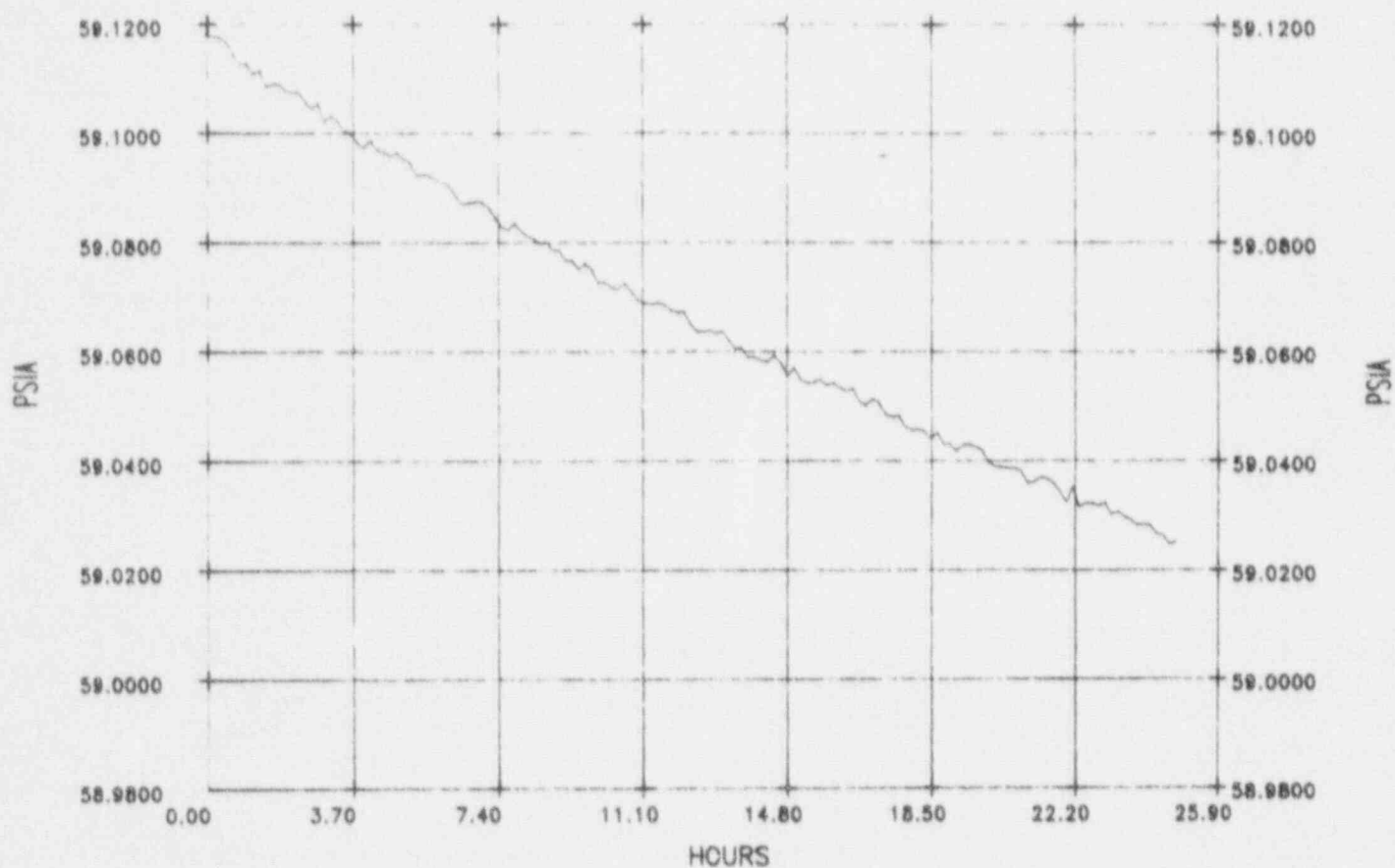
STARTING PLOT TIME: FEBRUARY 13 14:15

5.2.2 Containment Dry Air Mass-Statistical Test

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CONTAINMENT DRY AIR PRESSURE VS TIME

Normal Test



STARTING PLOT TIME: FEBRUARY 13 14:15

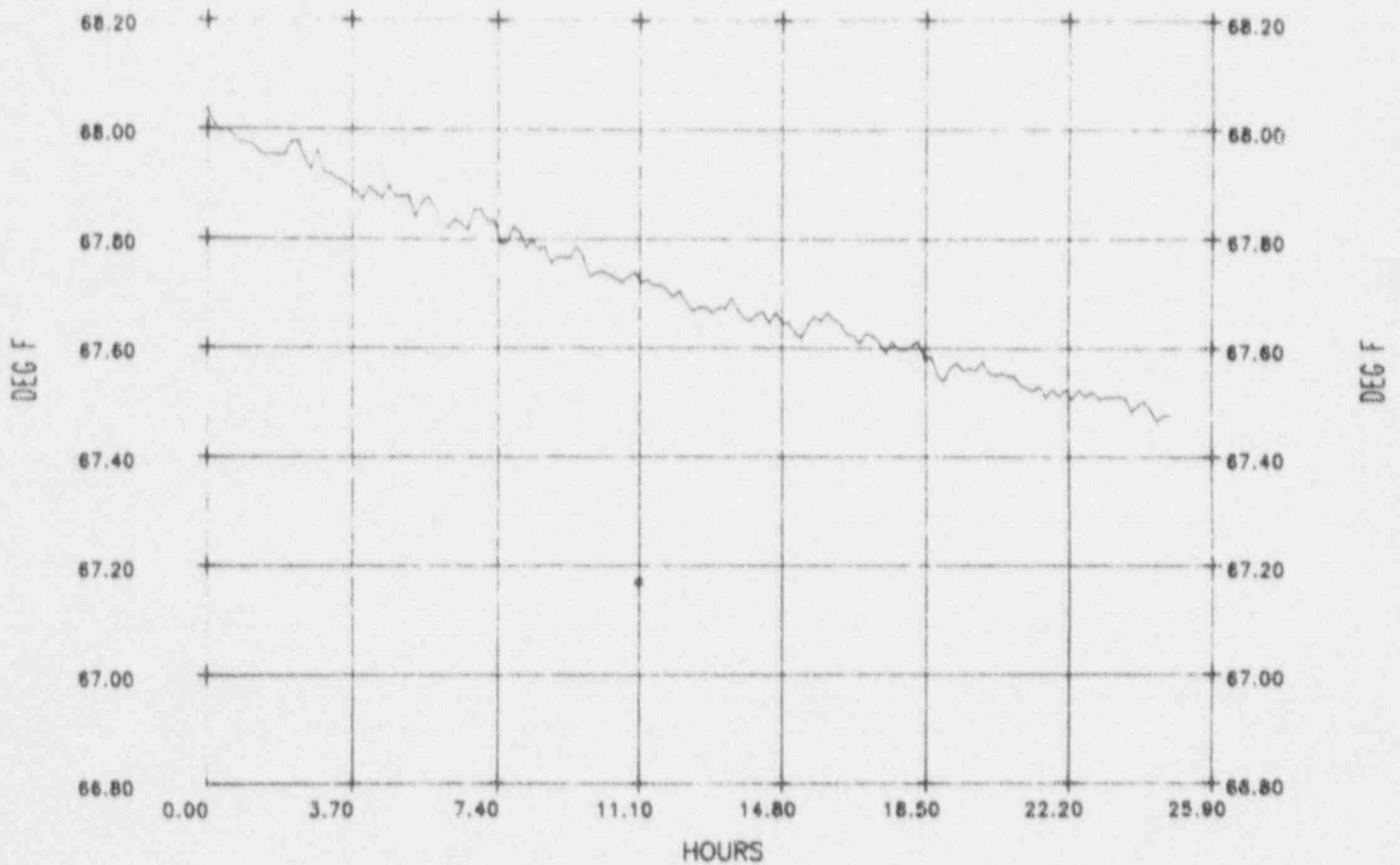
5.2.3

Containment Dry Air Pressure-Statistical Test

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CONTAINMENT AIR TEMPERATURE VS TIME

Normal Test



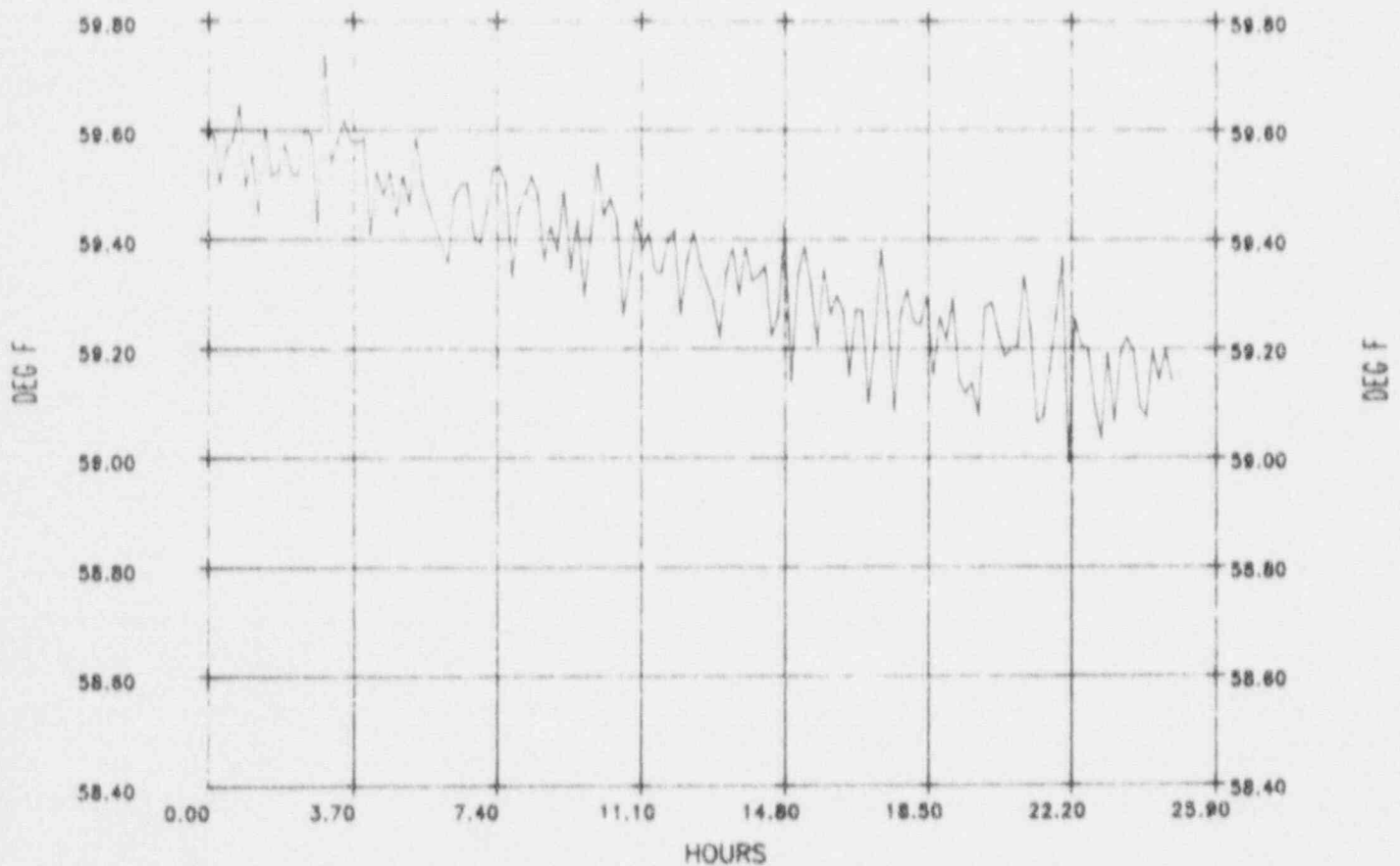
STARTING PLOT TIME: FEBRUARY 13 14:15

5.2.4 Containment Air Temperature-Statistical Test

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CONTAINMENT DEWCELL TEMPERATURE VS TIME

Normal Test



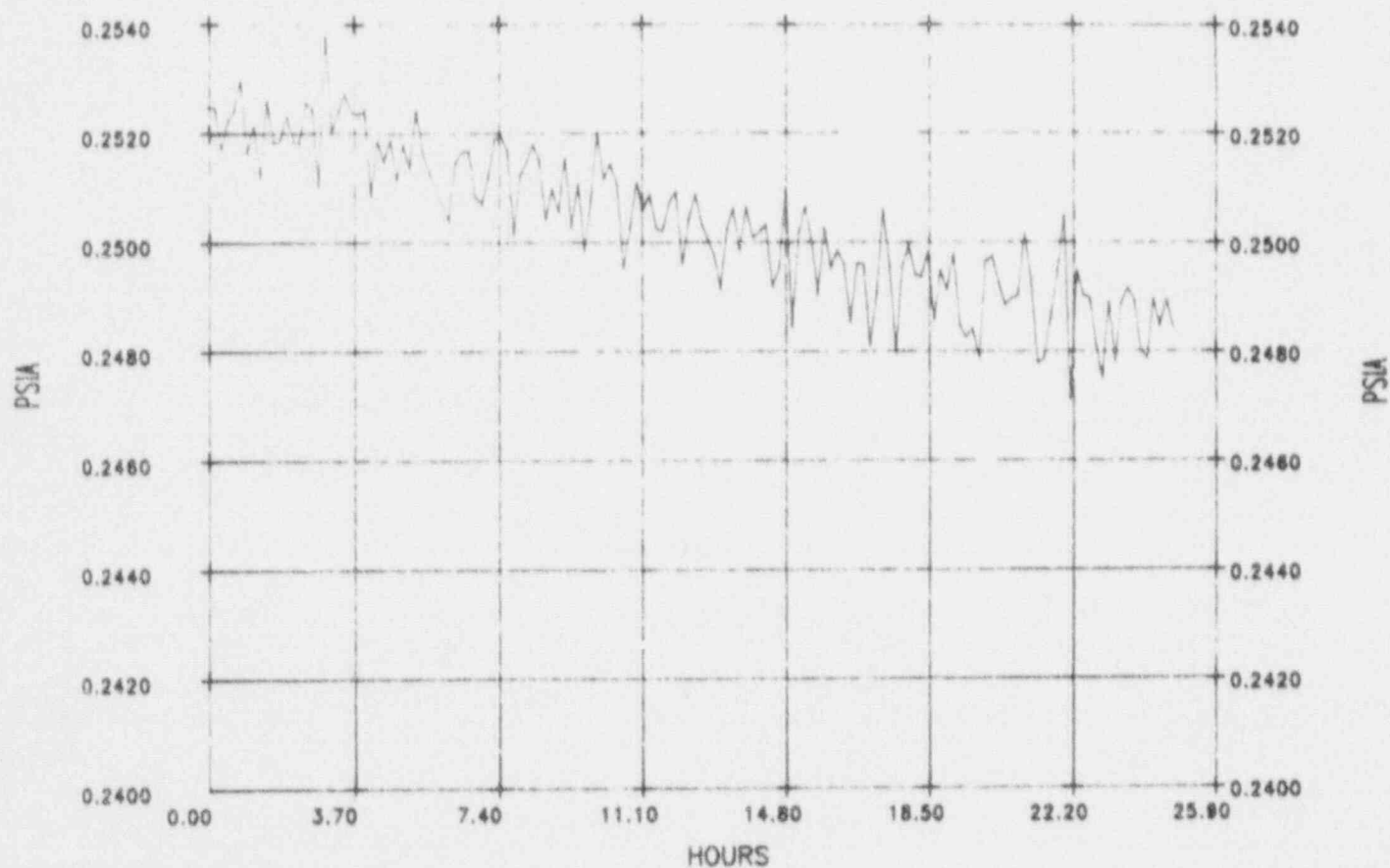
STARTING PLOT TIME: FEBRUARY 13 14:15

5.2.5 Containment Dewcell Temperature-Statistical Test

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CONTAINMENT VAPOR PRESSURE VS TIME

