

REACTOR CONTAINMENT BUILDING
INTEGRATED LEAK RATE TEST
SEQUOYAH NUCLEAR PLANT UNIT 1
CONDUCTED DECEMBER 17-20, 1993

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TEST REPORT

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DATE APPROVED: 3-7-94

SUBMITTED TO:
THE UNITED STATES NUCLEAR REGULATORY COMMISSION
PURSUANT TO
FACILITY OPERATING LICENSE

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1.0 INTRODUCTION

As prescribed in Sequoyah Nuclear Plant (SQN) Unit 1 Technical Specification 4.6.1.2, the leakage of air from the boundary forming the reactor building primary containment is limited to 0.25 percent by weight of the containment air mass per day at a pressure of Pa (i.e. 12.0 psig). In conformance with Title 10, Code of Federal Regulations (CFR), Part 50, Appendix J, SQN Technical Specifications require that a reactor building containment integrated leak rate test (CILRT) be performed as part of the surveillance program to demonstrate the continuing leak-tight integrity of the reactor building primary containment.

The fourth inservice reactor building CILRT was successfully completed on SQN Unit 1 by TVA personnel on December 17-20, 1993. This test was conducted in accordance with plant approved surveillance instructions 1-SI-SLT-088-156.0 and 1-PI-SLT-000-156.0, which are on file at the plant site. These SIs implement the requirements of SQN Unit 1 Technical Specifications and 10 CFR 50, Appendix J. The American National Standard for Containment Testing, ANSI 45.4-1972, the American Nuclear Society for Containment Testing, ANS 56.8, and the procedure outlined in Bechtel's topical report, "Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants" (BN-TOP-1, Revision 1) provided guidance for the procedures implemented by the SI and PI.

SQN Unit 1 is a 3,411 megawatt thermal, pressurized water reactor employing an ice condenser pressure suppression containment. The Final Safety Analysis Report defines the calculated peak accident pressure, Pa, to be 12.0 psig. The reactor building containment is divided into three major compartments for the CILRT analysis--the ice condenser houses the energy absorbing ice beds and supporting machinery for the ice condenser systems, the lower compartment which contains the reactor and main piping systems, and the upper compartment which provides for a large work area within containment and also can accommodate the displaced air mass from the other compartments in the unlikely event of a loss-of-coolant accident (LOCA). These three compartments are connected by means of blowout panels located between the ice condenser and the upper/lower compartments. In the event of a LOCA, steam flows from the lower compartment through the ice condenser compartment and into upper containment. The upper compartment is sealed from the lower compartment to ensure that any steam released in an accident will be forced through energy absorbing ice beds. For the performance of the CILRT, the lower compartment and upper compartments were not sealed from each other to promote the free flow of air in containment.

This report outlines the objectives, principal events, special equipment used, and analysis of the test results for the CILRT conducted on December 17-20, 1993, on SQN Unit 1. In addition, a summary of local leak rate tests conducted since the previous CILRT is included in Appendix L.

2.0 SUMMARY

The SQN Unit 1 inservice CILRT was conducted on December 17-20, 1993, in conjunction with the Cycle 6 refueling outage. The CILRT was successfully completed in 13 hours and 10 minutes and included 80 data points.

The calculated Total Time Leak Rate (TTLR) for the CILRT was 0.1333%/day. The associated reportable "as found" leak rate, which includes the upper confidence limit (UCL), the Type B and C leakage rates for systems in service during the CILRT, the leakage savings and leakage rate compensation for water level changes not accounted for by the CILRT computer system was 0.2416%/day. The "as left" leakage rate, including the UCL, leakage rates (Type B and C) of systems inservice during the CILRT, and leak rate compensation for water level change was 0.1742%/day.

The "as found" mass leak rate (MLR) for the CILRT was 0.1980%/day. The reportable "as left" leak rate was 0.1306%/day. These two values reflect the add on leakage adjustments described for the TTLR calculation.

The verification test agreement was -3.3590% for TTLR by Appendix J method and -2.2206% by BN-TOP-1 calculation. The MLR verification agreement by Appendix J method was 4.0515% and 2.5842% by BN-TOP-1 procedure. The allowable agreement is $\pm 25.0\%$.

Graphical and tabular data for the CILRT and verification test are included in Appendices A-F.

3.0 TEST PURPOSE AND RESULTS

3.1 Test Purpose

The objective of the inservice CILRT was to demonstrate the continuing leak tight integrity of the Unit 1 reactor building containment for return-to-power operation.

For SQN Unit 1, the leak-tight integrity is defined in Technical Specification 4.6.1.2 to be that the leakage of air from containment is not to exceed 0.1875%/day at peak accident pressure Pa (12.0 psig).

3.2 Test Results

NOTE: CILRT and verification test graphical and tabular data are included in Appendices A-F.

3.0 TEST PURPOSE AND RESULTS (continued)

3.2 Test Results (continued)

Pressurization was started at 2238 on December 17, 1993. During pressurization, pressurizer level was reported to be dropping and at 2357 pressurization was stopped to evaluate this situation. Apparently an air void existed in the reactor coolant system. However, it was determined that compression of the air void would not affect test results since equilibrium with containment ambient pressure would exist. During the remainder of pressurization, make up to the reactor coolant system continued to maintain pressurizer level constant. Pressurization was completed at 0940 on December 18, 1993. The stabilization phase was started at 0956. During stabilization, a difference in control room containment pressure and CILRT data acquisition system containment pressure was noted. Investigation revealed the calibrated data for the atmospheric pressure gauge, which is part of the CILRT test system, had been entered incorrectly. After reentering the calibration data, the CILRT test system indicated a containment pressure of 13.32 psig. This pressure was greater than that specified by the test procedure but was below the ASME Section 8 Paragraph UG 100 limit of 13.5 psig. The decision was made to continue the test sequence at the current pressure since any possible effects or results would be in the conservative direction. The temperature stabilization phase was ended at sample 29 after four and one-half hours of data. Temperature stabilization was 0.0624°F/hour, which was only 12.5% of the allowable 0.5°F/hour.

The test phase was started at sample 30 at 1426 on December 18, 1993. At 1456, it was reported that a penetration used to supply ice during outages (X-79B) was leaking. The initial set of data was terminated at sample 60 at 1927 on December 18, 1993. The indicated calculated TTLR and MLR of sample 60 were 0.1825%/day and 0.187%/day, respectively. Inspection of the "O" ring seals on X-79B penetration revealed damage (breakage) which had apparently occurred when the penetration flange was replaced approximately two weeks prior to the conduct of the CILRT. This damage was not detected during the Type B LLRT performed after replacement due to an obstruction (foreign material) in the flange test port. The flange and surfaces were cleaned, the seals were replaced, and the flange retorqued. The possible presence of foreign material in the flange test port is being investigated. The seals were replaced and the flange retorqued. The test was resumed at sample 81 at 0221 on December 19, 1993.

3.0 TEST PURPOSE AND RESULTS (continued)

3.2 Test Results (continued)

The test continued until sample 160 when the TTLR UCL was 0.1742%/day and the MLR UCL was 0.1306%/day. The leak rate was increasing slightly at the conclusion of the test. However, the TTLR calculated value of 0.1338%/day, when extrapolated, as described in BN-TOP-1, was 0.1382%/day which is well within the required acceptance criteria of 0.1875%/day. The mean value of the measured total time leak rates over the last five hours of the test period was 0.1169%/day, which is significantly less than 0.75 La (0.1875%/day) as required by the termination criteria of BN-TOP-1.

A leak rate of approximately La was established and allowed to stabilize for one hour in accordance with BN-TOP-1 requirements for the verification test. The verification test started at sample 168 at 1651 on December 19, 1993 with an imposed leak rate of 104,884.4 standard cubic centimeters per minute (SCCM) or 98.6% of the allowable leak rate. The test was concluded satisfactorily at sample 210 at 2354 on December 19, 1993 after seven hours. The agreement was well within the limits of $\pm 25\%$. The TTLR agreement per Appendix J and BN-TOP-1 was -3.3590% and -2.2206% respectively. The agreement for MLR was 4.0515% and 2.5842% for the Appendix J and BN-TOP-1 analysis respectively.

The following table presents the tests results as well as the instrument selection guide (ISG) evaluation for post test conditions.

TABLE OF CILRT AND VERIFICATION TEST RESULTS

"As Found" and "As Left" Acceptance Criteria is 0.75 La or (0.1875%/Day)

Post Test ISG 12.9729 Percent La (Using Instrument Accuracy)
1.0830 Percent La (Using Instrument Repeatability)
(25% La Allowable)

As Found

	<u>Calculated</u>		<u>With 95% UCL</u>
TTLR	<u>0.2007</u>	%/Day(1)(2)(3)	<u>0.2416</u> %/Day(1)(2)(3)
MLR	<u>0.1962</u>	%/Day(1)(2)(3)	<u>0.1980</u> %/Day(1)(2)(3)

As Left

	<u>Calculated</u>		<u>With 95% UCL</u>
TTLR	<u>0.1333</u>	%/Day(2)(3)	<u>0.1742</u> %/Day(2)(3)
MLR	<u>0.1288</u>	%/Day(2)(3)	<u>0.1306</u> %/Day(2)(3)

CILRT Test Duration 13 Hours 10 Minutes
CILRT Number of Samples 80
CILRT Sample Span 81 to 160
Mean Value of Measured TTLR 0.1169 %/Day

Verification Test

TTLR Agreement -3.3590 (4) Appendix J TTLR Agreement -2.2206 BN-TOP-1
MLR Agreement 4.0515 (4) Appendix J MLR Agreement 2.5842 BN-TOP-1

Verification Test Duration 7 Hours 0 Minutes
Verification Number of Samples 43
Verification Sample Span 168 to 210

TTLR = Total Time Leak Rate
MLR = Mass Leak Rate

- (1) Reflects leakage savings of 0.0674 percent per day.
- (2) Reflects leakage of systems inservice during CILRT of 0.0000 percent per day. See Appendix G.
- (3) Reflects adjustment of 0.0000 percent per day due to sump level changes. See Appendix H for calculations. Sump level influence on leak rate is facilitated by manual collection and evaluation of data. Pressurizer level changes are automatically monitored by the CILRT computer system and included in computed test results.
- (4) See Appendix F for verification calculations.

4.0 CONDUCT OF TEST

The following is a summary of events from the test log and test procedure for the Unit 1 CILRT.

<u>Date</u>	<u>Time</u>	<u>Event</u>
12/17/93	1400	Completed inspection of Unit 1 containment in accordance with SI-254.
12/17/93	2238	Started pressurization.
12/17/93	2357	Stopped pressurization due to pressurizer level drop.
12/18/93	0021	Pressurizer level drop apparently due to compression of air void in the reactor coolant system. Pressurizer makeup will be concurrent with pressurization.
12/18/93	0940	Completed pressurization.
12/18/93	0956	Started stabilization phase.
12/18/93	1042	Pressurization spool piece removed. Compressor is now disconnected from containment.
12/18/93	1100	Began leak checks in annulus. There is a discrepancy of 0.55 psi in the Unit 1 control room ready for containment pressure and the CILRT data acquisition system.
12/18/93	1340	Investigation into pressure discrepancy revealed calibration for CILRT atmospheric pressure gauge had been entered incorrectly. After reentering the calibration data pressure was 13.32 psig. This is greater than that specified by the test procedure but is below containment design pressure and ASME Section 8 Paragraph UG 100 limit of 13.5 psig.
12/18/93	1426	Temperature stabilization criteria met. Started test phase on sample 30.
12/18/93	1456	X-79B reported leaking.
12/18/93	1927	Test stopped at sample 60 to repair X-79B. Leak rate 0-1825%/day TTR (calculated) 0.187%/day MLR (calculated).
12/19/93	0050	Exited containment after repairs to X-79B.

4.0 CONDUCT OF TEST (continued)

<u>Date</u>	<u>Time</u>	<u>Event</u>
12/19/93	0200	Restart test at sample 78.
12/19/93	0215	Problem with P3 gauge reading (spike) will restart test at sample 81.
12/19/93	0221	Restart test at sample 81.
12/19/93	0900	Noticed anomaly in P3 reading. Deleted P3 from test data base.
12/19/93	1313	R24 in ice compartment overranged. Failed R24 from test data base.
12/19/93	1531	Concluded CILRT test phase at sample 160.
12/19/93	1550	Established verification test imposed leak.
12/19/93	1651	Started verification test at sample 168.
12/19/93	1750	AD 10/10 error 21 RS 232 1A timeout to primary computer. Concurrently bad data warning for dew cell D45. Failed D45 from test data based. Continuing on one computer.
12/19/93	2354	Terminated verification test.
12/20/93	0142	Started depressurization.
12/20/93	0615	Containment pressure is zero psig.

5.0 MEASUREMENTS AND CALIBRATIONS5.1 Test Equipment

Appendix K lists the instrument specification used for the Unit 1 Cycle 6 CILRT. All instruments were calibrated within six months of the CILRT and the temperature and dew point instruments also received an additional "in place" loop calibration after installation in primary containment.

5.2 Sensor Location

Appendix J gives the final volumetric weighing factor for each temperature and dew point sensor based upon a three-compartment model. The associated figures indicate sensor locations. The pressure sensors were divided so that two sensors measured each of the three compartments through X-27, X-87A, and X-87D.

5.0 MEASUREMENTS AND CALIBRATIONS (continued)

5.2 Sensor Location (continued)

Utilizing two pressure sensors per compartment allows the removal of any one malfunctioning pressure gauge during the test and continue to accurately monitor pressure. An additional pressure gauge measured barometric pressure at the test station.

5.3 Computer-Based Data Acquisition and Data Reduction

The raw test data measured by the special test instrumentation during the SQN Unit 1 CILRT was scanned and collected by a microprocessor based data acquisition system. The raw test data was automatically presented to a portable minicomputer system for correction to calibration curves and reduction to containment leak rate. The minicomputer produced immediate statistical and graphical results of the containment test parameters, including temperature, pressure, vapor pressure, mass, total time leak rate, and mass leak rate plots.

These calculated results were reported automatically to the test director as the data was collected. Appendix I depicts the functional relationship between the special test instrumentation and the data acquisition and analysis system.

All calculations performed by the minicomputer system were in conformance with the procedure outlined in ANS 56.8, ANSI 45.4, and Bechtel Topical Report (BN-TOP-1), Revision 1).

Source listings for all computer programs are on file with the Plant Operating Systems Section in Chattanooga, Tennessee.

5.4 Reactor Building Containment Model

An ice condenser pressure suppression containment presents special problems not normally encountered in the leak testing of dry containment structures. The pressure suppression design feature requires the reactor building containment to be divided into distinct compartments, where vastly different temperatures and vapor pressures may exist. While each compartment is vented to the containment atmosphere during the performance of the CILRT, the direct circulation of air is limited.

5.0 MEASUREMENTS AND CALIBRATIONS (continued)

5.4 Reactor Building Containment Model (continued)

Since an ice condenser containment typically exhibits a 40°F temperature differential between the ice compartments and others, it is necessary to compensate by compartmentalization so the leak rate is accurately measured. For SQN Unit 1 CILRT, a three-compartment containment model was used to measure the leak rate. The free air mass is calculated individually for each compartment, and containment leak rate is calculated from the sum of the compartmental masses. Each sensor within a compartment is volume weighted for the calculation of compartment average temperature and vapor pressure.

6.0 ANALYSIS OF TEST DATA

The previous sections of this report have discussed the general test conduct, calibration methods, and test equipment. In this section, events and problems that influenced the test results are discussed and are used to formulate conclusions on the performance of the SQN Unit 1, Cycle 6 CILRT.

6.1 Instrument Check

The instrument complement for SQN Unit 1 was 49 RTDs, 13 Dewcells (measure vapor pressure), 1 flow meter (for verification test), and 9 Mensor quartz pressure gauges (6 containment pressure and one atmospheric pressure gauge).

During testing, 1 pressure gauge, 1 resistance temperature detector, and 1 dew cell instrument had to be failed from the data base due to malfunctioning (i.e. spiking and overranging). Regardless of these losses, the instrumentation analysis in accordance with the ISG of ANSI 56.8-1987 proved that the instrument system provided excellent performance in determining the leak rate. See Section 3.2 for test results.

6.2 Discussion of Graphical and Tabular Results for the CILRT

The trends exhibited during the SQN Unit 1 Cycle 6 CILRT were typical of that experienced during past tests on a containment system employing an ice condenser. The trends of measured parameters in the upper and lower compartments uniformly are decreasing. However, the temperature and vapor pressure in the ice condenser typically, and in the case of the Unit 1 Cycle 6 CILRT, trend upwardly. This phenomenon along with electronic

6.0 ANALYSIS OF TEST DATA (continued)

6.2 Discussion of Graphical and Tabular Results for the CILRT (continued)

fluctuation in the instrument system and naturally occurring air currents in containment tend to produce instability in some test results. These influences appear to be the precipitating cause in the slight increase in the leak rate trend, although the extrapolated leak rate (as required and described by BN-TOP-1) was well below 0.75 La. No operational causes could be discovered to explain the trend and the magnitude of the trend (+0.002 slope of the leak rate line) was so small that the trend in leak rate had reversed itself (i.e. slope of leak rate line was -0.014) during the verification test. Other potential sources of instability, such as pressurizer level, which is monitored by the data acquisition and volume corrections made on a real time basis, and the influence of sump level on leak rates are corrected for subsequent to CILRT were found to be too small and not concurrent with the trend in leak rate to have been an influencing factor. Other than the slightly increasing trend in the leak rate toward the end of the test, no significant or unusual observations were recorded for the duration of the CILRT.

6.3 Discussion of Agreement (Verification Test)

Since this test was conducted in accordance with BN-TOP-1, the verification flow was allowed to stabilize for approximately one hour prior to starting the verification phase of testing. The verification test was concluded in seven hours, which is slightly over the duration of one-half the CILRT test phase as required by BN-TOP-1. No significant problems in data trends were recorded during this phase. Test summary data for the verification test is included in Appendix D, E, and F. The verification results were within $\pm 5\%$, which is well within the acceptance limit of $\pm 25\%$.

7.0 CONCLUSION

The CILRT performed on SQN Unit 1 Cycle 6 recorded an "as left" leak rates determined by the procedure outlined in BN-TOP-1, of 0.1742%/Day which is below the limit of 0.1875%/Day for return to power operation. The "as found" leak rate was 0.2416%/Day and included leakage savings of Type B and C tests performed prior to the CILRT. There was close agreement of the TTLR and MLR results, especially when the upper confidence limit is not included which gives credence to the test results produced by each method.

