

Reactor Containment Building

Integrated Leak Rate Test

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SECTION

1

COOPER NUCLEAR STATION  
SUMMARY TECHNICAL REPORT  
ON  
INTEGRATED PRIMARY CONTAINMENT LEAK RATE TEST

I. INTRODUCTION

Cooper Nuclear Station Technical Specification Section 4.7.A requires that an integrated leak rate test be performed at approximately three and one-third year intervals so that any ten-year interval would include four ILRT's. Section 4.7.A further states that integrated leak rate tests may be performed at either Pa (58 psig, 73 psia) or PT (29 psig, 44 psia), and that the leak rate will be less than 75% of La, where La is .635% of the primary containment volume per 24 hours at 58 psig. In compliance with this requirement, an integrated primary containment leak rate test was performed on November 6th and 7th, 1976. The leak rate found was <.75 La. All type 'A' testing was done in full compliance with 10CFR50, Appendix J.

Section 4.7.A of the Technical Specifications also requires that "local leak rate tests shall be performed on the primary containment testable penetrations and isolation valves at a pressure of 58 psig (except for the main steam isolation valves) each operating cycle, but in no case at intervals greater than two years. Bolted double-gasket seals shall be tested whenever the seal is closed after being opened and at least once per operating cycle, but in no case at intervals greater than two years".

Local leak rate tests were conducted on all testable isolation valves, double-gasket seals, expansion bellows and electrical penetrations during October and November, 1975. The as found condition of the Type 'B' and 'C' test did exceed Technical Specifications. The as left condition was well below Technical Specification limits.

II. TEST RESULTS

A. DISCREPANCIES

While pressurizing the drywell, three major leaks were found. One of the leaks was at a weld connection of a valve and sensing line. The line was a 3/8" instrument sensing line which connected to drywell pressure transmitter PC-PT-513. This connection is located near the steam tunnel entrance on 903' level northeast reactor building, and leads to drywell penetration X-47b. This leak was noted by sound of air leakage at approximately one half of full pressure (Pa). The penetration isolation valve was closed and the integrated leak rate test was continued. Following completion of the integrated leak rate test, the leakage from this weld connection was measured and found to be 15.31 scfh at 58 psig. The weld was then repaired and the penetration was again tested using local leak rate test methods, and was found to be leaking at .017 scfh. The weld was soap-bubble tested with no leakage found. It is assumed that the .017 scfh leakage is through the manual isolation valve and into the drywell.

Again during pressurization, air was heard coming from the drywell dampers control solenoids exhaust ports. This is the second major leak found during pressurization of the drywell. The air was blowing from the drywell fan coil unit damper solenoids 501 A, B, C and D. Root valves to these solenoids on penetrations X-47 C, D, E and F were closed; however, the air continued to blow. Further investigation showed that one port of all damper solenoids were tied together and connected to penetration X-100b. This penetration isolation valve was closed and the exhaust ports stopped blowing air. The integrated leak rate test was continued following isolation of X-100b. It has been determined that the leakage seen from this penetration would be that of an unrestricted 1/2" copper tube 50' in length. \*From tables and calculations it has been determined that this leakage was approximately 32 scfm or 1920 scfh at 58 psig drywell pressure. The Technical Specification limit of leakage  $L_a = .635\%$  of the contained air per day = 315.2 scfh.

The drywell damper control air system is designed so that on increasing pressure of 5 psi an isolation solenoid, between the damper and its control air solenoid, closes and vents the damper to the drywell. Investigation of why the isolation solenoids did not operate properly showed that they were installed wrong and were the wrong type. This style of solenoid is, per manufacturers instruction, to be installed in a vertical position rather than the horizontal position in which they were found. For the application of this damper control design, an ASCO Model 8302C27U solenoid should have been used. However, an ASCO Model 8320C31F was found in the damper control system. Upon actuation of this solenoid, the drywell vent line (X-100b), is connected to the control solenoid. All damper control lines are presently isolated at the penetration. The dampers are all fail open to give maximum cooling. The correct solenoids have been properly installed.

After the drywell and torus were taken to full pressure (58 psig), and while the primary containment was stabilizing, a search for possible leaks was conducted. During this search, RHR heat exchanger 1B relief valves 28 RV and 29 RV were found leaking slightly around the adjusting screw cover. These covers were tightened to eliminate the leakage and the leak rate test was continued. Investigation found that earlier in the refueling outage both of these valves were removed from RHR heat exchanger 1B and taken to the maintenance shop for periodic maintenance and testing. During this periodic maintenance, the valves were disassembled, inspected, cleaned and adjusted. After testing and adjustment, the adjusting screw covers were not properly tightened. This leakage did not exist prior to the refueling outage of Oct., 1976. The relief valves on RHR heat exchanger 1A (26 RV and 27 RV) were soap-bubble tested and a very slight leakage was seen. No attempt was made to reduce or repair this leakage.

#### B. INSTRUMENT LINE FLOW CHECK VALVES

From Technical Specifications Section 4.7.D, the operability of the reactor coolant system instrument line flow check valves shall

\*"Crane", Flow of Fluids, Technical Paper No. 410

be verified at least once per operating cycle. On November 4, 1976, prior to the integrated leak rate test, all instrument penetrations in which flow checks are installed were tested. There were a total of 78 check valves tested and of these valves one was found with a leakage greater than that recommended by the manufacturer. Technical Specifications states that valves will be accepted if a marked decrease in flow rate is observed and the leakage rate is acceptable. The manufacturer "Marotta, Inc." states that the flow rate will be acceptable if it is between .2 and .7 gpm. Penetration X-33d on which 28 CV was installed had a flow rate of 1.04 gpm. The check valve internals were replaced and the leakage was .48 gpm.

### C. INTEGRATED LEAK RATE RESULTS

The reference chamber method of testing the primary containment for leakage was used at a pressure of Pa (58 psig). The leakage measurement system employed the use of a reference system, u-tube water manometer, a differential pressure gauge, an absolute pressure gauge and other assorted connecting hardware as shown in Figure A. The rotometer test setup used in the controlled bleed rate or supplemental portion of the integrated leak test is shown in Figure B. The rotometer was connected to a separate penetration.

Twenty resistance temperature devices (RTD's) were used to measure the containment temperature, and six dewcells were used to measure containment vapor pressure. The location of the dewcells and RTD'S is given in Table I. This table also gives the weighting factor of each RTD and dewcel.

The RTD's were wired directly to the plant process computer and were typed out on a special log every 20 minutes in degrees Fahrenheit. The dewcells were also wired directly to the plant process computer and were typed out on a special log in inches of water vapor pressure. The instrument accuracy certifications are attached for all instruments used in the integrated leak rate test.

Prior to the integrated leak rate test, the reference chamber was leak tested for 48 hours using the absolute method and it was found to be tight. Upon completion of the integrated leak rate test, the reference chamber was again tested and found to be tight. See reference chamber pre and post test data and results.

The primary containment leak rate was measured for three overlapping 24 hour periods. The leak rate found for those periods were .238%/day, .230%/day and .229%/day. The Technical Specification limit is .476%/day.

A leakage rate of .26%/day was superimposed onto the exiting primary containment leakage of .24%/day. The drywell leakage monitoring showed a total leak rate of .418/day. The superimposed leak rate data is acceptable if :

$$\begin{aligned} |L_{am} - L_{am}| &\leq .25 L_a \\ |.158 - .238| &\leq .25 (.635) \\ .080 &\leq .159 \end{aligned}$$

### III. CONTAINMENT INSPECTION

The accessible interior and exterior surfaces of the drywell and suppression chamber were inspected prior to the integrated leak rate test. Particular attention was paid to all primary containment penetrations. No signs of structural deterioration could be seen.

Following completion of the integrated leak rate test, the drywell and suppression chamber interior and exterior surfaces were again inspected for signs of structural deterioration. No signs of structural deterioration of the drywell or suppression chamber could be found.

### IV. DATA ANALYSIS

The data was taken at twenty minute intervals throughout the test period and was analyzed for each set of twenty minute readings and hourly readings using the following formula:

$$\text{**CALCULATED LEAK RATE WT\%/24-HR} = \left[ \frac{T_1 (\Delta P_2 + P_{v2})}{T_2 (P_1 - P_{v1})} - \frac{\Delta P_1 + P_{v1}}{P_1 - P_{v1}} \right] \frac{2400}{h}$$

$T_1$  = average absolute containment temperature at start of test ( $^{\circ}\text{R}$ )

$T_2$  = average absolute containment temperature at later time ( $^{\circ}\text{R}$ )

$\Delta P_1$  = drywell-reference chamber dp at start of test (IN  $\text{H}_2\text{O}$ )

$\Delta P_2$  = drywell-reference chamber dp at later time (IN  $\text{H}_2\text{O}$ )

$P_{v1}$  = containment vapor pressure at start of test (IN  $\text{H}_2\text{O}$  ABS)

$P_{v2}$  = containment vapor pressure at later time (IN  $\text{H}_2\text{O}$  ABS)

$P_1$  = absolute drywell pressure at start of test (IN  $\text{H}_2\text{O}$  ABS)

$h$  = time interval in hours since start of test

Data were entered into a programmable calculator and the following analyses were made and printed: interval leak rate, total time leak rate, statistical error, leak rate trend, limit for trend slope and a mass plot analysis.

The point to point statistical error is reported as twice the standard deviation of the individual leakage rates.

As an indication of any trend that the successive leakage rates are showing, least squares fit analysis is performed on the data to indicate the trend over the last 4 hours and the trend from the

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\*\*From ANSI N 45.4 - 1972 Appendix 'A'

beginning of the test.

For informational purposes, a mass plot analysis is performed by calculating the containment air mass at the end of each interval and performing a least squares fit analysis on these values with the slope of the resultant line being the mass plot leakage rate. This mass plot leakage rate is analyzed for the 95% confidence level assuming a t-distribution probability equation.

## V. ERROR ANALYSIS

### 1. Assumptions

- A. All instrument errors are random.
- B. All instrument readings are independent of other readings.
- C. The reference chamber exhibited zero leakage during the test.

### 2. Estimate of Confidence Interval of Leak Rate Calculations

Given the assumptions above, all test measurements entering the leak rate calculation are independent random variables. An estimate of the error in the leak rate calculations can be obtained as a function of the variances of the individual measurements. The leak rate formula is:

$$L = \left[ \frac{T_1 (\Delta P_2 + P_{V2})}{T_2 (P_1 - P_{V1})} - \frac{\Delta P_1 + P_{V1}}{P_1 - P_{V1}} \right] \frac{2400}{h}$$

The variance becomes:

$$\begin{aligned} \sigma^2 (L) = & \left( \frac{\delta L}{\delta T_1} \right)^2 \sigma^2 (T_1) + \left( \frac{\delta L}{\delta T_2} \right)^2 \sigma^2 (T_2) \\ & + \left( \frac{\delta L}{\delta \Delta P_1} \right)^2 \sigma^2 (\Delta P_1) + \left( \frac{\delta L}{\delta \Delta P_2} \right)^2 \sigma^2 (\Delta P_2) \\ & + \left( \frac{\delta L}{\delta P_{V1}} \right)^2 \sigma^2 (P_{V1}) + \left( \frac{\delta L}{\delta P_{V2}} \right)^2 \sigma^2 (P_{V2}) \\ & + \left( \frac{\delta L}{\delta P_1} \right)^2 \sigma^2 (P_1) + \left( \frac{\delta L}{\delta h} \right)^2 \sigma^2 (h) \end{aligned}$$

Make the following additional assumptions and definitions:

$$\sigma^2 (T_1) = \sigma^2 (T_2) = \sigma^2 (T) \quad (T = 80^\circ\text{F})$$

$$\sigma^2 (P_1) = \sigma^2 (P) \quad (P_1 = 73 \text{ psia})$$

$$\sigma^2 (P_{v1}) = \sigma^2 (P_{v2}) = \sigma^2 (P_v) \quad (P_v = 80^\circ\text{F} = 1.50 \text{ psia at } 73 \text{ psia})$$

$$\sigma^2 (\Delta P_1) = \sigma^2 (\Delta P_2) = \sigma^2 (\Delta P) \quad (\Delta P = .5 \text{ psid} = 13.837 \text{ inches water})$$

$$h = 24 \quad \sigma^2(h) = 0$$

$$T_1 = T_2 = T$$

$$P_{v1} = P_{v2} = P_v$$

$L$  = maximum allowable containment leak rate = .476 wt % per 24 hours

The partial derivatives are ( $h = 24$ ):

$$\left| \frac{\delta L}{\delta T_1} \right| = \left| \frac{\delta L}{\delta T_2} \right| = \frac{100}{P_1 T} (\Delta P_2 + P_v) = \frac{100}{PT} (\Delta P + P_v)$$

$$\left| \frac{\delta L}{\delta P_1} \right| = \frac{L}{P_1} = \frac{L}{P}$$

$$\left| \frac{\delta L}{\delta \Delta P_1} \right| = \left| \frac{\delta L}{\delta \Delta P_2} \right| = \frac{100}{P_1} = \frac{100}{P}$$

$$\left| \frac{\delta L}{\delta P_{v1}} \right| = \left| \frac{\delta L}{\delta P_{v2}} \right| = \frac{100}{P_1} = \frac{100}{P}$$

The variance becomes:

$$\sigma^2 (L) = 2 \sigma^2 (T) \left[ \frac{100}{PT} (\Delta P + P_v) \right]^2 + \sigma^2 (P) \left( \frac{L}{P} \right)^2$$

$$+ 2 \sigma^2 (\Delta P) \left( \frac{100}{P} \right)^2 + 2 \sigma^2 (P_v) \left( \frac{100}{P} \right)^2$$

### 3. Estimated Variance of Each Measurement

#### 3.1 Estimate of $\sigma^2(T)$

All temperature measurements are obtained with nickel resistance temperature detectors connected to the plant process computer which has a precision reference junction temperature measuring circuit. This system has one standard deviation accuracy of 0.3°F:

$$\sigma(T) = .3^\circ\text{F}$$

$$\sigma^2(T) = .09$$

#### 3.2 Estimate of $\sigma^2(P)$

The Texas Instrument Inc. pressure instrumentation used to measure containment absolute pressure has a certified accuracy of .015 percent of reading:

$$\sigma(P) = (73 \text{ psia}) (.00015) = 1.1 \times 10^{-2} \text{ psia}$$

$$\sigma^2(P) = 1.2 \times 10^{-4}$$

#### 3.3 Estimate of $\sigma^2(\Delta P)$

The Texas Instrument Inc. pressure instrumentation used to measure differential pressure has a certified accuracy of .015% of reading:

$$\sigma(\Delta P) = (.5 \text{ psid}) (.00015) = 7.5 \times 10^{-5}$$

$$\sigma^2(\Delta P) = 5.63 \times 10^{-9}$$

#### 3.4 Estimate of $\sigma^2(P_v)$

All vapor pressure measurements were obtained with Foxboro dewcels connected to the plant computer through special RTD processing boards. The dewcel accuracies are as follows:

<u>Cell</u>	<u>Weighting Factor (<math>W_{vi}</math>)</u>	<u>Error <math>^\circ\text{F}</math></u>
1	.100	.11
2	.150	.15
3	.150	.18
4	.150	.22
5	.225	.25
6	.225	.32

$$P_v = \sum_{i=1}^6 W_{vi} P_{vi}$$

$$\sigma^2(P_v) = \sum_{i=1}^6 W_{vi} \sigma^2(P_{vi}) = .002698$$

$$\sigma^2(P_v) = .052^\circ\text{F} = .071 \text{ inches water at 73 psia}$$

$$\sigma(P_v) = .00257 \text{ psia}$$

$$\sigma^2(P_v) = 6.605 \times 10^{-6}$$

$$\sigma^2 (L) = 2 (.09) \frac{100}{73 \cdot 450} (.5 + 1.5)^2 + (1.2 \times 10^{-4}) \frac{.476^2}{73} +$$

$$2 (5.63 \times 10^{-9}) \frac{100^2}{73} + 2(6.605 \times 10^{-6}) \frac{100^2}{73}$$

$$\sigma^2 (L) = 4.6 \times 10^{-6} + 5.1 \times 10^{-9} + 2.1 \times 10^{-8} + 2.48 \times 10^{-5}$$

$$\sigma^2 (L) = 2.94 \times 10^{-5}$$

$$\sigma^2 (L) = 5.4 \times 10^{-3} = .0054$$

$$95\% \text{ confidence} = 2 \sigma (L) = .0108$$

#### VI. SPECIAL POST TEST

Following the regular primary containment integrated leak rate test and the superimposed leak verification test, a special test was conducted with a modified valve line-up.

An NRC inspector on site for observation of the integrated leak rate test posed several questions as to valve line-up of certain valves not directly associated with primary containment. The contention was that class II lines could fail during a loss of coolant accident and therefore these lines should be vented to ensure no downstream leakage barriers. This was done following the superimposed leak test. After repositioning some of the downstream valves, per Attachment D of ILRT Surv. Procedure, data was taken for an additional 5.67 hours and it was found that the leak rate did not change significantly. The leakage found was .289%/day, and that found during the unmodified valve line-up was .238%/day.

#### VII. ISOLATED EQUIPMENT

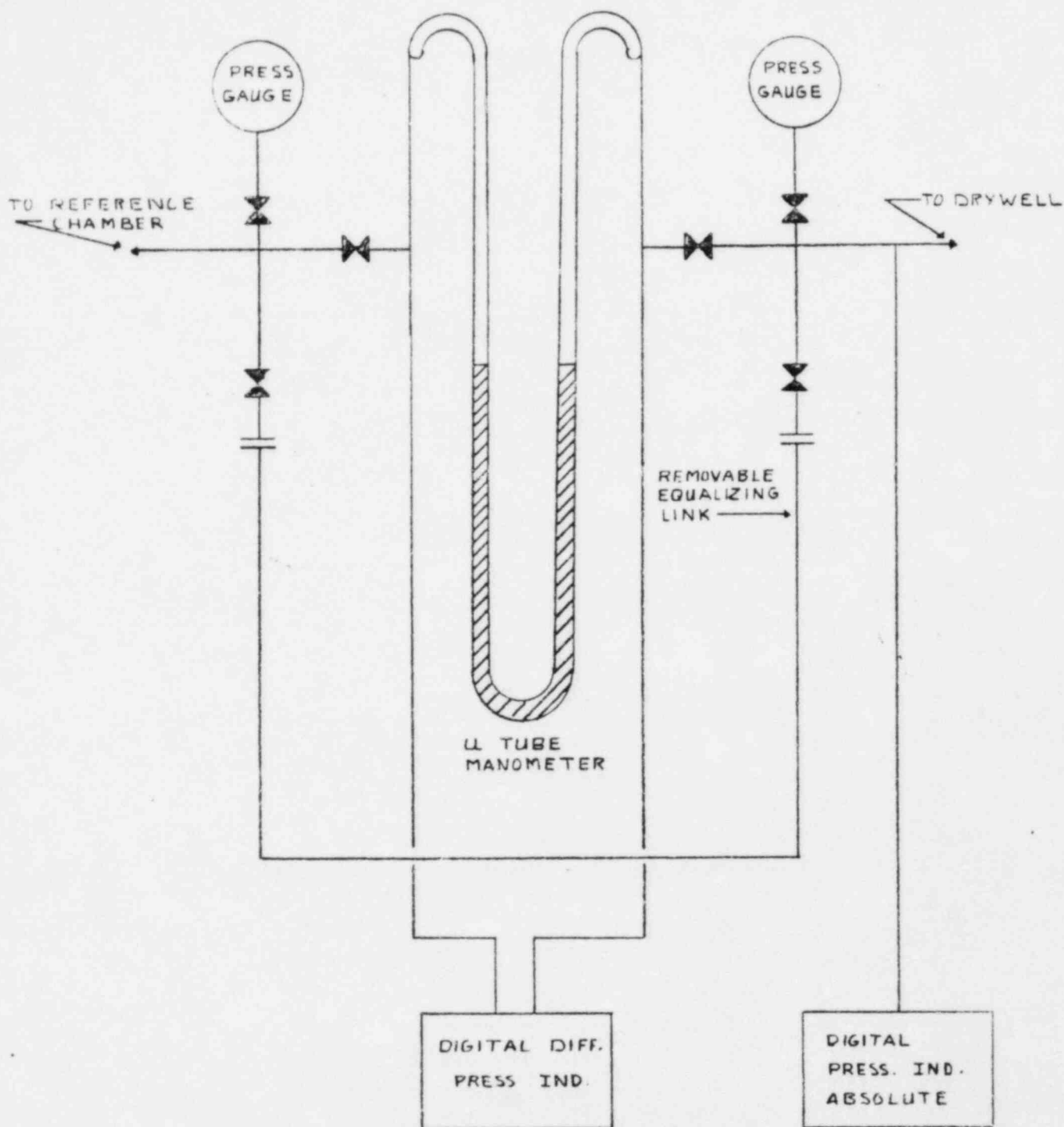
##### A. DRYWELL RADIATION MONITOR

Section A, step 21, of the integrated leak test procedure directs the removal of detectors from the drywell radiation monitor and installation of plugs. The monitor is then left valved into the primary containment and tested along with it. While performing this part, it was found that the plugs used in place of the detectors could not be found. The drywell radiation monitor was then isolated and the integrated leak test continued. The plugs were found after completion of the integrated leak test and the drywell radiation monitor was tested at 58 psig using local leak test methods. The leakage of this equipment was found to be 1.35 scfh. This leakage is insignificant compared to the allowable drywell leakage of 315 scfh.

##### B. DRYWELL OXYGEN AND HYDROGEN ANALYZERS

There are two drywell oxygen and hydrogen analyzers located on the 976' level of the reactor building. These analyzers take samples from 4 locations in primary containment. During the integrated leak rate test, both analyzers were isolated since

the sensors may have been damaged by the drywell pressure. Following the integrated leak rate test, both analyzers were leak tested using local leak rate methods, at a reduced pressure of 23 psig. The leak rates found were .66 scfh for the Beckman analyzer and .28 scfh for the Bendix analyzer.



REVISIONS DATE

TEST PANEL USED TO MONITOR  
DRYWELL AND REFERENCE CHAMBER  
PRESSURES

DRAWN BY

WDR

APPROVED BY

WJH

SCALE



Nebraska  
Public  
Power  
District

SIZE

A

FIG. A

TO-DRYWELL  
SEPERATE  
PENETRATION

THERMOMETER

NEEDLE VALVE

ROTOMETER

# SUPPLEMENTAL LEAKAGE TEST

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WDR

APPROVED BY

WJH

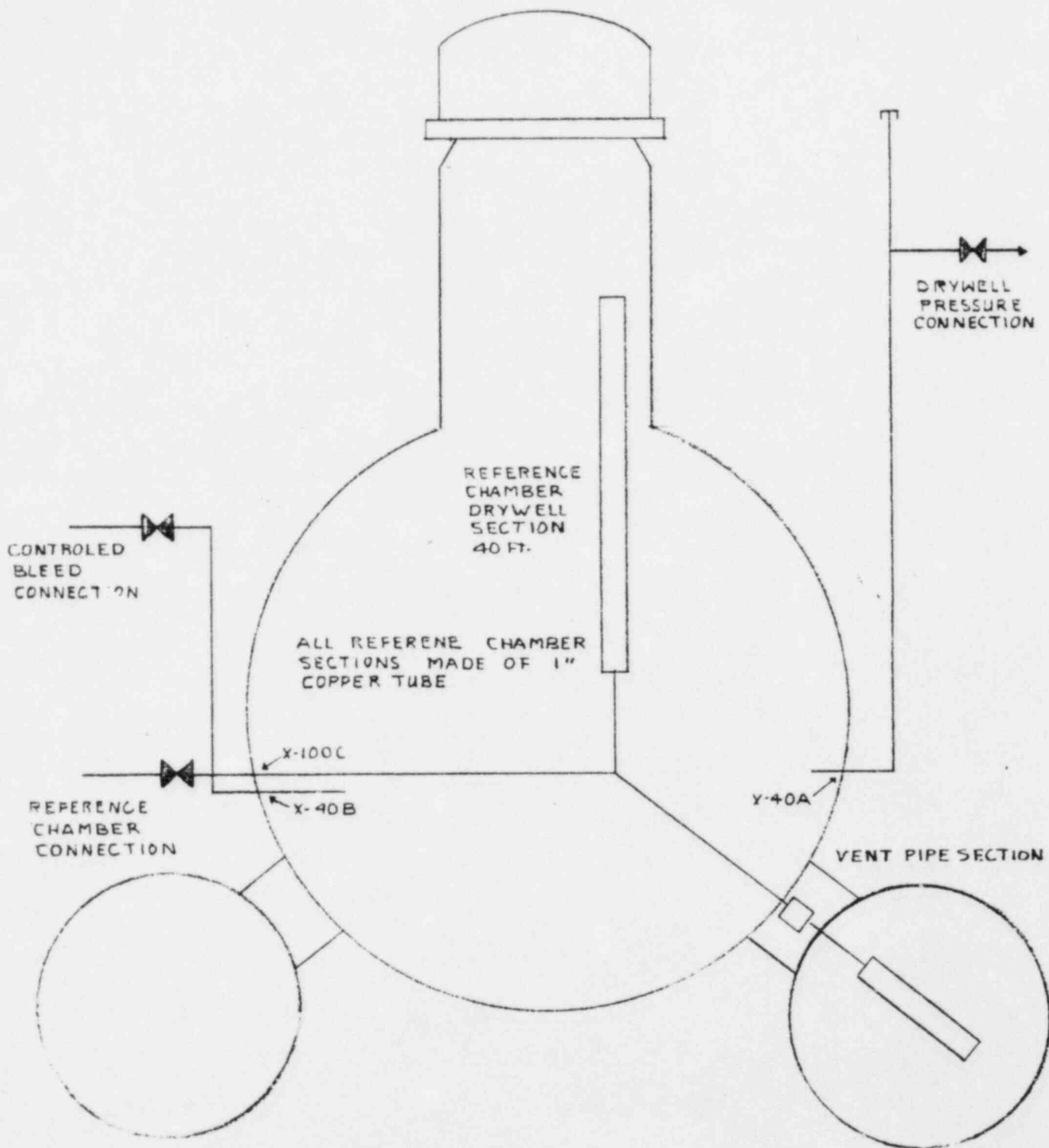
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FIG. B



DATE  
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# DRYWELL REFERENCE CHAMBER PENETRATIONS

-12-

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*W.D.R.*

APPROVED BY

*W.F.H.*

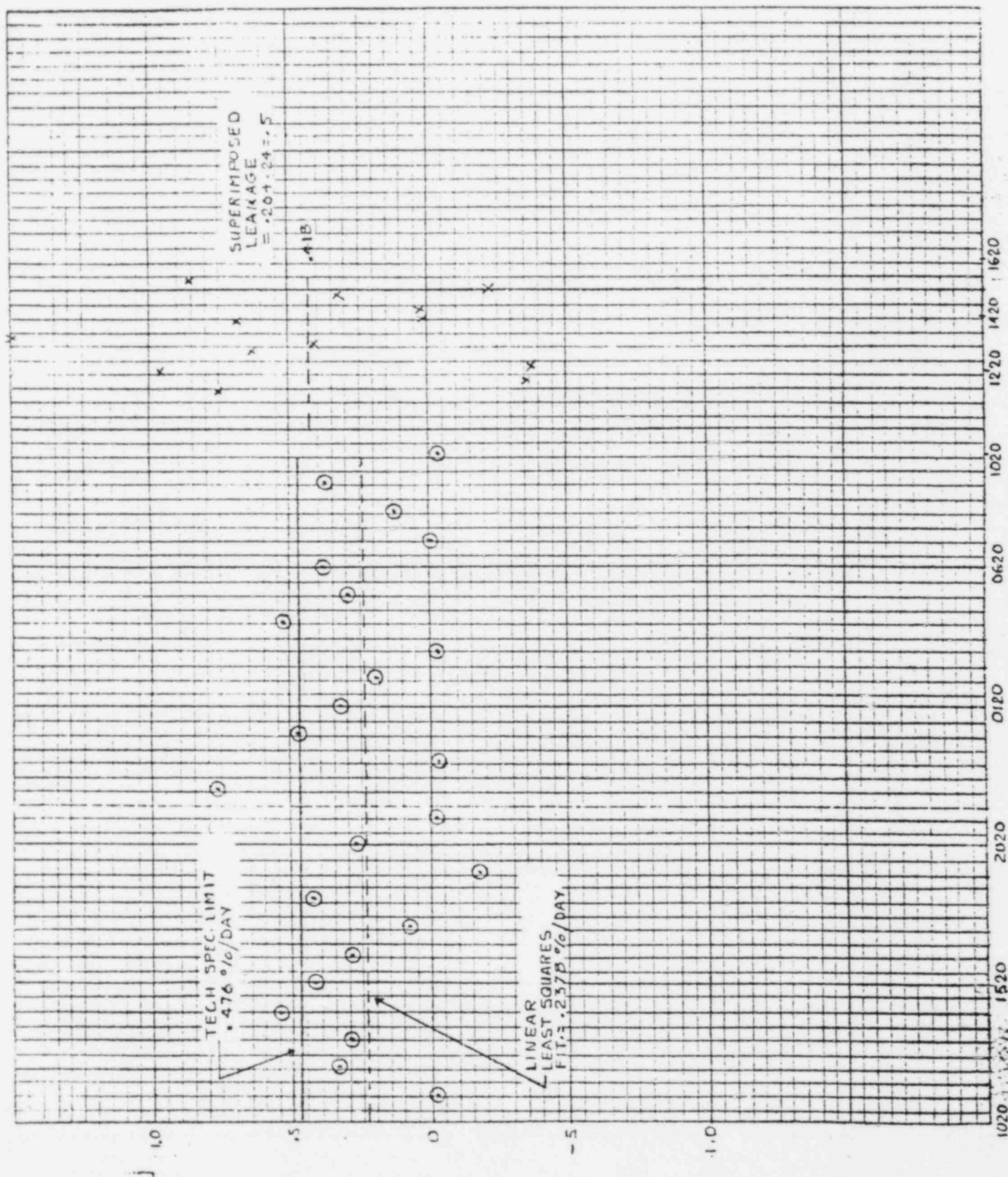
SCALE



Nebraska  
Public  
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SIZE  
A

FIG. C



DATE

IONS

COOPER ILRT 1976

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W.F.H.

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Nebraska  
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FIG. D

SECTION

2

# VIII. LOCAL LEAK RATE TEST DISCUSSION

With the exception of penetrations X9A & B, all containment isolation valves were tested by pressurizing the space between valves and observing pressure decay. By calculating the volume of the test space between valves, and observing the time rate of pressure decrease, leak rate in cfh is computed. Temperature correction was employed only on the main steam isolation valves since they were tested immediately following shutdown and the high temperatures were a significant factor in the calculations. Any leakage rate calculated without temperature correction will yield larger indicated leakage, since all valves are above standard temperature. Thus from the standpoint of Technical Specifications for allowable leakage, the uncorrected data is more conservative.

All type B and C tests were conducted in accordance with 10CFR50 Appendix J with the following exceptions:

1. Main steam isolation valves were tested at 29 psig instead of Pa (58 psig).
2. Feedwater check valves were tested with water instead of air or nitrogen.
3. Main steam and feedwater line expansion bellows were tested at 5 psig instead of Pa.
4. The personnel airlock hatch to the drywell was tested at 3 psig, following each opening, instead of Pa. However a full pressure test at Pa is conducted at 12 month intervals.

The main steam isolation valves were tested in September of 1975 and in September of 1976. During the 1975 tests, steam line 'A' outboard isolation valve was found leaking in excess of Technical Specifications. The valve was repaired and retested. During the 1976 tests, all main steam isolation valves were found with a leakage rate less than Technical Specification limits.

The volumes used for calculating local leakage rates were obtained from physical measurements.

The volumes of the toroidal spaces in the double-gasketed seals and bellows are somewhat uncertain due to the presence of flexible rubber, and in all cases the volumes are very small. For all seals and bellows a test rig was used which contained a known volume of .25 ft<sup>3</sup> and the seal and bellows volume was considered insignificant.

The allowable local leakage rate as specified in the CNS Technical Specifications for all valves and penetrations other than the main steam isolation valves is .60 La.

## Local Leakage Limit Calculations:

Drywell Volume	132250 ft <sup>3</sup>	Total contained mass of air at
Torus Volume	110300 ft <sup>3</sup>	58 psig (or 72.7 psia):
Primary Cont. Volume	242550 ft <sup>3</sup>	$M = \frac{(72.7)144(242550)}{53.3(530)}$
		= 89270 lbs.
in <sup>2</sup> /ft <sup>2</sup>	144	
° Rankine	530	
gas constant	53.3	

The maximum allowable leakage for the integrated leak test is  $L_a = .635\%$  of the contained weight of air per 24 hours.

$$\begin{aligned} L_a &= .00635 (89270) \\ &= 566.9 \text{ lb/day} \\ &= 23.62 \text{ lb/hr} \end{aligned}$$

Converting this flow to cubic feet per hour at standard conditions:

$$L_a = \frac{(23.62)(53.3)(530)}{14.7(144)} = 315.2 \text{ SCFH}$$

The maximum allowable leakage for the local leakage tests is  $.60 L_a$ .

$$.60 L_a = 315.2(.6) = 189 \text{ SCFH}$$

During the local leak rate tests conducted in October of 1975, all primary containment doublegasketed seals, testable bellows, electrical penetrations, isolation valves, and airlock doors were tested in accordance with Technical Specifications 4.7.A.F. There were a total of 83 penetrations tested, of which 14 were found to be leaking above limits and were repaired and retested. All 14 of the leaking penetrations found were isolation valve or type "C" penetrations. No electrical penetrations, double-gasketed seals or bellows leaked excessively.

Listed below is a summary of each primary containment penetration tested since the preoperational leak rate test. The penetrations which were found leaking excessively and were repaired are listed first. Leak rate limits for each penetration are arbitrary limits established from the preoperational local leak rate test results.

X-25-Primary containment purge and vent supply to drywell PC-MO-232 (inboard isolation valve) and PC-AO-238 (outboard isolation valve). During October, 1975 testing leakage was found to be 799.7 scfh. The established limit was 2.0 scfh. PC-AO-238 was repaired by replacing damaged rubber seat, and adjusting valve stroke. After repair, leakage was 1.09 scfh. PC-MO-232 was not repaired or adjusted. Therefore primary containment would have been maintained by the inboard isolation valve PC-MO-232. The leaking valve PC-AO-238 is an Allis-Chalmers 24" butterfly valve.

This penetration was again tested on November 5, 1976 following valve and operator maintenance. The leakage rate observed during that test was .58 scfh. Another test was conducted on December 15, 1976 following operator maintenance, and the leakage was found to be 1.39 scfh.

X-205-Suppression chamber vacuum relief PC-AO-244 (inboard isolation valve), and PC-14CV (outboard isolation valve). October, 1975 leak rate tests showed that this penetration test area was leaking at a rate greater than 1100 scfh since it would not seal sufficiently to pressurize. The established limit is 10.0 scfh. PC-AO-244 was repaired by replacing a flange gasket and tightening the rubber seat by installing a 1/8" steel flange ring. After repair, leakage was 0.06 scfh. PC-14CV was not repaired or adjusted. Therefore primary containment would have been maintained by the outboard isolation valve PC-14CV. The leaking valve PC-AO-244 is an Allis-Chalmers 20" butterfly valve.

X-205-Suppression chamber vacuum relief PC-AO-243 (inboard isolation valve) and PC-13CV (outboard isolation valve). October, 1975 leakage tests showed that this penetration test area was leaking at a rate greater than 1100 scfh since it would not seal sufficiently to pressurize. The established limit is 7.0 scfh. PC-AO-243 was repaired by replacing the flange gasket and tightening a rubber seat by installing a 1/8" steel flange ring. After repair, leakage was 0.017 scfh. PC-13CV was not repaired or adjusted. Therefore primary containment would have been maintained by the outboard isolation valve PC-13CV. PC-AO-243 is an Allis-Chalmers 20" butterfly valve.

X-26-Primary containment purge and vent exhaust from drywell, and ACAD vent. PC-MO-231 (inboard isolation), PC-AO-246 (outboard isolation), and ACAD-1308MV (outboard isolation). October, 1975 leak test showed that this penetration was leaking at a rate of 3208 scfh. The established limit is 3.0 scfh. PC-AO-246 was repaired by replacement of the rubber seat ring. After repair of PC-AO-246 the leakage was reduced to 5.0 scfh. PC-MO-231 was then repaired by replacement of the rubber seat ring which further reduced the leakage rate to zero. The rubber seat rings on both valves were scratched and nicked. Prior to repair of PC-MO-231 it was established that PC-MO-231 as found leakage was 5.0 scfh. Even though this leak rate is above the established individual valve limit for this test, primary containment would have been maintained within maximum allowable limits. PC-MO-231 & AO-246 are both Allis-Chalmers 24" butterfly valves.

Further testing was done on this penetration during October and December of 1976 following maintenance of the valve and operator. The leak rates found during those tests were 2.27 and 1.89 scfh respectively.

X-220-Primary containment purge and vent exhaust from suppression chamber PC-MO-230 (inboard isolation valve) and PC-AO-245 (outboard isolation valve). October, 1975 leakage tests showed this test volume to be leaking at a rate of 241.92 scfh. The established limit for this penetration is 5.0 scfh. PC-AO-245 was repaired by adjustment of the valve stroke and replacement of the valve stem packing. After repair of PC-AO-245 the leak rate was reduced to 0.75 scfh. PC-MO-230 was not repaired, or adjusted. Therefore, primary containment would have been maintained by the inboard isolation valve PC-MO-230. PC-AO-245 is an Allis-Chalmers 24" butterfly valve.

X-212-RCIC turbine exhaust to the suppression chamber RCIC-15CV. The test volume for this penetration is between RCIC-15CV and manual valve RCIC-37. Leakage tests showed a leak rate of 153.9 scfh. RCIC-15CV was disassembled for repair, and it was found that the disc nut and washer had come loose and were missing. This caused the valve disc to bind and not seat properly. The valve body and disc seats were damaged. A new nut and washer were installed and the nut was tack-welded to the disc to insure that the malfunction would not reoccur. The valve seats were lapped. After repair of RCIC-15CV the leak rate was reduced to zero. RCIC-15CV is an Anchor 8" swing check valve.

X-210B-RHR "B" loop discharge to the suppression chamber RHR-MO-21B. The test volume for this penetration is between RHR-MO-21B and manual valve RHR-189. Leakage tests showed a leak rate of 43.93 scfh. The

established limit is 1.5 scfh. RHR-MO-21B was disassembled for repair and it was found that the seating surfaces were rough. The valve disc and body seating surfaces were lapped. After repair of RHR-MO-21B the leak rate was reduced to 0.046 scfh. RHR-MO-21B is an Anchor 4" 300 lb. gate valve.

X-214-HPCI turbine exhaust to the suppression chamber HPCI-15CV. The test volume for this penetration is between HPCI-15CV and manual valve HPCI-44. Leakage tests showed a leak rate of 361.22 scfh. The established limit for this penetration test volume is 0.5 scfh. HPCI-15CV was disassembled for repair and it was found that the valve disc and body seats were rough. Both seating surfaces were lapped. After repair the leak rate was reduced to zero. HPCI-15CV is an Anchor 20" 300 lb. check valve.

X-214-HPCI turbine exhaust drain valves HPCI-AO-70 (inboard isolation valve) and HPCI-AO-71 (outboard isolation valve). Leakage tests showed a leak rate of 32.65 scfh. The established limit for this test volume is 0.1 scfh. Both valves were disassembled for repair and it was found that seating surfaces were scratched and badly worn. These are ball valves with graphite seats. The ball and seats of both valves were replaced. After repair of both valves the leak rate was reduced to .012 scfh. HPCI-AV-70 & 71 are 1"-300 lb. Hills-McCanna ball valves.

X-221-RCIC barametric condenser vacuum pump discharge to suppression chamber RCIC-12V. The test volume for this penetration is between RCIC-12CV and manual valve RCIC-42. Leakage tests showed a leak rate of 3.99 scfh. The established limit is 0.1 scfh. RCIC-12CV was disassembled for repair and it was found that the seat area was dirty causing improper seating. The seat was cleaned, and a retest of the valve showed that the leak rate was reduced to zero. Even though the leak rate exceeded the individual valve limit, primary containment would have been maintained within maximum allowable limits. RCIC-12CV is Anchor 2"-600 lb. check valve.

X-223A-Core spray "A" minimum flow to the suppression chamber CS-MO-5A. The test volume for this penetration is between CS-MO-5A and manual valve CS-24. Leakage tests showed a leak rate of 33.8 scfh. The established limit is 1.5 scfh. CS-MO5A was disassembled for repair and it was found that the seating surfaces were rough. The seats were lapped. After repair the leak rate was reduced to .001 scfh. CS-MO-5A is an Anchor 3"-300 lb. gate valve.

X-223B-Core spray "B" minimum flow to the suppression chamber CS-MO-5B. The test volume for this penetration is between CS-MO-5B and manual valve CS-25. Leakage tests showed a leak rate of 18.66 scfh. The established limit is 1.0 scfh. CS-MO-5B was disassembled for repair and it was found that the seating surfaces were rough and pitted. The valve seats were cleaned and lapped. After repair the leak rate was reduced to 1.6 scfh. Although the reduced leak rate is greater than the individual valve limit, the leakage was attributed to the manual valve which is not a primary containment isolation valve. CS-MO-5B is an Anchor 3"-300 lb. gate valve.

X-225B-Residual heat removal pump "C" suction from the suppression chamber RHR-MO-13C. The test volume for this penetration is between RHR-MO-13C and manual valve RHR-19. Leakage tests showed a leak rate of 14.89 scfh. The established limit is 10 scfh. RHR-MO-13C was disassembled for repair and it was found that the seating surfaces were rough and pitted. The seats were lapped, and the leak rate was reduced to 3.19 scfh. Even though the initial leak rate exceeded the limit, primary containment would have been maintained within limits due to the safety margin in the established limits. RHR-MO-13C is an Anchor 20"-150 lb. gate valve.

X-226-HPCI pump suction from the suppression chamber HPCI-MO-58. The test volume for this penetration is between HPCI-MO-58 and manual valve HPCI-12. Leakage tests showed a leak rate of 105.66 scfh. The established limit is 3.0 scfh. HPCI-MV-58 was disassembled for repair, and it was found that the valve seats were rough and pitted. The seats were lapped and the leak rate was reduced to 2.89 scfh. HPCI-MO-58 is an Anchor 16"-150 lb. gate valve.

X-227A-Core spray pump "A" suction from the suppression chamber, CS-MO-7A. The test volume for this penetration is between CS-MO-7A and manual valve CS-10. Leakage tests showed a leak rate of 6.35 scfh. The limit for this penetration is 1.0 scfh. CS-MV-7A was disassembled for repair and it was found that the valve seating surfaces were rough and dirty. The seats were cleaned and lapped. The leak rate was reduced to 0.373 scfh. CS-MO-7A is an Anchor 14"-150 lb. gate valve.

X-8-Main Steam Line Drains MS-MO-74 (inboard isolation) and MS-MO-77 (outboard isolation). October, 1975 leak tests showed a leak rate of 1.9 scfh. The established limit for this penetration is 1.5 scfh. Although the leakage found is greater than the limit, the valves were not repaired due to the closeness of the two valves, and the wide margin between the maximum leakage and the allowable Technical Specification limit.

X-9A-Feedwater Check Valves RF-15CV and RF-16CV. This penetration test volume was tested in October, 1975 with water. The pressure was maintained at 58 psig and the leakage water was collected as time was recorded. Calculations converted the measured water leakage to a corresponding air leak rate. The leak rates found were 12.3 scfh for RF-15CV and .13 scfh for RF-16CV. The established limit for this penetration is 2.0 scfh. Although the leakage found was greater than limits, the valves were not repaired because of the margin between the established maximum and Tech. Spec. allowable.

X-9A-RCIC and RWCU connection to Feedwater, RCIC-AO-22, RCIC-MO-17, and RWCU-15CV. This penetration test volume was tested in October, 1975 with water. The pressure was maintained at 58 psig and the leakage water was collected as a function of time. Calculations converted this leakage rate to that of air. The leak rate found was .461 for this penetration. The established maximum for this test volume is 13.0 scfh. The leak rate found is well within limits.

X-9B-Feedwater Check Valves RF-13CV and RF-14CV. This test volume was tested with water as described in penetration X-9A. The leak rate test of October, 1975 showed a combined leakage for both valves

was 17.69 scfh. The established maximum for this penetration is 10.0 scfh. Neither valve was repaired because of the margin between the established maximum and allowable.

X-9B-HPCI Connection to Feedwater HPCI-AO-18 and HPCI-MO-57. The October 1975 test of this penetration showed a leak rate of 0 scfh with an established maximum of 10.0 scfh. This penetration was tested with water as described in X-9A.

X-10-RCIC Steam Supply Line RCIC-MO-15 and RCIC-MO-16. This penetration test volume showed a leak rate of 7.9 scfh. The established maximum for these valves is 2.0 scfh. Neither of the valves were repaired because of the margin of the allowable and established limits. This penetration was tested in October, 1975.

X-11-HPCI Steam Supply Line HPCI-MO-15 and HPCI-MO-16. On April 23, 1974 HPCI-MO-16 was suspected of leaking excessively. A leak rate measurement at that time showed a leakage of 246.26 scfh. HPCI-MO-16 was disassembled and the seating surfaces were lapped. The valve was retested following repair on April 29, 1974, with a measured leakage of 0 scfh. HPCI-MO-16 was again suspected of leaking and tested on December 10, 1974. The leakage found at that time was .86 scfh. During the routine local leak rate tests conducted in October, 1975 the leakage of this penetration was found to be .985 scfh. The established maximum is 2.0 scfh. HPCI-MO-16 is an Anchor 10" gate valve.

X-12-RHR shutdown cooling suction valves RHR-MO-17 and RHR-MO-18. This penetration was tested in October, 1975 and showed a leak rate of 0 scfh. The established maximum for this penetration is 4.0 scfh.

X-13A-RHR Injection Line to Reactor RHR-MO-25A and RHR-MO-27A. This penetration was tested in October, 1975. The leakage rate found was .103 scfh. The established maximum leakage for this test volume is 5.0 scfh.

X-13B-RHR Injection Line to Reactor RHR-MO-25B and RHR-MO-27B. This penetration was tested in October, 1975. The leakage rate found was 4.85 scfh. The established maximum for these valves is 1.5 scfh. Although the maximum was exceeded neither valve was repaired because of the margin between the total maximum and the allowable, and also because of the low leakage found in the 'A' injection valves (X-13A).

X-14-RWCU System Inlet RWCU-MO-15 and RWCU-MO-18. This penetration was tested in October, 1975 with the leakage rate found at 1.29 scfh. The established maximum for these valves is 2.0 scfh.

X-16A-Core Spray to Reactor CS-MO-11A and CS-MO-12A. This penetration was tested in October, 1975. The leakage rate found was .61 scfh. The established maximum for these valves is 1.0 scfh.

X-16B-Core Spray to Reactor CS-MO-11B and CS-MO-12B. This penetration was tested in October, 1975. The leak rate found was .08 scfh. The established maximum for these valves is 1.0 scfh.

X-17-Reactor Head Spray Line RHR-MO-32 and RHR-MO-33. This penetration was tested in October, 1975. The leak rate found was .87 scfh. The established maximum for these valves is 4.0 scfh.

X-18-Drywell Equipment Drain Sump Discharge Line RW-732AV and RW-733AV. This penetration was tested in October 1975. The leak rate found was .10 scfh. The established maximum for these valves is 1.5 scfh.

X-19-Drywell Floor Drain Sump Discharge Line RW-765AV and RW-766AV. This penetration was tested in October 1975. The leak rate found was .549 scfh. The established maximum for these valves is 2.0 scfh.

X-25-Purge and Vent Supply to Drywell ACAD-1305MV and ACAD-1306MV. This penetration was tested in November 1975 following its installation in October 1975. The leak rate found was 0 scfh. The established maximum for these valves is .1 scfh.

X-36-Control Rod Drive Exhaust Water to Reactor CRD-11CV and CRD-12CV. These valves were individually tested in October 1975. The leakage found for CRD-11CV was 1.05 scfh and that found for CRD-12CV was .426 scfh. The established maximum for both valves is 6.5 scfh.

X-39A-Drywell Spray Header Supply RHR-MO-26A and RHR-MO-31A. This penetration was tested in October 1975. The leak rate found was 0 scfh, and the established maximum for these valves is 1.0 scfh.

X-39B-Drywell Spray Header Supply RHR-MO-26B and RHR-MO-31B. This penetration was tested in October 1975. The leak rate found was 0 scfh, and the established maximum for these valves is 1.0 scfh.

X-39B-ACAD Supply Inlet Lines ACAD-1311MV and ACAD-1312MV. These valves were installed in the Primary Containment System in October 1975 and were tested in November 1975. The leak rate found was 0 scfh. The established maximum for these valves is .1 scfh.

X-41-Reactor Water Sample Line RR-740AV and RR-741AV. This penetration was tested in October 1975. The leak rate found was .008 scfh, and the established maximum for these valves is 1.0 scfh.

X-42-Standby Liquid Control Injection SLC-12CV and SLC-13CV. These valves were individually tested in October 1975. The leak rate of SLC-12CV was .01 scfh, and that of SLC-13CV was .17 scfh. The combined established maximum is 1.5 scfh.

X-205-Purge and Vent Supply to Torus PC-233MV and PC-237MV. This penetration was leak tested in October 1975. The leak rate found was 7.29 scfh. The established maximum for these valves is 5.0 scfh. Although the as found leakage was greater than the maximum neither valve was repaired due to the margin between maximum and allowable.

X-205-ACAD Supply to the Torus ACAD-1303MV and ACAD-1304MV. Both of these valves were installed in October 1975 and were leak tested in November 1975. The leak rate found was 0 scfh. The established maximum for these valves is .1 scfh.

X-210A-RCIC Minimum Flow Line RCIC-MO-27 and RCIC-13CV. This penetration was leak tested in October 1975. The leak rate was found to be .85 scfh. The established maximum for these valves is 1.0 scfh.

X-210A-RHR to Torus RHR-MO-21A. This penetration was tested in October 1975. The leak rate for this valve was .449 scfh. The established maximum is 1.0 scfh.

X-210A-RHR Minimum Flow Line RHR-MO-16A RHR-10CV and RHR-12CV. This penetration was tested in October 1975. The leak rate was found to be .66 scfh. The established maximum for these valves is 1.0 scfh.

X-210B-HPCI Minimum Flow Line HPCI-MO-25 and HPCI-17CV. This penetration was tested in October 1975. The leak rate was found to be .147 scfh. The established maximum for these valves is 1.0 scfh.

X-210B-RHR Minimum Flow Line RHR-MO-16B, RHR-11CV and RHR-13CV. This penetration was tested in October 1975. The leak rate found was .033 scfh. The established maximum for these valves is .1 scfh.

X-210A & 211A-RHR Discharge to Torus RHR-MO-34A, RHR-MO-38A and RHR-MO-39A. These penetrations were tested in October 1975. The leak rate found was .140 scfh. The established maximum for these valves is 1.0 scfh.

X-210B & 211B-RHR Discharge to Torus RHR-MO-34B, RHR-MO-38B, and RHR-MO-39B. These penetrations were tested in October 1975. The leak rate found was 1.21 scfh. The established maximum for these valves is 8.0 scfh.

X-211B-ACAD Supply to Torus ACAD-1301MV and ACAD 1302MV. Both of these valves were installed in October 1975. The valves were tested in November 1975 and the leak rate was found to be .025 scfh. The established maximum for these valves is .1 scfh.

X-222-HPCI Turbine Drain HPCI-16CV. This penetration was tested in October 1975. The leak rate found was .303 scfh. The established maximum for this valve is 1.0 scfh.

X-223A-Core Spray Test Line to Torus CS-MO-26A. This penetration was tested in October 1975. The leak rate found was .089 scfh. The established maximum combined leakage of CS-MO-5A and CS-MO-26A is 1.5 scfh. The as left combined leakage was .09 scfh (see previous discussion of X-223A).

X-223B-Core Spray Test Line to Torus CS-MO-26B. This penetration was tested in October 1975. The leak rate found was 0 scfh. The established maximum combined leakage of CS-MO-5B and CS-MO-26B is 1.0 scfh. The as left combined leakage was 1.63 scfh (see previous discussion of X-223B).

X-225A-RHR Suction from Torus RHR-MO-13A. This penetration was tested in October 1975. The leak rate found was .15 scfh. The total established maximum leak rate of penetrations X-225A thru D is 10.0 scfh.

X-225C-RHR Suction from Torus RHR-MO-13B. This penetration was tested in October 1975. The leak rate found was 3.69 scfh. The total established maximum leak rate of penetrations X-225A thru D is 10.0 scfh.

X-225D-RHR Suction from Torus RHR-MO-13D. This penetration was tested in October 1975. The leak rate found was 1.11 scfh. The total established maximum leak rate of penetrations X-225A thru D is 10.0 scfh.

X-224-RCIC Suction from Torus RCIC-MO-41. This penetration was tested in October 1975. The leak rate found was 1.26 scfh. The established maximum for this valve is .5 scfh. Although the maximum leakage was exceeded the valve was not repaired due to the margin between the total maximum and allowed.

X-227B-Core Spray Suction from Torus CS-MO-7B. This penetration was tested in October 1975. The leak rate found was .159 scfh. The total established maximum leakage for penetrations X-227A and B is 1.0 scfh. The as left leakage for both penetrations was .532 scfh (see previous discussion of X-227A).

The following penetrations are Type B which include expansion bellows, double gasketed seals, airlock doors, and electrical penetrations.

X-1A-Northeast Drywell Equipment Hatch. This penetration has been tested 12 times since the last Type A test. The maximum time between tests was 6 months, and the maximum leakage seen was .1 scfh, as measured on February 8, 1975. The maximum leakage seen was 0 scfh and was recorded on 8 of the 12 tests. The established maximum for this penetration is .1 scfh.

X-1B-Southwest Drywell Equipment Hatch. This penetration was tested in October 1975 and again in November 1976. The leak rate found in October 1975 was .453 scfh and in November 1976 it was .068 scfh. The established maximum leakage for this hatch is .1 scfh. In the 1975 test the gaskets were not cleaned or replaced even though the maximum was exceeded.

X-4-Drywell Head Access Hatch. This penetration was tested in July 1974 and again in October 1975. Both tests indicated a leak rate of 0 scfh. The established maximum leakage for this hatch is .1 scfh.

X-6-Control Rod Drive Removal Hatch. This penetration was tested 7 times since last Type A test. The maximum time between tests was 10 months. The highest leak rate seen was during the October 1975 test with a leakage of .068, and the smallest leakage seen was 0 scfh. The established maximum leakage for this hatch is .1 scfh.

X-200A-Northwest Torus Access Hatch. This penetration has been tested 11 times since the last Type A test. The maximum time between tests was 7 months. All 11 tests yielded a leak rate of 0 scfh. The established maximum for this batch is .1 scfh.

X-200B-Southeast Torus Access Hatch. This penetration was tested in October 1975 and in November 1975. The 1975 test result was 0 scfh and the 1976 test result was .017 scfh. The established maximum for this hatch is .1 scfh.

Drywell Head - This seal was tested in October 1975 and again in November 1976. The 1975 test showed a leakage of .41 scfh and the 1976 test showed a leakage of .02 scfh. The established maximum leakage is .1 scfh. The 1975 test exceeded the maximum limit however no gasket replacement or repair was done due to the margin between the total maximum and the allowable.