Normal Test



STARTING PLOT TIME: FEBRUARY 13 14:15

5.2.6 Containment Vapor Pressure-Statistical Test

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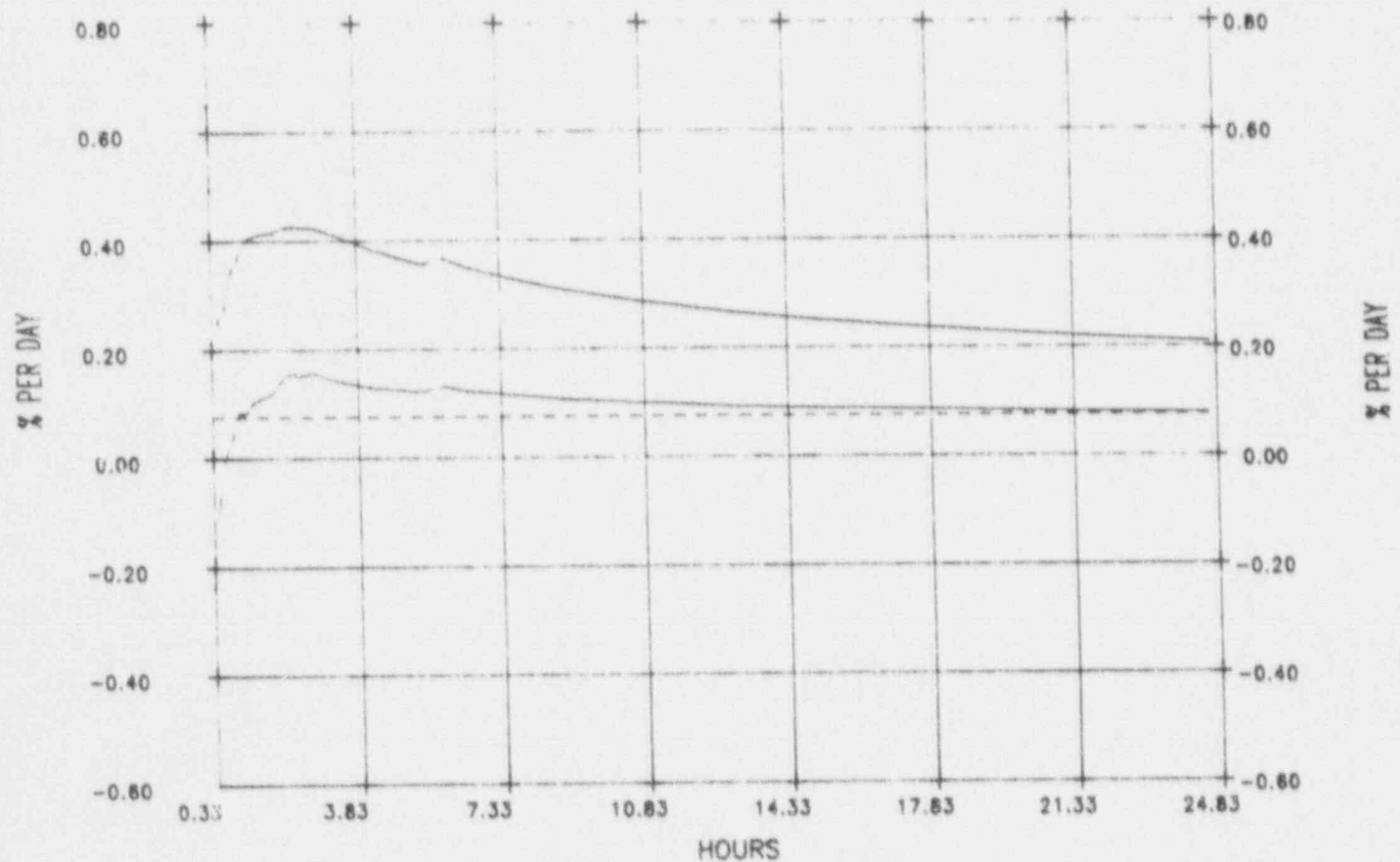
BN-TOP-1 LEAKRATES VS TIME

CALCULATED LEAK RATE

95 % UPPER CONFIDENCE LIMIT

Normal Test

Allowed Leak Rate

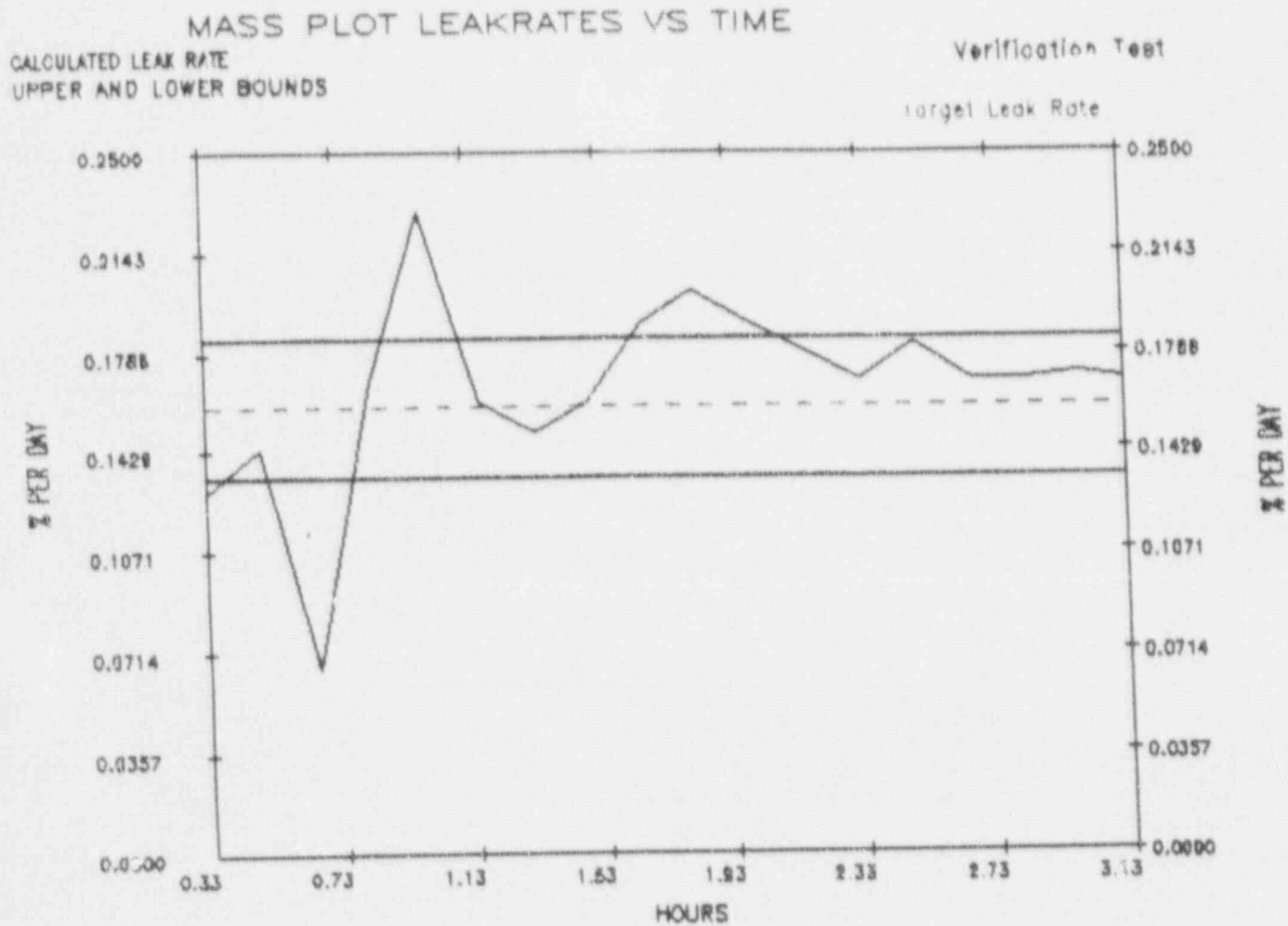


STARTING PLOT TIME: FEBRUARY 13 14:15

5.2.7

BN-TOP-1 Leakrates-Statistical Test (Information Only)

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SOFTWARE ID NUMBER: GN01405-0.0

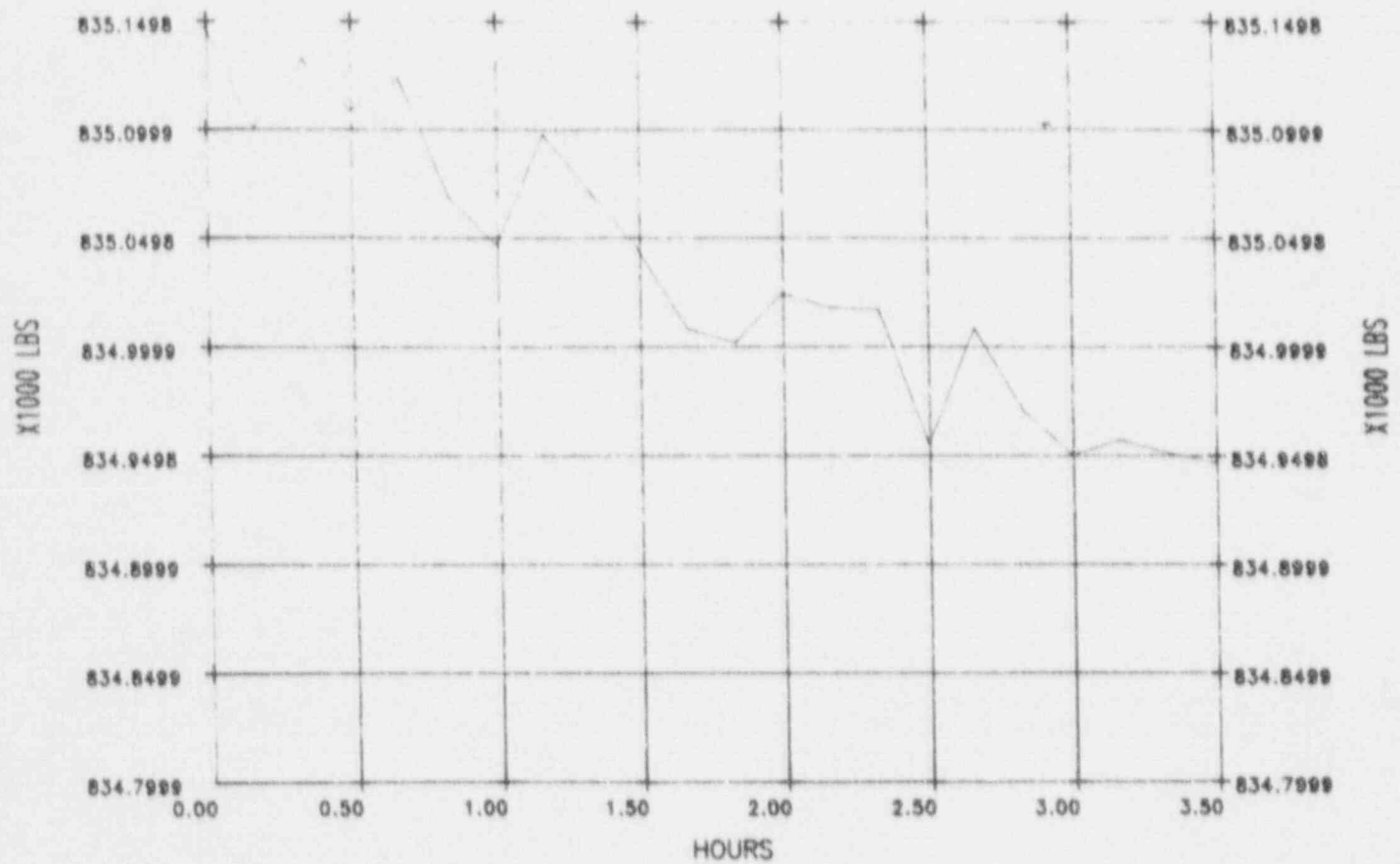
5.3.1 Mass Plot Leakrates-Verification Test

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CONTAINMENT DRY AIR MASS VS TIME

Normal Test



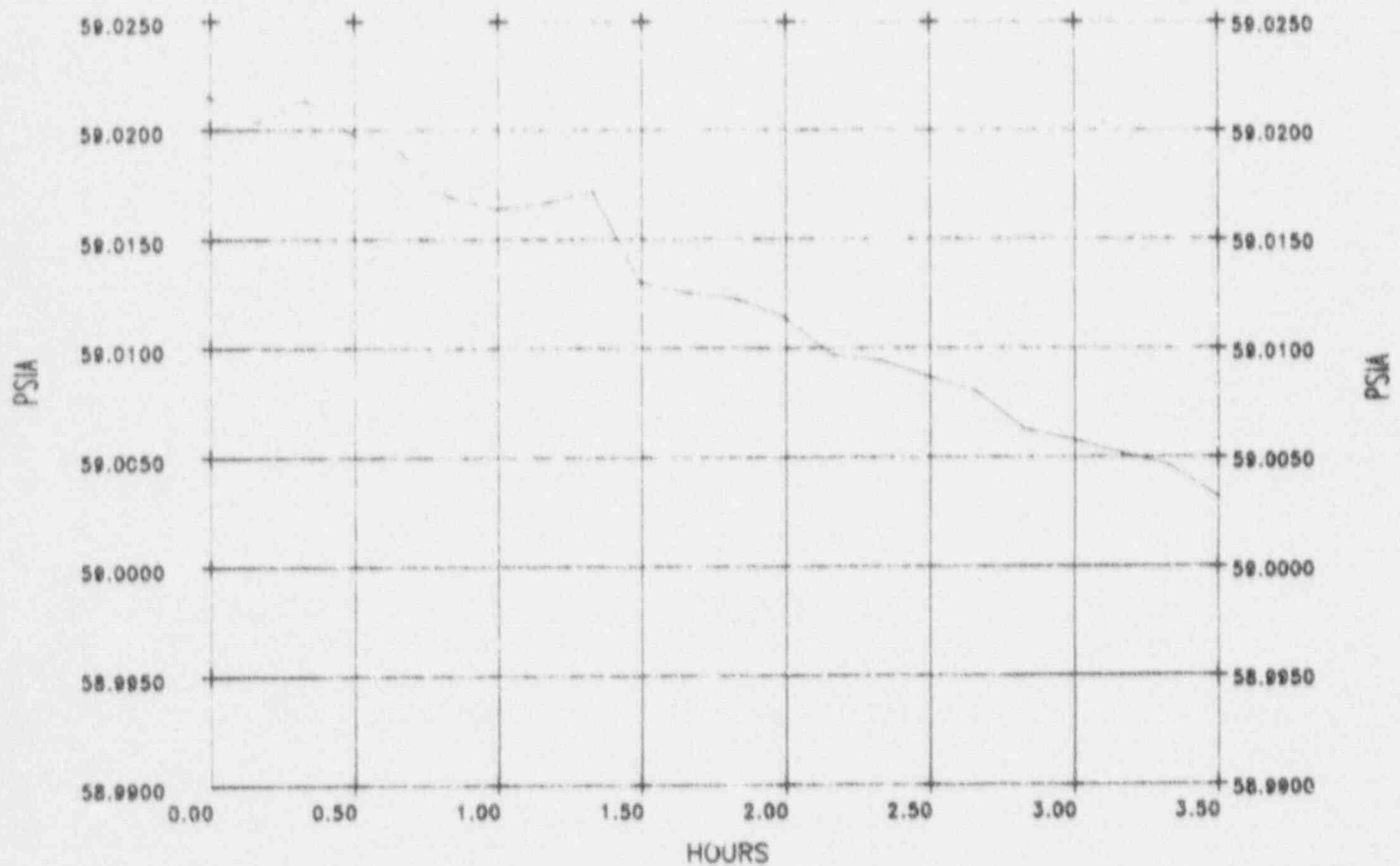
STARTING PLOT TIME: FEBRUARY 14 15:35

5.3.2 Containment Dry Air Mass-Verification Test

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CONTAINMENT DRY AIR PRESSURE VS TIME

Normal Test



STARTING PLOT TIME: FEBRUARY 14 15:35

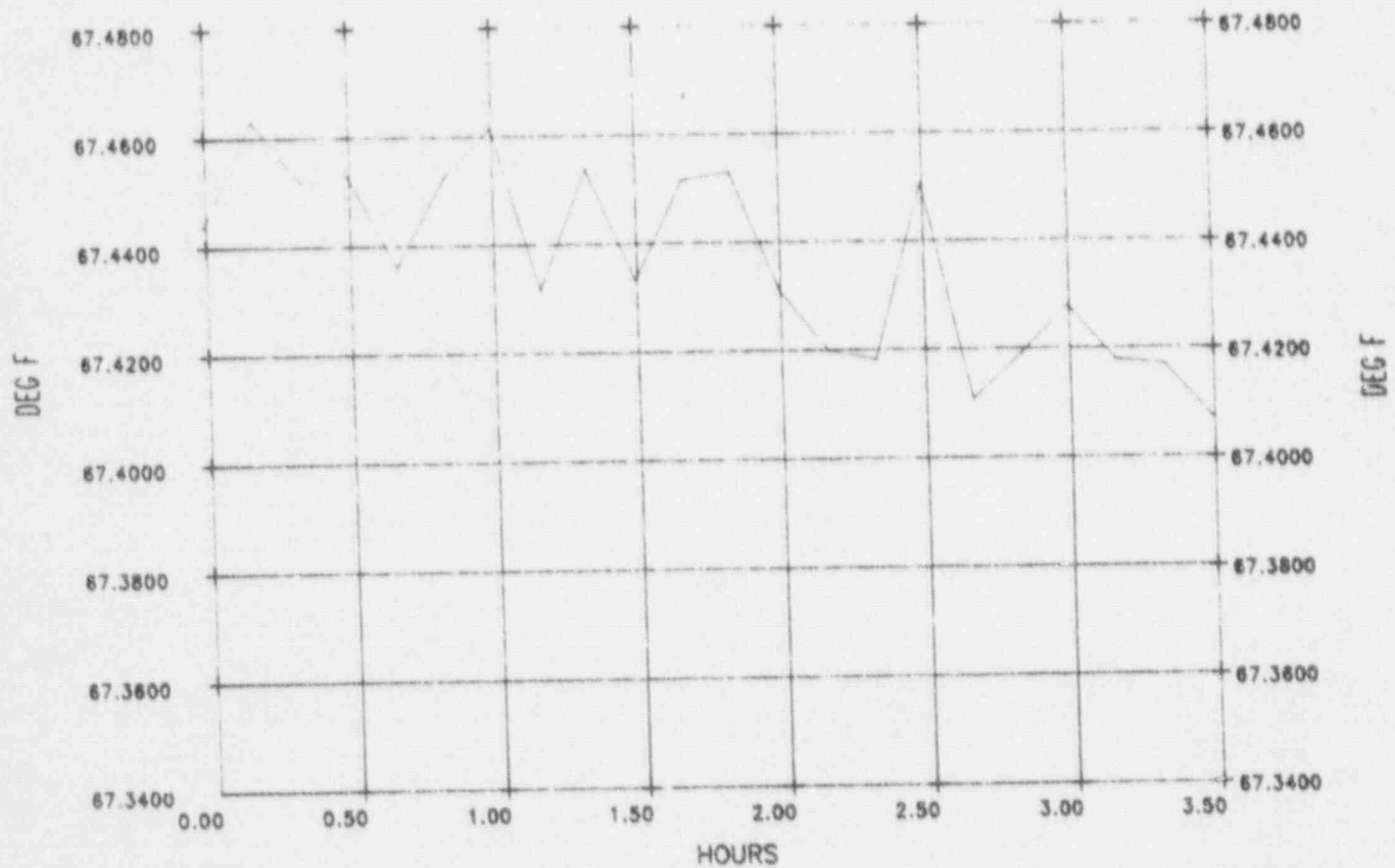
5.3.3 Containment Dry Air Pressure-Verification Test