APPENDIX A

STABILIZATION PHASE

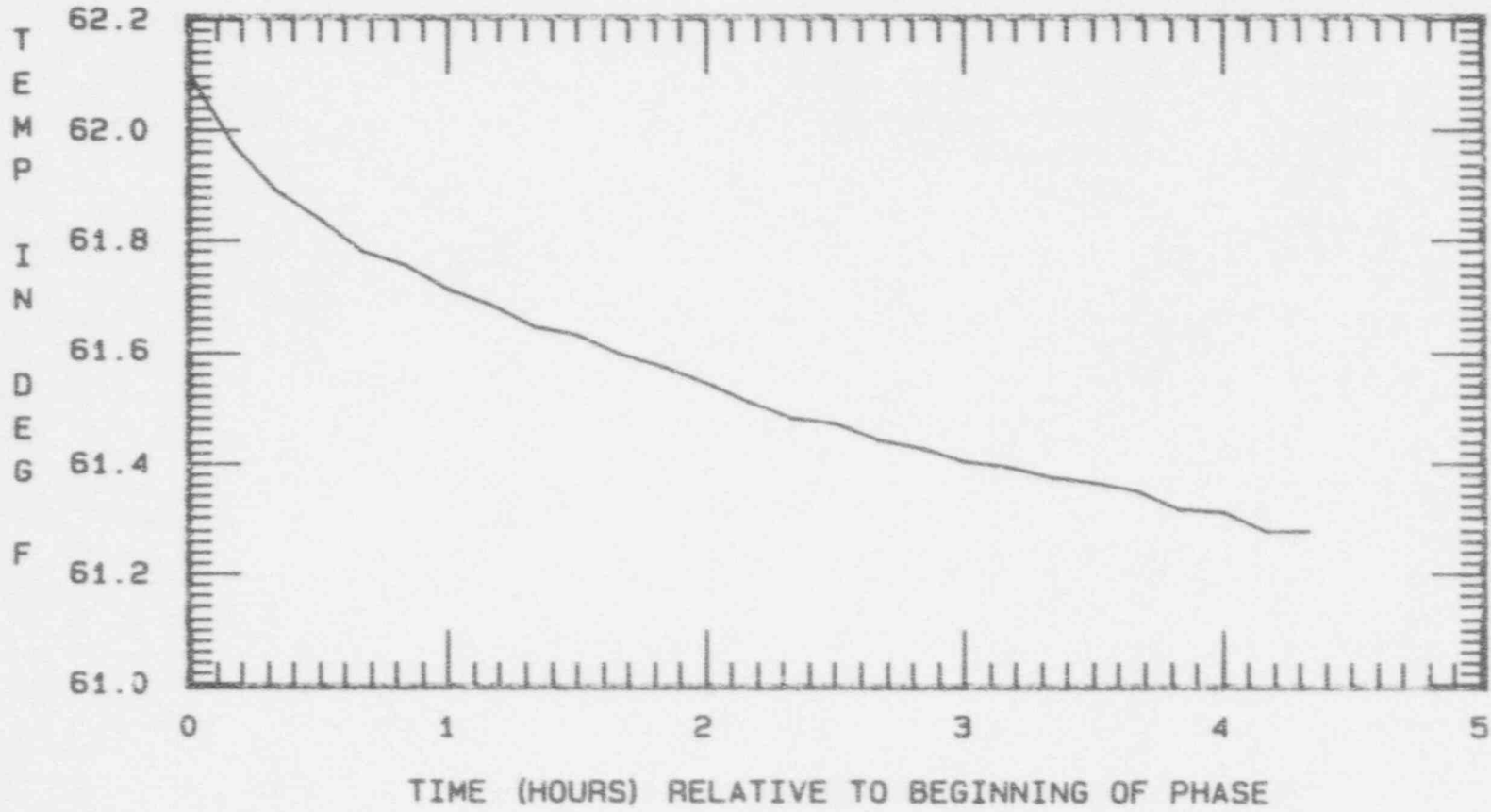
CONTENTS: REVIEW TEMPERATURE STABILIZATION CRITERIA
CONTAINMENT TEMPERATURE

REVIEW TEMPERATURE STABILIZATION CRITERIA

SAMPLE J	ELAPSED TIME	AVG TEMPERATURE	RATE OF CHANGE OF CONTAINMENT TEMP (DEGF/HR)
3	000:00	62.09613	0.0000000
4	000:10	61.97534	0.7247314
5	000:20	61.89321	0.4928055
6	000:30	61.84287	0.3020096
7	000:40	61.78403	0.3530502
8	000:50	61.73968	0.1461182
9	001:00	61.71555	0.2647705
10	001:10	61.68560	0.1796951
11	001:20	61.64830	0.2238235
12	001:30	61.63092	0.1042557
13	001:40	61.59669	0.2053986
14	001:50	61.57214	0.1473083
15	002:00	61.54669	0.1526642
16	002:10	61.51240	0.2057648
17	002:20	61.48307	0.1759415
18	002:30	61.47151	0.6959697E-01
19	002:40	61.44345	0.1683426
20	002:50	61.43080	0.7592010E-01
21	003:00	61.40638	0.1465073
22	003:10	61.39505	0.6800079E-01
23	003:20	61.37648	0.1113968
24	003:30	61.36622	0.6156921E-01
25	003:40	61.35113	0.9054565E-01
26	003:50	61.31921	0.1915283
27	004:00	61.31237	0.4099274E-01
28	004:10	61.27747	0.2094269
29	004:20	61.27706	0.2449036E-02

THE AVG. RATE OF TEMP CHANGE FOR THE LAST 4 HOURS = 0.1479730 DEGF/HR,
 THE AVG. RATE OF TEMP CHANGE FOR THE LAST HOUR = 0.8556584E-01 DEGF/HR,
 THE TEMP. STABILIZATION CHECK INDICATED A VALUE OF 0.6240717E-01 DEGF/HR,
 WHICH IS ONLY 12.48143 % OF THE RECOMMENDED 0.5 DEGF/HR

STABILITY CHECK INDICATES CONDITIONS ARE FAVORABLE TO PROCEED WITH CILRT.



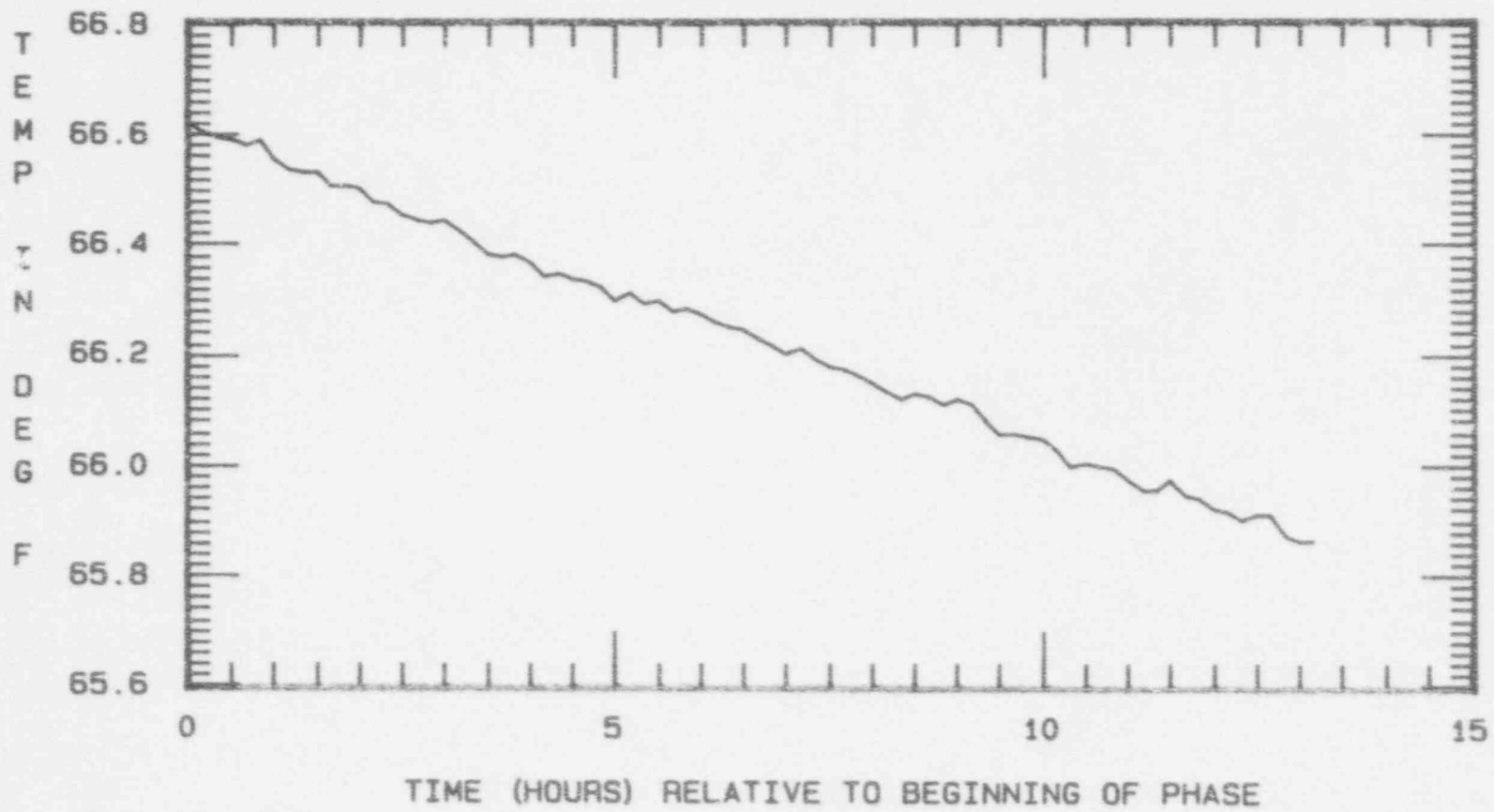
CONTAINMENT TEMPERATURE
TEMPERATURE STABILITY PHASE

APPENDIX B

CILET GRAPHS

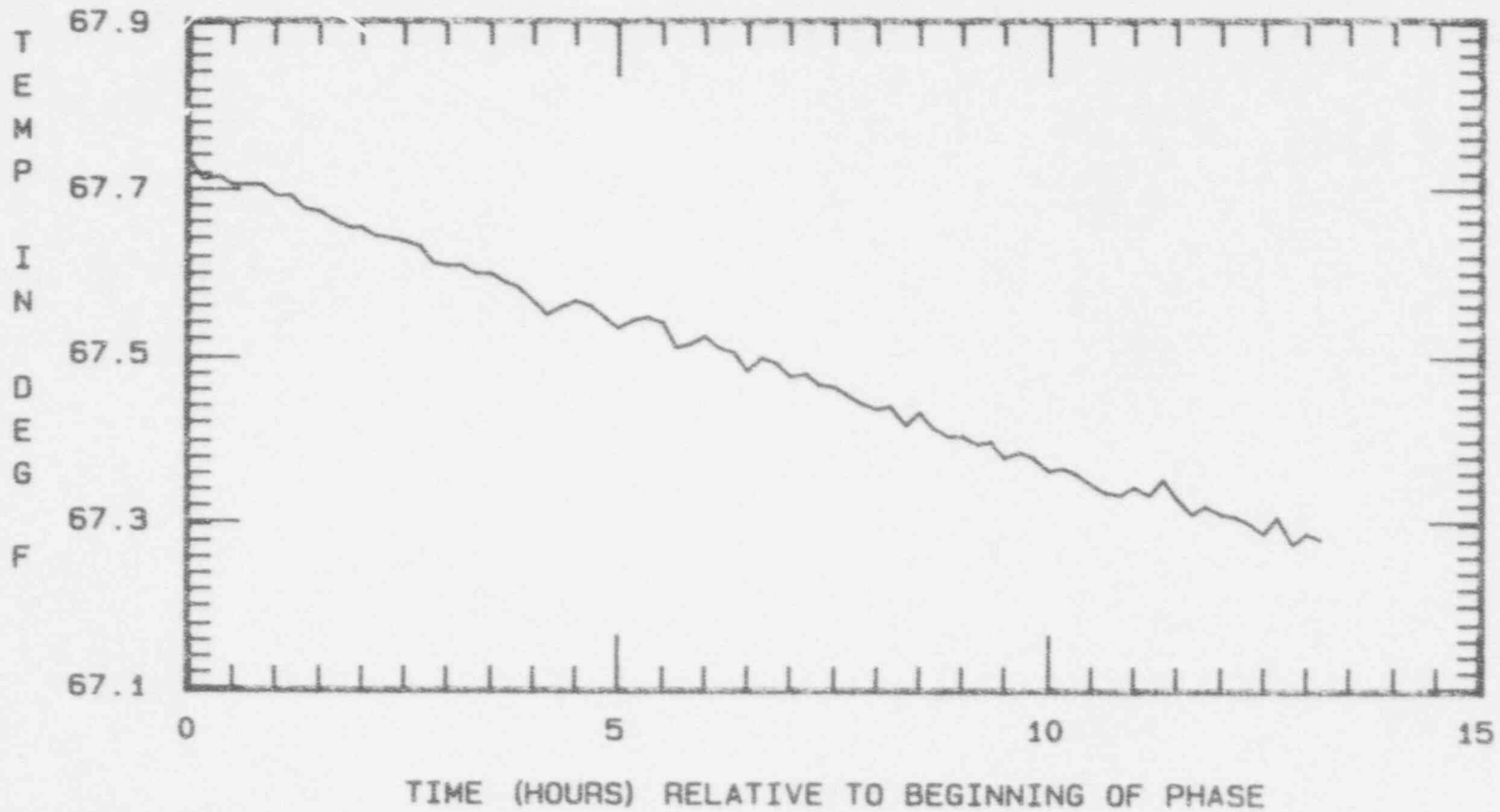
CONTENTS: COMPARTMENT TEMPERATURE
COMPARTMENT VAPOR PRESSURE
COMPARTMENT PRESSURE
CONTAINMENT TEMPERATURE
CONTAINMENT VAPOR PRESSURE
CONTAINMENT PRESSURE
CALCULATED TOTAL TIME LEAK RATE
CALCULATED MASS LEAK RATE