X-2-Drywell Personnel Air Lock Door. This penetration has been tested 77 times since the last Type A test. Four of these tests were conducted at Pa (58 psig) and the remainder were at 3 psig. The higher pressure tests were conducted in March 1974, February 1975, October 1975, and September 1976. The leak rates found from these full pressure tests were 11.5, 7.9, 2.87, and 0 scfh respectively. The maximum leakage found at the reduced pressure was 46 scfh on October 22, 1974. A retest following gasket cleaning showed a 0 scfh leak rate. The maximum reduced pressure leak rate found, in which no repair or retest was done, was 11.55 scfh on January 5, 1975. The established maximum leakage is 6.3 scfh at full pressure and 1.36 scfh at the reduced pressure. The leak rates that exceeded the maximum were not repaired because of the margin between the total maximum and the allowable. The inner door gasket was replaced following the full pressure test on September 20, 1976 and prior to the Type A test conducted on November 7, 1976. The inner door gasket was replaced because of a tear in the lower section. This tear was not across the sealing surface and did not inhibit the sealing ability of the inner door. A reduced pressure test was conducted on November 11, 1976 to insure the inner door gasket was installed and sealing properly. The leak rate found was 0 scfh.

X-7A thru X-7D-Main Steam Line Expansion Bellows. These four penetrations were tested at 5 psig in October 1975. The highest leak rate found was on penetration X-7C inner bellows with a leakage of .04 scfh. This leak rate corrected to 58 psig is .14 scfh. The total leakage of all four penetrations was .14 scfh. Correction to 58 psig gives .46 scfh. The established maximum for these same penetrations is .4 scfh.

X-9A & X-9B-Reactor Feedwater Line Expansion Bellows. Both of these penetrations were tested in October 1975 at 5 psig. The leak rate found for both was 0 scfh. The total established maximum for these two penetrations is .2 scfh.

Electrical Penetrations-There are 20 electrical penetrations into the drywell. All of these were tested in late September 1975. The established maximum leakage for each electrical penetration is .1 scfh. The maximum leakage seen from these penetrations was .05 scfh as found on X-100E. The total leakage of all electrical penetrations was .084 scfh.

X-7A-Main Steam Isolation Valves MS-AO-80A and MS-AO-86A. This penetration was tested on September 27, 1975 and again on September 18, 1976. During the 1975 tests the leakage was found to be 30.72 scfh from both valves at 29 psig. Further testing showed that the outboard valve MS-AO-86A was leaking more than the inboard valve.

The outboard valve MS-AO-86A was disassembled and inspected to determine the cause of leakage. The only damage found on the main seat was a small scratch and three small pits at the bottom of the seat. Lapping was accomplished using a pneumatic lapping tool.

The concentricity of the stem disc was checked and found to be approximately twenty five mills out of round with respect to the shaft. The seating surface was ground and polished to bring it back into round with the shaft. The stem disc was then lapped to its seat, and 100% seating contact was verified.

The valve was then reassembled and retested. The leak rate following repair was 1.77 scfh at 29 psig. The established maximum for these valves is 5.0 scfh, and the Technical Specification limit is 11.5 scfh.

This penetration was again tested on September 18, 1976. The leak rate found during that test was 5.83 scfh. Since this leakage was within Technical Specification limits no repair was done.

X-7B-Main Steam Isolation Valves MS-AO-80B and MS-AO-86B. This penetration has been tested twice since the last Type A test. In September 1975 the combined leakage of both valves was 13.82 scfh. Since this is above limits further testing was done to determine individual valve leakages, and it was found that MS-AO-80B had a leakage of 9.37 scfh and MS-AO86B had a leakage of 4.45 scfh. No repairs were made since the leakage was acceptable.

The penetration was again tested in September of 1976. The combined leakage found was 11.48 scfh. Since this is above limits further testing was done to determine the individual valve leakage rates. It was found that MS-AO-80B had a leakage of 10.00 scfh and MS-AO-86B had a leakage of 1.48 scfh. The individual leakages were within limits and no repairs were made to the valves.

X-7C-Main Steam Isolation Valves MS-AO-80C and MS-AO-86C. This penetration was tested twice since the last Type A test. In September, 1975 the leakage found was 8.633 scfh. Since this was within limits no repair was done. In September, 1976 the leakage found was 9.43 scfh. Again no repair was done since this leakage was within limits.

S-7D-Main Steam Isolation Valves MS-AO-80D and MS-AO-86D. This penetration has been tested twice since the last Type A test. In September, 1975 the leakage of both valves was 14.384 scfh. Further testing showed that the inboard valve leakage MS-AO-80D was 11.494 scfh and the outboard valve leakage MS-AO-86D was 2.89 scfh. Since both valves tested within limits no repair was done.

In September, 1976 these valves were again tested for leakage. The combined leakage of both valves was 13.75 scfh. Further testing was done to determine the individual valve leakages, and it was seen that MS-AO-80D had a leak rate of 6.21 scfh and MS-AO-86D had a leak rate of 7.54 scfh. Since both leakages were within limits no repairs were made.

The total uncontained leakage found during the October, 1975 local leak rate tests was 900 scfh. The total leak rate of all Type B & C tests following repair and/or adjustment of all 14 primary containment penetrations was 121.74 scfh. The allowable limit of Type B & C tests for Cooper Station is 189 scfh.

The previously stated intent of the Nebraska Public Power District was to devise and test procedures for leak testing of Main Steam Isolation Valves at the Design Basis Accident (DBA) pressure of 58 psig. Reasons for failure of the October, 1975 test to produce valid test results have also been previously discussed.

The test conducted during the first refueling outage in September, 1976 produced invalid results due to the following apparent reasons:

1. Temperature decay effects on the piping between the MSIV's, also tends to reduce pressures of the test medium in that piping section. Such pressure decreases are not distinguishable from pressure drops due to leakage, thus giving false indications of leakage.
2. The reactor pressure was difficult to control, during the test period, due to:
  - a) the large volume of the reactor system, which leads to a relatively lengthy response times for given pressure adjustments;
  - b) the relatively low pressures and ranges of pressure control; and
  - c) variations in vapor pressures in the reactor system caused by transient cooling effects of the RHR system.

The difficulties in maintaining reactor system pressure control leak to leakage across the valve seat because of a pressure differential applied against the normal flow direction of the valve.

The pressure decay method (which is an acceptable method of testing) was employed during the outboard MSIV DBA Leak Test. This method of testing applies pressure to the bottom of the main plug of the inboard MSIV tending to unseat the valve when variations in reactor pressure permit a sufficient pressure differential across the plug. It is concluded, that the tendency to unseat when pressurized in the reverse directions accounts for the inconclusive correlation of data observed during the 29 psig and 58 psig leak tests. When performing its isolation function, pressure would be applied to the upstream side of the Main Steam Valve and would tend to seat the valve. For this reason, testing the MSIV's at 29 psig is considered acceptable and accurate.

Due to problems in developing a viable procedure for testing MSIV leakage at 58 psig, the District will continue the surveillance testing at the pressures and interval currently required by the Technical Specifications.

SECTION

3

## INSTRUMENT CALIBRATION DATA

SERVICE Integrated Leak Rate Test

MANUFACTURER YSI

MODEL: 100N

SERIAL NO.: 595539

LOCATION: Field

INPUT

AS  
FOUND

Error

AS  
LEFT

80 = 28.270

116.292

116.29

- .002°

120 = 29.392

130.723

130.72

- .003°

150 = 32.179

142.121

142.12

- .001°

Per MP 2,555.2,

COMMENTS

FS-1792, ES-1725, ES 1941

TESTED BY:

Al Kieth,

DATE:

9-16-76

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James

SERIAL NO: 59560

MODEL: 100N

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142.121	142.06	-0.06°
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286	287	288
289	290	291
292	293	294
295	296	297
298	299	300
301	302	303
304	305	306
307	308	309
310	311	312
313	314	315
316	317	318
319	320	321
322	323	324
325	326	327
328	329	330
331	332	333
334	335	336
337	338	339
340	341	342
343	344	345
346	347	348
349	350	351
352	353	354
355	356	357
358	359	360
361	362	363
364	365	366
367	368	369
370	37	

--	--	--	--


IS-1797, IS-1725, IS 1941

TESTED BY: All Kiel

DATE: 9-16-76

SERVICE Integrated Leak Rate Test

SERIAL NO: 59561

MODEL: 100N

1

MANUFACTURER YSI

INPUT

DESIRED  
OUTPUTAS  
FOUND

of AS LEFT

80	=	28.270
----	---	--------

116.292

116.35

 $0.850 +$ 

120	= 29.392
-----	----------

130.723

130.78

+.0570

150	= 32,179
-----	----------

142.121

14218

4.059°

Per AP 75-52

Per AP

25-52

COMMENTS	FS 1797, FS-1725, FS-1941

TESTED BY: Al Keith

DATE: 9-16-76

## IBRATION DATA

YSZ

DESIRED  
OUTPUT

MODEL: 1001

SERIAL NO.: 66250

AS  
FOUND

OF  
Error  
AS LEFT

	FOUND	LEFT	Error
80	116.292	116.26	-0.0320
120	130.723	130.69	-0.0330
150	142.121	142.08	-0.0410
Per MP 7.5.512			

IS-1725

LS-1797

204/21

9-16-76

INSTRUMENT  $\alpha$  . BRATION DATA

ITEM NO. 1-50 D

SERVICE PC-100 Coil B-10 outlet

MANUFACTURER Yellow Springs Inst. Co.

MODEL: 100-2 Nickel

SERIAL NO.: NA

INPUT

DESIRED  
OUTPUT

AS  
FOUND

AS  
LEFT

$^{\circ}\text{F}$	Temp Standard $\Omega$	$\Omega$	$\Omega$	$\Omega$	$\Omega$
80°	28.27086	116.292	116.675	116.675	116.675 + 105°
100°	29.39236	123.406	123.52	123.52	123.52 + 320°
150°	32.17946	142.12	142.99	142.99	142.99 + 2, 120°

COMMENTS

IS-1941 Versa Bath

IS-1766 Whetstone

TESTED BY: *P. Geralt*

IS-1725 Thermometer Bridge

Bridge

DATE: 10/28/76

IS-1797 Temp Standard

IS-1934 Thermometer

Procedure 7552

## INSTRUMENT CALIBRATION DATA

SERVICE NO. 2012; CONTINUED LONG 6458631.3 LOCATION: Dugood + Fore 1

MANUFACTURER  $\frac{1}{2}$  E. S. Meyer & Co. F.

MODEL: ATD JCC

SERIAL NO.:

INPUT

DESIRED  
OUTPUTAS  
FOUND

AS-  
LEFT-

Levi

[illegible]

TESTED BY: John Smith

DATE: 9-23-56



# TEXAS INSTRUMENTS INCORPORATED

POST OFFICE BOX 1444 • HOUSTON, TEXAS 77001

*Digital Systems Division*

## CERTIFICATE OF CALIBRATION

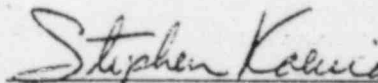
Pressure Gage No. 2843 Model No. 145-01 Bourdon Capsule No. 10420

Calibration Date: October 7, 1976

This instrument has been calibrated to meet or exceed all published specifications. The calibration has been performed with a pressure measurement system whose accuracy is traceable to the National Bureau of Standards.

Traceability is achieved through a pressure standard which is certified by the National Bureau of Standards at planned intervals. This standard is maintained and operated in an environment controlled to the extent necessary to assure continued measurements of the required accuracy. Test data, applicable to this instrument, is maintained on file at Texas Instruments Incorporated for a period of five years from date of shipment.

<u>Standard</u>	<u>NBS Test No.</u>	<u>Date</u>
Ruska Double-Range Dead Weight Tester	213170	12-17-75 12-24-75
Low Range Piston No. L-135 High Range Piston No. V-192		
Ruska Weight Set Model 2460-91C/SPL, No. 13788	40093	6-04-70

  
TEXAS INSTRUMENTS INCORPORATED  
Standards Laboratory



# TEXAS INSTRUMENTS INCORPORATED

POST OFFICE BOX 1444 • HOUSTON, TEXAS 77001

*Digital Systems Division*

## CERTIFICATE OF CALIBRATION

Pressure Gage No. 2844 Model No. 145-01 Bourdon Capsule No. 10418

Calibration Date: October 18, 1976

This instrument has been calibrated to meet or exceed all published specifications. The calibration has been performed with a pressure measurement system whose accuracy is traceable to the National Bureau of Standards.

Traceability is achieved through a pressure standard which is certified by the National Bureau of Standards at planned intervals. This standard is maintained and operated in an environment controlled to the extent necessary to assure continued measurements of the required accuracy. Test data, applicable to this instrument, is maintained on file at Texas Instruments Incorporated for a period of five years from date of shipment.

<u>Standard</u>	<u>NBS Test No.</u>	<u>Date</u>
Ruska Double-Range Dead Weight Tester	213170	12-17-75 12-24-75
Low Range Piston No. L-135 High Range Piston No. V-192		
Ruska Weight Set Model 2460-910/SPL, No. 13788	40093	6-04-70

*Stephen Koenig*  
TEXAS INSTRUMENTS INCORPORATED  
Standards Laboratory

TEXAS INSTRUMENTS INCORPORATED, DIGITAL SYSTEMS DIVISION  
P.O. BOX 1444, HOUSTON, TEXAS 77001  
TELEPHONE: 713-494-5115

\*\*\*\*\* PRECISION PRESSURE CALIBRATION TABLE \*\*\*\*\*

CAPSULE S/N: 10418 INSTR. S/N: 2844 CAL'N DATE: 10/18/76  
CAPSULE RATED PRESSURE: 100 PSIA MAX PRESS: 200 PSIA  
CAPSULE TYPE: 811 INSTRUMENT MODEL: 145-01  
CAPSULE TEMPERATURE AT CALIBRATION: 49.2 DEG. C.  
CALIBRATION STANDARD: P1601-5767 CTR GEARING: 2.00:1  
CALIBRATED BY: *C. Marsh*

TRUE PRESSURE ( PSIA )	COUNTER READING ( COUNTS )	CORR. ( IN )
0.0	0.	0
5.000	1997.	+3
10.000	1998.	+3
15.000	15003.	-3
20.000	20000.	0
25.000	24996.	+4
30.000	29992.	+8
35.000	34996.	+4
40.000	39992.	+8
45.000	44994.	+6
50.000	49997.	+3
55.000	54999.	+1
60.000	60000.	0
65.000	65004.	-4
70.000	70000.	0
75.000	74999.	+1
80.000	80004.	
85.000	85006.	
90.000	90010.	
95.000	95014.	
100.000	100015.	

NOTES:

1. THIS CALIBRATION TRACEABLE TO THE NBS THRU THE ABOVE STANDARD.
2. THIS SECONDARY STANDARD SHOULD BE RECALIBRATED PERIODICALLY:  
AT 6 - 12 MO. INTERVALS OR, AS USE, HISTORY, OR POLICY DICTATE.
3. PRESSURE CALIBRATION STANDARDS CORRECTED TO STANDARD GRAVITY,  
980.665 CM/SEC/SEC. UNITS OF MERCURY CORRECTED TO ZERO DEG. C.
4. COUNTER READING VS TRUE PRESSURE APPLIES ONLY AT ABOVE SPECIFIED  
CAPSULE TEMPERATURE. FOR OTHER TEMPERATURE, COUNTER READING VS  
PRESSURE FOR FUSED QUARTZ BOURDON CAPSULE MAY BE CORRECTED BY  
+0.013% OF COUNTER READING PER + DEG. C. DEVIATION FROM CALIBRATION  
TEMP. (REFER TO MANUAL IF TEMPERATURE SETTING NEEDS READJUSTMENT.)
5. DIRECT READING CAPSULES (S/N'S 10000 - 19999): ~~W A R N I N G~~  
ABOVE CALIBRATION DATA APPLIES ONLY IF DPR MODULE INSTALLED  
BEARING ABOVE CAPSULE AND INSTRUMENT S/N'S.

S/L: 1340-3317-01 CUSTOMER: GENERAL ELECTRIC CO.

TEXAS INSTRUMENTS INCORPORATED, DIGITAL SYSTEMS DIVISION  
P.O. BOX 1444, HOUSTON, TEXAS 77001  
TELEPHONE: 713-494-5115

\*\*\*\*\* PRECISION PRESSURE CALIBRATION TABLE \*\*\*\*\*

CAPSULE S/N: 10420 INSTR. S/N: 2843 CAL'N DATE: 10/07/76  
CAPSULE RATED PRESSURE: 10 PSID MAX PRESS: 20 PSID  
CAPSULE TYPE: 801 INSTRUMENT MODEL: 145-01  
CAPSULE TEMPERATURE AT CALIBRATION: 49.8 DEG. C.  
CALIBRATION STANDARD: P-1602-3118 CTR GEARING: 2.00:1  
CALIBRATED BY: *C. Mandy*

TRUE PRESSURE ( PSID )	COUNTER READING (COUNTS)
0.0	0.
0.5000	5000.
1.0000	9998.
1.5000	15002.
2.0000	20003.
2.5000	25004.
3.0000	30002.
3.5000	35005.
4.0000	40002.
4.5000	45002.
5.0000	50003.
5.5000	55007.
6.0000	60004.
6.5000	65005.
7.0000	70002.
7.5000	74999.
8.0000	79991.
8.5000	84993.
9.0000	89993.
9.5000	95001.
10.0000	100008.

NOTES:

1. THIS CALIBRATION TRACEABLE TO THE NBS THRU THE ABOVE STANDARD.
2. THIS SECONDARY STANDARD SHOULD BE RECALIBRATED PERIODICALLY:  
AT 6 - 12 MO. INTERVALS OR, AS USE, HISTORY, OR POLICY DICTATE.
3. PRESSURE CALIBRATION STANDARDS CORRECTED TO STANDARD GRAVITY,  
980.665 CM/SEC/SEC. UNITS OF MERCURY CORRECTED TO ZERO DEG.C.
4. COUNTER READING VS TRUE PRESSURE APPLIES ONLY AT ABOVE SPECIFIED  
CAPSULE TEMPERATURE. FOR OTHER TEMPERATURE, COUNTER READING VS  
PRESSURE FOR FUSED QUARTZ BOURDON CAPSULE MAY BE CORRECTED BY  
+0.013% OF COUNTER READING PER + DEG.C. DEVIATION FROM CALIBRATION  
TEMP. (REFER TO MANUAL IF TEMPERATURE SETTING NEEDS READJUSTMENT.)
5. DIRECT READING CAPSULES (S/N'S 10000 - 19999): **W A R N I N G**  
ABOVE CALIBRATION DATA APPLIES ONLY IF DPR MODULE INSTALLED  
BEARING ABOVE CAPSULE AND INSTRUMENT S/N'S.

7201140-2417-01 CUSTOMER: GENERAL ELECTRIC

# HOMER R. DULIN CO.

729 EAST WILLOW STREET

LONG BEACH, CALIFORNIA 90806

424-8533

636-4096

## CALIBRATION CERTIFICATION

SUBMITTED BY: NEBRASKA PUBLIC POWER DISTRICT

FLOWMETER SERIAL NO. — TUBE NO. 1/2-21-G-10/83

MANUFACTURER F & P MFG. SERIAL NO. 6908A 2640 A1

REMARKS: Percent tube scale, calibrated in SCFM Air @ 14.7 PSIA & 70°F.

Accuracy: ±1% full scale

INDICATED		ACTUAL	
PERCENT		SCFM	
100		2.509	
75		1.904	
50		1.282	
25		0.667	
10		0.264	

Flowmeter Certified with HOMER R. DULIN CO.

Equipment No. 12400 Accuracy 0.2% Calib. Due 7-77

NBS No. Cert. No. 2.4/146224

Our standards are certified by or are traceable to the National Bureau of Standards and comply with MIL-C-45662A.

P.O. No. 111073 Shipper No. —

9-13-76

CALIBRATION DATE

3-13-77

RECALIBRATION DATE

R. Dulin

CALIBRATION TECHNICIAN



**FOXBORO**

File 10/109

# TEST CERTIFICATE

Customer NEBRASKA PUBLIC POWER DISTRICT Their Order No. 109104  
 Address Columus, Nebraska Our Order No. 76R-92972 1/2  
 Instrument M/2701RG Dewred w/Dynatherm Bulb.

Serial No. DS507			Serial No.			Serial No.		
Range 100 - 140°F			Range			Range		
Curve No. NR226			Curve No.			Curve No.		
Test	Instr.	Error	Test	Instr.	Error	Test	Instr.	Error
100°F	99.89°	-.11°						
120	119.89	-.11°						
140	139.89	-.11°						

Serial No.			Serial No.			Serial No.		
Range			Range			Range		
Curve No.			Curve No.			Curve No.		
Test	Instr.	Error	Test	Instr.	Error	Test	Instr.	Error

Comments: This ~~(These)~~ Instrument (s) has (have) been calibrated and is ~~(are)~~ guaranteed to be accurate within ( .5°F ~~XXXXXXXXXXXXXXXXXXXXXXXXXXXX~~ )

Certified Correct

ENGINEERING DEPT.  
 Signed M. Doiron

Date 9-2-76

THE FOXBORO COMPANY

Test Made By N.E. Provost

Checked By R. Roderick

Date 8-31-76

**FOXBORO**

File 107104

**TEST CERTIFICATE**Customer Nebraska Public Power DistrictTheir Order No. 109104Address Columbus, NebraskaOur Order No. 76R-92972 1/2Instrument M/2701RG Dewcel W/Dynatherm Bulb

Serial No. DS485	Serial No.	Serial No.
Range 100 - 140°F	Range	Range
Curve No. NR226	Curve No.	Curve No.
Test Instr. Error	Test Instr. Error	Test Instr. Error
100°F 99.85° -.15°		
120 119.82 -.18		
140 139.93 -.07		

Serial No.	Serial No.	Serial No.
Range	Range	Range
Curve No.	Curve No.	Curve No.
Test Instr. Error	Test Instr. Error	Test Instr. Error
Note 1: Dewcel test temperature points 100, 120, and 140°F correspond to Dewpoint Temperatures of 35.5, 50.5, and 64.2°F.		
Note 2: Use DI-2 curve to convert Dewcel Temperature to Dewpoint.		
Note 3: Temperature and Resistance tests were made using equipment whose calibration is directly traceable to the National Bureau of Standards.		

Comments: This ~~(These)~~ Instrument ~~(s)~~ has ~~(have)~~ been calibrated and is ~~(are)~~ guaranteed to be accurate within ( .5° F ) ~~1% of the total chart or scale range.~~

Certified Correct

ENGINEERING DEPT.

Signed

*M. Doiron*  
M. DoironDate 8/24/76

THE FOXBORO COMPANY

Test Made By N. E. ProvostChecked By R. RoderickDate 8/20/76

File 109104

**FOXBORO**

## TEST CERTIFICATE

Customer Nebraska Public Power District

Their Order No. 109104

Address Columbus, Nebraska

Our Order No. 76R-92972 1/2

Instrument M/2701RG Dewcel W/Dynatherm Bulb

Serial No. <u>DS484</u>			Serial No. _____			Serial No. _____		
Range <u>100-140° F</u>			Range _____			Range _____		
Curve No. <u>NR226</u>			Curve No. _____			Curve No. _____		
Test	Instr.	Error	Test	Instr.	Error	Test	Instr.	Error
100° F	99.70°	-.3°						
120	119.68	-.32						

Serial No. _____			Serial No. _____			Serial No. _____		
Range _____			Range _____			Range _____		
Curve No. _____			Curve No. _____			Curve No. _____		
Test	Instr.	Error	Test	Instr.	Error	Test	Instr.	Error
Note 1: Dewcel test temperature points 100, 120, and 140° F correspond to Dewpoint Temperatures of 35.5, 50.5, and 64.2° F.								
Note 2: Use DI-2 curve to convert Dewcel Temperature to Dewpoint.								
Note 3: Temperature and Resistance tests were made using equipment whose calibration is directly traceable to the National Bureau of Standards.								

Comments: This ~~(These)~~ Instrument ~~(s)~~ has ~~(have)~~ been calibrated and is ~~(are)~~ guaranteed to be accurate within ( .5° F ) ~~1% of the total chart or scale range.~~

Certified Correct

ENGINEERING DEPT.

Signed M. Doiron  
M. Doiron

Date 8/24/76

THE FOXBORO COMPANY

Test Made By N. E. Provost

Checked By R. Roderick

Date 8/20/76



# TEST CERTIFICATE

File. ~~109104~~ 109104

Customer Nebraska Public Power District

Their Order No. 109104

Address Columbus, Nebraska

Our Order No. 76R-92972 1/2

Instrument M/2701RG Dewcel W/Dynatherm Bulb

Serial No. <u>DS447</u>	Serial No.	Serial No.
Range <u>100-140°F</u>	Range	Range
Curve No. <u>NR 226</u>	Curve No.	Curve No.
Test Instr. Error	Test Instr. Error	Test Instr. Error
100°F 99.85° -.15°		
120 119.75 -.25		
140 139.89 -.11		

Serial No.	Serial No.	Serial No.
Range	Range	Range
Curve No.	Curve No.	Curve No.
Test Instr. Error	Test Instr. Error	Test Instr. Error
Note 1:	Dewcel test temperature points 100, 120, and 140°F correspond to Dewpoint Temperatures of 35.5, 50.5, and 64.2°F.	
Note 2:	Use DI-2 curve to convert Dewcel Temperature to Dewpoint.	
Note 3:	Temperature and Resistance tests were made using equipment whose calibration is directly traceable to the National Bureau of Standards.	

Comments: This (These) Instrument (s) has (have) been calibrated and is (are) guaranteed to be accurate within ( .5°F ) 1% of the total chart or scale range.

Certified Correct

ENGINEERING DEPT.

Signed

*M. Doiron*  
M. Doiron

Date 8/24/76

THE FOXBORO COMPANY

Test Made By N. E. Provost

Checked By R. Roderick

Date 8/20/76

File. 107104

**FOXBORO**

# TEST CERTIFICATE

Customer Nebraska Public Power District

Their Order No. 109104

Address Columbus, Nebraska

Our Order No. 76R-92972 1/2

Instrument M/2701RG Dewcel W/Dynatherm Bulb

Serial No. <u>DS 495</u>	Serial No.	Serial No.
Range <u>100 - 140° F</u>	Range	Range
Curve No. <u>NR226</u>	Curve No.	Curve No.
Test Instr. Error	Test Instr. Error	Test Instr. Error
100° F 99.85° -.15°		
120 119.86 -.14		
140 139.89 -.11		

Serial No.	Serial No.	Serial No.
Range	Range	Range
Curve No.	Curve No.	Curve No.
Test Instr. Error	Test Instr. Error	Test Instr. Error
Note 1: Dewcel test temperature points 100, 120, and 140° F correspond to Dewpoint Temperatures of 35.5, 50.5, and 64.2° F.		
Note 2: Use DI-2 curve to convert Dewcel Temperature to Dewpoint.		
Note 3: Temperature and Resistance Tests were made using equipment whose calibration is directly traceable to the National Bureau of Standards.		

Comments: This (These) Instrument (s) has (have) been calibrated and is (are) guaranteed to be accurate within ( .5° F ) ~~1% of the total chart or scale range.~~

Certified Correct

ENGINEERING DEPT.

Signed M. Doiron

Date 8/24/76

THE FOXBORO COMPANY

Test Made By N.E. Provost

Checked By R. Roderick

Date 8/20/76



# TEST CERTIFICATE

Customer Nebraska Public Power District

Their Order No. 109104

Address Columbus, Nebraska

Our Order No. 76R-92972 1/2

Instrument M/2701RG Dewcel W/Dynatherm Bulb

Serial No. DS446			Serial No.			Serial No.		
Range 100-140° F			Range			Range		
Curve No. NR226			Curve No.			Curve No.		
Test	Instr.	Error	Test	Instr.	Error	Test	Instr.	Error
100° F	99.82°	-.18°						
120	119.78	-.22						
140	139.89	-.11						

Serial No.			Serial No.			Serial No.		
Range			Range			Range		
Curve No.			Curve No.			Curve No.		
Test	Instr.	Error	Test	Instr.	Error	Test	Instr.	Error
Note 1: Dewcel test temperature points 100, 120, and 140° F correspond to Dewpoint Temperatures of 35.5, 50.5, and 64.2° F.								
Note 2: Use DI-2 curve to convert Dewcel Temperature to Dewpoint.								
Note 3: Temperature and Resistance tests were made using equipment whose calibration is directly traceable to the National Bureau of Standards.								

Comments: This ~~(These)~~ Instrument ~~(s)~~ has ~~(have)~~ been calibrated and is ~~(are)~~ guaranteed to be accurate within ( .5° F ) ~~1% of the total chart or scale range.~~

Certified Correct

ENGINEERING DEPT.

Signed M. Doiron

Date 8/24/76

THE FOXBORO COMPANY

Test Made By N. E. Provost

Checked By R. Roderick

Date 8/20/76

SECTION

4

I. PURPOSE

To provide a detailed instruction for station personnel to assure that the leakage of the primary containment vessel is within the allowable leakage limit specified in the Technical Specifications for Cooper Nuclear Station.

II. DISCUSSION

The primary containment integrated leakage tests will determine the primary containment leakage rate in weight percent per day by pressurizing the containment vessel to 58 psig and measuring pressure decay.

III. REFERENCE MATERIAL

## A. SAR.

1. Volume I, Section I, Table I-7-4.
2. Volume II, Section V.
3. Volume III, Section VII, Subsection 3.0.
4. Volume V, Section XIII, Subsection 4.0.

## B. Flow Diagrams.

1. B & R Dwg. 2022, Rev. 18 (N-03); Flow Diagrams, Primary Containment Cooling and Nitrogen Inerting System.
2. B & R Dwg. 2026, Rev. 7 (N-01); Reactor Vessel Instrumentation.
3. B & R Dwg. 2027, Rev. 13 (N-02); Flow Diagram - Reactor Recirculation and Suppression Chamber Vent System and Connections.
4. B & R Dwg. 2028, Rev. 17; Flow Diagram - Reactor Building and Drywell Equipment Drain System.
5. B & R Dwg. 2029, Rev. 13; Flow Diagram - Demineralized Water System.
6. B & R Dwg. 2031, Sht. 1, Rev. 16; Sht. 2, Rev. 18 (N-02); Sht. 3, Rev. 23 (N-01); Flow Diagram - Reactor Building Closed Cooling Water System.

7. B & R Dwg. 2038, Rev. 11; Flow Diagram - Reactor Building Floor and Roof Drains.
8. B & R Dwg. 2039, Rev. 11 (N-02); Flow Diagram - Control Rod Drive Hydraulic System.
9. B & R Dwg. 2040, Rev. 13 (N-01); Flow Diagram - Residual Heat Removal System.
10. B & R Dwg. 2041, Rev. 22 (N-02); Flow Diagram - Reactor Building Main Steam System.
11. B & R Dwg. 2042, Sht. 1, Rev. 13 (N-01); Sht. 2, Rev. 13; Sht. 3, Rev. 13; Flow Diagram - Reactor Water Clean-up System.
12. B & R Dwg. 2043, Rev. (N-01); Flow Diagram - Reactor Core Isolation Coolant and Reactor Feed System.
13. B & R Dwg. 2044, Rev. 16 (N-02); Flow Diagram - High Pressure Coolant Injection and Reactor Feed System.
14. B & R Dwg. 2045, Rev. 18 (N-01); Flow Diagram - Core Spray and Standby Liquid Control System.
15. B & R Dwg. 2049, Sht. 1, Rev. 24; Sht. 2, Rev. 23 (N-05); Sht. 3, Rev. 21; Sht. 4, Rev. 23; Flow Diagram - Condensate Supply System.
16. B & R Dwg. 4259, Rev. 8; Containment Vessels, Sht. 1.
17. B & R Dwg. 4260, Rev. 7; Containment Vessels, Sht. 2.
18. B & R Dwg. 4261, Rev. 5; Containment Vessels, Sht. 3.
19. B & R Dwg. 4262, Rev. 8; Containment Vessels, Sht. 4, Penetration Details.

C. Codes and Documents.

1. 10CFR50, Appendix J.
2. ANSI 45.4.

IV. PREREQUISITES

- A. Notify Shift Supervisor before starting the test.
- B. Coordinate testing with control room operator.
- C. Verify that penetration X-1A, X-1B, X-4, X-6, X-2, X-200A, drywell head, and X-200B have been secured and leak tested.

V. LIMITATIONS

- A. Surveillance Requirements - Technical Specifications (Section 4.7).

Maximum leakage is 0.476%/day at 58 psig or 0.337%/day at 29 psig.

Test Frequency - Perform this test three times each 10 year period during a refueling outage.

B. Administrative Limits.

1. All discrepancies or repairs made to leakage paths shall be recorded in the Shift Supervisor's log and the Data Sheet under discrepancies.
2. Data Sheet 6.3.1.3 attached shall be used to record the test, and filed as part of the station records.
3. All testing shall be coordinated with the control room operator.
4. Any jumpers installed or fuses pulled, during the performance of this procedure, shall be recorded in the jumper log.
5. Failed data sensors and/or massive leakage may cause the test to be discontinued. This decision will be made by the test engineer.

VI. PRECAUTIONS

- A. Barriers are to be established to limit access to the test area. Warning signs shall be posted around the periphery of the test area. Access beyond these established barriers at any time that the containment is pressurized shall be permitted only to those persons authorized by the NPPD Test Engineer. *Access to tour area for drilling 1/2" holes in floor is acceptable. R. G. Lison 11-7-76*
- B. Prior to test pressurizing, the areas within the Drywell and Suppression Chamber shall be examined for equipment which may be damaged from pressurizing to 58 psig.
- C. The vessel head flange must be kept above 80°F - Tech. Spec. 3.6.A.

VII. TEST EQUIPMENT

- A. Twenty resistance temperature detectors, range 40°F-180°F.
- B. 6 dewcells, resistance type, range 0°F-150°F. Complete with power supplies.
- C. Well type water manometer - 36" scale range.
- D. Sling psychrometer.
- E. Precision glass thermometers, range 30°F-120°F.
- F. Two test pressure gauges 8 inch diameter, range 0 to 100 psig.
- G. Two air blowers, heavy duty type, suitable for air at 58 psig.
- H. Rotometer, maximum capacity 10.0 scf/min.

## VIII. TEST PROCEDURE

### A. Preparations.

1. Obtain permission from the Shift Supervisor before beginning work.
- ✓ 2. Inspect accessible interior and exterior surfaces of the containment structure to uncover any evidence of structural deterioration which may affect either the containment structural integrity or leak tightness. Any structural deterioration detected and corrective action taken shall be reported with the results of this test.
- ✓ 3. Open the 12 drywell to suppression chamber vacuum breakers approximately 6" using wooden blocks.
- ✓ 4. Install two temporary fans in the suppression chamber to promote air mixing. Connect to feeder switch for CRD removal platform. This circuit is fed from MCC-N Breaker 3BL. Refuse feeder for approximately 4 amps. *2.2 amps 0800 11/4/76*
- ✓ 5. Modify the drywell fan units by decreasing the blower speed by approximately 1/2.
- ✓ 6. Evacuate the reference chamber and refill with dry N<sub>2</sub> to a pressure of 60 psig. Conduct a 48 hour leak rate test using the absolute method to confirm zero leakage. Complete Data Sheet.
- ✓ 7. Remove level switch floats from RW-LS-355F, RW-LS-355G, RW-LS-390F, and RW-LS-390G (drywell equipment and floor drain sumps), and store floats outside of drywell.
8. ~~Remove and tag TIP System drive mechanism primary power connector, I-4,~~ *Mode switch* *R.A. Jankins* *S. Collins* for each of the four TIP drives.
9. Conduct a thorough examination of the drywell and pressure suppression chamber to remove anything which may be damaged by the test pressure and insure all personnel are out of the drywell and torus.
10. Establish normal operating level of the pressure suppression chamber and reactor vessel, and limit all activities that could remove or add water inventory to the vessel.
- ✓ 11. Vent the reactor pressure vessel to the drywell, and block open the vent line check valve.
- ✓ 12. Install RTD's and Dewcells in the drywell and torus at the following locations. Apply the listed weighing factors to all calculations.

Note: Do not mount sensors near fan discharges or any source of heat.

SENSOR TYPE	SENSOR NO.	WEIGHING NO.	ELEVATION	AZIMUTH	
Dewcell	DC1	ME-1	.150	903'	0°
	DC2	ME-2	.150	903'	240°
	DC3	ME-3	.100	958'	0°
	DC4	ME-4	.150	903'	120°
	DC5	ME-5	.225	Torus	180°
	DC6	ME-6	.225	Torus	0°
RTD's	T1	501-B	.027	903'	90°
	T2	501-C	.027	903'	300°
	T3	501-D	.027	903'	180°
	T4	500-A	.027	903'	135°
	T5	500-B	.027	903'	90°
	T6	500-C	.027	903'	300°
	T7	500-D	.027	903'	180°
	T8	502-A	.075	888'	60°
	T9	502-B	.075	888'	240°
	T10	505-A	.030	931'	0°
	T11	505-C	.030	931'	225°
	T12	505-E	.030	931'	135°
	T13	510-A	.025	958'	0°
	T14	510-B	.025	958'	300°
	T15	510-C	.025	958'	210°
	T16	510-D	.025	958'	135°
	T17	TE-1	.118	Torus	0°
	T18	TE-2	.118	Torus	90°
	T19	TE-3	.118	Torus	180°
	T20	TE-4	.118	Torus	270°

13. Close the isolation valve and open the test connection valve in order to isolate and vent the following containment pressure instruments. Attach caution tags to each isolation valve and test valve.

Rack 25-5 and 6.

- ✓ a. PC-PS-100A-D. ✓
- ✓ b. PC-PS-101A-D. ✓
- ✓ c. PC-PS-119A-D. ✓
- ✓ d. PC-PS-16. ✓
- ✓ e. PC-PS-12C and D. ✓
- ✓ f. PC-PT-513. ✓

✓ I. PC-PT-20 ✓  
✓ J. PC-DPT-20 ✓  
✓ K. PC-PI-20 ✓  
✓ L. PC-PI-513 ✓  
M.  
N

g. Drywell O<sub>2</sub> Analyzer.

h. Drywell H<sub>2</sub> Analyzer.

- ✓ 14. Remove PC-PS-12A and B pressure switches lines from ~~their~~ sensing lines. These sensing lines will be used for connecting the rotometer and drywell sensing instruments to the containment atmosphere. ✓

15. Manually pump down the drywell drain sumps and place ~~pump~~ switches to off, and tag switches.

16. Close all primary containment boundary valves by ~~their~~ normal means (air or motor operators) with no preliminary exercising. The attached valve lineup list should be completed - Attachment C. All vented systems shall be drained of water to assure exposure to air test pressure.

- Tags Removed  
17. Tag the control switches in pull to lock for the condensate and condensate booster pumps.

18. Survey the drywell and suppression chamber and remove gas bottles or any other items that could cause an increase in containment air inventory.

19. Shutoff the N<sub>2</sub> supply to the MSIV and relief valves. Drain all N<sub>2</sub> from the MSIV and MSR accumulators.

20. Verify all equipment and access hatches are secured and have been leak checked.

21. Remove detectors from drywell rad. monitor and install plugs. Turn pump off. *Isolate NMC from Drywell*

22. *Isolate & tag NMC pressure maintenance.*  
B. Pressurization and Data Recording.

1. Commence pressurization of the containment by use of service air and/or the pressurization skid connected to the recirculation system flushing penetration. Do not exceed 5 psi/hr. pressurization or depressurization rate.

2. While pressurizing the containment, inspections should be made of the following areas for water or air leakage.
  - a. Rx. Bldg. Quadrants.
  - b. RHR Hx Areas.
  - c. RWCU Area.
  - d. Torus Area.
  - e. Airlock Area.
  - f. Steam Tunnel.
3. When test pressure ( $29 \pm .5$  psig or  $58 \pm .5$  psig) is reached, disconnect the flex hose immediately upstream of the pressurization isolation valve and blank the line.
4. Allow at least 4 hours for the containment atmosphere to stabilize. (Drywell atmosphere is stable when temperature changes  $< 1^\circ\text{F/hr.}$ ) (Try to maintain drywell temperature stable at  $90^\circ\text{F} \pm 5^\circ\text{F.}$ )
5. After equilibrium conditions are reached place the manometer in service.
6. Record data on Data Sheet 6.3.1.3 each hour for a minimum of 24 hrs.
7. When all necessary data has been recorded establish a constant bleed off through a rotometer to verify the accuracy of the leak rate test. This bleed off rate should be near the allowable leak rate either  $L_t$  or  $L_a$ . Take data for superimposed leakage every 30 minutes for 4 hours, and record on Data Sheet 6.3.1.3.
8. Calculate leak rates per calculations 6.3.1.3.
9. After all data has been found acceptable, isolate the reference chamber and vent the containment. Do not exceed <sup>15</sup> ~~8~~ psi/hrs. depressurization rate. *R. Pearson*  
*D. Mager*
10. Perform a leak test of the reference chamber using the absolute method to insure that it remains leak tight.
11. Perform an inspection of the drywell and torus interior and note any damage.
12. Install drywell floor and equipment drain sump floats and verify proper operation. Place pumps in auto.
13. Install the TIP drive connectors J-4 for each of the TIP drives.
14. Remove RTD's and Dewcells from the containment.
15. Close the root valve at penetration X-100B for the reference chamber.
16. Return instruments isolated in Step VIII.A.13 and 14 to normal.

17. Return containment isolation valves to their normal configuration.
18. Remove blocks from drywell vacuum breakers.

### C. CONTAINMENT LEAK RATE CALCULATIONS

#### 1. Reference Vessel Method.

Primary containment leak rate is calculated each hour during the test. Use data sheets 6.3.1.3. Calculations are summarized and are performed per the following procedures:

- a. Calculate containment absolute pressure hourly.

$$\text{DRYWELL (PSIA) = } P_B + P_{PI-2}$$

PRESSURE

$$P_B = \text{Barometric Pressure (PSIA)}$$

$$P_{PI-2} = \text{Drywell Pressure (PSIG)}$$

$$\text{DRYWELL (IN H}_2\text{O ABS) = 27.67 x (DRYWELL PRESS. PSIA)}$$

PRESSURE

- b. Calculate weighted average absolute containment temperature hourly.

$$\begin{aligned} \text{WEIGHTED AVERAGE (}^\circ\text{R)} \\ \text{CONTAINMENT TEMP.} &= \sum_{i=1}^{i=20} w_i t_i + 459.72 \end{aligned}$$

$$w_i = \text{weighing factor for RTD}_i \text{ from Table 1 of Appendix B}$$

$$t_i = \text{reading of RTD}_i \text{ (}^\circ\text{F)}$$

- c. Calculate weighted average absolute containment vapor pressure hourly.

$$\begin{aligned} \text{WEIGHTED AVERAGE (IN H}_2\text{O ABS)} \\ \text{CONTAINMENT VAPOR} \\ \text{PRESSURE} &= \sum_{i=1}^{i=6} w_{vi} P_{vi} \end{aligned}$$

$$w_{vi} = \text{weighing factor for DEWCEL } i$$

$$P_{vi} = \text{vapor pressure computer reading (IN H}_2\text{O) from DEWCEL } i \text{ as defined in Table 1 of Appendix B.}$$

- d. Calculate drywell-reference chamber differential pressure hourly.

$$\begin{aligned} \text{DRYWELL-REF CHAMB (IN H}_2\text{O)} \\ \text{DIFFERENTIAL PRESS.} &= L_{RL} - L_{LL} \end{aligned}$$

$L_{RL}$  = Right leg DPI-1 level (INCHES) (Connected to containment)

$L_{LL}$  = Left leg DPI-1 level (INCHES) (Connected to reference chamber)

- e. Calculate the test interval for each hourly leak rate determination. (Total time method) and (point to point method).

$$\text{TEST INTERVAL (HOURS)} = \left[ \begin{array}{l} \text{time since taking the first} \\ \text{set of acceptable test data} \end{array} \right]$$

- f. Calculate the 24 HR containment leakage using the Reference Vessel Method data.

$$\begin{array}{l} \text{CALCULATED LEAK} \\ \text{RATE WT\%/24-HR} \end{array} = \left[ \frac{T_1 (\Delta P_2 + P_{v2})}{T_2 (P_1 - P_{v1})} - \frac{\Delta P_1 + P_{v1}}{P_1 - P_{v1}} \right] \frac{2400}{h}$$

$T_1$  = average absolute containment temperature at start of test ( $^{\circ}\text{R}$ )

$T_2$  = average absolute containment temperature at later time ( $^{\circ}\text{R}$ )

$\Delta P_1$  = drywell-reference chamber dp at start of test (IN  $\text{H}_2\text{O}$ )

$\Delta P_2$  = drywell-reference chamber dp at later time (IN  $\text{H}_2\text{O}$ )

$P_{v1}$  = containment vapor pressure at start of test (IN  $\text{H}_2\text{O}$  ABS)

$P_{v2}$  = containment vapor pressure at later time (IN  $\text{H}_2\text{O}$  ABS)

$P_1$  = absolute drywell pressure at start of test (IN  $\text{H}_2\text{O}$  ABS)

$h$  = time interval in hours since start of test

- g. Plot the 24 hour leakage calculations hourly using the point to point method. This allows early detection of parameter changes. (Use least square fit to data points.)

- h. Superimposed leakage.

- 1) Each 30 min. calculate the containment leakage rate from the combined measured rate as follows:

$$L'_{am} = L_{as} - L_s$$

where:

$L'_{am}$  = containment leak rate (wt%/24 hrs)

$L_{as}$  = measured combined leak rate (wt%/24 hrs)

$L_s$  = superimposed controlled leak rate (wt%/24 hrs)

- 2) Calculate the average  $\bar{L}'_{am}$  from the hourly rate.
- 3) Verification of the leakage measuring system accuracy is achieved if:

$$|\bar{L}'_{am} - \bar{L}_{am}| \leq 0.25 L_a$$

- 4) Record the following summary data.

$L_{am} = .228$  measured leakage at 58 psig (Z/24 hours)

$L_{tm} = NA$  measured leakage at 29 psig (Z/24 hours)

$L_{as} = .270\%/day$  leakage measured by the supplemental test at 58 psig (see Section VIII.B.7).  
*• 45% from leak rate data*

$L_{ts} = NA$  leakage measured by the supplemental test at 29 psig (see Section VIII.B.4).

$L_{am} (max.) = .476\%/day = L_a \times .75$

$L_{tm} (max.) = .337\%/day = L_t \times .75$

The supplemental leakage measured data must be within  $\pm 25\%$  of the calculated supplemental leakage data.

combined measured =  $L_{as} = .45\%/day$

$$L_{ami} = .45 - .270 = .18$$

$$L_{am} = .228$$

$$|L_{am} - L_{ami}| = .18 - .228 = .05$$

$$\text{limit Max} = .16$$

$$.05 < .16$$

WJH

#### IX. ATTACHMENTS

A. Data Sheet 6.3.1.3, Rev. 2.

B. Error Analysis.

C. Valve Lineup.

D. Addendum to 6.3.1.3

PROCEDURE	DATA CHECK
Preparations.	<del>WJH</del>
1. Obtain permission from Shift Supervisor.	WJH
2. Inspect drywell.	WJH
3. Open and block vacuum breakers.	WJH
4. Install torus fans. 2.2 amps on 11/3/76 @ 0800	WJH
5. Modify drywell fans.	WJH
6. Pressurize and leak check reference chamber.	WJH
7. Remove level switch floats.	WJH
8. <del>Remove TIP plug J-4. Tag TIP System Drives Mode Switch to OFF.</del>	WJH
9. Remove anything that may be damaged from D.W.	WJH
10. Establish normal operation level of torus and vessel.	WJH
11. Vent reactor vessel to drywell.	WJH
12. Install RTD's and Dewcells.	WJH
13. Isolate low pressure instruments.	WJH
14. Remove sensing lines to PC-PS-12A and B.	WJH
15. Pump down drywell sumps.	WJH
16. Close boundary valves per Attachment "C". <i>Stm. lines Drained.</i>	WJH
17. Tag and pull to lock condensate and condensate booster pumps.	WJH
18. Survey drywell and remove gas bottles.	WJH
19. Drain MSIV and MSRV accumulators.	WJH
20. Access hatches secured and tested.	WJH
21. Drywell rad. monitor <del>plugs installed. Isolated.</del>	WJH
Pressurization and Data Recording.	WJH
1. Commence pressurization.	WJH
2. Inspect for air and water leakage.	WJH
3. Blank line when pressure is reached.	WJH
4. Allow containment to stabilize.	WJH
5. Place manometer in service.	WJH
6. Record data on data sheets.	WJH
7. Establish superimposed leakage and take data.	WJH
8. Calculate leakage rates.	WJH
9. Isolate ref. chamber and vent containment.	WJH
10. Leak check ref. chamber.	WJH
11. Inspect drywell and torus for damage.	WJH
12. Install sump floats.	WJH
13. Install TIP plug J-4. <i>Release Tag on Tip System Drives Mode Switch</i>	WJH
14. Remove RTD's and dewcells from drywell.	WJH
15. Close root valve to ref. chamber.	WJH
16. Return instruments to normal.	WJH
17. Return containment isolation valves to normal.	WJH
18. Remove blocks from drywell vacuum breakers.	WJH

Reduced/Full Pressure Supplemental TestSuperimposed Leakage Flow, SCFH,  $L_s$  = \_\_\_\_\_

Containment Pressure \_\_\_\_\_

Drywell-Ref. Chamber  $\Delta P$  \_\_\_\_\_

Containment Temperature:

T1 \_\_\_\_\_

T2 \_\_\_\_\_

T3 \_\_\_\_\_

T4 \_\_\_\_\_

T5 \_\_\_\_\_

T6 \_\_\_\_\_

T7 \_\_\_\_\_

T8 \_\_\_\_\_

T9 \_\_\_\_\_

T10 \_\_\_\_\_

T11 \_\_\_\_\_

T12 \_\_\_\_\_

T13 \_\_\_\_\_

T14 \_\_\_\_\_

T15 \_\_\_\_\_

T16 \_\_\_\_\_

T17 \_\_\_\_\_

T18 \_\_\_\_\_

T19 \_\_\_\_\_

T20 \_\_\_\_\_

Containment Humidity:

DC1 \_\_\_\_\_

DC2 \_\_\_\_\_

DC3 \_\_\_\_\_

DC4 \_\_\_\_\_

DC5 \_\_\_\_\_

DC6 \_\_\_\_\_

Ambient Temperature \_\_\_\_\_

Ambient Pressure \_\_\_\_\_

Verified By \_\_\_\_\_

Date \_\_\_\_\_

Time \_\_\_\_\_

Reduced/Full Pressure Test

Containment Pressure \_\_\_\_\_

Drywell-Ref. Chamber  $\Delta P$  \_\_\_\_\_

Containment Temperature:

T1 \_\_\_\_\_

T2 \_\_\_\_\_

T3 \_\_\_\_\_

T4 \_\_\_\_\_

T5 \_\_\_\_\_

T6 \_\_\_\_\_

T7 \_\_\_\_\_

T8 \_\_\_\_\_

T9 \_\_\_\_\_

T10 \_\_\_\_\_

T11 \_\_\_\_\_

T12 \_\_\_\_\_

T13 \_\_\_\_\_

T14 \_\_\_\_\_

T15 \_\_\_\_\_

T16 \_\_\_\_\_

T17 \_\_\_\_\_

T18 \_\_\_\_\_

T19 \_\_\_\_\_

T20 \_\_\_\_\_

Containment Humidity:

DC1 \_\_\_\_\_

DC2 \_\_\_\_\_

DC3 \_\_\_\_\_

DC4 \_\_\_\_\_

DC5 \_\_\_\_\_

DC6 \_\_\_\_\_

Ambient Temperature \_\_\_\_\_

Ambient Pressure \_\_\_\_\_

Verified By \_\_\_\_\_

Date \_\_\_\_\_

Time \_\_\_\_\_

Discrepancies:

Operator

S. Gehris 1/10/25/76  
Date

Shift Supervisor

R. A. Jansky 1/10/25/76 Permission to Start  
Date

Shift Supervisor

R. D. Black 1/11-16-76 Test Complete & Reviewed  
Date

Shift Supervisor

1 NCR Written if Required  
Date

MWR(s) Number if Required

Reviewed By

Walt Holler 1/11-15-76  
Date

# 1. Error Analysis

The measured leakage rate in weight percent per day for the absolute method is given by the formula:

$$L = 100 \frac{24}{h} \left( 1 - \frac{T_1 P_2'}{T_2 P_1'} \right)$$

where

L = leakage rate in weight percent per day

h = time between conditions 1 and 2 in hours

T<sub>1</sub> = containment mean temperature at beginning of test in degrees Rankine

T<sub>2</sub> = containment mean temperature at next point of test in degrees Rankine

P<sub>1</sub>' = P<sub>1</sub> - P<sub>v1</sub> = containment pressure corrected for water vapor pressure at beginning of test in psia.

P<sub>2</sub>' = P<sub>2</sub> - P<sub>v2</sub> = containment pressure corrected for water vapor pressure at next point of test in psia

The error in "L" due to errors in the measured quantities is given by

$$dL = \frac{2400}{h} \left[ \left( \frac{\partial L}{\partial T_1} dT_1 \right)^2 + \left( \frac{\partial L}{\partial T_2} dT_2 \right)^2 + \left( \frac{\partial L}{\partial P_1'} dP_1' \right)^2 + \left( \frac{\partial L}{\partial P_2'} dP_2' \right)^2 \right]^{1/2}$$

In order to simplify the evaluation of dL the following assumptions will be made.