March 8, 1991

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CONTAINMENT AIR TEMPERATURE VS TIME

Normal Test



STARTING PLOT TIME: FEBRUARY 14 15:35

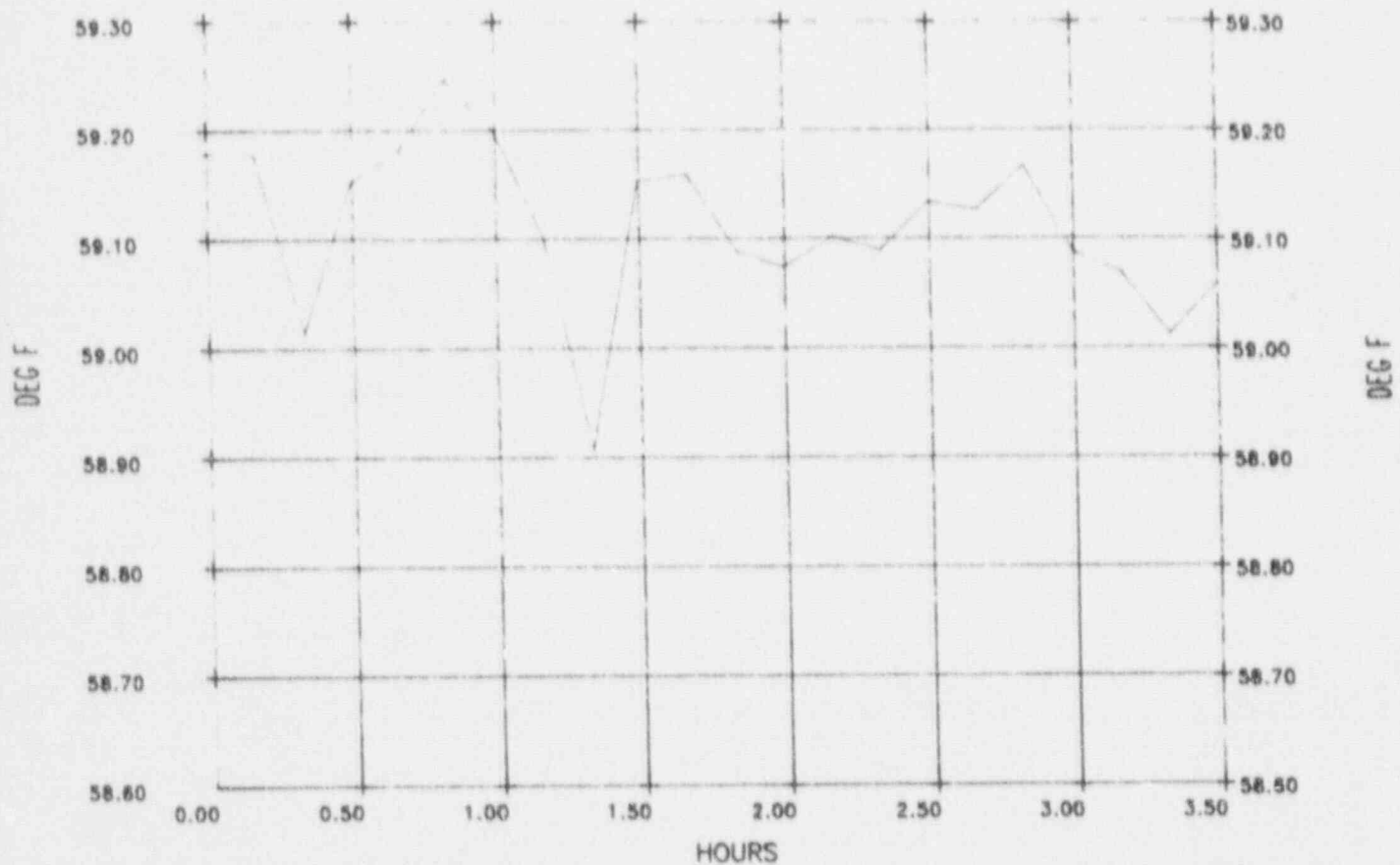
5.3.4 Containment Air Temperature-Verification Test

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CONTAINMENT DEWCELL TEMPERATURE VS TIME

Normal Test



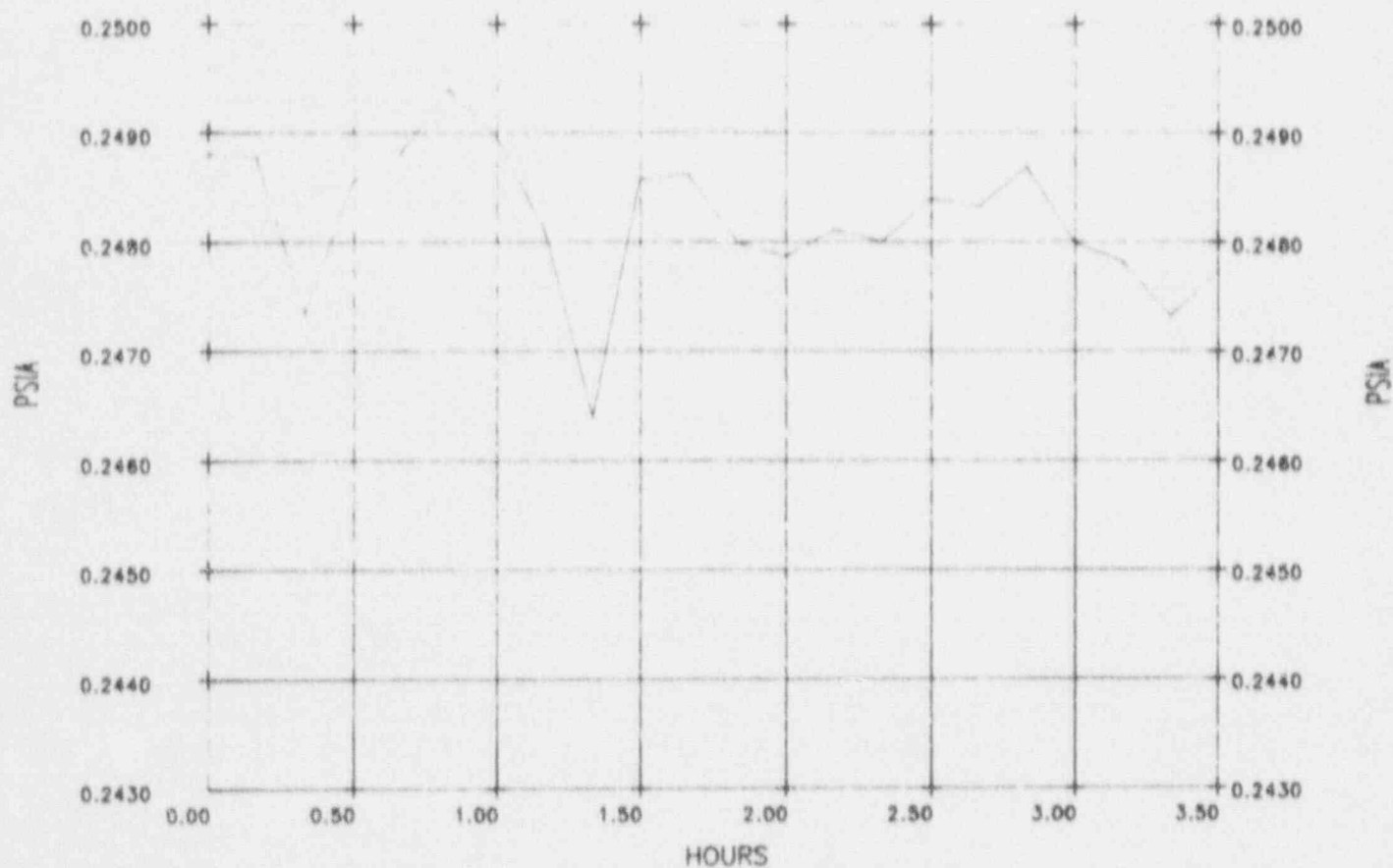
STARTING PLOT TIME: FEBRUARY 14 15:35

5.3.5 Containment Dewcell Temperature-Verification Test

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CONTAINMENT VAPOR PRESSURE VS TIME

Normal Test



STARTING PLOT TIME: FEBRUARY 14 15:35

5.3.6 Containment Vapor Pressure-Verification Test

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6.0 TYPE A TEST CORRECTIONS

During the Type A Test, there were penetrations that were not properly challenged by full containment pressure. Two of these penetrations (P-4, I-3) are in use during the performance of the ILRT. The other penetrations (5-Total) developed leakage paths from the containment prior to the beginning of the twenty-four hour statistical test. As discussed in Section Seven, these pathways remained isolated during the leak rate test. Because of this, a local leak rate test was performed either prior to or after the ILRT for each leakage path. The minpath leak rate was then calculated for each of these penetrations and added to the ILRT Test 95% UCL.

The total leakage to be added to the 'As Found' ILRT result is 13.18 SCFH or .0028 wt %/day. When added to the 95% UCL (0.05286 wt %/day), the final composite leakage rate is .0557 wt %/day. This leakage is acceptable being less than 0.75La. Appendix F provides leak rate correction data in tabular format.

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7.0 INTERPRETATION OF TEST RESULTS

7.1 MEASURED LEAK RATE TEST RESULTS

The "As Found"/"As Left" statistically averaged leak rate (95% UCL) after corrections was 0.0557 wt %/day.

Containment dry air temperature and dew cell temperature trended downward throughout the test. This is indicative of a stable containment with no major heat sources as the reactor coolant was kept constant throughout the test. Measured tank and containment sump levels were not significantly changed from pre-test to post test levels.

One instrument, (Dew cell #5, DAS channel 45) was locked out for the duration of the test.

During pressurization a number of leakage paths were identified. The magnitude of leakage from these paths could not be quantified by visual observation, although they appeared to be small. It was decided to continue pressurization and measure the total containment leakage rate once at pressure and stable. Those later computer calculated results showed that the total containment leakage rate exceeded 0.75La with leakage from paths associated with penetrations P-1, P-97, P-55 and P-6/10 (see Section 7.1.2).

One by one, the leakage paths were isolated and the effects upon the total containment leakage rate were observed. The data shows that isolation of the first four leakage paths had a noticeable but small effect upon the total containment leakage. It was only after isolation of an additional leakage path, the equipment airlock shaft seals (see Section 7.1.1), did the total leakage rate sharply drop to a value under 0.75La.

The test was then successfully continued until completion. The previously isolated pathways were left isolated during the entire test. A Minimum Pathway As Found penalty was later assessed for each of these pathways.

It is CECO's policy to Type A test containments in as close to the Post LOCA condition as possible. The pathways were left isolated in this case for the following reasons.

For all cases, there were no direction dependency concerns. The leakages measured by the Type C tests performed after the Type A test can in all cases clearly be shown to yield results conservative relative to what would have been their actual contributions had they remained open during the Type A test.

The cumulative effect of suddenly opening all of these pathways may have had the effect of destabilizing the containment atmosphere. This would have both extended the test duration and reduced the quality of the results.

It is always desirable to minimize the number of valve manipulations during ILRTs. This reduces the potential for line up errors and other unforeseen problems.

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7.1.1 Observed Leakage from the Equipment Hatch Airlock Shaft Seal

Prior to the performance of the statistical leak rate test, during the temperature stabilization period, leakage was observed from the Equipment Hatch airlock shaft seal. The leakage was evident, as during the test the hatch is aligned with the interior door closed and the exterior door open to facilitate inspection of the seals. This was the last containment barrier to be isolated. It was only after these seals were blocked that the ILRT leakage dropped below 0.75La.

The airlock had been As Found tested following the start of the refueling outage, prior to performance of the Type A test. That test showed the leakage to be small. It should be noted that the Type A test was performed with the outer door open. This door is closed during the Type B test. The leakage found during the Type A test was all from the inner door.

The Type B test results indicate that under Post LOCA conditions, any leakage past the inner door would be stopped by the outer door. Thus, the minimum pathway leakage calculations of this pathway is not affected by the leak or the isolation of the leak from the inner door. Thus, no penalty is required to be added to the ILRT results as a result of this isolation though it was added as a result of CECO's conservative approach to ILRT testing.

The discrepancy between the results of the Type B test performed on the airlock prior to the Type A test and the results observed during the Type A test require explanation. The shaft seals may have been damaged following the Type B test at the start of the outage. Alternately, the Type B test may not adequately test the inner door due to possible direction dependency of leakage through the shaft seals.

It must be noted that the outer door was challenged in the proper direction by the Type B test performed prior to the Type A test. The problem of recurring inner airlock door shaft seal leakages is currently being investigated by CECO corporate maintenance staff, with the intent of preventing recurrence at any CECO station.

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7.1.2 Observed Leakage from Mechanical Piping Penetrations

Prior to the performance of the statistical leak rate test, during the temperature stabilization period, four lines penetrating the containment wall were identified as having excessive leakage. The following information applies to the identified lines:

ITEM NUMBER	SYSTEM	PENETRATION NUMBER	CONTAINMENT ISOLATION VALVES TESTED	VENT PATH	REFERENCE DRAWING
1.	CS	P-1	1CS007A 1CS008A	1CS014A	M-46-1C
2.	VQ	P-27	1VQ001B 1VQ001A	Open duct access door	M-105-1
3.	SI	P-55	1SI8880 1SI8946	1SI8817	M-61-1
4.	W	P-6	1W0006A 1W0007A	1W052A	M-118-4/5
		P-10	1W0006B 1W0007B	1W052A	M-118-4/5

Upon the identification of the leakage the associated vent path was closed and the effect on the containment leakage rate was observed by plant personnel.

7.1.2.1 CS and VQ Penetrations

Upon isolating the CS and VQ piping penetrations the calculated leakrates did not decrease significantly. Indeed there appeared that upon isolating the first two paths that leakage from the containment decreased and then again started to increase after a short period of time. This lack of reduction of leakage rate was thought to be due to the time required for the space between the valves to equalize with containment pressure.

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The Commonwealth Edison Corporate ILRT coordinator (J. Glover) was consulted. Through discussion between Mr. Glover and station personnel a temporary procedure change was proposed to permit the following conditions on the affected penetration lines.

1. The CS line was pressurized through the use of a local leak rate monitor (LRM) instrument between valve 1CSG07A and the established auxiliary building boundary valves. At no time was the piping volume pressurized by the LRM to a pressure greater than the containment. Hourly logging was added to the ILRT procedure to determine both pressures inside the containment and inside the pressurized VQ piping volume. The observed differential between the two pressurized volumes could then be determined for the test duration. Minimum differential pressure between the containment and the pressurized space was 2.2 psia for the duration of the statistical leak and induced leak test. This arrangement allowed the inner space near the containment wall to nearly reach containment pressure, and thus the containment leakage rate from other sources could be quantified. The penetration was considered to not be properly challenged during the test and was scheduled for post ILRT Local leakage rate testing.
2. The VQ line was pressurized through the use of a local leak rate monitor instrument between valves 1VQ001B and 1VQ001A. At no time was the pressurized volume pressurized greater than the containment. Hourly logging was added to the ILRT procedure to determine both pressures inside the containment and inside the pressurized VQ piping volume. The observed differential between the two pressurized volumes could then be determined for the test duration. Minimum differential pressure between the containment and the pressurized space was 2.2 psia for the duration of the statistical leak and induced leak test. This arrangement allowed the inner space near the containment wall to nearly reach containment pressure, and thus the containment leakage rate from other sources could be quantified. The penetration was considered to not be properly challenged during the test and was scheduled for post ILRT Local leakage rate testing.

The procedure change was prepared and Mr. F. Mora of Region III was consulted. Based upon his recommendation a procedure change was initiated. After these piping volumes were nearly equalized with containment pressure, no large change in leakage rate could be seen on the computer.