CMPT. 1 = RED



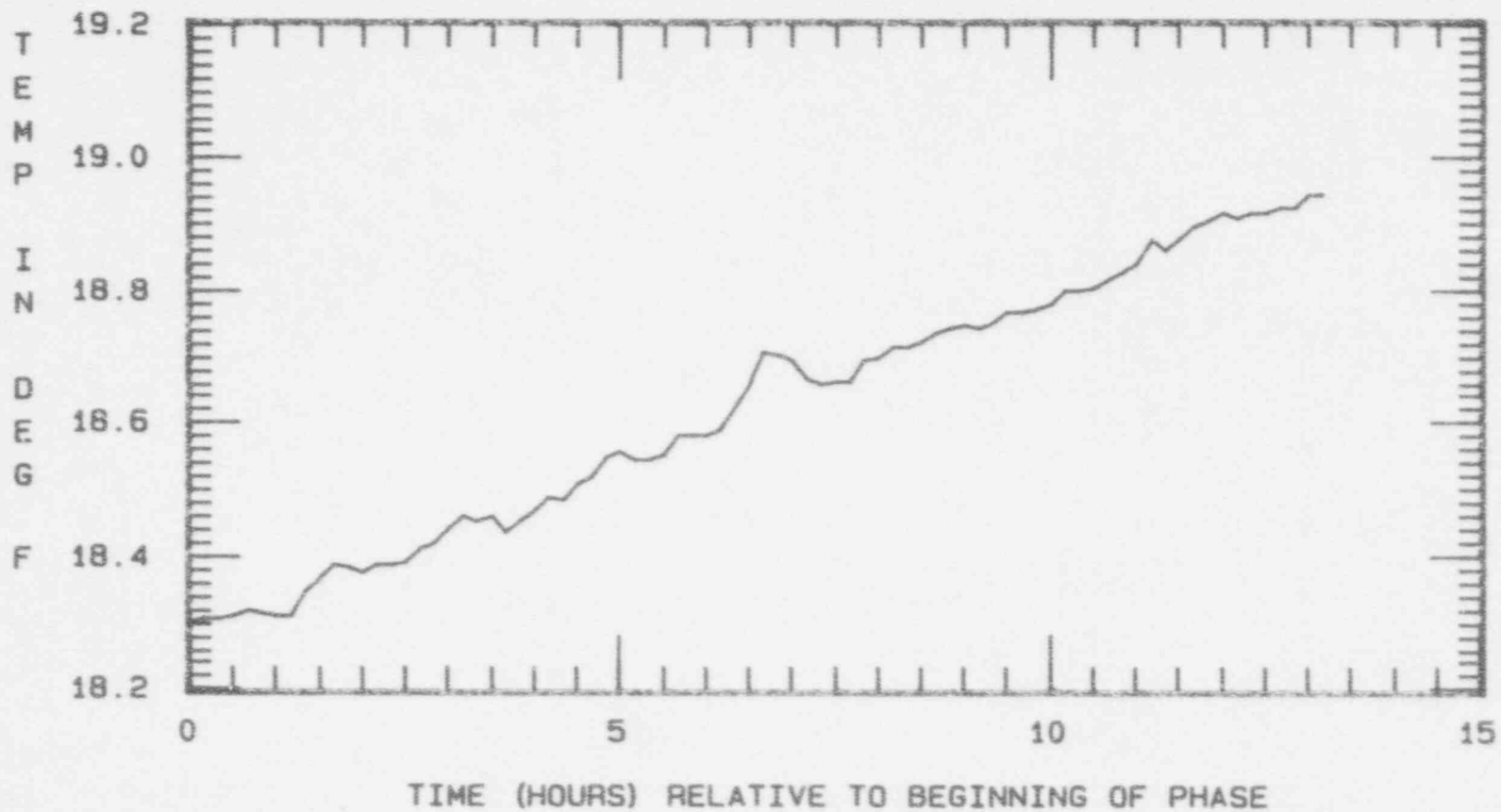
COMPARTMENT TEMPERATURE
TEST PHASE

CMPT. 2 = RED



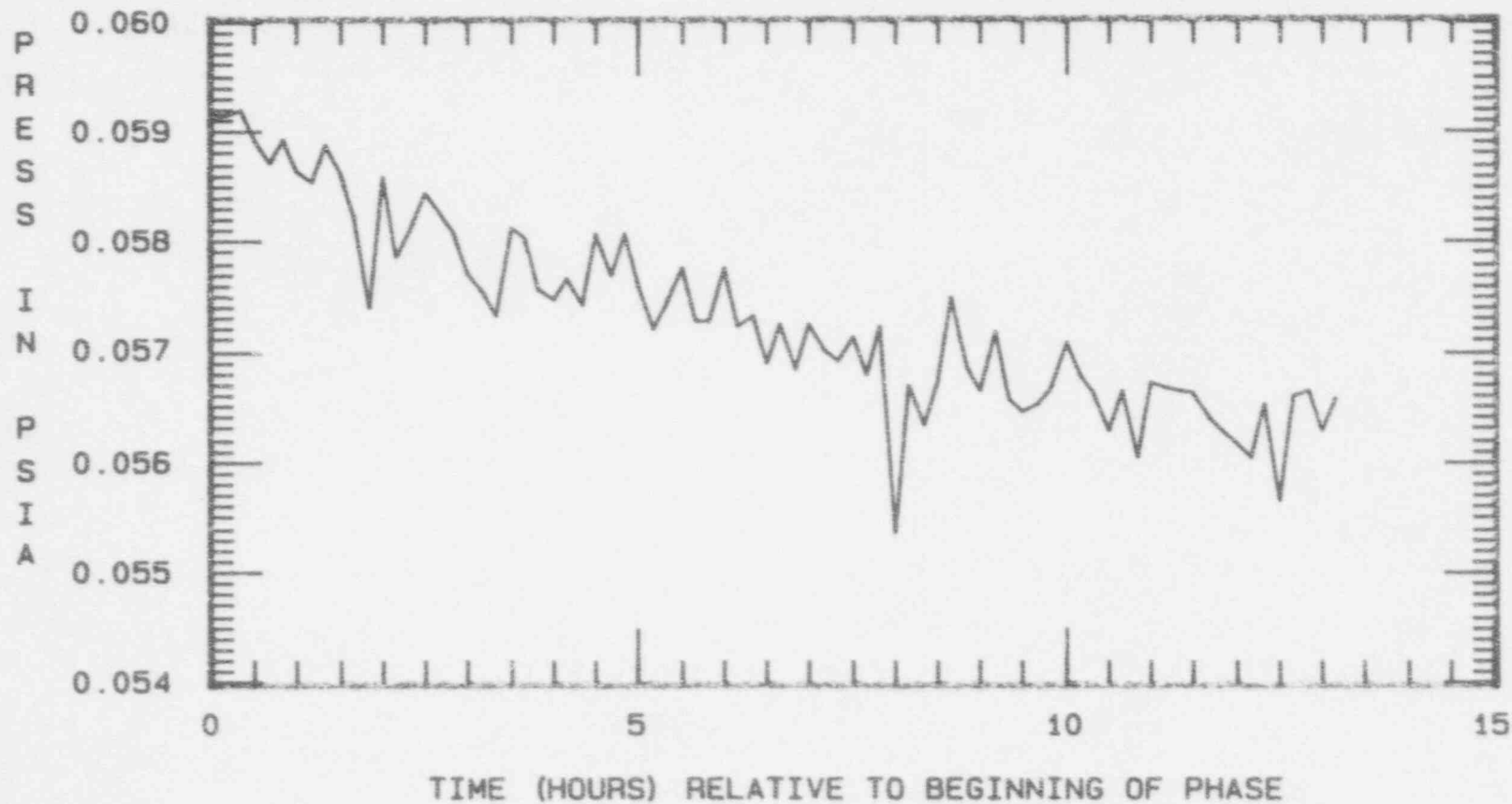
COMPARTMENT TEMPERATURE
TEST PHASE

CMPT. 3 - RED



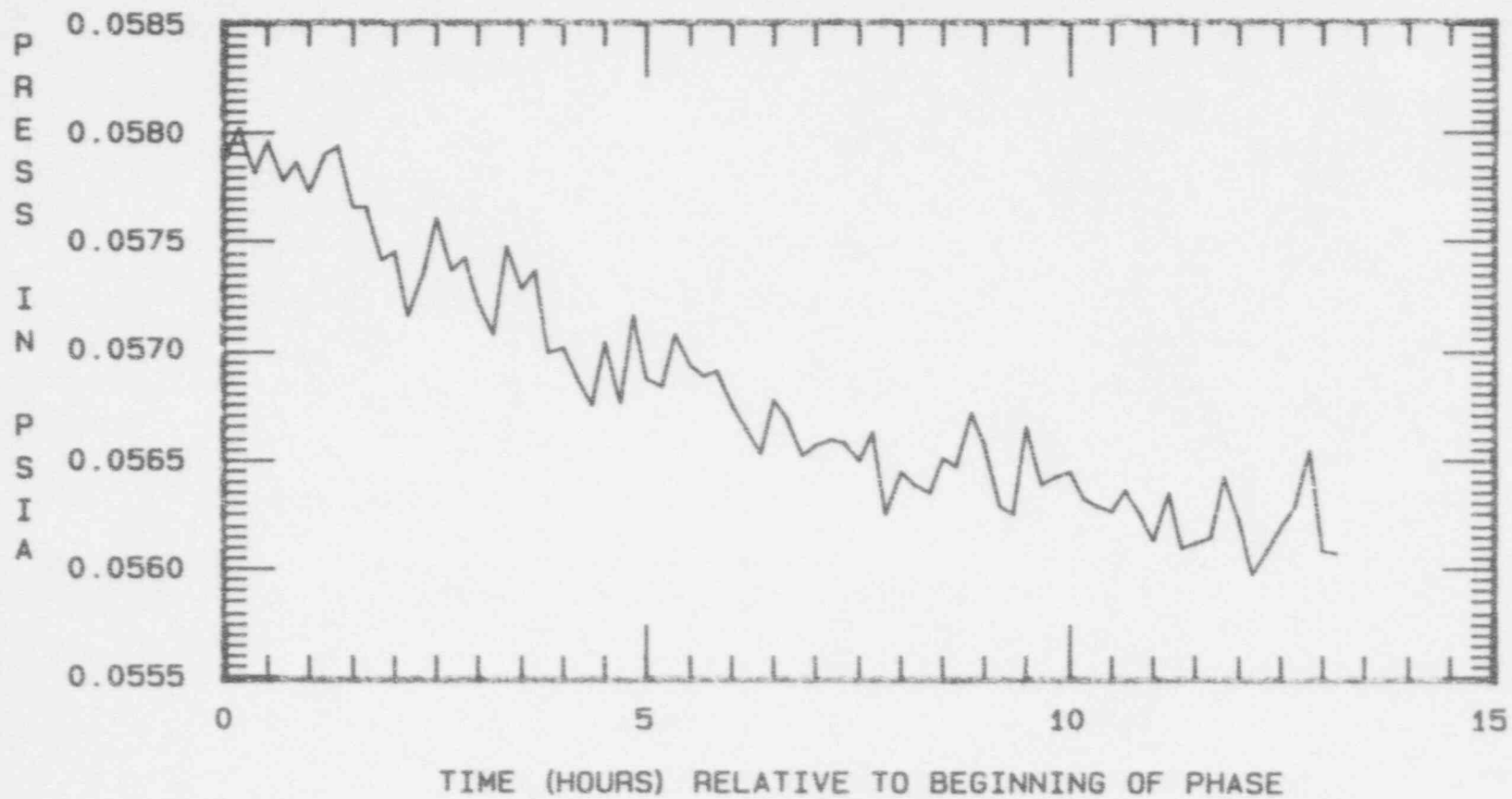
COMPARTMENT TEMPERATURE
TEST PHASE

CMPT. 1 - RED



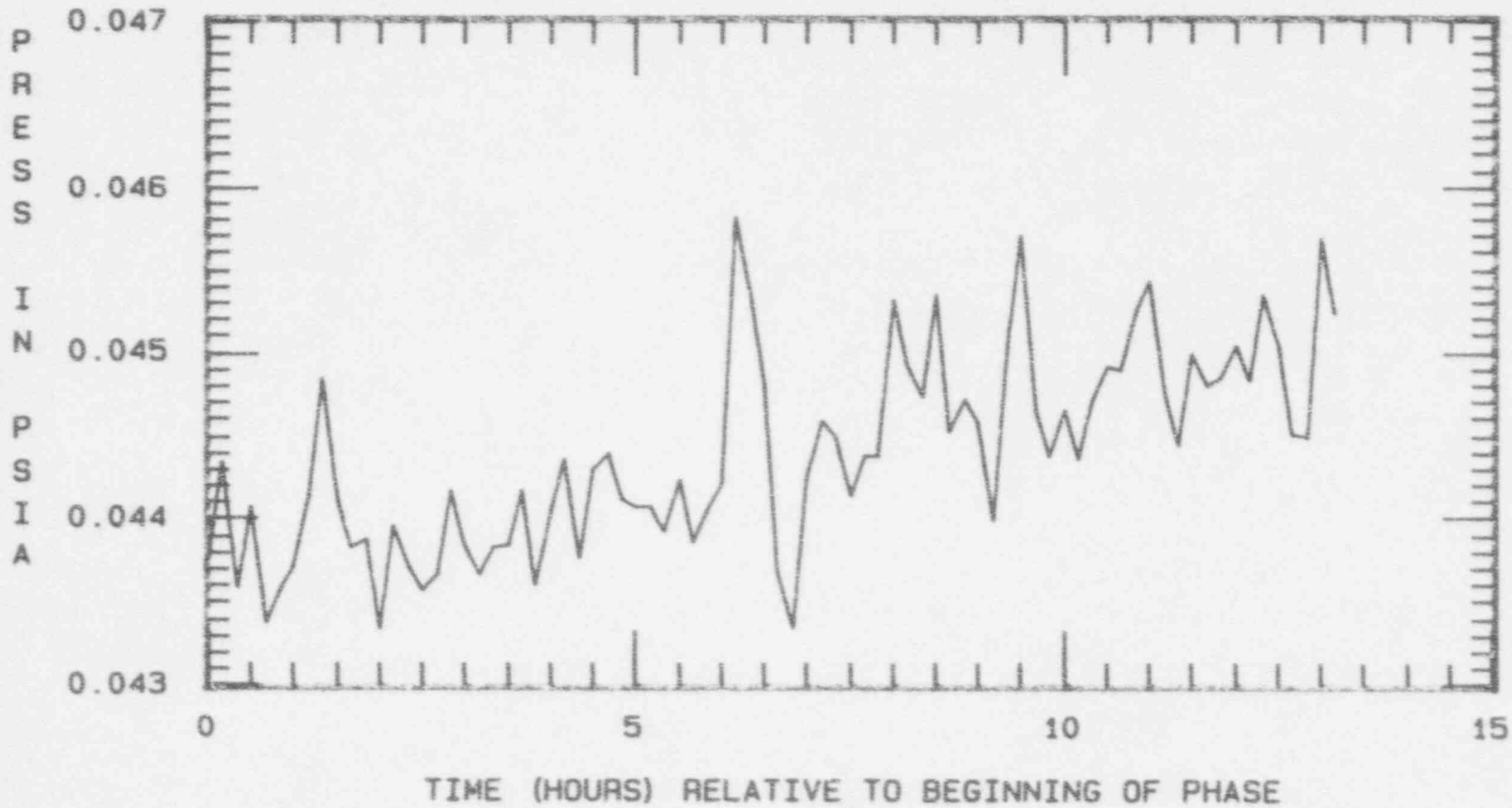
COMPARTMENT VAPOR PRESSURE
TEST PHASE

CMPT. 2 - RED



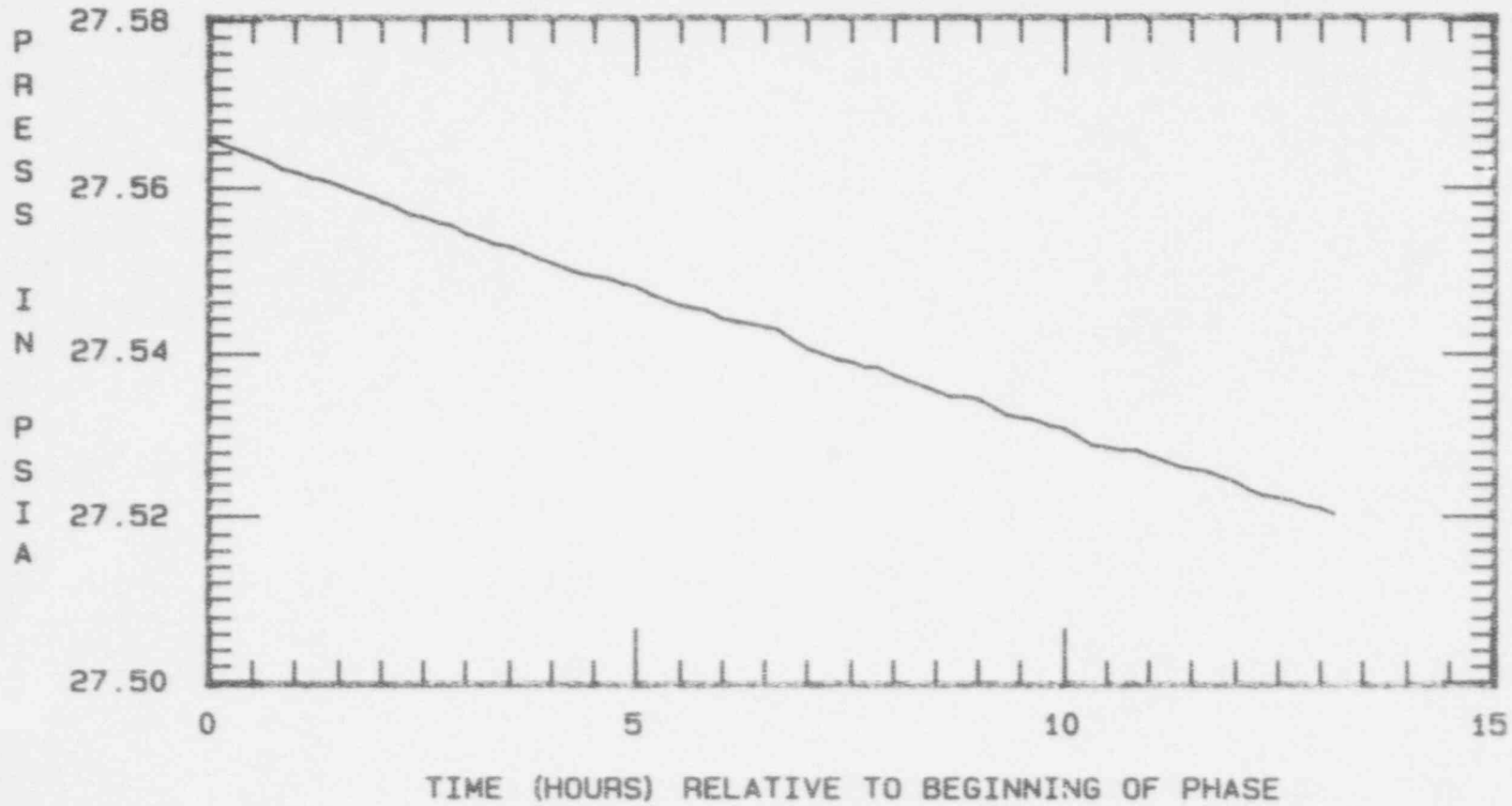
COMPARTMENT VAPOR PRESSURE
TEST PHASE

CMPT. 3 - RED



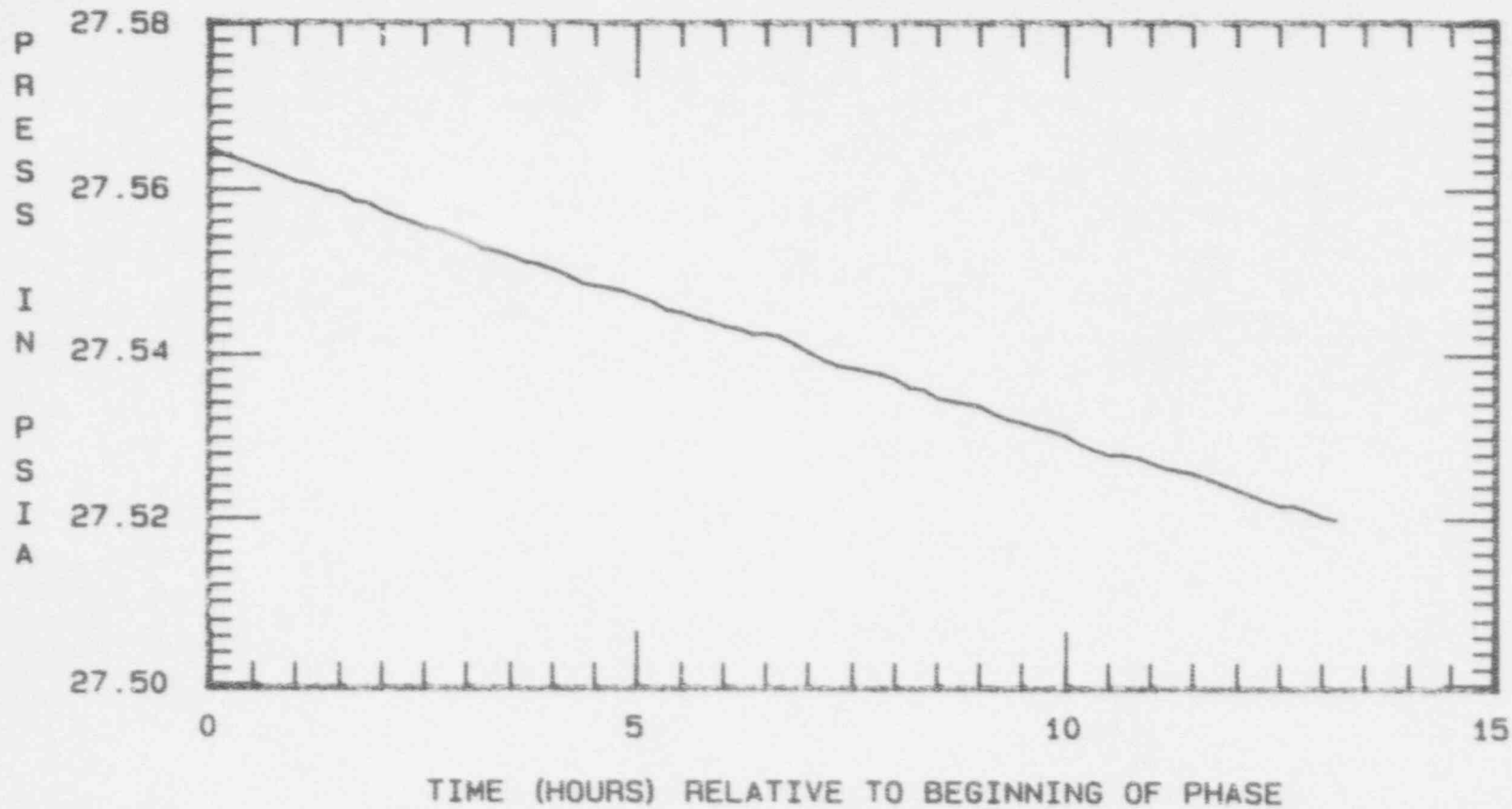
COMPARTMENT VAPOR PRESSURE
TEST PHASE

CMPT. 1 - RED



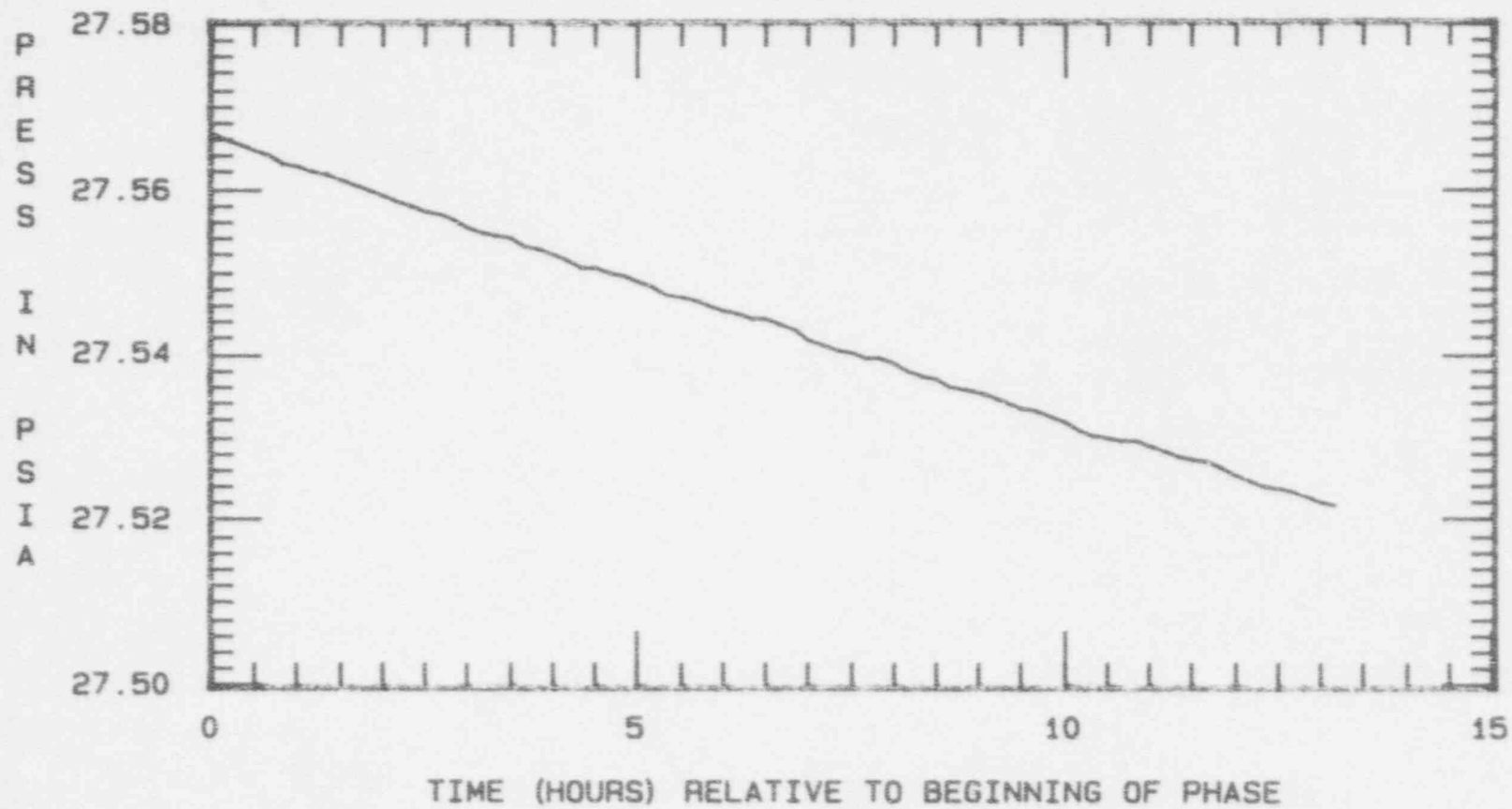
COMPARTMENT ABSOLUTE PRESSURE
TEST PHASE

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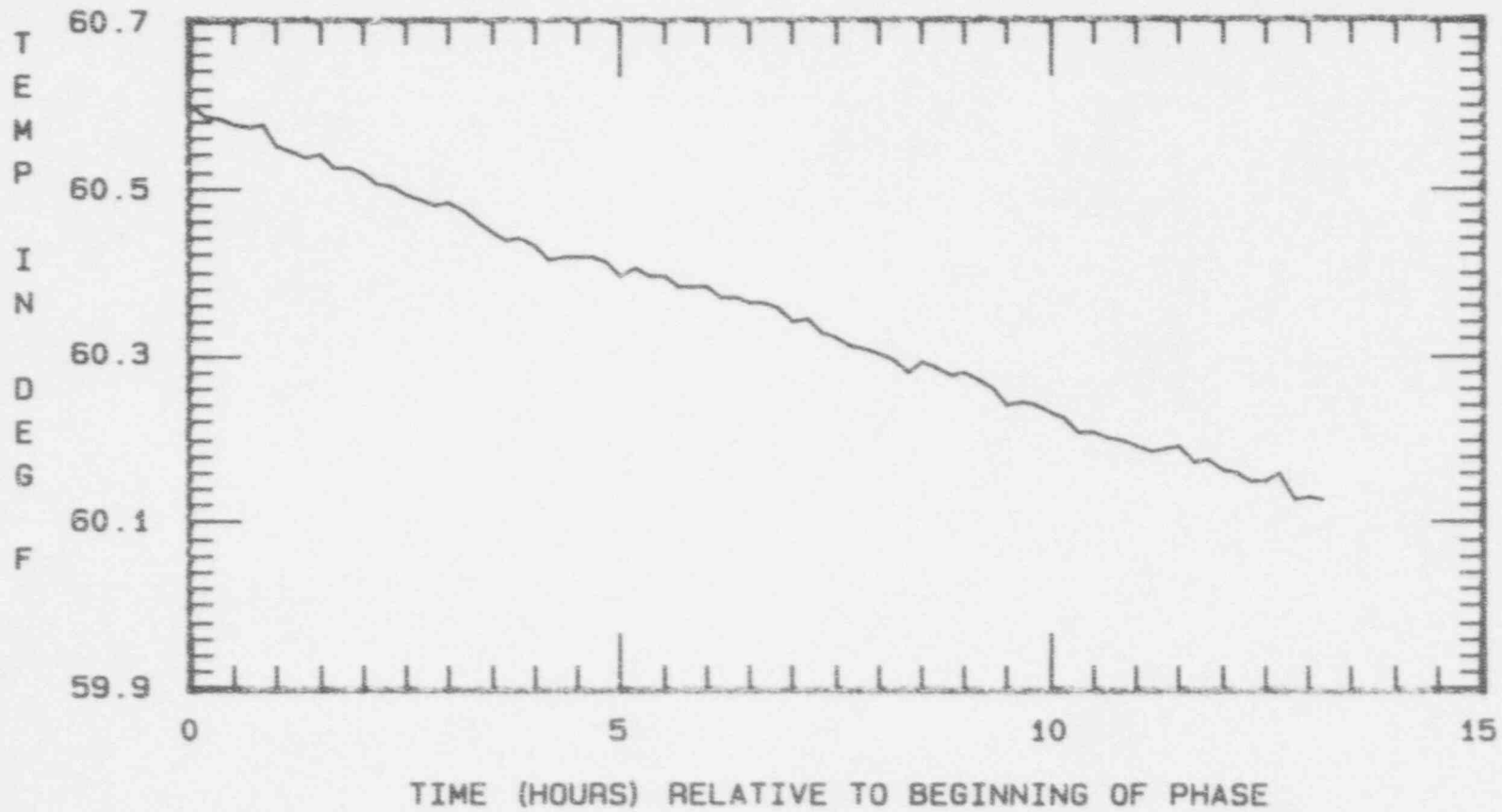