1. h = 24 hours

2. The containment average temperature is nearly constant at 90°F

$$T = T_1 + T_2 = 90^\circ\text{F}$$

$$dT = dT_2 = dT$$

3. The containment pressure is nearly constant at 72 psia

$$P = P_1 = P_2 = 72.0 \text{ psia}$$

$$dP = dP_1' = dP_2'$$

4. The containment average dewcell temperature is 75°F

$$T_{DC} = 75^\circ\text{F}$$

Using these assumptions the equation for dL becomes:

$$dL = 100 \cdot 2 \left[ \frac{(dP)^2}{(P)} + 2 \frac{(dT)^2}{(T)} \right]^{1/2}$$

where

dP = total error in the pressure measurement

$$= (dP_T^2 + dP_V^2)^{1/2}$$

dP<sub>T</sub> = error in the total pressure measurement

$$= \pm .02 \text{ psia}$$

dP<sub>V</sub> = error in water vapor pressure determination

$$= \pm 0.014 \text{ psia}$$

$$dP = \left[ (.02)^2 + (.014)^2 \right]^{1/2}$$

$$= 0.0244 \text{ psi}$$

dT = instru. error /  $\sqrt{\text{number of instruments}}$  for the temperature sensors

$$= 0.5^\circ \text{ R} / \sqrt{20}$$

$$= \pm .112^\circ \text{ F}$$

Using these values the total error becomes

$$dL = \pm 0.056\% \text{ of the contained weight of air per day}$$

Using these assumptions the equation for dL becomes:

$$dL = 100 \cdot 2 \left[ \frac{(dP)^2}{(P)} + 2 \frac{(dT)^2}{(T)} \right]^{1/2}$$

where

dP = total error in the pressure measurement

$$= (dP_T^2 + dP_V^2)^{1/2}$$

dP<sub>T</sub> = error in the total pressure measurement

$$= \pm .02 \text{ psia}$$

dP<sub>V</sub> = error in water vapor pressure determination

$$= \pm 0.014 \text{ psia}$$

$$dP = [(.02)^2 + (.014)^2]^{1/2}$$

$$= 0.0244 \text{ psi}$$

dT = instru. error/  $\sqrt{\text{number of instruments}}$  for the temperature sensors

$$= 0.5^\circ \text{ R} / \sqrt{20}$$

$$= \pm .112^\circ \text{ F}$$

Using these values the total error becomes

$$dL = \pm 0.056\% \text{ of the contained weight of air per day}$$

SYSTEM	VALVE NO.	DESCRIPTION	DWG.	TEST POSITION INITIAL	POST TEST POSITION INITIAL
PC	235-AV	Torus Purge and Vent	2022	O <u>Ru 11/5/76</u>	C <u>Om</u>
	241-AV	Purge and Vent N <sub>2</sub> Supply		O <u>Tol</u>	C <u>Om</u>
	236-AV	Purge and Vent		O <u>Om 11/5/76</u>	C <u>Om</u>
	234-AV	Drywell Purge and Vent		O <u>Om 11/5/76</u>	C <u>Om</u>
	239-AV	N <sub>2</sub> Purge Supply		C <u>Om 11/5/76</u>	C <u>Om</u>
	230-MV	Torus Exhaust		C <u>Om 11/5/76</u>	C <u>Om</u>
	245-AV	Torus Exhaust		C <u>Om 11/5/76</u>	C <u>Om</u>
	231-MV	Drywell Exhaust		C <u>Om 11/5/76</u>	O <u>Om</u>
	246-AV	Drywell Exhaust		C <u>Om 11/5/76</u>	O <u>Om</u>
	-87	Instrument Air to Drywell	2010	C <u>Om 11/4/76</u>	O <u>Om</u>
SA	-357	Service Air to Drywell		C <u>Om 11/5/76</u>	O <u>Om</u>
RF	30-MV	RF Pump B Discharge	2004	C <u>ME 11/5/76</u>	C <u>Om</u>
	29-MV	RF Pump A Discharge		C <u>ME 11/5/76</u>	C <u>Om</u>
	32-MV	29MV Bypass		O <u>ME 11/5/76</u>	C <u>Om</u>
	27-MV	F.W. Bypass to Condensate		C <u>Tol</u>	C <u>Om</u>
	28-MV	F.W. Bypass to Condensate		C <u>Tol</u>	C <u>Om</u>
AR	150-MV	Main Cond. Vac. Breaker	2009	O <u>ME 11/5/76</u>	O <u>Om</u>
KHR	MO-274B	Testable Check Bypass	2040	C <u>Tol</u>	C <u>Om</u>
	MO-15A	Shutdown Cooling Suction		C <u>NA</u>	C <u>Om (SDC)</u>
	MO-15B	Shutdown Cooling Suction		C <u>Tol</u>	C <u>Om</u>
	MO-15C	Shutdown Cooling Suction		C <u>Tol</u>	O <u>Om (SDC)</u>
	MO-15D	Shutdown Cooling Suction		C <u>Tol</u>	C <u>Om</u>
	765AV	Drywell Floor Drain		C <u>Tol</u>	O <u>Tol</u>
	766AV	Drywell Floor Drain		C <u>Tol</u>	O <u>Tol</u>
	770AV	Drywell Equip Drain		C <u>Tol</u>	O <u>Tol</u>
	773AV	Drywell Equip Drain		C <u>Tol</u>	O <u>Tol</u>

*S. Cochran*  
*PD J. J. J.*

SYSTEM	VALVE NO.	DESCRIPTION	DWG.	TEST POSITION INITIAL	POST TEST POSITION INITIAL
PER	MO-27A	Loop A Injection	2040	O NA	O <i>du</i> (SDC)
	MO-25A	Loop A Injection		O NA	O <i>du</i> (SDC)
	MO-27B	Loop B Injection		O <i>tp</i>	C <i>du</i>
	MO-25B	Loop B Injection		O <i>tp</i>	C <i>du</i>
	MO-36A	1A Hx Drain to RCIC	2043	C <i>ME 11/5/76</i>	C <i>du</i>
	MO-36B	1B Hx Drain to RCIC		C <i>ME 11/5/76</i>	C <i>du</i>
	MO-38A	Torus Spray Line	2040	C <i>ME 11/5/76</i>	C <i>du</i>
	MO-38B	Torus Spray Line		C <i>ME 11/5/76</i>	C <i>du</i>
	MO-34A	Torus Cooling Discharge		C NA	C <i>du</i>
	MO-39A	Torus Cooling Discharge		C <i>ME 11/5/76</i>	C <i>du</i>
	MO-34B	Torus Cooling Discharge		<del>C <i>ME 11/5/76</i></del>	C <i>du</i>
	MO-34B <sup>-396</sup>	Torus Cooling Discharge		C <i>ME 11/5/76</i>	C <i>du</i>
	MO-16A	Min. Flow Bypass 1A		C <i>tp</i>	C <i>du</i>
	MO-16B	Min. Flow Bypass 1B		C <i>tp</i>	C <i>du</i>
	MO-13A	Pump A Torus Suction		O NA	O <i>du</i> (SDC)
	MO-13B	Pump B Torus Suction		O NA	O <i>du</i> (SDC)
	MO-13C	Pump C Torus Suction		O NA	O <i>du</i> (SDC)
	MO-13D	Pump D Torus Suction		O NA	O <i>du</i> (SDC)
	MO-66A	Hx 1A Bypass		O <i>tp</i>	O <i>du</i>
	MO-66B	Hx 1B Bypass		O <i>tp</i>	O <i>du</i>
	MO-65A	Hx 1A Inlet		O <i>tp</i>	O <i>du</i>
	MO-65B	Hx 1B Inlet		O <i>tp</i>	O <i>du</i>
	740A	R <sub>1</sub> Water Sample Valve	2027	C <i>tp</i>	O <i>du</i>
	740B	R <sub>2</sub> Water Sample Valve		C <i>tp</i>	O <i>du</i>

SYSTEM	VALVE NO.	DESCRIPTION	DWG.	TEST POSITION INITIAL	POST TEST POSITION INITIAL
RHR	MO-12A	Hx 1A Outlet	2040	O NA	O DM
	MO-12B	Hx 1B Outlet		O <i>typ</i>	O <i>dm</i>
	MO-20	Crosstie Stop ( <i>for LKI mod.</i> )		C <i>typ</i>	C <i>dm</i>
	MO-21A	Heat Ex. 1A Drain Lines		C <i>typ</i>	C <i>dm</i>
	MO-21B	Heat Ex. 1B Drain Lines		C <i>typ</i>	C <i>dm</i>
	MO-18	S/D Cooling Supply		C <i>typ</i>	C <i>dm</i>
	MO-17	S/D Cooling Supply		C <i>typ</i>	C <i>dm</i>
	MO-274A	1A Injection Testable Check Bypass		C <i>typ</i>	C <i>dm</i>
	MO-26A	1A Drywell Spray		C <i>typ</i>	C <i>dm</i>
	MO-31A	1A Drywell Spray		C <i>typ</i>	C <i>dm</i>
	MO-26B	1B Drywell Spray		C <i>typ</i>	C <i>dm</i>
	MO-31B	1B Drywell Spray		C <i>typ</i>	C <i>dm</i>
	MO-32	Head Spray		C <i>typ</i>	C <i>dm</i>
	MO-33	Head Spray		C <i>typ</i>	C <i>dm</i>
	MO-67	RHR to Radwaste		C <i>typ</i>	C <i>dm</i>
RCIC	MO-15	Steam Supply	2041	C <i>typ</i>	C <i>dm</i>
	MO-16	Steam Supply		C <i>typ</i>	C <i>dm</i>
	MO-41	Pump Suction From Torus		C <i>typ</i>	C <i>dm</i>
	MO-27	RCIC Min. Flow		C <i>typ</i>	C <i>dm</i>
	MO-17	Testable Check Bypass		C <i>typ</i>	C <i>dm</i>
	MO-21	RCIC To Rx Pressure Vessel		C <i>typ</i>	C <i>dm</i>
	MO-18	Condensate Storage Supply		C <i>typ</i>	C <i>dm</i>

## COOPER NUCLEAR STATION OPERATIONS MANUAL

ATTACHMENT "C" SURVEILLANCE PROCEDURE

6.3.1.3

PRIMARY CONTAINMENT INTEGRATED LEAKAGE TEST

SYSTEM	VALVE NO.	DESCRIPTION	DWG.	TEST POSITION INITIAL	POST TEST POSITION INITIAL
K&CU	MO-15	Supply Isolation	2042	C <i>tp</i>	O <i>dm</i>
	MO-18	Supply Isolation		C <i>tp</i>	O <i>dm</i>
	MO-68	Return to Rx Vessel		O <i>tp</i>	O <i>dm</i>
CS	MO-11B	1B Inj. Isolation	2045	O <i>tp</i>	O <i>dm</i>
	MO-12B	1B Inj. Isolation		O <i>tp</i>	C <i>dm</i>
	MO-11A	1A Inj. Isolation		O <i>tp</i>	O <i>dm</i>
	MO-12A	1A Inj. Isolation		O <i>tp</i>	C <i>dm</i>
	MO-26A	1A Test Line Isolation		C <i>tp</i>	C <i>dm</i>
	MO-26B	1B Test Line Isolation		C <i>tp</i>	C <i>dm</i>
	MO-5A	1A Min. Flow		C <i>tp</i>	O <i>dm</i>
	MO-5B	1B Min. Flow		C <i>tp</i>	C <i>dm</i>
	MO-7A	Pump Suction 1A		O <i>tp</i>	O <i>dm</i>
	MO-7B	Pump Suction 1B		O <i>tp</i>	O <i>dm</i>
	MO-15A	1A Testable Ck. Bypass		C <i>tp</i>	C <i>dm</i>
	MO-15B	1B Testable Ck. Bypass		C <i>tp</i>	C <i>dm</i>
PC	232-MV	Drywell Purge and Vent	2022	C <i>tp</i>	C <i>dm</i> (co-76-68)
	238-AV	Drywell Purge and Vent		C <i>tp</i>	C <i>dm</i> "
	243-AV	Drywell Purge and Vent to Vac. Bkr.		C <i>tp</i>	C <i>dm</i>
	244-AV	Drywell Purge and Vent to Vac. Bkr.		C <i>tp</i>	C <i>dm</i>
	240-AV	Torus N <sub>2</sub> Makeup Stop		O <i>tp</i>	C <i>dm</i>
	242-AV	Drywell N <sub>2</sub> Makeup Stop		O <i>tp</i>	C <i>dm</i>
	233-MV	Torus Purge and Vent		C <i>tp</i>	C <i>dm</i>

SYSTEM	VALVE NO.	DESCRIPTION	DWG.	TEST POSITION INITIAL	POST TEST POSITION INITIAL
PC	237-AV	Torus Purge and Vent	2041	C <i>tl</i>	C <i>tl</i>
MS	786AV	RHR Hx 1B Supply Drain		O <i>tl</i>	O <i>tl</i>
	787AV	RHR Hx 1B Supply Drain		O <i>tl</i>	O <i>tl</i>
	791AV	RHR Hx 1B Supply Trap Bypass		C <i>tl</i>	C <i>tl</i>
	AO-80A	MSIV Inboard		C <i>tl</i>	C <i>tl</i>
	AO-86A	MSIV Outboard		C <i>tl</i>	C <i>tl</i>
	AO-80B	MSIV Inboard		C <i>tl</i>	C <i>tl</i>
	AO-86B	MSIV Outboard		C <i>tl</i>	C <i>tl</i>
	AO-80C	MSIV Inboard		C <i>tl</i>	C <i>tl</i>
	AO-86C	MSIV Outboard		C <i>tl</i>	C <i>tl</i>
	AO-80D	MSIV Inboard		C <i>tl</i>	C <i>tl</i>
	AO-86D	MSIV Outboard		C <i>tl</i>	C <i>tl</i>
	MO-74	Main Steam Line Drain		C <i>tl</i>	C <i>tl</i>
	MO-77	Main Steam Line Drain		C <i>tl</i>	C <i>tl</i>
	MO-79	M.S. Line Orifice Bypass		C <i>tl</i>	C <i>tl</i>
	784AV	RHR Hx 1A Steam Supply Drain		O <i>tl</i>	O <i>tl</i>
	785AV	RHR Hx 1A Steam Supply Drain		O <i>tl</i>	O <i>tl</i>
	790AV	RHR Hx 1A Supply Drain Bypass		C <i>tl</i>	C <i>tl</i>
HPCI	MO-17	Pump Suction Emergency Condensate		O <i>tl</i>	O <i>tl</i>
	MO-58	Pump Suction Torus		C <i>tl</i>	C <i>tl</i>
	MO-25	Min. Flow Bypass		C <i>tl</i>	C <i>tl</i>

SYSTEM	VALVE NO.	DESCRIPTION	DWG.	TEST POSITION INITIAL	POST TEST POSITION INITIAL
EPCI	MO-15	Steam Supply Isolation	2044	C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	MO-16	Steam Supply Isolation		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	MO-14	Steam Supply Isolation		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	MO-21	Test to Condensate Storage		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	MO-24	Test to Condensate Storage		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	AO-70	Exhaust Drain		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	AO-71	Exhaust Drain		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	MO-57	Testable Check Bypass		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	MO-19	Injection to Rx. Vessel		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	MO-20	Pump Discharge		O <u>  <i>typ</i>  </u>	O <u>  <i>On</i>  </u>
	920MV	Steam to Radwaste	2041	C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	921MV	Steam to Radwaste		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1485MV	921MV Bypass		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
ACAD	1301MV	Torus Purge	2084	C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1302MV	Torus Purge		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1303MV	Torus Purge		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1304MV	Torus Purge		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1305MV	Drywell Purge		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1306MV	Drywell Purge		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1311MV	Drywell Purge		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>
	1312MV	Drywell Purge		C <u>  <i>typ</i>  </u>	C <u>  <i>On</i>  </u>

SYSTEM	VALVE NO.	DESCRIPTION	DWG.	TEST POSITION INITIAL	POST TEST POSITION INITIAL
ACAD	1308MV	Drywell Vent		C <u>typ</u>	C <u>typ</u>
	1310MV	Torus Vent		C <u>typ</u>	C <u>typ</u>
Air Lock	Penn. X-2	Outer Personnel Air Door Chained, Locked, and Tagged Closed.	N/A	C <u>typ</u>	C <u>typ</u>

It may be necessary to deviate from this list to place shutdown cooling into service. Any deviations will be so noted on this line-up sheet.

X 46 A, K, C, D, E, F  
 X 47 A,  
 X 29 F  
 X 49 F  
 X 37 e  
 X 52 e, f  
 X 100 b  
 X 47b, c, d, e, f (Steam tunnel NW)

C Sc O typ  
 C Sc O typ  
 C Sc O typ  
 C Sc O typ  
 C Sc O typ  
 C Sc O typ  
 C Sc O typ  
 C Sc O typ

INTENTIONALLY

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## Primary Containment Integrated Leakage Test

Following completion of the superimposed leakage test described in Steps 7+8 (page 7) perform the following steps:

1) Align + Tag the following valves

Return					
On	C	✓	RCIC MD-18 (Open)		<u>89</u>
On	C	✓	RCIC MD-21 (Open)		<u>89</u>
On	C	✓	RCIC MD-132 (Closed)		<u>89</u>
On	C	✓	RHR MD-36A (Closed)		<u>89</u>
On	C	✓	RHR MD-36B (Closed)		<u>89</u>
On	C	✓	CM-197 (Closed)	IN 2-9	<u>89</u>
On	C	✓	CM-198 (Closed)	OUT	<u>89</u>
On	C	✓	CM-199 (Closed)	Bypass	<u>89</u>
On	C	✓	HPCI MD-19 (Open)		<u>89</u>
On	C	✓	CM-200 (Closed)	IN	<u>89</u>
On	C	✓	CM-201 (Closed)	OUT	<u>89</u>
On	C	✓	CM-202 (Closed)	Byp	<u>89</u>

2) Isolate + vent portions of the CRD + RWCH systems by completing the following operations:

Return					
On	C	✓	Shut + Tag RWCH pump suction valves RWCH-16, RWCH-17, RWCH-23 + RWCH-24		<u>89</u>
On	C	✓	Vent three Inst Tag on PI 114. (RACK 25-2)		<u>89</u>
On	C	✓	Shut + tag manual CRD valves CRD 42 + CRD 15		<u>89</u>

4) Went thru Inst taps  
on PI-227 (local)

3) Take primary containment leak rate data on Data Sheet 6.3.1.3 until the leakage rate can be successfully compared with the leakage measured in step 6 (page 7).

4) Complete Steps 10 - 19 of "Attachment  
11/7/76 1355  
11-7-76 1501 A" to 6.3.1.3.  
R. H. Williams  
Stevens

Approval: C. D. Nov 19 11/7/76  
Paul J. Boxer 11/7/76

*Alfred* 11-7-26

SENSOR TYPE	SENSOR NO.	WEIGHING NO.	ELEVATION	AZIMUTH	
Dewcell	DC1	ME-1	.150	903'	0°
	DC2	ME-2	.150	903'	240°
	DC3	ME-3	.100	958'	0°
	DC4	ME-4	.150	903'	120°
	DC5	ME-5	.225	Torus	180°
	DC6	ME-6	.225	Torus	0°
RTD's	T1	501-B	.027	903'	90°
	T2	501-C	.027	903'	300°
	T3	501-D	.027	903'	180°
	T4	500-A	.027	903'	135°
	T5	500-B	.027	903'	90°
	T6	500-C	.027	903'	300°
	T7	500-D	.027	903'	180°
	T8	502-A	.075	888'	60°
	T9	502-B	.075	888'	240°
	T10	505-A	.030	931'	0°
	T11	505-C	.030	931'	225°
	T12	505-E	.030	931'	135°
	T13	510-A	.025	958'	0°
	T14	510-B	.025	958'	300°
	T15	510-C	.025	958'	210°
	T16	510-D	.025	958'	135°
	T17	TE-1	.118	Torus	0°
	T18	TE-2	.118	Torus	90°
	T19	TE-3	.118	Torus	180°
	T20	TE-4	.118	Torus	270°

Table I RTD & dewcell location & weighting factor

SECTION

5

COOPER NUCLEAR STATION  
 NOVEMBER 1976  
 INTEGRATED PRIMARY CONTAINMENT LEAK RATE TEST  
 XXX

	TOTAL TIME LEAK RATE (WT%/24HRS) -----	PT TO PT STAT ERROR (+/- WT%) -----	MASS PLOT LEAK RATE (WT%/24HRS) -----	95% CONF LEVEL (+/- WT%) -----
REF CHAMBER PRE TEST	-0.016	0.428	0.001	0.025
*-24 HOUR IPLRT				
20 MIN INTERVAL	0.238	1.040	0.253	0.006
60 MIN INTERVAL	0.238	0.469	0.251	0.010
24 HOUR LEAK RATES				
1100 TO 1100	0.228	-----NOT APPLICABLE-----		
1120 TO 1120	0.240	-----NOT APPLICABLE-----		
**--VERIFICATION TEST	0.418	1.204	0.450	0.064
***--POST TEST	0.289	1.360	0.449	0.087
REF CHAMB AFTER TEST	-0.012	0.091	-0.016	0.028

\*\*\*--ACCEPTANCE BASIS

LA = MAX ALLOWABLE LEAK RATE = .635 WT%/24HRS  
 LAM = MEASURED LEAK RATE = .238 WT%/24HRS

TEST SATISFACTORY IF:

LAM  $\leq$  .75\*LA  
 .238  $\leq$  .75\*(.635)  
 .238  $\leq$  .476

THEREFORE--TEST IS ACCEPTABLE

\*\*\*--ACCEPTANCE BASIS

LS = SUPERIMPOSED LEAK RATE = .260 WT%/24HRS  
 LAS = MEASURED COMBINED LEAK RATE = .418 WT%/24HRS  
 LAM' = CONTAINMENT LEAK RATE = LAS-LS = .158 WT%/24HRS

TEST SATISFACTORY IF:

ABS(LAM' - LAM)  $\leq$  .25\*LA  
 ABS(.158 - .238)  $\leq$  .25\*(.635)  
 .080  $\leq$  .159

THEREFORE--TEST IS ACCEPTABLE

\*\*\*--POST TEST WAS CONDUCTED WITH A MODIFIED VALVE ALIGNMENT  
 PER DISCUSSION WITH NRC REPRESENTATIVE

COOPER ANALYSIS SECTION NOV. 1976  
REFERENCE VESSEL METHOD  
SINGLE INTERVAL CALCULATION

THREE INDEPENDENT 24 HOUR SINGLE INTERVAL CALCULATIONS

FROM 11/ 6/ 76 AT 1020 HOURS  
TO 11/ 7/ 76 AT 1020 HOURS

INTERVAL DURATION 24.00 HOURS

	INITIAL CONDITIONS		FINAL CONDITIONS	
	-----		-----	
CONT.PRESS.	73.232			
TEMPERATURE	72.345		74.864	DEG.F
DEWPOINT	10.948		11.551	IN H2O
REF.VESSEL DP	0.144		0.298	PSID

LEAK RATE= 0.2370 WT%/24 HRS

FROM 11/ 6/ 76 AT 1100 HOURS  
TO 11/ 7/ 76 AT 1100 HOURS

INTERVAL DURATION 24.00 HOURS

	INITIAL CONDITIONS		FINAL CONDITIONS	
	-----		-----	
CONT.PRESS.	73.253			
TEMPERATURE	72.434		75.003	DEG.F
DEWPOINT	10.945		11.597	IN H2O
REF.VESSEL DP	0.149		0.296	PSID

LEAK RATE= 0.2294 WT%/24 HRS

FROM 11/ 6/ 76 AT 1120 HOURS  
TO 11/ 7/ 76 AT 1120 HOURS

INTERVAL DURATION 24.00 HOURS

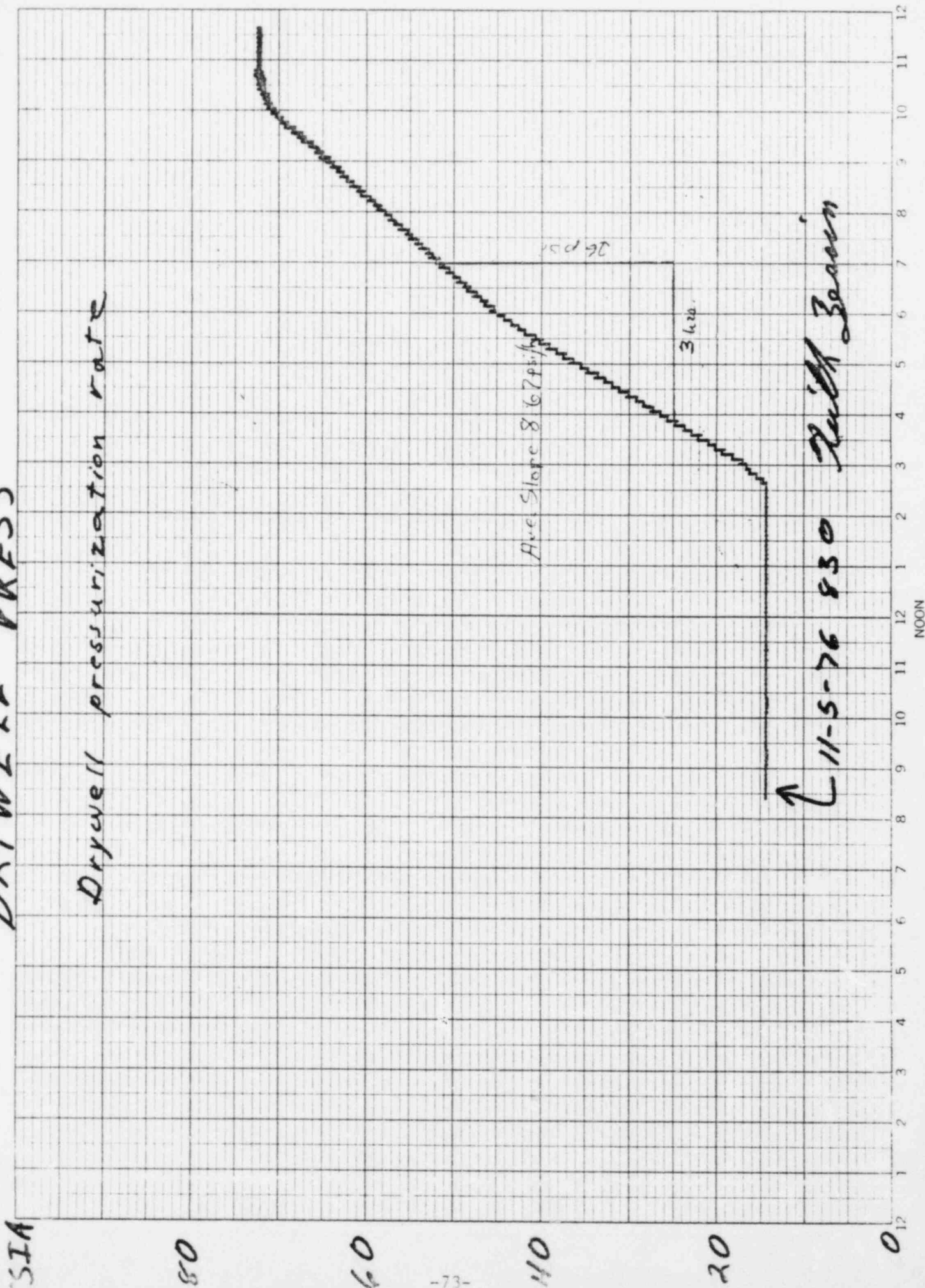
	INITIAL CONDITIONS		FINAL CONDITIONS	
	-----		-----	
CONT.PRESS.	73.260			
TEMPERATURE	72.514		75.027	DEG.F
DEWPOINT	10.849		11.601	IN H2O
REF.VESSEL DP	0.147		0.298	PSID

LEAK RATE= 0.2399 WT%/24 HRS

# SECTION 6

# DRYWELL PRESS

Drywell pressurization rate



SIA Drywell Press.

drywell depressurization rate

11-8-76

11-7-76

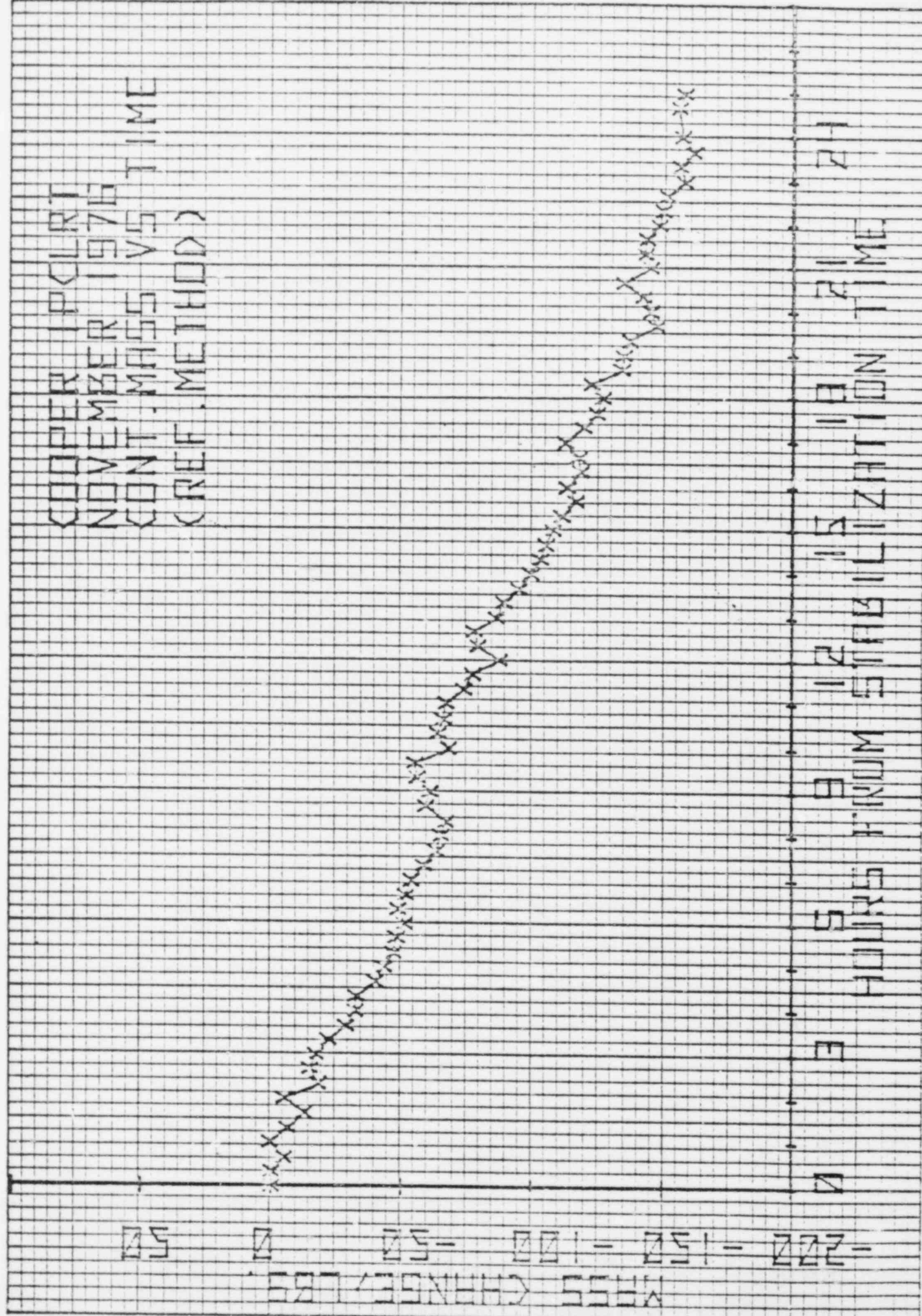
Avg. Slope = 7.67 PSI/hour

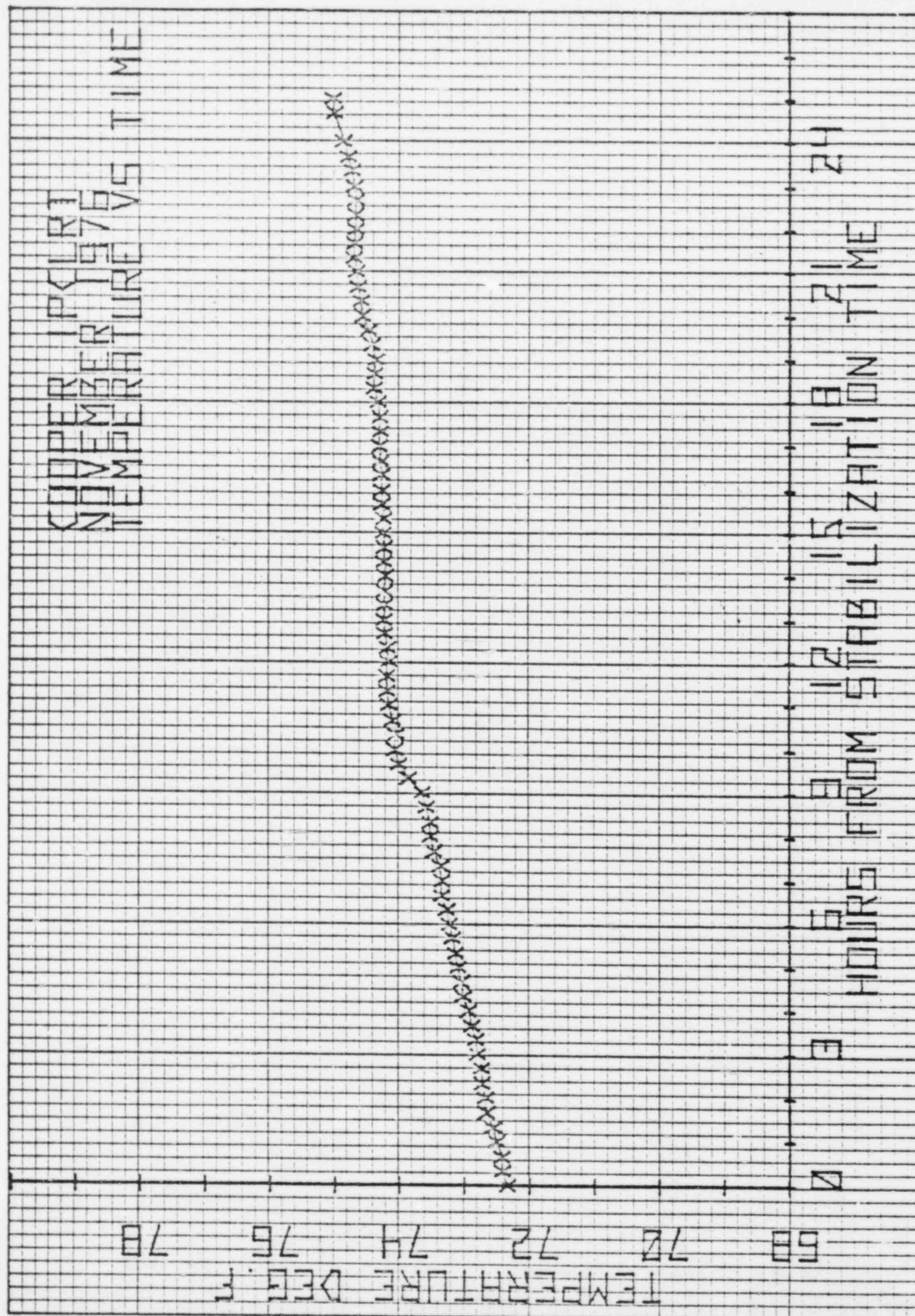
2.3 PSI

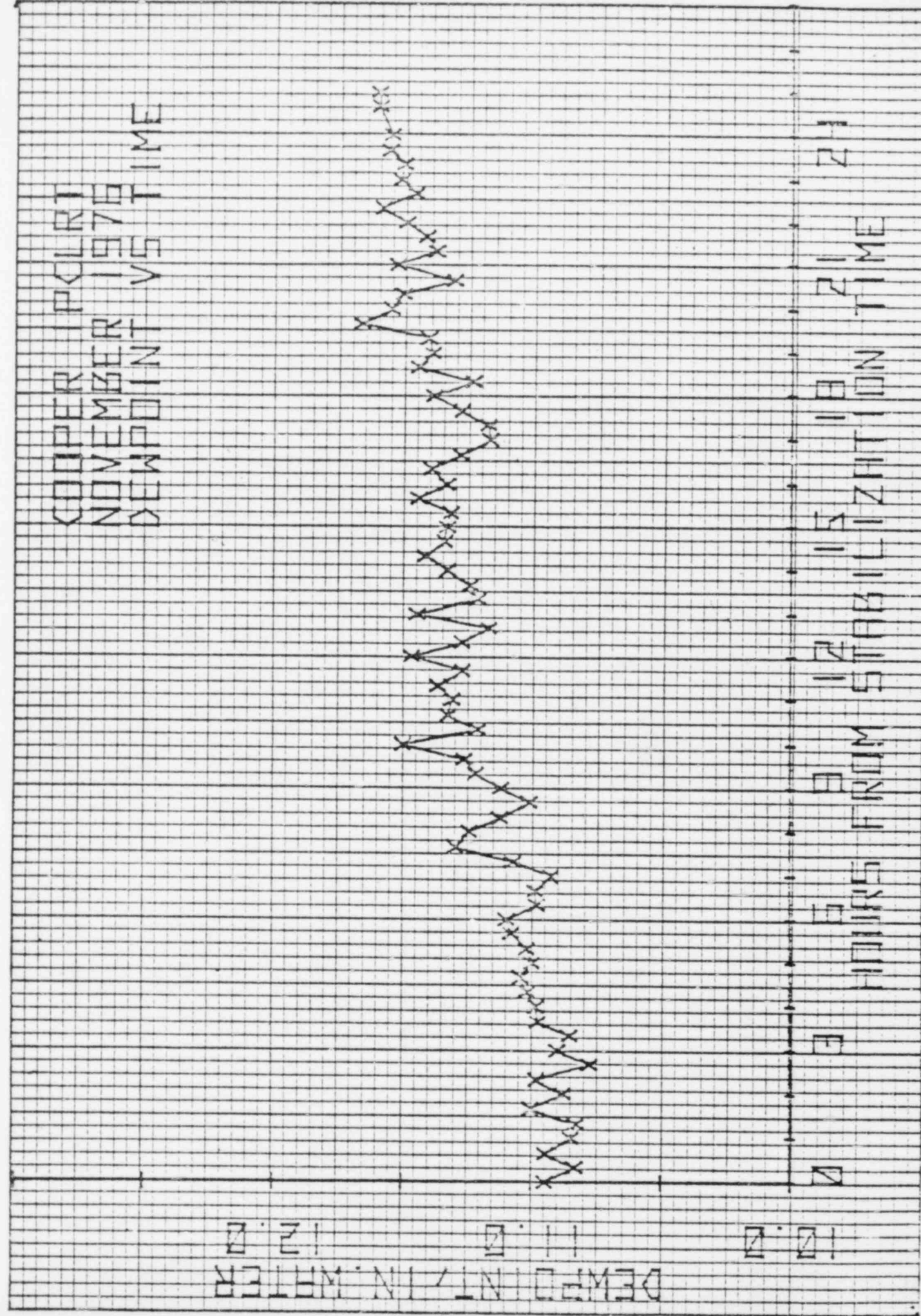
3 hrs

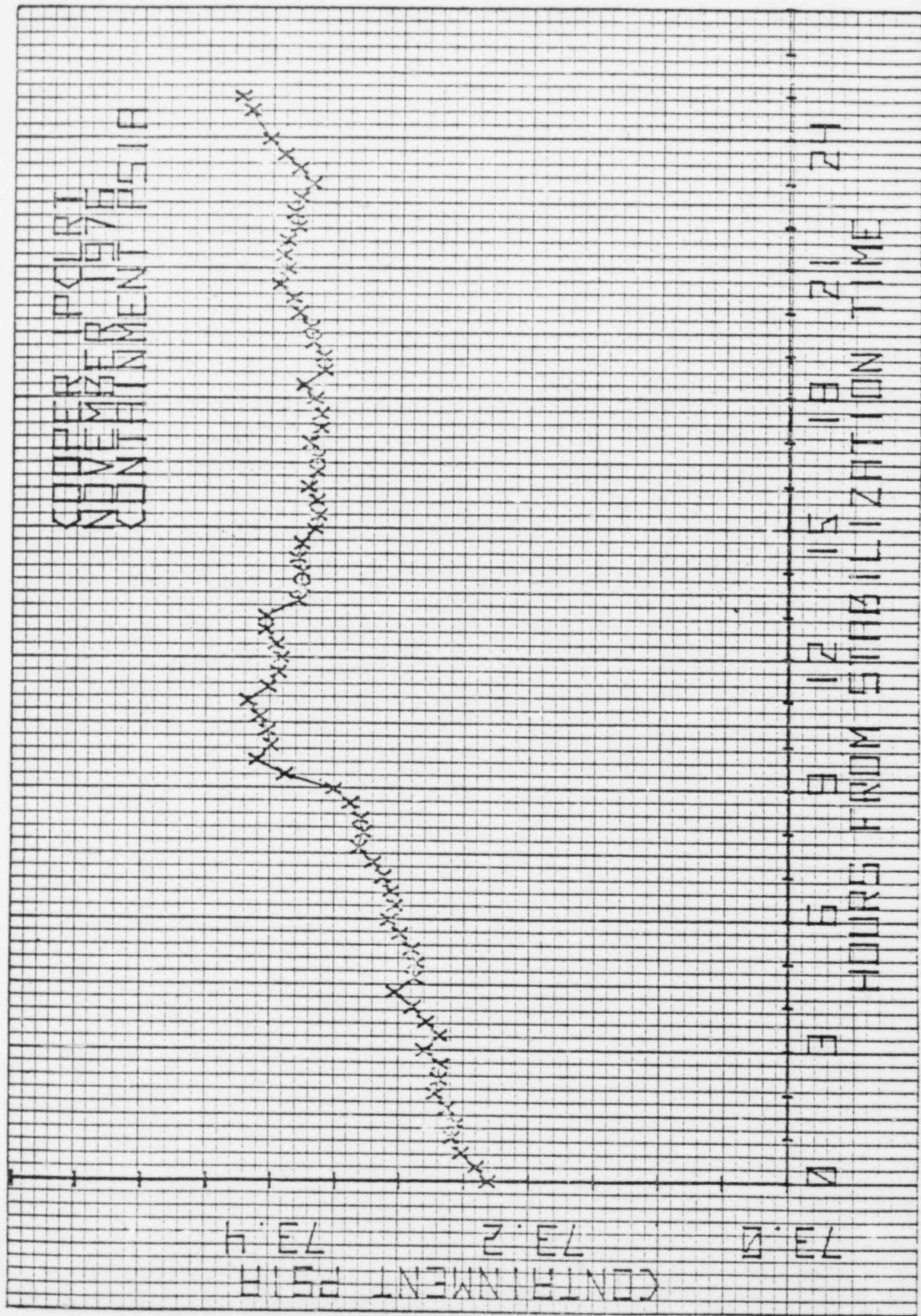
Keith Brean

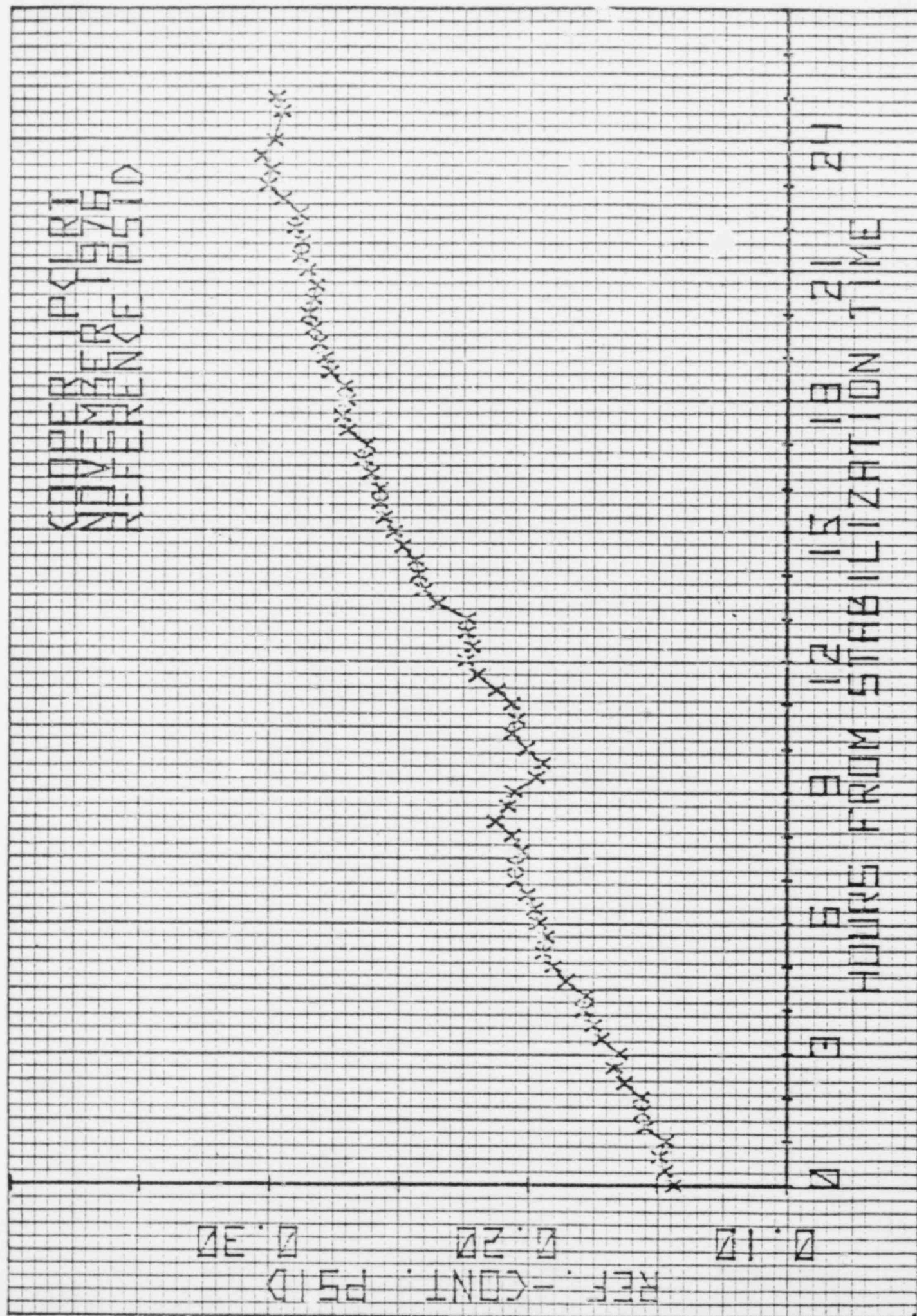
NOON







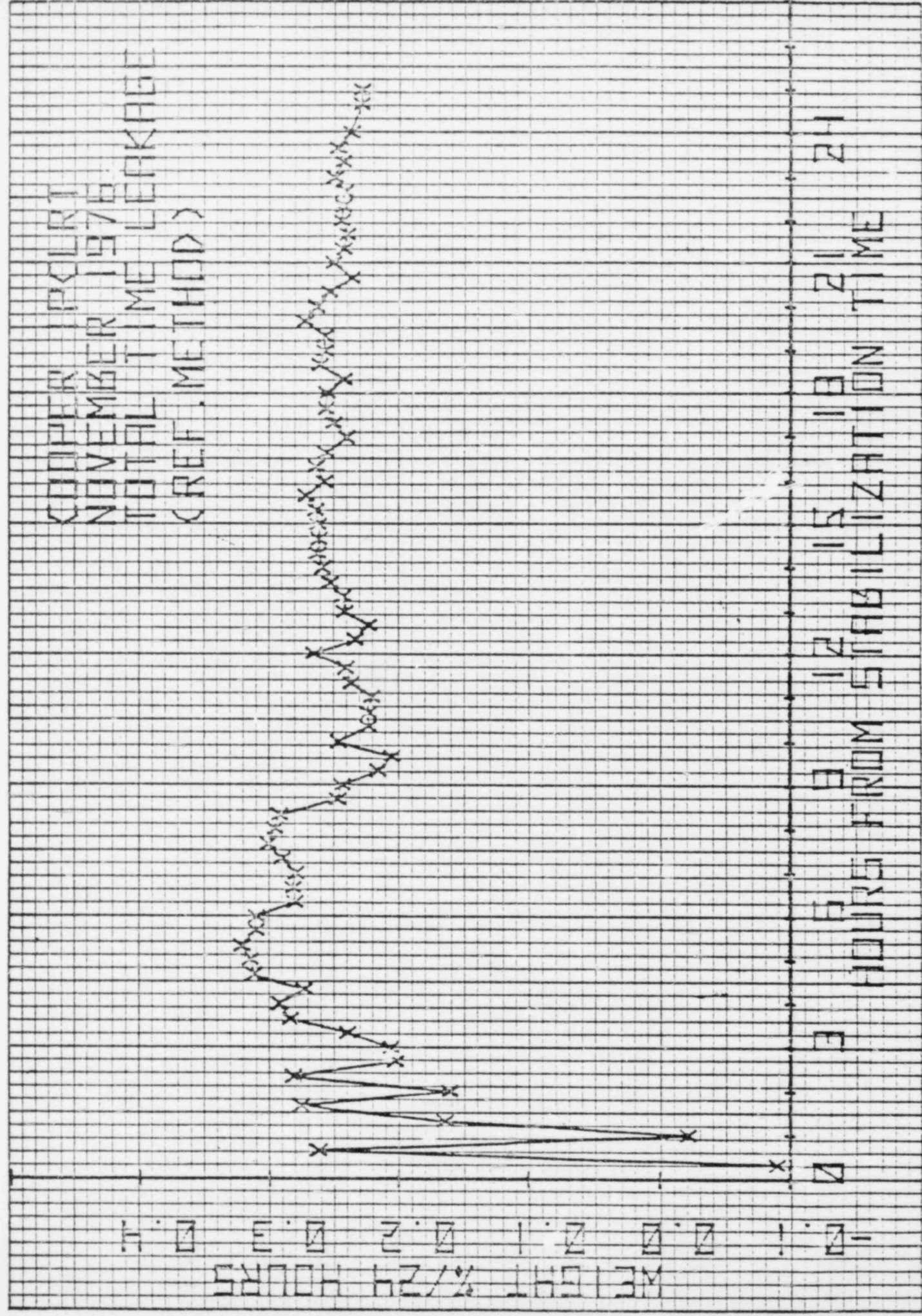


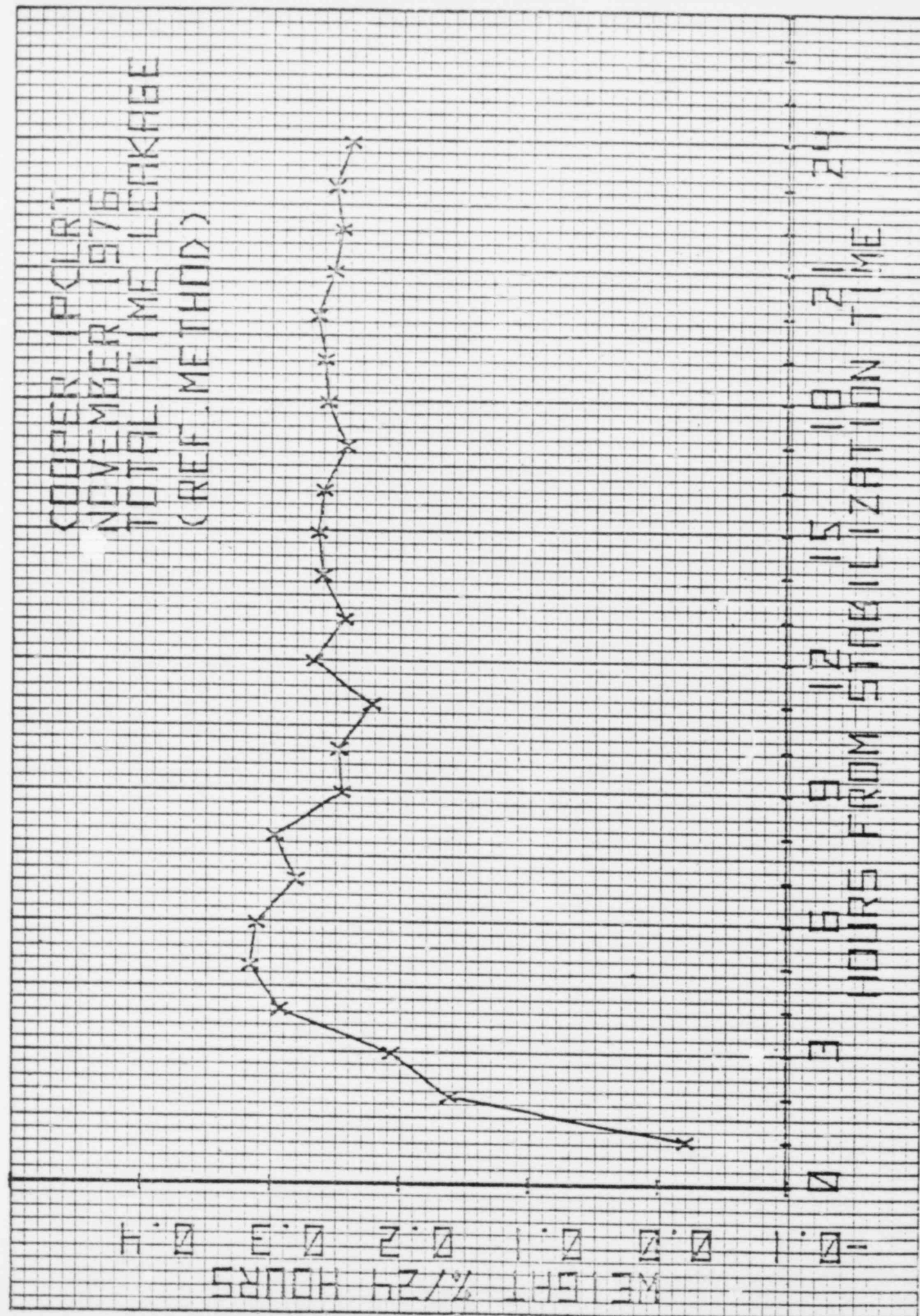


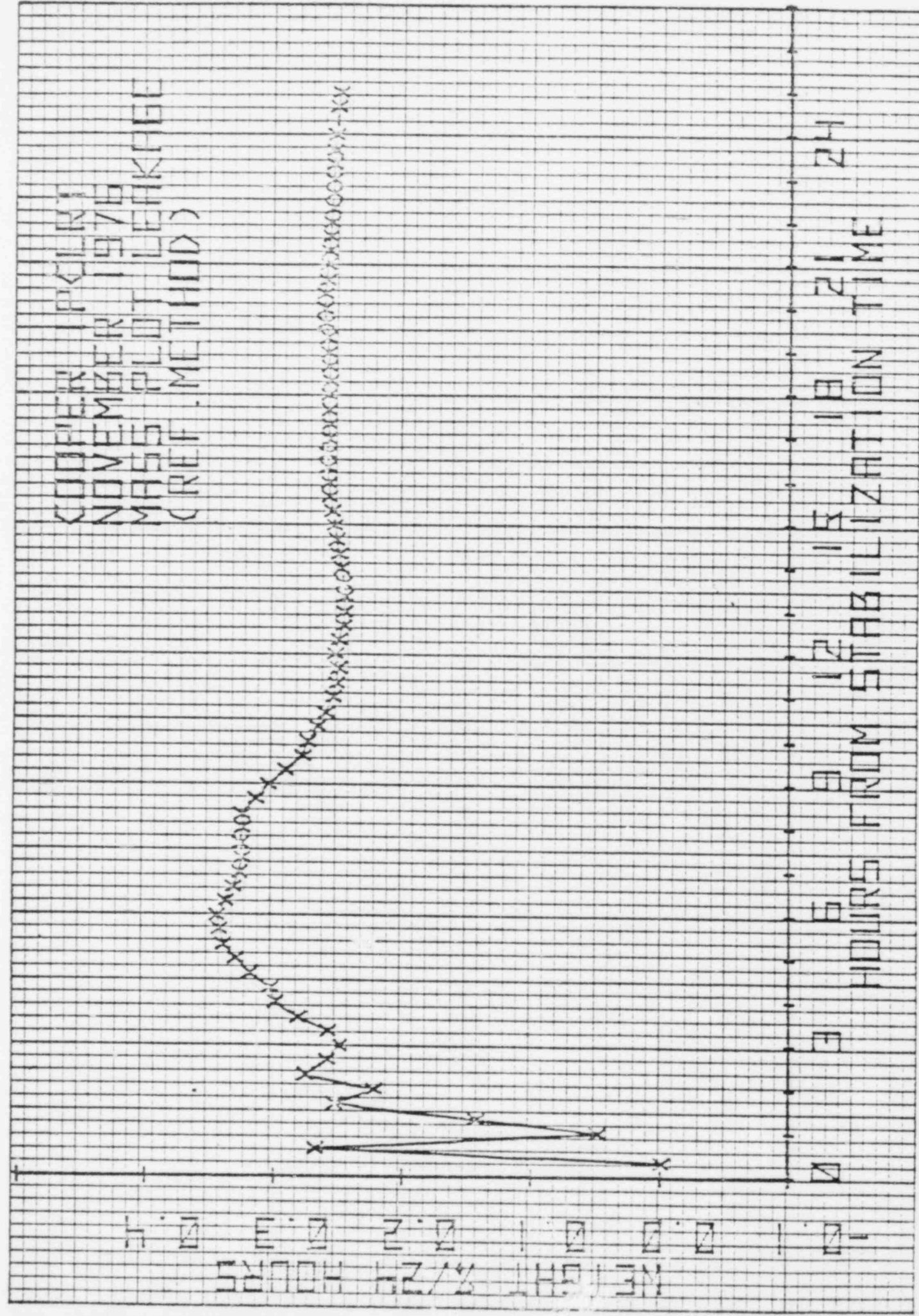
COOPER REPORT  
 NOVEMBER 1976  
 TOTAL TIME LEAKAGE  
 (REF. METHOD)