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7.1.2.2 SI and WO Penetrations

Upon isolating the SI and WO penetrations no abnormal oscillations were observed in mass plot leakage rate. These penetrations were then considered to not be properly challenged during the test and were also scheduled for post ILRT local leakage rate testing.

7.2 SUPPLEMENTAL VERIFICATION TEST RESULTS

The supplemental/verification test was performed following the 24 hour mass plot leak rate test. The starting data set was number 468. After a thirty minute stabilization period (allowed because of the Mass Plot Method used in the previous test) the induced leakrate test commenced and was completed at 1535 with data set 471. The statistically averaged composite leak rate was verified to be stable and within $\pm 0.25\text{La}$ of the sum of the statistically averaged measured leak rate and the average flowmeter induced leak rate. No abnormal containment response or significant events occurred during this test.

7.3 COMPARISON TO PREVIOUS TEST RESULTS

This was the second ILRT performed at Braidwood Unit 1. The previous test was the pre-operational ILRT performed on 05/21/86 to 05/29/86.

7.3.1 Pre-Operational Measured Leak Rate Test Results (1986 ILRT)

The statistically averaged containment leakage rate (Lam - weight percent per 24 hours) during the 1986 test was $0.0292\%/day$ after 24 hours and 96 data sets. The 5% upper confidence limit of the containment leakage rate, L_{ucl} was $0.033\%/day$. With no Reactor Containment Fan Coolers producing heat, the containment building cooled during the test resulting in a downward trend of the containment average pressure and temperature plots. The plot of containment leakage was well below the allowable limit and at the termination of the test was still decreasing.

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7.3.2 Pre-Operational Supplemental Verification Test Results (1986 ILRT)

The statistically averaged composite leakage rate (Lc) during the 1986 test was 0.111%/day after 5.75 hours and 69 data sets. This was within 0.25 of La of the sum of the statistically averaged full pressure leakage rate and the average flowmeter induced leakage rate.

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Appendix A - INSTRUMENTATION SPECIFICATIONS

A.1

Data Acquisition System, Volumetrics A-100

A/D Conversion:	Dual slope integration 16 BIT A/D 202 sample per second conversion factor
Display:	5+Digit, Polarity, Decimal & Legend.
Sampling Rate:	10 channels/second
Common Mode Rejection:	DC-140 db, 1000 ohm unbalance AC -140 db at 50-60 hz
Normal Mode Rejection:	80-db
Input Impedence:	1000 megaohms/volt
Ambient Temp Range:	32-125 deg. F
Zero Offset:	Recalibrate before each reading automatically
Full Scale Temp Compensation:	± 5 PPM/C or 0.005%/C
Accuracy:	$\pm 0.005\%$ F.S., $\pm 0.0-05\%$ of reading at 25 deg C with $\pm 10\%$ AC Power variation
Time Accuracy:	± 1 minute/24 hours
Time Resolution	1 second

A.2

Dry Bulb Temperature

Number of sensors:	25
Type of sensor:	Thermistor, Glass encapsulated YSI Model 46043
Configuration	3 wire
Accuracy: 55-135 deg F	± 0.25 deg F
Repeatability:	± 0.01 deg F
Resolution:	0.1 deg F

A.3

Dew Point Temperature

Number of sensors:	10
Type of sensor:	Lithium Chloride
Configuration:	5 wire
Range:	40 - 100 deg F dew temperature
Accuracy:	± 1.5 deg F
Repeatability:	± 0.5 deg F
Resolution:	0.1 deg F

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A.4 Pressure

Number of sensors:	2
Type of sensor:	Precision Pressure Monitor (Solid State Electronic)
Manufacturer:	Volumetrics, Inc.
Range:	0 - 100 psia
Accuracy:	+0.02% of reading
	+0.005 psig
Repeatability:	+0.001 psia
Sensitivity:	+0.001 psia
Resolution:	0.0001 psia

A.5 Verification Flow System

Number of sensors:	1
Type of sensor:	Rotometer
Range:	0 - 10 SCFM
Accuracy:	± 1% F.S.
Corrections:	Corrected for temperature and discharge pressure
Hardware:	Metering valve

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Appendix B - STATISTICAL ANALYSIS METHODS

Total Time Calculations

This method calculates the rate of change with respect to time of dry air mass using the Total Time Method.

Initially, a reference time (t_r) is chosen. For every data set the rate of change of dry air mass between t_r and the most recent time, t_i is calculated using the two point method shown below.

$$M_i = \frac{2400}{(t_i - t_r)} (1 - M_i/M_r)$$

Then the least squares fit and 95% UCL of the Total Time leakrates are calculated as shown below:

$$B = \frac{\sum M_i \sum (t_i)^2 - \sum t_i \sum M_i t_i}{N \sum (t_i)^2 - \sum t_i^2}$$

$$A = \frac{(N \sum t_i M_i - \sum t_i \sum M_i)}{N \sum (t_i)^2 - (\sum t_i)^2}$$

$$L = B + At$$

$$T = \frac{1.6559 (N-1) + 3.5283 + 0.85602/(N-2)}{(N-1) + 1.2209 - 1.5162/(N-2)}$$

Note: N is the number of data sets minus one.

$$F = \frac{1}{N} + \frac{(t_p - \sum (t_i) / N)^2}{\sum (t_i)^2 - (\sum t_i)^2 / N}$$

$$\sigma = \frac{F}{N} \sum (M_i)^2 - B \sum M_i - A \sum M_i t_i$$

$$UCL = L + T\sigma$$

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Calculation of Instrument Selection Guide, (ISG)

$$ISG = \frac{2400}{t} \left[\frac{2(e_p/p)^2}{N_p} + \frac{2(e_r/T)^2}{N_r} + \frac{2(e_d/p)^2}{N_d} \right]$$

where: t is the test time in hours

p is test pressure, psia

T is the volume weighed average cnmt. temp. °R

N_p is the number of pressure transmitters

N_r is the number of RTDs

N_d is the number of dew cells

e_p is the combined pressure transmitters' error, psia

e_r is the combined Rtds' error, °R

e_d is the combined dew cells' error, °R

$$e_p = (S_p)^2 + (RP_p + RS_p)^2$$

where: S_p is the sensitivity of a pressure transmitter

RP_p is the repeatability of a pressure transmitter

RS_p is the resolution of a pressure transmitter

$$e_r = (S_r)^2 + (RP_r + RS_r)^2$$

where: S_r is the sensitivity of an RTD

RP_r is the repeatability of an RTD

RS_r is the resolution of an RTD

$$e_d = -P_v T_d (s_d)^2 + (RP_d + RS_d)^2$$

where: S_d is the sensitivity of a dew cell

RP_d is the repeatability of a dew cell

RS_d is the resolution of a dew cell

$-P_v T_d$ = change in vapor pressure

$-T_v$ change in saturation temperature

The above ratio is from ASME steam tables and evaluated at the containment's saturation temperature at that time.

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Appendix C - TEMPERATURE STABILIZATION DATA

The following tables present the data for the temperature stabilization phase of the ILRT. The temperature stabilization phase is defined as data collected from data sets 290 to 321 inclusive. The following data is included:

TABLE	TITLE
C.1	Summary of Temperatures
C.2	Summary of Dew Cell Temperatures

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Table C.1

SUMMARY OF TEMPERATURES

***** SUMMARY TABLE OF TEMPERATURES *****

BRAIDWOOD UNIT 1 13:23:26 THU, 21 FEB 1991

DATA SET#	DATA TIME DAY HH MM SS	AVERAGE TEMP, (DEG F)	AVERAGE SUBVOLUME TEMPERATURES, (DEG F)										
			#1	#2	#3	#4	#5	#6	#7	#8	#9		
290	044 09:05:24	68.2	68.1	68.2	68.3	68.1	68.2	68.2	69.3	67.2	69.0		
291	044 09:15:24	68.2	68.1	68.1	68.3	68.1	68.1	68.2	69.3	67.1	69.0		
292	044 09:25:24	68.2	68.1	68.1	68.2	68.1	68.1	68.2	69.3	67.1	69.0		
293	044 09:35:24	68.2	68.1	68.1	68.2	68.1	68.1	68.1	69.3	67.1	69.0		
294	044 09:45:24	68.2	68.0	68.1	68.3	68.1	68.1	68.1	69.3	67.1	69.0		
295	044 09:55:24	68.2	68.1	68.3	68.3	68.0	68.1	68.2	69.3	67.1	69.0		
296	044 10:05:24	68.2	68.1	68.2	68.2	68.1	68.1	68.2	69.3	67.1	69.0		
297	044 10:15:24	68.2	68.1	68.2	68.2	68.1	68.1	68.1	69.3	67.1	68.9		
298	044 10:25:24	68.2	68.1	68.2	68.3	68.1	68.1	68.1	69.3	67.1	68.9		
299	044 10:35:24	68.2	68.1	68.2	68.2	68.0	68.0	68.2	69.3	67.1	69.0		
300	044 10:45:24	68.2	68.1	68.2	68.2	68.1	68.1	68.1	69.3	67.1	68.9		
301	044 10:55:24	68.1	68.0	68.1	68.2	68.0	68.1	68.1	69.3	67.1	68.9		
302	044 11:05:24	68.1	68.0	68.1	68.2	68.0	68.0	68.1	69.3	67.1	69.0		
303	044 11:15:24	68.1	68.0	68.1	68.2	68.0	68.1	68.1	69.2	67.1	68.9		
304	044 11:25:24	68.1	68.0	68.0	68.2	68.0	68.0	68.1	69.2	67.1	68.9		
305	044 11:35:24	68.1	68.0	68.1	68.2	68.0	68.0	68.1	69.2	67.1	68.9		
306	044 11:45:24	68.1	68.0	68.1	68.1	68.0	68.0	68.1	69.1	67.1	68.9		
307	044 11:55:24	68.1	68.0	68.0	68.1	68.0	68.0	68.1	69.1	67.1	68.9		
308	044 12:05:24	68.1	68.0	68.0	68.2	68.0	68.0	68.1	69.2	67.0	68.9		
309	044 12:15:24	68.0	67.9	68.0	68.1	68.0	67.9	68.1	69.1	67.0	68.9		
310	044 12:25:24	68.0	67.9	68.0	68.1	68.0	68.0	68.1	69.2	67.0	68.9		
311	044 12:35:24	68.1	68.0	68.0	68.1	68.0	68.0	68.1	69.2	67.0	68.9		
312	044 12:45:24	68.0	67.9	68.0	68.1	68.0	68.0	68.0	69.2	67.0	68.9		
313	044 12:55:24	68.0	68.0	68.0	68.1	67.9	68.0	68.0	69.1	67.0	68.9		
314	044 13:05:24	68.1	68.0	68.0	68.1	68.0	68.0	68.1	69.2	67.0	68.8		
315	044 13:15:24	68.0	68.0	68.0	68.1	67.9	67.9	68.0	69.1	67.0	68.8		
316	044 13:25:24	68.0	67.9	68.0	68.1	67.9	67.9	68.0	69.2	67.0	68.8		
317	044 13:35:24	68.0	67.9	68.0	68.1	67.9	68.0	68.0	69.2	67.0	68.8		
318	044 13:45:24	68.0	67.9	68.0	68.1	67.9	67.9	68.0	69.1	67.0	68.8		
319	044 13:55:24	68.1	68.0	68.1	68.1	67.9	68.0	68.0	69.1	67.0	68.8		
320	044 14:05:24	68.0	68.0	68.1	68.1	67.9	67.9	68.0	69.1	67.0	68.8		
321	044 14:15:24	68.0	68.0	68.1	68.1	67.9	67.9	68.0	69.1	67.0	68.8		

NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 45 IS LOCKED OUT FROM DSN 1

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TABLE C.2

SUMMARY OF DEW CELL TEMPERATURES

***** SUMMARY TABLE OF DEW TEMPERATURES *****

BRAIDWOOD

UNIT 1

11:57:21

WED, 13 MAR 1991

DATA SET#	DAY	TIME	DEW TEMP, (DEG F)	AVERAGE	SUBVOLUME TEMPERATURES, (DEG F)								
SET#	DAY	HH MM SS	(DEG F)	#1	#2	#3	#4	#5	#6	#7	#8	#9	
290	044	09:05:24	59.7	60.0	59.7	59.8	59.7	59.7	59.7	59.4	59.2	60.0	
291	044	09:15:24	59.8	59.9	59.8	59.7	60.0	60.0	59.6	59.5	59.1	59.9	
292	044	09:25:24	59.8	60.3	59.8	59.8	59.7	59.7	59.6	59.3	59.1	59.9	
293	044	09:35:24	59.7	59.8	59.7	59.9	59.6	59.6	59.6	59.2	59.1	59.9	
294	044	09:45:24	59.8	60.0	59.8	59.9	60.0	60.0	59.5	59.3	59.1	59.9	
295	044	09:55:24	59.7	59.9	59.8	59.7	59.8	59.8	59.5	59.4	59.1	59.9	
296	044	10:05:24	59.7	59.8	59.8	59.9	59.7	59.7	59.5	59.4	59.1	59.9	
297	044	10:15:24	59.7	59.8	59.8	59.7	59.6	59.6	59.6	59.3	59.1	59.9	
298	044	10:25:24	59.7	60.0	59.8	59.7	59.6	59.6	59.6	59.4	59.1	59.9	
299	044	10:35:24	59.7	59.6	59.8	59.8	59.8	59.8	59.7	59.4	59.1	59.9	
300	044	10:45:24	59.7	60.0	59.6	59.7	59.8	59.8	59.6	59.1	59.1	59.9	
301	044	10:55:24	59.6	59.5	59.8	59.8	59.7	59.7	59.6	59.3	59.1	59.9	
302	044	11:05:24	59.8	59.9	59.8	59.9	59.8	59.8	59.5	59.2	59.1	59.9	
303	044	11:15:24	59.6	59.5	59.3	59.9	59.7	59.7	59.5	59.4	59.0	59.9	
304	044	11:25:24	59.6	59.8	59.5	59.8	59.4	59.4	59.4	59.5	59.1	59.9	
305	044	11:35:24	59.7	60.0	59.7	59.7	59.7	59.7	59.7	59.3	59.1	59.9	
306	044	11:45:24	59.8	60.1	59.8	59.8	59.8	59.3	59.6	59.2	59.1	59.9	
307	044	11:55:24	59.7	60.0	59.8	59.7	59.7	59.7	59.5	59.3	59.0	59.9	
308	044	12:05:24	59.7	60.0	59.7	59.8	59.7	59.7	59.4	59.4	59.1	59.8	
309	044	12:15:24	59.7	59.8	59.7	59.9	59.7	59.7	59.5	59.3	59.0	59.9	
310	044	12:25:24	59.6	59.8	59.7	59.7	59.6	59.6	59.4	59.3	59.0	59.9	
311	044	12:35:24	59.6	59.7	59.8	59.6	59.6	59.6	59.5	59.2	59.0	59.9	
312	044	12:45:24	59.6	60.0	59.7	59.8	59.5	59.5	59.5	59.1	59.0	59.8	
313	044	12:55:24	59.6	59.9	59.6	59.5	59.8	59.8	59.5	59.3	59.0	59.9	
314	044	13:05:24	59.7	60.1	59.7	59.6	59.7	59.7	59.4	59.1	59.0	59.8	
315	044	13:15:24	59.7	59.9	59.7	59.7	59.8	59.8	59.5	59.3	59.0	59.9	
316	044	13:25:24	59.7	59.9	59.6	59.7	59.8	59.8	59.5	59.3	59.0	59.8	
317	044	13:35:24	59.6	59.6	59.5	59.7	59.6	59.6	59.4	59.2	59.0	59.8	
318	044	13:45:24	59.6	59.8	59.7	59.8	59.6	59.6	59.5	59.1	59.0	59.8	
319	044	13:55:24	59.7	59.7	59.7	59.8	59.8	59.8	59.5	59.2	59.0	59.8	
320	044	14:05:24	59.7	59.9	59.7	59.8	59.8	59.8	59.3	59.1	59.0	59.9	
321	044	14:15:24	59.6	59.8	59.6	59.6	59.7	59.7	59.3	59.1	59.0	59.8	

NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 45 IS LOCKED OUT FROM DSN 1

UNIT 1 ILRT FINAL REPORT

Appendix D - MEASURED LEAK RATE TEST DATA

The following tables present the data for the leak test phases of the ILRT using the Mass Plot Method. The measured leak test is defined as the interval between data sets 321 and 468 inclusive. This corresponds to a 24 hour and 50 minute test duration. The following data is included:

TABLE	TITLE
D.1	Summary of Mass Plot Leakrates
D.2	Summary of Pressures
D.3	Summary of Temperatures
D.4	Summary of Dew Cell Temperatures