COMPARTMENT ABSOLUTE PRESSURE
TEST PHASE

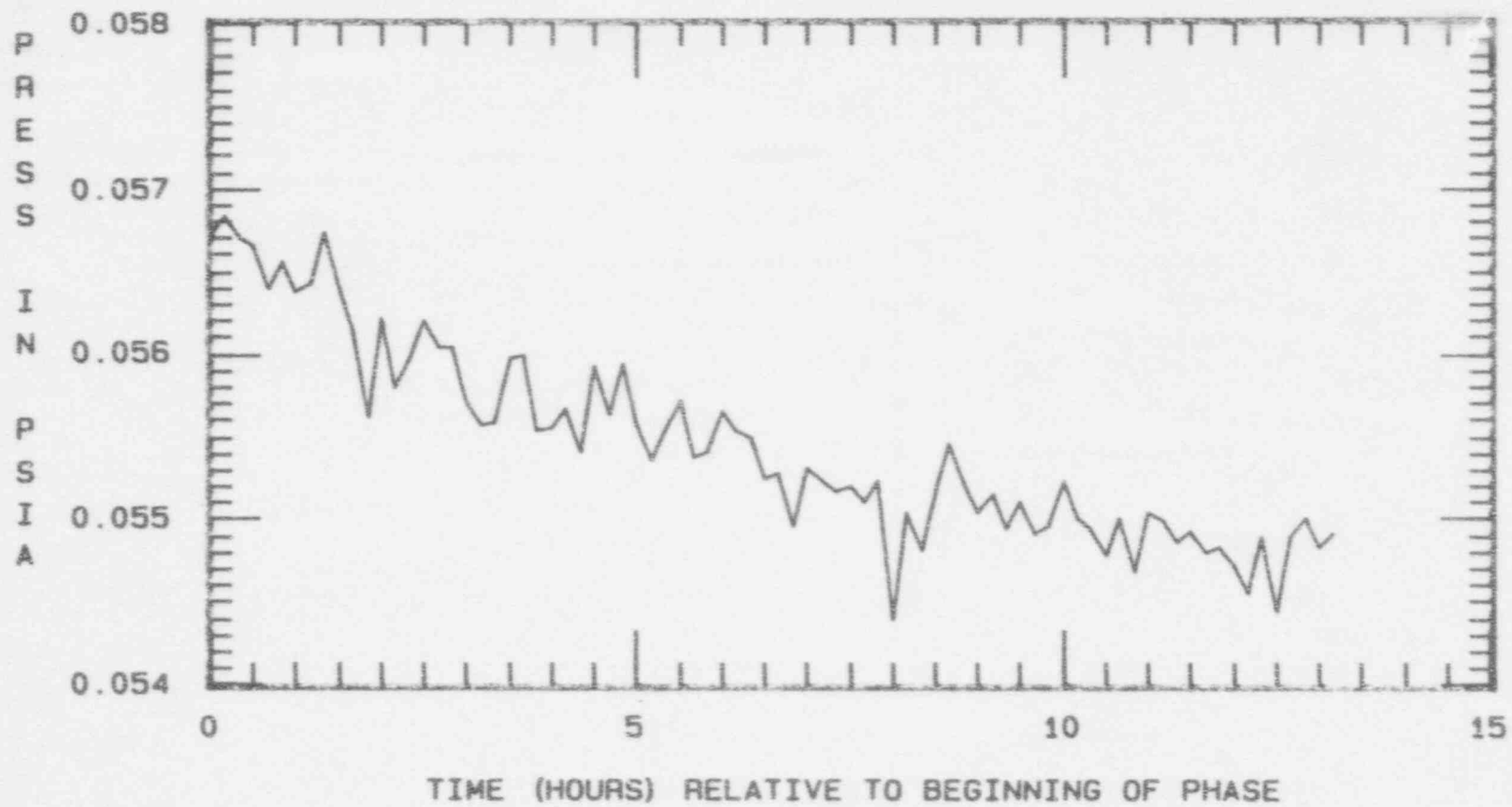
CMPT. 3 - RED



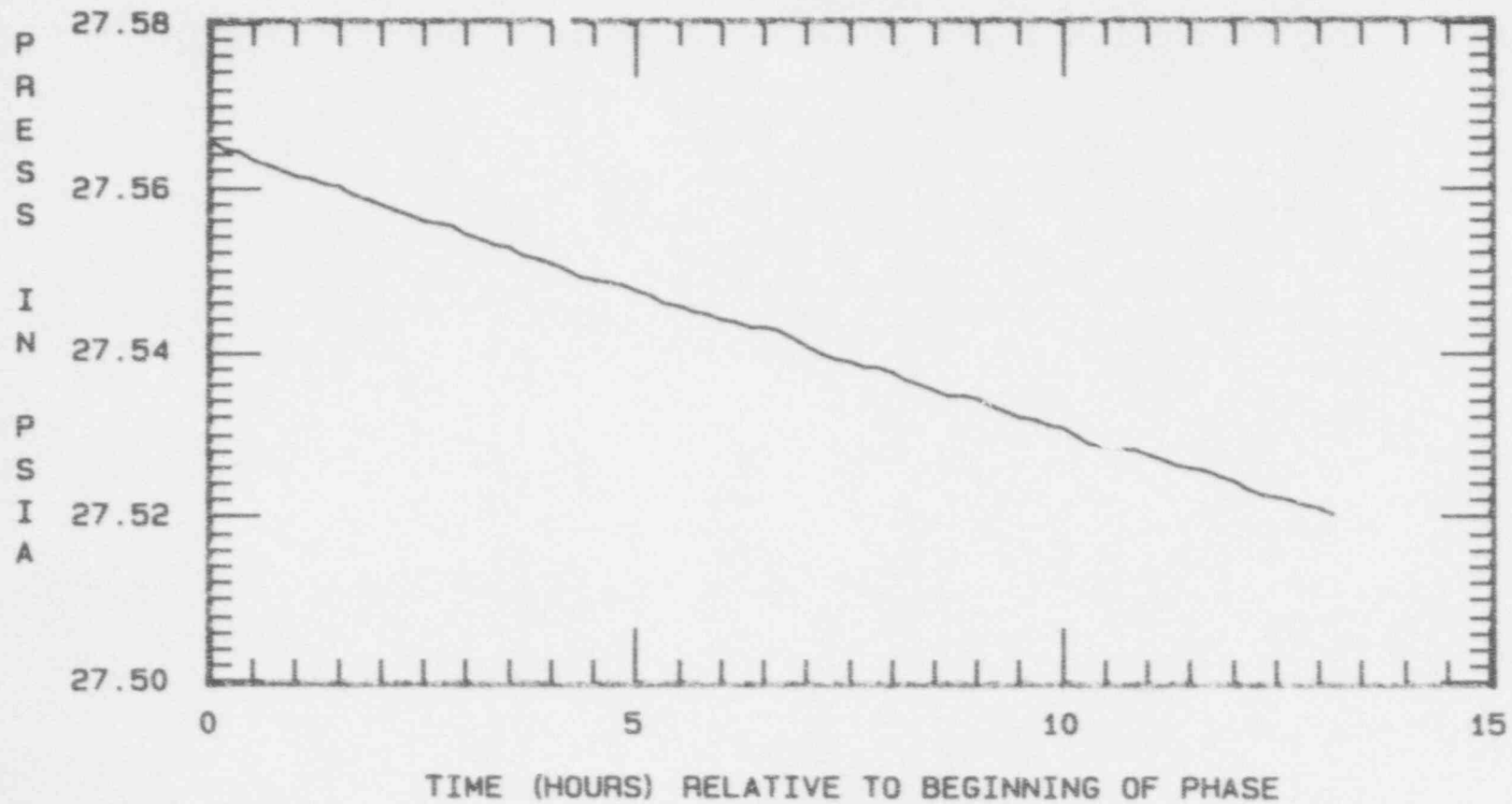
COMPARTMENT ABSOLUTE PRESSURE
TEST PHASE



CONTAINMENT TEMPERATURE
TEST PHASE

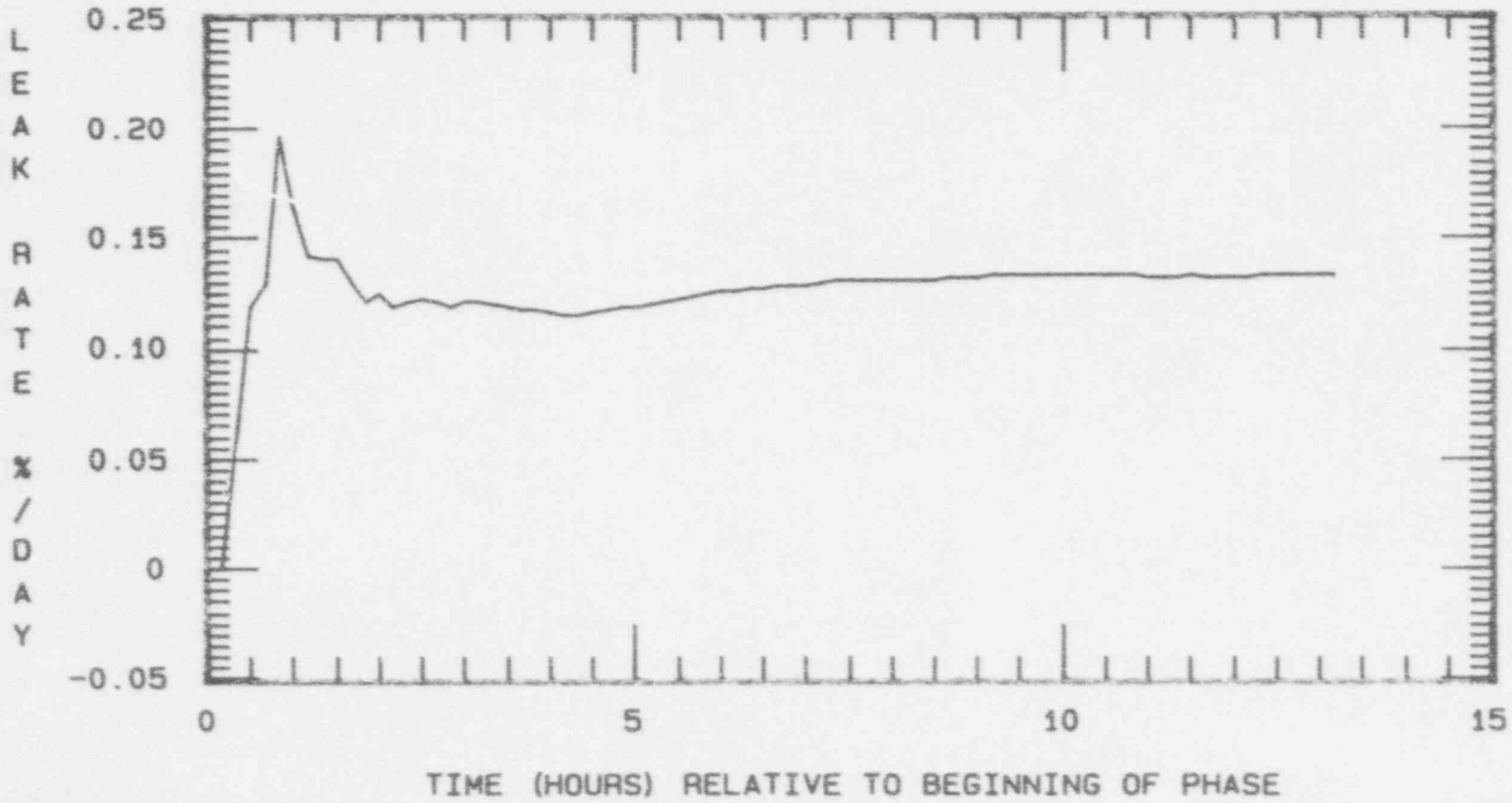


CONTAINMENT VAPOR PRESSURE
TEST PHASE



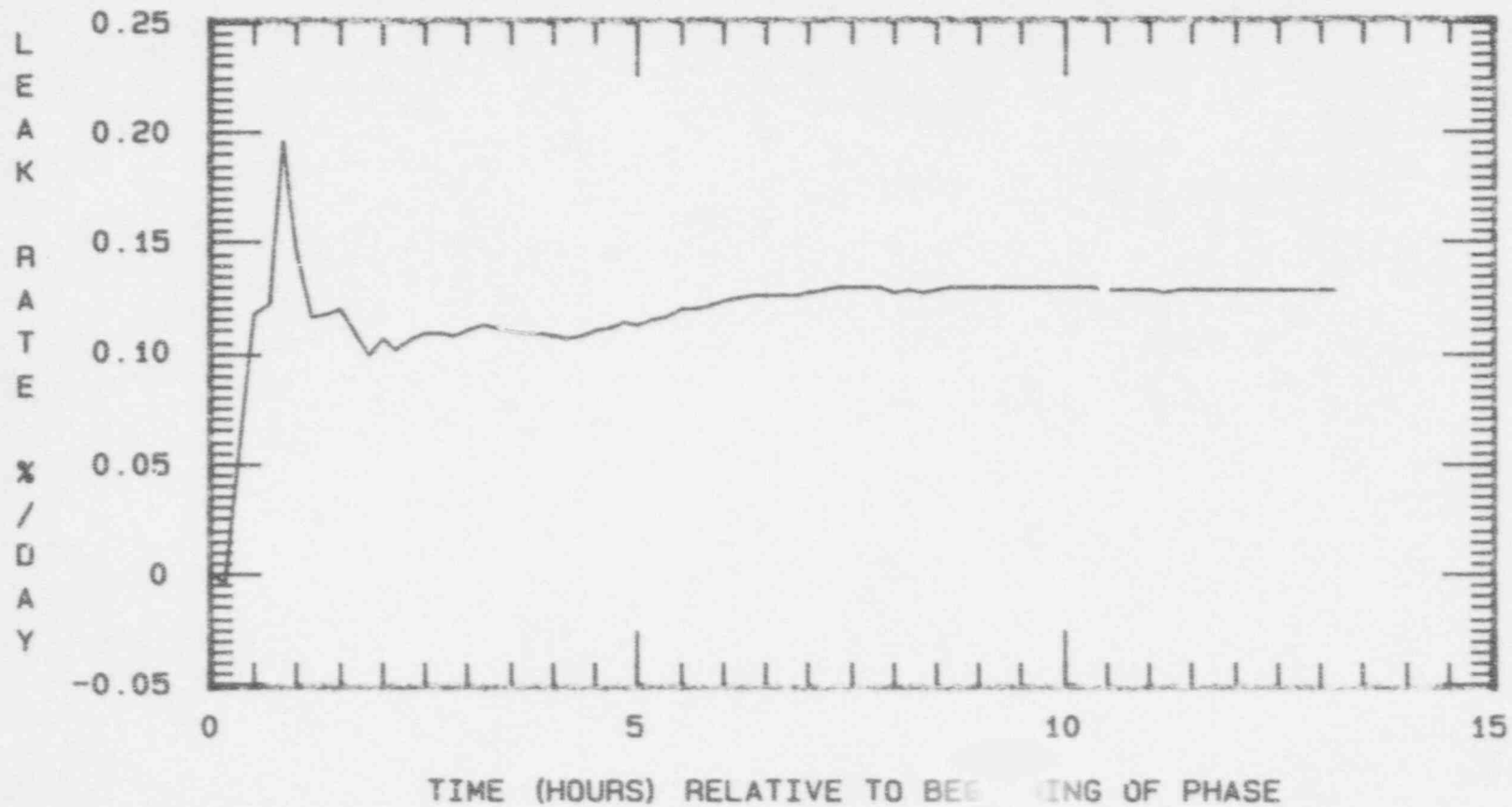
CONTAINMENT PRESSURE
TEST PHASE

CALCULATED TOTAL TIME LEAK RATE FOR THE LEAK RATE TEST PHASE



CALCULATED TOTAL TIME LEAK RATE
TEST PHASE

CALCULATED MASS LEAK RATE FOR THE LEAK RATE TEST PHASE



CALCULATED MASS LEAK RATE
TEST PHASE

APPENDIX C

CILRT TABULAR DATA

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MASS LEAK RATE SUMMARY

TOTAL TIME LEAK RATE (TTLR) SUMMARY
 RESULTS USING 80 SAMPLES (SAMPLES T-081 - T-160) ELAPSED TIME 013:10

FOR THE MEASURED TOTAL TIME LEAK RATE (%/DAY)

MEAN = 0.11690 STANDARD DEV. = 0.25356E-01 SKEW = 0.22973E-02
 EXTRAPOLATED VALUE = 0.13817 (%/DAY) WHICH IS 55.267 % OF LA
 EXTRAPOLATION VALUE MUST BE LESS THAN 75% OF LA (LA = 0.25000 (%/DAY))

INDIVIDUAL SAMPLE TTLR SUMMARY

SAMPLE NO	ELAPSED TIME	MEASURED TTLR (%/DAY)	CALCULATED TTLR (%/DAY)	95 % UCL FOR TTLR (%/DAY)	CONVERGENCE (95%UCL-CALC)
81	000:00	0.0000000	-----	-----	-----
82	000:10	-0.6600320E-02	-----	-----	-----
83	000:20	0.6336307E-01	-----	-----	-----
84	000:30	0.1166057	0.1193925	0.1855219	0.6612940E-01
85	000:40	0.1082453	0.1300703	0.2736323	0.1435620
86	000:50	0.2138504	0.1962495	0.3060841	0.1098346
87	001:00	0.9328452E-01	0.1654480	0.3600569	0.1946089
88	001:10	0.8448410E-01	0.1422841	0.3351818	0.1928978
89	001:20	0.1160006	0.1402981	0.3100022	0.1697041
90	001:30	0.1223259	0.1409120	0.2929446	0.1520326
91	001:40	0.9266850E-01	0.1307305	0.2749355	0.1442049
92	001:50	0.8676420E-01	0.1213333	0.2583033	0.1369699
93	002:00	0.1223259	0.1247501	0.2516775	0.1269274
94	002:10	0.9260756E-01	0.1190371	0.2399375	0.1209004
95	002:20	0.1181457	0.1211085	0.2349522	0.1138437
96	002:30	0.1157256	0.1220696	0.2299774	0.1079078
	002:40	0.1087403	0.1211729	0.2242369	0.1030641
98	002:50	0.1036639	0.1192933	0.2183369	0.9904361E-01
99	003:00	0.1190258	0.1208513	0.2158113	0.9495994E-01
100	003:10	0.1171383	0.1217288	0.2130853	0.9135648E-01
101	003:20	0.1053411	0.1202305	0.2087559	0.8852540E-01
102	003:30	0.1052280	0.1189136	0.2048189	0.8590531E-01
103	003:40	0.1050051	0.1177286	0.2012090	0.8348041E-01
104	003:50	0.1085896	0.1172751	0.1983901	0.8111498E-01
105	004:00	0.1053301	0.1163530	0.1953751	0.7902205E-01
106	004:10	0.1002193	0.1147655	0.1920066	0.7724112E-01
107	004:20	0.1105300	0.1148654	0.1901574	0.7529195E-01
108	004:30	0.1228148	0.1166622	0.1901722	0.7350995E-01
109	004:40	0.1182872	0.1176175	0.1894111	0.7179361E-01
110	004:50	0.1229480	0.1190598	0.1892696	0.7020975E-01
111	005:00	0.1088613	0.1185402	0.1873755	0.6883527E-01
112	005:10	0.1212756	0.1195917	0.1870122	0.6742049E-01
113	005:20	0.1247048	0.1209301	0.1870328	0.6610272E-01
114	005:30	0.1323664	0.1230078	0.1879620	0.6495424E-01
115	005:40	0.1200482	0.1234803	0.1872526	0.6377234E-01
116	005:50	0.1246518	0.1243997	0.1870372	0.6263749E-01
117	006:00	0.1333631	0.1261502	0.1877734	0.6162323E-01
118	006:10	0.1240503	0.1267621	0.1873679	0.6060575E-01
119	006:20	0.1279767	0.1277059	0.1873339	0.5962798E-01
120	006:30	0.1191104	0.1276815	0.1864611	0.5877960E-01
121	006:40	0.1246471	0.1281825	0.1860836	0.5790107E-01
122	006:50	0.1234743	0.1285219	0.1855971	0.5707520E-01
123	007:00	0.1280148	0.1292419	0.1855002	0.5625834E-01
124	007:10	0.1340325	0.1304365	0.1859238	0.5548730E-01
125	007:20	0.1287962	0.1310697	0.1858088	0.5473906E-01

TOTAL TIME LEAK RATE (TTLR) SUMMARY
 RESULTS USING 80 SAMPLES (SAMPLES T-081 - T-160) ELAPSED TIME 013:10

FOR THE MEASURED TOTAL TIME LEAK RATE (%/DAY)

ME. = 0.11690 STANDARD DEV. = 0.25356E-01 SKEW = 0.22973E-02
 EXTRAPOLATED VALUE = 0.13817 (%/DAY) WHICH IS 55.267 % OF LA
 EXTRAPOLATION VALUE MUST BE LESS THAN 75% OF LA (LA = 0.10641E+00 (%/DAY))