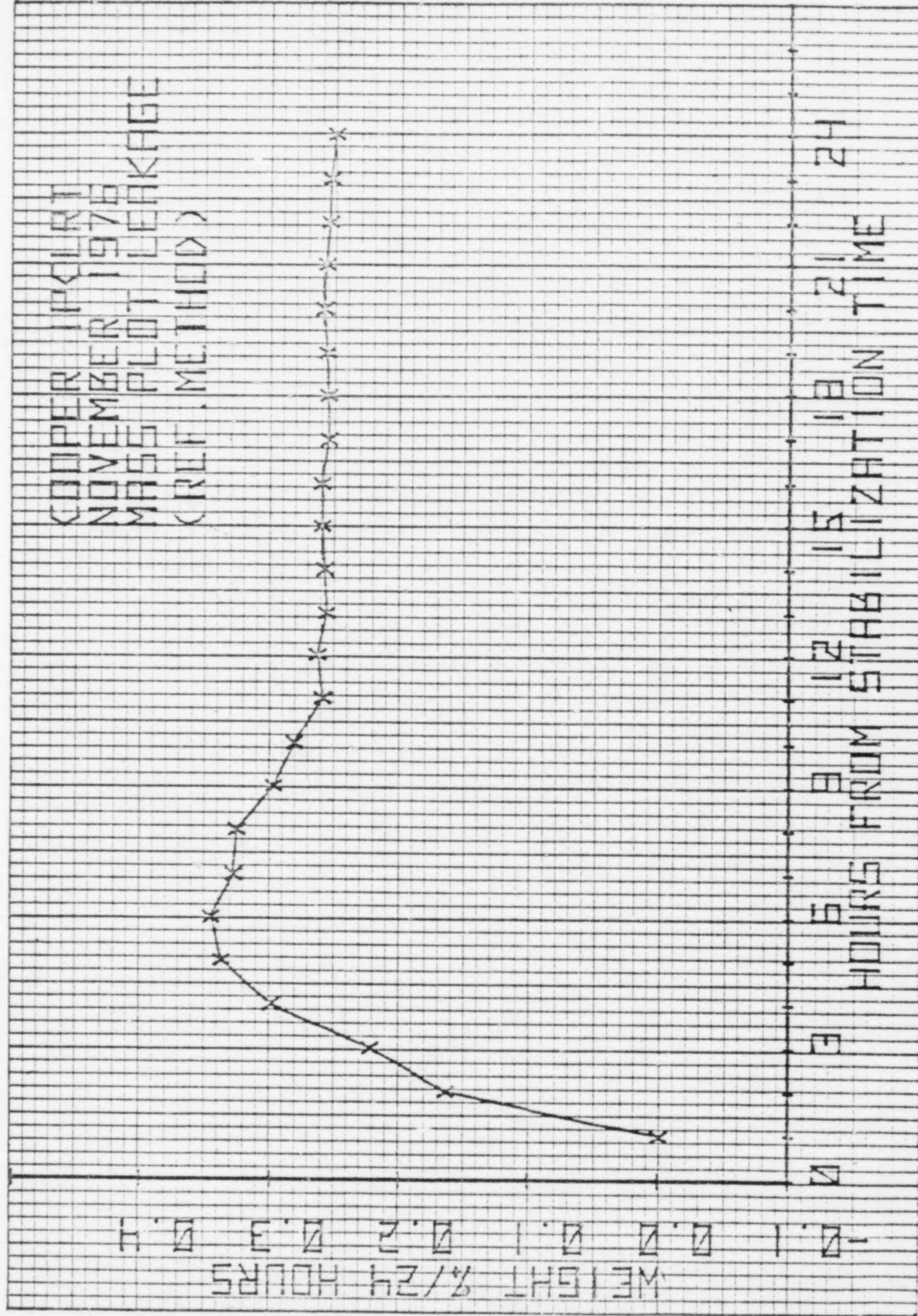
WEIGHT %/24 HOURS

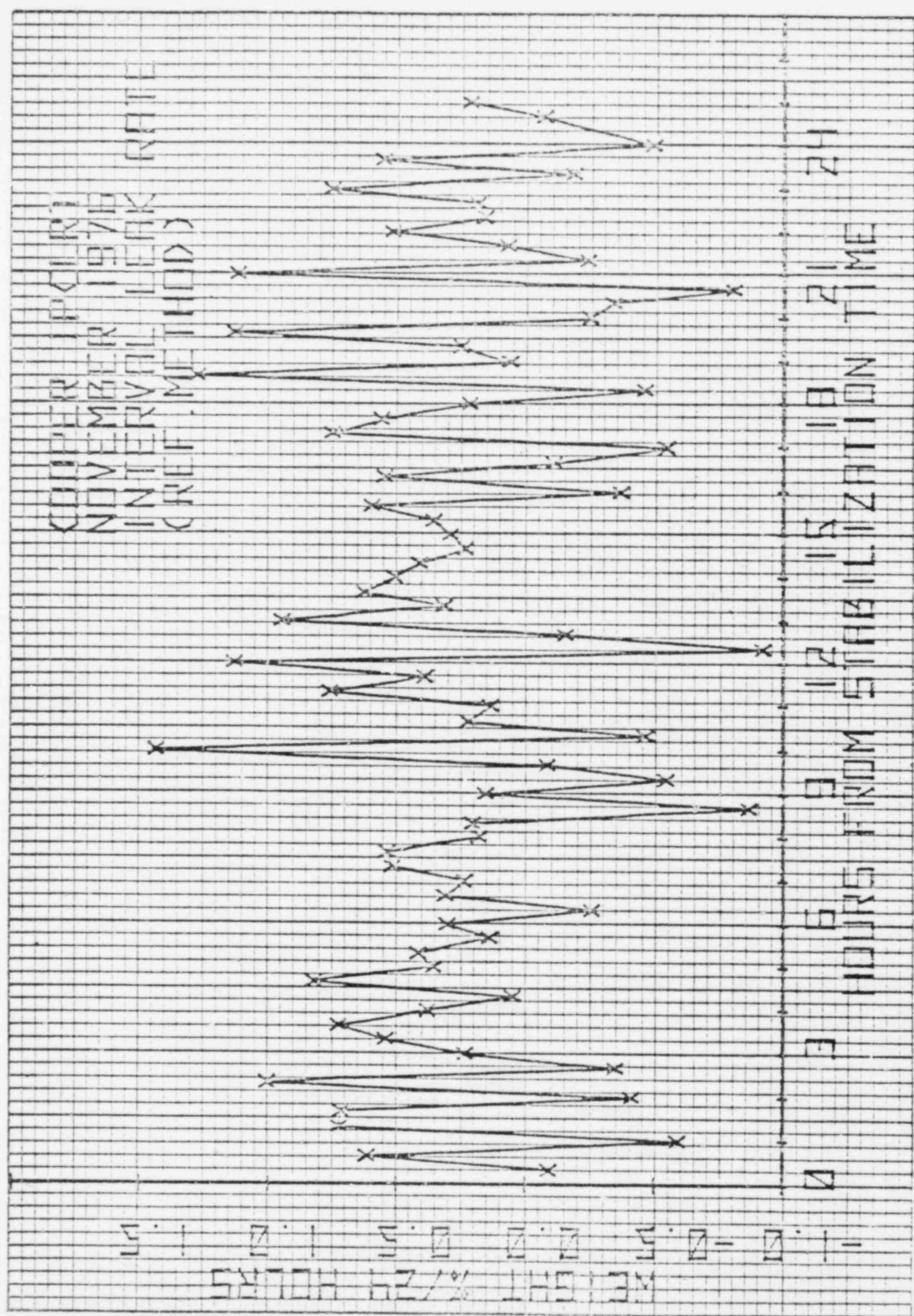
HOURS FROM STABILIZATION TIME









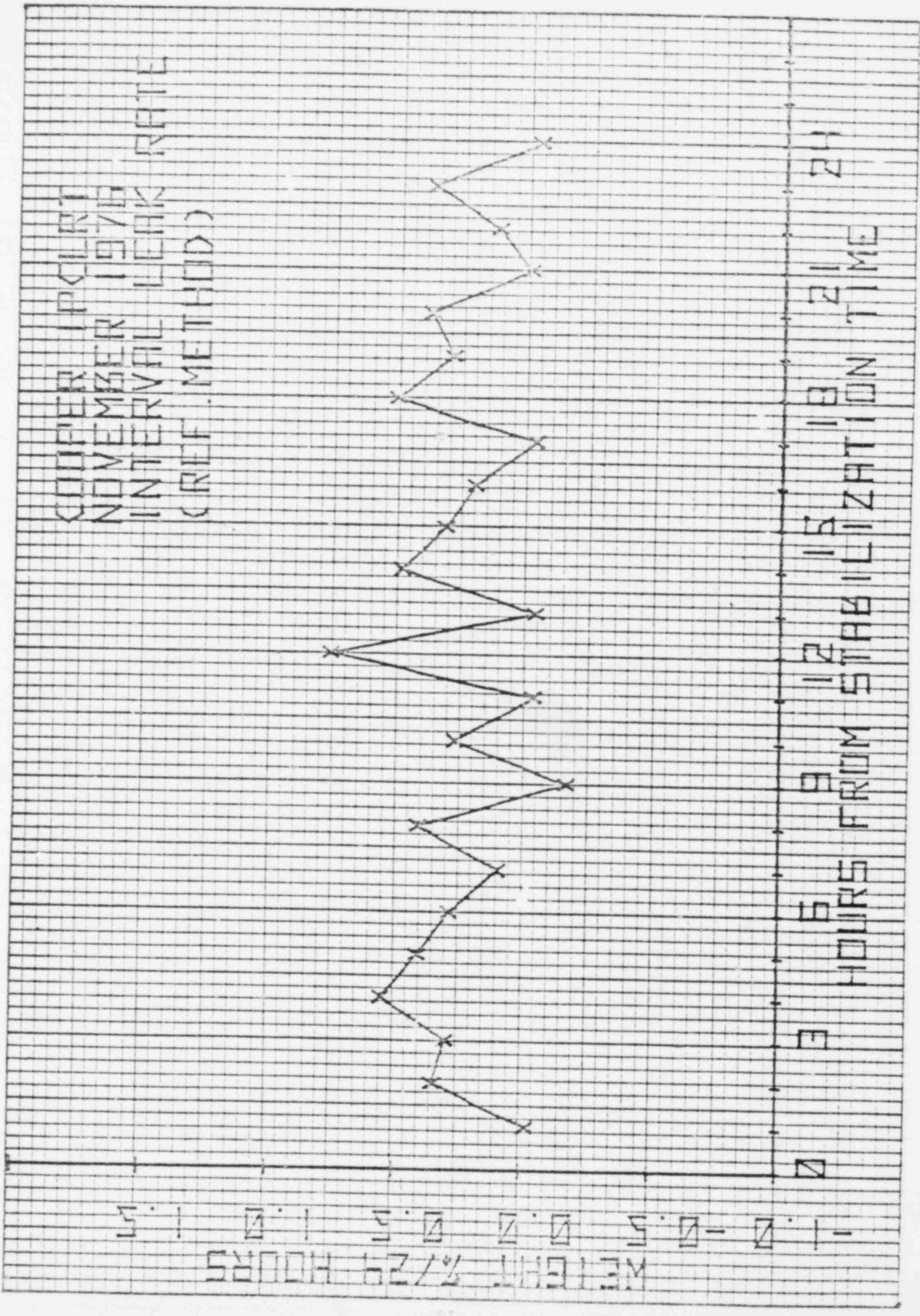


COOPER IPCLRT  
NOVEMBER 1976  
INTERVAL LEAK RATE  
(REF. METHOD)

WEIGHT %/24 HOURS

-1.0 -0.5 0.0 0.5 1.0 1.5

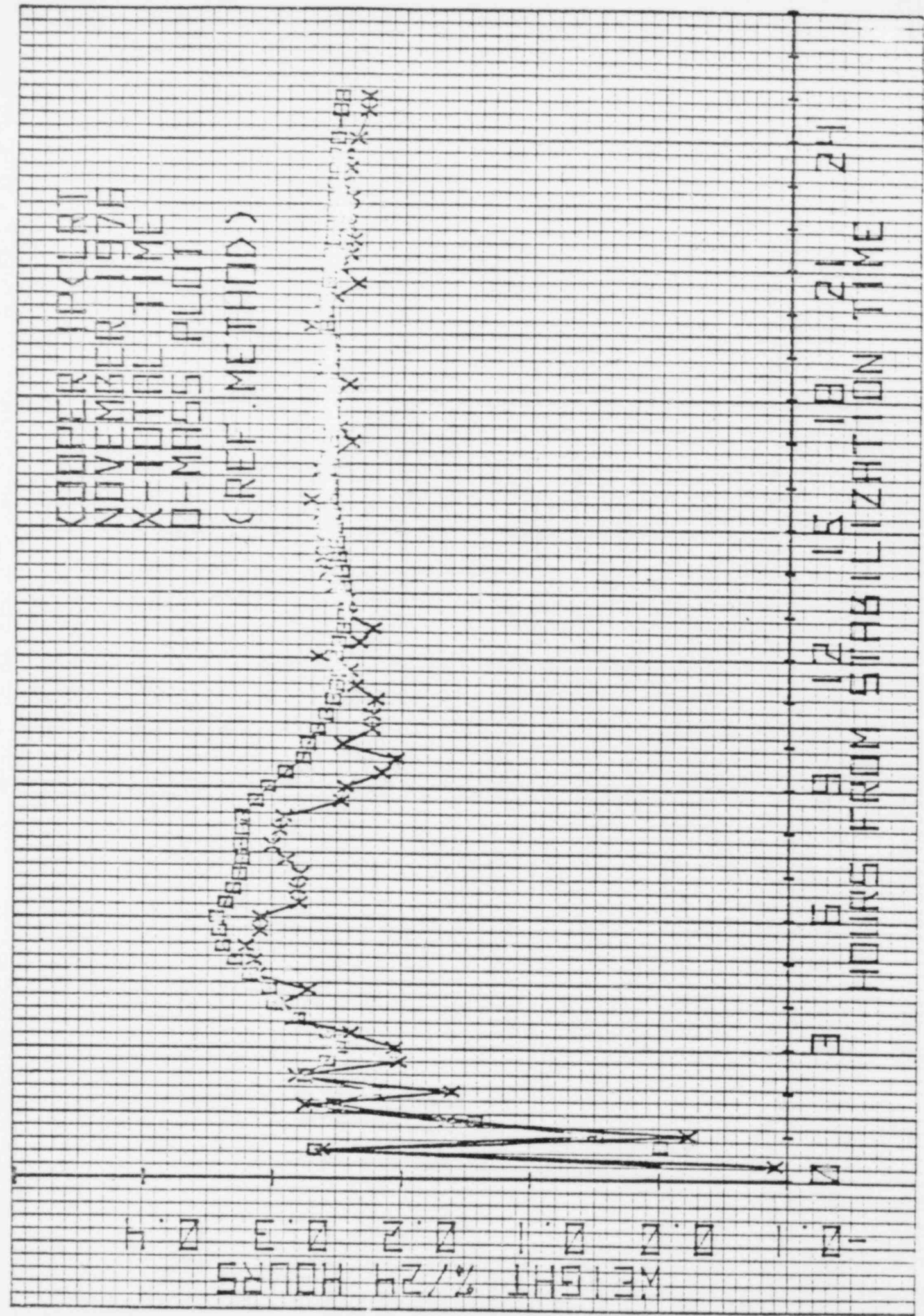
0 3 6 9 12 15 18 21 24  
HOURS FROM STABILIZATION TIME



COVER UP CLIPS  
COVER TIME  
CONTROL TIME  
TIMES PLOT  
(REF. METHOD)

WEIGHT %/24 HOURS

HOURS FROM STABILIZATION TIME



SECTION

7

COOPER NUCLEAR STATION-NOV 1976  
SUMMARY OF IPLCRT CALCULATED DATA--ABSOLUTE METHOD

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REFERENCE CHAMBER PRE TEST

FROM 10/ 31/ 76 AT 1600 HOURS  
TO 11/ 2/ 76 AT 1600 HOURS

DATA SET NO	HRS. FROM T=0	CONT MASS LBS	CONT PRESS PSIA	AVG CONT DEG F	AVG DEWPOINT IN H2O	INTER LEAK RATE	TOT TIME LKRT
1	0.00	0.1595	74.780	70.46	0.00	0.000	0.000
2	16.00	0.1594	74.674	69.94	0.00	0.066	0.066
3	18.00	0.1594	74.757	70.62	0.00	0.207	0.082
4	20.00	0.1594	74.825	70.99	0.00	-0.254	0.048
5	22.00	0.1595	74.911	71.48	0.00	-0.271	0.019
6	24.00	0.1595	74.960	71.80	0.00	-0.062	0.012
7	26.00	0.1595	74.989	72.01	0.00	0.010	0.012
8	28.00	0.1595	74.978	72.04	0.00	0.244	0.029
9	30.00	0.1594	74.960	72.03	0.00	0.137	0.006
10	32.00	0.1594	74.954	72.00	0.00	0.156	0.043
11	34.00	0.1594	74.940	71.96	0.00	0.134	0.049
12	40.00	0.1595	74.922	71.63	0.00	-0.152	0.019
	42.00	0.1594	74.954	71.96	0.00	0.233	0.029
	44.00	0.1594	75.012	72.33	0.00	-0.093	0.023
15	48.00	0.1596	75.096	72.53	0.00	-0.446	-0.016

COOPER NUCLEAR STATION NOV 1976  
 1 POLY SUMMARY OF CALCULATED DATA--REF VESS METHOD

24 HOUR SUMMARY FOR 20 MIN DATA

FROM 11/ 6/ 76 AT 1000 HOURS  
 TO 11/ 7/ 76 AT 1100 HOURS

DATA SET NO.	HRS. FROM T=0	REF-CONT DR PSID	CONT. PRESS. PSIA	AVG. CONT. DEG.F	AVG. DEWPOINT IN.H2O	INTER LEAK RATE	TOT TIME LKRT
1	0.00	0.144	73.232	72.35	10.95	0.000	0.000
2	0.33	0.147	73.241	72.42	10.83	-0.090	-0.090
3	0.67	0.149	73.253	72.43	10.95	0.615	0.262
4	1.00	0.147	73.260	72.51	10.85	-0.590	-0.022
5	1.33	0.155	73.257	72.57	10.93	0.726	0.165
6	1.67	0.156	73.264	72.66	11.00	0.718	0.276
7	2.00	0.157	73.273	72.68	10.88	-0.411	0.161
8	2.33	0.163	73.270	72.73	10.98	1.005	0.282
9	2.67	0.167	73.269	72.74	10.77	-0.350	0.203
10	3.00	0.165	73.281	72.80	10.90	0.235	0.286
11	3.33	0.172	73.270	72.83	10.85	0.543	0.240
12	3.67	0.175	73.280	72.89	10.98	0.727	0.284
13	4.00	0.179	73.290	72.94	10.98	0.380	0.292
14	4.33	0.178	73.304	73.02	11.02	0.047	0.273
15	4.67	0.186	73.289	73.05	11.04	0.824	0.313
16	5.00	0.191	73.288	73.10	11.00	0.357	0.316
17	5.33	0.194	73.291	73.14	11.02	0.414	0.322
18	5.67	0.193	73.300	73.19	11.08	0.138	0.311
19	6.00	0.196	73.309	73.24	11.10	0.303	0.311
20	6.33	0.198	73.304	73.27	10.98	-0.259	0.281
21	6.67	0.201	73.307	73.35	10.99	0.310	0.282
22	7.00	0.205	73.313	73.35	10.93	0.237	0.280
23	7.33	0.205	73.321	73.37	11.07	0.517	0.291
24	7.67	0.203	73.332	73.47	11.30	0.537	0.301
25	8.00	0.207	73.339	73.53	11.24	0.179	0.296
26	8.33	0.213	73.331	73.53	11.12	0.205	0.293
27	8.67	0.203	73.339	73.59	11.01	-0.863	0.248
28	9.00	0.205	73.352	73.66	11.12	0.153	0.244
29	9.33	0.197	73.390	73.93	11.22	-0.545	0.216
30	9.67	0.195	73.413	74.01	11.26	-0.085	0.206
31	10.00	0.201	73.431	74.07	11.50	1.437	0.247
32	10.33	0.207	73.434	74.33	11.21	-0.464	0.224
33	10.67	0.205	73.413	74.11	11.33	0.220	0.224
34	11.00	0.207	73.419	74.17	11.31	0.132	0.221
35	11.33	0.213	73.433	74.19	11.37	0.761	0.237
36	11.67	0.210	73.433	74.23	11.37	0.390	0.241
37	12.00	0.214	73.433	74.27	11.47	1.131	0.266
38	12.33	0.212	73.433	74.13	11.27	-0.921	0.214
39	12.67	0.213	73.435	74.23	11.17	-0.157	0.224
40	13.00	0.214	73.435	74.24	11.45	0.946	0.242

IPCLST SUMMARY OF CALCULATED DATA--REF VESS METHOD

DATA SET NO.	HRS. FROM T=0	REF-CONT DP PSID	CONT. PRESS. PSIA	AVG. CONT. DEG.F	AVG. DEWPOINT IN.H2O	INTER LEAK RATE	TOT TIME LKRT
41	13.03	0.235	73.380	74.23	11.21	0.314	0.244
42	13.67	0.241	73.377	74.23	11.24	0.627	0.253
43	14.00	0.242	73.377	74.22	11.33	0.505	0.259
44	14.33	0.244	73.380	74.24	11.41	0.409	0.263
45	14.67	0.249	73.377	74.23	11.34	0.231	0.262
46	15.00	0.252	73.367	74.25	11.33	0.291	0.263
47	15.33	0.256	73.364	74.25	11.32	0.355	0.265
48	15.67	0.258	73.366	74.27	11.44	0.597	0.272
49	16.00	0.258	73.372	74.27	11.34	-0.368	0.258
50	16.33	0.261	73.366	74.28	11.39	0.547	0.264
51	16.67	0.264	73.366	74.29	11.28	-0.110	0.257
52	17.00	0.263	73.371	74.31	11.16	-0.547	0.241
53	17.33	0.270	73.363	74.30	11.17	0.753	0.251
54	17.66	0.272	73.363	74.31	11.28	0.559	0.257
55	18.00	0.270	73.368	74.33	11.39	0.216	0.256
56	18.33	0.271	73.376	74.39	11.23	-0.461	0.243
57	18.66	0.277	73.360	74.38	11.44	1.279	0.261
58	19.00	0.279	73.361	74.37	11.39	0.058	0.258
59	19.33	0.281	73.369	74.43	11.41	0.258	0.258
60	19.66	0.283	73.371	74.48	11.66	1.131	0.273
61	20.00	0.285	73.380	74.57	11.55	-0.250	0.264
62	20.33	0.283	73.384	74.60	11.50	-0.341	0.254
63	20.66	0.282	73.395	74.65	11.31	-0.807	0.237
64	21.00	0.286	73.389	74.66	11.53	1.121	0.251
65	21.33	0.289	73.392	74.71	11.38	-0.240	0.243
66	21.66	0.288	73.389	74.70	11.42	0.070	0.241
67	22.00	0.293	73.381	74.68	11.49	0.518	0.245
68	22.33	0.289	73.383	74.68	11.58	0.158	0.243
69	22.66	0.294	73.379	74.67	11.46	0.187	0.243
70	23.00	0.291	73.370	74.70	11.51	0.753	0.253
71	23.33	0.293	73.380	74.74	11.50	-0.184	0.244
72	23.66	0.293	73.391	74.80	11.55	0.554	0.248
73	24.00	0.296	73.403	74.86	11.55	-0.495	0.238
74	24.33	0.295	73.418	75.00	11.60	-0.070	0.230
75	25.00	0.296	73.433	75.03	11.60	0.216	0.229

COOPER NUCLEAR STATION    NOV 1976  
 IPLRT SUMMARY OF CALCULATED DATA--REF VESS METHOD

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SUMMARY OF 24 HOUR IPLRT TEST

FROM    11/ 6/ 76    AT    1020 HOURS  
 TO      11/ 7/ 76    AT    1020 HOURS

DATA SET NO.	HRS. FROM T=0	REF-CONT DP PSID	CONT. PRESS. PSIA	AVG. CONT. DEG.F	AVG. DENPOINT IN.H2O	INTER LEAK RATE	TOTAL TIME LKRT
1	0.00	0.144	73.232	72.35	10.95	0.000	0.000
2	1.00	0.147	73.260	72.51	10.85	-0.022	-0.022
3	2.00	0.157	73.273	72.68	10.88	0.344	0.161
4	3.00	0.165	73.281	72.80	10.90	0.296	0.206
5	4.00	0.179	73.290	72.94	10.98	0.550	0.292
6	5.00	0.191	73.288	73.10	11.00	0.409	0.316
7	6.00	0.196	73.309	73.24	11.10	0.285	0.310
8	7.00	0.205	73.313	73.35	10.93	0.096	0.280
9	8.00	0.207	73.329	73.53	11.24	0.411	0.296
10	9.00	0.206	73.352	73.66	11.12	-0.170	0.244
11	10.00	0.201	73.401	74.07	11.50	0.269	0.247
12	11.00	0.207	73.419	74.17	11.31	-0.037	0.221
13	12.00	0.224	73.393	74.17	11.47	0.760	0.266
14	13.00	0.224	73.405	74.24	11.45	-0.044	0.242
15	14.00	0.242	73.377	74.22	11.33	0.482	0.259
16	15.00	0.252	73.367	74.25	11.33	0.310	0.263
17	16.00	0.258	73.372	74.27	11.34	0.195	0.258
18	17.00	0.263	73.371	74.31	11.16	-0.037	0.241
19	18.00	0.270	73.368	74.33	11.39	0.509	0.256
20	19.00	0.279	73.361	74.37	11.39	0.292	0.258
21	20.00	0.285	73.380	74.57	11.55	0.377	0.264
22	21.00	0.286	73.389	74.66	11.53	-0.009	0.251
23	22.00	0.290	73.381	74.68	11.49	0.116	0.245
24	23.00	0.301	73.370	74.70	11.51	0.366	0.250
25	24.00	0.298	73.403	74.87	11.55	-0.042	0.238

COOPER NUCLEAR STATION NOV 1976  
 IFCRT SUMMARY OF CALCULATED DATA--REF VESS METHOD

IFCRT VERIFICATION TEST WITH SUPERIMPOSED LEAK OF .26 WT%/24HRS

FROM 11/ 7/ 76 AT 1220 HOURS  
 TO 11/ 7/ 76 AT 1640 HOURS

DATA SET NO.	REF. FROM T=0	REF-CONT DP PSID	CONT. PRESS. PSIA	AVG. CONT. DEG.F	AVG. DEWPOINT IN.H2O	INTER LEAK RATE	TOTAL TIME LKRT
1	0.00	0.302	73.4220	75.06	11.51	0.000	0.000
2	0.33	0.304	73.4250	75.08	11.66	0.725	0.725
3	0.67	0.303	73.4340	75.13	11.60	-0.356	0.185
4	1.00	0.310	73.4290	75.18	11.67	0.973	0.447
5	1.33	0.310	73.4300	75.21	11.55	-0.380	0.241
6	1.67	0.313	73.4360	75.25	11.65	0.635	0.320
7	2.00	0.315	73.4380	75.30	11.72	0.403	0.333
8	2.33	0.336	73.4090	75.27	11.63	1.717	0.531
9	2.67	0.342	73.4050	75.26	11.64	0.690	0.551
10	3.00	0.342	73.4050	75.27	11.67	0.027	0.493
11	3.33	0.344	73.4090	75.30	11.61	0.029	0.446
12	3.67	0.345	73.4150	75.37	11.69	0.330	0.436
13	4.00	0.345	73.4190	75.43	11.63	-0.212	0.382
14	4.33	0.347	73.4210	75.46	11.80	0.856	0.412

COOPER NUCLEAR STATION NOV 1976  
IPCLRT SUMMARY OF CALCULATED DATA--PEF VESS METHOD

RESULTS OF POST TEST WITH MODIFIED VALVE ALIGNMENT

FROM 11/ 7/ 76 AT 1740 HOURS  
TO 11/ 7/ 76 AT 2000 HOURS

DATA SET NO.	HRS. FROM T=0	REF-CON* DP PSID	CONT. PRESS. PSIA	AVG. CONT. DEG.F	AVG. DEWPOINT IN.H2O	INTER LEAK RATE	TOTAL TIME LKRT
1	0.00	0.339	73.447	75.58	11.70	0.000	0.000
2	0.33	0.339	73.460	75.62	11.74	0.127	0.127
3	0.67	0.335	73.475	75.74	11.74	-0.410	-0.141
4	1.00	0.338	73.481	75.81	11.76	0.388	0.035
5	1.33	0.335	73.490	75.86	11.87	0.076	0.045
6	1.67	0.332	73.480	75.88	11.76	-0.740	-0.112
7	2.00	0.345	73.481	75.93	11.81	1.438	0.146
8	2.33	0.356	73.465	75.90	11.80	1.118	0.285
9	2.67	0.366	73.450	75.88	11.67	0.508	0.313
10	3.00	0.381	73.429	75.80	11.72	1.615	0.458
11	3.33	0.392	73.410	75.76	11.68	0.967	0.509
12	3.67	0.395	73.405	75.72	11.75	0.536	0.511
13	4.00	0.396	73.405	75.70	11.73	0.045	0.472
14	4.33	0.398	73.396	75.64	11.78	0.397	0.466
15	4.67	0.398	73.395	75.64	11.70	-0.262	0.414
16	5.00	0.397	73.397	75.63	11.64	-0.364	0.363
17	5.33	0.394	73.402	75.62	11.69	-0.102	0.333
18	5.67	0.391	73.408	75.66	11.64	-0.427	0.289

COOPER NUCLEAR STATION-NOV 1976  
SUMMARY OF IFCRT CALCULATED DATA--ABSOLUTE METHOD

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REFERENCE CHAMBER F IER TEST

FROM 11/ 8/ 76 AT 1900 HOURS  
TO 11/ 11/ 76 AT 1600 HOURS

DATA SET NO	HRS. FROM T=0	CONT MASS LBS	CONT PRESS PSIA	AVG CONT DEG F	AVG DEWPOINT IN H2O	INTER LEAK RATE	TOT TIME LKRT
1	0.00	0.1561	73.046	69.61	0.00	0.000	0.000
2	21.00	0.1560	72.771	67.77	0.00	0.033	0.033
3	38.00	0.1561	73.089	69.79	0.00	-0.076	-0.016
4	62.00	0.1561	72.546	65.83	0.00	-0.005	-0.012
5	69.00	0.1561	72.601	66.20	0.00	-0.019	-0.012

COOPER NUCLEAR STATION NOV 1976  
 IPCLRT SUMMARY, MASS PLOT ANALYSES--ABSOLUTE METHOD

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REFERENCE CHAMBER PRE TEST

FROM 10/ 31/ 76 AT 1600 HOURS  
 TO 11/ 2/ 76 AT 1600 HOURS

DATA SET NO.	HRS. FROM T=0	CONT. MASS LBS.	INTER. LEAK RATE	95% CONFIDENCE ERROR
1	0.00	0.1595	0.0000	0.0000
2	16.00	0.1594	0.0000	0.0000
3	18.00	0.1594	0.0757	0.3188
4	20.00	0.1594	0.0623	0.1258
5	22.00	0.1595	0.0409	0.0986
6	24.00	0.1595	0.0246	0.1595
7	26.00	0.1595	0.0140	0.0556
8	28.00	0.1595	0.0147	0.0431
9	30.00	0.1594	0.0190	0.0358
10	32.00	0.1594	0.0258	0.0316
11	34.00	0.1594	0.0333	0.0289
12	40.00	0.1595	0.0245	0.0254
13	42.00	0.1594	0.0241	0.0215
14	44.00	0.1594	0.0216	0.0187
15	48.00	0.1596	0.0032	0.0246

COOPER NUCLEAR STATION NOV 1976  
 1PCLAT SUMMARY: MASS PLOT ANALYSES--PEP VESS METHOD

24 HOUR SUMMARY FOR 20 MIN DATA

FROM 11 6 76 AT 1020 HOURS  
 TO 11 7 76 AT 1120 HOURS

DATA SET NO.	HRS. FROM T=0	CONT. MASS LBS.	INTER. LEAK RATE	95% CONFIDENCE ERROR
1	0.00	64545.00	0.0000	0.0000
2	0.33	64545.00	0.0000	0.0000
3	0.67	64545.00	0.2677	4.7649
4	1.00	64545.40	0.0491	0.9985
5	1.33	64538.00	0.1428	0.3526
6	1.67	64538.00	0.2528	0.2305
7	2.00	64530.90	0.2219	0.1455
8	2.33	64526.00	0.2752	0.1175
9	2.67	64529.90	0.2586	0.0892
10	3.00	64527.70	0.2495	0.0701
11	3.33	64522.00	0.2580	0.0570
12	3.67	64516.20	0.2813	0.0527
13	4.00	64512.70	0.2990	0.0478
14	4.33	64512.20	0.3032	0.0409
15	4.67	64504.80	0.3189	0.0387
16	5.00	64501.60	0.3303	0.0357
17	5.33	64497.80	0.3400	0.0328
18	5.67	64496.50	0.3433	0.0293
19	6.00	64493.70	0.3453	0.0262
20	6.33	64496.00	0.3380	0.0246
21	6.67	64493.20	0.3324	0.0229
22	7.00	64491.00	0.3271	0.0214
23	7.33	64486.30	0.3252	0.0196
24	7.67	64481.40	0.3260	0.0180
25	8.00	64479.70	0.3253	0.0165
26	8.33	64477.80	0.3208	0.0153
27	8.67	64485.50	0.3133	0.0176
28	9.00	64484.10	0.3036	0.0189
29	9.33	64483.90	0.2901	0.0220
30	9.67	64481.60	0.2767	0.0244
31	10.00	64475.70	0.2728	0.0231
32	10.33	64480.00	0.2654	0.0228
33	10.67	64470.00	0.2590	0.0223
34	11.00	64477.50	0.2531	0.0217
35	11.33	64470.70	0.2503	0.0206
36	11.67	64467.20	0.2491	0.0193
37	12.00	64457.00	0.2517	0.0166
38	12.33	64456.20	0.2491	0.0178
39	12.67	64456.00	0.2454	0.0172
40	13.00	64456.10	0.2447	0.0164

IPCLRT SUMMARY-MASS PLOT ANALYSES--REF VESS METHOD

DATA SET NO.	HRS. FROM T=0	CONT. MASS LBS.	INTER. LEAK RATE	95% CONFIDENCE ERROR
41	13.33	64455.20	0.2444	0.0156
42	13.67	64449.50	0.2455	0.0149
43	14.00	64444.90	0.2473	0.0143
44	14.33	64441.20	0.2493	0.0137
45	14.67	64439.10	0.2511	0.0132
46	15.00	64436.50	0.2527	0.0127
47	15.33	64433.30	0.2544	0.0123
48	15.67	64427.90	0.2568	0.0120
49	16.00	64431.10	0.2574	0.0115
50	16.33	64426.20	0.2586	0.0111
51	16.67	64427.10	0.2589	0.0107
52	17.00	64431.90	0.2574	0.0103
53	17.33	64425.10	0.2571	0.0100
54	17.66	64420.00	0.2575	0.0096
55	18.00	64418.00	0.2577	0.0092
56	18.33	64422.10	0.2566	0.0090
57	18.66	64419.60	0.2575	0.0087
58	19.00	64419.00	0.2580	0.0084
59	19.33	64407.70	0.2584	0.0081
60	19.66	64397.50	0.2602	0.0080
61	20.00	64399.70	0.2610	0.0078
62	20.33	64402.70	0.2609	0.0075
63	20.66	64409.90	0.2591	0.0075
64	21.00	64399.80	0.2588	0.0072
65	21.33	64401.90	0.2578	0.0071
66	21.66	64401.20	0.2567	0.0069
67	22.00	64395.50	0.2560	0.0068
68	22.33	64395.00	0.2553	0.0066
69	22.66	64393.30	0.2545	0.0065
70	23.00	64386.50	0.2544	0.0063
71	23.33	64388.10	0.2538	0.0061
72	23.66	64383.10	0.2537	0.0059
73	24.00	64387.50	0.2526	0.0059
74	24.66	64383.70	0.2510	0.0059
75	25.00	64386.70	0.2494	0.0059

COOPER NUCLEAR STATION    NOV 1976  
 IFCLRT SUMMARY, MASS PLOT ANALYSES--REF VESS METHOD

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SUMMARY OF 24 HOUR IFCLRT TEST

FROM    11/ 6/ 76   AT   1020 HOURS  
 TO      11/ 7/ 76   AT   1020 HOURS

DATA SET NO.	HRS. FROM T=0	CONT. MASS LBS.	INTER. LEAK RATE	95% CONFIDENCE ERROR
1	0.00	64545.00	0.0000	0.0000
2	1.00	64545.50	0.0000	0.0000
3	2.00	64536.20	0.1636	2.4382
4	3.00	64528.20	0.2220	0.3687
5	4.00	64513.40	0.2993	0.1863
6	5.00	64502.30	0.3376	0.1050
7	6.00	64494.60	0.3458	0.0649
8	7.00	64492.00	0.3285	0.0490
9	8.00	64480.90	0.3260	0.0365
10	9.00	64485.40	0.2978	0.0413
11	10.00	64478.10	0.2812	0.0375
12	11.00	64479.00	0.2596	0.0381
13	12.00	64458.50	0.2631	0.0322
14	13.00	64459.60	0.2566	0.0282
15	14.00	64446.60	0.2580	0.0243
16	15.00	64438.20	0.2602	0.0213
17	16.00	64432.90	0.2604	0.0187
18	17.00	64433.80	0.2554	0.0173
19	18.00	64420.10	0.2559	0.0155
20	19.00	64412.20	0.2568	0.0139
21	20.00	64402.00	0.2590	0.0127
22	21.00	64402.20	0.2575	0.0117
23	22.00	64399.00	0.2549	0.0109
24	23.00	64389.10	0.2540	0.0100
25	24.00	64390.20	0.2506	0.0098

COOPER NUCLEAR STATION NOV 1976  
 IPCLRT SUMMARY, MASS PLOT ANALYSES--REF VESS METHOD

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IPCLRT VERIFICATION TEST WITH SUPERIMPOSED LEAK OF .36 WT%/24HRS

FROM 11/ 7/ 76 AT 1220 HOURS  
 TO 11/ 7/ 76 AT 1640 HOURS

DATA SET NO.	HRS. FROM T=0	CONT. MASS LBS.	INTER. LEAK RATE	95% CONFIDENCE ERROR
1	0.00	64366.60	0.0000	0.0000
2	0.33	64360.10	0.0000	0.0000
3	0.67	64363.20	0.1902	7.2058
4	1.00	64354.50	0.3714	1.1114
5	1.33	64357.00	0.2595	0.3986
6	1.67	64352.10	0.2816	0.1950
7	2.00	64348.50	0.3024	0.1217
8	2.33	64333.10	0.4295	0.1673
9	2.67	64326.90	0.5064	0.1500
10	3.00	64326.60	0.5198	0.1176
11	3.33	64326.30	0.5049	0.0958
12	3.67	64323.30	0.4899	0.0803
13	4.00	64325.10	0.4580	0.0749
14	4.33	64317.40	0.4495	0.0643

COOPER NUCLEAR STATION NOV 1976  
IFCLRT SUMMARY\*MASS FLOT ANALYSES--REF VESS METHOD

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RESULTS OF POST TEST WITH MODIFIED VALVE ALIGNMENT

FROM 11/ 7/ 76 AT 1740 HOURS  
TO 11/ 7/ 76 AT 2320 HOURS

DATA SET NO.	HRS. FROM T=0	CONT. MASS LBS.	INTER. LEAK RATE	95% CONFIDENCE ERROR
1	0.00	64319.80	0.0000	0.0000
2	0.33	64318.60	0.0000	0.0000
3	0.67	64322.20	-0.1343	3.5891
4	1.00	64318.70	-0.0034	0.6553
5	1.33	64318.00	0.0392	0.2191
6	1.67	64324.60	-0.0598	0.1745
7	2.00	64311.70	0.0660	0.1876
8	2.33	64301.70	0.2062	0.2056
9	2.67	64297.10	0.2922	0.1794
10	3.00	64282.60	0.4086	0.1867
11	3.33	64273.90	0.4978	0.1767
12	3.67	64269.10	0.5508	0.1554
13	4.00	64268.60	0.5665	0.1313
14	4.33	64265.00	0.5717	0.1119
15	4.67	64267.30	0.5543	0.0980
16	5.00	64270.50	0.5226	0.0912
17	5.33	64271.40	0.4886	0.0872
18	5.67	64275.20	0.4487	0.0870

COOPER NUCLEAR STATION NOV 1976  
 IPCLRT SUMMARY MASS PLOT ANALYSES--ABSOLUTE METHOD  
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REFERENCE CHAMBER AFTER TEST

FROM 11/ 8/ 76 AT 1900 HOURS  
 TO 11/ 11/ 76 AT 1600 HOURS

DATA SET NO.	HRS. FROM T=0	CONT. MASS LBS.	INTER. LEAK RATE	95% CONFIDENCE ERROR
1	0.00	0.1561	0.0000	0.0000
2	21.00	0.1560	0.0000	0.0000
3	38.00	0.1561	-0.0131	0.7177
4	62.00	0.1561	-0.0157	0.0831
5	69.00	0.1561	-0.0162	0.0283

SECTION

8

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 1  
11/ 8/ 76 1900 HOURS  
LAST INTERVAL HOURS 0.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	69.61	0.00	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 73.0460 ( 0.0000) PSIA  
 AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
 AVG.CONT.TEMP= 69.610 ( 0.0000) DEG.F  
 REF VESSEL TOTAL MASS (DRY AIR)= 0.1561 POUNDS

NO LEAKAGE RATE VALUE CALCULATED FOR DATA SET#1

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 2  
11/ 9/ 76 1600 HOURS  
LAST INTERVAL HOURS 21.00 HOURS FROM T=0 21.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	67.77	-1.84	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.027
9	0.00	0.00	0.075
10	0.00	0.00	0.075
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.030
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.025
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 72.7710 ( -0.2750) PSIA  
AVG. DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG. CONT. TEMP= 67.770 ( -1.8400) DEG.F

INTERVAL 1 LEAK RATE= 0.033 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.033 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.000 WT%/24HRS  
TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1560 POUNDS  
LEAK RATE NOT CALC. (<3 DATA SETS)

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 3  
11/ 10/ 76 0900 HOURS  
LAST INTERVAL HOURS 17.00 HOURS FROM T=0 38.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	69.79	2.02	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 73.0890 ( 0.3180) PSIA  
AVG. DEWPOINT PRESS = 0.000 ( 0.0000) IN H2O  
AVG. CONT. TEMP = 69.790 ( 2.0200) DEG.F

INTERVAL 2 LEAK RATE = -0.076 WT%/24HRS  
TOTAL TIME LEAK RATE = -0.016 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR = +/- 0.155 WT%/24HRS  
TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR) = 0.1561 POUNDS  
LEAK RATE = -0.013 WT%/24HRS  
95% CONFIDENCE LEVEL = +/- 0.718 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER

4

11/ 11/ 76

0900 HOURS

LAST INTERVAL, HOURS

24.00

HOURS FROM T=0

62.00

TEMPERATURE

DEGREES F

CHANGE DEG.F

WT.FACTOR

1	65.83	-3.96	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118

DEWPOINT

IN. WATER

CHANGE 1NCH.

WT.FACTOR

1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS =

72.5460

( -0.5430)

PSIA

AVG. DEWPOINT PRESS=

0.000

( 0.0000)

IN H2O

AVG. CONT. TEMP=

65.830

( -3.9600)

DEG.F

INTERVAL 3 LEAK RATE=

-0.005

WT%/24HRS

TOTAL TIME LEAK RATE=

-0.012

WT%/24HRS

POINT TO POINT STATISTICAL ERROR= +/- 0.111

WT%/24HRS

TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)=

0.1561

POUNDS

LEAK RATE=

-0.016

WT%/24HRS

95% CONFIDENCE LEVEL=

+/- 0.083

WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 5  
11/ 11/ 76 1600 HOURS  
LAST INTERVAL HOURS 7.00 HOURS FROM T=0 69.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	66.20	0.37	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 72.6010 ( 0.0550) PSIA  
AVG. DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG. CONT. TEMP= 66.200 ( 0.3700) DEG.F

INTERVAL 4 LEAK RATE= -0.019 WT%/24HRS  
TOTAL TIME LEAK RATE= -0.012 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.091 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= -0.005 - 0.0019 X HRS

LEAK RATE TREND SINCE T=0  
LEAK RATE= 0.004 - 0.0004 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.01 < SLOPE < 0.00  
-0.35 < LEAK RATE < 0.30

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1561 POUNDS  
LEAK RATE= -0.016 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.028 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 1  
10/ 31/ 76 1600 HOURS  
LAST INTERVAL HOURS 0.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	70.46	0.00	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.7800 ( 0.0000) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 70.460 ( 0.0000) DEG.F  
REF VESSEL TOTAL MASS (DRY AIR)= 0.1595 POUNDS

NO LEAKAGE RATE VALUE CALCULATED FOR DATA SET#1

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 2  
11/ 1/ 76 0800 HOURS  
LAST INTERVAL HOURS 16.00 HOURS FROM T=0 16.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	69.94	-0.52	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.6740 ( -0.1060) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 69.940 ( -0.5200) DEG.F

INTERVAL 1 LEAK RATE= 0.066 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.066 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR +/- 0.000 WT%/24HRS  
TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1594 POUNDS  
LEAK RATE NOT CALC.(<3 DATA SETS)

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 3

11/ 1/ 76 1000 HOURS  
LAST INTERVAL, HOURS 2.00

HOURS FROM T=0 18.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	70.62	0.68	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.7570 ( 0.0830) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 70.620 ( 0.6800) DEG.F

INTERVAL 2 LEAK RATE= 0.207 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.081 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.253 WT%/24HRS  
TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1594 POUNDS  
LEAK RATE= 0.076 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.319 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 4  
11/ 1/ 76 1200 HOURS  
LAST INTERVAL HOURS 2.00 HOURS FROM T=0 20.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	70.99	0.37	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.8250 ( 0.0680) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 70.990 ( 0.3700) DEG.F

INTERVAL 3 LEAK RATE= -0.254 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.048 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.483 WT%/24HRS  
TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1594 POUNDS  
LEAK RATE= 0.062 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.126 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 5  
11/ 1/ 76 1400 HOURS  
LAST INTERVAL, HOURS 2.00 HOURS FROM T=0 22.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	71.48	0.49	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9110 ( 0.0860) PSIA  
AVG. DEWPOINT PRESS = 0.000 ( 0.0000) IN H2O  
AVG. CONT. TEMP = 71.480 ( 0.4900) DEG.F

INTERVAL 4 LEAK RATE = -0.271 WT%/24HRS  
TOTAL TIME LEAK RATE = 0.019 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR = +/- 0.511 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE = 0.133 - 0.1194 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE  
-0.53 < SLOPE < 0.29

LEAK RATE TREND SINCE T=0  
LEAK RATE = 1.334 - 0.0735 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.20 < SLOPE < 0.06  
-3.15 < LEAK RATE < 2.59

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR) = 0.1595 POUNDS  
LEAK RATE = 0.041 WT%/24HRS  
95% CONFIDENCE LEVEL = +/- 0.099 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 5  
11/ 1/ 76 1600 HOURS  
LAST INTERVAL HOURS 2.00 HOURS FROM T=0 24.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	71.80	0.32	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.30	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9600 ( 0.0490) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 71.800 ( 0.3200) DEG.F

INTERVAL 5 LEAK RATE= -0.062 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.012 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.444 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= -0.292 + 0.0480 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE  
-0.16 < SLOPE < 0.26

LEAK RATE TREND SINCE T=0  
LEAK RATE= 0.670 - 0.0366 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.11 < SLOPE < 0.04  
-2.04 < LEAK RATE < 1.62

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1595 POUNDS  
LEAK RATE= 0.025 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.072 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 7  
11/ 1/ 76 1800 HOURS  
LAST INTERVAL HOURS 2.00

HOURS FROM T=0 26.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	72.01	0.21	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9890 ( 0.0290) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 72.010 ( 0.2100) DEG.F

INTERVAL 6 LEAK RATE= 0.010 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.012 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.397 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= -0.248 + 0.0702 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE -0.06 < SLOPE < 0.20

LEAK RATE TREND SINCE T=0  
LEAK RATE= 0.279 - 0.0157 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.07 < SLOPE < 0.03  
-1.43 < LEAK RATE < 1.17

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1595 POUNDS  
LEAK RATE= 0.014 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.056 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 8  
11/ 1/ 76 2000 HOURS  
LAST INTERVAL, HOURS 2.00 HOURS FROM T=0 28.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	72.04	0.03	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9780 ( -0.0110) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 72.040 ( 0.0300) DEG.F

INTERVAL 7 LEAK RATE= 0.244 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.028 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.414 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= -0.089 + 0.0764 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE  
-0.07 < SLOPE < 0.23

LEAK RATE TREND SINCE T=0  
LEAK RATE= -0.140 + 0.0060 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.04 < SLOPE < 0.05  
-1.12 < LEAK RATE < 1.18

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1595 POUNDS  
LEAK RATE= 0.015 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.043 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 9  
11/ 1/ 76 2200 HOURS  
LAST INTERVAL, HOURS 2.00 HOURS FROM T=0 30.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	72.03	-0.01	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9600 ( -0.0100) PSIA  
 AVG. DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
 AVG. CONT. TEMP= 72.030 ( -0.0100) DEG.F

INTERVAL 8 LEAK RATE= 0.137 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.036 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.394 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.067 + 0.0319 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.28 < SLOPE < 0.35

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.222 + 0.0101 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.04  
 -0.81 < LEAK RATE < 0.97

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1594 POUNDS  
 LEAK RATE= 0.019 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.036 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 10  
11/ 1/ 76 2400 HOURS  
LAST INTERVAL, HOURS 2.00 HOURS FROM T=0 32.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	72.00	-0.03	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1/100	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9540 ( -0.0140) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 72.000 ( -0.0300) DEG.F

INTERVAL 9 LEAK RATE= 0.156 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.043 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.380 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= 0.223 - 0.0218 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE  
-0.14 < SLOPE < 0.09

LEAK RATE TREND SINCE T=0  
LEAK RATE= -0.261 + 0.0119 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.01 < SLOPE < 0.03  
-0.60 < LEAK RATE < 0.84

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1594 POUNDS  
LEAK RATE= 0.026 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.032 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 11  
11/ 2/ 76 0200 HOURS  
LAST INTERVAL, HOURS 2.00 HOURS FROM T=0 34.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	71.96	-0.04	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9400 ( -0.0140) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 71.960 ( -0.0400) DEG.F

INTERVAL 10 LEAK RATE= 0.134 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.049 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.364 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= 0.144 - 0.0009 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE  
-0.04 < SLOPE < 0.04

LEAK RATE TREND SINCE T=0  
LEAK RATE= -0.254 + 0.0116 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.01 < SLOPE < 0.03  
-0.46 < LEAK RATE < 0.74

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1594 POUNDS  
LEAK RATE= 0.033 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.029 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 12  
11/ 2/ 76 0800 HOURS  
LAST INTERVAL HOURS 6.00 HOURS FROM T=0 40.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	71.63	-0.33	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9220 ( -0.0180) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 71.630 ( -0.3300) DEG.F

INTERVAL 11 LEAK RATE= -0.152 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.018 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.363 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= 0.134 - 0.0477 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE -0.05 < SLOPE < -0.05

LEAK RATE TREND SINCE T=0  
LEAK RATE= -0.043 + 0.0024 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.01 < SLOPE < 0.02  
-0.54 < LEAK RATE < 0.64

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1595 POUNDS  
LEAK RATE= 0.025 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.025 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 13  
11/ 2/ 76 1000 HOURS  
LAST INTERVAL HOURS 2.00 HOURS FROM T=0 42.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	71.96	0.33	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 74.9540 ( 0.0020) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 71.960 ( 0.3000) DEG.F

INTERVAL 12 LEAK RATE= 0.233 WT%/24HRS  
TOTAL TIME LEAK RATE= 0.029 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.367 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= 0.078 - 0.0015 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE  
-0.31 < SLOPE < 0.31

LEAK RATE TREND SINCE T=0  
LEAK RATE= -0.120 + 0.0057 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.01 < SLOPE < 0.02  
-0.39 < LEAK RATE < 0.62

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1594 POUNDS  
LEAK RATE= 0.024 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.021 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 14  
11/ 2/ 76 1200 HOURS  
LAST INTERVAL, HOURS 2.00 HOURS FROM T=0 44.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	72.33	0.37	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1/1000	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 75.0120 ( 0.0580) PSIA  
AVG. DEWPOINT PRESS = 0.000 ( 0.0000) IN H2O  
AVG. CONT. TEMP = 72.330 ( 0.3700) DEG.F

INTERVAL 13 LEAK RATE = -0.093 WT%/24HRS  
TOTAL TIME LEAK RATE = 0.023 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR = +/- 0.359 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE = -0.034 + 0.0147 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE -0.64 < SLOPE < 0.67

LEAK RATE TREND SINCE T=0  
LEAK RATE = -0.040 + 0.0023 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.01 < SLOPE < 0.01  
-0.39 < LEAK RATE < 0.52

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR) = 0.1594 POUNDS  
LEAK RATE = 0.022 WT%/24HRS  
95% CONFIDENCE LEVEL = +/- 0.019 WT%/24HRS

COOPER NUCLEAR STATION--ABSOLUTE METHOD  
REFERENCE CHAMBER LEAK RATE TEST

DATA SET NUMBER 15  
11/ 2/ 76 1600 HOURS  
LAST INTERVAL HOURS 4.00 HOURS FROM T=0 48.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	72.53	0.20	0.027
2	0.00	0.00	0.027
3	0.00	0.00	0.027
4	0.00	0.00	0.027
5	0.00	0.00	0.027
6	0.00	0.00	0.027
7	0.00	0.00	0.027
8	0.00	0.00	0.075
9	0.00	0.00	0.075
10	0.00	0.00	0.030
11	0.00	0.00	0.030
12	0.00	0.00	0.030
13	0.00	0.00	0.025
14	0.00	0.00	0.025
15	0.00	0.00	0.025
16	0.00	0.00	0.025
17	0.00	0.00	0.118
18	0.00	0.00	0.118
19	0.00	0.00	0.118
20	0.00	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	0.00	0.00	0.150
2	0.00	0.00	0.150
3	0.00	0.00	0.100
4	0.00	0.00	0.150
5	0.00	0.00	0.225
6	0.00	0.00	0.225

REF VESS PRESS = 75.0960 ( 0.0840) PSIA  
AVG.DEWPOINT PRESS= 0.000 ( 0.0000) IN H2O  
AVG.CONT.TEMP= 72.530 ( 0.2000) DEG.F

INTERVAL 14 LEAK RATE= -0.446 WT%/24HRS  
TOTAL TIME LEAK RATE= -0.016 WT%/24HRS  
POINT TO POINT STATISTICAL ERROR= +/- 0.428 WT%/24HRS  
LEAK RATE TREND FOR LAST 4 HOURS  
LEAK RATE= -0.093 - 0.0082 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE -0.09 < SLOPE < -0.09

LEAK RATE TREND SINCE T=0  
LEAK RATE= 0.130 - 0.0045 X HRS  
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
-0.01 < SLOPE < 0.01  
-0.59 < LEAK RATE < 0.42

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

REF VESSEL TOTAL MASS (DRY AIR)= 0.1596 POUNDS  
LEAK RATE= 0.003 WT%/24HRS  
95% CONFIDENCE LEVEL= +/- 0.025 WT%/24HRS

SECTION

9

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 1  
 11 6 76 1020 HOURS  
 LAST INTERVAL HOURS 0.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	76.55	0.00	0.027
2	75.09	0.00	0.027
3	72.00	0.00	0.027
4	71.49	0.00	0.027
5	73.04	0.00	0.027
6	71.14	0.00	0.027
7	71.49	0.00	0.027
8	72.35	0.00	0.075
9	71.65	0.00	0.075
10	74.50	0.00	0.030
11	70.89	0.00	0.030
12	71.92	0.00	0.030
13	75.95	0.00	0.025
14	75.09	0.00	0.025
15	76.12	0.00	0.025
16	75.01	0.00	0.025
17	71.92	0.00	0.118
18	71.57	0.00	0.118
19	71.75	0.00	0.118
20	70.80	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT. FACTOR
1	9.57	0.00	0.150
2	9.75	0.00	0.150
3	9.55	0.00	0.100
4	9.64	0.00	0.150
5	10.05	0.00	0.225
6	9.27	0.00	0.225