UNIT 1 ILRT FINAL REPORT

Table D.1

SUMMARY OF MASS PLOT LEAKRATES

*****SUMMARY TABLE OF LEAKRATES*****

BRAIDWOOD

UNIT 1

13:29:28

THU, 21 FEB 1991

DATA SET 321 THROUGH 468

STATISTICAL LEAKRATE RESULTS CALCULATED USING THE MASS PLOT METHOD

DATA (N)	DATA SET TIME DAY HR MM SS	TEST TIME, (HR)	DRY AIR MASS, (LEM)	LEAK RATE, (L/D)	95% UP CONF LIMIT, (L/D)
321	044 14:15:24	0.000	0.83557637E+06		
322	044 14:25:24	0.167	0.83556071E+06		
323	044 14:35:24	0.333	0.83556318E+06	-0.4783E+02	-0.3211E+02
324	044 14:45:24	0.500	0.83561150E+06	-0.2242E+00	0.3031E+00
325	044 14:55:24	0.667	0.83559662E+06	-0.7734E-01	0.3254E+00
326	044 15:05:24	0.833	0.83559013E+06	-0.8302E-02	0.1796E+02
327	044 15:15:24	1.000	0.83559687E+06	0.4776E-02	0.1313E+00
328	044 15:25:24	1.167	0.83557262E+06	0.4465E-01	0.1460E+00
329	044 15:35:24	1.333	0.83560037E+06	0.2640E-01	0.1070E+00
330	044 15:45:24	1.500	0.83557335E+06	0.4408E-01	0.1079E+00
331	044 15:55:24	1.667	0.83557650E+06	0.4808E-01	0.9959E-01
332	044 16:05:24	1.833	0.83557735E+06	0.4804E-01	0.9042E-01
333	044 16:15:24	2.000	0.83556150E+06	0.5538E-01	0.9167E-01
334	044 16:25:24	2.167	0.83551862E+06	0.7953E-01	0.1191E+00
335	044 16:35:24	2.333	0.83551550E+06	0.9457E-01	0.1320E+00
336	044 16:45:24	2.500	0.83553975E+06	0.9334E-01	0.1259E+00
337	044 16:55:24	2.667	0.83555762E+06	0.8462E-01	0.1145E+00
338	044 17:05:24	2.833	0.83551600E+06	0.8961E-01	0.1165E+00
339	044 17:15:24	3.000	0.83552875E+06	0.8829E-01	0.1123E+00
340	044 17:25:24	3.167	0.83555037E+06	0.8074E-01	0.1036E+00
341	044 17:35:24	3.333	0.83555225E+06	0.7369E-01	0.9546E-01
342	044 17:45:24	3.500	0.83553437E+06	0.7117E-01	0.9107E-01
343	044 17:55:24	3.667	0.83554100E+06	0.6724E-01	0.8578E-01
344	044 18:05:24	3.833	0.83553350E+06	0.6484E-01	0.8196E-01
345	044 18:15:24	4.000	0.83554250E+06	0.6093E-01	0.7712E-01
346	044 18:25:24	4.167	0.83552562E+06	0.5983E-01	0.7478E-01
347	044 18:35:24	4.333	0.83551687E+06	0.5967E-01	0.7350E-01
348	044 18:45:24	4.500	0.83552875E+06	0.5760E-01	0.7057E-01
349	044 18:55:24	4.667	0.83548013E+06	0.6130E-01	0.7391E-01
350	044 19:05:24	4.833	0.83552137E+06	0.5933E-01	0.7124E-01
351	044 19:15:24	5.000	0.83550300E+06	0.5928E-01	0.7040E-01
352	044 19:25:24	5.167	0.83549387E+06	0.5979E-01	0.7022E-01
353	044 19:35:24	5.333	0.83552100E+06	0.5739E-01	0.6745E-01
354	044 19:45:24	5.500	0.83548375E+06	0.5834E-01	0.6785E-01
355	044 19:55:24	5.667	0.83546087E+06	0.6074E-01	0.6999E-01
356	044 20:05:24	6.167	0.83552687E+06	0.5646E-01	0.6589E-01
357	044 20:35:24	6.333	0.83547500E+06	0.5679E-01	0.6564E-01
358	044 20:45:24	6.500	0.83546400E+06	0.5763E-01	0.6599E-01
359	044 20:55:24	6.667	0.83548737E+06	0.5650E-01	0.6445E-01
360	044 21:05:24	6.833	0.83542987E+06	0.5903E-01	0.6690E-01
361	044 21:15:24	7.000	0.83542950E+06	0.6099E-01	0.6866E-01
362	044 21:25:24	7.167	0.83545262E+06	0.6112E-01	0.6840E-01
363	044 21:35:24	7.333	0.83542175E+06	0.6272E-01	0.6980E-01
364	044 21:45:24	7.500	0.83546637E+06	0.6161E-01	0.6843E-01
365	044 21:55:24	7.667	0.83545112E+06	0.6123E-01	0.6774E-01
366	044 22:05:24	7.833	0.83542587E+06	0.6190E-01	0.6815E-01
367	044 22:15:24	8.000	0.83542262E+06	0.6247E-01	0.6847E-01

UNIT 1 ILRT FINAL REPORT

Table D.1

SUMMARY OF MASS PLOT LEAKRATES

364	044	22:25:24	8.167	0.83545350E+06	0.6151E-01	0.6733E-01
365	044	22:35:24	8.333	0.83542375E+06	0.6173E-01	0.6730E-01
370	044	22:45:24	8.500	0.83543863E+06	0.6120E-01	0.6656E-01
371	044	22:55:24	8.667	0.83543887E+06	0.6089E-01	0.6606E-01
372	044	23:05:24	8.833	0.83546337E+06	0.5933E-01	0.6452E-01
373	044	23:15:24	9.000	0.83544212E+06	0.5856E-01	0.6361E-01
374	044	23:25:24	9.167	0.83541575E+06	0.5862E-01	0.6340E-01
375	044	23:35:24	9.333	0.83542300E+06	0.5838E-01	0.6307E-01
376	044	23:45:24	9.500	0.83536537E+06	0.5979E-01	0.6451E-01
377	044	23:55:24	9.667	0.83540775E+06	0.5970E-01	0.6426E-01
378	045	00:05:24	9.833	0.83545050E+06	0.5830E-01	0.6291E-01
379	045	00:15:24	10.000	0.83540500E+06	0.5920E-01	0.6265E-01
380	045	00:25:24	10.167	0.83540325E+06	0.5806E-01	0.6237E-01
381	045	00:35:24	10.333	0.83539837E+06	0.5798E-01	0.6215E-01
382	045	00:45:24	10.500	0.83540550E+06	0.5764E-01	0.6170E-01
383	045	00:55:24	10.667	0.83543250E+06	0.5660E-01	0.6066E-01
384	045	01:05:24	10.833	0.83539637E+06	0.5643E-01	0.6036E-01
385	045	01:15:24	11.000	0.83536087E+06	0.5700E-01	0.6085E-01
386	045	01:25:24	11.167	0.83538300E+06	0.5693E-01	0.6070E-01
387	045	01:35:24	11.333	0.83536770E+06	0.5713E-01	0.6078E-01
388	045	01:45:24	11.500	0.83539012E+06	0.5682E-01	0.6036E-01
389	045	01:55:24	11.667	0.83538262E+06	0.5660E-01	0.6005E-01
390	045	02:05:24	11.833	0.83538150E+06	0.5636E-01	0.5972E-01
391	045	02:15:24	12.000	0.83539887E+06	0.5574E-01	0.5906E-01
392	045	02:25:24	12.167	0.83538312E+06	0.5540E-01	0.5865E-01
393	045	02:35:24	12.333	0.83538400E+06	0.5502E-01	0.5820E-01
394	045	02:45:24	12.500	0.83539050E+06	0.5449E-01	0.5763E-01
395	045	02:55:24	12.667	0.83537962E+06	0.5414E-01	0.5721E-01
396	045	03:05:24	12.833	0.83538250E+06	0.5371E-01	0.5674E-01
397	045	03:15:24	13.000	0.83538837E+06	0.5317E-01	0.5616E-01
398	045	03:25:24	13.167	0.83538150E+06	0.5273E-01	0.5568E-01
399	045	03:35:24	13.333	0.83536262E+06	0.5256E-01	0.5544E-01
400	045	03:45:24	13.500	0.83530837E+06	0.5319E-01	0.5606E-01
401	045	03:55:24	13.667	0.83534450E+06	0.5319E-01	0.5599E-01
402	045	04:05:24	13.833	0.83534412E+06	0.5315E-01	0.5588E-01
403	045	04:15:24	14.000	0.83535425E+06	0.5292E-01	0.5560E-01
404	045	04:25:24	14.167	0.83532662E+06	0.5305E-01	0.5568E-01
405	045	04:35:24	14.333	0.83531462E+06	0.5330E-01	0.5587E-01
406	045	04:45:24	14.500	0.83536712E+06	0.5279E-01	0.5535E-01
407	045	04:55:24	14.667	0.83531237E+06	0.5298E-01	0.5549E-01
408	045	05:05:24	14.833	0.83531200E+06	0.5313E-01	0.5559E-01
409	045	05:15:24	15.000	0.83533162E+06	0.5298E-01	0.5539E-01
410	045	05:25:24	15.167	0.83533037E+06	0.5283E-01	0.5519E-01
411	045	05:35:24	15.333	0.83533625E+06	0.5258E-01	0.5490E-01
412	045	05:45:24	15.500	0.83529750E+06	0.5275E-01	0.5503E-01
413	045	05:55:24	15.667	0.83528300E+06	0.5305E-01	0.5530E-01
414	045	06:05:24	15.833	0.83528062E+06	0.5332E-01	0.5553E-01
415	045	06:15:24	16.000	0.83525987E+06	0.5376E-01	0.5597E-01
416	045	06:25:24	16.167	0.83526900E+06	0.5405E-01	0.5623E-01
417	045	06:35:24	16.333	0.83527062E+06	0.5427E-01	0.5642E-01
418	045	06:45:24	16.500	0.83530025E+06	0.5406E-01	0.5618E-01
419	045	06:55:24	16.667	0.83528050E+06	0.5411E-01	0.5619E-01
420	045	07:05:24	16.833	0.83529437E+06	0.5399E-01	0.5603E-01
421	045	07:15:24	17.000	0.83528162E+06	0.5397E-01	0.5597E-01
422	045	07:25:24	17.167	0.83527550E+06	0.5398E-01	0.5594E-01
423	045	07:35:24	17.333	0.83526650E+06	0.5404E-01	0.5597E-01
424	045	07:45:24	17.500	0.83529175E+06	0.5384E-01	0.5574E-01
425	045	07:55:24	17.667	0.83526237E+06	0.5389E-01	0.5575E-01
426	045	08:05:24	17.833	0.83525637E+06	0.5396E-01	0.5579E-01
427	045	08:15:24	18.000	0.83524750E+06	0.5407E-01	0.5587E-01

UNIT 1 ILRT FINAL REPORT

Table D.1

SUMMARY OF MASS PLOT LEAKRATES

428	045 08:25:24	18.167	0.83524087E+06	0.5421E-01	0.5598E-01
429	045 08:35:24	18.333	0.83521975E+06	0.5449E-01	0.5625E-01
430	045 08:45:24	18.500	0.83525362E+06	0.5445E-01	0.5618E-01
431	045 08:55:24	18.667	0.83526000E+06	0.5434E-01	0.5605E-01
432	045 09:05:24	18.833	0.83528550E+06	0.5401E-01	0.5571E-01
433	045 09:15:24	19.000	0.83530397E+06	0.5353E-01	0.5527E-01
434	045 09:25:24	19.167	0.83524637E+06	0.5349E-01	0.5519E-01
435	045 09:35:24	19.333	0.83524762E+06	0.5341E-01	0.5509E-01
436	045 09:45:24	19.500	0.83527187E+06	0.5314E-01	0.5482E-01
437	045 09:55:24	19.667	0.83525575E+06	0.5298E-01	0.5463E-01
438	045 10:05:24	19.833	0.83525650E+06	0.5280E-01	0.5443E-01
439	045 10:15:24	20.000	0.83519600E+06	0.5207E-01	0.5465E-01
440	045 10:25:24	20.167	0.83521862E+06	0.5207E-01	0.5466E-01
441	045 10:35:24	20.333	0.83522687E+06	0.5203E-01	0.5460E-01
442	045 10:45:24	20.500	0.83521762E+06	0.5204E-01	0.5458E-01
443	045 10:55:24	20.667	0.83522350E+06	0.5298E-01	0.5450E-01
444	045 11:05:24	20.833	0.83522012E+06	0.5293E-01	0.5443E-01
445	045 11:15:24	21.000	0.83521200E+06	0.5292E-01	0.5439E-01
446	045 11:25:24	21.167	0.83522462E+06	0.5280E-01	0.5426E-01
447	045 11:35:24	21.333	0.83524500E+06	0.5255E-01	0.5400E-01
448	045 11:45:24	21.500	0.83522687E+06	0.5240E-01	0.5384E-01
449	045 11:55:24	21.667	0.83525150E+06	0.5209E-01	0.5354E-01
450	045 12:05:24	21.833	0.83520375E+06	0.5206E-01	0.5349E-01
451	045 12:15:24	22.000	0.83519687E+06	0.5206E-01	0.5346E-01
452	045 12:25:24	22.167	0.83521487E+06	0.5193E-01	0.5332E-01
453	045 12:35:24	22.333	0.83519475E+06	0.5191E-01	0.5327E-01
454	045 12:45:24	22.500	0.83517275E+06	0.5199E-01	0.5334E-01
455	045 12:55:24	22.667	0.83519437E+06	0.5193E-01	0.5326E-01
456	045 13:05:24	22.833	0.83517375E+06	0.5197E-01	0.5326E-01
457	045 13:15:24	23.000	0.83520275E+06	0.5184E-01	0.5314E-01
458	045 13:25:24	23.167	0.83516887E+06	0.5188E-01	0.5316E-01
459	045 13:35:24	23.333	0.83517567E+06	0.5186E-01	0.5312E-01
460	045 13:45:24	23.500	0.83516075E+06	0.5191E-01	0.5315E-01
461	045 13:55:24	23.667	0.83515475E+06	0.5196E-01	0.5319E-01
462	045 14:05:24	23.833	0.83518362E+06	0.5186E-01	0.5308E-01
463	045 14:15:24	24.000	0.83516512E+06	0.5184E-01	0.5304E-01
464	045 14:25:24	24.167	0.83515175E+06	0.5187E-01	0.5305E-01
465	045 14:35:24	24.333	0.83515337E+06	0.5188E-01	0.5304E-01
466	045 14:45:24	24.500	0.83518437E+06	0.5172E-01	0.5288E-01
467	045 14:55:24	24.667	0.83514462E+06	0.5174E-01	0.5289E-01
468	045 15:05:24	24.833	0.83514900E+06	0.5173E-01	0.5286E-01

 NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 45 IS LOCKED OUT FROM DSN 1

March 8, 1991

UNIT 1 ILRT FINAL REPORT

TABLE D.2

SUMMARY OF PRESSURES

***** SUMMARY TABLE OF PRESSURE *****

BRAIDWOOD UNIT 1 11:41:03 WTD, 13 MAR 1991

DATA	DATA SET							
SET #	DAY	HH	MM	SS	#1, (PSIA)	#2 (PSIA)	, (PSIA)	, (PSIA)
321	044	14:15:24			59.3703	59.3704	59.3703	0.2525
322	044	14:25:24			59.3698	59.3699	59.3698	0.2525
323	044	14:35:24			59.3688	59.3690	59.3689	0.2517
324	044	14:45:24			59.3684	59.3685	59.3684	0.2522
325	044	14:55:24			59.3665	59.3666	59.3665	0.2524
326	044	15:05:24			59.3652	59.3653	59.3652	0.2530
327	044	15:15:24			59.3640	59.3640	59.3640	0.2516
328	044	15:25:24			59.3626	59.3627	59.3626	0.2521
329	044	15:35:24			59.3622	59.3623	59.3622	0.2512
330	044	15:45:24			59.3607	59.3608	59.3607	0.2526
331	044	15:55:24			59.3605	59.3604	59.3604	0.2518
332	044	16:05:24			59.3604	59.3604	59.3604	0.2519
333	044	16:15:24			59.3597	59.3597	59.3597	0.2523
334	044	16:25:24			59.3589	59.3590	59.3589	0.2518
335	044	16:35:24			59.3589	59.3589	59.3589	0.2518
336	044	16:45:24			59.3579	59.3579	59.3579	0.2525
337	044	16:55:24			59.3566	59.3567	59.3566	0.2524
338	044	17:05:24			59.3562	59.3562	59.3562	0.2510
339	044	17:15:24			59.3555	59.3555	59.3555	0.2538
340	044	17:25:24			59.3549	59.3549	59.3549	0.2520
341	044	17:35:24			59.3543	59.3543	59.3543	0.2523
342	044	17:45:24			59.3529	59.3529	59.3529	0.2527
343	044	17:55:24			59.3520	59.3520	59.3520	0.2524
344	044	18:05:24			59.3504	59.3504	59.3504	0.2523
345	044	18:15:24			59.3494	59.3494	59.3494	0.2524
346	044	18:25:24			59.3492	59.3492	59.3492	0.2508
347	044	18:35:24			59.3485	59.3485	59.3485	0.2519
348	044	18:45:24			59.3478	59.3477	59.3477	0.2515
349	044	18:55:24			59.3474	59.3473	59.3473	0.2518
350	044	19:05:24			59.3474	59.3472	59.3473	0.2511
351	044	19:15:24			59.3468	59.3468	59.3468	0.2518
352	044	19:25:24			59.3457	59.3459	59.3458	0.2513
353	044	19:35:24			59.3444	59.3444	59.3444	0.2524
354	044	19:45:24			59.3438	59.3438	59.3438	0.2516
355	044	19:55:24			59.3432	59.3432	59.3432	0.2513
356	044	20:05:24			59.3403	59.3405	59.3404	0.2504
357	044	20:15:24			59.3397	59.3397	59.3397	0.2514
358	044	20:25:24			59.3383	59.3385	59.3384	0.2516
359	044	20:35:24			59.3386	59.3386	59.3386	0.2517
360	044	21:05:24			59.3381	59.3380	59.3380	0.2508
361	044	21:15:24			59.3378	59.3378	59.3378	0.2507
362	044	21:25:24			59.3373	59.3374	59.3373	0.2512
363	044	21:35:24			59.3362	59.3362	59.3362	0.2519
364	044	21:45:24			59.3346	59.3346	59.3346	0.2519
365	044	21:55:24			59.3336	59.3336	59.3336	0.2517
366	044	22:05:24			59.3334	59.3335	59.3334	0.2501
367	044	22:15:24			59.3331	59.3331	59.3331	0.2512