INDIVIDUAL SAMPLE TTLR SUMMARY

SAMPLE NO	ELAPSED TIME	MEASURED TTLR (%/DAY)	CALCULATED TTLR (%/DAY)	95 % UCL FOR TTLR (%/DAY)	CONVERGENCE (95%UCL-CALC)
126	007:30	0.1264915	0.1314481	0.1854883	0.5404024E-01
127	007:40	0.1232825	0.1315198	0.1849323	0.5341254E-01
128	007:50	0.1228783	0.1315451	0.1843612	0.5291611E-01
129	008:00	0.1137455	0.1308231	0.1832792	0.5245610E-01
130	008:10	0.1255408	0.1310783	0.1829351	0.5185680E-01
131	008:20	0.1171689	0.1306594	0.1820829	0.5142350E-01
132	008:30	0.1312817	0.1313371	0.1821715	0.5083440E-01
133	008:40	0.1337326	0.1321473	0.1824145	0.5026715E-01
134	008:50	0.1265020	0.1323687	0.1821164	0.4974769E-01
135	009:00	0.1282662	0.1326973	0.1819289	0.4923157E-01
136	009:10	0.1297263	0.1331031	0.1818274	0.4872429E-01
137	009:20	0.1275276	0.1333256	0.1815779	0.4825230E-01
138	009:30	0.1220480	0.1331548	0.1810280	0.4787320E-01
139	009:40	0.1237446	0.1331030	0.1805780	0.4747500E-01
140	009:50	0.1244216	0.1330941	0.1801724	0.4707824E-01
141	010:00	0.1263961	0.1332095	0.1798783	0.4666884E-01
142	010:10	0.1273754	0.1333765	0.1796390	0.4626243E-01
143	010:20	0.1239796	0.1333161	0.1792256	0.4590946E-01
144	010:30	0.1245260	0.1332887	0.1788466	0.4555796E-01
145	010:40	0.1241273	0.1332344	0.1784554	0.4522103E-01
146	010:50	0.1195369	0.1329030	0.1778723	0.4496939E-01
147	011:00	0.1222059	0.1327434	0.1774150	0.4467167E-01
148	011:10	0.1227462	0.1326200	0.1769913	0.4437134E-01
149	011:20	0.1266291	0.1327229	0.1767553	0.4403239E-01
150	011:30	0.1289454	0.1329489	0.1766346	0.4368575E-01
151	011:40	0.1225774	0.1328044	0.1762188	0.4341434E-01
152	011:50	0.1251644	0.1328066	0.1759218	0.4311520E-01
153	012:00	0.1245260	0.1327711	0.1756014	0.4283032E-01
154	012:10	0.1256954	0.1327971	0.1753365	0.4253936E-01
155	012:20	0.1279570	0.1329391	0.1751756	0.4223654E-01
156	012:30	0.1264797	0.1329946	0.1749478	0.4195324E-01
157	012:40	0.1321627	0.1333383	0.1749852	0.4164696E-01
158	012:50	0.1242403	0.1332605	0.1746644	0.4140390E-01
159	013:00	0.1258630	0.1332653	0.1744129	0.4114766E-01
160	013:10	0.1268598	0.1333171	0.1742049	0.4088786E-01

TOTAL TIME LEAK RATE (TTLR) SUMMARY
 RESULTS USING 80 SAMPLES (SAMPLES T-081 - T-160) ELAPSED TIME 013:10

FOR THE MEASURED TOTAL TIME LEAK RATE (%/DAY)

MEAN = 0.11690 STANDARD DEV. = 0.25356E-01 SKEW = 0.22973E-02
 EXTRAPOLATED VALUE = 0.13817 (%/DAY) WHICH IS 55.267 % OF LA
 EXTRAPOLATION VALUE MUST BE LESS THAN 75% OF LA (LA = 0.25000 (%/DAY))

INDIVIDUAL SAMPLE TTLR SUMMARY

SAMPLE NO	ELAPSED TIME	MEASURED TTLR (%/DAY)	MEAN MEASURED TTLR (%/DAY)	CALCULATED TTLR (%/DAY)	DELTA CALC TTLR (%/DAY)
81	000:00	0.0000000			
82	000:10	-0.6600320E-02			
83	000:20	0.6336307E-01	0.2838138E-01		
84	000:30	0.1166057	0.5778947E-01	0.1193925	
85	000:40	0.1082453	0.7040342E-01	0.1300703	0.1067786E-01
86	000:50	0.2138504	0.9909280E-01	0.1962495	0.6617922E-01
87	001:00	0.9328452E-01	0.9812476E-01	0.1654480	-0.3080150E-01
88	001:10	0.8448410E-01	0.9617610E-01	0.1422841	-0.2316397E-01
89	001:20	0.1160006	0.9865417E-01	0.1402981	-0.1985982E-02
90	001:30	0.1223259	0.1012844	0.1409120	0.6138980E-03
91	001:40	0.9266850E-01	0.1004238	0.1307305	-0.1018143E-01
92	001:50	0.8676420E-01	0.9918109E-01	0.1213333	-0.9397194E-02
93	002:00	0.1223259	0.1011098	0.1247501	0.3416732E-02
94	002:10	0.9260756E-01	0.1004558	0.1190371	-0.5712971E-02
95	002:20	0.1181457	0.1017194	0.1211085	0.2071351E-02
96	002:30	0.1157256	0.1026531	0.1220696	0.9611696E-03
	002:40	0.1087403	0.1030336	0.1211729	-0.8967742E-03
98	002:50	0.1036639	0.1030706	0.1192933	-0.1879536E-02
99	003:00	0.1190258	0.1039570	0.1208513	0.1558028E-02
100	003:10	0.1171383	0.1046508	0.1217288	0.8774698E-03
101	003:20	0.1053411	0.1046853	0.1202305	-0.1498289E-02
102	003:30	0.1052280	0.1047111	0.1189136	-0.1316890E-02
103	003:40	0.1050051	0.1047245	0.1177286	-0.1185067E-02
104	003:50	0.1085896	0.1048925	0.1172751	-0.4534945E-03
105	004:00	0.1053301	0.1049108	0.1163530	-0.9220541E-03
106	004:10	0.1002193	0.1047231	0.1147655	-0.1587495E-02
107	004:20	0.1105300	0.1049465	0.1148654	0.9987503E-04
108	004:30	0.1228148	0.1056082	0.1166622	0.1796849E-02
109	004:40	0.1182872	0.1060611	0.1176175	0.9552017E-03
110	004:50	0.1229480	0.1066434	0.1190598	0.1442358E-02
111	005:00	0.1088613	0.1067173	0.1185402	-0.5196258E-03
112	005:10	0.1212756	0.1071869	0.1195917	0.1051493E-02
113	005:20	0.1247048	0.1077344	0.1209301	0.1338378E-02
114	005:30	0.1323664	0.1084808	0.1230078	0.2077751E-02
115	005:40	0.1200482	0.1088210	0.1234803	0.4724488E-03
116	005:50	0.1246518	0.1092733	0.1243997	0.9194389E-03
117	006:00	0.1333631	0.1099425	0.1261502	0.1750514E-02
118	006:10	0.1240503	0.1103238	0.1267621	0.6119162E-03
119	006:20	0.1279767	0.1107883	0.1277059	0.9437799E-03
120	006:30	0.1191104	0.1110017	0.1276815	-0.2437830E-04
121	006:40	0.1246471	0.1113428	0.1281825	0.5009621E-03
122	006:50	0.1234743	0.1116387	0.1285219	0.3394037E-03
123	007:00	0.1280148	0.1130286	0.1292419	0.7199794E-03
124	007:10	0.1340325	0.1125403	0.1304365	0.1194671E-02
125	007:20	0.1287962	0.1129098	0.1310697	0.6331950E-03

TOTAL TIME LEAK RATE (TTLR) SUMMARY
 RESULTS USING 80 SAMPLES (SAMPLES T-081 - T-160) ELAPSED TIME 013:10

FOR THE MEASURED TOTAL TIME LEAK RATE (%/DAY)

MEAN = 0.11690 STANDARD DEV. = 0.25356E-01 SKEW = 0.22973E-02
 EXTRAPOLATED VALUE = 0.13817 (%/DAY) WHICH IS 55.267 % OF LA
 EXTRAPOLATION VALUE MUST BE LESS THAN 75% OF LA (LA = 0.10641E+06 (%/DAY))

INDIVIDUAL SAMPLE TTLR SUMMARY

SAMPLE NO	ELAPSED TIME	MEASURED TTLR (%/DAY)	MEAN MEASURED TTLR (%/DAY)	CALCULATED TTLR (%/DAY)	DELTA CALC TTLR (%/DAY)
126	007:30	0.1264915	0.1132116	0.1314481	0.3783256E-03
127	007:40	0.1232825	0.1134306	0.1315198	0.7173419E-04
128	007:50	0.1228783	0.1136316	0.1315451	0.2525747E-04
129	008:00	0.1137455	0.1136339	0.1308231	-0.7219762E-03
130	008:10	0.1255408	0.1138769	0.1310783	0.2552569E-03
131	008:20	0.1171689	0.1139428	0.1306594	-0.4189610E-03
132	008:30	0.1312817	0.1142828	0.1313371	0.6777197E-03
133	008:40	0.1337326	0.1146568	0.1321473	0.8102506E-03
134	008:50	0.1265020	0.1148803	0.1323687	0.2213418E-03
135	009:00	0.1282662	0.1151282	0.1326973	0.3286302E-03
136	009:10	0.1297263	0.1153936	0.1331031	0.4058033E-03
137	009:20	0.1275276	0.1156103	0.1333256	0.2224743E-03
138	009:30	0.1220480	0.1157232	0.1331548	-0.1707822E-03
139	009:40	0.1237446	0.1158615	0.1331030	-0.5179644E-04
140	009:50	0.1244216	0.1160066	0.1330941	-0.8866191E-05
141	010:00	0.1263961	0.1161798	0.1332095	0.1153201E-03
142	010:10	0.1273754	0.1163633	0.1333765	0.1670369E-03
143	010:20	0.1239796	0.1164862	0.1333161	-0.6040931E-04
144	010:30	0.1245260	0.1166138	0.1332887	-0.2743304E-04
145	010:40	0.1241273	0.1167312	0.1332344	-0.5432963E-04
146	010:50	0.1195369	0.1167744	0.1329030	-0.3314018E-03
147	011:00	0.1222059	0.1168566	0.1327434	-0.1595914E-03
148	011:10	0.1227462	0.1169446	0.1326200	-0.1233816E-03
149	011:20	0.1266291	0.1170870	0.1327229	0.1029074E-03
150	011:30	0.1289454	0.1172588	0.1329489	0.2260059E-03
151	011:40	0.1225774	0.1173348	0.1328044	-0.1444668E-03
152	011:50	0.1251644	0.1174451	0.1328066	0.2175570E-05
153	012:00	0.1245260	0.1175434	0.1327711	-0.3553927E-04
154	012:10	0.1256954	0.1176551	0.1327971	0.2606213E-04
155	012:20	0.1279570	0.1177943	0.1329391	0.1419634E-03
156	012:30	0.1264797	0.1179101	0.1329946	0.5550683E-04
157	012:40	0.1321627	0.1180977	0.1333383	0.3436953E-03
158	012:50	0.1242403	0.1181774	0.1332005	-0.7779896E-04
159	013:00	0.1258630	0.1182760	0.1332653	0.4783273E-05
160	013:10	0.1268598	0.1183846	0.1333171	0.5178154E-04

MASS LEAK RATE (MLR) SUMMARY
 RESULTS USING OBO SAMPLES (SAMPLES T-081 - T-160) ELAPSED TIME 013:10

SAMPLE	ELAPSED TIME	CALCULATED MLR (%/DAY)	95 % UCL (MLR) (%/DAY) APPROX.	95% UCL (MLR) (%/DAY) EXACT
81	000:00	0.0000000	-----	-----
82	000:10	-0.3960191E-02	-----	-----
83	000:20	0.6336296E-01	0.4090369	0.4090270
84	000:30	0.1172212	0.2252003	0.2251977
85	000:40	0.1219734	0.1718432	0.1718420
86	000:50	0.1964233	0.2928286	0.2928237
87	001:00	0.1470920	0.2332429	0.2332387
88	001:10	0.1169198	0.1873856	0.1873824
89	001:20	0.1177495	0.1709560	0.1709535
90	001:30	0.1205816	0.1623790	0.1623769
91	001:40	0.1100214	0.1458440	0.1458422
92	001:50	0.1001405	0.1314133	0.1314117
93	002:00	0.1072299	0.1345944	0.1345929
94	002:10	0.1013811	0.1253946	0.1253933
95	002:20	0.1063595	0.1276136	0.1276123
96	002:30	0.1095808	0.1282868	0.1282855
97	002:40	0.1090217	0.1254443	0.1254432
98	002:50	0.1077630	0.1223813	0.1223803
99	003:00	0.1107185	0.1241348	0.1241338
100	003:10	0.1128146	0.1249902	0.1249892
101	003:20	0.1112555	0.1223619	0.1223611
102	003:30	0.1101965	0.1203401	0.1203392
	003:40	0.1089444	0.1182458	0.1182450
104	003:50	0.1090946	0.1176030	0.1176022
105	004:00	0.1083996	0.1162473	0.1162466
106	004:10	0.1067533	0.1141863	0.1141855
107	004:20	0.1076940	0.1146039	0.1146032
108	004:30	0.1104257	0.1174970	0.1174962
109	004:40	0.1118683	0.1186457	0.1186450
110	004:50	0.1141236	0.1208293	0.1208285
111	005:00	0.1134400	0.1197325	0.1197317
112	005:10	0.1152050	0.1213191	0.1213183
113	005:20	0.1170685	0.1231236	0.1231228
114	005:30	0.1202000	0.1265836	0.1265826
115	005:40	0.1204065	0.1264425	0.1264417
116	005:50	0.1218647	0.1276793	0.1276785
117	006:00	0.1242611	0.1302175	0.1302168
118	006:10	0.1251299	0.1308080	0.1308071
119	006:20	0.1260062	0.1314997	0.1314987
120	006:30	0.1257260	0.1309460	0.1309447
121	006:40	0.1262829	0.1312713	0.1312706
122	006:50	0.1265088	0.1312614	0.1312605
123	007:00	0.1273750	0.1319756	0.1319748
124	007:10	0.1290282	0.1336554	0.1336544
125	007:20	0.1294289	0.1338931	0.1338919
126	007:30	0.1297954	0.1340734	0.1340722
127	007:40	0.1295376	0.1336318	0.1336308
128	007:50	0.1293103	0.1332371	0.1332365
129	008:00	0.1279657	0.1319240	0.1319232
130	008:10	0.1281300	0.1319338	0.1319330
131	008:20	0.1273437	0.1310703	0.1310695

MASS LEAK RATE (MLR) SUMMARY

RESULTS USING 080 SAMPLES (SAMPLES T-081 - T-160) ELAPSED TIME 013:10

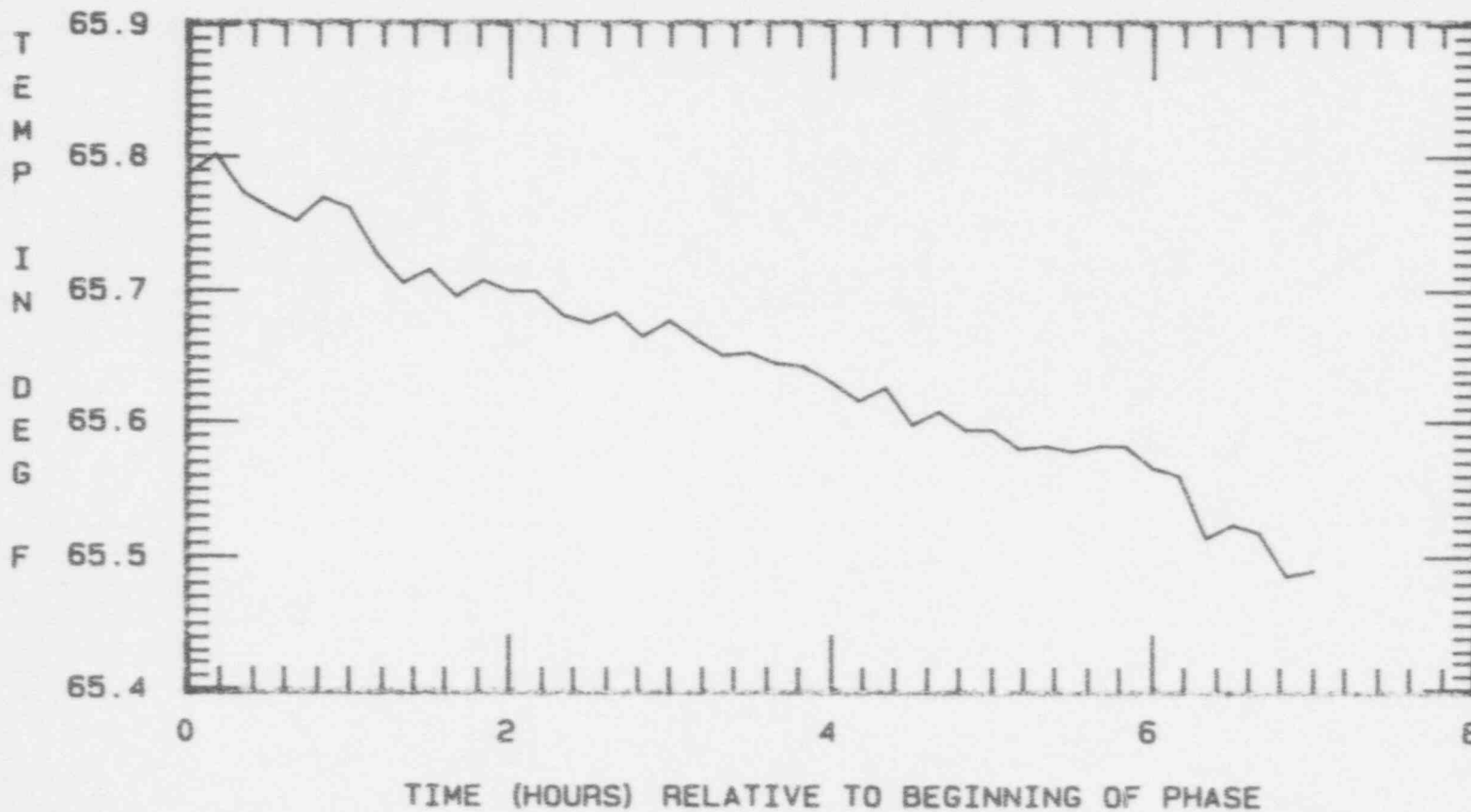
SAMPLE No	ELAPSED TIME	CALCULATED MLR (%/DAY)	95 % UCL (MLR) (%/DAY) APPROX.	95% UCL (MLR) (%/DAY) EXACT
132	008:30	0.1282714	0.1319491	0.1319484
133	008:40	0.1293195	0.1329979	0.1329967
134	008:50	0.1293759	0.1329223	0.1329214
135	009:00	0.1296133	0.1330442	0.1330436
136	009:10	0.1301367	0.1334726	0.1334719
137	009:20	0.1303709	0.1335927	0.1335923
138	009:30	0.1298542	0.1329880	0.1329869
139	009:40	0.1296422	0.1326735	0.1326730
140	009:50	0.1294635	0.1323978	0.1323965
141	010:00	0.1296324	0.1324684	0.1324675
142	010:10	0.1296886	0.1324358	0.1324345
143	010:20	0.1294493	0.1321160	0.1321153
144	010:30	0.1292308	0.1318158	0.1318149
145	010:40	0.1290282	0.1315376	0.1315369
146	010:50	0.1284993	0.1309907	0.1309901
147	011:00	0.1282516	0.1306840	0.1306831
148	011:10	0.1279386	0.1303084	0.1303082
149	011:20	0.1282338	0.1305370	0.1305368
150	011:30	0.1284205	0.1306767	0.1306757
151	011:40	0.1282372	0.1304416	0.1304407
152	011:50	0.1281832	0.1303264	0.1303257
153	012:00	0.1281163	0.1302022	0.1302016
154	012:10	0.1281563	0.1301852	0.1301847
155	012:20	0.1282890	0.1302714	0.1302706
156	012:30	0.1283909	0.1303220	0.1303212
157	012:40	0.1288897	0.1308264	0.1308260
158	012:50	0.1287130	0.1306050	0.1306045
159	013:00	0.1287232	0.1305665	0.1305659
160	013:10	0.1288037	0.1306014	0.1306011