REF. VESSEL DP= 0.1438 ( 0.0000) PSID  
 DRYWELL PRESSURE= 73.2320 ( 0.0000) PSIA  
 AVG. DEWPOINT PRESS= 10.948 ( 0.0000) IN H2O  
 AVG. CONT. TEMP= 72.345 ( 0.0000) DEG. F  
 CONTAINMENT TOTAL MASS(DRY AIR)= 64545.00 POUNDS

NO LEAKAGE RATE VALUE CALCULATED FOR DATA SET#1

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 2  
 11/ 5/ 76 1040 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 0.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	76.72	0.17	0.027
2	75.27	0.18	0.027
3	72.09	0.09	0.027
4	71.57	0.08	0.027
5	73.38	0.34	0.027
6	71.32	0.18	0.027
7	71.57	0.08	0.027
8	72.35	0.00	0.075
9	71.75	0.09	0.075
10	74.75	0.25	0.030
11	70.97	0.08	0.030
12	72.09	0.17	0.030
13	76.04	0.09	0.025
14	75.18	0.09	0.025
15	76.21	0.09	0.025
16	75.09	0.08	0.025
17	71.92	0.00	0.118
18	71.66	0.09	0.118
19	71.75	0.00	0.118
20	70.80	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.62	0.05	0.150
2	9.55	-0.20	0.150
3	9.58	0.03	0.100
4	9.62	-0.02	0.150
5	9.84	-0.21	0.225
6	9.07	-0.20	0.225

REF.VESSEL DP=	0.1471	( 0.0033)	PSID
DRYWELL PRESSURE=	73.2410	( 0.0090)	PSIA
AVG.DEWPOINT PRESS=	10.834	( -0.1146)	IN H2O
AVG.CONT.TEMP=	72.417	( 0.0720)	DEG.F

INTERVAL 1 LEAK RATE=	-0.090	WT%/24HRS
TOTAL TIME LEAK RATE=	-0.090	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.000	WT%/24HRS
TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)		

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64545.80	POUNDS
LEAK RATE NOT CALC.(<3 DATA SETS)		

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 3  
 11/ 6/ 76 1100 HOURS  
 LAST INTERVAL, HOURS 0.33 HOURS FROM T=0 0.67

TEMPERATURE	DEGREES F	CHANGE DEG. F	WT. FACTOR
1	76.79	0.07	0.017
2	75.33	0.06	0.017
3	72.24	0.15	0.017
4	71.73	0.16	0.017
5	73.19	-0.19	0.017
6	71.29	-0.03	0.017
7	71.73	0.16	0.017
8	72.50	0.15	0.015
9	71.73	-0.02	0.015
10	74.82	0.07	0.030
11	71.04	0.07	0.030
12	72.16	0.07	0.030
13	76.02	-0.02	0.025
14	75.33	0.15	0.025
15	76.36	0.15	0.025
16	75.25	0.16	0.025
17	71.90	-0.02	0.118
18	71.55	-0.11	0.118
19	71.73	-0.02	0.118
20	70.78	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1 INCH.	WT. FACTOR
1	9.70	0.08	0.150
2	9.96	0.41	0.150
3	9.66	0.08	0.100
4	9.70	0.08	0.150
5	9.81	-0.03	0.225
6	9.18	0.11	0.225

REF. VESSEL DP=	0.1493	(	0.0022)	PSID
DRYWELL PRESSURE=	73.2530	(	0.0120)	PSIA
AVG. DEWPOINT PRESS=	10.945	(	0.1118)	IN H <sub>2</sub> O
AVG. CONT. TEMP=	72.434	(	0.0170)	DEG. F

INTERVAL 2 LEAK RATE=	0.615	WT%/24HRS
TOTAL TIME LEAK RATE=	0.262	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.998	WT%/24HRS
TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)		

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)=	64540.20	POUNDS
LEAK RATE=	0.268	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 4.765	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 4  
 11/ 6/ 76 1120 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	76.87	0.00	0.027
2	75.33	0.00	0.027
3	72.33	0.09	0.027
4	71.73	0.00	0.027
5	73.19	0.00	0.027
6	71.47	0.18	0.027
7	71.81	0.08	0.027
8	72.58	0.08	0.075
9	71.81	0.08	0.075
10	74.99	0.17	0.030
11	71.12	0.08	0.030
12	72.41	0.25	0.030
13	76.27	0.25	0.025
14	75.59	0.26	0.025
15	76.53	0.17	0.025
16	75.42	0.17	0.025
17	71.90	0.00	0.118
18	71.64	0.09	0.118
19	71.73	0.00	0.118
20	70.86	0.08	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.48	-0.22	0.150
2	9.77	-0.19	0.150
3	9.66	0.00	0.100
4	9.66	-0.04	0.150
5	9.61	-0.20	0.225
6	9.25	0.07	0.225

REF.VESSEL DP=	0.1469	( -0.0024)	PSID
DRYWELL PRESSURE=	73.2600	( 0.0070)	PSIA
AVG.DEWPOINT PRESS=	10.849	( -0.0966)	IN H2O
AVG.CONT.TEMP=	72.514	( 0.0800)	DEG.F

INTERVAL 3 LEAK RATE=	-0.590	WT%/24HRS
TOTAL TIME LEAK RATE=	-0.022	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.211	WT%/24HRS
TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)		

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64545.40	POUNDS
LEAK RATE=	0.049	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.999	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET NUMBER 5  
 11/ 6/ 79 1140 HOURS  
 LAST INTERVAL, HOURS 0.33 HOURS FROM T=0 1.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	76.98	0.11	0.027
2	75.44	0.11	0.027
3	72.35	0.02	0.027
4	71.83	0.10	0.027
5	73.47	0.28	0.027
6	71.57	0.10	0.027
7	71.83	0.02	0.027
8	72.69	0.11	0.075
9	72.00	0.19	0.075
10	75.01	0.02	0.030
11	71.23	0.11	0.030
12	72.35	-0.06	0.030
13	76.38	0.11	0.025
14	75.61	0.02	0.025
15	76.55	0.02	0.025
16	75.44	0.02	0.025
17	71.92	0.02	0.118
18	71.66	0.02	0.118
19	71.75	0.02	0.118
20	70.89	0.03	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR
1	9.44	-0.04	0.150
2	9.70	-0.07	0.150
3	9.44	-0.22	0.100
4	9.73	0.07	0.150
5	9.74	0.13	0.225
6	9.16	-0.09	0.225

REF. VESSEL DP=	0.1550	( 0.0081)	PSID
DRYWELL PRESSURE=	73.2570	( -0.0030)	PSIA
AVG. DEWPOINT PRESS=	10.830	( -0.0191)	IN H2O
AVG. CONT. TEMP=	72.573	( 0.0590)	DEG. F

INTERVAL 4 LEAK RATE=	0.726	WT%/24HRS
TOTAL TIME LEAK RATE=	0.165	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.240	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	-0.022 +	0.3734 % HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-2.92 <	SLOPE < 3.69

LEAK RATE TREND SINCE T=0		
LEAK RATE=	-0.146 +	0.3734 % HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-2.92 <	SLOPE < 3.69
	-4.04 <	LEAK RATE < 4.74

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)=	64538.80	POUNDS
LEAK RATE=	0.143	WT%/24HRS
95% CONFIDENCE LIMIT=	+/- 0.353	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 6  
 11/ 6/ 76 1200 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.08	0.10	0.027
2	75.54	0.10	0.027
3	72.46	0.11	0.027
4	72.03	0.20	0.027
5	73.40	-0.07	0.027
6	71.60	0.03	0.027
7	72.03	0.20	0.027
8	72.80	0.11	0.075
9	72.11	0.11	0.075
10	75.20	0.19	0.030
11	71.34	0.11	0.030
12	72.46	0.11	0.030
13	76.49	0.11	0.025
14	75.72	0.11	0.025
15	76.66	0.11	0.025
16	75.54	0.10	0.025
17	72.03	0.11	0.118
18	71.60	0.02	0.118
19	71.85	0.10	0.118
20	70.91	0.02	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.77	0.33	0.150
2	9.89	0.19	0.150
3	9.73	0.29	0.100
4	9.75	0.02	0.150
5	10.07	0.33	0.225
6	9.11	-0.05	0.225

REF.VESSEL DP=	0.1561	( 0.0011)	PSID
DRYWELL PRESSURE=	73.2640	( 0.0070)	PSIA
AVG.DEWPOINT PRESS=	11.003	( 0.1732)	IN H <sub>2</sub> O
AVG.CONT.TEMP=	72.660	( 0.0070)	DEG.F

INTERVAL 5 LEAK RATE=	0.718	WT%/24HRS
TOTAL TIME LEAK RATE=	0.276	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.182	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	-0.070 +	0.5186 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.89 <	SLOPE < 1.93
LEAK RATE TREND SINCE T=0		
LEAK RATE=	-0.243 +	0.5186 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.89 <	SLOPE < 1.93
	-1.73 <	LEAK RATE < 2.33

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64532.30	POUNDS
LEAK RATE=	0.253	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.230	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 7  
 11/ 6/ 76 1220 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 2.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.23	0.15	0.021
2	75.61	0.07	0.021
3	72.52	0.06	0.021
4	72.09	0.06	0.021
5	73.55	0.15	0.021
6	71.66	0.06	0.021
7	72.00	-0.03	0.021
8	72.86	0.06	0.075
9	72.09	-0.02	0.075
10	75.35	0.15	0.030
11	71.40	0.06	0.030
12	72.61	0.15	0.030
13	76.55	0.06	0.025
14	75.78	0.06	0.025
15	76.72	0.06	0.025
16	75.61	0.07	0.025
17	72.00	-0.03	0.118
18	71.66	-0.02	0.118
19	71.83	-0.02	0.118
20	70.89	-0.02	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.72	-0.05	0.150
2	9.79	-0.10	0.150
3	9.77	0.04	0.100
4	9.77	0.02	0.150
5	9.62	-0.45	0.225
6	9.07	-0.04	0.225

REF.VESSEL DP= 0.1565 ( 0.0004) PSID  
 DRYWELL PRESSURE= 73.2730 ( 0.0090) PSIA  
 AVG.DEWPOINT PRESS= 10.877 ( -0.1256) IN H2O  
 AVG.CONT.TEMP= 72.684 ( 0.0240) DEG.F

INTERVAL 6 LEAK RATE= -0.411 WTX/24HRS  
 TOTAL TIME LEAK RATE= 0.161 WTX/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.197 WTX/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.160 + 0.0018 N -PS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -1.02 < SLOPE < 1.02

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.159 + 0.0018 N -PS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -1.02 < SLOPE 1.02  
 -1.08 < LEAK RATE 0.20

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64535.90 FOUNDED  
 LEAK RATE= 0.222 WT. 24-HRS  
 95% CONFIDENCE LEVEL= +/- 0.146 WT. 24-HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 8  
 11/ 5/ 76 1240 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 2.23

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.23	0.00	0.037
2	75.78	0.17	0.037
3	72.61	0.09	0.037
4	72.09	0.00	0.037
5	73.64	0.09	0.037
6	71.75	0.09	0.037
7	72.09	0.09	0.037
8	72.95	0.09	0.075
9	72.18	0.09	0.075
10	75.27	-0.08	0.030
11	71.49	0.09	0.030
12	72.61	0.00	0.030
13	76.72	0.17	0.025
14	75.87	0.09	0.025
15	76.81	0.09	0.025
16	75.78	0.17	0.025
17	72.00	0.00	0.118
18	71.66	0.00	0.118
19	71.83	0.00	0.118
20	70.89	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.89	0.17	0.150
2	9.95	0.16	0.150
3	9.62	-0.15	0.100
4	9.79	0.02	0.150
5	9.75	0.13	0.225
6	9.23	0.16	0.225

REF.VESSEL DP= 0.1630 ( 0.0065) PSID  
 DRYWELL PRESSURE= 73.2700 ( -0.0030) PSIA  
 AVG.DEWPOINT PRESS= 10.980 ( 0.1027) IN H2O  
 AVG.CONT.TEMP= 72.725 ( 0.0410) DEG.F

INTERVAL 7 LEAK RATE= 1.005 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.282 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.265 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.010 + 0.2722 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.46 < SLOPE < 1.01

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.081 + 0.2722 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.46 < SLOPE < 1.01  
 -1.16 < LEAK RATE < 2.27

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64526.80 POUNDS  
 LEAK RATE= 0.275 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.117 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 9

11/ 6/ 76 1300 HOURS

LAST INTERVAL HOURS 0.33 HOURS FROM T=0 2.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.23	0.00	0.037
2	75.78	0.00	0.027
3	72.61	0.00	0.027
4	72.09	0.00	0.027
5	73.55	-0.09	0.037
6	71.75	0.00	0.027
7	72.00	-0.09	0.027
8	72.95	0.00	0.075
9	72.26	0.08	0.075
10	75.35	0.08	0.030
11	71.57	0.08	0.030
12	72.69	0.08	0.030
13	76.64	-0.08	0.025
14	75.78	-0.09	0.025
15	76.81	0.00	0.025
16	75.78	0.00	0.025
17	72.00	0.00	0.118
18	71.75	0.09	0.118
19	71.83	0.00	0.118
20	70.89	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	9.72	-0.17	0.150
2	9.66	-0.29	0.150
3	9.59	-0.03	0.100
4	9.80	0.01	0.150
5	9.25	-0.50	0.225
6	9.13	-0.10	0.225

REF.VESSEL DP= 0.1669 ( 0.0039) PSID  
 DRYWELL PRESSURE= 73.2690 ( -0.0010) PSIA  
 AVG.DEWPOINT PRESS= 10.775 ( -0.2055) IN H2O  
 AVG.CONT.TEMP= 72.740 ( 0.0150) DEG.F

INTERVAL 8 LEAK RATE= -0.350 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.203 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.254 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.175 + 0.0235 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.57 < SLOPE < 0.63

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.167 + 0.0235 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.57 < SLOPE < 0.63  
 -1.35 < LEAK RATE < 1.01

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64529.90 POUNDS  
 LEAK RATE= 0.259 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.089 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 10  
11/ 6/ 76 1320 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.32	0.09	0.037
2	75.78	0.00	0.037
3	72.69	0.08	0.037
4	72.26	0.17	0.037
5	73.72	0.17	0.037
6	71.83	0.08	0.037
7	72.18	0.18	0.037
8	73.04	0.09	0.075
9	72.26	0.00	0.075
10	75.44	0.09	0.030
11	71.66	0.09	0.030
12	72.86	0.17	0.030
13	76.72	0.08	0.025
14	76.04	0.26	0.025
15	76.89	0.08	0.025
16	75.87	0.09	0.025
17	72.00	0.00	0.118
18	71.75	0.00	0.118
19	71.83	0.00	0.118
20	70.97	0.08	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.69	-0.03	0.150
2	9.80	0.14	0.150
3	9.69	0.10	0.100
4	9.72	-0.08	0.150
5	9.73	0.48	0.225
6	9.13	0.00	0.225

REF. VESSEL DP= 0.1649 ( -0.0020) PSID  
 DRYWELL PRESSURE= 73.2810 ( 0.0120) PSIA  
 AVG. DEWPOINT PRESS= 10.897 ( 0.1228) IN H2O  
 AVG. CONT. TEMP= 72.800 ( 0.0600) DEG.F

INTERVAL 9 LEAK RATE= 0.235 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.206 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.173 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.176 + 0.0228 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.42 < SLOPE < 0.47

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.168 + 0.0228 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.42 < SLOPE < 0.47  
 -1.11 < LEAK RATE < 1.55

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64527.70 POUNDS  
 LEAK RATE= 0.249 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.070 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 11  
 11/ 6/ 76 1340 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.32	0.00	0.027
2	75.78	0.00	0.027
3	72.69	0.00	0.027
4	72.26	0.00	0.027
5	73.72	0.00	0.027
6	71.92	0.09	0.027
7	72.26	0.00	0.027
8	73.04	0.00	0.075
9	72.35	0.09	0.075
10	75.44	0.00	0.030
11	71.66	0.00	0.030
12	72.69	-0.17	0.030
13	76.81	0.09	0.025
14	76.04	0.00	0.025
15	76.98	0.09	0.025
16	75.87	0.00	0.025
17	72.09	0.09	0.118
18	71.75	0.00	0.118
19	71.92	0.09	0.118
20	70.97	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	9.84	0.15	0.150
2	9.61	-0.19	0.150
3	9.58	-0.11	0.100
4	9.80	0.08	0.150
5	9.38	-0.35	0.225
6	9.31	0.18	0.225

REF.VESSEL DP=	0.1720	( 0.0071)	PSID
DRYWELL PRESSURE=	73.2700	( -0.0110)	PSIA
AVG.DEWPOINT PRESS=	10.854	( -0.0435)	IN H2O
AVG.CONT.TEMP=	72.831	( 0.0310)	DEG.F

INTERVAL 10 LEAK RATE=	0.543	WT%/24HRS
TOTAL TIME LEAK RATE=	0.240	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.126	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.132 +	0.0717 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.28 <	SLOPE < 0.43

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.109 +	0.0717 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.28 <	SLOPE < 0.7
	-0.84 <	LEAK RATE < 1.13

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64522.80	POUNDS
LEAK RATE=	0.258	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.057	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 12  
 11/ 6/ 76 1400 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	77.51	0.00	0.027
2	75.97	0.00	0.027
3	72.89	0.00	0.027
4	72.37	0.00	0.027
5	73.74	0.00	0.027
6	72.03	0.00	0.027
7	72.37	0.00	0.027
8	73.14	0.00	0.075
9	72.37	0.00	0.075
10	75.54	0.00	0.030
11	71.77	0.00	0.030
12	72.89	0.00	0.030
13	76.83	0.00	0.025
14	76.06	-0.80	0.025
15	77.08	0.00	0.025
16	75.97	0.00	0.025
17	72.11	0.00	0.118
18	71.77	0.00	0.118
19	71.94	0.00	0.118
20	70.99	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT. FACTOR
1	9.84	0.00	0.150
2	9.86	0.00	0.150
3	9.76	0.00	0.100
4	9.87	0.00	0.150
5	9.65	0.00	0.225
6	9.29	0.00	0.225

REF. VESSEL DP= 0.1750 ( 0.0030) PSID  
 DRYWELL PRESSURE= 73.2800 ( 0.0100) PSIA  
 AVG. DEWPOINT PRESS= 10.976 ( 0.1225) IN H2O  
 AVG. CONT. TEMP= 72.893 ( 0.0620) DEG.F

INTERVAL 11 LEAK RATE= 0.727 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.284 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.108 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.084 + 0.1202 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.17 < SLOPE < 0.41

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.044 + 0.1202 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.17 < SLOPE < 0.41  
 -0.58 < LEAK RATE < 1.55

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64516.20 POUNDS  
 LEAK RATE= 0.281 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.053 WT%/24HRS

COOPER MODEL 100 SIMILION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 13  
 11/ 5/ 76 1420 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 4.00

TEMPERATURE	DEGREE: F	CHANGE DEG.F	WT.FACTOR
1	77.58	0.07	0.027
2	75.95	-0.02	0.027
3	72.95	0.06	0.027
4	72.43	0.06	0.027
5	73.89	0.15	0.027
6	72.89	0.06	0.027
7	72.52	0.15	0.027
8	73.29	0.15	0.027
9	72.52	0.15	0.075
10	75.78	0.24	0.075
11	71.83	0.06	0.030
12	73.04	0.15	0.030
13	76.89	0.06	0.030
14	76.12	0.06	0.025
15	77.15	0.06	0.025
16	76.04	0.07	0.025
17	72.09	0.07	0.025
18	71.75	-0.02	0.118
19	71.92	-0.02	0.118
20	70.97	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	9.72	-0.12	0.150
2	10.13	0.27	0.150
3	9.84	0.08	0.100
4	9.84	-0.03	0.150
5	9.77	0.12	0.225
6	9.09	-0.20	0.225

REF.VESSEL DP= 0.1786 ( 0.0036) PSID  
 DRYWELL PRESSURE= 73.2900 ( 0.0100) PSIA  
 AVG.DEWPOINT PRESS= 10.985 ( 0.0082) IN H2O  
 AVG.CONT.TEMP= 72.941 ( 0.0480) DEG.F

INTERVAL 12 LEAK RATE= 0.380 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.292 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.058 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.102 + 0.1035 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.14 < SLOPE < 0.34

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.068 + 0.1035 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.14 < SLOPE < 0.34  
 -0.48 < LEAK RATE < 1.45

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64512.70 POUNDS  
 LEAK RATE= 0.299 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.048 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 14  
 11/ 6/ 76 1440 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 4.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.75	-0.08	0.037
2	76.21	-0.17	0.037
3	73.12	0.00	0.037
4	72.52	-0.09	0.037
5	74.07	-0.08	0.037
6	72.26	-0.09	0.037
7	72.61	-0.08	0.037
8	73.38	-0.09	0.075
9	72.61	-0.08	0.075
10	75.95	0.17	0.030
11	72.00	-0.09	0.030
12	73.21	0.17	0.030
13	77.06	-0.17	0.025
14	76.38	-0.08	0.025
15	77.32	-0.09	0.025
16	76.21	-0.17	0.025
17	72.09	0.00	0.118
18	71.75	0.00	0.118
19	71.92	0.00	0.118
20	70.97	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.95	0.00	0.150
2	10.08	0.26	0.150
3	9.76	-0.10	0.100
4	9.93	0.05	0.150
5	9.76	-0.13	0.225
6	9.11	-0.13	0.225

REF. VESSEL DP= 0.1779 ( -0.0007) PSID  
 DRYWELL PRESSURE= 73.3040 ( 0.0140) PSIA  
 AVG. DEWPOINT PRESS= 11.020 ( 0.0350) IN H2O  
 AVG. CONT. TEMP= 73.019 ( 0.0780) DEG.F

INTERVAL 13 LEAK RATE= 0.047 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.273 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.022 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.159 + 0.0571 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.15 < SLOPE < 0.36  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.140 + 0.0571 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.15 < SLOPE < 0.36  
 -0.51 < LEAK RATE < 1.19

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64512.20 POUNDS  
 LEAK RATE= 0.303 WT%/24-HRS  
 95% CONFIDENCE LEVEL= +/- 0.041 WT%/24-HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET NUMBER 15  
11/ 5/ 76 1500 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 4.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.83	0.08	0.0217
2	76.38	0.17	0.0237
3	73.12	0.00	0.0237
4	72.61	0.09	0.0237
5	74.15	0.08	0.0237
6	72.35	0.09	0.0237
7	72.69	0.08	0.0237
8	73.47	0.09	0.025
9	72.69	0.08	0.025
10	75.78	-0.17	0.030
11	72.09	0.09	0.030
12	73.04	-0.17	0.030
13	77.23	0.17	0.025
14	76.46	0.08	0.025
15	77.41	0.09	0.025
16	76.38	0.17	0.025
17	72.09	0.00	0.118
18	71.75	0.00	0.118
19	71.92	0.00	0.118
20	70.97	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.95	0.00	0.150
2	9.82	-0.26	0.150
3	9.86	0.10	0.100
4	9.88	-0.05	0.150
5	9.89	0.13	0.225
6	9.24	0.13	0.225

REF. VESSEL DP= 0.1855 ( 0.0076) PSID  
 DRYWELL PRESSURE= 73.2890 ( -0.0150) PSIA  
 AVG. DEWPOINT PRESS= 11.041 ( 0.0217) IN H2O  
 AVG. CONT. TEMP= 73.053 ( 0.0340) DEG.F

INTERVAL 14 LEAK RATE= 0.824 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.313 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.025 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.111 + 0.0929 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.09 < SLOPE < 0.27

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.080 + 0.0929 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.09 < SLOPE < 0.27  
 -0.33 < LEAK RATE < 1.36

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64504.80 POUNDS  
 LEAK RATE= 0.319 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.039 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1978

DATA SET NUMBER 15  
 11/ 6/ 76 1520 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 5.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.77	-0.06	0.017
2	76.40	0.02	0.017
3	73.23	0.11	0.017
4	72.71	0.10	0.017
5	74.26	0.11	0.027
6	72.37	0.02	0.017
7	72.71	0.02	0.017
8	73.57	0.10	0.075
9	72.80	0.11	0.075
10	75.80	0.02	0.030
11	72.11	0.02	0.030
12	73.14	0.10	0.030
13	77.08	-0.15	0.025
14	76.40	-0.06	0.025
15	77.26	-0.15	0.025
16	76.23	-0.15	0.025
17	72.11	0.02	0.118
18	71.77	0.02	0.118
19	72.03	0.11	0.118
20	71.08	0.11	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.80	-0.15	0.150
2	9.98	0.16	0.150
3	9.95	0.09	0.100
4	9.95	0.07	0.150
5	9.78	-0.11	0.225
6	9.08	-0.16	0.225

REF. VESSEL DP=	0.1906	( 0.0051)	PSID
DRYWELL PRESSURE=	73.2880	( -0.0010)	PSIA
AVG. DEWPOINT PRESS=	11.001	( -0.0398)	IN H2O
AVG. CONT. TEMP=	73.099	( 0.0460)	DEG.F

INTERVAL 15 LEAK RATE=	0.357	WT%/24HRS
TOTAL TIME LEAK RATE=	0.316	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.988	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.222 +	0.0568 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.12 <	SLOPE < 0.24

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.106 +	0.0788 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.08 <	SLOPE < 0.24
	-0.28 <	LEAK RATE < 1.23

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)=	64501.60	POUNDS
LEAK RATE=	0.330	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.036	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 17  
 11/ 5/ 76 1540 HOURS  
 LAST INTERVAL, HOURS 0.33 HOURS FROM T=0 5.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	77.85	0.08	0.027
2	76.32	-0.03	0.027
3	73.32	0.09	0.027
4	72.80	0.09	0.027
5	74.17	-0.09	0.027
6	72.46	0.09	0.027
7	72.80	0.09	0.027
8	73.66	0.09	0.027
9	72.89	0.09	0.075
10	75.80	0.00	0.075
11	72.11	0.00	0.030
12	73.23	0.09	0.030
13	77.00	-0.08	0.030
14	76.32	-0.08	0.025
15	77.26	0.00	0.025
16	76.23	0.00	0.025
17	72.20	0.09	0.025
18	71.85	0.08	0.118
19	72.03	0.00	0.118
20	71.08	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1 INCH.	WT. FACTOR
1	9.87	0.07	0.150
2	10.07	0.09	0.150
3	9.93	-0.02	0.100
4	9.92	-0.03	0.150
5	9.66	-0.12	0.225
6	9.20	0.12	0.225

REF. VESSEL DP= 0.1942 ( 0.0036) PSID  
 DRYWELL PRESSURE= 73.2910 ( 0.0030) PSIA  
 AVG. DEWPOINT PRESS= 11.019 ( 0.0176) IN H2O  
 AVG. CONT. TEMP= 73.139 ( 0.0400) DEG.F

INTERVAL 16 LEAK RATE= 0.414 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.322 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.956 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.136 + 0.0895 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.08 < SLOPE < 0.26

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.120 + 0.0714 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.07 < SLOPE < 0.21  
 -0.23 < LEAK RATE < 1.23

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64497.80 POUNDS  
 LEAK RATE= 0.340 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.033 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 18  
 11/ 6/ 76 1600 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 5.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	73.02	0.17	0.027
2	76.49	0.17	0.027
3	73.40	0.08	0.017
4	72.89	0.09	0.017
5	74.43	0.26	0.017
6	72.46	0.00	0.027
7	72.80	0.00	0.027
8	73.74	0.08	0.075
9	72.97	0.08	0.075
10	75.97	0.17	0.030
11	72.20	0.09	0.030
12	73.32	0.09	0.030
13	77.08	0.08	0.025
14	76.32	0.00	0.025
15	77.26	0.00	0.025
16	76.32	0.09	0.025
17	72.20	0.00	0.118
18	71.85	0.00	0.118
19	72.03	0.00	0.118
20	71.08	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.84	-0.03	0.150
2	10.22	0.15	0.150
3	9.98	0.05	0.100
4	9.97	0.05	0.150
5	9.77	0.11	0.225
6	9.23	0.03	0.225

REF. VESSEL DP= 0.1934 ( -0.0008) PSID  
 DRYWELL PRESSURE= 73.3000 ( 0.0090) PSIA  
 AVG. DEWPOINT PRESS= 11.081 ( 0.0622) IN H2O  
 AVG. CONT. TEMP= 73.187 ( 0.0480) DEG.F

INTERVAL 17 LEAK RATE= 0.138 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.311 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.930 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.421 - 0.0181 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.17 < SLOPE < 0.14

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.165 + 0.0487 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.07 < SLOPE < 0.17  
 -0.25 < LEAK RATE < 1.13

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64496.50 POUNDS  
 LEAK RATE= 0.343 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.029 WT%/24HRS

COOPER NUCLEAR STATION -REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 19  
11/ 6/ 76 1620 HOURS  
LAST INTERVAL HOURS 0.33

HOURS FROM T=0 6.00

TEMPERATURE	DEGREE: F	CHANGE DEG.F	WT.FACTOR
1	73.11	0.09	0.027
2	75.49	0.00	0.027
3	72.40	0.00	0.027
4	72.97	0.08	0.027
5	74.43	0.00	0.027
6	72.54	0.08	0.027
7	72.97	0.17	0.027
8	73.74	0.00	0.075
9	73.06	0.09	0.075
10	76.23	0.26	0.030
11	72.37	0.17	0.030
12	73.49	0.17	0.030
13	77.26	0.18	0.025
14	76.49	0.17	0.025
15	77.43	0.17	0.025
16	76.40	0.08	0.025
17	72.20	0.00	0.118
18	71.85	0.00	0.118
19	72.03	0.00	0.118
20	71.08	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	9.89	0.05	0.150
2	10.14	-0.08	0.150
3	9.98	0.00	0.100
4	10.02	0.05	0.150
5	9.72	-0.05	0.225
6	9.33	0.10	0.225

REF.VESSEL DP=	0.1960	( 0.0026)	PSID
DRYWELL PRESSURE=	73.3090	( 0.0090)	PSIA
AVG.DEWPOINT PRESS=	11.096	( 0.0144)	IN H2O
AVG.CONT.TEMP=	73.238	( 0.0510)	DEG.F

INTERVAL 18 LEAK RATE=	0.303	WT%/24HRS
TOTAL TIME LEAK RATE=	0.310	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.902	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.332 +	0.0091 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.14 <	SLOPE < 0.16

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.182 +	0.0405 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.07 <	SLOPE < 0.1
	-0.23 <	LEAK RATE < 1.

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64493.70	POUNDS
LEAK RATE=	0.345	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.026	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 20  
 11/ 6/ 76 1640 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 6.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	78.05	-0.06	0.027
2	76.68	0.19	0.027
3	73.51	0.11	0.027
4	72.91	-0.06	0.027
5	74.45	0.02	0.027
6	72.65	0.11	0.027
7	72.99	0.02	0.027
8	73.85	0.11	0.075
9	73.08	0.02	0.075
10	76.17	-0.06	0.030
11	72.39	0.02	0.030
12	73.42	-0.07	0.030
13	77.28	0.02	0.025
14	76.59	0.10	0.025
15	77.62	0.19	0.025
16	76.51	0.11	0.025
17	72.22	0.02	0.118
18	71.88	0.03	0.118
19	72.05	0.02	0.118
20	71.10	0.02	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT. FACTOR
1	10.01	0.12	0.150
2	10.08	-0.06	0.150
3	9.92	-0.06	0.100
4	10.01	-0.01	0.150
5	9.28	-0.44	0.225
6	9.25	-0.08	0.225

REF. VESSEL DP=	0.1976	( 0.0016)	PSID
DRYWELL PRESSURE=	73.3040	( -0.0050)	PSIA
AVG. DEWPOINT PRESS=	10.980	( -0.1156)	IN H2O
AVG. CONT. TEMP=	73.274	( 0.0360)	DEG.F

INTERVAL 19 LEAK RATE=	-0.259	WT%/24HR=
TOTAL TIME LEAK RATE=	0.281	WT%/24HR=
POINT TO POINT STATISTICAL ERROR= +/-	0.915	WT%/24HR=
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.297 -	0.0070 % HR
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.16 <	SLOPE < 0.15

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.256 +	0.0075 % HR
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.09 <	SLOPE < 0.11
	-0.35 <	LEAK RATE < 0.35

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64496.00	POUNDS
LEAK RATE=	0.338	WT%/24-HR
95% CONFIDENCE LEVEL=	+/- 0.025	WT%/24-HR

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 21  
11/ 5 76 1700 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 6.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.22	0.17	0.027
2	76.68	0.00	0.027
3	73.59	0.08	0.027
4	73.08	0.17	0.027
5	74.45	0.00	0.027
6	72.74	0.09	0.027
7	73.08	0.09	0.027
8	73.94	0.09	0.075
9	73.17	0.09	0.075
10	76.17	0.00	0.030
11	72.48	0.09	0.030
12	73.51	0.09	0.030
13	77.36	0.08	0.025
14	76.68	0.09	0.025
15	77.62	0.00	0.025
16	76.51	0.00	0.025
17	72.31	0.09	0.118
18	71.96	0.08	0.118
19	72.13	0.08	0.118
20	71.19	0.09	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	9.82	-0.19	0.150
2	10.17	0.09	0.150
3	9.84	-0.08	0.100
4	10.07	0.06	0.150
5	9.55	0.27	0.225
6	9.07	-0.18	0.225

REF. VESSEL DP=	0.2006	( 0.0030)	PSID
DRYWELL PRESSURE=	73.3070	( 0.0030)	PSIA
AVG. DEWPOINT PRESS=	10.986	( 0.0064)	IN H2O
AVG. CONT. TEMP=	73.353	( 0.0790)	DEG.F

INTERVAL 20 LEAK RATE=	0.310	WT%/24HRS
TOTAL TIME LEAK RATE=	0.282	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.890	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.492 -	0.0732 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.21 <	SLOPE < 0.06
LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.255 +	0.0077 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.08 <	SLOPE < 0.10
	-0.31 <	LEAK RATE < 0.9

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64493.20	POUNDS
LEAK RATE=	0.332	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.023	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 22  
 11 5 76 1720 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 7.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.20	-0.02	0.027
2	76.66	-0.02	0.027
3	73.57	-0.02	0.027
4	73.06	-0.02	0.027
5	74.60	0.15	0.027
6	72.80	0.06	0.027
7	73.14	0.06	0.027
8	73.92	-0.02	0.075
9	73.14	-0.03	0.075
10	76.23	0.06	0.030
11	72.46	-0.02	0.030
12	73.57	0.06	0.030
13	77.34	-0.02	0.025
14	76.66	-0.02	0.025
15	77.60	-0.02	0.025
16	76.57	0.06	0.025
17	72.28	-0.03	0.118
18	71.94	-0.02	0.118
19	72.11	-0.02	0.118
20	71.17	-0.02	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.82	0.00	0.150
2	9.86	-0.31	0.150
3	10.03	0.19	0.100
4	9.95	-0.12	0.150
5	9.35	-0.20	0.225
6	9.20	0.13	0.225

REF. VESSEL DP=	0.2052	( 0.0046)	PSID
DRYWELL PRESSURE=	73.3130	( 0.0060)	PSIA
AVG. DEWPOINT PRESS=	10.925	( -0.0612)	IN H2O
AVG. CONT. TEMP=	73.347	( -0.0060)	DEG.F

INTERVAL 21 LEAK RATE=	0.237	WT%/24HRS
TOTAL TIME LEAK RATE=	0.280	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.868	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.312 -	0.0152 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.13 <	SLOPE < 0.10

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.262 +	0.0049 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.08 <	SLOPE < 0.09
	-0.29 <	LEAK RATE < 0.68

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS DRY AIR=	64491.00	POUNDS
LEAK RATE=	0.327	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.021	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 23  
 11/ 6/ 76 1740 HOURS  
 LAST INTERVAL HOURS 0.33

HOURS FROM T=0 7.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.28	0.08	0.027
2	76.83	0.17	0.027
3	73.74	0.17	0.027
4	73.14	0.08	0.027
5	74.52	-0.08	0.027
6	72.80	0.00	0.027
7	73.14	0.00	0.027
8	73.92	0.00	0.027
9	73.23	0.09	0.075
10	76.49	0.26	0.030
11	72.63	0.17	0.030
12	73.66	0.09	0.030
13	77.51	0.17	0.025
14	76.83	0.17	0.025
15	77.68	0.08	0.025
16	76.66	0.09	0.025
17	72.28	0.00	0.025
18	71.85	-0.09	0.118
19	72.03	-0.08	0.118
20	71.17	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	9.98	0.16	0.150
2	10.09	0.23	0.150
3	9.90	-0.13	0.100
4	9.96	0.01	0.150
5	9.77	0.42	0.225
6	9.23	0.03	0.225

REF. VESSEL DP= 0.2051 ( -0.0001 ) PSID  
 DRYWELL PRESSURE= 73.3210 ( 0.0080 ) PSIA  
 AVG. DEWPOINT PRESS= 11.074 ( 0.1485 ) IN H2O  
 AVG. CONT. TEMP= 73.373 ( 0.0260 ) DEG.F

INTERVAL 22 LEAK RATE= 0.517 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.291 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.853 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.464 - 0.0570 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.15 < SLOPE < 0.04

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.242 + 0.0127 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.06 < SLOPE < 0.09  
 -0.22 < LEAK RATE < 0.89

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64486.30 POUNDS  
 LEAK RATE= 0.325 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.020 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1975

DATA SET NUMBER 24  
 11/ 5/ 76 1800 HOURS  
 LAST INTERVAL HOURS 0.33

HOURS FROM T=0 7.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.39	0.11	0.027
2	76.85	0.02	0.027
3	73.77	0.03	0.027
4	73.25	0.11	0.027
5	74.71	0.19	0.027
6	72.91	0.11	0.027
7	73.25	0.11	0.027
8	74.11	0.19	0.075
9	73.34	0.11	0.075
10	76.68	0.19	0.030
11	72.65	0.02	0.030
12	73.85	0.19	0.030
13	77.62	0.11	0.025
14	76.94	0.11	0.025
15	77.87	0.19	0.025
16	76.76	0.10	0.025
17	72.31	0.03	0.118
18	71.96	0.11	0.118
19	72.13	0.10	0.118
20	71.19	0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.09	0.11	0.150
2	10.40	0.31	0.150
3	10.55	0.65	0.100
4	10.17	0.21	0.150
5	10.23	0.46	0.225
6	9.05	-0.18	0.225

REF.VESSEL DP=	0.2026	( -0.0025)	PSID
DRYWELL PRESSURE=	73.3320	( 0.0110)	PSIA
AVG.DEWPOINT PRESS=	11.296	( 0.2227)	IN H2O
AVG.CONT.TEMP=	73.470	( 0.0970)	DEG.F

INTERVAL 33 LEAK RATE=	0.537		WT%/24HRS
TOTAL TIME LEAK RATE=	0.301		WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.840		WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS			
LEAK RATE=	0.472 -	0.0507	% HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.15	< SLOPE	< 0.05
LEAK RATE TREND SINCE T=0			
LEAK RATE=	0.225 +	0.0191	% HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.05	< SLOPE	< 0.09
	-0.16	< LEAK RATE	< 0.90

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64401.40	POUNDS
LEAK RATE=	0.326	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.019	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 35  
 11 64 75 1820 HOURS  
 LAST INTERVAL HOURS 0.33

HOURS FROM T=0 8.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.47	0.00	0.027
2	77.11	0.26	0.027
3	73.77	0.00	0.027
4	73.25	0.00	0.027
5	74.79	0.00	0.027
6	72.99	0.00	0.027
7	73.34	0.09	0.027
8	74.20	0.09	0.075
9	73.51	0.17	0.075
10	76.68	0.00	0.030
11	72.74	0.09	0.030
12	73.85	0.00	0.030
13	77.79	0.17	0.025
14	77.11	0.17	0.025
15	78.05	0.18	0.025
16	76.94	0.18	0.025
17	72.31	0.00	0.118
18	71.96	0.00	0.118
19	72.13	0.00	0.118
20	71.19	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.88	-0.21	0.150
2	10.30	-0.10	0.150
3	10.08	-0.72	0.100
4	10.12	-0.05	0.150
5	10.13	-0.10	0.225
6	9.35	0.30	0.225

REF. VESSEL DP= 0.2065 ( 0.0039) PSID  
 DRYWELL PRESSURE= 73.3290 ( -0.0030) PSIA  
 AVG. DEWPOINT PRESS= 11.240 ( -0.0561) IN H2O  
 AVG. CONT. TEMP= 73.525 ( 0.0550) DEG.F

INTERVAL 24 LEAK RATE= 0.179 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.296 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.023 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.442 - 0.0486 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.15 < SLOPE < 0.05

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.241 + 0.0132 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.05 < SLOPE < 0.05  
 -0.16 < LEAK RATE < 0.34

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64479.70 POUNDS  
 LEAK RATE= 0.325 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.016 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 36  
 11 5 76 1340 HOURS  
 LAST INTERVAL HOURS 0.13 HOURS FROM T=0 0.33

TEMPERATURE	DEGREE'S F	CHANGE DEG.F	WT.FACTOR
1	78.47	0.00	0.027
2	77.02	-0.09	0.027
3	73.85	0.00	0.027
4	73.34	0.09	0.027
5	74.97	0.18	0.027
6	72.99	0.00	0.027
7	73.25	-0.09	0.027
8	74.20	0.00	0.075
9	73.51	0.00	0.075
10	76.59	-0.09	0.030
11	72.74	0.00	0.030
12	73.85	0.00	0.030
13	77.87	0.00	0.025
14	77.11	0.00	0.025
15	78.05	0.00	0.025
16	76.94	0.00	0.025
17	72.31	0.00	0.118
18	71.96	0.00	0.118
19	72.13	0.00	0.118
20	71.19	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.09	0.21	0.150
2	10.36	0.06	0.150
3	9.88	-0.20	0.100
4	10.09	-0.03	0.150
5	9.65	-0.48	0.225
6	9.24	-0.11	0.225

REF. VESSEL DP= 0.2128 ( 0.0063) PSID  
 DRYWELL PRESSURE= 73.3310 ( 0.0020) PSIA  
 AVG. DEWPOINT PRESS= 11.124 ( -0.1167) IN H2O  
 AVG. CONT. TEMP= 73.529 ( 0.0040) DEG.F

INTERVAL 25 LEAK RATE= 0.205 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.293 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.806 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.345 - 0.0212 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.11 < SLOPE < 0.07  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.253 + 0.0091 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.05 < SLOPE < 0.07  
 -0.16 < LEAK RATE < 0.32

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64477.00 POUNDS  
 LEAK RATE= 0.324 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.015 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET NUMBER 37  
11/ 6/ 76 1900 HOURS  
LAST INTERVAL HOURS 0.33

HOURS FROM T=0 9.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.56	0.09	0.027
2	77.02	0.00	0.027
3	73.94	0.09	0.027
4	73.42	0.08	0.027
5	74.88	-0.09	0.027
6	73.08	0.09	0.027
7	73.51	0.26	0.027
8	74.28	0.08	0.075
9	73.51	0.00	0.075
10	76.76	0.17	0.030
11	72.82	0.08	0.030
12	74.02	0.17	0.030
13	77.87	0.00	0.025
14	77.28	0.17	0.025
15	78.13	0.08	0.025
16	77.11	0.17	0.025
17	72.39	0.08	0.118
18	72.05	0.09	0.118
19	72.13	0.00	0.118
20	71.19	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.03	-0.06	0.150
2	10.28	-0.08	0.150
3	9.84	-0.04	0.100
4	10.23	0.14	0.150
5	9.16	-0.49	0.225
6	9.24	0.00	0.225

REF. VESSEL DP= 0.2082 ( -0.0046) PSID  
 DRYWELL PRESSURE= 73.3390 ( 0.0080) PSIA  
 AVG. DEWPOINT PRESS= 11.010 ( -0.1140) IN H2O  
 AVG. CONT. TEMP= 73.592 ( 0.0630) DEG.F

INTERVAL 36 LEAK RATE= -0.868 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.248 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.912 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.456 - 0.1133 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.25 < SLOPE < 0.02

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.345 - 0.0217 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.08 < SLOPE < 0.04  
 -0.38 < LEAK RATE < 0.72

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64485.50 POUNDS  
 LEAK RATE= 0.313 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.018 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 28  
 11/ 6/ 75 1920 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 9.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.64	0.08	0.027
2	77.11	0.09	0.027
3	74.11	0.17	0.027
4	73.59	0.17	0.027
5	75.05	0.17	0.027
6	73.25	0.17	0.027
7	73.68	0.17	0.027
8	74.37	0.09	0.075
9	73.59	0.08	0.075
10	76.94	0.18	0.030
11	72.99	0.17	0.030
12	74.20	0.18	0.030
13	77.96	0.09	0.025
14	77.36	0.08	0.025
15	78.30	0.17	0.025
16	77.11	0.00	0.025
17	72.39	0.00	0.118
18	72.05	0.00	0.118
19	72.13	0.00	0.118
20	71.19	0.00	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	9.92	-0.11	0.150
2	10.29	0.01	0.150
3	10.11	0.27	0.100
4	10.17	-0.06	0.150
5	9.48	0.32	0.225
6	9.40	0.16	0.225

REF.VESSEL DP=	0.2058	( -0.0024)	PSID
DRYWELL PRESSURE=	73.3520	( 0.0130)	PSIA
AVG.DEWPOINT PRESS=	11.121	( 0.1113)	IN H2O
AVG.CONT.TEMP=	73.657	( 0.0650)	DEG.F

INTERVAL 27 LEAK RATE=	0.153	WT%/24HRS
TOTAL TIME LEAK RATE=	0.244	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.895	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.509 -	0.1343 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.26 <	SLOPE < -0.01
LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.345 -	0.0216 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.08 <	SLOPE < 0.04
	-0.37 <	LEAK RATE < 0.67

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64484.10	POUNDS
LEAK RATE=	0.304	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.019	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET NUMBER 29  
 11/ 6/ 76 1940 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 9.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	79.13	0.49	0.027
2	77.51	0.40	0.027
3	74.52	0.41	0.027
4	74.00	0.41	0.027
5	75.45	0.41	0.027
6	73.74	0.49	0.027
7	74.17	0.49	0.027
8	74.60	0.33	0.027
9	73.92	0.33	0.027
10	77.34	0.40	0.030
11	73.23	0.24	0.030
12	74.52	0.32	0.030
13	73.49	0.49	0.035
14	77.85	0.49	0.025
15	78.88	0.58	0.025
16	77.60	0.49	0.025
17	72.37	-0.02	0.118
18	72.03	-0.02	0.118
19	72.11	-0.02	0.118
20	71.25	0.06	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR
1	10.30	0.38	0.150
2	10.50	0.21	0.150
3	10.27	0.16	0.100
4	10.34	0.17	0.150
5	9.65	0.18	0.225
6	9.07	-0.33	0.225

REF. VESSEL DP=	0.1970	( -0.0088)	PSID
DRYWELL PRESSURE=	73.3900	( 0.0380)	PSIA
AVG. DEWPOINT PRESS=	11.218	( 0.0970)	IN H <sub>2</sub> O
AVG. CONT. TEMP=	73.862	( 0.2050)	DEG.F

INTERVAL 20 LEAK RATE=	-0.545	WT%/24HRS
TOTAL TIME LEAK RATE=	0.216	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.928	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.422 -	0.1397 % HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.27 <	SLOPE < -0.01
LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.395 -	0.0369 % HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.09 <	SLOPE < 0.32
	-0.47 <	LEAK RATE < 0.57

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64488.90	POUNDS
LEAK RATE=	0.290	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.022	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 20  
11/ 6/ 76 2000 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 9.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.30	0.17	0.027
2	77.60	0.09	0.027
3	74.77	0.25	0.027
4	74.26	0.26	0.027
5	75.63	0.17	0.027
6	73.83	0.09	0.027
7	74.34	0.17	0.027
8	74.95	0.35	0.075
9	74.17	0.25	0.075
10	77.77	0.43	0.030
11	73.49	0.26	0.030
12	74.95	0.43	0.030
13	78.79	0.34	0.025
14	78.20	0.35	0.025
15	79.13	0.25	0.025
16	77.85	0.25	0.025
17	72.37	0.00	0.118
18	72.03	0.00	0.118
19	72.20	0.09	0.118
20	71.25	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.38	0.08	0.150
2	10.64	0.14	0.150
3	10.41	0.14	0.100
4	10.44	0.10	0.150
5	9.54	-0.12	0.225
6	9.11	0.04	0.225

REF.VESSEL DP=	0.1947	( -0.0023)	PSID
DRYWELL PRESSURE=	73.4120	( 0.0220)	PSIA
AVG.DEWPOINT PRESS=	11.262	( 0.0445)	IN H2O
AVG.CONT.TEMP=	74.014	( 0.1520)	DEG.F

INTERVAL 29 LEAK RATE=	-0.085	WT%/24HRS
TOTAL TIME LEAK RATE=	0.206	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.918	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.378 -	0.1339 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.26 <	SLOPE < -0.00
LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.403 -	0.0394 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.09 <	SLOPE < 0.0
	-0.48 <	LEAK RATE < 0.5

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64489.60	POUNDS
LEAK RATE=	0.277	WT%/24H
95% CONFIDENCE LEVEL=	+/- 0.024	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 31

11 5 76 2020 HOURS

LAST INTERVAL HOURS 0.23 HOURS FROM T=0 10.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	79.39	0.09	0.027
2	77.77	0.17	0.027
3	74.86	0.09	0.027
4	74.34	0.08	0.027
5	75.72	0.09	0.027
6	73.92	0.09	0.027
7	74.34	0.00	0.027
8	75.12	0.17	0.025
9	74.43	0.26	0.075
10	77.60	-0.17	0.030
11	73.57	0.08	0.030
12	74.77	-0.18	0.025
13	78.96	0.17	0.025
14	78.28	0.08	0.025
15	79.30	0.17	0.025
16	78.02	0.17	0.025
17	72.37	0.00	0.118
18	72.03	0.00	0.118
19	72.20	0.00	0.118
20	71.25	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT. FACTOR
1	10.38	0.00	0.150
2	10.54	-0.10	0.150
3	10.42	0.01	0.100
4	10.34	-0.10	0.150
5	10.52	0.98	0.225
6	9.31	0.20	0.225

REF. VESSEL DP= 0.2008 ( 0.0061) PSID  
 DRYWELL PRESSURE= 73.4010 ( -0.0110) PSIA  
 AVG. DEWPOINT PRESS= 11.499 ( 0.2362) IN H2O  
 AVG. CONT. TEMP= 74.069 ( 0.0550) DEG.F

INTERVAL 30 LEAK RATE= 1.437 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.247 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.008 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.131 + 0.0140 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.18 < SLOPE < 0.21

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.308 - 0.0118 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.07 < SLOPE < 0  
 -0.36 < LEAK RATE < 0

MASS FLOW CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64476.70 POUNDS  
 LEAK RATE= 0.273 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.023 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 32  
11/ 6/ 76 2040 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 10.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.37	-0.02	0.027
2	77.75	-0.02	0.027
3	74.84	-0.02	0.027
4	74.41	0.07	0.027
5	75.95	0.23	0.027
6	73.98	0.06	0.027
7	74.41	0.07	0.027
8	75.03	-0.03	0.075
9	74.50	0.07	0.075
10	77.66	0.06	0.030
11	73.64	0.07	0.030
12	74.84	0.07	0.030
13	78.86	-0.10	0.025
14	78.17	-0.11	0.025
15	79.11	-0.19	0.025
16	77.92	-0.10	0.025
17	72.35	-0.02	0.118
18	72.00	-0.03	0.118
19	72.09	-0.11	0.118
20	71.23	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.23	-0.15	0.150
2	10.44	-0.10	0.150
3	10.13	-0.29	0.100
4	10.48	0.14	0.150
5	9.59	-0.93	0.225
6	9.16	-0.15	0.225

REF. VESSEL DP= 0.2065 ( 0.0057) PSID  
 DRYWELL PRESSURE= 73.4040 ( 0.0030) PSIA  
 AVG. DEWPOINT PRESS= 11.210 ( -0.2883) IN H2O  
 AVG. CONT. TEMP= 74.054 ( -0.0150) DEG.F

INTERVAL 31 LEAK RATE= -0.464 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.224 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.023 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.209 - 0.0419 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.25 < SLOPE < 0.16

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.350 - 0.0236 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.08 < SLOPE < 0.00  
 -0.44 < LEAK RATE < 0.19

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS DRY AIR= 61480.00 POUNDS  
 LEAK RATE= 0.265 WT./24HRS  
 0.032 WT./24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 33  
11 6 75 2100 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 10.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT FACTOR
1	79.56	0.19	0.037
2	77.94	0.19	0.017
3	74.86	0.02	0.037
4	74.43	0.02	0.037
5	75.37	0.02	0.017
6	74.00	0.02	0.037
7	74.43	0.02	0.017
8	75.20	0.11	0.075
9	74.32	0.02	0.075
10	77.77	0.11	0.030
11	73.74	0.10	0.030
12	75.03	0.19	0.030
13	78.88	0.02	0.025
14	78.28	0.11	0.025
15	79.22	0.11	0.025
16	78.02	0.10	0.025
17	72.37	0.02	0.118
18	72.03	0.03	0.118
19	72.11	0.02	0.118
20	71.25	0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.41	0.18	0.150
2	10.64	0.20	0.150
3	10.30	0.17	0.100
4	10.46	-0.02	0.150
5	9.64	0.05	0.225
6	9.31	0.15	0.225

REF. VESSEL DP= 0.2046 ( -0.0019) PSID  
 DRYWELL PRESSURE= 73.4100 ( 0.0060) PSIA  
 AVG. DEWPOINT PRESS= 11.326 ( 0.1160) IN H2O  
 AVG. CONT. TEMP= 74.108 ( 0.0540) DEG.F

INTERVAL 33 LEAK RATE= 0.220 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.224 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.006 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.145 - 0.0150 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.22 < SLOPE < 0.11

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.342 - 0.0215 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.07 < SLOPE  
 -0.41 < LEAK RATE < 0.