1

NO PRESSURE CHANNELS ARE LOCKED OUT
DAS CHANNEL # 45 IS LOCKED OUT FROM DSN 1

March 8, 1991

UNIT 1 ILRT FINAL REPORT

TABLE D.3

SUMMARY OF TEMPERATURES

***** SUMMARY TABLE OF TEMPERATURES *****

BRAIDWOOD UNIT 1 11:41:39 WED, 13 MAR 1991

DATA SET#	DAY	HH	MM	SS	AVERAGE TEMP, (DEG F)	AVERAGE #1	AVERAGE #2	SUBVOLUME #3	TEMPERATURES, #4	#5	#6	#7	#8	#9
321	044	14:15:24	68.0	68.0	68.1	68.1	67.9	67.9	68.0	69.1	67.0	68.8		
322	044	14:25:24	68.0	67.9	68.0	68.1	67.9	67.9	68.0	69.2	67.0	68.8		
323	044	14:35:24	68.0	67.9	68.0	68.1	67.9	67.9	68.0	69.1	67.0	68.8		
324	044	14:45:24	68.0	67.9	68.0	68.1	67.9	67.9	68.0	69.0	67.0	68.8		
325	044	14:55:24	68.0	67.9	67.9	68.1	67.9	67.9	68.0	69.2	67.0	68.8		
326	044	15:05:24	68.0	67.9	67.9	68.0	67.9	67.9	68.0	69.1	67.0	68.8		
327	044	15:15:24	68.0	67.9	67.9	68.0	67.9	67.9	68.0	69.0	67.0	68.8		
328	044	15:25:24	68.0	67.9	68.0	68.0	67.9	67.9	68.0	69.0	67.0	68.8		
329	044	15:35:24	68.0	67.9	67.9	68.0	67.8	67.9	67.9	69.0	67.0	68.8		
330	044	15:45:24	67.9	67.8	67.9	68.0	67.8	68.0	67.9	69.1	67.0	68.8		
331	044	15:55:24	68.0	67.9	67.9	68.0	67.8	67.9	67.9	69.1	66.9	68.8		
332	044	16:05:24	67.9	67.9	67.9	68.0	67.8	67.9	67.9	69.0	66.9	68.7		
333	044	16:15:24	67.9	67.9	67.9	68.0	67.8	67.9	67.9	69.1	66.9	68.7		
334	044	16:25:24	68.0	67.9	68.0	68.0	67.9	67.9	67.9	69.0	66.9	68.7		
335	044	16:35:24	68.0	67.9	68.0	68.1	67.9	67.9	67.9	69.0	66.9	68.7		
336	044	16:45:24	67.9	67.8	67.9	68.0	67.9	67.8	67.9	69.0	66.9	68.7		
337	044	16:55:24	67.9	67.8	67.9	68.0	67.8	67.8	67.9	69.2	66.9	68.7		
338	044	17:05:24	68.0	67.9	68.0	68.0	67.8	67.8	67.9	69.0	66.9	68.7		
339	044	17:15:24	67.9	67.9	68.0	68.0	67.8	67.8	67.9	69.0	66.9	68.7		
340	044	17:25:24	67.9	67.8	67.9	68.0	67.8	67.8	67.9	69.0	66.9	68.7		
341	044	17:35:24	67.9	67.8	67.9	68.0	67.8	67.8	67.9	69.0	66.9	68.7		
342	044	17:45:24	67.9	67.8	67.9	68.0	67.8	67.8	67.9	69.0	66.9	68.7		
343	044	17:55:24	67.9	67.8	67.8	68.0	67.8	67.9	67.9	69.0	66.9	68.7		
344	044	18:05:24	67.9	67.8	67.8	68.0	67.8	67.8	67.9	69.0	66.9	68.7		
345	044	18:15:24	67.9	67.8	67.9	67.9	67.8	67.8	67.8	68.9	66.9	68.7		
346	044	18:25:24	67.9	67.8	67.8	68.0	67.8	67.9	67.9	69.0	66.9	68.7		
347	044	18:35:24	67.9	67.8	67.8	68.0	67.8	67.8	67.9	69.1	66.9	68.7		
348	044	18:45:24	67.9	67.8	67.8	68.0	67.8	67.8	67.9	69.0	66.9	68.6		
349	044	18:55:24	67.9	67.8	67.9	68.0	67.8	67.8	67.9	69.1	66.9	68.7		
350	044	19:05:24	67.9	67.7	67.9	67.9	67.8	67.8	67.9	69.0	66.9	68.7		
351	044	19:15:24	67.9	67.8	67.9	68.0	67.8	67.8	67.9	68.9	66.9	68.6		
352	044	19:25:24	67.9	67.8	67.9	68.0	67.8	67.8	67.8	69.0	66.9	68.7		
353	044	19:35:24	67.8	67.7	67.8	67.9	67.8	67.8	67.8	69.1	66.9	68.6		
354	044	19:45:24	67.9	67.7	67.8	67.9	67.8	67.8	67.8	69.0	66.9	68.7		
355	044	19:55:24	67.9	67.8	67.9	67.9	67.7	67.8	67.9	69.0	66.9	68.6		
356	044	20:05:24	67.8	67.7	67.8	67.9	67.7	67.8	67.8	68.9	66.9	68.6		
357	044	20:35:24	67.8	67.8	67.8	67.9	67.7	67.8	67.8	68.9	66.8	68.6		
358	044	20:45:24	67.8	67.7	67.8	67.9	67.7	67.8	67.8	68.9	66.8	68.6		
359	044	20:55:24	67.8	67.7	67.8	67.9	67.7	67.7	67.8	69.0	66.8	68.6		
360	044	21:05:24	67.9	67.8	67.9	67.9	67.7	67.8	67.8	69.0	66.8	68.6		
361	044	21:15:24	67.9	67.8	67.9	67.9	67.7	67.7	67.8	69.0	66.8	68.6		
362	044	21:25:24	67.8	67.7	67.9	67.9	67.7	67.7	67.8	68.9	66.8	68.6		
363	044	21:35:24	67.8	67.8	67.8	67.9	67.7	67.7	67.8	69.0	66.8	68.6		
364	044	21:45:24	67.8	67.7	67.7	67.9	67.7	67.8	67.7	68.9	66.8	68.6		

UNIT 1 ILRT FINAL REPORT

TABLE D.3

SUMMARY OF TEMPERATURES

365	044	21:55:24	67.8	67.7	67.8	67.9	67.7	67.7	67.8	68.9	66.8	68.6
366	044	22:05:24	67.8	67.7	67.8	67.9	67.7	67.8	67.8	69.0	66.8	68.6
367	044	22:15:24	67.8	67.7	67.8	67.9	67.7	67.8	67.8	68.9	66.8	68.6
368	044	22:25:24	67.8	67.6	67.7	67.9	67.7	67.7	67.8	69.0	66.8	68.6
369	044	22:35:24	67.8	67.7	67.8	67.9	67.7	67.7	67.8	69.0	66.8	68.6
370	044	22:45:24	67.8	67.7	67.8	67.8	67.7	67.7	67.7	68.9	66.8	68.6
371	044	22:55:24	67.8	67.7	67.8	67.8	67.7	67.7	67.8	68.9	66.8	68.6
372	044	23:05:24	67.8	67.6	67.7	67.8	67.7	67.7	67.8	68.9	66.8	68.6
373	044	23:15:24	67.8	67.6	67.7	67.9	67.7	67.7	67.8	68.9	66.8	68.6
374	044	23:25:24	67.8	67.6	67.7	67.9	67.7	67.7	67.8	68.9	66.8	68.6
375	044	23:35:24	67.8	67.7	67.8	67.8	67.7	67.7	67.7	68.9	66.8	68.6
376	044	23:45:24	67.8	67.7	67.8	67.8	67.6	67.7	67.8	68.9	66.8	68.6
377	044	23:55:24	67.8	67.7	67.8	67.8	67.7	67.7	67.8	68.9	66.8	68.6
378	045	00:05:24	67.7	67.6	67.7	67.8	67.6	67.6	67.8	68.8	66.8	68.5
379	045	00:15:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.8	66.8	68.5
380	045	00:25:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.9	66.8	68.5
381	045	00:35:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.9	66.8	68.5
382	045	00:45:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.9	66.8	68.5
383	045	00:55:24	67.7	67.5	67.6	67.8	67.6	67.7	67.7	68.9	66.8	68.5
384	045	01:05:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.9	66.8	68.5
385	045	01:15:24	67.7	67.6	67.8	67.8	67.6	67.7	67.7	68.9	66.8	68.5
386	045	01:25:24	67.7	67.6	67.7	67.8	67.6	67.8	67.7	68.8	66.8	68.5
387	045	01:35:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.9	66.8	68.5
388	045	01:45:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.8	66.8	68.5
389	045	01:55:24	67.7	67.6	67.7	67.8	67.6	67.6	67.7	68.8	66.8	68.5
390	045	02:05:24	67.7	67.7	67.7	67.8	67.6	67.5	67.7	68.8	66.8	68.5
391	045	02:15:24	67.7	67.6	67.7	67.8	67.6	67.6	67.7	68.8	66.8	68.5
392	045	02:25:24	67.7	67.6	67.7	67.8	67.6	67.7	67.7	68.8	66.8	68.5
393	045	02:35:24	67.7	67.6	67.6	67.8	67.6	67.7	67.7	68.8	66.8	68.5
394	045	02:45:24	67.7	67.5	67.6	67.7	67.6	67.6	67.7	68.8	66.7	68.5
395	045	02:55:24	67.7	67.5	67.6	67.7	67.6	67.7	67.6	68.8	66.7	68.5
396	045	03:05:24	67.7	67.6	67.6	67.7	67.6	67.6	67.7	68.8	66.7	68.5
397	045	03:15:24	67.7	67.6	67.6	67.8	67.6	67.6	67.7	68.7	66.7	68.5
398	045	03:25:24	67.7	67.6	67.6	67.8	67.6	67.6	67.7	68.7	66.7	68.4
399	045	03:35:24	67.7	67.5	67.6	67.7	67.6	67.6	67.7	68.7	66.7	68.4
400	045	03:45:24	67.7	67.6	67.6	67.8	67.6	67.7	67.7	68.7	66.7	68.4
401	045	03:55:24	67.7	67.6	67.6	67.7	67.6	67.6	67.7	68.7	66.7	68.4
402	045	04:05:24	67.7	67.6	67.6	67.7	67.5	67.6	67.6	68.8	66.7	68.4
403	045	04:15:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.8	66.7	68.4
404	045	04:25:24	67.7	67.6	67.6	67.7	67.6	67.6	67.6	68.8	66.7	68.4
405	045	04:35:24	67.7	67.6	67.6	67.7	67.6	67.6	67.7	68.8	66.7	68.4
406	045	04:45:24	67.6	67.5	67.6	67.7	67.5	67.5	67.7	68.8	66.7	68.4
407	045	04:55:24	67.7	67.5	67.6	67.7	67.5	67.5	67.7	68.7	66.7	68.4
408	045	05:05:24	67.6	67.5	67.6	67.7	67.6	67.6	67.6	68.7	66.7	68.4
409	045	05:15:24	67.6	67.5	67.6	67.7	67.5	67.7	67.6	68.7	66.7	68.4
410	045	05:25:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.8	66.7	68.4
411	045	05:35:24	67.6	67.5	67.5	67.7	67.5	67.6	67.6	68.8	66.7	68.4
412	045	05:45:24	67.6	67.5	67.6	67.7	67.5	67.7	67.6	69.0	66.7	68.4
413	045	05:55:24	67.7	67.5	67.6	67.7	67.6	67.6	67.6	69.0	66.7	68.4
414	045	06:05:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	69.0	66.7	68.4
415	045	06:15:24	67.7	67.6	67.7	67.7	67.6	67.5	67.6	68.9	66.7	68.4
416	045	06:25:24	67.6	67.5	67.6	67.7	67.6	67.5	67.6	68.8	66.7	68.4
417	045	06:35:24	67.6	67.6	67.6	67.7	67.6	67.5	67.6	68.7	66.7	68.3
418	045	06:45:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.8	66.7	68.4
419	045	06:55:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.7	66.7	68.4
420	045	07:05:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.8	66.7	68.4
421	045	07:15:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.7	66.7	68.3
422	045	07:25:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.7	66.7	68.3
423	045	07:35:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.7	66.7	68.3
424	045	07:45:24	67.6	67.4	67.6	67.7	67.5	67.5	67.6	68.7	66.7	68.3

125(051391)

ZD79G

UNIT 1 ILRT FINAL REPORT

TABLE D.3

SUMMARY OF TEMPERATURES

425	045	07:55:24	67.6	67.5	67.6	67.7	67.5	67.5	67.6	68.7	66.7	68.3
426	045	08:05:24	67.6	67.5	67.6	67.6	67.5	67.6	67.5	68.7	66.7	68.3
427	045	08:15:24	67.6	67.5	67.5	67.6	67.5	67.6	67.6	68.8	66.7	68.3
428	045	08:25:24	67.6	67.5	67.6	67.7	67.5	67.5	67.6	68.7	66.7	68.3
429	045	08:35:24	67.6	67.5	67.6	67.7	67.5	67.6	67.6	68.7	66.7	68.3
430	045	08:45:24	67.6	67.5	67.5	67.6	67.5	67.5	67.5	68.7	66.7	68.3
431	045	08:55:24	67.6	67.4	67.5	67.7	67.5	67.6	67.6	68.7	66.6	68.4
432	045	09:05:24	67.5	67.4	67.5	67.6	67.5	67.5	67.6	68.7	66.6	68.3
433	045	09:15:24	67.5	67.4	67.5	67.6	67.4	67.5	67.5	68.6	66.6	68.4
434	045	09:25:24	67.6	67.4	67.5	67.6	67.5	67.5	67.5	68.7	66.7	68.4
435	045	09:35:24	67.6	67.5	67.5	67.7	67.5	67.5	67.5	68.7	66.6	68.4
436	045	09:45:24	67.6	67.5	67.5	67.7	67.5	67.4	67.6	68.7	66.6	68.3
437	045	09:55:24	67.6	67.4	67.5	67.6	67.5	67.5	67.6	68.6	66.7	68.3
438	045	10:05:24	67.6	67.4	67.5	67.6	67.5	67.5	67.6	68.7	66.7	68.3
439	045	10:15:24	67.6	67.5	67.6	67.6	67.5	67.5	67.5	68.7	66.6	68.3
440	045	10:25:24	67.6	67.4	67.5	67.6	67.5	67.5	67.5	68.7	66.6	68.3
441	045	10:35:24	67.5	67.5	67.6	67.6	67.4	67.4	67.5	68.7	66.6	68.3
442	045	10:45:24	67.6	67.5	67.5	67.6	67.5	67.5	67.5	68.7	66.6	68.3
443	045	10:55:24	67.5	67.5	67.5	67.6	67.4	67.5	67.5	68.7	66.6	68.3
444	045	11:05:24	67.5	67.4	67.5	67.6	67.5	67.5	67.5	68.6	66.6	68.3
445	045	11:15:24	67.5	67.4	67.5	67.6	67.4	67.5	67.5	68.7	66.6	68.3
446	045	11:25:24	67.5	67.4	67.5	67.6	67.4	67.5	67.5	68.6	66.6	68.3
447	045	11:35:24	67.5	67.4	67.5	67.6	67.4	67.4	67.5	68.6	66.6	68.3
448	045	11:45:24	67.5	67.4	67.5	67.6	67.4	67.4	67.5	68.6	66.6	68.3
449	045	11:55:24	67.5	67.4	67.5	67.6	67.4	67.4	67.5	68.6	66.6	68.3
450	045	12:05:24	67.5	67.4	67.5	67.6	67.4	67.5	67.6	68.6	66.6	68.3
451	045	12:15:24	67.5	67.4	67.4	67.6	67.4	67.5	67.5	68.6	66.6	68.3
452	045	12:25:24	67.5	67.4	67.5	67.6	67.4	67.5	67.5	68.6	66.6	68.3
453	045	12:35:24	67.5	67.4	67.5	67.5	67.4	67.5	67.5	68.6	66.6	68.3
454	045	12:45:24	67.5	67.4	67.5	67.6	67.4	67.5	67.5	68.7	66.6	68.3
455	045	12:55:24	67.5	67.3	67.5	67.6	67.4	67.5	67.5	68.6	66.6	68.3
456	045	13:05:24	67.5	67.4	67.5	67.6	67.4	67.5	67.5	68.6	66.6	68.3
457	045	13:15:24	67.5	67.4	67.4	67.6	67.4	67.5	67.5	68.6	66.6	68.3
458	045	13:25:24	67.5	67.4	67.4	67.6	67.4	67.5	67.4	68.6	66.6	68.3
459	045	13:35:24	67.5	67.4	67.5	67.6	67.4	67.4	67.5	68.7	66.6	68.2
460	045	13:45:24	67.5	67.4	67.5	67.6	67.4	67.4	67.5	68.6	66.6	68.2
461	045	13:55:24	67.5	67.4	67.5	67.6	67.4	67.4	67.5	68.6	66.6	68.3
462	045	14:05:24	67.5	67.3	67.4	67.5	67.4	67.5	67.5	68.5	66.6	68.2
463	045	14:15:24	67.5	67.4	67.4	67.5	67.4	67.5	67.5	68.7	66.6	68.3
464	045	14:25:24	67.5	67.4	67.5	67.6	67.4	67.5	67.5	68.6	66.6	68.2
465	045	14:35:24	67.5	67.4	67.5	67.5	67.4	67.4	67.5	68.6	66.6	68.2
466	045	14:45:24	67.5	67.3	67.4	67.5	67.4	67.4	67.5	68.6	66.6	68.2
467	045	14:55:24	67.5	67.4	67.4	67.5	67.4	67.4	67.5	68.6	66.6	68.2
468	045	15:05:24	67.5	67.4	67.4	67.6	67.4	67.4	67.5	68.6	66.6	68.2

 NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 45 IS LOCKED OUT FROM DSN 1

March 8, 1991-

UNIT 1 ILRT FINAL REPORT

TABLE D.4

SUMMARY OF DEW CELL TEMPERATURES

***** SUMMARY TABLE OF DEW TEMPERATURES *****

BRAIDWOOD UNIT 1 11:44:26 WED, 13 MAR 1991

DATA SET AVERAGE					AVERAGE SUBVOLUME TEMPERATURES, (DEG F)								
DATA	TIME	DEW TEMP,											
SET#	DAY	HH MM SS (DEG F)	#1	#2	#3	#4	#5	#6	#7	#8	#9		
321	044	14:15:24	59.6	59.8	59.6	59.6	59.7	59.7	59.3	59.1	59.0	59.8	
322	044	14:25:24	59.6	59.8	59.7	59.8	59.5	59.5	59.3	59.3	59.0	59.8	
323	044	14:35:24	59.5	59.7	59.6	59.6	59.4	59.4	59.4	59.2	59.0	59.8	
324	044	14:45:24	59.6	59.6	59.7	59.7	59.5	59.5	59.5	59.2	59.0	59.9	
325	044	14:55:24	59.6	59.7	59.6	59.6	59.7	59.7	59.5	59.0	59.0	59.9	
326	044	15:05:24	59.6	59.6	59.7	59.7	59.8	59.8	59.5	59.3	59.0	59.8	
327	044	15:15:24	59.5	59.7	59.7	59.5	59.4	59.4	59.4	59.1	59.0	59.8	
328	044	15:25:24	59.6	59.8	59.6	59.8	59.4	59.4	59.4	59.3	59.0	59.8	
329	044	15:35:24	59.4	58.9	59.6	59.3	59.7	59.7	59.4	59.2	59.0	59.8	
330	044	15:45:24	59.6	59.7	59.6	59.7	59.7	59.7	59.3	59.4	59.0	59.8	
331	044	15:55:24	59.5	59.7	59.6	59.8	59.4	59.4	59.4	59.3	59.0	59.8	
332	044	16:05:24	59.5	59.7	59.6	59.4	59.6	59.6	59.3	59.3	59.0	59.8	
333	044	16:15:24	59.6	59.8	59.6	59.7	59.6	59.6	59.4	58.9	59.0	59.8	
334	044	16:25:24	59.5	59.7	59.7	59.7	59.4	59.4	59.3	59.2	58.9	59.8	
335	044	16:35:24	59.5	59.7	59.5	59.6	59.6	59.6	59.3	59.1	58.9	59.8	
336	044	16:45:24	59.6	59.7	59.6	59.7	59.7	59.7	59.4	59.3	59.0	59.8	
337	044	16:55:24	59.6	59.7	59.7	59.7	59.6	59.6	59.3	59.2	58.9	59.7	
338	044	17:05:24	59.4	59.5	59.5	59.6	59.4	59.4	59.1	59.2	58.9	59.7	
339	044	17:15:24	59.7	59.8	59.7	59.7	60.0	60.0	59.5	59.2	58.9	59.8	
340	044	17:25:24	59.5	59.6	59.5	59.7	59.6	59.6	59.1	59.2	58.9	59.7	
341	044	17:35:24	59.6	59.7	59.6	59.7	59.7	59.7	59.4	59.0	58.9	59.7	
342	044	17:45:24	59.6	59.7	59.6	59.6	59.8	59.8	59.3	59.3	58.9	59.8	
343	044	17:55:24	59.6	59.9	59.6	59.6	59.6	59.6	59.4	59.2	58.9	59.8	
344	044	18:05:24	59.6	59.7	59.7	59.6	59.7	59.7	59.4	59.1	58.9	59.7	
345	044	18:15:24	59.6	60.0	59.6	59.7	59.5	59.5	59.4	59.2	58.9	59.7	
346	044	18:25:24	59.4	59.8	59.5	59.6	59.1	59.1	59.4	59.2	58.9	59.7	
347	044	18:35:24	59.5	59.7	59.6	59.7	59.5	59.5	59.5	59.2	58.9	59.7	
348	044	18:45:24	59.5	59.6	59.6	59.5	59.5	59.5	59.4	59.1	58.9	59.8	
349	044	18:55:24	59.5	59.8	59.7	59.6	59.5	59.5	59.3	59.1	58.9	59.7	
350	044	19:05:24	59.4	59.4	59.6	59.5	59.4	59.4	59.4	59.3	58.9	59.8	
351	044	19:15:24	59.5	59.7	59.6	59.2	59.7	59.7	59.3	59.3	58.8	59.7	
352	044	19:25:24	59.5	59.6	59.6	59.7	59.3	59.3	59.4	59.1	58.9	59.7	
353	044	19:35:24	59.6	59.9	59.6	59.5	59.7	59.7	59.4	59.1	58.9	59.7	
354	044	19:45:24	59.5	59.8	59.6	59.7	59.4	59.4	59.4	58.9	58.9	59.8	
355	044	19:55:24	59.5	59.6	59.5	59.6	59.4	59.4	59.3	59.1	58.9	59.7	
356	044	20:05:24	59.4	59.6	59.5	59.4	59.2	59.2	59.4	59.1	58.9	59.7	
357	044	20:15:24	59.5	59.5	59.6	59.6	59.6	59.6	59.3	59.1	58.7	59.7	
358	044	20:25:24	59.5	59.7	59.5	59.6	59.5	59.5	59.3	59.2	58.9	59.7	
359	044	20:35:24	59.5	59.9	59.3	59.6	59.5	59.5	59.3	59.1	58.8	59.7	
360	044	21:05:24	59.4	59.6	59.3	59.5	59.4	59.4	59.6	59.1	58.8	59.7	
361	044	21:15:24	59.4	59.7	59.4	59.6	59.3	59.3	59.2	59.1	58.9	59.6	
362	044	21:25:24	59.4	59.6	59.3	59.5	59.6	59.6	59.3	59.0	58.9	59.7	
363	044	21:35:24	59.5	59.8	59.5	59.6	59.6	59.6	59.4	59.0	58.9	59.7	
364	044	21:45:24	59.5	59.9	59.6	59.6	59.6	59.6	59.2	58.9	58.8	59.7	

UNIT 1 ILRT FINAL REPORT

TABLE D.4

SUMMARY OF DEW CELL TEMPERATURES

365	044	21:55:24	59.5	59.6	59.6	59.7	59.5	59.5	59.6	59.1	58.8	59.7
366	044	22:05:24	59.3	59.7	59.5	59.4	59.2	59.2	59.1	58.8	58.8	59.7
367	044	22:15:24	59.4	59.7	59.4	59.6	59.4	59.4	59.3	59.1	58.8	59.6
368	044	22:25:24	59.5	59.6	59.3	59.6	59.7	59.7	59.2	59.0	58.8	59.6
369	044	22:35:24	59.5	59.6	59.6	59.6	59.6	59.6	59.3	59.1	58.8	59.7
370	044	22:45:24	59.5	59.4	59.5	59.5	59.7	59.7	59.3	58.9	58.8	59.6
371	044	22:55:24	59.4	59.7	59.4	59.5	59.3	59.3	59.3	59.0	58.8	59.7
372	044	23:05:24	59.4	59.4	59.5	59.4	59.5	59.5	59.2	59.0	58.8	59.7
373	044	23:15:24	59.4	59.6	59.3	59.5	59.4	59.4	59.4	58.9	58.8	59.7
374	044	23:25:24	59.5	59.2	59.5	59.5	59.8	59.8	59.4	59.2	58.8	59.6
375	044	23:35:24	59.3	59.1	59.5	59.3	59.5	59.5	59.2	58.9	58.8	59.6
376	044	23:45:24	59.4	59.7	59.5	59.3	59.6	59.6	59.2	58.9	58.8	59.6
377	044	23:55:24	59.3	59.5	59.3	59.4	59.2	59.2	59.2	58.9	58.8	59.6
378	045	00:05:24	59.4	59.7	59.6	59.5	59.3	59.3	59.3	59.0	58.8	59.6
379	045	00:15:24	59.5	59.8	59.5	59.5	59.7	59.7	59.2	58.9	58.8	59.6
380	045	00:25:24	59.4	59.7	59.5	59.5	59.5	59.5	59.3	59.2	58.8	59.6
381	045	00:35:24	59.5	59.8	59.4	59.4	59.6	59.6	59.2	59.1	58.8	59.6
382	045	00:45:24	59.4	59.7	59.5	59.5	59.5	59.5	59.2	58.8	58.8	59.6
383	045	00:55:24	59.3	59.5	59.4	59.5	59.9	59.9	59.3	59.1	58.8	59.6
384	045	01:05:24	59.3	59.5	59.4	59.3	59.4	59.4	59.3	59.1	58.8	59.6
385	045	01:15:24	59.4	59.6	59.3	59.4	59.6	59.6	59.2	58.9	58.8	59.6
386	045	01:25:24	59.4	59.6	59.4	59.4	59.4	59.4	59.1	59.0	58.8	59.6
387	045	01:35:24	59.4	59.5	59.4	59.5	59.5	59.5	59.2	59.0	58.7	59.6
388	045	01:45:24	59.3	59.5	59.5	59.4	59.3	59.3	59.3	59.0	58.7	59.6
389	045	01:55:24	59.3	59.6	59.5	59.4	59.3	59.3	59.1	58.8	58.8	59.6
390	045	02:05:24	59.4	59.6	59.2	59.6	59.5	59.5	59.1	59.1	58.7	59.6
391	045	02:15:24	59.4	59.5	59.5	59.5	59.5	59.5	59.3	58.9	58.8	59.6
392	045	02:25:24	59.3	59.2	59.3	59.4	59.3	59.3	59.2	58.9	58.7	59.6
393	045	02:35:24	59.4	59.6	59.4	59.4	59.4	59.4	59.2	58.9	58.7	59.6
394	045	02:45:24	59.4	59.7	59.4	59.4	59.5	59.5	59.2	59.1	58.8	59.6
395	045	02:55:24	59.4	59.4	59.3	59.5	59.5	59.5	59.2	59.0	58.7	59.6
396	045	03:05:24	59.3	59.4	59.5	59.4	59.3	59.3	59.1	58.9	58.7	59.6
397	045	03:15:24	59.3	59.5	59.5	59.4	59.1	59.1	59.2	59.1	58.8	59.6
398	045	03:25:24	59.2	59.3	59.2	59.3	59.3	59.3	59.2	58.7	58.7	59.5
399	045	03:35:24	59.3	59.4	59.4	59.4	59.4	59.4	59.4	59.0	58.7	59.5
400	045	03:45:24	59.4	59.6	59.4	59.4	59.3	59.3	59.2	58.9	58.7	59.6
401	045	03:55:24	59.3	59.5	59.4	59.4	59.3	59.3	59.2	58.8	58.7	59.5
402	045	04:05:24	59.4	59.5	59.4	59.4	59.5	59.5	59.2	59.0	58.7	59.5
403	045	04:15:24	59.3	59.4	59.3	59.4	59.4	59.4	59.2	58.9	58.7	59.6
404	045	04:25:24	59.3	59.5	59.4	59.4	59.3	59.3	59.2	59.0	58.7	59.5
405	045	04:35:24	59.3	59.5	59.2	59.4	59.4	59.4	59.2	59.0	58.7	59.5
406	045	04:45:24	59.2	59.4	59.1	59.4	59.2	59.2	59.2	59.0	58.7	59.6
407	045	04:55:24	59.3	59.6	59.3	59.4	59.4	59.4	59.2	59.1	58.7	59.5
408	045	05:05:24	59.4	59.7	59.5	59.5	59.5	59.5	59.2	58.8	58.7	59.5
409	045	05:15:24	59.1	58.8	59.4	59.3	59.1	59.1	59.1	58.9	58.7	59.5
410	045	05:25:24	59.3	59.4	59.4	59.4	59.4	59.4	59.1	58.9	58.7	59.5
411	045	05:35:24	59.4	59.5	59.3	59.3	59.4	59.4	59.2	59.0	58.7	59.5
412	045	05:45:24	59.3	59.6	59.3	59.4	59.4	59.4	59.1	58.8	58.7	59.5
413	045	05:55:24	59.2	59.2	59.1	59.4	59.3	59.3	59.1	58.8	58.7	59.5
414	045	06:05:24	59.3	59.5	59.4	59.2	59.4	59.4	59.2	58.9	58.7	59.5
415	045	06:15:24	59.3	59.5	59.3	59.2	59.3	59.3	59.2	58.8	58.7	59.5
416	045	06:25:24	59.3	59.7	59.2	59.5	59.3	59.3	59.2	58.9	58.7	59.5
417	045	06:35:24	59.3	59.3	59.4	59.4	59.3	59.3	59.1	58.9	58.7	59.5
418	045	06:45:24	59.1	59.4	59.2	59.1	59.2	59.2	59.1	58.9	58.7	59.5
419	045	06:55:24	59.3	59.3	59.3	59.4	59.3	59.3	59.1	58.8	58.7	59.5
420	045	07:05:24	59.3	59.6	59.3	59.4	59.2	59.2	59.1	58.9	58.6	59.5
421	045	07:15:24	59.1	59.3	59.3	59.3	59.6	59.6	59.2	58.9	58.7	59.5
422	045	07:25:24	59.2	59.2	59.1	59.4	59.3	59.3	59.2	58.9	58.7	59.5
423	045	07:35:24	59.4	59.5	59.4	59.4	59.5	59.5	59.1	58.8	58.6	59.5
424	045	07:45:24	59.3	59.4	59.3	59.4	59.3	59.3	59.2	58.9	58.7	59.5

UNIT 1 ILRT FINAL REPORT

TABLE D.4

SUMMARY OF DEW CELL TEMPERATURES

434	045	07:15:104	59.1	59.0	59.3	59.3	59.1	59.1	59.1	59.9	59.7	59.4
435	045	08:10:104	59.3	59.4	59.3	59.4	59.4	59.3	59.3	59.0	59.7	59.3
436	045	08:15:104	59.3	59.4	59.3	59.3	59.4	59.4	59.1	59.0	59.7	59.3
437	045	08:20:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.7	59.7	59.3
438	045	08:25:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.7	59.6	59.4
439	045	08:30:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
440	045	08:35:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
441	045	08:40:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
442	045	08:45:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
443	045	08:50:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
444	045	08:55:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
445	045	09:00:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
446	045	09:05:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
447	045	09:10:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
448	045	09:15:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
449	045	09:20:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
450	045	09:25:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
451	045	09:30:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
452	045	09:35:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
453	045	09:40:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
454	045	09:45:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
455	045	09:50:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
456	045	09:55:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
457	045	10:00:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
458	045	10:05:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
459	045	10:10:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
460	045	10:15:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
461	045	10:20:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
462	045	10:25:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
463	045	10:30:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
464	045	10:35:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
465	045	10:40:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
466	045	10:45:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
467	045	10:50:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4
468	045	10:55:104	59.3	59.4	59.3	59.3	59.4	59.4	59.3	59.0	59.6	59.4

 NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 40 IS LOCKED OUT FROM DSN 1

UNIT 1 ILRT FINAL REPORT

Appendix E - INDUCED LEAKAGE TEST DATA

The following tables present the data for the induced leakage phase of the ILRT. The induced leakage test is defined as the interval between data sets 471 and 492 inclusive. This corresponds to a 3 hour, 30 minute test duration. The following data is included:

TABLE	TITLE
E.1	Summary of Mass Plot Leakrates
E.2	Summary of Pressures
E.3	Summary of Temperatures
E.4	Summary of Dew Cell Temperatures