APPENDIX D

VERIFICATION GRAPHS

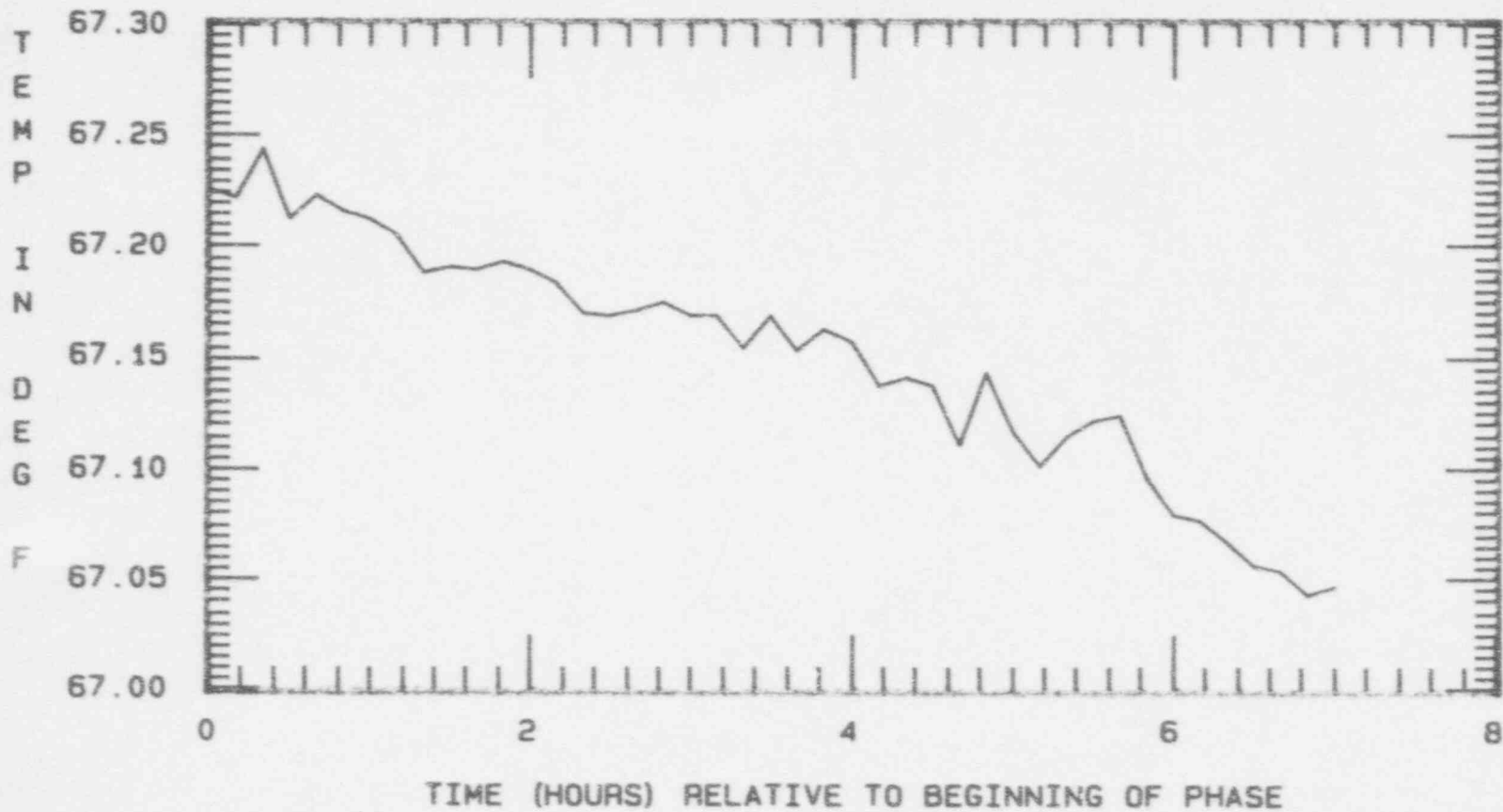
CONTENTS: COMPARTMENT TEMPERATURE
COMPARTMENT VAPOR PRESSURE
COMPARTMENT ABSOLUTE PRESSURE
CONTAINMENT TEMPERATURE
CONTAINMENT VAPOR PRESSURE
CONTAINMENT PRESSURE
CALCULATED TOTAL TIME LEAK RATE
CALCULATED MASS LEAK RATE

CMPT. 1 = RED



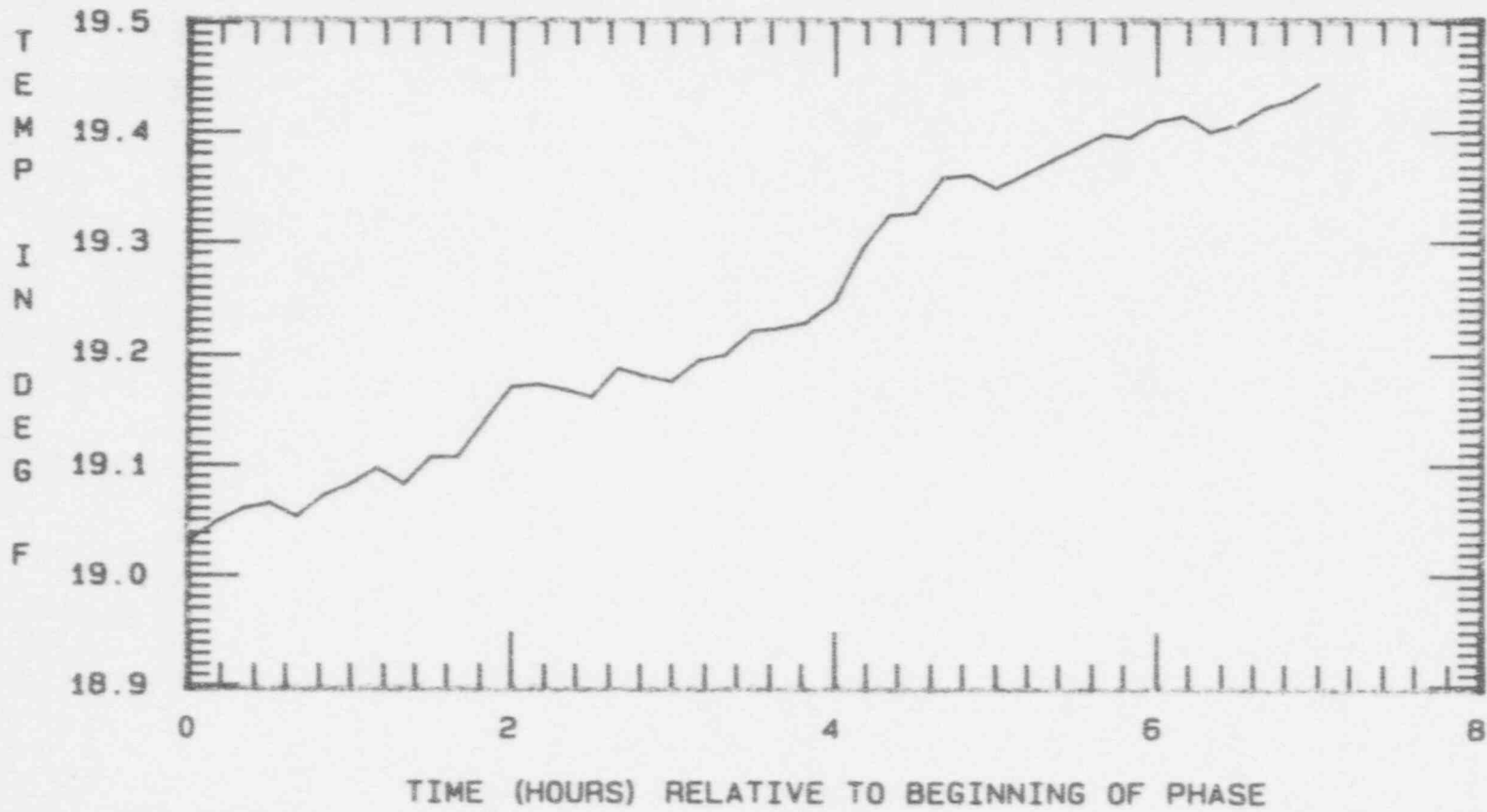
COMPARTMENT TEMPERATURE
VERIFICATION PHASE

CMPT. 2 = RED



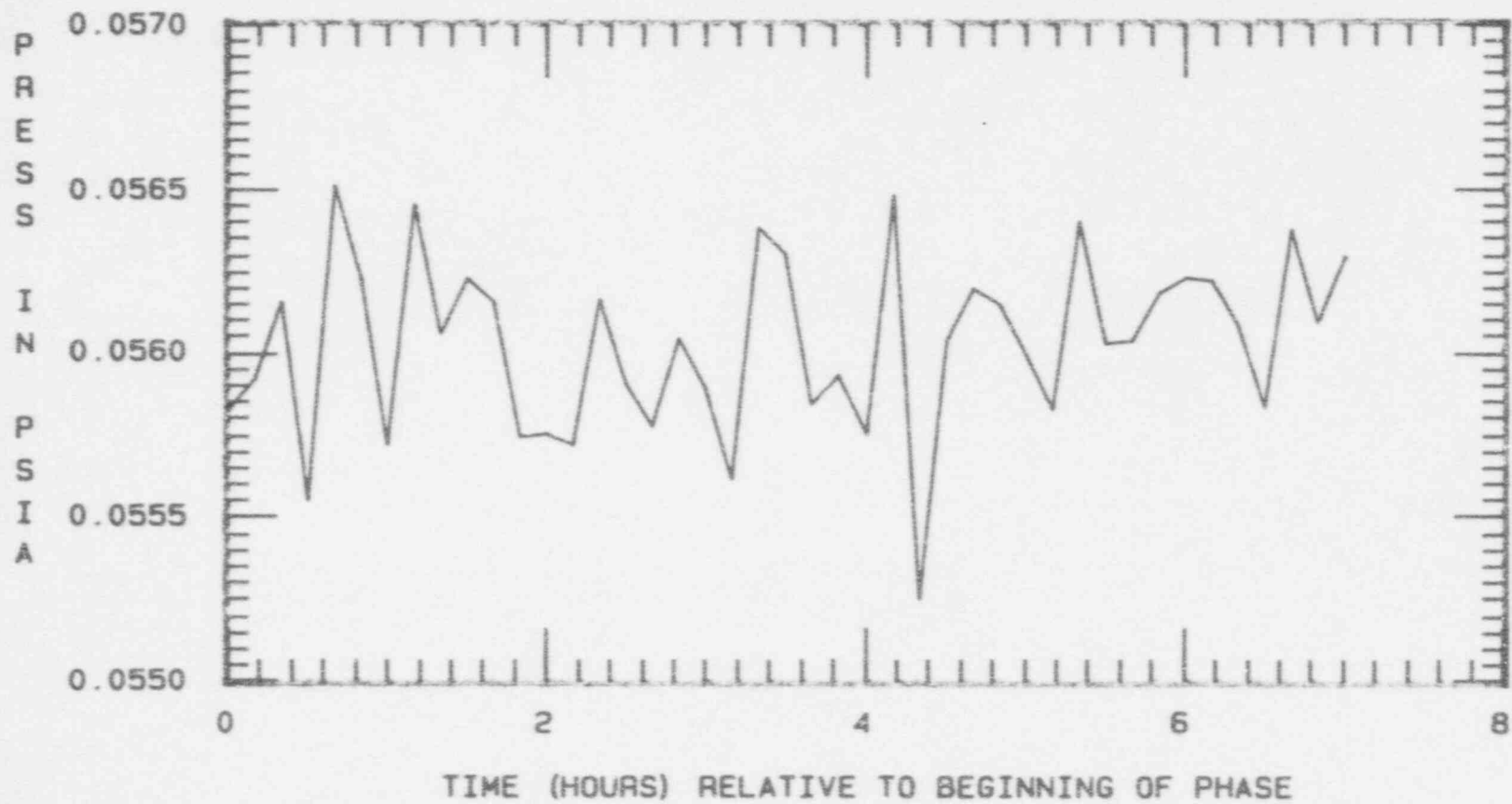
COMPARTMENT TEMPERATURE
VERIFICATION PHASE

CMPT. 3 - RED



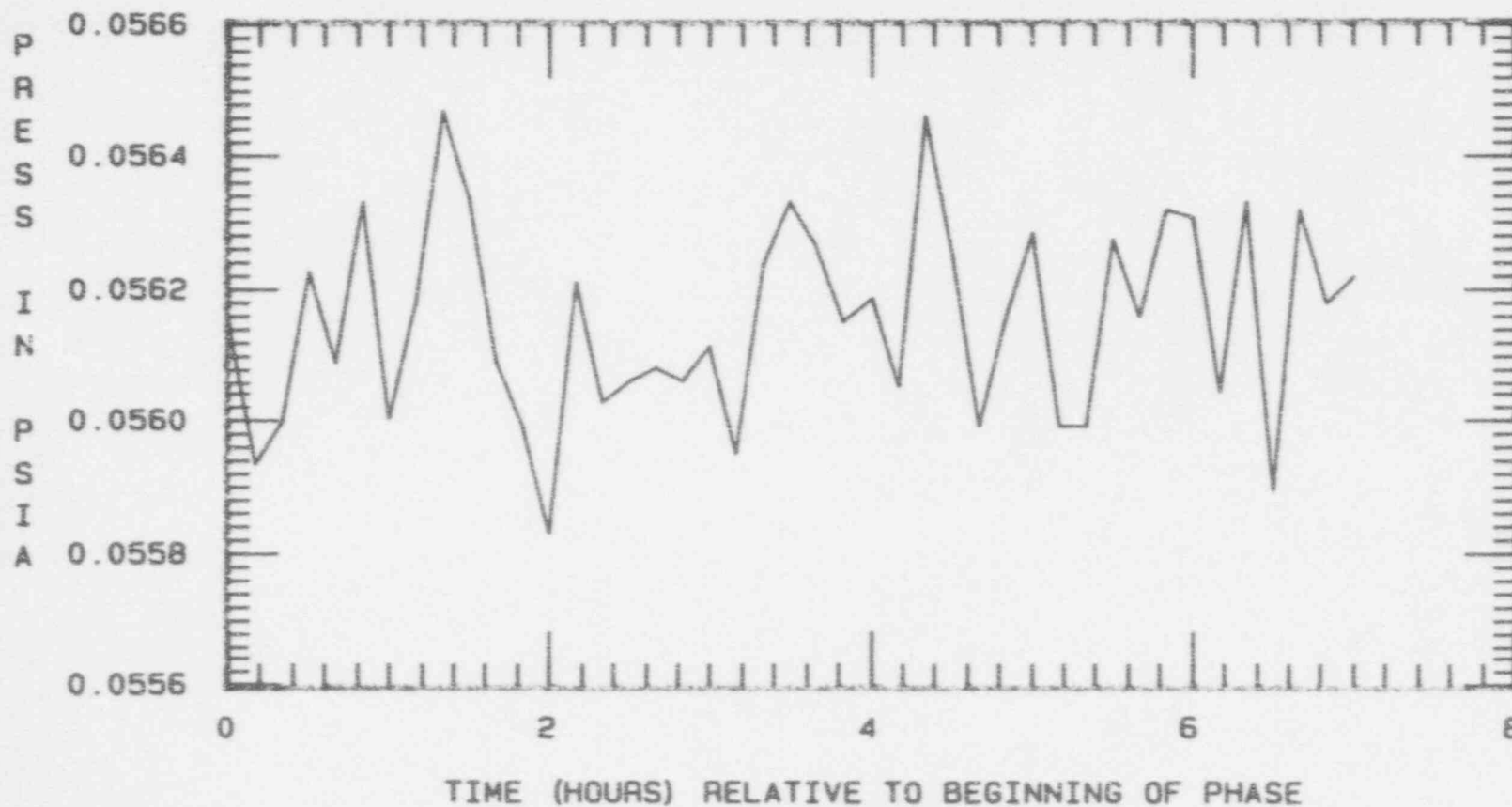
COMPARTMENT TEMPERATURE
VERIFICATION PHASE