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64470.90 POUNDS  
 LEAK RATE= 0.259 WT%/24HRS  
 CONFIDENCE LEVEL= +/- 0.022 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--JULY 1974

DATA SET UNSET 04  
11/ 6/ 78 2120 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 11.04

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	73.56	0.00	0.027
2	77.94	0.00	0.017
3	74.95	0.09	0.017
4	74.52	0.09	0.017
5	75.89	-0.08	0.017
6	74.09	0.09	0.017
7	74.52	0.09	0.017
8	75.29	0.09	0.017
9	74.60	0.08	0.075
10	77.94	0.17	0.030
11	73.83	0.09	0.030
12	75.12	0.09	0.030
13	78.96	0.08	0.025
14	78.45	0.17	0.025
15	79.30	0.08	0.025
16	78.02	0.00	0.025
17	72.37	0.00	0.118
18	72.03	0.00	0.118
19	72.20	0.09	0.118
20	71.34	0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.52	0.11	0.150
2	10.24	-0.40	0.150
3	10.48	0.18	0.130
4	10.37	-0.09	0.150
5	9.93	0.29	0.225
6	9.12	-0.19	0.225

REF.VESSEL DP= 0.2066 ( 0.0020) PSID  
 DRYWELL PRESSURE= 73.4190 ( 0.0090) PSIA  
 AVG.DEWPOINT PRESS= 11.310 ( -0.0163) IN H2O  
 AVG.CONT.TEMP= 74.168 ( 0.0600) DEG.F

INTERVAL 33 LEAK RATE= 0.132 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.221 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.991 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.249 - 0.0499 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.25 < SLOPE < 0.15  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.340 - 0.0211 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.07 < SLOPE < 0.30  
 -0.40 < LEAK RATE < 0.13

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64477.60 POUNDS  
 LEAK RATE= 0.253 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.022 WT%/24HRS

COAST GUARD STATION--REPORTING VESSEL METHOD  
 INTERMITTENT PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1970

DATA SET NUMBER 15  
 11:00 2140 HOURS  
 CYCLE INTERVAL HOURS 0.33 HOURS FROM T=0 11.3

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.56	0.00	0.027
2	78.02	0.08	0.027
3	75.03	0.08	0.027
4	74.52	0.00	0.027
5	76.14	0.25	0.027
6	74.09	0.00	0.027
7	74.52	0.00	0.027
8	75.29	0.00	0.075
9	74.60	0.00	0.075
10	77.94	0.00	0.030
11	73.83	0.00	0.030
12	75.03	-0.09	0.030
13	79.13	0.17	0.025
14	78.54	0.09	0.025
15	79.47	0.17	0.025
16	78.20	0.18	0.025
17	72.37	0.00	0.118
18	72.03	0.00	0.118
19	72.20	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.47	-0.05	0.150
2	10.55	0.31	0.150
3	10.29	-0.19	0.100
4	10.48	0.11	0.150
5	9.98	0.05	0.225
6	9.16	0.04	0.225

REF. VESSEL DP= 0.2123 ( 0.0057) PSID  
 DRYWELL PRESSURE= 73.4030 ( -0.0160) PSIA  
 AVG. DEWPOINT PRESS= 11.367 ( 0.0565) IN. H2O  
 AVG. CONT. TEMP= 74.192 ( 0.0240) DEG. F

INTERVAL 34 LEAK RATE= 0.761 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.237 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.993 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.129 + 0.0201 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.19 < SLOPE < 0.13  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.302 - 0.0111 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.06 < SLOPE < 0.06  
 -0.33 < LEAK RATE < 0.9

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64470.70 POUNDS  
 LEAK RATE= 0.051 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.021 WT%/24HRS

HOURS FROM T=0 11.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACT
-----	-----	-----	-----
1	79.56	0.00	0.000
2	78.20	0.18	0.000
3	75.03	0.00	0.000
4	74.43	-0.09	0.000
5	76.06	-0.08	0.000
6	74.17	0.08	0.000
7	74.60	0.08	0.000
8	75.07	0.08	0.000
9	74.69	0.09	0.000
10	77.68	-0.26	0.000
11	73.03	0.00	0.000
12	74.95	-0.08	0.000
13	78.96	-0.17	0.000
14	78.37	-0.17	0.000
15	79.30	-0.17	0.000
16	78.20	0.00	0.000
17	72.37	0.00	0.110
18	72.11	0.08	0.110
19	72.20	0.00	0.110
20	71.34	0.00	0.110
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
-----	-----	-----	-----
1	10.25	-0.22	0.150
2	10.33	-0.22	0.150
3	10.45	0.16	0.100
4	10.45	-0.03	0.150
5	9.83	-0.15	0.225
6	9.13	-0.03	0.225

REF. VESSEL DP=	0.2197	( 0.0074)	PSID
DRYWELL PRESSURE=	73.3950	( -0.0090)	PSIA
AVG. DEWPOINT PRESS=	11.271	( -0.0952)	PSIA
AVG. CONT. TEMP=	74.196	( 0.0040)	DEG F
INTERVAL 35 LEAK RATE=	0.390	WT%/24-HRS	
TOTAL TIME LEAK RATE=	0.241	WT%/24-HRS	
POINT TO POINT STATISTICAL ERROR= +/-	0.980	WT%/24-HRS	
LEAK RATE TREND FOR LAST 4 HOURS			
LEAK RATE=	0.086 +	0.0451	X -15
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.16	<	SLOPE < 0.00
LEAK RATE TREND SINCE T=0			
LEAK RATE=	0.289 -	0.0060	X -95
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.03	<	SLOPE < 0
	-0.30	<	LEAK RATE < 0

### MASS FLOW CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINER TOTAL MASS(DRY AIR)=	64467.20	PO: 05
LEAK RATE=	0.249	WT: 24H
LEAK RATE +/-	0.000	WT: 24H

COOPER WINDLE STATION--REFERRAL VESSEL METHOD  
 SEPARATE PRIMARY CONTAINMENT LEAKAGE RATE TEST-NO. 1176

DATA SET NUMBER 37  
 11/ 5/ 74 2320 HOURS  
 LEAK INTERVAL-HOURS 0.33 HOURS FROM T=0 12.0

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.64	0.00	0.000
2	78.02	-0.18	0.000
3	74.95	-0.08	0.000
4	74.43	0.00	0.000
5	75.89	-0.17	0.000
6	74.17	0.00	0.000
7	74.52	-0.08	0.000
8	75.29	-0.08	0.000
9	74.60	-0.09	0.000
10	77.77	0.09	0.000
11	73.83	0.00	0.000
12	74.95	0.00	0.000
13	78.96	0.00	0.000
14	78.20	-0.17	0.000
15	79.13	-0.17	0.000
16	78.02	-0.18	0.000
17	72.46	0.09	0.118
18	72.11	0.00	0.118
19	72.20	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.33	0.00	0.150
2	10.79	0.46	0.150
3	10.23	-0.22	0.100
4	10.41	-0.04	0.150
5	10.27	0.44	0.225
6	9.32	0.19	0.225

REF. VESSEL DP= 0.2241 ( 0.0044) PSID  
 DRYWELL PRESSURE= 73.3930 ( -0.0020) PSIA  
 AVG. DEWPOINT PRESS= 11.466 ( 0.1947) IN H2O  
 AVG. CONT. TEMP= 74.172 ( -0.0240) DEG.F

INTERVAL 36 LEAK RATE= 1.131 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.266 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.010 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.118 + 0.1593 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.05 < SLOPE < 0.37

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.237 + 0.0047 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.04 < SLOPE < 0.03  
 -0.21 < LEAK RATE < 0.73

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64457.00 POUNDS  
 LEAK RATE= 0.252 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.019 WT%/24HRS

COOPER W/UTAH STATION--REFERENCE VESSEL METHOD  
 INTERIM (P10HR) CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET: 1000000000 38  
 11 75 2240 HOURS  
 LAST INTERIM HOURS 0.33 HOURS FROM T=0 12.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.64	0.00	0.037
2	77.94	-0.08	0.037
3	74.95	0.00	0.037
4	74.43	0.00	0.037
5	75.97	0.08	0.037
6	74.17	0.00	0.037
7	74.52	0.00	0.037
8	75.29	0.00	0.075
9	74.60	0.00	0.075
10	77.85	0.08	0.030
11	73.83	0.00	0.030
12	75.03	0.08	0.030
13	78.88	-0.08	0.025
14	78.20	0.00	0.025
15	79.13	0.00	0.025
16	78.02	0.00	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.08	0.118
20	71.34	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.41	0.08	0.150
2	10.53	-0.26	0.150
3	10.37	0.14	0.100
4	10.52	0.11	0.150
5	9.57	-0.70	0.225
6	9.14	-0.18	0.225

REF.VESSEL DP=	0.2218	( -0.0023)	PSID
DRYWELL PRESSURE=	73.3970	( 0.0040)	PSIA
AVG.DEWPOINT PRESS=	11.272	( -0.1944)	IN H2O
AVG.CONT.TEMP=	74.184	( 0.0120)	DEG.F

INTERVAL 37 LEAK RATE=	-0.921	WT%/24HRS
TOTAL TIME LEAK RATE=	0.234	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.070	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	-0.075 +	0.0914 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.15 <	SLOPE < 0.34

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.303 -	0.0109 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.05 <	SLOPE < 0
	-0.35 <	LEAK RATE < 0

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64465.20	POUNDS
LEAK RATE=	0.249	WT%/24H
95% CONFIDENCE LEVEL=	+/- 0.018	WT%/24H

COOPER LEAK TEST STATION--REFERENCE VESSEL METHOD  
 INTEL. TEST--PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET # 11/17 3300 HOURS  
 LAST INSP. L-HOURS 0.33 HOURS FROM T=0 12.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.F
1	79.73	0.09	0.031
2	78.11	0.17	0.027
3	75.03	3.08	0.027
4	74.60	0.17	0.027
5	76.06	0.09	0.02
6	74.17	0.00	0.02
7	74.60	0.08	0.027
8	75.37	0.08	0.075
9	74.60	0.00	0.075
10	77.94	0.09	0.030
11	73.92	0.09	0.030
12	75.20	0.17	0.033
13	78.96	0.08	0.025
14	78.37	0.17	0.025
15	79.30	0.17	0.025
16	78.11	0.09	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.27	-0.14	0.150
2	10.21	-0.32	0.150
3	10.43	0.06	0.100
4	10.49	-0.03	0.150
5	9.30	-0.27	0.225
6	9.25	0.11	0.225

REF. VESSEL DP= 0.2240 ( 0.0022) PSID  
 DRYWELL PRESSURE= 73.4050 ( 0.0080) PSIA  
 AVG. DEWPOINT PRESS= 11.168 ( -0.1033) IN H2O  
 AVG. CONT. TEMP= 74.231 ( 0.0470) DEG.F

INTERVAL 38 LEAK RATE= -0.157 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.224 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.063 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.059 + 0.0729 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.18 < SLOPE < 0.02

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.320 - 0.0148 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.05 < SLOPE < 0.0  
 -0.38 < LEAK RATE < 0.0

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64466.60 POUNDS  
 LEAK RATE= 0.245 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.017 WT%/24HRS

DUKE POWER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED (AIR) CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET NO. B-2 40  
 11/ 2/ 75 2320 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 13.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	79.64	-0.09	0.01
2	78.11	0.00	0.027
3	75.12	0.09	0.01
4	74.52	-0.08	0.01
5	76.14	0.08	0.01
6	74.17	0.00	0.01
7	74.60	0.00	0.027
8	75.37	0.00	0.01
9	74.60	0.00	0.01
10	78.02	0.08	0.100
11	74.00	0.08	0.01
12	75.20	0.00	0.01
13	79.13	0.17	0.021
14	78.45	0.08	0.01
15	79.39	0.09	0.025
16	78.20	0.09	0.01
17	72.46	0.00	0.110
18	72.11	0.00	0.118
19	72.20	-0.08	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR
1	10.44	0.17	0.150
2	10.53	0.32	0.150
3	10.43	0.00	0.100
4	10.48	-0.01	0.150
5	10.09	0.79	0.220
6	9.37	0.12	0.225

REF. VESSEL DP= 0.2236 ( -0.0004) PSID  
 DRYWELL PRESSURE= 73.4050 ( 0.0000) PSIA  
 AVG. DEWPOINT PRESS= 11.445 ( 0.2767) IN H2O  
 AVG. CONT. TEMP= 74.237 ( 0.0060) DEG. F

INTERVAL 39 LEAK RATE= 0.946 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.242 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.074 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.186 + 0.1560 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.10 < SLOPE < 0.4

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.278 - 0.0004 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.04 < SLOPE < 0.0  
 -0.30 < LEAK RATE < 0.0

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 6438.10 PO  
 LEAK RATE= 0.245 WT%  
 95% CONFIDENCE LEVEL= +/- 0.016 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 41  
 11/ 6/ 76 2340 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 13.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.03	0.027
2	78.05	-0.06	0.027
3	75.05	-0.07	0.027
4	74.54	0.02	0.027
5	75.99	-0.15	0.027
6	74.20	0.03	0.027
7	74.54	-0.06	0.027
8	75.48	0.11	0.075
9	74.79	0.19	0.075
10	77.79	-0.23	0.030
11	73.94	-0.06	0.030
12	74.97	-0.23	0.030
13	79.07	-0.06	0.025
14	78.39	-0.06	0.025
15	79.33	-0.06	0.025
16	78.22	0.02	0.025
17	72.39	-0.07	0.118
18	72.13	0.02	0.118
19	72.22	0.02	0.118
20	71.36	0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.23	-0.21	0.150
2	10.53	0.00	0.150
3	10.41	-0.02	0.100
4	10.53	0.05	0.150
5	9.35	-0.74	0.225
6	9.18	-0.19	0.225

REF.VESSEL DP= 0.2353 ( 0.0117) PSID  
 DRYWELL PRESSURE= 73.3800 ( -0.0250) PSIA  
 AVG.DEWPOINT PRESS= 11.209 ( -0.2358) IN H2O  
 AVG.CONT.TEMP= 74.232 ( -0.0050) DEG.F

INTERVAL 40 LEAK RATE= 0.314 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.244 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.061 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.087 + 0.0690 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.17 < SLOPE < 0.31

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.272 - 0.0042 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.04 < SLOPE < 0.03  
 -0.28 < LEAK RATE < 0.71

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64455.20 POUNDS  
 LEAK RATE= 0.244 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.016 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 41  
 11/ 6/ 75 2340 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 13.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.03	0.027
2	78.05	-0.06	0.027
3	75.05	-0.07	0.027
4	74.54	0.02	0.027
5	75.99	-0.15	0.027
6	74.20	0.03	0.027
7	74.54	-0.06	0.027
8	75.48	0.11	0.075
9	74.79	0.19	0.075
10	77.79	-0.23	0.030
11	73.94	-0.06	0.030
12	74.97	-0.23	0.030
13	79.07	-0.06	0.025
14	78.39	-0.06	0.025
15	79.33	-0.06	0.025
16	78.22	0.02	0.025
17	72.39	-0.07	0.118
18	72.13	0.02	0.118
19	72.22	0.02	0.118
20	71.36	0.02	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.23	-0.21	0.150
2	10.53	0.00	0.150
3	10.41	-0.02	0.100
4	10.53	0.05	0.150
5	9.35	-0.74	0.225
6	9.18	-0.19	0.225

REF.VESSEL DP= 0.2353 ( 0.0117) PSID  
 DRYWELL PRESSURE= 73.3800 ( -0.0250) PSIA  
 AVG.DEWPOINT PRESS= 11.209 ( -0.2358) IN H2O  
 AVG.CONT.TEMP= 74.232 ( -0.0050) DEG.F

INTERVAL 40 LEAK RATE= 0.314 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.244 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.061 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.087 + 0.0690 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.17 < SLOPE < 0.31  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.272 - 0.0042 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.04 < SLOPE < 0.03  
 -0.28 < LEAK RATE < 0.71

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64455.20 POUNDS  
 LEAK RATE= 0.244 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.016 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRESSURE CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 42  
 11/ 6/ 76 2400 HOURS  
 LAST INTERVAL HOURS 0.33

HOURS FROM T=0 13.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.00	0.027
2	78.05	0.00	0.027
3	75.05	0.00	0.027
4	74.54	0.00	0.027
5	76.08	0.09	0.027
6	74.20	0.00	0.027
7	74.54	0.00	0.027
8	75.48	0.00	0.075
9	74.71	-0.08	0.075
10	77.70	-0.09	0.030
11	73.94	0.00	0.030
12	75.05	0.08	0.030
13	78.90	-0.17	0.025
14	78.22	-0.17	0.025
15	79.07	-0.26	0.025
16	78.05	-0.17	0.025
17	72.48	0.09	0.118
18	72.13	0.00	0.118
19	72.31	0.09	0.118
20	71.36	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.27	0.04	0.150
2	10.37	-0.16	0.150
3	10.55	0.14	0.100
4	10.45	-0.08	0.150
5	9.48	0.13	0.225
6	9.25	0.07	0.225

REF.VESSEL DP= 0.2406 ( 0.0053) PSID  
 DRYWELL PRESSURE= 73.3770 ( -0.0030) PSIA  
 AVG.DEWPOINT PRESS= 11.238 ( 0.0290) IN H2O  
 AVG.CONT.TEMP= 74.230 ( -0.0020) DEG.F

INTERVAL 41 LEAK RATE= 0.627 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.253 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.054 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.066 + 0.0942 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.15 < SLOPE < 0.33

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.252 + 0.0001 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.04 < SLOPE < 0.04  
 -0.23 < LEAK RATE < 0.74

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64449.50 POUNDS  
 LEAK RATE= 0.246 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.015 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 43  
11/ 7/ 76 0020 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 14.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.00	0.027
2	78.05	0.00	0.027
3	75.05	0.00	0.027
4	74.54	0.00	0.027
5	75.91	-0.17	0.027
6	74.20	0.00	0.027
7	74.54	0.00	0.027
8	75.39	-0.09	0.075
9	74.71	0.00	0.075
10	77.79	0.09	0.030
11	74.02	0.00	0.030
12	74.97	-0.00	0.030
13	78.81	-0.09	0.025
14	78.13	-0.09	0.025
15	79.07	0.00	0.025
16	77.96	-0.09	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.49	0.22	0.150
2	10.53	0.16	0.150
3	10.34	-0.21	0.100
4	10.49	0.04	0.150
5	9.79	0.31	0.225
6	9.16	-0.09	0.225

REF.VESSEL DP=	0.2424	( 0.0018)	PSID
DRYWELL PRESSURE=	73.3770	( 0.0000)	PSIA
AVG.DEWPOINT PRESS=	11.330	( 0.0914)	IN H2O
AVG.CONT.TEMP=	74.215	( -0.0150)	DEG.F

INTERVAL 42 LEAK RATE=	0.505	WT%/24HRS
TOTAL TIME LEAK RATE=	0.259	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.044	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.273 +	0.0336 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.20 <	SLOPE < 0.26

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.240 +	0.0026 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.03 <	SLOPE < 0.04
	-0.20 <	LEAK RATE < 0.75

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64444.90	POUNDS
LEAK RATE=	0.247	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.014	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 44  
 11/ 7/ 76 0040 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 14.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.00	0.027
2	78.13	0.08	0.027
3	75.05	0.00	0.027
4	74.54	0.00	0.027
5	75.91	0.00	0.027
6	74.20	0.00	0.027
7	74.54	0.00	0.027
8	75.48	0.09	0.075
9	74.71	0.00	0.075
10	77.87	0.08	0.030
11	74.02	0.00	0.030
12	75.14	0.17	0.030
13	78.81	0.00	0.025
14	78.22	0.09	0.025
15	79.15	0.08	0.025
16	78.05	0.09	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.31	-0.18	0.150
2	10.34	-0.19	0.150
3	10.25	-0.09	0.100
4	10.48	-0.01	0.150
5	10.41	0.62	0.225
6	9.21	0.05	0.225

REF.VESSEL DP=	0.2435	( 0.0011)	PSID
DRYWELL PRESSURE=	73.3800	( 0.0030)	PSIA
AVG.DEWPOINT PRESS=	11.415	( 0.0849)	IN H2O
AVG.CONT.TEMP=	74.238	( 0.0230)	DEG.F

INTERVAL 43 LEAK RATE=	0.409	WT%/24HRS
TOTAL TIME LEAK RATE=	0.263	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.032	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.389 -	0.0036 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.23 <	SLOPE < 0.22

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.234 +	0.0039 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.03 <	SLOPE < 0.04
	-0.17 <	LEAK RATE < 0.75

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64441.20	POUNDS
LEAK RATE=	0.249	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.014	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 45  
11 7 75 0100 HOURS  
LAST INTERVAL HOURS 0.33

HOURS FROM T=0 14.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.00	0.027
2	78.05	-0.08	0.027
3	75.05	0.00	0.027
4	74.45	-0.09	0.027
5	75.99	0.08	0.027
6	74.20	0.00	0.027
7	74.54	0.00	0.027
8	75.39	-0.09	0.075
9	74.71	0.00	0.075
10	77.87	0.00	0.030
11	74.02	0.00	0.030
12	75.05	-0.09	0.030
13	78.98	0.17	0.025
14	78.30	0.08	0.025
15	79.24	0.09	0.025
16	78.05	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.37	0.06	0.150
2	10.71	0.37	0.150
3	10.37	0.12	0.100
4	10.47	-0.01	0.150
5	9.52	-0.89	0.225
6	9.44	0.23	0.225

REF.VESSEL DP= 0.2485 ( 0.0050) PSID  
 DRYWELL PRESSURE= 73.3770 ( -0.0030) PSIA  
 AVG.DEWPOINT PRESS= 11.341 ( -0.0736) IN. H2O  
 AVG.CONT.TEMP= 74.234 ( -0.0040) DEG.F

INTERVAL 44 LEAK RATE= 0.231 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.262 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.020 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.104 + 0.0001 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.10 < SLOPE < 0.28  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.237 + 0.0033 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.03 < SLOPE < 0.03  
 -0.17 < LEAK RATE < 0.74

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64439.10 POUNDS  
 LEAK RATE= 0.251 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.013 WT%/24HRS

COOPER NUCLEAR STATION--REF. VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 46  
 11/ 7/ 76 0120 HOURS  
 LAST INTERVAL HOURS 0.33

HOURS FROM T=0 15.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.00	0.027
2	78.13	0.08	0.027
3	75.14	0.09	0.027
4	74.54	0.09	0.027
5	76.00	0.09	0.027
6	74.28	0.08	0.027
7	74.54	0.00	0.027
8	75.48	0.09	0.075
9	74.71	0.00	0.075
10	77.87	0.00	0.030
11	74.11	0.09	0.030
12	75.05	0.00	0.030
13	78.90	-0.08	0.025
14	78.22	-0.08	0.025
15	79.24	0.00	0.025
16	78.13	0.08	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.25	-0.12	0.150
2	10.78	0.07	0.150
3	10.16	-0.21	0.100
4	10.48	0.01	0.150
5	9.86	0.34	0.225
6	9.18	-0.26	0.225

REF.VESSEL DP= 0.2518 ( 0.0033) PSID  
 DRYWELL PRESSURE= 73.3670 ( -0.0100) PSIA  
 AVG.DEWPOINT PRESS= 11.332 ( -0.0092) IN H2O  
 AVG.CONT.TEMP= 74.253 ( 0.0190) DEG.F

INTERVAL 45 LEAK RATE= 0.291 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.263 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.009 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.321 + 0.0127 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.17 < SLOPE < 0.19

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.237 + 0.0034 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.03 < SLOPE < 0.03  
 -0.15 < LEAK RATE < 0.73

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64436.50 POUNDS  
 LEAK RATE= 0.253 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.013 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 47  
 11/ 7/ 76 0140 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 15.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.00	0.037
2	78.22	0.09	0.027
3	75.05	-0.09	0.027
4	74.62	0.03	0.027
5	75.99	-0.09	0.027
6	74.28	0.00	0.027
7	74.54	0.00	0.027
8	75.48	0.00	0.075
9	74.79	0.08	0.075
10	77.79	-0.08	0.030
11	74.02	-0.09	0.030
12	75.05	0.00	0.030
13	78.90	0.00	0.025
14	78.13	-0.09	0.025
15	79.07	-0.17	0.025
16	78.05	-0.08	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.29	0.04	0.150
2	10.59	-0.19	0.150
3	10.17	0.01	0.100
4	10.47	-0.01	0.150
5	9.68	-0.18	0.225
6	9.40	0.22	0.225

REF.VESSEL DP= 0.2559 ( 0.0041) PSID  
 DRYWELL PRESSURE= 73.3640 ( -0.0030) PSIA  
 AVG.DEWPOINT PRESS= 11.318 ( -0.0141) IN H2O  
 AVG.CONT.TEMP= 74.245 ( -0.0080) DEG.F

INTERVAL 46 LEAK RATE= 0.355 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.265 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.998 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.357 + 0.0006 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.18 < SLOPE < 0.18

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.234 + 0.0039 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.03  
 -0.14 < LEAK RATE < 0.73

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64433.30 POUNDS  
 LEAK RATE= 0.254 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.012 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 48  
11/ 7/ 76 0200 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 15.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.75	0.00	0.027
2	78.22	0.00	0.027
3	75.05	0.00	0.027
4	74.54	-0.08	0.027
5	76.00	0.09	0.027
6	74.28	0.00	0.027
7	74.62	0.08	0.027
8	75.48	0.00	0.075
9	74.79	0.00	0.075
10	77.87	0.08	0.030
11	74.11	0.09	0.030
12	75.14	0.09	0.030
13	78.81	-0.09	0.025
14	78.13	0.00	0.025
15	79.15	0.08	0.025
16	78.05	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.45	0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.35	0.06	0.150
2	10.69	0.10	0.150
3	10.44	0.27	0.100
4	10.55	0.08	0.150
5	10.02	0.34	0.225
6	9.33	-0.07	0.225

REF.VESSEL DP= 0.2575 ( 0.0016) PSID  
 DRYWELL PRESSURE= 73.3660 ( 0.0020) PSIA  
 AVG.DEWPOINT PRESS= 11.441 ( 0.1238) IN H2O  
 AVG.CONT.TEMP= 74.268 ( 0.0230) DEG.F

INTERVAL 47 LEAK RATE= 0.597 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.272 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.992 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.394 - 0.0013 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.18 < SLOPE < 0.18  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.221 + 0.0063 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.03  
 -0.10 < LEAK RATE < 0.74

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64427.90 POUNDS  
 LEAK RATE= 0.257 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.012 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 49  
 11/ 7/ 76 0220 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 16.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.75	0.00	0.027
2	78.22	0.00	0.027
3	75.14	0.09	0.027
4	74.71	0.17	0.027
5	76.08	0.00	0.027
6	74.28	0.00	0.027
7	74.71	0.09	0.027
8	75.48	0.00	0.075
9	74.79	0.00	0.075
10	77.96	0.09	0.030
11	74.11	0.00	0.030
12	75.14	0.00	0.030
13	78.81	0.00	0.025
14	78.22	0.09	0.025
15	79.15	0.00	0.025
16	78.05	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	-0.09	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.35	0.00	0.150
2	10.70	0.01	0.150
3	10.55	0.11	0.100
4	10.48	-0.07	0.150
5	9.74	-0.28	0.225
6	9.13	-0.20	0.225

REF. VESSEL DP= 0.2576 ( 0.0001) PSID  
 DRYWELL PRESSURE= 73.3720 ( 0.0060) PSIA  
 AVG. DEWPOINT PRESS= 11.336 ( -0.1059) IN H2O  
 AVG. CONT. TEMP= 74.272 ( 0.0040) DEG.F

INTERVAL 48 LEAK RATE= -0.368 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.258 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.998 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.375 - 0.0299 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.22 < SLOPE < 0.16

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.250 + 0.0010 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.03 < SLOPE < 0.03  
 -0.16 < LEAK RATE < 0.59

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64431.10 POUNDS  
 LEAK RATE= 0.257 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.012 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 50  
 11/ 7/ 76 0240 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 16.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.75	0.00	0.027
2	78.22	0.00	0.027
3	75.14	0.00	0.027
4	74.62	-0.09	0.027
5	76.08	0.00	0.027
6	74.20	-0.08	0.027
7	74.62	-0.09	0.027
8	75.48	0.00	0.075
9	74.79	0.00	0.075
10	77.87	-0.09	0.030
11	74.11	0.00	0.030
12	75.14	0.00	0.030
13	78.98	0.17	0.025
14	78.30	0.08	0.025
15	79.33	0.18	0.025
16	78.22	0.17	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.55	0.20	0.150
2	10.69	-0.01	0.150
3	10.48	-0.07	0.100
4	10.49	0.01	0.150
5	9.70	-0.04	0.225
6	9.32	0.19	0.225

REF.VESSEL DP=	0.2611	( 0.0035)	PSID
DRYWELL PRESSURE=	73.3660	( -0.0060)	PSIA
AVG.DEWPOINT PRESS=	11.392	( 0.0567)	IN H2O
AVG.CONT.TEMP=	74.277	( 0.0050)	DEG.F

INTERVAL 49 LEAK RATE=	0.547	WT%/24HRS
TOTAL TIME LEAK RATE=	0.264	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.991	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.326 -	0.0017 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.19 <	SLOPE < 0.19
LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.239 +	0.0031 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.02 <	SLOPE < 0.03
	-0.13 <	LEAK RATE < 0.70

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64426.20	POUNDS
LEAK RATE=	0.259	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.011	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 51  
 11/ 7/ 76 0300 HOURS  
 LAST INTERVAL, HOURS 0.33 HOURS FROM T=0 16.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.84	0.09	0.027
2	78.22	0.00	0.027
3	75.14	0.00	0.027
4	74.62	0.00	0.027
5	76.17	0.09	0.027
6	74.37	0.17	0.027
7	74.62	0.00	0.027
8	75.48	0.00	0.075
9	74.79	0.00	0.075
10	77.96	0.09	0.030
11	74.11	0.00	0.030
12	75.22	0.08	0.030
13	78.98	0.00	0.025
14	78.30	0.00	0.025
15	79.24	-0.09	0.025
16	78.22	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.37	-0.18	0.150
2	10.62	-0.07	0.150
3	10.29	-0.19	0.100
4	10.47	-0.02	0.150
5	9.45	-0.25	0.225
6	9.33	0.01	0.225

REF. VESSEL DP= 0.2641 ( 0.0030) PSID  
 DRYWELL PRESSURE= 73.3660 ( 0.0000) PSIA  
 AVG. DEWPOINT PRESS= 11.279 ( -0.1135) IN H2O  
 AVG. CONT. TEMP= 74.290 ( 0.0130) DEG.F

INTERVAL 50 LEAK RATE= -0.110 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.257 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.987 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.144 + 0.0412 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.13 < SLOPE < 0.21

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.255 + 0.0003 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.15 < LEAK RATE < 0.67

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64427.10 POUNDS  
 LEAK RATE= 0.259 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.011 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 52  
 11/ 7/ 76 0320 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 17.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.84	0.00	0.027
2	78.30	0.00	0.027
3	75.14	0.00	0.027
4	74.71	0.00	0.027
5	76.17	0.00	0.027
6	74.45	0.00	0.027
7	74.62	0.00	0.027
8	75.57	0.00	0.075
9	74.79	0.00	0.075
10	78.05	0.00	0.030
11	74.20	0.00	0.030
12	75.22	0.00	0.030
13	78.98	0.00	0.025
14	78.30	0.00	0.025
15	79.33	0.00	0.025
16	78.22	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.48	0.11	0.150
2	10.53	-0.09	0.150
3	10.35	0.06	0.100
4	10.37	-0.10	0.150
5	9.09	-0.36	0.225
6	9.21	-0.12	0.225

REF. VESSEL DP=	0.2627	( -0.0014)	PSID
DRYWELL PRESSURE=	73.3710	( 0.0050)	PSIA
AVG. DEWPOINT PRESS=	11.165	( -0.1139)	IN H2O
AVG. CONT. TEMP=	74.311	( 0.0210)	DEG.F

INTERVAL 51 LEAK RATE=	-0.547	WT%/24HRS
TOTAL TIME LEAK RATE=	0.241	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.003	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.563 -	0.1399 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.27 <	SLOPE < -0.61

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.286 -	0.0052 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.03 <	SLOPE < 0.02
	-0.21 <	LEAK RATE < 0.61

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64431.90	POUNDS
LEAK RATE=	0.257	WT%/24HRS
95% CONFIDENCE LEVEL=	-172- +/- 0.010	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 53  
11/ 7/ 76 0340 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 17.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.81	-0.03	0.027
2	78.20	-0.10	0.027
3	75.20	0.00	0.027
4	74.69	-0.02	0.027
5	76.14	-0.03	0.027
6	74.43	-0.02	0.027
7	74.69	0.07	0.027
8	75.54	-0.03	0.075
9	74.77	-0.02	0.075
10	77.94	-0.11	0.030
11	74.17	-0.03	0.030
12	75.12	-0.10	0.030
13	79.05	0.07	0.025
14	78.45	0.15	0.025
15	79.47	0.14	0.025
16	78.20	-0.02	0.025
17	72.46	-0.02	0.118
18	72.11	-0.02	0.118
19	72.28	-0.03	0.118
20	71.34	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.27	-0.21	0.150
2	10.52	-0.01	0.150
3	10.19	-0.16	0.100
4	10.41	0.04	0.150
5	9.32	0.23	0.225
6	9.21	0.00	0.225

REF.VESSEL DP= 0.2700 ( 0.0073) PSID  
 DRYWELL PRESSURE= 73.3630 ( -0.0080) PSIA  
 AVG.DEWPOINT PRESS= 11.173 ( 0.0085) IN H2O  
 AVG.CONT.TEMP= 74.296 ( -0.0150) DEG.F

INTERVAL 52 LEAK RATE= 0.753 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.251 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.003 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.626 - 0.1388 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.27 < SLOPE < -0.00

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.265 - 0.0016 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.17 < LEAK RATE < 0.64

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64425.10 POUNDS  
 LEAK RATE= 0.257 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.010 WT%/24HRS

COOPER H. NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 54  
 11/ 7/ 76 0400 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 17.66

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.90	0.09	0.027
2	78.28	0.08	0.027
3	75.20	0.00	0.027
4	74.69	0.00	0.027
5	76.23	0.09	0.027
6	74.34	-0.09	0.027
7	74.69	0.00	0.027
8	75.54	0.00	0.075
9	74.86	0.09	0.075
10	77.94	0.00	0.030
11	74.17	0.00	0.030
12	75.20	0.08	0.030
13	79.13	0.08	0.025
14	78.37	-0.08	0.025
15	79.30	-0.17	0.025
16	78.20	0.00	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.44	0.17	0.150
2	10.80	0.28	0.150
3	10.27	0.08	0.100
4	10.48	0.07	0.150
5	9.48	0.16	0.225
6	9.12	-0.09	0.225

REF.VESSEL DP=	0.2720	( 0.0020)	PSID
DRYWELL PRESSURE=	73.3630	( 0.0000)	PSIA
AVG.DEWPOINT PRESS=	11.275	( 0.1018)	IN H2O
AVG.CONT.TEMP=	74.305	( 0.0090)	DEG.F

INTERVAL 53 LEAK RATE=	0.559	WT%/24HRS
TOTAL TIME LEAK RATE=	0.257	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.997	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.421 -	0.0573 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.19 <	SLOPE < 0.08

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.253 +	0.0005 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.02 <	SLOPE < 0.02
	-0.14 <	LEAK RATE < 0.66

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64420.00	POUNDS
LEAK RATE=	0.257	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.010	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 55  
 11/ 78 0420 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 18.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.90	0.00	0.027
2	78.28	0.00	0.027
3	75.29	0.09	0.027
4	74.69	0.00	0.027
5	76.23	0.00	0.027
6	74.43	0.09	0.027
7	74.77	0.08	0.027
8	75.63	0.09	0.075
9	74.86	0.00	0.075
10	78.11	0.17	0.030
11	74.26	0.09	0.030
12	75.29	0.09	0.030
13	79.13	0.00	0.025
14	78.45	0.08	0.025
15	79.30	0.00	0.025
16	78.20	0.00	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.55	0.11	0.150
2	10.53	-0.27	0.150
3	10.34	0.07	0.100
4	10.57	0.09	0.150
5	9.83	0.35	0.225
6	9.28	0.16	0.225

REF.VESSEL DP= 0.2702 ( -0.0018) PSID  
 DRYWELL PRESSURE= 73.3680 ( 0.0050) PSIA  
 AVG.DEWPOINT PRESS= 11.386 ( 0.1113) IN H2O  
 AVG.CONT.TEMP= 74.332 ( 0.0270) DEG.F

INTERVAL 54 LEAK RATE= 0.216 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.256 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.987 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.426 - 0.0626 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.20 < SLOPE < 0.07

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.251 + 0.0002 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.13 < LEAK RATE < 0.65

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64418.00 POUNDS  
 LEAK RATE= 0.258 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.009 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 56  
 11/ 7/ 76 0440 HOURS  
 LAST INTERVAL HOURS 0.33

HOURS FROM T=0 18.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.99	0.09	0.027
2	78.37	0.09	0.027
3	75.37	0.08	0.027
4	74.86	0.17	0.027
5	76.40	0.17	0.027
6	74.52	0.09	0.027
7	74.86	0.09	0.027
8	75.72	0.09	0.075
9	74.95	0.09	0.075
10	78.28	0.17	0.030
11	74.34	0.08	0.030
12	75.46	0.17	0.030
13	79.22	0.09	0.025
14	78.54	0.09	0.025
15	79.56	0.26	0.025
16	78.37	0.17	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.47	-0.08	0.150
2	10.41	-0.12	0.150
3	10.41	0.07	0.100
4	10.53	-0.04	0.150
5	9.53	-0.30	0.225
6	9.02	-0.26	0.225

REF.VESSEL DP=	0.2712	( 0.0010)	PSID
DRYWELL PRESSURE=	73.3760	( 0.0080)	PSIA
AVG.DEWPOINT PRESS=	11.232	( -0.1548)	IN H2O
AVG.CONT.TEMP=	74.394	( 0.0620)	DEG.F

INTERVAL 55 LEAK RATE=	-0.461	WT%/24HRS
TOTAL TIME LEAK RATE=	0.243	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.997	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.416 -	0.0937 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.24 <	SLOPE < 0.05

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.280 -	0.0040 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.03 <	SLOPE < 0.02
	-0.18 <	LEAK RATE < 0.60

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64422.10	POUNDS
LEAK RATE=	0.257	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.009	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 57  
11/ 7/ 76 0500 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 18.66

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.99	0.00	0.027
2	79.45	0.00	0.027
3	75.29	-0.08	0.027
4	74.77	-0.09	0.027
5	76.40	0.00	0.027
6	74.43	-0.09	0.027
7	74.77	-0.09	0.027
8	75.72	0.00	0.075
9	75.03	0.08	0.075
10	78.02	-0.26	0.030
11	74.34	0.00	0.030
12	75.29	-0.17	0.030
13	79.22	0.00	0.025
14	78.62	0.00	0.025
15	79.56	0.00	0.025
16	78.28	-0.09	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.34	-0.13	0.150
2	10.66	0.25	0.150
3	10.33	-0.08	0.100
4	10.51	-0.02	0.150
5	10.19	0.66	0.225
6	9.27	0.25	0.225

REF.VESSEL DP= 0.2765 ( 0.0053) PSID  
 DRYWELL PRESSURE= 73.3600 ( -0.0160) PSIA  
 AVG.DEWPOINT PRESS= 11.443 ( 0.2114) IN H2O  
 AVG.CONT.TEMP= 74.380 ( -0.0140) DEG.F

INTERVAL 56 LEAK RATE= 1.279 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.261 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.026 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.210 + 0.0266 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.16 < SLOPE < 0.21  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.242 + 0.0020 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.12 < LEAK RATE < 0.68

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64410.60 POUNDS  
 LEAK RATE= 0.258 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.009 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 58  
 11/ 7/ 76 0520 HOURS  
 LAST INTERVAL, HOURS 0.33 HOURS FROM T=0 19.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.99	0.00	0.027
2	78.45	0.00	0.027
3	75.29	0.00	0.027
4	74.77	0.00	0.027
5	76.23	-0.17	0.027
6	74.52	0.09	0.027
7	74.86	0.09	0.027
8	75.72	0.00	0.075
9	74.95	-0.08	0.075
10	78.11	0.09	0.030
11	74.34	0.00	0.030
12	75.29	0.00	0.030
13	79.13	-0.09	0.025
14	78.45	-0.17	0.025
15	79.39	-0.17	0.025
16	78.28	0.00	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.49	0.15	0.150
2	10.59	-0.07	0.150
3	10.37	0.04	0.100
4	10.59	0.00	0.150
5	9.86	-0.33	0.225
6	9.25	-0.02	0.225

REF.VESSEL DP= 0.2789 ( 0.0024) PSID  
 DRYWELL PRESSURE= 73.3610 ( 0.0010) PSIA  
 AVG.DEWPOINT PRESS= 11.392 ( -0.0507) IN H2O  
 AVG.CONT.TEMP= 74.366 ( -0.0140) DEG.F

INTERVAL 57 LEAK RATE= 0.058 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.258 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.018 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.194 + 0.0225 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.16 < SLOPE < 0.21

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.250 + 0.0008 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.13 < LEAK RATE < 0.66

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64410.00 POUNDS  
 LEAK RATE= 0.258 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.008 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 59  
 11/ 7/ 76 0540 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 19.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	80.07	0.08	0.027
2	78.45	0.00	0.027
3	75.46	0.17	0.027
4	74.95	0.18	0.027
5	76.40	0.17	0.027
6	74.60	0.08	0.027
7	74.95	0.09	0.027
8	75.72	0.00	0.075
9	75.03	0.08	0.075
10	78.28	0.17	0.030
11	74.43	0.09	0.030
12	75.46	0.17	0.030
13	79.22	0.09	0.025
14	78.62	0.17	0.025
15	79.56	0.17	0.025
16	78.28	0.00	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.42	0.08	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.55	0.06	0.150
2	10.48	-0.11	0.150
3	10.30	-0.07	0.100
4	10.63	0.04	0.150
5	9.73	-0.13	0.225
6	9.48	0.23	0.225

REF.VESSEL DP=	0.2810	( 0.0021)	PSID
DRYWELL PRESSURE=	73.3690	( 0.0080)	PSIA
AVG.DEWPOINT PRESS=	11.406	( 0.0141)	IN H2O
AVG.CONT.TEMP=	74.426	( 0.0600)	DEG.F

INTERVAL 58 LEAK RATE=	0.250	WT%/24HRS
TOTAL TIME LEAK RATE=	0.257	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.009	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.196 +	0.0220 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.16 <	SLOPE < 0.21

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.251 +	0.0007 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.02 <	SLOPE < 0.02
	-0.12 <	LEAK RATE < 0.65

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64407.70	POUNDS
LEAK RATE=	0.258	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.008	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 60  
 11/ 7/ 76 0600 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 19.66

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	80.16	0.09	0.027
2	78.62	0.17	0.027
3	75.54	0.08	0.027
4	75.03	0.08	0.027
5	76.49	0.09	0.027
6	74.77	0.17	0.027
7	75.12	0.17	0.027
8	75.89	0.17	0.075
9	75.12	0.09	0.075
10	78.37	0.09	0.030
11	74.52	0.09	0.030
12	75.54	0.08	0.030
13	79.39	0.17	0.025
14	78.71	0.09	0.025
15	79.73	0.17	0.025
16	78.45	0.17	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	-0.08	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.48	-0.07	0.150
2	10.84	0.36	0.150
3	10.62	0.32	0.100
4	10.63	0.00	0.150
5	10.55	0.82	0.225
6	9.46	-0.02	0.225

REF.VESSEL DP= 0.2833 ( 0.0023) PSID  
 DRYWELL PRESSURE= 73.3710 ( 0.0020) PSIA  
 AVG.DEWPOINT PRESS= 11.662 ( 0.2556) IN H2O  
 AVG.CONT.TEMP= 74.481 ( 0.0550) DEG.F

INTERVAL 59 LEAK RATE= 1.131 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.272 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.026 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.082 + 0.1027 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.09 < SLOPE < 0.30

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.221 + 0.0051 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.01 < SLOPE < 0.02  
 -0.06 < LEAK RATE < 0.71

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64397.50 POUNDS  
 LEAK RATE= 0.260 WT%/24HRS  
 95% CONFIDENCE LEVEL= -180- +/- 0.008 WT%/24HRS

COOPER HILLDA STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 51  
 11/ 7/ 76 0620 HOURS  
 LAST INTERVAL HOURS 0.13 HOURS FROM T=0 20.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	70.33	0.17	0.037
2	70.88	0.26	0.027
3	75.80	0.26	0.027
4	75.30	0.17	0.027
5	76.66	0.17	0.027
6	74.86	0.09	0.027
7	75.29	0.17	0.027
8	76.06	0.17	0.075
9	75.29	0.17	0.075
10	78.37	0.00	0.030
11	74.60	0.08	0.030
12	75.63	0.09	0.030
13	79.56	0.17	0.025
14	78.88	0.17	0.025
15	79.81	0.08	0.025
16	78.62	0.17	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.42	0.08	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.53	0.05	0.150
2	10.84	0.00	0.150
3	10.53	-0.09	0.100
4	10.66	0.03	0.150
5	9.96	-0.59	0.225
6	9.53	0.07	0.225

REF.VESSEL DP= 0.2850 ( 0.0017) PSID  
 DRYWELL PRESSURE= 73.3800 ( 0.0090) PSIA  
 AVG.DEWPOINT PRESS= 11.548 ( -0.1138) IN H2O  
 AVG.CONT.TEMP= 74.571 ( 0.0900) DEG.F

INTERVAL 60 LEAK RATE= -0.250 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.264 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.026 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.130 + 0.0603 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.15 < SLOPE < 0.37

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.240 + 0.0023 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.10 < LEAK RATE < 0.57

MASS FLOW CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64000.70 POUNDS  
 LEAK RATE= 0.261 WT%/24HRS  
 95% CONF. LIMIT= +/- 0.009 WT%/24HRS

CONTAINMENT LEAKAGE RATE TEST--REFERENCE VESSEL METHOD  
 INTERIM REPORT OF CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NO. 1  
 11 04 00 HOURS  
 LAST INTERVAL--00:00 0.11 HOURS FROM T=0 20.33

TEMPERATURE	DEWPOINT F	CHANGE DEG.F	WT.FACTOR
1	70.50	0.00	0.027
2	70.71	-0.17	0.027
3	70.80	0.00	0.027
4	70.80	0.00	0.027
5	70.80	0.17	0.027
6	74.93	0.09	0.027
7	75.59	0.00	0.027
8	76.14	0.08	0.075
9	75.37	0.08	0.075
10	70.54	0.17	0.030
11	74.89	0.09	0.030
12	75.72	0.09	0.030
13	79.47	-0.09	0.025
14	70.88	0.00	0.025
15	79.90	0.09	0.025
16	70.62	0.00	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.42	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.63	0.10	0.150
2	10.82	-0.02	0.150
3	10.53	0.00	0.100
4	10.67	0.01	0.150
5	10.02	0.06	0.225
6	9.21	-0.32	0.225

REF.VESSEL DP= 0.2832 ( -0.0018) PSID  
 DRYWELL PRESSURE= 73.3840 ( 0.0040) PSIA  
 AVG.DEWPOINT PRESS= 11.503 ( -0.0449) IN H2O  
 AVG.CONT.TEMP= 74.596 ( 0.0250) DEG.F

INTERVAL 61 LEAK RATE= -0.341 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.254 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.029 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.103 + 0.0419 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.17 < SLOPE < 0.26  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.261 - 0.0007 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.01  
 -0.13 < LEAK RATE < 0.53

MASS FLOW CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64402.70 POUNDS  
 LEAK COEFF= 0.261 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.008 WT%/24HRS

COOPER MODEL- STATION--REFERENCE VESSEL METHOD  
 DATE--11/11/76-- CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET NUMBER 62  
 11 74 0700 HOURS  
 LAST INTERVAL HOURS 0.12 HOURS FROM T=0 20.66

TEMPERATURE	DEGREE F	CHANGE DEG.F	WT.FACTOR
1	80.52	0.19	0.027
2	78.90	0.19	0.027
3	75.81	0.02	0.027
4	75.39	0.19	0.027
5	76.85	0.02	0.027
6	74.97	0.02	0.027
7	75.39	0.10	0.027
8	76.17	0.03	0.075
9	75.48	0.11	0.075
10	78.73	0.19	0.030
11	74.79	0.10	0.030
12	75.82	0.10	0.030
13	79.58	0.11	0.025
14	78.98	0.10	0.025
15	79.92	0.02	0.025
16	78.64	0.02	0.025
17	72.48	0.02	0.118
18	72.13	0.02	0.118
19	72.31	0.03	0.118
20	71.36	-0.06	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.55	-0.08	0.150
2	10.49	-0.33	0.150
3	10.51	-0.02	0.100
4	10.59	-0.08	0.150
5	9.39	-0.63	0.225
6	9.30	0.09	0.225

REF. VESSEL DF= 0.2822 ( -0.0010) PSID  
 DRYWELL PRESSURE= 73.3950 ( 0.0110) PSIA  
 AVG. DEWPOINT PRESS= 11.307 ( -0.1968) IN H2O  
 AVG. CONT. TEMP= 74.645 ( 0.0490) DEG F

INTERVAL 62 LEAK RATE= -0.807 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.237 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.056 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.378 - 0.0995 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.32 < SLOPE < 0.13

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.295 - 0.0055 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.01  
 -0.21 < LEAK RATE < 0.57

WISS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS DRY AIR= 64489.90 POUNDS  
 LEAK RATE= 0.259 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.007 WT%/24HRS

DOCKET NUMBER STATION--REFERENCE VESSEL METHOD  
 INTERNAL LEAKAGE CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 64  
 11 75 0720 HOURS  
 LAST INTERVAL HOURS 0.53 HOURS FROM T=0 21.00

TEMPERATURE	DEGREE F	CHANGE DEG.F	WT.FACTOR
1	80.50	0.06	0.027
2	78.96	0.06	0.027
3	75.83	0.07	0.027
4	75.37	-0.02	0.027
5	76.83	-0.02	0.027
6	75.03	0.06	0.027
7	75.37	-0.02	0.027
8	76.23	0.06	0.075
9	75.54	0.06	0.075
10	78.62	-0.11	0.030
11	74.77	-0.02	0.030
12	75.89	0.07	0.030
13	79.81	0.23	0.025
14	79.13	0.15	0.025
15	80.07	0.15	0.025
16	78.79	0.15	0.025
17	72.46	-0.02	0.118
18	72.11	-0.02	0.118
19	72.28	-0.03	0.118
20	71.34	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.53	-0.02	0.150
2	10.88	0.39	0.150
3	10.74	0.23	0.100
4	10.70	0.11	0.150
5	9.91	0.52	0.225
6	9.34	0.04	0.225

REF. VESSEL DP= 0.2856 ( 0.0034) PSID  
 DRYWELL PRESSURE= 73.3890 ( -0.0060) PSIA  
 AVG. DEWPOINT PRESS= 11.527 ( 0.2209) IN H2O  
 AVG. CONT. TEMP= 74.664 ( 0.0190) DEG.F

INTERVAL 63 LEAK RATE= 1.121 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.251 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.071 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.159 + 0.0206 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.23 < SLOPE < 0.27  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.365 - 0.0013 X HRS  
 90% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.15 < LEAK RATE < 0.63

BASE PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS/DRY AIR= 64399.80 POUNDS  
 LEAK RATE= 0.259 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.007 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 45  
11: 76 0740 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 21.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	80.60	0.02	0.027
2	78.98	0.02	0.027
3	75.93	0.10	0.027
4	75.48	0.11	0.027
5	76.85	0.02	0.027
6	75.14	0.11	0.027
7	75.57	0.20	0.027
8	76.34	0.11	0.075
9	75.57	0.03	0.075
10	78.73	0.11	0.030
11	74.79	0.02	0.030
12	75.91	0.02	0.030
13	79.75	-0.06	0.025
14	79.15	0.02	0.025
15	80.09	0.02	0.025
16	78.81	0.02	0.025
17	72.48	0.02	0.118
18	72.13	0.02	0.118
19	72.31	0.03	0.118
20	71.36	0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.55	0.02	0.150
2	10.59	-0.29	0.150
3	10.63	-0.11	0.100
4	10.73	0.03	0.150
5	9.40	-0.51	0.225
6	9.41	0.07	0.225

REF.VESSEL DP= 0.2885 ( 0.0029) PSID  
 DRYWELL PRESSURE= 73.3920 ( 0.0030) PSIA  
 AVG.DEWPOINT PRESS= 11.381 ( -0.1460) IN H2O  
 AVG.CONT.TEMP= 74.705 ( 0.0410) DEG.F

INTERVAL 64 LEAK RATE= -0.240 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.243 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.069 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.299 - 0.0484 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.30 < SLOPE < 0.20

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.280 - 0.0034 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE LEAK RATE  
 -4.02 < SLOPE 0.01  
 -0.18 < LEAK RATE 0.33

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS DRY AIR= 54101.99 POUNDS  
 LEAK RATE= 0.250 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.007 WT%/24HRS

COOPER VULCAN STATION--REFERENCE VESSEL METHOD  
 INITIAL TEST PERIOD CONTINUED LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 66  
 11 75 0300 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 21.66

TEMPERATURE	DEGREES F	CHANGE DEG. F	WT. FACTOR
1	80.52	-0.08	0.017
2	78.98	0.00	0.017
3	75.91	-0.03	0.017
4	75.43	0.00	0.017
5	76.83	0.00	0.017
6	75.63	-0.09	0.017
7	75.09	-0.18	0.027
8	76.23	-0.09	0.015
9	75.97	0.00	0.015
10	78.90	0.17	0.030
11	74.88	0.09	0.030
12	75.99	0.08	0.030
13	79.75	0.00	0.025
14	79.15	0.00	0.025
15	80.01	-0.08	0.025
16	78.81	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1 INCH.	WT. FACTOR
1	10.70	0.15	0.150
2	10.84	0.25	0.150
3	10.59	-0.04	0.100
4	10.73	0.00	0.150
5	9.44	0.04	0.225
6	9.28	-0.13	0.225

REF. VESSEL DP= 0.2879 ( -0.0006) PSID  
 DRYWELL PRESSURE= 73.3890 ( -0.0030) PSIA  
 AVG. DEWPOINT PRESS= 11.417 ( 0.0358) IN H2O  
 AVG. CONT. TEMP= 74.695 ( -0.0100) DEG. F

INTERVAL 65 LEAK RATE= 0.070 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.240 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.062 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.525 - 0.1324 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.36 < SLOPE < 0.09

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.284 - 0.0040 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.01  
 -0.18 < LEAK RATE < 0.31

COOPER VULCAN STATION--REFERENCE VESSEL METHOD

INITIAL POINT TOTAL MASS (DRY AIR)= 44401.30 POUNDS  
 0.257 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.007 WT%/24HRS

LEAK RATE TEST STATION--REFERENCE VESSEL METHOD  
 DATE: 11/15/75 TEST TIME: 10:00 AM TEST DATE: 11/15/75

DATA SET: 11  
 11 HOURS FROM T=0 12.00  
 LAST INTERFERED 0.11

TEMPERATURE	DEGREE F	CHANGE DEG. F	WT. FACTOR
1	78.52	0.00	0.017
2	78.66	-0.03	0.017
3	78.62	-0.04	0.017
4	78.31	-0.17	0.017
5	78.65	0.00	0.017
6	78.65	0.00	0.017
7	78.69	0.00	0.017
8	78.25	0.00	0.075
9	78.57	0.00	0.075
10	78.64	-0.26	0.030
11	74.79	-0.09	0.030
12	75.91	-0.08	0.030
13	79.75	0.00	0.025
14	79.15	0.00	0.025
15	80.09	0.08	0.025
16	78.81	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT. FACTOR
1	10.49	-0.21	0.150
2	10.90	0.06	0.150
3	10.37	-0.22	0.100
4	10.66	-0.07	0.150
5	10.04	0.60	0.225
6	9.26	-0.02	0.225

REF. VESSEL DP= 0.2904 ( 0.0025) PSID  
 DRYWELL PRESSURE= 73.3810 ( -0.0080) PSIA  
 AVG. DEWPOINT PRESS= 11.493 ( 0.0753) IN H2O  
 AVG. CONT. TEMP= 74.675 ( -0.0200) DEG. F

INTERVAL 66 LEAK RATE= 0.518 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.244 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.056 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.346 - 0.0576 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.29 ( SLOPE ( 0.17

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.274 - 0.0027 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 ( SLOPE ( 0.01  
 -0.16 ( LEAK RATE ( 0.59

PAAS FLOT CONTINGENT LEAKAGE RATE ANALYSIS

MINIMUM TOTAL MASS DAY AIR= 44396.50 POUNDS  
 LEAK RATE= 0.256 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.007 WT%/24HRS

DATA SET 11.000 48  
 11 75 0840 HOURS  
 LAST INTER. 11.000 0.13 HOURS FROM T=0 22.03

TEMPERATURE	TEMPERATURE	CHANGE DEG.F	WT.FACTOR
1	80.52	0.00	0.027
2	78.98	0.03	0.027
3	75.91	0.09	0.027
4	75.31	0.00	0.027
5	76.65	0.00	0.027
6	75.05	0.00	0.027
7	75.31	-0.08	0.027
8	76.25	0.00	0.075
9	75.40	-0.09	0.075
10	78.73	0.09	0.030
11	74.79	0.00	0.030
12	75.91	0.00	0.030
13	79.67	-0.08	0.025
14	79.15	0.00	0.025
15	80.01	-0.08	0.025
16	78.81	0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.45	0.09	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.70	0.21	0.150
2	10.83	-0.07	0.150
3	10.67	0.30	0.100
4	10.69	0.03	0.150
5	9.98	-0.06	0.225
6	9.48	0.22	0.225