March 8, 1991

UNIT 1 ILRT FINAL REPORT

TABLE E.1

SUMMARY OF MASS PLOT LEAKRATES

*****SUMMARY TABLE OF LEAKRATES*****

BRADWOOD UNIT 1 13134147 THU, 21 FEB 1991

DATA SET 471 THROUGH 492

VERIFICATION TEST RESULTS CALCULATED USING THE MASS PLOT METHOD

DATA SET #	DATA SET TIME DAY HH MM SS	TEST TIME, (HR)	DRY AIR MASS, (LBM)	LEAK RATE, (%/D)	95% UP CONF LIMIT, (%/D)
471	045 15:35:24	0.000	0.83514687E+06		
472	045 15:45:24	0.167	0.83509962E+06		
473	045 15:55:24	0.333	0.83513200E+06	0.1284E+00	0.3520E+01
474	045 16:05:24	0.500	0.83510825E+06	0.1441E+00	0.6662E+00
475	045 16:15:24	0.667	0.83512325E+06	0.6662E-01	0.3298E+00
476	045 16:25:24	0.833	0.83506900E+06	0.1686E+00	0.3689E+00
477	045 16:35:24	1.000	0.83504637E+06	0.2288E+00	0.3798E+00
478	045 16:45:24	1.167	0.83509775E+06	0.1609E+00	0.2935E+00
479	045 16:55:24	1.333	0.83507025E+06	0.1502E+00	0.2510E+00
480	045 17:05:24	1.500	0.83504400E+06	0.1612E+00	0.2410E+00
481	045 17:15:24	1.667	0.83500775E+06	0.1883E+00	0.2586E+00
482	045 17:25:24	1.833	0.83500162E+06	0.2007E+00	0.2601E+00
483	045 17:35:24	2.000	0.83502425E+06	0.1888E+00	0.2400E+00
484	045 17:45:24	2.167	0.83501762E+06	0.1791E+00	0.2238E+00
485	045 17:55:24	2.333	0.83501675E+06	0.1688E+00	0.2086E+00
486	045 18:05:24	2.500	0.83495487E+06	0.1817E+00	0.2187E+00
487	045 18:15:24	2.667	0.83500850E+06	0.1688E+00	0.2038E+00
488	045 18:25:24	2.833	0.83497062E+06	0.1683E+00	0.1993E+00
489	045 18:35:24	3.000	0.83495000E+06	0.1708E+00	0.1986E+00
490	045 18:45:24	3.167	0.83495712E+06	0.1685E+00	0.1935E+00
491	045 18:55:24	3.333	0.83495075E+06	0.1661E+00	0.1887E+00
492	045 19:05:24	3.500	0.83494650E+06	0.1631E+00	0.1839E+00

NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 45 IS LOCKED OUT FROM DSN 1

March 8, 1991

UNIT 1 ILRT FINAL REPORT

TABLE E.2

SUMMARY OF PRESSURES

***** SUMMARY TABLE OF PRESSURES *****

BRAIDWOOD UNIT 1 11:51:16 WED, 13 MAR 1991

DATA SET	DATA SET TIME	PRESSURE	PRESSURE	AVERAGE PRESSURE	VAPOR PRESSURE	DRY AIR PRESSURE
E	SET # DAY HH MM SS	#1, (PSIA)	#2 (PSIA)	, (PSIA)	, (PSIA)	, (PSIA)
471	045 15:35:24	59.2703	59.2702	59.2702	0.2488	59.0214
472	045 15:45:24	59.2690	59.2691	59.2690	0.2488	59.0203
473	045 15:55:24	59.2686	59.2687	59.2686	0.2473	59.0213
474	045 16:05:24	59.2683	59.2683	59.2683	0.2486	59.0197
475	045 16:15:24	59.2677	59.2677	59.2677	0.2488	59.0189
476	045 16:25:24	59.2663	59.2663	59.2663	0.2494	59.0169
477	045 16:35:24	59.2653	59.2653	59.2653	0.2490	59.0163
478	045 16:45:24	59.2647	59.2647	59.2647	0.2481	59.0166
479	045 16:55:24	59.2635	59.2636	59.2635	0.2464	59.0171
480	045 17:05:24	59.2615	59.2616	59.2615	0.2486	59.0130
481	045 17:15:24	59.2611	59.2611	59.2611	0.2486	59.0125
482	045 17:25:24	59.2602	59.2602	59.2602	0.2480	59.0122
483	045 17:35:24	59.2592	59.2592	59.2592	0.2479	59.0114
484	045 17:45:24	59.2578	59.2577	59.2577	0.2431	59.0096
485	045 17:55:24	59.2574	59.2574	59.2574	0.2480	59.0094
486	045 18:05:24	59.2570	59.2571	59.2570	0.2484	59.0086
487	045 18:15:24	59.2563	59.2563	59.2563	0.2483	59.0080
488	045 18:25:24	59.2549	59.2549	59.2549	0.2487	59.0062
489	045 18:35:24	59.2537	59.2538	59.2537	0.2480	59.0058
490	045 18:45:24	59.2529	59.2530	59.2529	0.2478	59.0051
491	045 18:55:24	59.2519	59.2519	59.2519	0.2473	59.0046
492	045 19:05:24	59.2509	59.2509	59.2509	0.2477	59.0032

NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 45 IS LOCKED OUT FROM DSN 1

March 8, 1991

UNIT 1 ILRT FINAL REPORT

TABLE E.3

SUMMARY OF TEMPERATURES

***** SUMMARY TABLE OF TEMPERATURES *****

BRAIDWOOD UNIT 1 11:51:36 WED, 13 MAR 1991

DATA SET#	DATA TIME DAY HH MM SS	AVERAGE TEMP, (DEG F)	AVERAGE SUBVOLUME #1	#2	#3	#4	JRES, (DEG F)	#6	#7	#8	#9
471	045 15:35:24	67.4	67.3	67.4	67.5	67.3	67.5	67.4	68.5	66.6	68.2
472	045 15:45:24	67.5	67.3	67.4	67.5	67.4	67.5	67.4	68.6	66.6	68.2
473	045 15:55:24	67.5	67.3	67.4	67.5	67.4	67.4	67.5	68.6	66.6	68.2
474	045 16:05:24	67.5	67.3	67.4	67.5	67.4	67.4	67.5	68.6	66.6	68.2
475	045 16:15:24	67.4	67.2	67.4	67.5	67.4	67.4	67.5	68.5	66.6	68.2
476	045 16:25:24	67.5	67.4	67.4	67.5	67.3	67.4	67.4	68.6	66.6	68.2
477	045 16:35:24	67.5	67.4	67.4	67.5	67.4	67.4	67.5	68.6	66.6	68.2
478	045 16:45:24	67.4	67.3	67.4	67.5	67.3	67.3	67.4	68.6	66.6	68.2
479	045 16:55:24	67.5	67.4	67.4	67.5	67.4	67.4	67.4	68.5	66.6	68.2
480	045 17:05:24	67.4	67.3	67.4	67.5	67.3	67.4	67.4	68.5	66.6	68.2
481	045 17:15:24	67.5	67.3	67.4	67.5	67.3	67.5	67.4	68.6	66.6	68.2
482	045 17:25:24	67.5	67.4	67.4	67.5	67.4	67.4	67.4	68.6	66.6	68.2
483	045 17:35:24	67.4	67.3	67.4	67.5	67.3	67.4	67.4	68.5	66.6	68.1
484	045 17:45:24	67.4	67.3	67.4	67.5	67.3	67.4	67.4	68.5	66.6	68.2
485	045 17:55:24	67.4	67.3	67.4	67.5	67.3	67.3	67.4	68.6	66.5	68.1
486	045 18:05:24	67.5	67.4	67.5	67.5	67.3	67.3	67.4	68.5	66.6	68.1
487	045 18:15:24	67.4	67.3	67.4	67.5	67.3	67.3	67.4	68.6	66.6	68.2
488	045 18:25:24	67.4	67.3	67.4	67.5	67.3	67.3	67.4	68.6	66.5	68.2
489	045 18:35:24	67.4	67.3	67.4	67.5	67.3	67.4	67.4	68.6	66.6	68.2
490	045 18:45:24	67.4	67.3	67.4	67.5	67.3	67.3	67.4	68.6	66.5	68.2
491	045 18:55:24	67.4	67.3	67.4	67.5	67.3	67.3	67.4	68.6	66.5	68.2
492	045 19:05:24	67.4	67.3	67.4	67.5	67.3	67.3	67.4	68.5	66.5	68.1

***** NO PRESSURE CHANNELS ARE LOCKED OUT *****

DAS CHANNEL # 10 LOCKED OUT FROM DSN 1

March 8, 1991

UNIT 1 ILRT FINAL REPORT

TABLE E.4

SUMMARY OF DEW CELL TEMPERATURES

***** SUMMARY TABLE OF DEW TEMPERATURES *****

BRAIDWOOD UNIT 1 11:52:10 WED, 13 MAR 1991

DATA SET#	TIME DAY HH MM SS	AVERAGE DEW TEMP, (DEG F)	AVERAGE SUBVOLUME TEMPERATURES, (DEG F)									
			#1	#2	#3	#4	#5	#6	#7	#8	#9	
471	045 15:35:24	59.2	59.1	59.1	59.3	59.3	59.3	59.1	58.9	58.8	59.4	
472	045 15:45:24	59.2	59.3	59.2	59.3	59.2	59.2	59.0	58.8	58.5	59.4	
473	045 15:55:24	59.0	59.3	59.1	59.3	58.8	58.8	59.0	59.1	58.5	59.0	
474	045 16:05:24	59.2	59.2	59.4	59.2	59.1	59.1	59.0	58.7	58.5	59.3	
475	045 16:15:24	59.2	59.4	59.1	59.2	59.3	59.3	59.1	58.7	58.5	59.4	
476	045 16:25:24	59.2	59.3	59.3	59.3	59.4	59.4	59.1	58.8	58.5	59.3	
477	045 16:35:24	59.2	59.3	59.3	59.3	59.2	59.2	58.9	58.9	58.5	59.3	
478	045 16:45:24	59.1	59.2	59.3	59.6	59.1	59.1	59.1	58.9	58.5	59.4	
479	045 16:55:24	58.9	58.7	59.2	59.3	58.7	58.7	59.0	58.6	58.5	59.3	
480	045 17:05:24	59.2	59.5	59.3	59.2	59.0	59.0	59.0	58.9	58.5	59.3	
481	045 17:15:24	59.2	59.3	59.1	59.2	59.3	59.3	59.0	58.8	58.5	59.3	
482	045 17:25:24	59.1	59.2	59.3	59.6	59.1	59.1	59.0	58.7	58.5	59.4	
483	045 17:35:24	59.1	59.0	59.2	59.2	59.1	59.1	59.0	58.8	58.5	59.3	
484	045 17:45:24	59.1	59.3	59.2	59.3	59.1	59.1	59.0	58.7	58.5	59.3	
485	045 17:55:24	59.1	59.3	59.2	59.2	59.1	59.1	59.0	58.7	58.5	59.3	
486	045 18:05:24	59.1	59.2	59.3	59.3	59.1	59.1	59.0	58.8	58.5	59.3	
487	045 18:15:24	59.1	59.2	59.3	59.1	59.1	59.1	59.1	58.7	58.5	59.3	
488	045 18:25:24	59.2	59.7	59.2	59.1	59.1	59.1	59.0	58.7	58.5	59.3	
489	045 18:35:24	59.1	59.3	59.2	59.1	59.1	59.1	59.0	58.8	58.5	59.3	
490	045 18:45:24	59.1	59.3	59.1	59.2	59.0	59.0	59.0	58.6	58.5	59.3	
491	045 18:55:24	59.0	59.2	59.1	59.2	58.9	58.9	58.9	58.8	58.5	59.3	
492	045 19:05:24	59.1	59.0	59.2	59.1	59.1	59.1	58.9	58.6	58.5	59.3	

NO PRESSURE CHANNELS ARE LOCKED OUT

DAS CHANNEL # 1 IS LOCKED OUT FROM DSN 1

UNIT 1 ILRT FINAL REPORT

Appendix F - TYPE A TEST CORRECTIONS

The following table presents the Type A Test corrections for leakage pathways isolated during the ILRT.

TABLE F.1
TYPE A TEST CORRECTIONS

<u>Pen No.</u>	<u>Description</u>	<u>Local Leak Test No.</u>	<u>MinPath Leakrate</u>
P-4	Pressurization Pen.	1BwVS 6.1.2.D-1.24	.053 SCFH
I-3	Instrumentation Test Line	1BwVS 6.1.2.D-1.7	.046 SCFH
---	Equipment Air Lock	1BwVS 6.1.3.B-1	5.74 SCFH
P-1	CS Supply to Ring Header	1BwVS 6.1.2.d-1.14	.740 SCFH
P-97	Containment Purge	1BwVS 6.1.7.3-1	4.92 SCFH
P-55	Accum. Fill Line	1BwVS 6.1.2.d-1.22	.601 SCFH
P-6/10	RCFC WO Supply	1BwVS 6.1.2.d-1.21	1.08 SCFH
TOTAL			13.18 SCFH

UNIT 1 ILRT FINAL REPORT

Appendix G - HISTORICAL LOCAL LEAKRATE DATA

Local leak rate testing has been performed twice at Braidwood Unit 1 prior to the subject ILRT and was performed after the ILRT during the second refueling outage (AIRO2). Results indicated for AIRO2 are "as left" LLRT values performed after the ILRT. Several containment penetrations, including the containment airlocks and purge valves, are tested at more frequent intervals, as specified by the plants Technical Specifications. The results below present the periodic Type B & C tests performed at month intervals to satisfy the requirements of 10CFR50 Appendix J.

TABLE G.1
HISTORICAL LOCAL LEAKRATE DATA

PENETRATION	SYSTEM	LLRT RESULTS (SCCM)		
		PRE-OP 5/86	AIRO1 12/89	AIRO2 2/91
ZONE 1	ELEC	69	23.2	39.4
ZONE 2	ELEC	36	610	660
ZONE 3	ELEC	32	271	240
ZONE 4	ELEC	99	551	52
FUEL X-FER TUBE		04	20.6	21.1
FUEL X-FER BELLOW		84	50.5	75.7
EQUIP HATCH		11	22.4	20.8
I-3	VQ	04	23.2	15.1
I-3	VQ	04	25.5	6.6
P-70	PS	04	89.2	96.1
P-70	PS	04	870	56.5
P-70	PS	04	340	400
P-70	PS	04	624	177.1
P-45	PS	207	16.1	20.9
P-45	PS	259	44.5	23.5
P-36	PS	172	7.1	34.4
P-36	PS	191	66.0	1440
P-41	CV	22	383	191
P-23	CV	247	270	31.8
P-11	RE	17	323	136
P-65	RE	04	20.3	49.2
P-65	RE	04	15.0	1250
P-27	RY	156	42.1	102
P-27	RY	483	356	1010
P-44	RY	65	14.2	49.6
I-5	RY	04	10.8	21.9
P-21	CC	295	58.2	31.2
P-24	CC	53	672	584
P-25	CC	32	390	965
P-32	FC	04	1.5	28.3
P-57	FC	04	6.8	23
P-1	CS	642	87.1	349
P-16	CS	131	105	82
P-39	IA	124	290	701

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TABLE G.1 (continued)

PENETRATION	SYSTEM	LLRT RESULTS (SCCM)		
		PRE-OP 5/86	AIR01 12/89	AIR02 2/91
P-56	SA	48	497	115
P-30	WM	153	706	515
P-47	RF	57	3.5	3
P-13	OG	28	46	50.6
P-69	OG	10	45	37.2
P-13	OG	118	46	42
P-23	OG	30	42.5	47.1
P-52	PR	04	26.5	20.8
P-52	PR	105	80	27.2
EQUIP. HATCH	PR	06	14	39
	PR	41	658	350
EMERG. HATCH	PR	29	40.1	39
	PR	184	38.4	904
P-5	WO	2140	6.0	114.2
P-8	WO	1150	820	108.7
P-6	WO	1665	365	190
P-10	WO	1410	170.2	319
P-55	SI	19	196	29.9
P-55	SI	04	181	284
P-4	CPP	04	23.9	25
P-63	SPARE	N/A	3.6	16.1
P-64	SPARE	N/A	4.1	13.9
P-74	SPARE	N/A	5.7	7.5
P-97	VQ	1064	3280	2320
P-95	VQ	1410	798	750
P-96	VQ	74	48.6	259
P-94	VQ	79	1648	375
EQUIP. HATCH	PC	1453	767	2710
EQUIP. HATCH FLANGE	PC	04	0.3	12.5
EMERG. HATCH	PC	2038	1840	995
FLANGE #1	PC	08	231	12.3
FLANGE #2	PC	04	11.3	11.2
P-82	SD	716	146.2	N/A*
P-83	SD	37	40.2	N/A*
P-80	SD	400	242	N/A*
P-81	SD	43	51.4	N/A*
P-88	SD	06	172	N/A*
P-89	SD	05	84.1	N/A*
P-90	SD	100	150	N/A*
P-91	SD	04	2.	N/A*

* Steam Generator Blowdown Valves no longer required to be leak tested per Type C LLRT program.