CMPT. 1 - RED



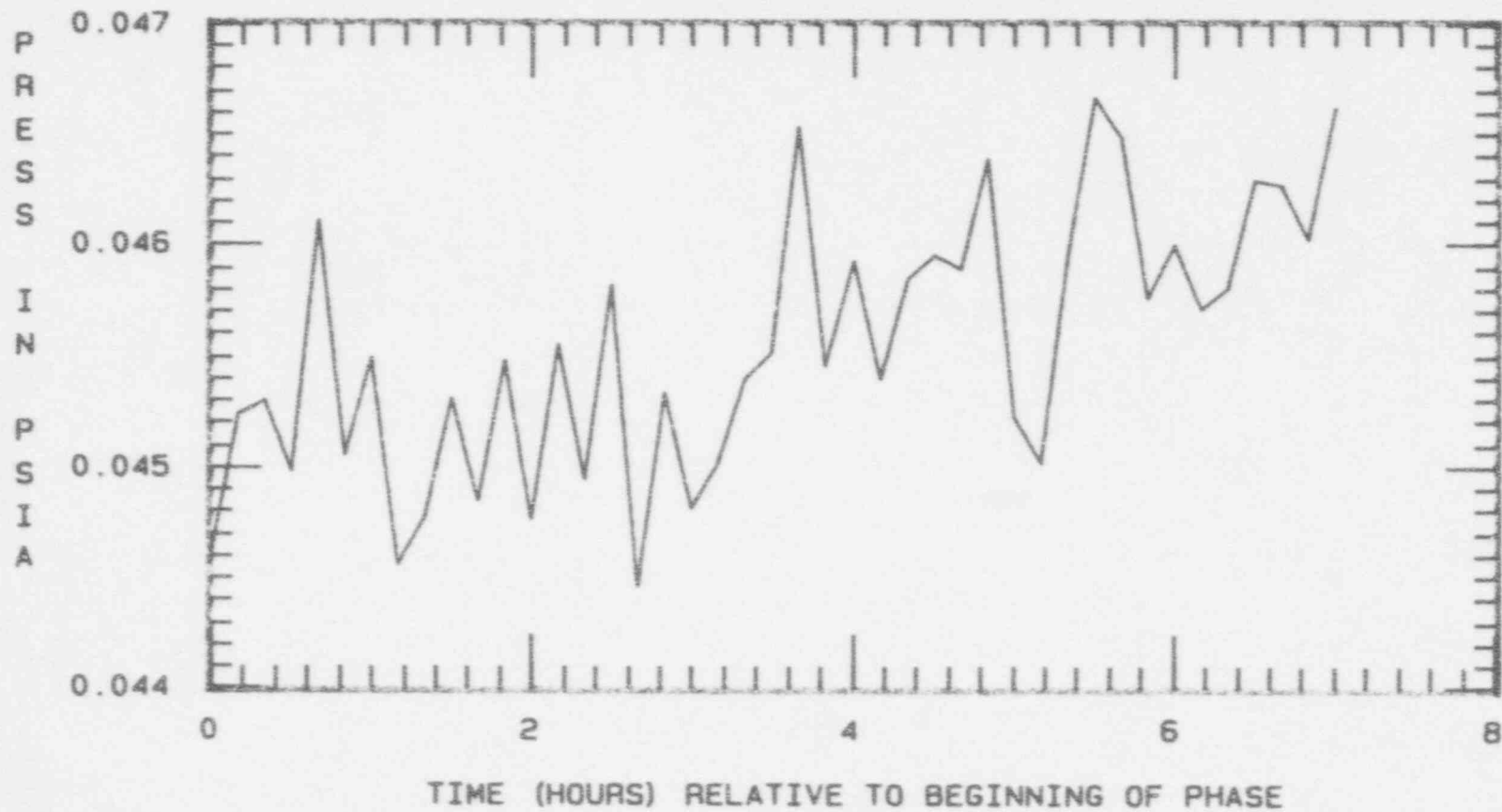
COMPARTMENT VAPOR PRESSURE
VERIFICATION PHASE

CMPT. 2 - RED



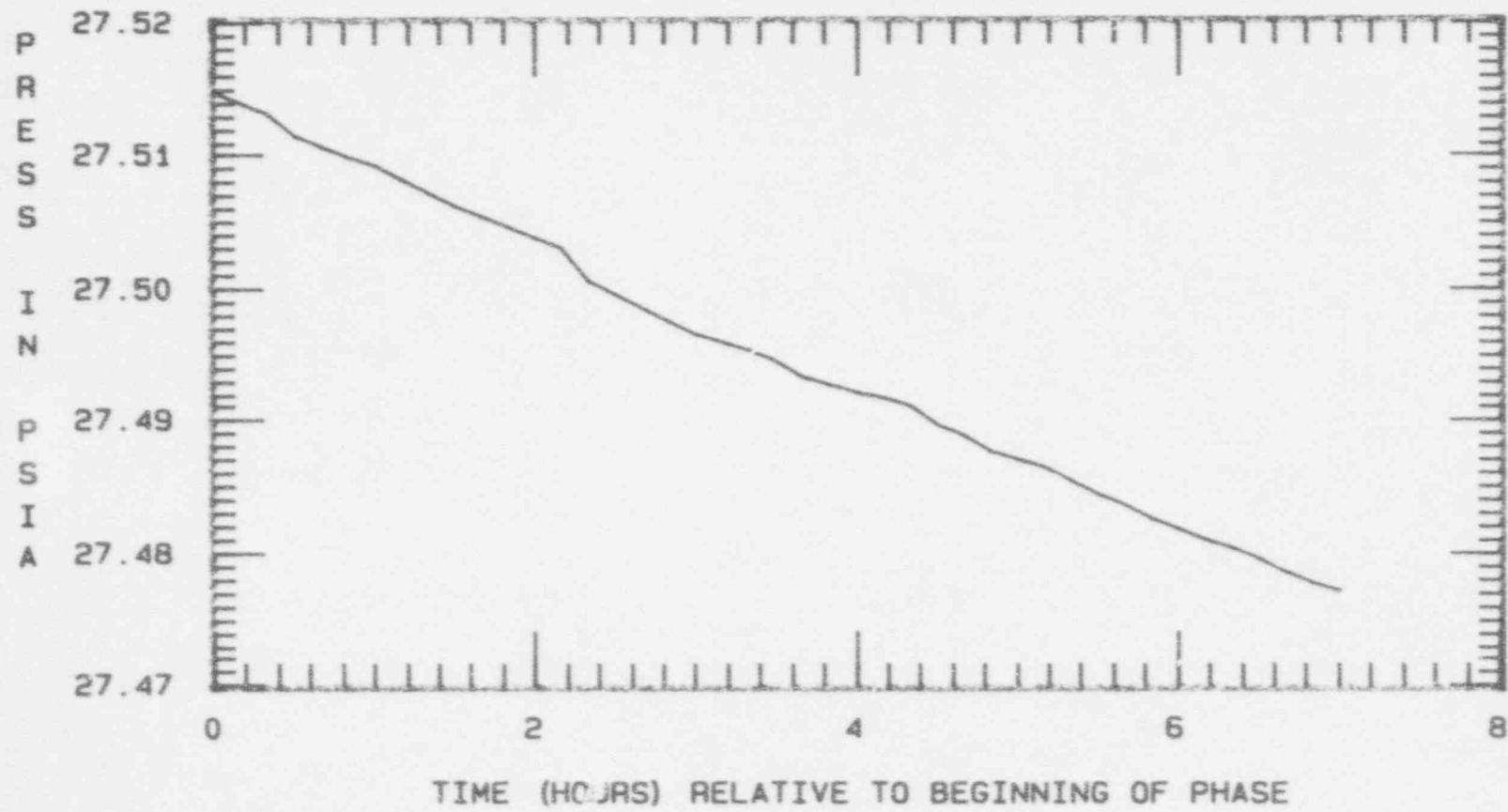
COMPARTMENT VAPOR PRESSURE
VERIFICATION PHASE

CMPT. 3 - RED



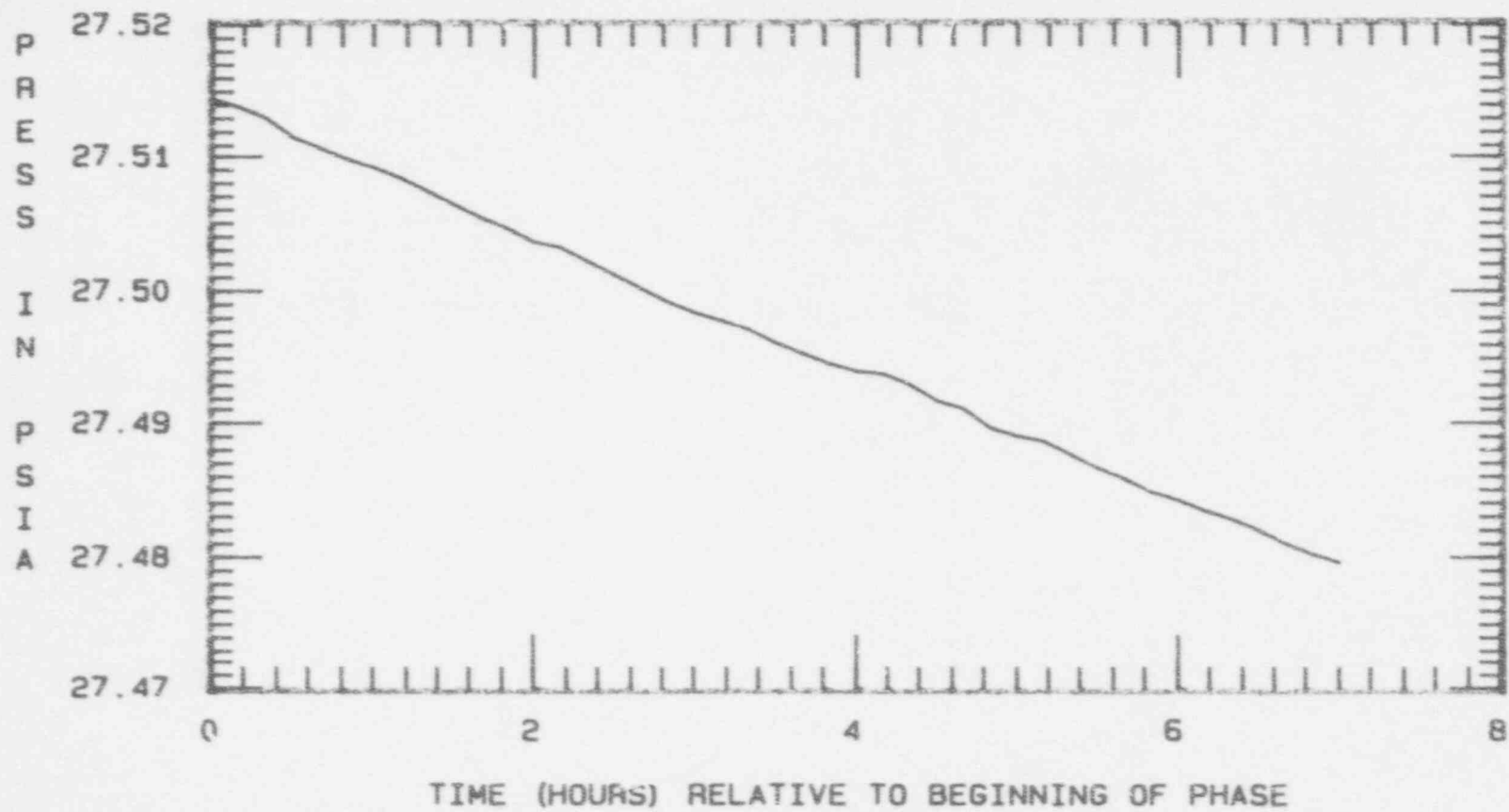
COMPARTMENT VAPOR PRESSURE
VERIFICATION PHASE

CMPT. 1 - RED



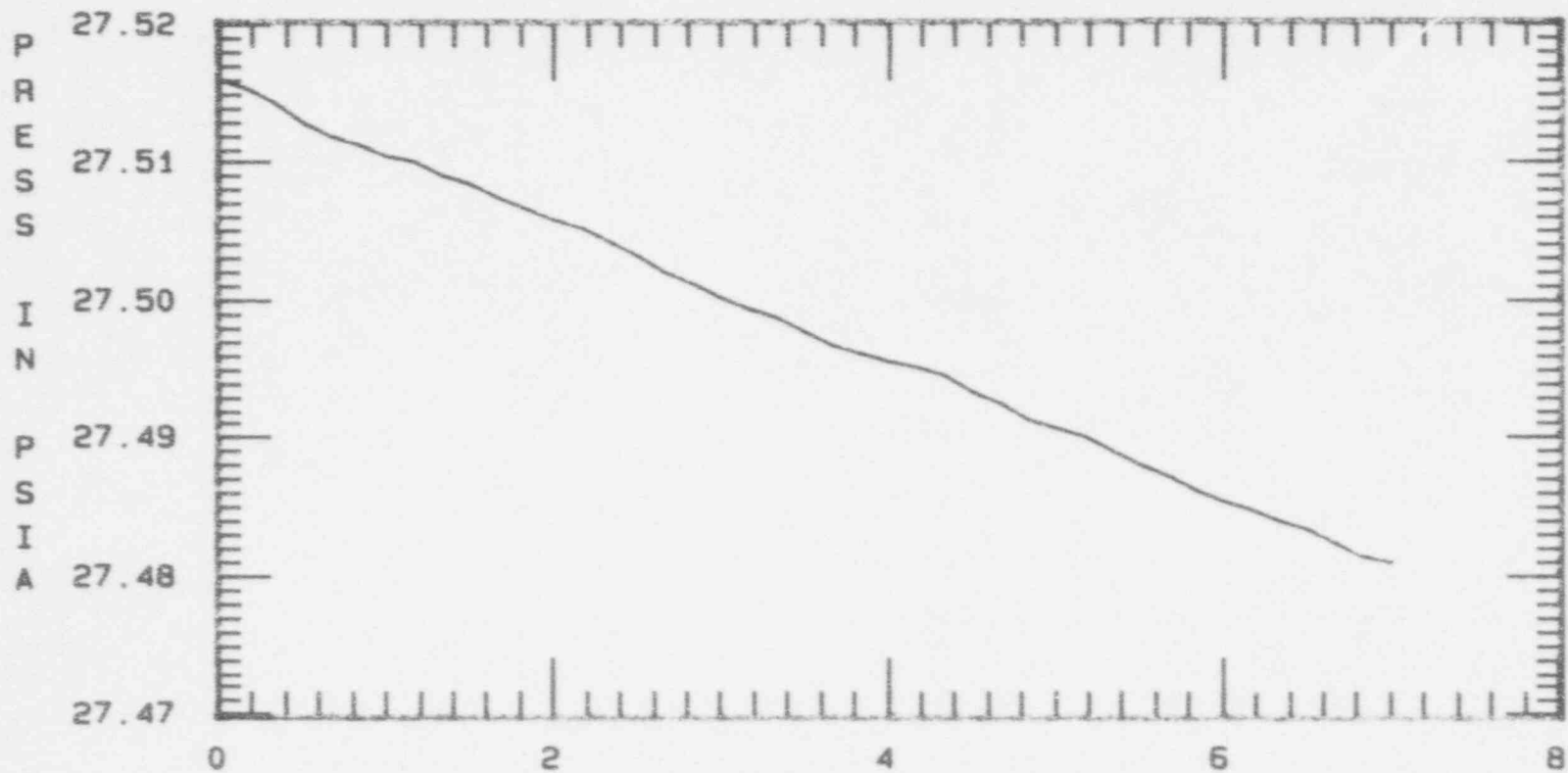
COMPARTMENT ABSOLUTE PRESSURE
VERIFICATION PHASE

CMPT. 2 = RED



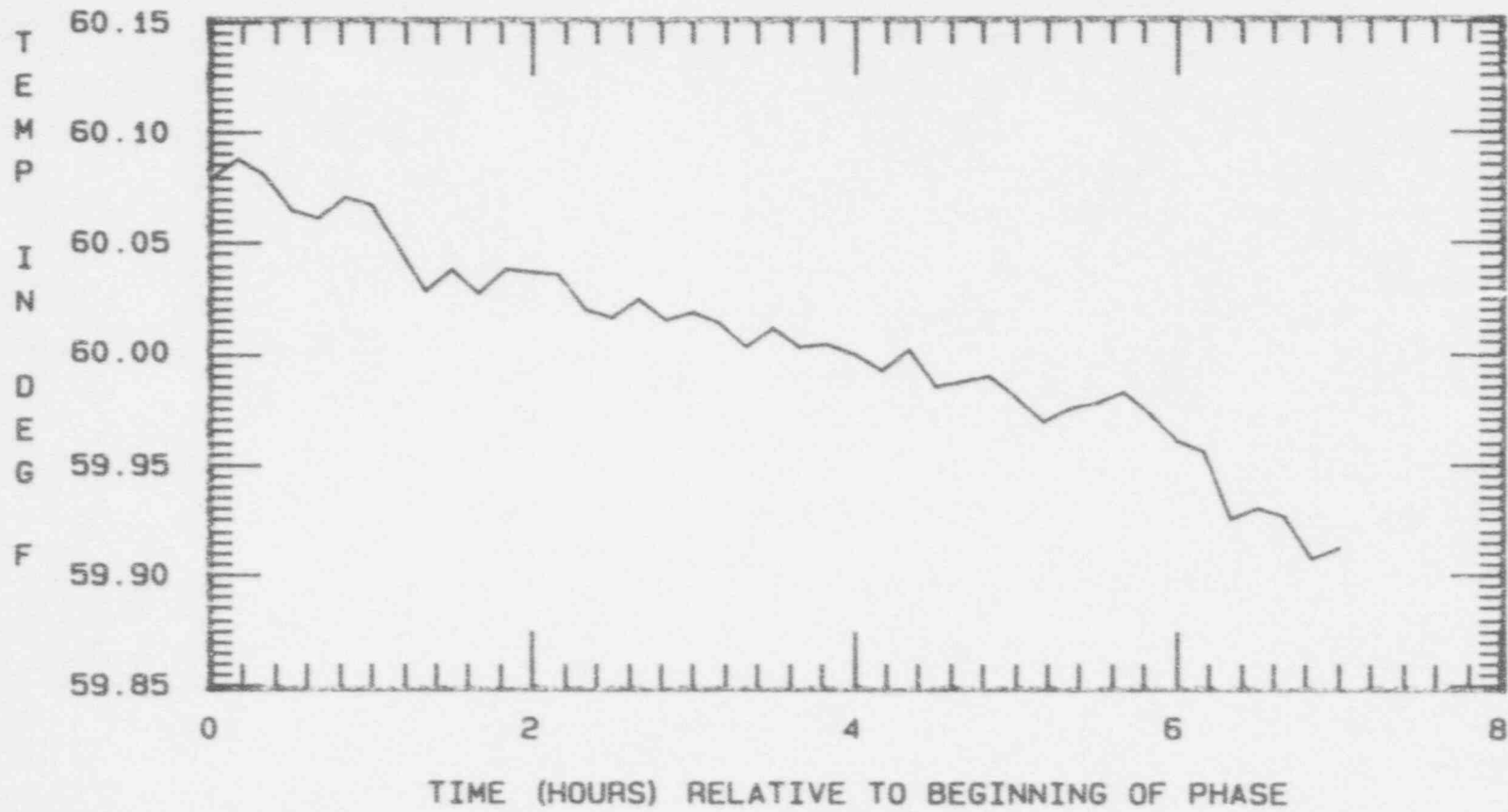
COMPARTMENT ABSOLUTE PRESSURE
VERIFICATION PHASE

CMPT. 3 - RED

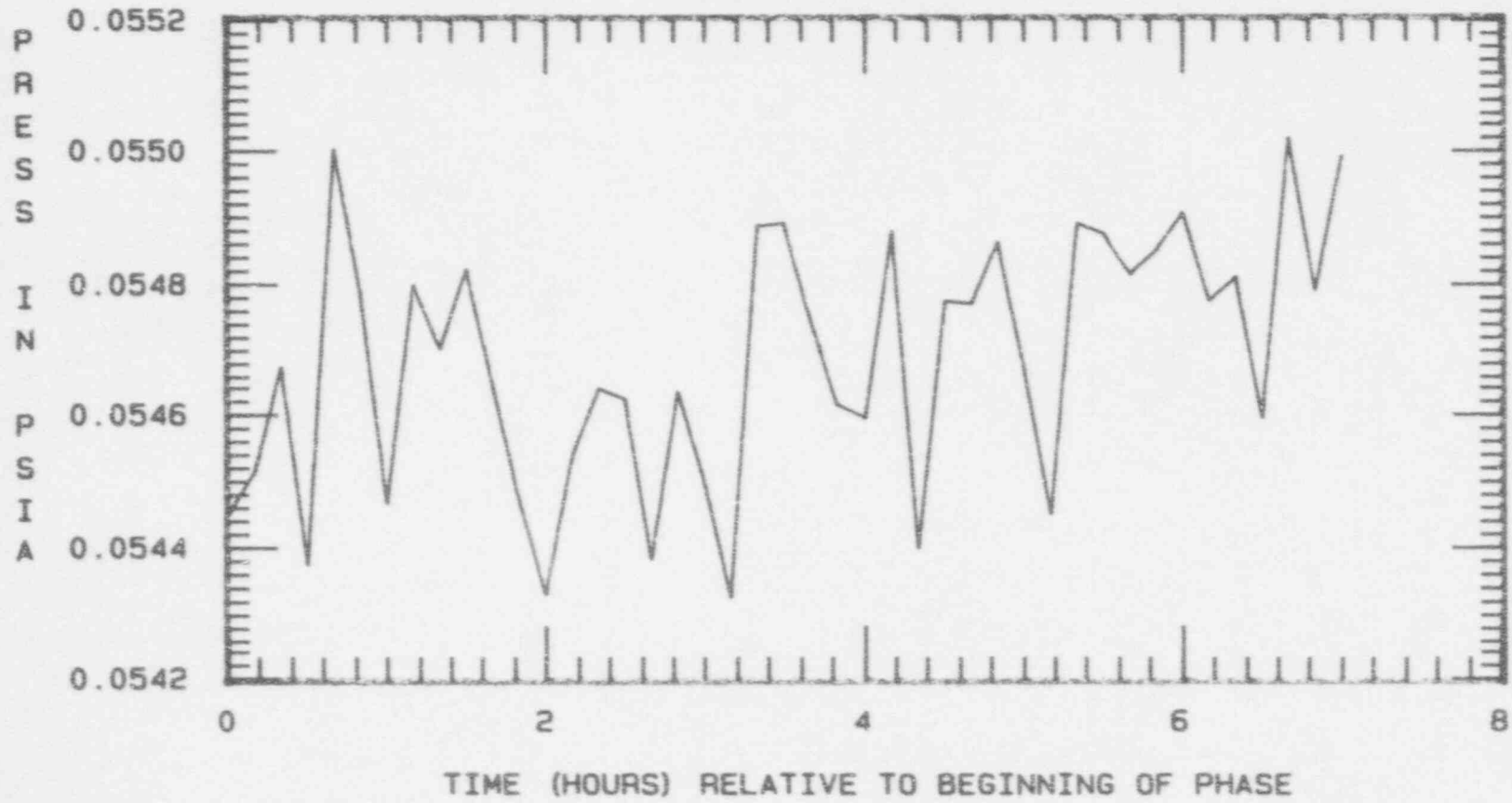


TIME (HOURS) RELATIVE TO BEGINNING OF PHASE

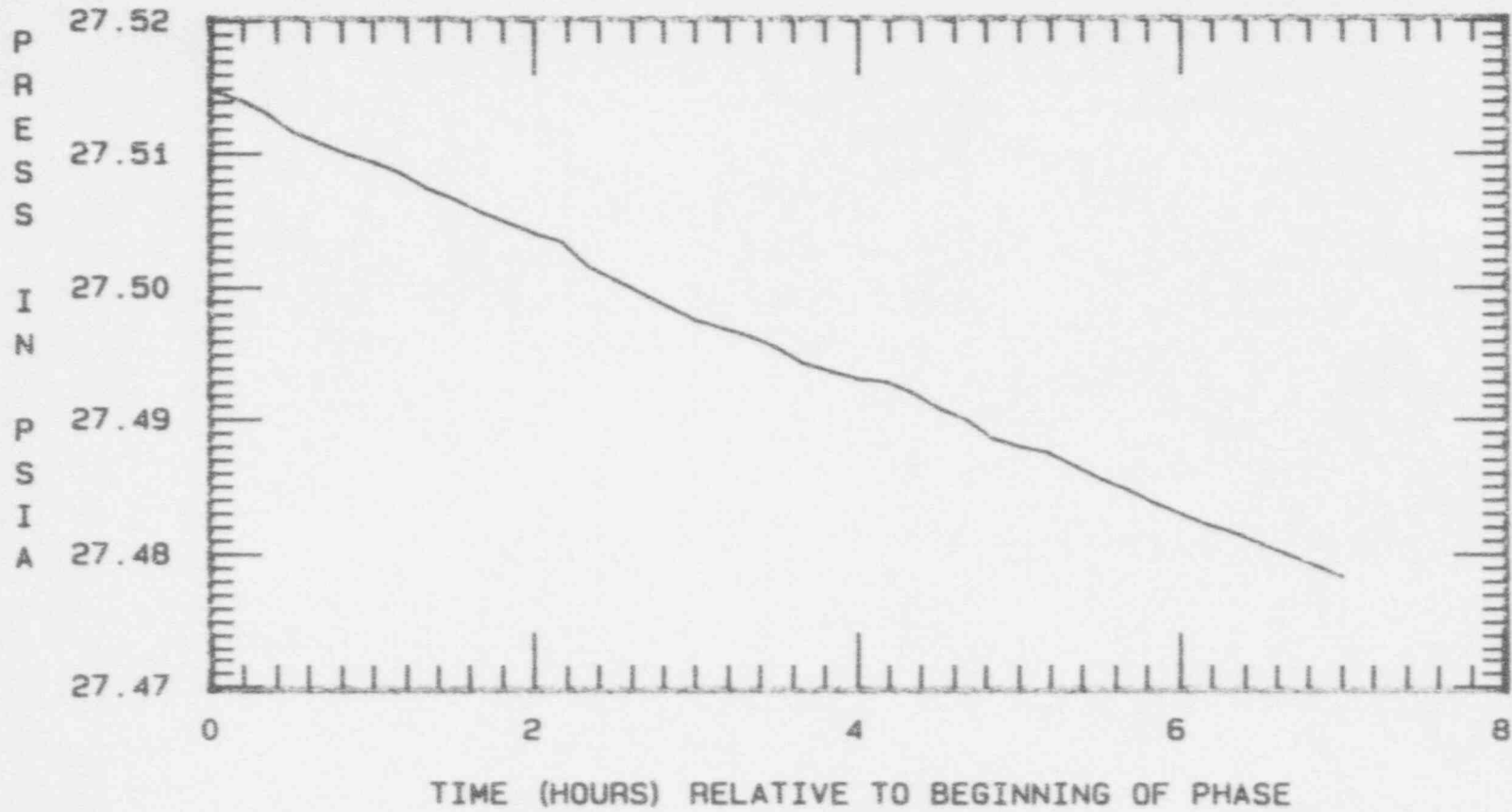
COMPARTMENT ABSOLUTE PRESSURE
VERIFICATION PHASE



CONTAINMENT TEMPERATURE
VERIFICATION PHASE

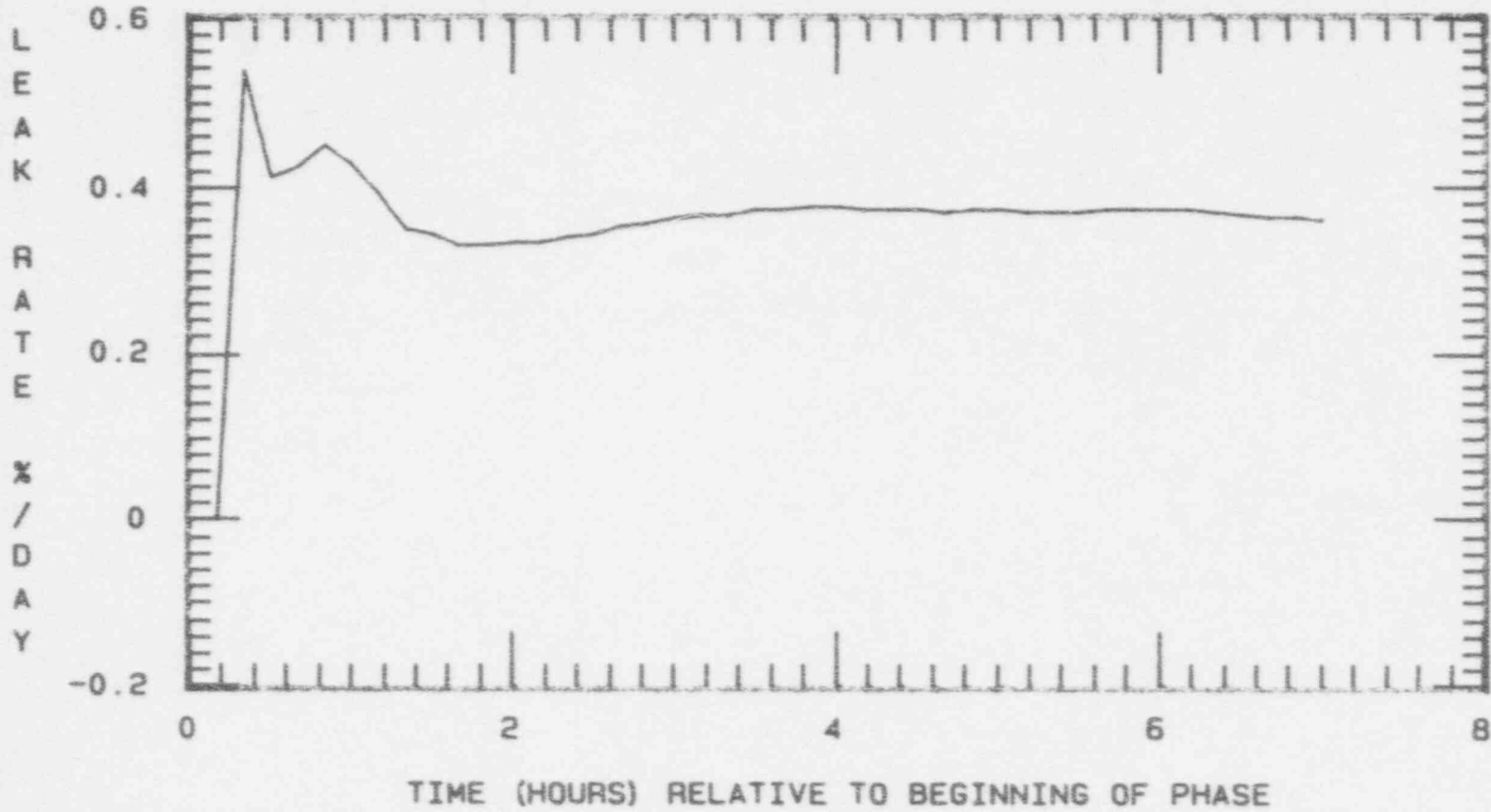


CONTAINMENT VAPOR PRESSURE
VERIFICATION PHASE



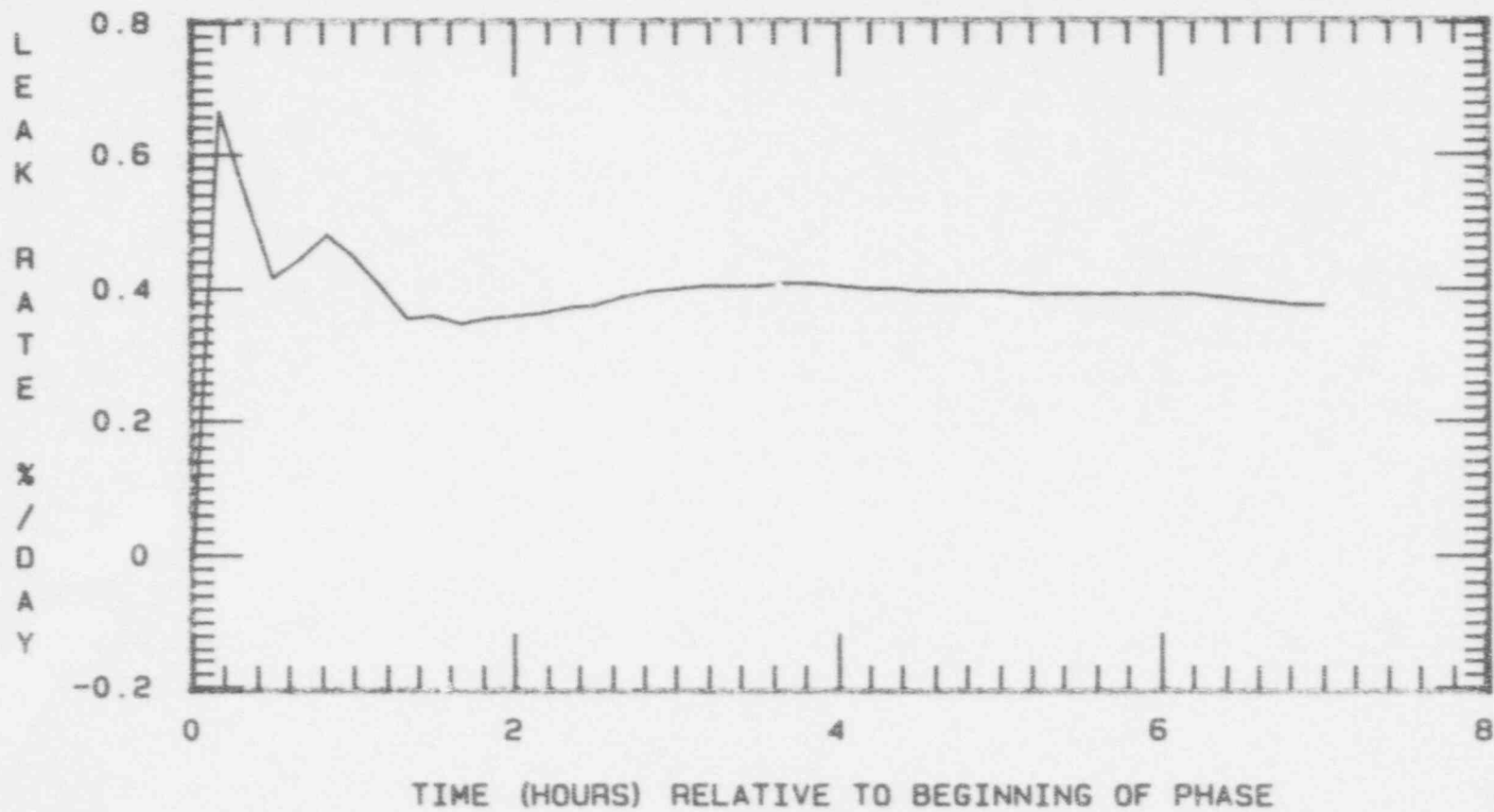
CONTAINMENT PRESSURE
VERIFICATION PHASE

CALCULATED TOTAL TIME LEAK RATE FOR THE VERIFICATION TEST PHASE



CALCULATED TOTAL TIME LEAK RATE
VERIFICATION PHASE

CALCULATED MASS LEAK RATE FOR THE VERIFICATION TEST PHASE



CALCULATED MASS LEAK RATE
VERIFICATION PHASE

APPENDIX E

VERIFICATION TEST TABULAR DATA

CONTENTS: TOTAL TIME LEAK RATE SUMMARY
MASS LEAK RATE SUMMARY

TOTAL TIME LEAK RATE (TTLR) SUMMARY

RESULTS USING 43 SAMPLES (SAMPLES V-168 - V-210) ELAPSED TIME 007:00

FOR THE MEASURED TOTAL TIME LEAK RATE (%/DAY)

MEAN = 0.39996 STANDARD DEV. = 0.82553E-01 SKEW = -0.14444E-01
 EXTRAPOLATED VALUE = 0.45071 (%/DAY) WHICH IS 180.29 % OF LA
 EXTRAPOLATION VALUE MUST BE LESS THAN 75% OF LA (LA = 0.25000 (%/DAY))

INDIVIDUAL SAMPLE TTLR SUMMARY

SAMPLE NO	ELAPSED TIME	MEASURED TTLR (%/DAY)	CALCULATED TTLR (%/DAY)	95 % UCL FOR TTLR (%/DAY)	CONVERGENCE (95%UCL-CALC)
168	000:00	0.0000000	-----	-----	-----
169	000:10	0.6645305	-----	-----	-----
170	000:20	0.5377016	-----	-----	-----
171	000:30	0.4139554	0.4134417	0.4256329	0.1219121E-01
172	000:40	0.4835351	0.4249208	0.8049673	0.3800465
173	000:50	0.5136569	0.4514933	0.7766741	0.3251808
174	001:00	0.4403780	0.4287238	0.6751635	0.2464407
175	001:10	0.3872810	0.3922885	0.5941668	0.2018782
176	001:20	0.3363938	0.3496930	0.5240985	0.1744055
177	001:30	0.3935512	0.3444863	0.5118185	0.1673322
178	001:40	0.3646330	0.3319804	0.4877184	0.1557380
179	001:50	0.3918964	0.3326234	0.4881991	0.1555757
180	002:00	0.3907254	0.3334912	0.4876241	0.1541330
181	002:10	0.3929866	0.3353707	0.4880903	0.1527196
182	002:20	0.4073811	0.3410172	0.4946889	0.1536717
183	002:30	0.4025055	0.3446738	0.4967833	0.1521095
184	002:40	0.4221024	0.3523892	0.5056337	0.1532445
185	002:50	0.4208978	0.3586362	0.5111241	0.1524880
186	003:00	0.4249648	0.3648010	0.5161626	0.1513615
187	003:10	0.4096907	0.3671077	0.5150530	0.1479454
188	003:20	0.4041349	0.3681569	0.5124025	0.1442455
189	003:30	0.4209385	0.3721582	0.5143356	0.1421773
190	003:40	0.4136951	0.3744410	0.5138173	0.1393762
191	003:50	0.4109876	0.3760527	0.5125425	0.1364898
192	004:00	0.3994229	0.3757161	0.5089038	0.1331877
193	004:10	0.3892590	0.3739710	0.5038009	0.1298299
194	004:20	0.3910049	0.3727767	0.4995924	0.1268156
195	004:30	0.3913004	0.3718395	0.4958999	0.1240604
196	004:40	0.3934149	0.3711637	0.4929538	0.1215901
197	004:50	0.4090960	0.3730556	0.4930299	0.1199743
198	005:00	0.3934778	0.3726288	0.4903867	0.1177579
199	005:10	0.3770773	0.3702795	0.4856475	0.1153680
200	005:20	0.3935741	0.3701915	0.4836984	0.1135068
201	005:30	0.3994229	0.3708333	0.4827916	0.1119584
202	005:40	0.4053162	0.3721145	0.4828221	0.1107076
203	005:50	0.4010586	0.3728416	0.4821496	0.1093080
204	006:00	0.3921934	0.3725886	0.4802845	0.1076959
205	006:10	0.3878421	0.3719380	0.4780134	0.1060754
206	006:20	0.3651893	0.3690817	0.4734558	0.1043741
207	006:30	0.3661574	0.3665982	0.4693393	0.1027411
208	006:40	0.3733525	0.3650462	0.4662716	0.1012254
209	006:50	0.3581240	0.3622176	0.4619604	0.9974266E-01
210	007:00	0.3634377	0.3601327	0.4584520	0.9831926E-01

TOTAL TIME LEAK RATE (TTLR) SUMMARY

RESULTS USING 43 SAMPLES (SAMPLES V-168 - V-210) ELAPSED TIME 007:00

FOR THE MEASURED TOTAL TIME LEAK RATE (%/DAY)

MEAN = 0.39996 STANDARD DEV. = 0.82553E-01 SKEW = -0.14444E-01
 EXTRAPOLATED VALUE = 0.45071 (%/DAY) WHICH IS 180.29 % OF LA
 EXTRAPOLATION VALUE MUST BE LESS THAN 75% OF LA (LA = 0.25000 (%/DAY))

INDIVIDUAL SAMPLE TTLR SUMMARY

SAMPLE NO	ELAPSED TIME	MEASURED TTLR (%/DAY)	MEAN MEASURED TTLR (%/DAY)	CALCULATED TTLR (%/DAY)	DELTA CALC TTLR (%/DAY)
168	000:00	0.0000000			
169	000:10	0.6645305			
170	000:20	0.5377016	0.6011161		
171	000:30	0.4139554	0.5387291	0.4134417	
172	000:40	0.4835351	0.5249306	0.4249208	0.1147914E-01
173	000:50	0.5136569	0.5226759	0.4514933	0.2657247E-01
174	001:00	0.4403780	0.5089596	0.4287228	-0.2277052E-01
175	001:10	0.3872810	0.4915769	0.3922885	-0.3643423E-01
176	001:20	0.3363938	0.4721790	0.3496930	-0.4259557E-01
177	001:30	0.3935512	0.4634426	0.3444863	-0.5206674E-02
178	001:40	0.3646330	0.4535616	0.3319804	-0.1250586E-01
179	001:50	0.3918964	0.4479557	0.3326234	0.6429553E-03
180	002:00	0.3907254	0.4431866	0.3334912	0.8677840E-03
181	002:10	0.3929866	0.4393250	0.3353707	0.1879513E-02
182	002:20	0.4073811	0.4370433	0.3410172	0.5646557E-02
183	002:30	0.4025055	0.4347408	0.3446738	0.3656536E-02
184	002:40	0.4221024	0.4339509	0.3523892	0.7715404E-02
185	002:50	0.4208978	0.4331831	0.3586362	0.6246984E-02