REF. VESSEL DP= 0.2887 ( -0.0017) PSID  
 DRYWELL PRESSURE= 73.3830 ( 0.0020) PSIA  
 AVG. DEWPOINT PRESS= 11.584 ( 0.0015) IN H2O  
 AVG. CONT. TEMP= 74.680 ( 0.0050) DEG.F

INTERVAL ST LEAK RATE= 0.158 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.243 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.048 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.257 - 0.0397 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.26 < SLOPE < 0.20

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.376 - 0.0023 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE LEAK RATE -0.02 < SLOPE < 0.01  
 -0.16 < LEAK RATE < 0.51

# 4-35 PLOT CONTINGENT LEAKAGE RATE ANALYSIS

CONTINGENT TOTAL CONT. LEAK RATE= 44345.00 POUNDS  
 LEAK RATE= 0.258 MTX/24HRS  
 95% CONFIDENCE LIMITS = +/- 0.007 MTX/24HRS

CONTAINMENT LEAKAGE RATE TEST--NOV. 1978  
 DIRECTORATE OF ENVIRONMENTAL PROTECTION  
 DATA SET OBJECT 03

11 0700 HOURS

LAST INTERNAL WGT 0.00

HOURS FROM T=0 22.88

TEMPERATURE	DEGREE F	CHANGE DEG.F	WT.FACTOR
1	80.20	0.00	0.027
2	78.90	-0.08	0.027
3	75.92	-0.09	0.027
4	75.39	0.03	0.027
5	75.85	0.00	0.027
6	74.97	-0.08	0.027
7	75.31	0.00	0.027
8	76.25	0.00	0.075
9	75.48	0.00	0.075
10	78.73	0.00	0.030
11	74.88	0.09	0.030
12	75.91	0.00	0.030
13	79.75	0.08	0.025
14	79.15	0.00	0.025
15	80.09	0.08	0.025
16	78.81	0.00	0.025
17	72.48	0.06	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	-0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.71	0.01	0.150
2	10.59	-0.24	0.150
3	10.53	-0.14	0.100
4	10.63	-0.06	0.150
5	10.02	0.04	0.225
6	9.14	-0.34	0.225

REF. VESSEL DP= 0.2951 ( 0.0064) PSID  
 DRYWELL PRESSURE= 73.3790 ( -0.0040) PSIA  
 AVG. DEWPOINT PRESS= 11.459 ( -0.1250) IN H2O  
 AVG. CONT. TEMP= 74.673 ( -0.0070) DEG.F

INTERVAL 68 LEAK RATE= 0.187 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.242 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= + - 1.040 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.251 - 0.0279 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.25 < SLOPE < 0.20

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.377 - 0.0020 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.03 < SLOPE < 0.01  
 -0.15 < LEAK RATE < 0.07

95% PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS DRY AIR= 64000.00 POUNDS  
 0.005 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/ - 0.005 WT%/24HRS

OVERHEAD REFERENCE VESSEL METHOD  
 INITIAL LEAKAGE RATE TEST-NOV. 1976

DATA FOR NO. 73  
 11/17/76 0920 HOURS  
 UNIT: PPM/INCH-H2O 0.12 HOURS FROM T=0 23.00

TEMPERATURE	DEGREE F	CHANGE DEG. F	WT. FACTOR
1	80.60	0.00	0.037
2	79.97	0.17	0.037
3	75.91	0.09	0.037
4	75.48	0.09	0.037
5	76.94	0.09	0.037
6	75.05	0.08	0.037
7	75.39	0.08	0.037
8	76.25	0.00	0.075
9	75.48	0.00	0.075
10	78.56	-0.17	0.030
11	74.88	0.00	0.030
12	75.82	-0.09	0.030
13	79.75	0.00	0.025
14	79.07	-0.08	0.025
15	80.01	-0.08	0.025
16	78.90	0.09	0.025
17	72.56	0.08	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.45	0.09	0.118

DEWPOINT	IN. WATER	CHANGE 1 INCH.	WT. FACTOR
1	10.77	0.06	0.150
2	10.80	0.21	0.150
3	10.62	0.09	0.100
4	10.71	0.08	0.150
5	9.83	-0.19	0.225
6	9.30	0.16	0.225

REF. VESSEL DP= 0.3008 ( 0.0057) PSID  
 DRYWELL PRESSURE= 73.3700 ( -0.0090) PSIA  
 AVG. DEWPOINT PRESS= 11.514 ( 0.0545) IN H2O  
 AVG. CONT. TEMP= 74.700 ( 0.0270) DEG. F

INTERVAL 60 LEAK RATE= 0.753 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.250 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.040 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.373 - 0.0442 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.27 < SLOPE < 0.18  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.261 - 0.0009 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE LEAK RATE  
 -0.03 < SLOPE < 0.01  
 -0.12 < LEAK RATE < 0.00

INITIAL CONTINUENT LEAKAGE RATE ANALYSIS

INITIAL CONT. LEAKAGE RATE (PPM/INCH-H2O)  
 0.254 POUNDS  
 95% CONF. LIMIT  
 +/- 0.008 WT%/24HRS

REF. VESSEL DP= 0.2994 ( -0.0014) PSID  
 DRYWELL PRESSURE= 73.3800 ( 0.0100) PSIA  
 AVG. DWP. PRESS= 11.502 ( -0.0115) IN H2O  
 AVG. CONT. TEMP= 74.735 ( 0.0350) DEG.F

INTERVAL TO LEAK RATE= -0.184 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.244 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.037 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.140 + 0.0152 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.19 < SLOPE < 0.23

TIME (HRS)	TEMP (F)	CHANGE (DEG.F)	WT. FACTOR
1	76.50	0.00	0.017
2	75.97	0.00	0.017
3	75.99	0.00	0.017
4	75.48	0.00	0.017
5	77.11	0.17	0.017
6	75.22	0.17	0.017
7	75.48	0.09	0.017
8	75.34	0.09	0.017
9	75.57	0.09	0.017
10	78.73	0.17	0.030
11	74.97	0.09	0.030
12	75.99	0.17	0.030
13	79.75	0.00	0.025
14	79.15	0.00	0.025
15	80.09	0.00	0.025
16	78.90	0.00	0.025
17	72.48	-0.08	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.45	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR

1	10.73	-0.04	0.150
2	11.09	0.29	0.150
3	10.48	-0.14	0.100
4	10.70	-0.01	0.150
5	9.71	-0.12	0.225
6	9.27	-0.03	0.225

REF. VESSEL DP= 0.2994 ( -0.0014) PSID  
 DRYWELL PRESSURE= 73.3800 ( 0.0100) PSIA  
 AVG. DWP. PRESS= 11.502 ( -0.0115) IN H2O  
 AVG. CONT. TEMP= 74.735 ( 0.0350) DEG.F

INTERVAL TO LEAK RATE= -0.184 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.244 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.037 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.140 + 0.0152 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.19 < SLOPE < 0.23

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.373 - 0.0025 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE LEAK RATE  
 -0.03 < SLOPE < 0.01  
 -0.14 < LEAK RATE < 0.57

LEAK RATE TREND SINCE T=0

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.373 - 0.0025 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE LEAK RATE  
 -0.03 < SLOPE < 0.01  
 -0.14 < LEAK RATE < 0.57

COOPER WILCOX STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1978

DATA SET NUMBER 73  
11 78 1000 HOURS  
LAST INTER-AL-HOURS 0.10 HOURS FROM T=0 23.68

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	80.69	0.09	0.017
2	79.24	0.17	0.017
3	78.08	0.09	0.017
4	78.65	0.17	0.027
5	77.11	0.00	0.027
6	75.31	0.09	0.027
7	75.65	0.17	0.027
8	76.43	0.08	0.075
9	75.74	0.17	0.075
10	78.98	0.25	0.030
11	75.05	0.08	0.030
12	76.08	0.09	0.030
13	79.84	0.09	0.025
14	79.24	0.09	0.025
15	80.18	0.09	0.025
16	78.98	0.08	0.025
17	72.56	0.08	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	-0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT. FACTOR
1	10.62	-0.11	0.150
2	10.95	-0.14	0.150
3	10.73	0.25	0.100
4	10.70	0.00	0.150
5	9.69	-0.02	0.225
6	9.59	0.32	0.225

REF. VESSEL DP= 0.3031 ( 0.0037) PSID  
 DRYWELL PRESSURE= 73.3910 ( 0.0110) PSIA  
 AVG. DEWPOINT PRESS= 11.557 ( 0.0552) IN H2O  
 AVG. CONT. TEMP= 74.795 ( 0.0600) DEG.F

INTERNAL T1 LEAK RATE= 0.554 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.248 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.030 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.130 + 0.0065 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.17 X SLOPE < 0.24

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.263 + 0.0010 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 SLOPE 0.01  
 -0.12 LEAK RATE 0.19

95% POINT CONTAINMENT LEAKAGE RATE ANALYSIS

95% POINT TOTAL HRS- DP SLOPE= 44380.10 POUNDS  
 LEAK RATE= 0.154 WT%/24HRS  
 95% CONF. LIMIT FOR TREND= +/- 0.005 WT%/24HRS

COBERT DRYWELL ISOLATION--REFERENCE VESSEL METHOD  
 INTERMITTENT LEAKAGE RATE TEST--NOV. 1975

DATA SET 524  
 11 72 1920 HOURS  
 LAST INTERVAL HOURS 0.23 HOURS FROM T=0 24.00

TEMPERATURE	DEGREE F	CHANGE DEG.F	WT.FACT.F
1	80.84	0.15	0.027
2	79.23	-0.02	0.027
3	76.23	0.15	0.027
4	75.80	0.15	0.027
5	77.43	0.32	0.027
6	75.46	0.15	0.027
7	75.72	0.07	0.027
8	76.49	0.07	0.075
9	75.80	0.06	0.075
10	79.13	0.15	0.030
11	75.12	0.07	0.030
12	76.23	0.15	0.030
13	79.99	0.15	0.025
14	79.39	0.15	0.025
15	80.33	0.15	0.025
16	79.05	0.07	0.025
17	72.54	-0.02	0.118
18	72.11	-0.02	0.118
19	72.37	0.06	0.118
20	71.42	0.06	0.118

DWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.76	0.14	0.150
2	10.98	0.03	0.150
3	10.56	-0.17	0.100
4	10.81	0.11	0.150
5	9.84	0.15	0.225
6	9.30	-0.29	0.225

REF.VESSEL DP= 0.2984 ( -0.0047) PSID  
 DRYWELL PRESSURE= 73.4030 ( 0.0120) PSIA  
 AVG.DWPOINT PRESS= 11.551 ( -0.0062) IN H2O  
 AVG.CONT.TEMP= 74.864 ( 0.0690) DEG.F

INTERVAL 72 LEAK RATE= -0.495 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.338 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.040 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.198 - 0.0198 X HRS

95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.24 < SLOPE < 0.20

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.294 - 0.0038 X HRS

95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.31  
 -0.16 < LEAK RATE < 0.55

NOISE PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS DRY AIR= 64087.50 POUNDS  
 LEAK RATE= 0.253 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.036 WT%/24HRS

REPORT NO. 37, 7101-REFERENCE VESSEL METHOD  
 DATE SET 11/11/76 11:00 HOURS  
 LAST INTER. PLT HOUR 0.17 HOURS FROM T=0 24.66

TEMPERATURE	DEGREE F	CHANGE DEG.F	WT. FACTOR
1	81.02	0.19	0.037
2	79.41	0.19	0.017
3	76.51	0.28	0.037
4	76.91	0.11	0.037
5	77.53	0.10	0.037
6	75.65	0.19	0.037
7	75.99	0.27	0.027
8	75.76	0.27	0.073
9	75.99	0.19	0.073
10	79.41	0.28	0.030
11	75.39	0.27	0.030
12	76.51	0.28	0.030
13	80.35	0.36	0.025
14	79.92	0.53	0.025
15	80.77	0.44	0.025
16	79.41	0.36	0.025
17	72.48	-0.06	0.118
18	72.13	0.02	0.118
19	72.39	0.02	0.118
20	71.45	0.03	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR
1	10.80	0.04	0.150
2	11.06	0.08	0.150
3	10.68	0.12	0.100
4	10.81	0.00	0.150
5	9.76	-0.08	0.225
6	9.45	0.15	0.225

REF. VESSEL DP= 0.2955 ( -0.0029) PSID  
 DRYWELL PRESSURE= 73.4180 ( 0.0150) PSIA  
 AVG. DEWPOINT PRESS= 11.597 ( 0.0460) IN. H2O  
 AVG. CONT. TEMP= 75.003 ( 0.1390) DEG. F

INTERVAL 73 LEAK RATE= -0.070 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.229 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.035 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.033 + 0.0301 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.18 < SLOPE < 0.24

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.291 - 0.0047 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE LEAK RATE  
 -0.02 < SLOPE < 0.01  
 -0.18 < LEAK RATE < 0.73

# WATER TIGHTNESS LEAKAGE RATE ANALYSIS

WATER TIGHTNESS TOTAL LEAKAGE RATE = 0.291 POUNDS  
 LEAKAGE RATE SINCE T=0 = 0.009 WT%/24HRS

COOPER NON LEAK STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA TEST NUMBER 75  
 TEST DATE 11/20/76 1120 HOURS  
 LAST INTER. PL. HOURS 0.33 HOURS FROM T=0 25.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.18	0.15	0.027
2	79.47	0.06	0.027
3	78.57	0.06	0.027
4	78.97	0.06	0.027
5	77.43	-0.10	0.027
6	75.63	-0.02	0.027
7	76.06	0.07	0.027
8	76.83	0.07	0.075
9	76.06	0.07	0.075
10	79.47	0.06	0.030
11	75.37	-0.02	0.030
12	76.57	0.06	0.030
13	80.41	0.06	0.025
14	79.90	-0.02	0.025
15	80.84	0.07	0.025
16	79.47	0.06	0.025
17	72.54	0.06	0.118
18	72.11	-0.02	0.118
19	72.37	-0.02	0.118
20	71.42	-0.03	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.84	0.04	0.150
2	11.10	0.04	0.150
3	10.66	-0.02	0.100
4	10.81	0.00	0.150
5	9.88	0.12	0.225
6	9.30	-0.15	0.225

REF. VESSEL DP= 0.2976 ( 0.0021) PSID  
 DRYWELL PRESSURE= 73.4250 ( 0.0070) PSIA  
 AVG. DEWPOINT PRESS= 11.601 ( 0.0035) IN H2O  
 AVG. CONT. TEMP= 75.027 ( 0.0240) DEG.F

INTERVAL 74 LEAK RATE= 0.216 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.229 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.028 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.147 - 0.0046 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.21 < SLOPE < 0.20

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.290 - 0.0045 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.01  
 -0.17 < LEAK RATE < 0.52

MASS FLOW CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 54386.70 POUNDS  
 LEAK RATE= 0.249 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.006 WT%/24HRS

SECTION

10

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 1  
 11/ 7/ 76 1020 HOURS  
 LAST INTERVAL HOURS 0.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	76.55	0.00	0.027
2	75.09	0.00	0.027
3	72.00	0.00	0.027
4	71.49	0.00	0.027
5	73.04	0.00	0.027
6	71.14	0.00	0.027
7	71.49	0.00	0.027
8	72.35	0.00	0.075
9	71.66	0.00	0.075
10	74.50	0.00	0.030
11	70.89	0.00	0.030
12	71.92	0.00	0.030
13	75.95	0.00	0.025
14	75.09	0.00	0.025
15	76.12	0.00	0.025
16	75.01	0.00	0.025
17	71.92	0.00	0.118
18	71.57	0.00	0.118
19	71.75	0.00	0.118
20	70.80	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	9.57	0.00	0.150
2	9.75	0.00	0.150
3	9.55	0.00	0.100
4	9.64	0.00	0.150
5	10.05	0.00	0.225
6	9.27	0.00	0.225

REF.VESSEL DP=	0.1438	( 0.0000)	PSID
DRYWELL PRESSURE=	73.2320	( 0.0000)	PSIA
AVG.DEWPOINT PRESS=	10.948	( 0.0000)	IN H2O
AVG.CONT.TEMP=	72.345	( 0.0000)	DEG.F
CONTAINMENT TOTAL MASS(DRY AIR)=	64545.00		POUNDS

NO LEAKAGE RATE VALUE CALCULATED FOR DATA SET#1

COOPER NUCLEAR CONTAINMENT--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 2  
 11/ 6/ 76 1120 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 1.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	76.87	0.32	0.027
2	75.33	0.24	0.027
3	72.33	0.33	0.027
4	71.73	0.24	0.027
5	73.19	0.15	0.027
6	71.47	0.33	0.027
7	71.81	0.32	0.027
8	72.58	0.23	0.028
9	71.81	0.15	0.025
10	74.99	0.49	0.030
11	71.12	0.23	0.030
12	72.41	0.49	0.030
13	76.27	0.32	0.025
14	75.59	0.50	0.025
15	76.53	0.41	0.025
16	75.42	0.41	0.025
17	71.90	-0.02	0.118
18	71.64	0.07	0.118
19	71.73	-0.02	0.118
20	70.86	0.06	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	9.48	-0.09	0.150
2	9.77	0.02	0.150
3	9.66	0.11	0.100
4	9.66	0.02	0.150
5	9.61	-0.44	0.225
6	9.25	-0.02	0.225

REF.VESSEL DP= 0.1469 ( 0.0031) PSID  
 DRYWELL PRESSURE= 73.2600 ( 0.0280) PSIA  
 AVG.DEWPOINT PRESS= 10.849 ( -0.0994) IN H2O  
 AVG.CONT.TEMP= 72.514 ( 0.1690) DEG.F

INTERVAL 1 LEAK RATE= -0.022 WT%/24HRS  
 TOTAL TIME LEAK RATE= -0.022 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.000 WT%/24HRS  
 TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64545.50 POUNDS  
 LEAK RATE NOT CALC.(<3 DATA SETS)

COOPER NUCLEAR ACTION--REFERENCE VESSEL METHOD  
 INTEGRATED FROM 1 CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 3  
 11/ 76 1230 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 2.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	77.23	0.36	0.027
2	75.61	0.28	0.027
3	72.52	0.19	0.027
4	72.39	0.36	0.027
5	73.55	0.36	0.027
6	71.66	0.19	0.027
7	72.00	0.19	0.027
8	72.86	0.28	0.075
9	72.09	0.28	0.075
10	75.35	0.36	0.030
11	71.40	0.28	0.030
12	72.61	0.20	0.030
13	76.55	0.28	0.025
14	75.78	0.19	0.025
15	76.72	0.19	0.025
16	75.61	0.19	0.025
17	72.00	0.10	0.118
18	71.66	0.02	0.118
19	71.83	0.10	0.118
20	70.89	0.03	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT. FACTOR
1	9.72	0.24	0.150
2	9.79	0.02	0.150
3	9.77	0.11	0.100
4	9.77	0.11	0.150
5	9.62	0.01	0.225
6	9.07	-0.18	0.225

REF. VESSEL DP= 0.1565 ( 0.0096) PSID  
 DRYWELL PRESSURE= 73.2730 ( 0.0130) PSIA  
 AVG. DEWPOINT PRESS= 10.877 ( 0.0285) IN H2O  
 AVG. CONT. TEMP= 72.684 ( 0.1700) DEG. F

INTERVAL 2 LEAK RATE= 0.344 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.161 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.518 WT%/24HRS  
 TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64536.20	POUNDS
LEAK RATE=	0.164	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 2.438	WT%/24HRS

COOPER CLEAR STRICTION--REFERENCE VESSEL METHOD  
 INTEGRAL PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 4  
 11 5 76 1020 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 3.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.32	0.09	0.027
2	75.78	0.17	0.027
3	72.69	0.17	0.027
4	72.26	0.17	0.027
5	73.72	0.17	0.027
6	71.83	0.17	0.027
7	72.18	0.18	0.027
8	73.04	0.18	0.075
9	72.26	0.17	0.075
10	75.44	0.09	0.030
11	71.66	0.26	0.030
12	72.86	0.25	0.030
13	76.72	0.17	0.025
14	76.04	0.26	0.025
15	76.89	0.17	0.025
16	75.87	0.26	0.025
17	72.00	0.00	0.118
18	71.75	0.09	0.118
19	71.83	0.00	0.118
20	70.97	0.08	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.69	-0.03	0.150
2	9.80	0.01	0.150
3	9.69	-0.08	0.100
4	9.72	-0.05	0.150
5	9.73	0.11	0.225
6	9.13	0.06	0.225

REF.VESSEL DP= 0.1649 ( 0.0084) PSID  
 DRYWELL PRESSURE= 73.2810 ( 0.0080) PSIA  
 AVG.DEWPOINT PRESS= 10.897 ( 0.0200) IN H2O  
 AVG.CONT.TEMP= 72.800 ( 0.1160) DEG.F

INTERVAL 3 LEAK RATE= 0.296 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.206 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.398 WT%/24HRS  
 TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64528.20 POUNDS  
 LEAK RATE= 0.222 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.369 WT%/24HRS

COOPER INCH--STATION--REFERENCE VESSEL METHOD  
 INTEGRATED AIR DRY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 5  
 11/ 6 1420 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 4.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACT
1	77.50	0.18	0.037
2	75.95	0.17	0.037
3	72.95	0.26	0.037
4	72.43	0.17	0.037
5	73.89	0.17	0.037
6	72.09	0.26	0.037
7	72.52	0.34	0.037
8	73.29	0.25	0.075
9	72.52	0.26	0.075
10	75.70	0.34	0.030
11	71.83	0.17	0.030
12	73.04	0.18	0.030
13	76.09	0.17	0.015
14	76.12	0.08	0.015
15	77.15	0.26	0.025
16	76.04	0.17	0.025
17	72.09	0.09	0.119
18	71.75	0.00	0.119
19	71.92	0.09	0.119
20	70.97	0.00	0.119
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACT
1	9.72	0.03	0.150
2	10.13	0.33	0.150
3	9.84	0.15	0.100
4	9.84	0.12	0.150
5	9.77	0.04	0.225
6	9.09	-0.04	0.225

REF.VESSEL DP= 0.1786 ( 0.0137) PSID  
 DRYWELL PRESSURE= 73.2900 ( 0.0090) PSIA  
 AVG.DENPOINT PRESS= 10.985 ( 0.0872) IN H2O  
 AVG.CONT.TEMP= 72.938 ( 0.1380) DEG.F

INTERVAL 4 LEAK RATE= 0.550 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.292 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.473 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.042 + 0.1667 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.01 < SLOPE < 0.35  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.125 + 0.1667 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.01 < SLOPE < 0.35  
 -0.18 < LEAK RATE < 1.25

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64513.40 POUNDS  
 LEAK RATE= 0.299 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.196 WT%/24HRS

COOPER LEAK STATION--REFERENCE VESSEL METHOD  
INTEC- TO PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 6  
11/ 6/ 1520 HOURS  
LAST INTER. HOURS 1.00 HOURS FROM T=0 5.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	77.77	0.27	0.027
2	76.40	0.45	0.017
3	73.23	0.28	0.017
4	72.71	0.28	0.017
5	74.26	0.37	0.017
6	72.37	0.28	0.017
7	72.71	0.19	0.027
8	73.57	0.28	0.075
9	72.80	0.28	0.075
10	75.80	0.02	0.000
11	72.11	0.28	0.000
12	73.14	0.10	0.000
13	77.08	0.19	0.013
14	76.40	0.28	0.025
15	77.26	0.11	0.035
16	76.23	0.19	0.035
17	72.11	0.02	0.110
18	71.77	0.02	0.110
19	72.03	0.11	0.110
20	71.08	0.11	0.110

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.80	0.08	0.150
2	9.98	-0.15	0.150
3	9.95	0.11	0.100
4	9.95	0.11	0.150
5	9.78	0.01	0.225
6	9.08	-0.01	0.225

REF. VESSEL DP= 0.1906 ( 0.0120) PSID  
 DRYWELL PRESSURE= 73.2880 ( -0.0020) PSIA  
 AVG. DEWPOINT PRESS= 11.001 ( 0.0169) IN H2O  
 AVG. CONT. TEMP= 73.099 ( 0.1610) DEG.F

INTERVAL 5 LEAK RATE= 0.409 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.316 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.423 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.102 + 0.1068 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.01 < SLOPE < 0.22

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.005 + 0.1068 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.01 < SLOPE < 0.22  
 -0.04 < LEAK RATE < 1.13

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64502.30 POUNDS  
 LEAK RATE= 0.338 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.105 WT%/24HRS

COOPER NUCLEAR STAT--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 1

11/ 6/ 76 1424 HOURS

LAST INTERVAL END 1100 HOURS FROM T=0 6.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.11	0.34	0.027
2	76.49	0.09	0.027
3	73.40	0.17	0.027
4	72.97	0.26	0.027
5	74.43	0.17	0.027
6	72.54	0.17	0.027
7	72.97	0.26	0.027
8	73.74	0.17	0.075
9	73.06	0.26	0.075
10	76.23	0.43	0.030
11	72.37	0.26	0.030
12	73.49	0.35	0.030
13	77.26	0.18	0.025
14	76.49	0.09	0.025
15	77.43	0.17	0.025
16	76.40	0.17	0.025
17	72.20	0.09	0.118
18	71.85	0.08	0.118
19	72.03	0.00	0.118
20	71.08	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	9.89	0.09	0.150
2	10.14	0.16	0.150
3	9.98	0.03	0.100
4	10.02	0.07	0.150
5	9.72	-0.06	0.225
6	9.33	0.25	0.225

REF. VESSEL DP= 0.196 ( 0.0054) PSID  
 DRYWELL PRESSURE= 73.3090 ( 0.0210) PSIA  
 AVG. DEWPOINT PRESS= 11.096 ( 0.0942) IN H2O  
 AVG. CONT. TEMP= 73.238 ( 0.1390) DEG.F

INTERVAL 6 LEAK RATE= 0.285 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.310 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.379 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.378 - 0.0006 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.10 < SLOPE < 0.10  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.112 + 0.0566 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.03 < SLOPE < 0.15  
 -0.08 < LEAK RATE < 0.99

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64494.60 POUNDS  
 LEAK RATE= 0.346 WT%/24HRS  
 95% CONFIDENCE LEVEL= -202- +/- 0.065 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY COOLANT CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 8  
 11/ 6/ 76 1720 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 7.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	78.20	0.09	0.027
2	76.66	0.17	0.027
3	73.57	0.17	0.027
4	73.06	0.09	0.027
5	74.60	0.17	0.027
6	72.80	0.26	0.027
7	73.14	0.17	0.027
8	73.92	0.18	0.027
9	73.14	0.08	0.070
10	76.23	0.00	0.030
11	72.46	0.09	0.030
12	73.57	0.08	0.030
13	77.34	0.08	0.025
14	76.66	0.17	0.025
15	77.60	0.17	0.025
16	76.57	0.17	0.025
17	72.28	0.08	0.118
18	71.94	0.09	0.118
19	72.11	0.08	0.118
20	71.17	0.09	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR
1	9.82	-0.07	0.150
2	9.86	-0.28	0.150
3	10.03	0.05	0.100
4	9.95	-0.07	0.150
5	9.35	-0.37	0.225
6	9.20	-0.13	0.225

REF. VESSEL DP=	0.2052	( 0.0092)	PSID
DRYWELL PRESSURE=	73.3130	( 0.0040)	PSIA
AVG. DEWPOINT PRESS=	10.925	( -0.1704)	IN H2O
AVG. CONT. TEMP=	73.347	( 0.1090)	DEG.F

INTERVAL 7 LEAK RATE=	0.096	WT%/24HRS
TOTAL TIME LEAK RATE=	0.280	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.382	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.460 -	0.0666 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.18 <	SLOPE < 0.05

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.230 +	0.0124 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.06 <	SLOPE < 0.09
	-0.22 <	LEAK RATE < 0.86

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64492.00	POUNDS
LEAK RATE=	0.328	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.049	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 9  
 11/ 6/ 76 0320 HOURS  
 LAST INTERVAL HOUR 1.00 HOURS FROM T=0 8.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	78.47	0.27	0.037
2	77.11	0.45	0.037
3	73.77	0.20	0.037
4	73.25	0.19	0.037
5	74.79	0.19	0.037
6	72.99	0.19	0.037
7	73.34	0.20	0.037
8	74.20	0.28	0.075
9	73.51	0.37	0.075
10	76.68	0.45	0.030
11	72.74	0.28	0.030
12	73.85	0.28	0.030
13	77.79	0.45	0.025
14	77.11	0.45	0.025
15	78.05	0.45	0.025
16	76.94	0.37	0.025
17	72.31	0.03	0.118
18	71.96	0.02	0.118
19	72.13	0.02	0.118
20	71.19	0.02	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	9.88	0.06	0.150
2	10.30	0.44	0.150
3	10.08	-0.04	0.100
4	10.12	-0.01	0.150
5	10.13	0.78	0.225
6	9.35	0.15	0.225

REF.VESSEL DP= 0.2065 ( 0.0013) PSID  
 DRYWELL PRESSURE= 73.3290 ( 0.0160) PSIA  
 AVG.DEWPOINT PRESS= 11.240 ( 0.3151) IN H2O  
 AVG.CONT.TEMP= 73.525 ( 0.1780) DEG.F

INTERVAL 8 LEAK RATE= 0.411 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.296 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.366 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.469 - 0.0591 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.19 < SLOPE < 0.07  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.210 + 0.0192 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.04 < SLOPE < 0.07  
 -0.08 < LEAK RATE < 0.91

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64480.90 POUNDS  
 LEAK RATE= 0.326 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.037 WT%/24HRS

PROPER LEAK STAT ON--REFERENCE VESSEL METHOD  
 DATE: FEB 11 1976 CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 10  
 11 76 1920 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 9.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.F
1	78.64	0.17	0.
2	77.11	0.00	0.
3	74.11	0.34	0.
4	73.59	0.34	0.
5	75.05	0.26	0.
6	73.25	0.26	0.
7	73.68	0.34	0.
8	74.37	0.17	0.
9	73.59	0.00	0.
10	76.94	0.26	0.
11	72.99	0.25	0.
12	74.20	0.35	0.
13	77.96	0.17	0.
14	77.36	0.25	0.
15	78.30	0.25	0.
16	77.11	0.17	0.
17	72.39	0.00	0.
18	72.05	0.09	0.
19	72.13	0.00	0.
20	71.19	0.00	0.

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FI
1	9.92	0.04	0.
2	10.29	-0.01	0.
3	10.11	0.03	0.
4	10.17	0.05	0.
5	9.48	-0.65	0.
6	9.40	0.05	0.

REF. VESSEL DP= 0.2058 (-0.0007) PSI  
 DRYWELL PRESSURE= 73.3520 (0.0230) PSI  
 AVG. DEWPOINT PRESS= 11.121 (-0.1194) IN H<sub>2</sub>O  
 AVG. CONT. TEMP= 73.657 (0.1320) DEG

INTERVAL 9 LEAK RATE= -0.170 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.244 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.462 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.413 - 0.1033 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.27 < SLOPE < 0

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.333 - 0.0176 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.08 < SLOPE < 0  
 -0.34 < LEAK RATE < 0

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64485.40 POUNDS  
 LEAK RATE= 0.298 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.041 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER

11

11/ 6/ 76 2020 HOURS

LAST INTERVAL HOURS 1.00

HOURS FROM T=0 10.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.39	0.75	0.027
2	77.77	0.66	0.027
3	74.86	0.75	0.027
4	74.34	0.75	0.027
5	75.72	0.67	0.027
6	73.92	0.67	0.027
7	74.34	0.66	0.027
8	75.12	0.75	0.075
9	74.43	0.84	0.075
10	77.60	0.66	0.030
11	73.57	0.58	0.030
12	74.77	0.57	0.030
13	78.96	1.00	0.025
14	78.28	0.92	0.025
15	79.30	1.00	0.025
16	78.02	0.91	0.025
17	72.37	-0.02	0.119
18	72.03	-0.02	0.119
19	72.20	0.07	0.118
20	71.25	0.06	0.119
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.38	0.46	0.150
2	10.54	0.25	0.150
3	10.42	0.31	0.100
4	10.34	0.17	0.150
5	10.52	1.04	0.225
6	9.31	-0.09	0.225

REF.VESSEL DP= 0.2008 ( -0.0050) PSID  
 DRYWELL PRESSURE= 73.4010 ( 0.0490) PSIA  
 AVG.DEWPOINT PRESS= 11.499 ( 0.3777) IN H2O  
 AVG.CONT.TEMP= 74.069 ( 0.4120) DEG.F

INTERVAL 10 LEAK RATE= 0.269 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.247 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.436 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.238 - 0.0298 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.23 < SLOPE < 0.17

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.310 - 0.0115 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.06 < SLOPE < 0.03  
 -0.26 < LEAK RATE < 0.65

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64478.10 POUNDS  
 LEAK RATE= 0.281 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.037 WT%/24HRS

COOPER WELLS STATION--REFERENCE VESSEL METHOD  
 INTEGRITY & PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 12  
 11/1/76 2120 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 11.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.56	0.17	0.037
2	77.94	0.17	0.037
3	74.95	0.09	0.037
4	74.52	0.18	0.037
5	75.89	0.17	0.037
6	74.09	0.17	0.027
7	74.52	0.18	0.027
8	75.29	0.17	0.075
9	74.60	0.17	0.075
10	77.94	0.34	0.030
11	73.83	0.26	0.030
12	75.12	0.35	0.030
13	78.96	0.00	0.025
14	78.45	0.17	0.025
15	79.30	0.00	0.025
16	78.02	0.00	0.025
17	72.37	0.00	0.113
18	72.03	0.00	0.118
19	72.20	0.00	0.118
20	71.34	0.09	0.118

DENPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.52	0.14	0.150
2	10.24	-0.30	0.150
3	10.48	0.06	0.100
4	10.37	0.03	0.150
5	9.93	-0.59	0.225
6	9.12	-0.19	0.225

REF.VESSEL DP=	0.2066	( 0.0058)	PSID
DRYWELL PRESSURE=	73.4190	( 0.0180)	PSIA
AVG.DENPOINT PRESS=	11.310	( -0.1886)	IN H2O
AVG.CONT.TEMP=	74.168	( 0.0990)	DEG.F

INTERVAL 11 LEAK RATE=	-0.037	WT%/24HRS
TOTAL TIME LEAK RATE=	0.221	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.448	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.195 -	0.0408 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.24 <	SLOPE < 0.16

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.350 -	0.0215 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.06 <	SLOPE < 0.02
	-0.31 <	LEAK RATE < 0.53

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64479.00	POUNDS
LEAK RATE=	0.260	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.038	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 13  
 11/ 6/ 76 2220 HOURS  
 LAST INTERVAL, HOURS 1.00 HOURS FROM T=0 12.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.64	0.08	0.027
2	78.02	0.08	0.027
3	74.95	0.00	0.027
4	74.43	-0.09	0.027
5	75.89	0.00	0.027
6	74.17	0.08	0.027
7	74.52	0.00	0.027
8	75.29	0.00	0.075
9	74.60	0.00	0.075
10	77.77	-0.17	0.030
11	73.83	0.00	0.030
12	74.95	-0.17	0.030
13	78.96	0.00	0.025
14	78.20	-0.25	0.025
15	79.13	-0.17	0.025
16	78.02	0.00	0.025
17	72.46	0.09	0.118
18	72.11	0.08	0.118
19	72.20	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.33	-0.19	0.150
2	10.79	0.55	0.150
3	10.23	-0.25	0.100
4	10.41	0.04	0.150
5	10.27	0.34	0.225
6	9.32	0.20	0.225

REF. VESSEL DP= 0.2241 ( 0.0175) PSID  
 DRYWELL PRESSURE= 73.3930 ( -0.0260) PSIA  
 AVG. DEWPOINT PRESS= 11.466 ( 0.1560) IN H2O  
 AVG. CONT. TEMP= 74.172 ( 0.0040) DEG.F

INTERVAL 12 LEAK RATE= 0.760 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.266 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.528 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.080 + 0.0032 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.23 < SLOPE < 0.39  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.239 + 0.0042 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE -0.04 < SLOPE < 0.05  
 -0.21 < LEAK RATE < 0.79

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64458.50 POUNDS  
 LEAK RATE= 0.263 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.032 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1975

DATA SET NUMBER 14  
 11/ 6/ 76 2320 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 13.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.64	0.00	0.027
2	78.11	0.09	0.027
3	75.12	0.17	0.027
4	74.52	0.09	0.027
5	76.14	0.25	0.027
6	74.17	0.00	0.027
7	74.60	0.08	0.027
8	75.37	0.08	0.075
9	74.60	0.00	0.075
10	78.02	0.25	0.030
11	74.00	0.17	0.030
12	75.20	0.25	0.030
13	79.13	0.17	0.025
14	78.45	0.25	0.025
15	79.39	0.26	0.025
16	78.20	0.18	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.20	0.00	0.118
20	71.34	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.44	0.11	0.150
2	10.53	-0.26	0.150
3	10.43	0.20	0.100
4	10.48	0.07	0.150
5	10.09	-0.18	0.225
6	9.37	0.05	0.225

REF. VESSEL DP= 0.2236 ( -0.0005) PSID  
 DRYWELL PRESSURE= 73.4050 ( 0.0120) PSIA  
 AVG. DEWPOINT PRESS= 11.445 ( -0.0210) IN H2O  
 AVG. CONT. TEMP= 74.237 ( 0.0650) DEG.F

INTERVAL 13 LEAK RATE= -0.044 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.242 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.534 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.007 + 0.0744 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.25 < SLOPE < 0.39  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.291 - 0.0069 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.04 < SLOPE < 0.30  
 -0.27 < LEAK RATE < 0.67

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64459.60 POUNDS  
 LEAK RATE= 0.257 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.028 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1975

DATA SET NUMBER 15  
11/ 7/ 76 0020 HOURS  
LAST INTERVAL HOURS 1.00 HOURS FROM T=0 14.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.67	0.03	0.027
2	78.05	-0.06	0.027
3	75.05	-0.07	0.027
4	74.54	0.02	0.027
5	75.91	-0.23	0.027
6	74.20	0.03	0.027
7	74.54	-0.06	0.027
8	75.39	0.02	0.075
9	74.71	0.11	0.075
10	77.79	-0.23	0.030
11	74.02	0.02	0.030
12	74.97	-0.23	0.030
13	78.81	-0.32	0.025
14	78.13	-0.32	0.025
15	79.07	-0.32	0.025
16	77.96	-0.24	0.025
17	72.48	0.02	0.118
18	72.13	0.02	0.118
19	72.31	0.11	0.118
20	71.36	0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.49	0.05	0.150
2	10.53	0.00	0.150
3	10.34	-0.09	0.100
4	10.49	0.01	0.150
5	9.79	-0.30	0.225
6	9.16	-0.21	0.225

REF.VESSEL DP= 0.2424 ( 0.0188) PSID  
 DRYWELL PRESSURE= 73.3770 ( -0.0280) PSIA  
 AVG.DENPOINT PRESS= 11.330 ( -0.1154) IN H2O  
 AVG.CONT.TEMP= 74.215 ( -0.0220) DEG.F

INTERVAL 14 LEAK RATE= 0.482 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.259 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.529 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.202 + 0.0419 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.26 < SLOPE < 0.35  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.250 + 0.0013 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.03 < SLOPE < 0.03  
 -0.18 < LEAK RATE < 0.72

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64446.60 POUNDS  
 LEAK RATE= 0.258 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.024 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV. 1976

DATA SET NUMBER 16  
 11/ 7/ 76 0120 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 15.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	79.67	0.00	0.027
2	78.13	0.08	0.027
3	75.14	0.09	0.027
4	74.54	0.00	0.027
5	76.08	0.17	0.027
6	74.28	0.08	0.027
7	74.54	0.00	0.027
8	75.48	0.09	0.075
9	74.71	0.00	0.075
10	77.87	0.08	0.030
11	74.11	0.09	0.030
12	75.05	0.08	0.030
13	78.90	0.09	0.025
14	78.22	0.09	0.025
15	79.24	0.17	0.025
16	78.13	0.17	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR
1	10.25	-0.24	0.150
2	10.78	0.25	0.150
3	10.16	-0.18	0.100
4	10.48	-0.01	0.150
5	9.86	0.07	0.225
6	9.18	0.02	0.225

REF. VESSEL DP=	0.2518	( 0.0094)	PSID
DRYWELL PRESSURE=	73.3670	( -0.0100)	PSIA
AVG. DEWPOINT PRESS=	11.332	( 0.0021)	IN H2O
AVG. CONT. TEMP=	74.253	( 0.0380)	DEG. F

INTERVAL 15 LEAK RATE=	0.310	WT%/24HRS
TOTAL TIME LEAK RATE=	0.262	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.511	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.211 +	0.0416 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.26 <	SLOPE < 0.35
LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.244 +	0.0023 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.03 <	SLOPE < 0.03
	-0.14 <	LEAK RATE < 0.70

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64438.20	POUNDS
LEAK RATE=	0.260	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.021	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 17  
 11/ 7/ 76 0220 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 16.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.75	0.00	0.027
2	78.22	0.09	0.027
3	75.14	0.00	0.027
4	74.71	0.17	0.027
5	76.08	0.00	0.027
6	74.28	0.00	0.027
7	74.71	0.17	0.027
8	75.48	0.00	0.075
9	74.79	0.00	0.075
10	77.96	0.09	0.030
11	74.11	0.00	0.030
12	75.14	0.09	0.030
13	78.81	-0.09	0.025
14	78.22	0.00	0.025
15	79.15	-0.09	0.025
16	78.05	-0.00	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.35	0.10	0.150
2	10.70	-0.00	0.150
3	10.55	0.39	0.100
4	10.48	0.00	0.150
5	9.74	-0.12	0.225
6	9.13	-0.05	0.225

REF. VESSEL DP= 0.2576 ( 0.0058) PSID  
 DRYWELL PRESSURE= 73.3720 ( 0.0050) PSIA  
 AVG. DEWPOINT PRESS= 11.336 ( 0.0038) IN H2O  
 AVG. CONT. TEMP= 74.272 ( 0.0190) DEG.F

INTERVAL 16 LEAK RATE= 0.195 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.258 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.494 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.496 - 0.0778 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.33 < SLOPE < 0.17

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.255 + 0.0004 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.13 < LEAK RATE < 0.65

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64432.90 POUNDS  
 LEAK RATE= 0.260 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.019 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 18  
11 76 0320 HOURS  
LAST INTERVAL HOURS 1.00 HOURS FROM T=0 17.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.84	0.09	0.027
2	78.30	0.08	0.027
3	75.14	0.00	0.027
4	74.71	0.00	0.027
5	76.17	0.09	0.027
6	74.45	0.17	0.027
7	74.62	-0.09	0.027
8	75.57	0.09	0.075
9	74.79	0.00	0.075
10	78.05	0.09	0.030
11	74.20	0.09	0.030
12	75.22	0.08	0.030
13	78.98	0.17	0.025
14	78.30	0.08	0.025
15	79.33	0.18	0.025
16	78.22	0.17	0.025
17	72.48	0.00	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.36	0.00	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.48	0.13	0.150
2	10.53	-0.17	0.150
3	10.35	-0.20	0.100
4	10.37	-0.11	0.150
5	9.09	-0.65	0.225
6	9.21	0.08	0.225

REF. VESSEL DP= 0.2627 ( 0.0051) PSID  
 DRYWELL PRESSURE= 73.3710 ( -0.0010) PSIA  
 AVG. DEWPOINT PRESS= 11.165 ( -0.1707) IN H2O  
 AVG. CONT. TEMP= 74.311 ( 0.0390) DEG.F

INTERVAL 17 LEAK RATE= -0.037 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.241 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.500 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.236 - 0.0273 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.23 < SLOPE < 0.17  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.290 - 0.0054 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.03 < SLOPE < 0.03  
 -0.18 < LEAK RATE < 0.57

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64433.80 POUNDS  
 LEAK RATE= 0.255 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.017 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1975

DATA SET NUMBER 19  
 11/ 7/ 76 0420 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 18.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.90	0.06	0.027
2	78.28	-0.02	0.027
3	75.29	0.15	0.027
4	74.69	-0.02	0.027
5	76.23	0.06	0.027
6	74.43	-0.02	0.027
7	74.77	0.15	0.027
8	75.63	0.06	0.075
9	74.86	0.07	0.075
10	78.11	0.06	0.030
11	74.26	0.06	0.030
12	75.29	0.07	0.030
13	79.13	0.15	0.025
14	78.45	0.15	0.025
15	79.30	-0.03	0.025
16	78.20	-0.02	0.025
17	72.46	-0.02	0.118
18	72.11	-0.02	0.118
19	72.28	-0.03	0.118
20	71.34	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.55	0.07	0.150
2	10.53	0.00	0.150
3	10.34	-0.01	0.100
4	10.57	0.20	0.150
5	9.83	0.74	0.225
6	9.28	0.07	0.225

REF. VESSEL DP= 0.2702 ( 0.0075) PSID  
 DRYWELL PRESSURE= 73.3680 ( -0.0030) PSIA  
 AVG. DEWPOINT PRESS= 11.386 ( 0.2216) IN H2O  
 AVG. CONT. TEMP= 74.332 ( 0.0210) DEG.F

INTERVAL 18 LEAK RATE= 0.509 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.256 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.501 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.350 - 0.0292 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.23 < SLOPE < 0.17

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.255 + 0.0001 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.02  
 -0.11 < LEAK RATE < 0.62

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64420.10 POUNDS  
 LEAK RATE= 0.256 WT%/24HRS  
 95% CONFIDENCE LEVEL= 0.015 WT%/24HRS

COOPER NUCLEAR STATION--PERFORMANCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 20  
 11/ 7/ 76 0520 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 19.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	79.93	0.09	0.037
2	78.45	0.17	0.037
3	75.29	0.00	0.037
4	74.77	0.00	0.027
5	76.23	0.00	0.027
6	74.52	0.09	0.027
7	74.66	0.09	0.027
8	75.72	0.09	0.075
9	74.95	0.09	0.075
10	78.11	0.00	0.030
11	74.34	0.00	0.030
12	75.29	0.00	0.030
13	79.13	0.00	0.025
14	78.45	0.00	0.025
15	79.39	0.09	0.025
16	78.28	0.00	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.49	-0.06	0.150
2	10.59	0.06	0.150
3	10.37	0.03	0.100
4	10.59	0.02	0.150
5	9.86	0.03	0.225
6	9.25	-0.03	0.225

REF. VESSEL DP=	0.2789	( 0.0087)	PSID
DRYWELL PRESSURE=	73.3610	( -0.0070)	PSIA
AVG. DEWPOINT PRESS=	11.392	( 0.0059)	IN H2O
AVG. CONT. TEMP=	74.366	( 0.0340)	DEG.F

INTERVAL 19 LEAK RATE=	0.292	WT%/24HRS
TOTAL TIME LEAK RATE=	0.258	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.487	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.198 +	0.0278 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.15 <	SLOPE < 0.20

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.351 +	0.0007 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.02 <	SLOPE < 0.02
	-0.08 <	LEAK RATE < 0.51

MASS FLOW CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)=	64412.20	POUNDS
LEAK RATE=	0.257	WT%/24HRS
95% CONFIDENCE LEVEL=	-215- +/- 0.014	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 21  
11/ 7/ 76 0620 HOURS  
LAST INTERVAL, HOURS 1.00 HOURS FROM T=0 20.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	80.33	0.34	0.027
2	78.89	0.44	0.027
3	75.80	0.51	0.027
4	75.20	0.43	0.027
5	76.66	0.43	0.027
6	74.86	0.34	0.027
7	75.29	0.43	0.027
8	76.06	0.34	0.075
9	75.29	0.34	0.075
10	78.37	0.26	0.030
11	74.60	0.26	0.030
12	75.63	0.34	0.030
13	79.56	0.43	0.025
14	78.88	0.43	0.025
15	79.81	0.42	0.025
16	78.62	0.34	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.42	0.08	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT. FACTOR
1	10.53	0.04	0.150
2	10.84	0.25	0.150
3	10.53	0.16	0.100
4	10.66	0.07	0.150
5	9.96	0.10	0.225
6	9.53	0.28	0.225

REF. VESSEL DP= 0.2850 ( 0.0061) PSID  
 DRYWELL PRESSURE= 73.3800 ( 0.0190) PSIA  
 AVG. DEWPOINT PRESS= 11.548 ( 0.1559) IN H2O  
 AVG. CONT. TEMP= 74.571 ( 0.2050) DEG.F

INTERVAL 20 LEAK RATE= 0.377 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.264 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.477 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.128 + 0.0694 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.09 < SLOPE < 0.23  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.240 + 0.0023 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.01 < SLOPE < 0.03  
 -0.04 < LEAK RATE < 0.61

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64402.00 POUNDS  
 LEAK RATE= 0.259 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.013 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 22  
 11/ 7 76 0720 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 21.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	80.58	0.25	0.027
2	78.96	0.07	0.027
3	75.89	0.09	0.027
4	75.37	0.17	0.027
5	76.83	0.17	0.027
6	75.03	0.17	0.027
7	75.37	0.08	0.027
8	76.23	0.17	0.075
9	75.54	0.25	0.075
10	78.62	0.25	0.030
11	74.77	0.17	0.030
12	75.89	0.26	0.030
13	79.81	0.25	0.025
14	79.13	0.25	0.025
15	80.07	0.26	0.025
16	78.79	0.17	0.025
17	72.46	0.00	0.118
18	72.11	0.00	0.118
19	72.28	0.00	0.118
20	71.34	-0.08	0.118

DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.53	0.00	0.150
2	10.88	0.04	0.150
3	10.74	0.21	0.100
4	10.70	0.04	0.150
5	9.91	-0.05	0.225
6	9.34	-0.19	0.225

REF. VESSEL DP=	0.2856	( 0.0006)	PSID
DRYWELL PRESSURE=	73.3890	( 0.0090)	PSIA
AVG. DEWPOINT PRESS=	11.527	( -0.0208)	IN H2O
AVG. CONT. TEMP=	74.664	( 0.0930)	DEG.F

INTERVAL 21 LEAK RATE=	-0.009	WT%/24HRS
TOTAL TIME LEAK RATE=	0.251	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.480	WT%/24HRS
LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.242 -	0.0077 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.22 <	SLOPE < 0.21
LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.268 -	0.0016 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE	-0.02 <	SLOPE < 0.01
	-0.09 <	LEAK RATE < 0.56

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64402.20	POUNDS
LEAK RATE=	0.258	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.012	WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST--NOV.1976

DATA SET NUMBER 23  
 11/ 7/ 76 0800 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 22.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	80.52	-0.06	0.027
2	78.90	-0.06	0.027
3	75.82	-0.07	0.027
4	75.31	-0.06	0.027
5	75.85	0.02	0.027
6	75.05	0.02	0.027
7	75.39	0.02	0.027
8	76.25	0.02	0.075
9	75.57	0.03	0.075
10	78.64	0.02	0.030
11	74.79	0.02	0.030
12	75.91	0.02	0.030
13	79.75	-0.06	0.025
14	79.15	0.02	0.025
15	80.09	0.02	0.025
16	78.81	0.02	0.025
17	72.48	0.02	0.118
18	72.13	0.02	0.118
19	72.31	0.03	0.118
20	71.36	0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.49	-0.04	0.150
2	10.90	0.02	0.150
3	10.37	-0.37	0.100
4	10.66	-0.04	0.150
5	10.04	0.13	0.225
6	9.26	-0.08	0.225

REF.VESSEL DP= 0.2904 ( 0.0048) PSID  
 DRYWELL PRESSURE= 73.3810 ( -0.0080) PSIA  
 AVG.DEWPOINT PRESS= 11.493 ( -0.0349) IN H2O  
 AVG.CONT.TEMP= 74.675 ( 0.0110) DEG.F

INTERVAL 22 LEAK RATE= 0.116 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.244 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.472 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.474 - 0.1087 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.21 < SLOPE < -0.01

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.279 - 0.0030 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.01  
 -0.09 < LEAK RATE < 0.52

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64399.00 POUNDS  
 LEAK RATE= 0.255 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.011 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 24  
11/ 7/ 76 0920 HOURS  
LAST INTERVAL HOURS 1.00 HOURS FROM T=0 23.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	80.60	0.00	0.027
2	79.07	0.17	0.027
3	75.91	0.09	0.027
4	75.48	0.17	0.027
5	76.94	0.09	0.027
6	75.05	0.00	0.027
7	75.39	0.00	0.027
8	76.25	0.00	0.075
9	75.48	-0.09	0.075
10	78.56	-0.08	0.030
11	74.88	0.09	0.030
12	75.82	-0.09	0.030
13	79.75	0.00	0.023
14	79.07	-0.08	0.023
15	80.01	-0.08	0.025
16	78.90	0.09	0.025
17	72.56	0.08	0.118
18	72.13	0.00	0.118
19	72.31	0.00	0.118
20	71.45	0.09	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.77	0.28	0.150
2	10.80	-0.10	0.150
3	10.62	0.25	0.100
4	10.71	0.05	0.150
5	9.83	-0.21	0.225
6	9.30	0.04	0.225

REF.VESSEL DP= 0.3008 ( 0.0104) PSID  
 DRYWELL PRESSURE= 73.3700 ( -0.0110) PSIA  
 AVG.DEWPOINT PRESS= 11.514 ( 0.0210) IN H2O  
 AVG.CONT.TEMP= 74.700 ( 0.0250) DEG.F

INTERVAL 23 LEAK RATE= 0.366 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.250 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.464 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.251 - 0.0113 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.16 < SLOPE < 0.14  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.265 - 0.0013 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.01 < SLOPE < 3.01  
 -0.06 < LEAK RATE < 0.51

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64389.10 POUNDS  
 LEAK RATE= 0.254 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.010 WT%/24HRS

COOPER NUCLEAR STAT--REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 35  
 11/ 7/ 76 1020 HOURS  
 LAST INTERVAL HOURS 1.00 HOURS FROM T=0 24.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	80.84	0.24	0.027
2	79.22	0.15	0.027
3	76.23	0.32	0.027
4	75.80	0.32	0.027
5	77.43	0.49	0.027
6	75.46	0.41	0.027
7	75.72	0.33	0.027
8	76.49	0.24	0.075
9	75.80	0.32	0.075
10	79.13	0.57	0.030
11	75.12	0.24	0.030
12	76.23	0.41	0.030
13	79.99	0.24	0.025
14	79.39	0.32	0.025
15	80.38	0.37	0.025
16	79.05	0.15	0.025
17	72.54	-0.02	0.118
18	72.11	-0.02	0.118
19	72.37	0.06	0.118
20	71.42	-0.03	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.76	-0.01	0.150
2	10.98	0.18	0.150
3	10.56	-0.06	0.100
4	10.81	0.10	0.150
5	9.84	0.01	0.225
6	9.30	0.00	0.225

REF.VESSEL DP= 0.2984 ( -0.0024) PSID  
 DRYWELL PRESSURE= 73.4030 ( 0.0330) PSIA  
 AVG.DEWPOINT PRESS= 11.551 ( 0.0375) IN H2O  
 AVG.CONT.TEMP= 74.865 ( 0.1650) DEG.F

INTERVAL 24 LEAK RATE= -0.042 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.238 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.469 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.254 - 0.0463 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.21 < SLOPE < 0.12

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.288 - 0.0040 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.02 < SLOPE < 0.01  
 -0.10 < LEAK RATE < 0.48

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64390.20 POUNDS  
 LEAK RATE= 0.251 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.010 WT%/24HRS

SECTION

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COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 1  
 11/ 7/ 76 1220 HOURS  
 LAST INTERVAL HOURS 0.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.18	0.00	0.027
2	79.47	0.00	0.027
3	76.49	0.00	0.027
4	76.06	0.00	0.027
5	77.51	0.00	0.027
6	75.72	0.00	0.027
7	75.97	0.00	0.027
8	76.83	0.00	0.075
9	76.14	0.00	0.075
10	79.47	0.00	0.030
11	75.46	0.00	0.030
12	76.66	0.00	0.030
13	80.67	0.00	0.025
14	79.99	0.00	0.025
15	81.09	0.00	0.025
16	79.73	0.00	0.025
17	72.54	0.00	0.118
18	72.11	0.00	0.118
19	72.37	0.00	0.118
20	71.42	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.87	0.00	0.150
2	10.95	0.00	0.150
3	10.56	0.00	0.100
4	10.86	0.00	0.150
5	9.64	0.00	0.225
6	9.25	0.00	0.225

REF.VESSEL DP=	0.3018	( 0.0000)	PSID
DRYWELL PRESSURE=	73.4220	( 0.0000)	PSIA
AVG.DEWPOINT PRESS=	11.515	( 0.0000)	IN H2O
AVG.CONT.TEMP=	75.062	( 0.0000)	DEG.F
CONTAINMENT TOTAL MASS(DRY AIR)=	64366.60		POUNDS

NO LEAKAGE RATE VALUE CALCULATED FOR DATA SET#1

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 2  
 11/ 7/ 76 1340 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 0.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.18	0.00	0.027
2	79.47	0.00	0.027
3	76.57	0.00	0.027
4	75.97	-0.09	0.027
5	77.69	0.09	0.027
6	75.63	-0.09	0.027
7	76.06	0.09	0.027
8	76.91	0.00	0.075
9	76.14	0.00	0.075
10	79.64	0.17	0.030
11	75.46	0.00	0.030
12	76.83	0.17	0.030
13	80.67	0.00	0.025
14	80.07	0.00	0.025
15	81.01	-0.08	0.025
16	79.64	-0.09	0.025
17	72.54	0.00	0.118
18	72.11	0.00	0.118
19	72.37	0.00	0.118
20	71.42	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.78	-0.09	0.150
2	11.21	0.26	0.150
3	10.78	0.22	0.100
4	10.99	0.13	0.150
5	9.66	0.02	0.225
6	9.58	0.33	0.225

REF.VESSEL DP= 0.3039 ( 0.0021) PSID  
 DRYWELL PRESSURE= 73.4250 ( 0.0030) PSIA  
 AVG.DEWPOINT PRESS= 11.661 ( 0.1459) IN H2O  
 AVG.CONT.TEMP= 75.078 ( 0.0160) DEG.F

INTERVAL 1 LEAK RATE= 0.725 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.725 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.000 WT%/24HRS

TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64360.10 POUNDS  
 LEAKAGE RATE NOT CALC.(LESS THAN 3 DATA SETS)

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 3  
 11/ 7/ 76 1300 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 0.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.26	0.08	0.027
2	79.64	0.17	0.027
3	76.57	0.00	0.027
4	76.14	0.17	0.027
5	77.60	0.00	0.027
6	75.72	0.09	0.027
7	76.14	0.08	0.027
8	76.91	0.00	0.075
9	76.14	0.00	0.075
10	79.90	0.26	0.030
11	75.54	0.08	0.030
12	76.91	0.08	0.030
13	80.75	0.08	0.025
14	80.24	0.17	0.025
15	81.18	0.17	0.025
16	79.73	0.09	0.025
17	72.54	0.00	0.118
18	72.20	0.09	0.118
19	72.37	0.00	0.118
20	71.42	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.84	0.06	0.150
2	10.95	-0.26	0.150
3	10.84	0.06	0.100
4	10.95	-0.04	0.150
5	9.66	0.00	0.225
6	9.45	-0.13	0.225

REF. VESSEL DP=	0.3025	( -0.0014)	PSID
DRYWELL PRESSURE=	73.4340	( 0.0090)	PSIA
AVG. DEWPOINT PRESS=	11.601	( -0.0591)	IN H2O
AVG. CONT. TEMP=	75.130	( 0.0520)	DEG.F

INTERVAL 2 LEAK RATE=	-0.356	WT%/24HRS
TOTAL TIME LEAK RATE=	0.185	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.528	WT%/24HRS

TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)=	64363.20	POUNDS
LEAK RATE=	0.190	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 7.206	WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 4  
 11/ 7/ 76 1320 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.35	0.09	0.027
2	79.64	0.00	0.027
3	76.66	0.09	0.027
4	76.14	0.00	0.027
5	77.68	0.08	0.027
6	75.80	0.08	0.027
7	76.23	0.09	0.027
8	77.00	0.09	0.075
9	76.23	0.09	0.075
10	79.90	0.00	0.030
11	75.63	0.09	0.030
12	76.91	0.00	0.030
13	80.92	0.17	0.025
14	80.41	0.17	0.025
15	81.35	0.17	0.025
16	79.90	0.17	0.025
17	72.54	0.00	0.118
18	72.20	0.00	0.118
19	72.37	0.00	0.118
20	71.42	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.84	0.00	0.150
2	10.87	-0.08	0.150
3	10.68	-0.16	0.100
4	10.97	0.02	0.150
5	10.27	0.61	0.225
6	9.25	-0.20	0.225

REF. VESSEL DP= 0.3100 ( 0.0075) PSID  
 DRYWELL PRESSURE= 73.4290 ( -0.0050) PSIA  
 AVG. DEWPOINT PRESS= 11.669 ( 0.0672) IN H2O  
 AVG. CONT. TEMP= 75.175 ( 0.0450) DEG.F

INTERVAL 3 LEAK RATE= 0.973 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.447 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.413 WT%/24HRS

TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64354.50 POUNDS  
 LEAK RATE= 0.371 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 1.111 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 5  
 11/ 7/ 76 1340 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.37	0.02	0.027
2	79.75	0.11	0.027
3	76.68	0.02	0.027
4	76.25	0.11	0.027
5	77.79	0.11	0.027
6	75.91	0.11	0.027
7	76.25	0.02	0.027
8	77.11	0.11	0.075
9	76.34	0.11	0.075
10	79.92	0.02	0.030
11	75.65	0.02	0.030
12	76.94	0.03	0.030
13	80.94	0.02	0.025
14	80.52	0.11	0.025
15	81.37	0.02	0.025
16	79.92	0.02	0.025
17	72.56	0.02	0.118
18	72.13	-0.07	0.118
19	72.39	0.02	0.118
20	71.45	0.03	0.118

DENPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.80	-0.04	0.150
2	11.14	0.27	0.150
3	10.56	-0.12	0.100
4	10.99	0.02	0.150
5	9.41	-0.86	0.225
6	9.48	0.23	0.225

REF. VESSEL DP=	0.3104	( 0.0004)	PSID
DRYWELL PRESSURE=	73.4300	( 0.0010)	PSIA
AVG. DENPOINT PRESS=	11.552	( -0.1163)	IN H2O
AVG. CONT. TEMP=	75.211	( 0.0360)	DEG.F

INTERVAL 4 LEAK RATE=	-0.380	WT%/24HRS
TOTAL TIME LEAK RATE=	0.241	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.420	WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.539 -	0.5958 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-4.23 <	SLOPE < 3.04

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.737 -	0.5958 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0	-4.23 <	SLOPE < 3.04
	-4.91 <	LEAK RATE < 4.79

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64357.80	POUNDS
LEAK RATE=	0.260	WT%/24HRS
95% CONFIDENCE LEVEL=	+/- 0.399	WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 6  
11/ 7/ 76 1400 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.35	-0.02	0.027
2	79.81	0.06	0.027
3	76.83	0.15	0.027
4	76.23	-0.02	0.027
5	77.85	0.06	0.027
6	75.89	-0.02	0.027
7	76.32	0.07	0.027
8	77.17	0.06	0.075
9	76.40	0.06	0.075
10	80.07	0.15	0.030
11	75.80	0.15	0.030
12	77.08	0.14	0.030
13	81.01	0.07	0.025
14	80.58	0.06	0.025
15	81.43	0.06	0.025
16	79.99	0.07	0.025
17	72.54	-0.02	0.118
18	72.20	0.07	0.118
19	72.37	-0.02	0.118
20	71.42	-0.03	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.81	0.01	0.150
2	11.09	-0.05	0.150
3	10.66	0.10	0.100
4	10.95	-0.04	0.150
5	9.89	0.48	0.225
6	9.45	-0.03	0.225

REF.VESSEL DP= 0.3133 ( 0.0029) PSID  
 DRYWELL PRESSURE= 73.4360 ( 0.0060) PSIA  
 AVG.DEWPOINT PRESS= 11.652 ( 0.0994) IN H2O  
 AVG.CONT.TEMP= 75.247 ( 0.0360) DEG.F

INTERVAL 5 LEAK RATE= 0.635 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.320 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.279 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.360 - 0.0610 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -1.78 < SLOPE < 1.66

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.381 - 0.0610 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -1.78 < SLOPE < 1.66  
 -2.59 < LEAK RATE < 3.15

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64352.10 POUNDS  
 LEAK RATE= 0.282 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.195 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 7  
11/ 7/ 76 1420 HOURS  
LAST INTERVAL, HOURS 0.33 HOURS FROM T=0 2.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.52	0.17	0.027
2	79.90	0.09	0.027
3	76.91	0.08	0.027
4	76.49	0.26	0.027
5	77.85	0.00	0.027
6	76.06	0.17	0.027
7	76.40	0.08	0.027
8	77.26	0.09	0.075
9	76.40	0.00	0.075
10	80.16	0.09	0.030
11	75.89	0.09	0.030
12	77.26	0.18	0.030
13	81.18	0.17	0.025
14	80.67	0.09	0.025
15	81.60	0.17	0.025
16	80.07	0.08	0.025
17	72.54	0.00	0.118
18	72.20	0.00	0.118
19	72.37	0.00	0.118
20	71.42	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.90	0.09	0.150
2	11.08	-0.01	0.150
3	10.70	0.13	0.100
4	11.03	0.08	0.150
5	9.94	0.05	0.225
6	9.55	0.10	0.225

REF. VESSEL DP= 0.3149 ( 0.0016) PSID  
 DRYWELL PRESSURE= 73.4380 ( 0.0020) PSIA  
 AVG. DEWPOINT PRESS= 11.723 ( 0.0708) IN H2O  
 AVG. CONT. TEMP= 75.301 ( 0.0540) DEG.F

INTERVAL 6 LEAK RATE= 0.403 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.333 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.146 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.333 + 0.0008 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.98 < SLOPE < 0.98

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.333 + 0.0008 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -0.98 < SLOPE < 0.98  
 -1.62 < LEAK RATE < 2.39

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64348.50 POUNDS  
 LEAK RATE= 0.302 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.122 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 8  
11/ 7/ 76 1440 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 2.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.52	0.00	0.027
2	79.90	0.00	0.027
3	76.83	-0.08	0.027
4	76.32	-0.17	0.027
5	77.94	0.09	0.027
6	75.97	-0.09	0.027
7	76.49	0.09	0.027
8	77.26	0.00	0.075
9	76.49	0.09	0.075
10	79.73	-0.43	0.030
11	75.80	-0.09	0.030
12	76.83	-0.43	0.030
13	81.18	0.00	0.025
14	80.58	-0.09	0.025
15	81.52	-0.08	0.025
16	80.16	0.09	0.025
17	72.54	0.00	0.118
18	72.20	0.00	0.118
19	72.37	0.00	0.118
20	71.42	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.76	-0.14	0.150
2	10.91	-0.17	0.150
3	10.58	-0.21	0.100
4	10.99	-0.04	0.150
5	10.05	0.11	0.225
6	9.36	-0.19	0.225

REF.VESSEL DP= 0.3356 ( 0.0207) PSID  
 DRYWELL PRESSURE= 73.4090 ( -0.0290) PSIA  
 AVG.DEWPOINT PRESS= 11.630 ( -0.0922) IN H2O  
 AVG.CONT.TEMP= 75.273 ( -0.0280) DEG.F

INTERVAL 7 LEAK RATE= 1.717 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.531 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.479 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.086 + 0.4452 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.37 < SLOPE < 1.26

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.062 + 0.4452 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -0.37 < SLOPE < 1.26  
 -0.93 < LEAK RATE < 2.88

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64333.10 POUNDS  
 LEAK RATE= 0.430 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.167 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 9

11/ 7/ 76 1500 HOURS

LAST INTERVAL HOURS 0.33

HOURS FROM T=0 2.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.52	0.00	0.027
2	79.90	0.00	0.027
3	76.91	0.08	0.027
4	76.40	0.08	0.027
5	77.94	0.00	0.027
6	75.97	0.00	0.027
7	76.40	-0.09	0.027
8	77.26	0.00	0.075
9	76.49	0.00	0.075
10	79.81	0.08	0.030
11	75.80	0.00	0.030
12	76.91	0.08	0.030
13	81.01	-0.17	0.025
14	80.33	-0.25	0.025
15	81.26	-0.26	0.025
16	79.99	-0.17	0.025
17	72.54	0.00	0.118
18	72.20	0.00	0.118
19	72.37	0.00	0.118
20	71.42	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.91	0.15	0.150
2	10.99	0.08	0.150
3	10.69	0.11	0.100
4	10.95	-0.04	0.150
5	9.77	-0.28	0.225
6	9.51	0.15	0.225

REF.VESSEL DP= 0.3422 ( 0.0066) PSID  
 DRYWELL PRESSURE= 73.4050 ( -0.0040) PSIA  
 AVG.DEWPOINT PRESS= 11.641 ( 0.0102) IN H2O  
 AVG.CONT.TEMP= 75.258 ( -0.0150) DEG.F

INTERVAL 8 LEAK RATE= 0.690 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.551 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.374 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.158 + 0.3364 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.26 < SLOPE < 0.93

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.046 + 0.3364 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -0.26 < SLOPE < 0.93  
 -0.64 < LEAK RATE < 2.53

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64326.90 POUNDS  
 LEAK RATE= 0.506 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.150 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 10  
11/ 7/ 76 1520 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.54	0.02	0.027
2	79.92	0.02	0.027
3	76.94	0.03	0.027
4	76.42	0.02	0.027
5	77.87	-0.07	0.027
6	75.99	0.02	0.027
7	76.42	0.02	0.027
8	77.28	0.02	0.075
9	76.51	0.02	0.075
10	79.84	0.03	0.030
11	75.82	0.02	0.030
12	77.02	0.11	0.030
13	80.94	-0.07	0.025
14	80.35	0.02	0.025
15	81.20	-0.06	0.025
16	79.92	-0.07	0.025
17	72.56	0.02	0.118
18	72.22	0.02	0.118
19	72.39	0.02	0.118
20	71.45	0.03	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.90	-0.01	0.150
2	10.83	-0.16	0.150
3	10.92	0.23	0.100
4	11.00	0.05	0.150
5	10.04	0.27	0.225
6	9.34	-0.17	0.225

REF. VESSEL DP=	0.3415	( -0.0007)	PSID
DRYWELL PRESSURE=	73.4050	( 0.0000)	PSIA
AVG. DEWPOINT PRESS=	11.668	( 0.0275)	IN H2O
AVG. CONT. TEMP=	75.274	( 0.0160)	DEG.F

INTERVAL 9 LEAK RATE=	0.027	WT%/24HRS
TOTAL TIME LEAK RATE=	0.493	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	1.332	WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS		
LEAK RATE=	0.318 +	0.1306 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE	-0.37 <	SLOPE < 0.63

LEAK RATE TREND SINCE T=0		
LEAK RATE=	0.275 +	0.1306 X HRS
95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0	-0.37 <	SLOPE < 0.63
	-0.83 <	LEAK RATE < 2.17

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64326.60	POUNDS
LEAK RATE=	0.520	WT%/24HRS
95% CONFIDENCE LEVEL=	0.118	WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
 INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 10  
 11/ 7/ 76 1520 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.54	0.02	0.027
2	79.92	0.02	0.027
3	76.94	0.03	0.027
4	76.42	0.02	0.027
5	77.87	-0.07	0.027
6	75.99	0.02	0.027
7	76.42	0.02	0.027
8	77.28	0.02	0.075
9	76.51	0.02	0.075
10	79.84	0.03	0.030
11	75.82	0.02	0.030
12	77.02	0.11	0.030
13	80.94	-0.07	0.025
14	80.35	0.02	0.025
15	81.20	-0.06	0.025
16	79.92	-0.07	0.025
17	72.56	0.02	0.118
18	72.22	0.02	0.118
19	72.39	0.02	0.118
20	71.45	0.03	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.90	-0.01	0.150
2	10.83	-0.16	0.150
3	10.92	0.23	0.100
4	11.00	0.05	0.150
5	10.04	0.27	0.225
6	9.34	-0.17	0.225

REF.VESSEL DP= 0.3415 ( -0.0007) PSID  
 DRYWELL PRESSURE= 73.4050 ( 0.0000) PSIA  
 AVG.DEWPOINT PRESS= 11.668 ( 0.0275) IN H2O  
 AVG.CONT.TEMP= 75.274 ( 0.0160) DEG.F

INTERVAL 9 LEAK RATE= 0.027 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.493 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.332 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.318 + 0.1306 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.37 < SLOPE < 0.63

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.275 + 0.1306 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -0.37 < SLOPE < 0.63  
 -0.83 < LEAK RATE < 2.17

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64326.60 POUNDS  
 LEAK RATE= 0.520 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.118 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 11  
11/ 7/ 76 1540 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.62	0.08	0.027
2	79.92	0.00	0.027
3	76.94	0.00	0.027
4	76.51	0.09	0.027
5	77.87	0.00	0.027
6	76.08	0.09	0.027
7	76.42	0.00	0.027
8	77.28	0.00	0.075
9	76.51	0.00	0.075
10	80.01	0.17	0.030
11	75.91	0.09	0.030
12	77.11	0.09	0.030
13	80.94	0.00	0.025
14	80.43	0.08	0.025
15	81.28	0.08	0.025
16	80.01	0.09	0.025
17	72.56	0.00	0.118
18	72.22	0.00	0.118
19	72.39	0.00	0.118
20	71.45	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	11.06	0.16	0.150
2	11.20	0.37	0.150
3	10.74	-0.18	0.100
4	11.01	0.01	0.150
5	9.49	-0.55	0.225
6	9.33	-0.01	0.225

REF.VESSEL DP= 0.3441 ( 0.0026) PSID  
 DRYWELL PRESSURE= 73.4090 ( 0.0040) PSIA  
 AVG.DEWPOINT PRESS= 11.605 ( -0.0629) IN H2O  
 AVG.CONT.TEMP= 75.297 ( 0.0230) DEG.F

INTERVAL 10 LEAK RATE= 0.029 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.446 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.290 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.418 + 0.0191 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.39 < SLOPE < 0.43

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.411 + 0.0191 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -0.39 < SLOPE < 0.43  
 -0.89 < LEAK RATE < 1.34

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64326.30 POUNDS  
 LEAK RATE= 0.505 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.096 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOW 1976

DATA SET NUMBER 12  
11/ 7/ 76 1600 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 0.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.62	0.00	0.027
2	80.01	0.09	0.027
3	77.02	0.06	0.027
4	76.51	0.00	0.027
5	77.87	0.00	0.027
6	76.08	0.00	0.027
7	76.59	0.17	0.027
8	77.36	0.08	0.075
9	76.59	0.08	0.075
10	80.09	0.08	0.030
11	75.99	0.08	0.030
12	77.28	0.17	0.030
13	81.20	0.26	0.025
14	80.60	0.17	0.025
15	81.45	0.17	0.025
16	80.09	0.08	0.025
17	72.56	0.00	0.118
18	72.31	0.09	0.118
19	72.39	0.00	0.118
20	71.53	0.08	0.118
DEWPOINT	IN. WATER	CHANGE 1/1000	WT.FACTOR
1	11.02	-0.04	0.150
2	11.20	0.00	0.150
3	10.56	-0.18	0.100
4	10.89	-0.12	0.150
5	9.93	0.44	0.225
6	9.45	0.12	0.225

REF.VESSEL DP= 0.3445 ( 0.0004) PSID  
 DRYWELL PRESSURE= 73.4150 ( 0.0060) PSIA  
 AVG.DEWPOINT PRESS= 11.689 ( 0.0842) IN H2O  
 AVG.CONT.TEMP= 75.365 ( 0.0680) DEG.F

INTERVAL 11 LEAK RATE= 0.330 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.436 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.225 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.438 - 0.0015 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.33 < SLOPE < 0.33

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.439 - 0.0015 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -0.33 < SLOPE < 0.33  
 -0.78 < LEAK RATE < 1.65

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64323.30 POUNDS  
 LEAK RATE= 0.436 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.080 WT%/24HRS

COOPER NUCLEAR STATION REFERENCE VESSEL METHOD  
INTEGRATED PRIMARY CONTAINMENT LEAKAGE RATE TEST-NOV.1976

DATA SET NUMBER 13  
11 74 76 1630 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 4.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACT
1	81.71	0.09	0.027
2	80.00	0.08	0.027
3	77.11	0.09	0.027
4	76.59	0.08	0.027
5	78.13	0.26	0.027
6	76.17	0.09	0.027
7	76.59	0.00	0.027
8	77.45	0.09	0.075
9	76.59	0.00	0.075
10	80.26	0.17	0.030
11	76.08	0.09	0.030
12	77.28	0.00	0.030
13	81.28	0.08	0.025
14	80.77	0.17	0.025
15	81.71	0.26	0.025
16	80.26	0.17	0.025
17	72.65	0.09	0.118
18	72.31	0.00	0.118
19	72.39	0.00	0.118
20	71.53	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.91	-0.11	0.150
2	11.01	-0.19	0.150
3	10.77	0.21	0.100
4	10.97	0.00	0.150
5	9.80	-0.13	0.225
6	9.38	-0.07	0.225

REF.VESSEL DP= 0.3445 ( 0.0000) PSID  
 DRYWELL PRESSURE= 73.4190 ( 0.0040) PSIA  
 AVG.DEWPOINT PRESS= 11.632 ( -0.0570) IN H2O  
 AVG.CONT.TEMP= 75.426 ( 0.0610) DEG.F

INTERVAL 12 LEAK RATE= -0.212 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.382 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.227 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.521 - 0.0759 X HRS  
 95% CONF. LIMIT FOR TREND EO. SLOPE  
 -0.36 < SLOPE < 0.21

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.546 - 0.0759 X HRS  
 95% CONF. LIMIT FOR TREND EO. SLOPE SINCE T=0  
 -0.36 < SLOPE < 0.21  
 -0.89 < LEAK RATE < 1.38

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64325.10 POUNDS  
 LEAK RATE= 0.458 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.075 WT%/24HRS

COOPER NUCLEAR STATION ALFREDGE VESSEL METHOD  
 INTEGRATED REF. VESSEL CONTAINMENT LEAKAGE RATE TEST-NOV. 1976

DATA SET NUMBER 14  
 11/ 7/ 76 1640 HOURS  
 LAST INTERVAL-HRS 0.33 HOURS FROM T=0 4.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.71	0.00	0.027
2	80.09	0.00	0.027
3	77.11	0.00	0.027
4	76.86	0.27	0.027
5	78.13	0.00	0.027
6	76.25	0.08	0.027
7	76.68	0.09	0.027
8	77.45	0.00	0.075
9	76.68	0.09	0.075
10	80.35	0.09	0.030
11	76.08	0.00	0.030
12	77.36	0.08	0.030
13	81.37	0.09	0.025
14	80.94	0.17	0.025
15	81.71	0.00	0.025
16	80.35	0.09	0.025
17	72.65	0.00	0.118
18	72.31	0.00	0.118
19	72.39	0.00	0.118
20	71.53	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	10.91	0.00	0.150
2	11.09	0.08	0.150
3	10.91	0.14	0.100
4	11.09	0.12	0.150
5	10.45	0.65	0.225
6	9.30	-0.08	0.225

REF. VESSEL DP= 0.3470 ( 0.0025) PSID  
 DRYWELL PRESSURE= 73.4210 ( 0.0020) PSIA  
 AVG. DEWPOINT PRESS= 11.805 ( 0.1723) IN H2O  
 AVG. CONT. TEMP= 75.459 ( 0.0330) DEG.F

INTERVAL 13 LEAK RATE= 0.856 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.418 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.204 WT%/24HRS

LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.444 - 0.0127 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.26 < SLOPE < 0.23

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.448 - 0.0127 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE SINCE T=0  
 -0.26 < SLOPE < 0.23  
 -0.68 < LEAK RATE < 1.46

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64317.40 POUNDS  
 LEAK RATE= 0.448 WT% 24HRS  
 95% CONFIDENCE LEVEL= -235- +/- 0.064 WT% 24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NO VALVE ALIGNMENT

DATA SET NUMBER 1  
11/ 7/ 76 1740 HOURS  
LAST INTERVAL HOURS 0.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.94	0.00	0.027
2	80.24	0.00	0.027
3	77.26	0.00	0.027
4	76.83	0.00	0.027
5	78.28	0.00	0.027
6	76.32	0.00	0.027
7	76.74	0.00	0.027
8	77.60	0.00	0.075
9	76.83	0.00	0.075
10	80.75	0.00	0.030
11	76.23	0.00	0.030
12	77.77	0.00	0.030
13	81.77	0.00	0.025
14	81.35	0.00	0.025
15	82.20	0.00	0.025
16	80.75	0.00	0.025
17	72.63	0.00	0.118
18	72.28	0.00	0.118
19	72.46	0.00	0.118
20	71.60	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	11.08	0.00	0.150
2	11.16	0.00	0.150
3	11.04	0.00	0.100
4	11.00	0.00	0.150
5	9.77	0.00	0.225
6	9.37	0.00	0.225

REF.VESSEL DP=	0.3391	(	0.0000)	PSID
DRYWELL PRESSURE=	73.4470	(	0.0000)	PSIA
AVG.DEWPOINT PRESS=	11.704	(	0.0000)	IN H <sub>2</sub> O
AVG.CONT.TEMP=	75.584	(	0.0000)	DEG.F
CONTAINMENT TOTAL MASS(DRY AIR)=	64319.80			POUNDS

NO LEAKAGE RATE VALUE CALCULATED FOR DATA SET#1

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 3  
11/ 7/ 76 1800 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 0.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.94	0.00	0.027
2	80.24	0.00	0.027
3	77.34	0.08	0.027
4	76.91	0.08	0.027
5	78.37	0.09	0.027
6	76.49	0.17	0.027
7	76.91	0.17	0.027
8	77.63	0.08	0.075
9	76.83	0.00	0.075
10	80.92	0.17	0.030
11	76.40	0.17	0.030
12	78.02	0.25	0.030
13	81.94	0.17	0.025
14	81.52	0.17	0.025
15	82.37	0.17	0.025
16	80.92	0.17	0.025
17	72.63	0.00	0.118
18	72.28	0.00	0.118
19	72.37	-0.09	0.118
20	71.51	-0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	11.08	0.00	0.150
2	11.02	-0.14	0.150
3	10.87	-0.17	0.100
4	11.21	0.21	0.150
5	9.76	-0.01	0.225
6	9.56	0.19	0.225

REF.VESSEL DP=	0.3392	( 0.0001)	PSID
DRYWELL PRESSURE=	73.4600	( 0.0130)	PSIA
AVG.DEWPOINT PRESS=	11.738	( 0.0343)	IN H2O
AVG.CONT.TEMP=	75.619	( 0.0350)	DEG.F

INTERVAL 1 LEAK RATE=	0.127	WT%/24HRS
TOTAL TIME LEAK RATE=	0.127	WT%/24HRS
POINT TO POINT STATISTICAL ERROR= +/-	0.000	WT%/24HRS
TREND EQUATION NOT CALC.(LESS THAN 5 DATA SETS)		

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)=	64318.60	POUNDS
LEAK RATE NOT CALC.(<3 DATA SETS)		

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPOLRT POST TEST WITH AEN VALVE ALIGNMENT

DATA SET NUMBER 3  
11 7 76 1820 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 0.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.13	0.19	0.027
2	80.52	0.28	0.027
3	77.45	0.11	0.027
4	76.94	0.03	0.027
5	78.64	0.27	0.027
6	76.51	0.02	0.027
7	77.02	0.11	0.027
8	77.79	0.11	0.075
9	76.94	0.11	0.075
10	81.28	0.36	0.030
11	76.51	0.11	0.030
12	78.22	0.20	0.030
13	82.22	0.28	0.025
14	81.96	0.44	0.025
15	82.64	0.27	0.025
16	81.11	0.19	0.025
17	72.65	0.02	0.118
18	72.31	0.03	0.118
19	72.48	0.11	0.118
20	71.62	0.11	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	10.99	-0.09	0.150
2	11.02	0.00	0.150
3	11.05	0.18	0.100
4	11.14	-0.07	0.150
5	9.98	0.22	0.225
6	9.38	-0.18	0.225

REF. VESSEL DP= 0.3351 ( -0.0041) PSID  
 DRYWELL PRESSURE= 73.4750 ( 0.0150) PSIA  
 AVG. DEWPOINT PRESS= 11.741 ( 0.0033) IN H2O  
 AVG. CONT. TEMP= 75.744 ( 0.1250) DEG.F

INTERVAL 2 LEAK RATE= -0.410 WT%/24HRS  
 TOTAL TIME LEAK RATE= -0.141 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.760 WT%/24HRS  
 TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64322.20 POUNDS  
 LEAK RATE= -0.134 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 3.589 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLRT COST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 4  
11/ 7/ 76 1840 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.30	0.17	0.027
2	80.52	0.00	0.027
3	77.62	0.17	0.037
4	77.11	0.17	0.037
5	78.64	0.00	0.027
6	76.59	0.00	0.027
7	77.11	0.09	0.027
8	77.87	0.00	0.075
9	77.11	0.17	0.075
10	81.37	0.09	0.030
11	76.59	0.00	0.030
12	78.22	0.00	0.030
13	82.39	0.17	0.025
14	82.13	0.17	0.025
15	82.90	0.26	0.025
16	81.37	0.26	0.025
17	72.74	0.09	0.118
18	72.31	0.00	0.118
19	72.48	0.00	0.118
20	71.53	-0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1/100	WT.FACTOR
1	11.23	0.24	0.150
2	11.18	0.16	0.150
3	10.98	-0.07	0.100
4	11.16	0.02	0.150
5	9.84	-0.14	0.225
6	9.36	-0.02	0.225

REF. VESSEL DP= 0.3384 ( 0.0033) PSID  
 DRYWELL PRESSURE= 73.4810 ( 0.0060) PSIA  
 AVG. DEWPOINT PRESS= 11.761 ( 0.0201) IN H2O  
 AVG. CONT. TEMP= 75.808 ( 0.0640) DEG.F

INTERVAL 3 LEAK RATE= 0.388 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.035 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.814 WT%/24HRS  
 TREND EQUATION NOT CALC. (LESS THAN 5 DATA SETS)

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64318.70 POUNDS  
 LEAK RATE= -0.003 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.655 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 5  
11/ 7/ 76 1500 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.23	-0.08	0.027
2	80.80	0.08	0.027
3	77.62	0.00	0.027
4	77.19	0.08	0.027
5	78.73	0.09	0.027
6	76.68	0.09	0.027
7	77.19	0.08	0.027
8	77.96	0.09	0.075
9	77.11	0.00	0.075
10	81.54	0.17	0.030
11	76.68	0.09	0.030
12	78.47	0.25	0.030
13	82.64	0.25	0.025
14	82.30	0.17	0.025
15	83.07	0.17	0.025
16	81.45	0.08	0.025
17	72.65	-0.09	0.118
18	72.31	0.00	0.118
19	72.48	0.00	0.118
20	71.62	0.09	0.118
DENPOINT	IN. WATER	CHANGE INCH.	WT.FACTOR
1	11.30	0.07	0.150
2	11.60	0.42	0.150
3	11.10	0.12	0.100
4	11.06	-0.10	0.150
5	9.77	-0.07	0.225
6	9.60	0.24	0.225

REF.VESSEL DP= 0.3353 ( -0.0031) PSID  
 DRYWELL PRESSURE= 73.4900 ( 0.0090) PSIA  
 AVG.DENPOINT PRESS= 11.870 ( 0.1089) IN H2O  
 AVG.CONT.TEMP= 75.856 ( 0.0480) DEG.F

INTERVAL 4 LEAK RATE= 0.076 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.045 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.666 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.051 + 0.1929 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -1.58 < SLOPE < 1.96

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.116 + 0.1929 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -1.58 < SLOPE < 1.96  
 -2.22 < LEAK RATE < 2.50

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64318.00 POUNDS  
 LEAK RATE= 0.039 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.219 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 (PCLET POST TEST WITH NEW VALVE ALIGNMENT)

DATA SET NUMBER 6  
 11/ 7/ 76 1920 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 1.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	92.39	0.17	0.027
2	80.69	0.09	0.027
3	77.70	0.08	0.027
4	77.19	0.00	0.027
5	78.90	0.17	0.027
6	76.85	0.17	0.027
7	77.28	0.09	0.027
8	78.05	0.09	0.075
9	77.19	0.08	0.075
10	81.37	-0.17	0.030
11	76.76	0.08	0.030
12	78.22	-0.25	0.030
13	82.73	0.09	0.025
14	82.39	0.09	0.025
15	83.15	0.08	0.025
16	81.62	0.17	0.025
17	72.65	0.00	0.118
18	72.31	0.00	0.118
19	72.48	0.00	0.118
20	71.53	-0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT. FACTOR
1	11.22	-0.08	0.150
2	11.52	-0.08	0.150
3	11.21	0.11	0.100
4	11.25	0.19	0.150
5	9.42	-0.35	0.225
6	9.38	-0.22	0.225

REF. VESSEL DP= 0.3319 ( -0.0034) PSID  
 DRYWELL PRESSURE= 73.4800 ( -0.0100) PSIA  
 AVG. DEWPOINT PRESS= 11.757 ( -0.1129) IN H2O  
 AVG. CONT. TEMP= 75.879 ( 0.0230) DEG.F

INTERVAL 5 LEAK RATE= -0.740 WT%/24HRS  
 TOTAL TIME LEAK RATE= -0.112 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 0.909 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.138 - 0.3749 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -1.48 < SLOPE < 0.73  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.263 - 0.3749 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -1.48 < SLOPE < 0.73  
 -2.20 < LEAK RATE < 1.48

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64324.60 POUNDS  
 LEAK RATE= -0.060 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.175 WT%/24HRS

COOPER HULLERY STATION - REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 7  
11/ 7/ 76 1940 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 2.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	82.39	0.00	0.027
2	80.59	0.00	0.027
3	77.79	0.09	0.027
4	77.38	0.09	0.027
5	78.81	-0.09	0.027
6	76.85	0.00	0.027
7	77.36	0.09	0.027
8	78.13	0.08	0.075
9	77.28	0.09	0.075
10	81.45	0.08	0.030
11	76.85	0.09	0.030
12	78.39	0.17	0.030
13	82.73	0.00	0.025
14	82.39	0.00	0.025
15	83.15	0.00	0.025
16	81.62	0.00	0.025
17	72.74	0.09	0.118
18	72.31	0.00	0.118
19	72.48	0.00	0.118
20	71.62	0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1 INCH.	WT. FACTOR
1	11.17	-0.05	0.150
2	11.22	-0.30	0.150
3	11.03	-0.18	0.100
4	11.22	-0.03	0.150
5	9.97	0.55	0.225
6	9.38	0.00	0.225

REF. VESSEL DP= 0.3448 ( 0.0129) PSID  
 DRYWELL PRESSURE= 73.4810 ( 0.0010) PSIA  
 AVG. DEWPOINT PRESS= 11.806 ( 0.0487) IN H2O  
 AVG. CONT. TEMP= 75.928 ( 0.0490) DEG.F

INTERVAL 6 LEAK RATE= 1.438 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.146 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.504 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.229 + 0.4501 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.74 < SLOPE < 1.64

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.379 + 0.4501 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.74 < SLOPE < 1.64  
 -1.96 < LEAK RATE < 2.90

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64011.70 POUNDS  
 LEAK RATE= 0.066 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.188 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPOLAT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 8  
11 7 7F 2000 HOURS  
LAST INTERVAL HOURS 0.03 HOURS FROM T=0 2.03

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.45	0.06	0.027
2	80.75	0.06	0.027
3	77.77	-0.02	0.027
4	77.34	0.06	0.027
5	78.88	0.07	0.027
6	76.83	-0.02	0.027
7	77.34	-0.02	0.027
8	78.11	-0.02	0.025
9	77.34	0.06	0.025
10	81.35	-0.10	0.030
11	76.83	-0.02	0.030
12	78.28	-0.11	0.030
13	82.62	-0.11	0.025
14	82.28	-0.11	0.025
15	83.13	-0.02	0.025
16	81.52	-0.10	0.025
17	72.63	-0.11	0.118
18	72.28	-0.03	0.118
19	72.46	-0.02	0.118
20	71.60	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	11.12	-0.05	0.150
2	11.41	0.19	0.150
3	11.12	0.09	0.100
4	11.21	-0.01	0.150
5	9.89	-0.08	0.225
6	9.31	-0.07	0.225

REF.VESSEL DP= 0.3563 ( 0.0115) PSID  
 DRYWELL PRESSURE= 73.4650 ( -0.0160) PSIA  
 AVG.DEWPOINT PRESS= 11.800 ( -0.0055) IN H2O  
 AVG.CONT.TEMP= 75.900 ( -0.0280) DEG.F

INTERVAL 7 LEAK RATE= 1.118 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.285 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.557 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.308 + 0.5936 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.20 < SLOPE < 1.39

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.506 + 0.5936 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.20 < SLOPE < 1.39  
 -0.98 < LEAK RATE < 2.74

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64801.70 POUNDS  
 LEAK RATE= 0.206 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.206 WT%/24HRS

COOPER HULL LEAK STATION--REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 9  
11/ 76 2030 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 2.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.39	-0.06	0.027
2	80.69	-0.06	0.027
3	77.79	0.02	0.027
4	77.28	-0.06	0.027
5	78.90	0.02	0.027
6	76.85	0.02	0.027
7	77.28	-0.06	0.027
8	78.13	0.02	0.075
9	77.36	0.02	0.075
10	81.20	-0.17	0.030
11	76.76	-0.07	0.030
12	78.13	-0.15	0.030
13	82.56	-0.06	0.025
14	82.13	-0.15	0.025
15	82.98	-0.15	0.025
16	81.45	-0.07	0.025
17	72.65	0.02	0.118
18	72.31	0.03	0.118
19	72.48	0.02	0.118
20	71.53	-0.07	0.118

DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	10.95	-0.17	0.150
2	11.36	-0.05	0.150
3	11.16	0.04	0.100
4	11.21	0.00	0.150
5	9.61	-0.28	0.225
6	9.12	-0.19	0.225

REF. VESSEL DP= 0.3663 ( 0.0100) PSID  
 DRYWELL PRESSURE= 73.4500 ( -0.0150) PSIA  
 AVG. DEWPOINT PRESS= 11.665 ( -0.1352) IN. H2O  
 AVG. CONT. TEMP= 75.876 ( -0.0240) DEG. F

INTERVAL 8 LEAK RATE= 0.500 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.313 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.450 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.214 + 0.4514 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.14 < SLOPE < 1.04

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.364 + 0.4514 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.14 < SLOPE < 1.04  
 -0.73 < LEAK RATE < 2.41

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64297.10 POUNDS  
 LEAK RATE= 0.292 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.179 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 IPCLRT POST EST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 10  
 11/ 7/ 76 2040 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.37	-0.02	0.037
2	80.67	-0.02	0.037
3	77.77	-0.02	0.037
4	77.17	-0.11	0.037
5	78.71	-0.19	0.037
6	76.74	-0.11	0.037
7	77.17	-0.11	0.037
8	78.11	-0.02	0.075
9	77.34	-0.02	0.075
10	80.92	-0.28	0.030
11	76.74	-0.02	0.030
12	77.85	-0.28	0.030
13	82.37	-0.19	0.025
14	81.86	-0.27	0.025
15	82.71	-0.27	0.025
16	81.26	-0.19	0.025
17	72.63	-0.02	0.118
18	72.28	-0.03	0.118
19	72.37	-0.11	0.118
20	71.51	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1INCH.	WT.FACTOR
1	11.03	0.00	0.150
2	11.32	-0.04	0.150
3	10.74	-0.42	0.100
4	11.24	0.03	0.150
5	9.62	0.01	0.225
6	9.48	0.36	0.225

REF. VESSEL DP= 0.3807 ( 0.0144) PSID  
 DRYWELL PRESSURE= 73.4290 ( -0.0210) PSIA  
 AVG. DEWPOINT PRESS= 11.717 ( 0.0514) IN H2O  
 AVG. CONT. TEMP= 75.796 ( -0.0800) DEG.F

INTERVAL 9 LEAK RATE= 1.615 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.457 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.610 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.311 + 0.5764 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE 0.11 < SLOPE < 1.34

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.503 + 0.5764 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 0.11 < SLOPE < 1.34  
 -0.17 < LEAK RATE < 3.50

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64282.60 POUNDS  
 LEAK RATE= 0.403 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.187 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 11  
11/ 7 76 2100 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 3.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.28	-0.09	0.027
2	80.67	0.00	0.027
3	77.60	-0.17	0.027
4	77.17	0.00	0.027
5	78.71	0.00	0.027
6	76.74	0.00	0.027
7	77.08	-0.09	0.027
8	73.02	-0.09	0.075
9	77.26	-0.08	0.075
10	80.67	-0.25	0.030
11	76.66	-0.08	0.030
12	77.68	-0.17	0.030
13	82.03	-0.34	0.025
14	81.52	-0.34	0.025
15	82.37	-0.34	0.025
16	81.09	-0.17	0.025
17	72.71	0.08	0.118
18	72.28	0.00	0.118
19	72.46	0.09	0.118
20	71.60	0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	11.15	0.12	0.150
2	11.09	-0.23	0.150
3	10.77	0.03	0.100
4	11.22	-0.02	0.150
5	9.66	0.04	0.225
6	9.35	-0.13	0.225

REF.VESSEL DP= 0.3918 ( 0.0111) PSID  
 DRYWELL PRESSURE= 73.4100 ( -0.0190) PSIA  
 AVG.DEWPOINT PRESS= 11.679 ( -0.0373) IN H2O  
 AVG.CONT.TEMP= 75.759 ( -0.0370) DEG.F

INTERVAL 10 LEAK RATE= 0.967 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.508 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.552 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.245 + 0.5026 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE 0.13 < SLOPE < 0.88

LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.413 + 0.5026 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 0.13 < SLOPE < 0.88  
 0.02 < LEAK RATE < 2.51

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64273.90 POUNDS  
 LEAK RATE= 0.498 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.177 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLPT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 12  
11/ 7/ 76 2120 HOURS  
LAST INTERVAL, HOURS 0.32 HOURS FROM T=0 3.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	82.28	0.00	0.027
2	80.67	0.00	0.027
3	77.60	0.00	0.027
4	77.08	-0.09	0.027
5	78.71	0.00	0.027
6	76.74	0.00	0.027
7	77.08	0.00	0.027
8	78.02	0.00	0.075
9	77.26	0.00	0.075
10	80.67	0.00	0.030
11	76.57	-0.09	0.030
12	77.68	0.00	0.030
13	81.86	-0.17	0.025
14	81.26	-0.26	0.025
15	82.11	-0.26	0.025
16	80.92	-0.17	0.025
17	72.63	-0.08	0.118
18	72.28	0.00	0.118
19	72.46	0.00	0.118
20	71.60	0.00	0.118
DEWPOINT	IN. WATER	CHANGE INCH.	WT. FACTOR
1	11.31	0.16	0.150
2	11.03	-0.06	0.150
3	11.11	0.34	0.100
4	11.22	0.00	0.150
5	9.77	0.11	0.225
6	9.34	-0.01	0.225

REF. VESSEL DP= 0.3946 ( 0.0028) PSID  
 DRYWELL PRESSURE= 73.4050 ( -0.0050) PSIA  
 AVG. DEWPOINT PRESS= 11.751 ( 0.0714) IN H2O  
 AVG. CONT. TEMP= 75.723 ( -0.0360) DEG.F

INTERVAL 11 LEAK RATE= 0.536 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.511 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.473 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= -0.123 + 0.3807 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE 0.05 < SLOPE < 0.71  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.250 + 0.3807 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 0.05 < SLOPE < 0.71  
 -0.05 < LEAK RATE < 2.34

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64269.10 POUNDS  
 LEAK RATE= 0.551 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.155 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 IFCLPT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 13  
 11/ 77 76 2140 HOURS  
 LAST INTERVAL, HOURS 0.33 HOURS FROM T=0 4.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	82.20	-0.00	0.027
2	80.58	-0.09	0.027
3	77.60	0.00	0.027
4	77.08	0.00	0.027
5	78.54	-0.17	0.027
6	76.66	-0.08	0.027
7	77.08	0.00	0.027
8	77.94	-0.08	0.075
9	77.17	-0.09	0.075
10	80.67	0.00	0.030
11	76.57	0.00	0.030
12	77.68	0.00	0.030
13	81.86	0.00	0.025
14	81.26	0.00	0.025
15	82.11	0.00	0.025
16	80.75	-0.17	0.025
17	72.63	0.00	0.118
18	72.28	0.00	0.118
19	72.46	0.00	0.118
20	71.60	0.00	0.118
DEWPOINT	IN. WATER	CHANGE 1 INCH.	WT. FACTOR
1	11.09	-0.22	0.150
2	11.54	0.51	0.150
3	11.00	-0.11	0.100
4	11.09	-0.13	0.150
5	9.70	-0.07	0.225
6	9.28	-0.06	0.225

REF. VESSEL DP= 0.3956 ( 0.0010) PSID  
 DRYWELL PRESSURE= 73.4050 ( 0.0000) PSIA  
 AVG. DEWPOINT PRESS= 11.735 ( -0.0162) IN H2O  
 AVG. CONT. TEMP= 75.695 ( -0.0280) DEG.F

INTERVAL 12 LEAK RATE= 0.045 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.472 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.430 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.034 + 0.2391 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE  
 -0.07 < SLOPE < 0.55  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= -0.046 + 0.2391 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.07 < SLOPE < 0.55  
 -0.32 < LEAK RATE < 2.14

MASS PLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS (DRY AIR)= 64268.60 POUNDS  
 LEAK RATE= 0.566 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.131 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 ISOLANT PUMP TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 14  
 11/ 7/ 76 2200 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 4.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	82.11	-0.09	0.027
2	80.41	-0.17	0.027
3	77.34	-0.26	0.027
4	76.91	-0.17	0.027
5	78.54	0.00	0.027
6	76.49	-0.17	0.027
7	76.91	-0.17	0.027
8	77.85	-0.09	0.075
9	77.08	-0.09	0.075
10	80.67	0.00	0.030
11	76.49	-0.08	0.030
12	77.68	0.00	0.030
13	81.69	-0.17	0.025
14	81.18	-0.08	0.025
15	81.94	-0.17	0.025
16	80.75	0.00	0.025
17	72.71	0.08	0.118
18	72.28	0.00	0.118
19	72.46	0.00	0.118
20	71.51	-0.09	0.118
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	11.26	0.17	0.150
2	11.37	-0.17	0.153
3	10.88	-0.12	0.100
4	11.17	0.08	0.150
5	9.77	0.07	0.225
6	9.40	0.12	0.225

REF.VESSEL DP= 0.3980 ( 0.0024) PSID  
 DRYWELL PRESSURE= 73.3960 ( -0.0090) PSIA  
 AVG.DEWPOINT PRESS= 11.777 ( 0.0425) IN H2O  
 AVG.CONT.TEMP= 75.640 ( -0.0550) DEG.F

INTERVAL 13 LEAK RATE= 0.397 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.466 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.369 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.106 + 0.1804 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.08 < SLOPE < 0.44  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.046 + 0.1804 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE -0.08 < SLOPE < 0.44  
 -0.32 < LEAK RATE < 1.57

CONTAINMENT LEAKAGE RATE ANALYSIS

MASS(DRY AIR)= 64265.00 POUNDS  
 -249- 0.572 WT%/24HRS  
 +/- 0.112 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 15  
11/ 7 76 2320 HOURS  
LAST INTERVAL HOURS 0.33 HOURS FROM T=0 4.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.95	-0.15	0.027
2	80.60	0.19	0.027
3	77.28	-0.06	0.027
4	76.85	-0.06	0.027
5	78.39	-0.15	0.027
6	76.42	-0.07	0.027
7	76.76	-0.15	0.027
8	77.79	-0.06	0.075
9	76.94	-0.14	0.075
10	80.69	0.02	0.030
11	76.51	0.02	0.030
12	77.70	0.02	0.030
13	81.71	0.02	0.025
14	81.28	0.10	0.025
15	82.05	0.11	0.025
16	80.69	-0.06	0.025
17	72.74	0.03	0.118
18	72.31	0.03	0.118
19	72.48	0.02	0.118
20	71.62	0.11	0.110
DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	11.08	-0.18	0.150
2	11.16	-0.21	0.150
3	11.05	0.17	0.100
4	11.16	-0.01	0.150
5	9.92	0.15	0.225
6	9.09	-0.31	0.225

REF. VESSEL DP= 0.3982 ( 0.0002) PSID  
 DRYWELL PRESSURE= 73.3950 ( -0.0010) PSIA  
 AVG. DEWPOINT PRESS= 11.698 ( -0.0790) IN H2O  
 AVG. CONT. TEMP= 75.641 ( 0.0010) DEG.F

INTERVAL 14 LEAK RATE= -0.262 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.414 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.372 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.237 + 0.0818 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.16 < SLOPE < 0.33  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.210 + 0.0818 X HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.16 < SLOPE < 0.33  
 -0.56 < LEAK RATE < -1.74

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64267.30 POUNDS  
 LEAK RATE= 0.554 WT% 24HRS  
 95% CONFIDENCE LEVEL= +/- 0.098 WT% 24HRS

COOPER HOLLAND STATION--REFERENCE VESSEL METHOD  
 IPOLEPT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 16  
 11/ 7/ 76 2240 HOURS  
 LAST INTERVAL HOURS 0.33 HOURS FROM T=0 5.00

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.95	0.00	0.027
2	80.15	-0.25	0.027
3	77.28	0.00	0.027
4	76.05	0.00	0.027
5	78.47	0.08	0.027
6	76.34	-0.08	0.027
7	76.76	0.00	0.027
8	77.79	-0.09	0.075
9	76.05	-0.09	0.075
10	80.69	0.00	0.030
11	76.51	0.00	0.030
12	77.79	0.00	0.030
13	81.79	0.08	0.025
14	81.28	0.00	0.025
15	82.13	0.08	0.025
16	80.77	0.08	0.025
17	72.74	0.00	0.118
18	72.31	0.00	0.118
19	72.48	0.00	0.118
20	71.62	0.00	0.118

DEWPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	11.16	0.08	0.150
2	11.08	-0.08	0.150
3	10.92	-0.13	0.100
4	11.07	-0.09	0.150
5	9.62	-0.30	0.225
6	9.26	0.17	0.225

REF. VESSEL DP= 0.3965 (-0.0017) PSID  
 DRYWELL PRESSURE= 73.3970 (-0.0020) PSIA  
 AVG. DEWPOINT PRESS= 11.642 (-0.0556) IN H2O  
 AVG. CONT. TEMP= 75.627 (-0.0140) DEG.F

INTERVAL 15 LEAK RATE= -0.364 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.362 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.382 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.408 - 0.0133 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.27 < SLOPE < 0.25

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.341 + 0.0081 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.22 < SLOPE < 0.23  
 -0.75 < LEAK RATE < 1.51

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64270.50 POUNDS  
 LEAK RATE= 0.523 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.091 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
IPCLRT POST TEST WITH NEW VALVE ALIGNMENT

DATA SET NUMBER 17  
11/ 7/ 76 2300 HOURS  
LAST INTERVAL HOURS 0.32 HOURS FROM T=0 5.33

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT. FACTOR
1	81.94	-0.02	0.037
2	80.33	-0.02	0.037
3	77.26	-0.02	0.037
4	76.83	-0.02	0.037
5	78.54	0.07	0.037
6	76.32	-0.03	0.037
7	76.66	-0.10	0.037
8	77.60	-0.10	0.075
9	76.83	-0.02	0.075
10	80.84	0.15	0.030
11	76.49	-0.02	0.030
12	77.77	0.07	0.030
13	81.94	0.15	0.025
14	81.43	0.15	0.025
15	82.28	0.15	0.025
16	80.84	0.07	0.025
17	72.71	-0.03	0.118
18	72.28	-0.03	0.118
19	72.46	-0.02	0.118
20	71.60	-0.02	0.118
DEWPOINT	IN. WATER	CHANGE 1 INCH.	WT. FACTOR
1	11.09	-0.07	0.150
2	11.09	0.01	0.150
3	10.64	-0.28	0.100
4	11.16	0.09	0.150
5	9.86	0.24	0.225
6	9.34	0.08	0.225

REF. VESSEL DP= 0.3937 ( -0.0028) PSID  
 DRYWELL PRESSURE= 73.4020 ( 0.0050) PSIA  
 AVG. DEWPOINT PRESS= 11.691 ( 0.0486) IN H2O  
 AVG. CONT. TEMP= 75.622 ( -0.0050) DEG.F

INTERVAL 16 LEAK RATE= -0.102 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.333 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.355 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.689 - 0.1327 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.38 < SLOPE < 0.11  
 LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.402 - 0.0241 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.22 < SLOPE < 0.18  
 -0.79 < LEAK RATE < 1.34

MASS FLOT CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64271.40 POUNDS  
 LEAK RATE= 0.489 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.097 WT%/24HRS

COOPER NUCLEAR STATION--REFERENCE VESSEL METHOD  
 POINT # 17 NOT WITHIN VALVE ALIGNMENT

DATA SET NUMBER 13  
 11/17/76 1020 HOURS  
 LAST INTERVAL HOURS 0.03 HOURS FROM T=0 5.67

TEMPERATURE	DEGREES F	CHANGE DEG.F	WT.FACTOR
1	81.94	0.00	0.027
2	80.30	0.00	0.027
3	77.26	0.00	0.027
4	76.83	0.00	0.027
5	78.54	0.00	0.027
6	76.32	0.00	0.027
7	76.74	0.08	0.027
8	77.60	0.08	0.075
9	76.83	0.00	0.075
10	80.92	0.08	0.030
11	76.57	0.08	0.030
12	77.94	0.17	0.030
13	82.03	0.09	0.025
14	81.60	0.17	0.025
15	82.37	0.09	0.025
16	80.92	0.08	0.025
17	72.71	0.00	0.118
18	72.37	0.09	0.118
19	72.46	0.00	0.118
20	71.60	0.00	0.118

DENPOINT	IN. WATER	CHANGE 1NCH.	WT.FACTOR
1	11.02	-0.07	0.150
2	11.31	0.22	0.150
3	10.84	0.20	0.100
4	10.94	-0.22	0.150
5	9.80	-0.06	0.225
6	9.14	-0.20	0.225

REF.VESSEL DP= 0.3912 ( -0.0025) PSID  
 DRYWELL PRESSURE= 73.4080 ( 0.0060) PSIA  
 AVG.DENPOINT PRESS= 11.642 ( -0.0489) IN H2O  
 AVG.CONT.TEMP= 75.661 ( 0.0390) DEG.F

INTERVAL 17 LEAK RATE= -0.427 WT%/24HRS  
 TOTAL TIME LEAK RATE= 0.289 WT%/24HRS  
 POINT TO POINT STATISTICAL ERROR= +/- 1.363 WT%/24HRS  
 LEAK RATE TREND FOR LAST 4 HOURS  
 LEAK RATE= 0.787 - 0.2050 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE -0.45 < SLOPE < 0.04

LEAK RATE TREND SINCE T=0  
 LEAK RATE= 0.483 - 0.0640 % HRS  
 95% CONF. LIMIT FOR TREND EQ. SLOPE/LEAK RATE  
 -0.24 < SLOPE < 0.11  
 -0.90 < LEAK RATE < 1.13

MASS FLOW CONTAINMENT LEAKAGE RATE ANALYSIS

CONTAINMENT TOTAL MASS(DRY AIR)= 64275.20 POUNDS  
 LEAK FRACTION= 0.449 WT%/24HRS  
 95% CONFIDENCE LEVEL= +/- 0.077 WT%/24HRS