186	003:00	0.4249648	0.4327266	0.3648010	0.6164879E-02
187	003:10	0.4096907	0.4315141	0.3671077	0.2306610E-02
188	003:20	0.4041349	0.4301452	0.3681569	0.1049280E-02
189	003:30	0.4209385	0.4297068	0.3721582	0.4001290E-02
190	003:40	0.4136951	0.4289790	0.3744410	0.2282798E-02
191	003:50	0.4109876	0.4281968	0.3760527	0.1611650E-02
192	004:00	0.3994229	0.4269978	0.3757161	-0.3365278E-03
193	004:10	0.3892590	0.4254883	0.3739710	-0.1745164E-02
194	004:20	0.3910049	0.4241620	0.3727767	-0.1194268E-02
195	004:30	0.3913004	0.4229449	0.3718395	-0.9372234E-03
196	004:40	0.3934149	0.4218903	0.3713637	-0.4758239E-03
197	004:50	0.4090960	0.4214491	0.3730556	0.1691967E-02
198	005:00	0.3934778	0.4205167	0.3726288	-0.4268587E-03
199	005:10	0.3770773	0.4191155	0.3702795	-0.2349317E-02
200	005:20	0.3935741	0.4183173	0.3701915	-0.8791685E-04
201	005:30	0.3994229	0.4177447	0.3708333	0.6417334E-03
202	005:40	0.4053162	0.4173792	0.3721145	0.1281232E-02
203	005:50	0.4010586	0.4169129	0.3728416	0.7270873E-03
204	006:00	0.3921934	0.4162262	0.3725886	-0.2529919E-03
205	006:10	0.3878421	0.4154591	0.3719380	-0.6506443E-03
206	006:20	0.3651893	0.4141362	0.3690817	-0.2856284E-02
207	006:30	0.3661574	0.4129060	0.3665982	-0.2483517E-02
208	006:40	0.3733525	0.4119171	0.3650462	-0.1551986E-02
209	006:50	0.3581240	0.4106051	0.3632176	-0.3828598E-02
210	007:00	0.3634377	0.4094821	0.3601327	-0.2084881E-02

MASS LEAK RATE (MLR) SUMMARY

RESULTS USING 043 SAMPLES (SAMPLES V-168 - V-210) ELAPSED TIME 007:00

SA NO	LE	ELAPSED TIME	CALCULATED MLR (%/DAY)	95 % UCL (MLR) (%/DAY) APPROX.	95% UCL (MLR) (%/DAY) EXACT
168		000:00	0.0000000	-----	-----
169		000:10	0.6658515	-----	-----
170		000:20	0.5370426	1.166929	1.166878
171		000:30	0.4137828	0.6461181	0.6461024
172		000:40	0.4454893	0.5607753	0.5607662
173		000:50	0.4810452	0.5621746	0.5621665
174		001:00	0.4495660	0.5146844	0.5146773
175		001:10	0.4046497	0.4731313	0.4731231
176		001:20	0.3556567	0.4302487	0.4302398
177		001:30	0.3582028	0.4165766	0.4165688
178		001:40	0.3476344	0.3958995	0.3958929
179		001:50	0.3538866	0.3941791	0.3941731
180		002:00	0.3588909	0.3929204	0.3929148
181		002:10	0.3634898	0.3927784	0.3927732
182		002:20	0.3718863	0.3986672	0.3986619
183		002:30	0.3767618	0.4006037	0.4005991
184		002:40	0.3867079	0.4100112	0.4100065
185		002:50	0.3942329	0.4161175	0.4161420
186		003:00	0.4005146	0.4212151	0.4212100
187		003:10	0.4020399	0.4206494	0.4206440
188		003:20	0.4015719	0.4183705	0.4183652
189		003:30	0.4053382	0.4210335	0.4210291
190		003:40	0.4068061	0.4211574	0.4211528
191		003:50	0.4071769	0.4203286	0.4203246
192		004:00	0.4054636	0.4177173	0.4177135
193		004:10	0.4013453	0.4132755	0.4132710
194		004:20	0.3989176	0.4102958	0.4102910
195		004:30	0.3965258	0.4073085	0.4073030
196		004:40	0.3948601	0.4049902	0.4049869
197		004:50	0.3968267	0.4064191	0.4064152
198		005:00	0.3954232	0.4044786	0.4044740
199		005:10	0.3912772	0.4006161	0.4006123
200		005:20	0.3910038	0.3997926	0.3997898
201		005:30	0.3914397	0.3997149	0.3997104
202		005:40	0.3927828	0.4006990	0.4006951
203		005:50	0.3933205	0.4008120	0.4008066
204		006:00	0.3923380	0.3994702	0.3994656
205		006:10	0.3908028	0.3976795	0.3976760
206		006:20	0.3863467	0.3941928	0.3941880
207		006:30	0.3826357	0.3909472	0.3909431
208		006:40	0.3804066	0.3886162	0.3886131
209		006:50	0.3762312	0.3850057	0.3849994
210		007:00	0.3732575	0.3820811	0.3820764

APPENDIX F

VERIFICATION TEST ANALYSIS

***** VERIFICATION ANALYSIS SUMMARY *****

TTLR REPORTED DURING VERIFICATION (SCCM):	160957.0	
MLR REPORTED DURING VERIFICATION (SCCM):	166822.9	
TTLR REPORTED DURING CILRT (SCCM):	59646.75	
MLR REPORTED DURING CILRT (SCCM):	57627.41	
AVERAGE FLOWMETER READING (SCCM):	104884.4	
MAXIMUM ALLOWABLE LEAK RATE (SCCM):	106405.3	
TTLR AGREEMENT BY APPENDIX J METHOD:	-3.359036	%
MLR AGREEMENT BY APPENDIX J METHOD:	4.051538	%
TTLR AGREEMENT BY BN1 METHOD:	-2.220588	%
MLR AGREEMENT BY BN1 METHOD:	2.584209	%

APPENDIX G

PENETRATIONS INSERVICE DURING CILRT

APPENDIX G

TESTABLE PENETRATIONS REQUIRED TO BE
INSERVICE DURING TEST PERFORMANCE

<u>Penetration</u>	<u>Description</u>	<u>Justification</u>	<u>Leakage Rate Added To 95% UCL</u>
X-27(C)	Integrated Leak Rate System Pressure	Isolation Valves Required To Be Open To Monitor Containment Pressure	0.0000 SCFH
X-47A	Ice Condenser System	Glycol Cooling supply To Air Handling Units In Ice Condenser Required To Ensure Ice Condition Is Maintained	0.0000 SCFH
X-47B	Ice Condenser System	Same As X-47A	0.0000 SCFH
X-54	Thimble Renewal	Used As Pressurization Point For Air Compressors	0.0000 SCFH
X-114	Ice Condenser System	Glycol Return From Air Handling Units Required To Ensure Ice Condition Is Maintained	0.0000 SCFH
X-115	Ice Condenser System	Same As X-114	0.0000 SCFH
X-118	Hatch	Used As Source For Verification Flow And Post-Test Depressurization	0.0000 SCFH
X-46	Waste Disposal	Used To Provide Leak-Off For RCP Seals	0.0000 SCFH
X-87A	Integrated Leak Rate System Pressure	Same As X-27C	0.0000 SCFH
X-87D	Integrated Leak Rate System Pressure	Same As X-27C	0.0000 SCFH

APPENDIX H

LEAK RATE CALCULATIONS DUE TO SUMP LEVEL CHANGES

CORRECTING LEAK RATES TO COMPENSATE
FOR SUMP LEVEL CHANGES

DATA: There was a two and one-half gallons increase in the Auxiliary Reactor Building Floor and Equipment Drain Sump during the CILRT and Verification Test.

CALCULATION: There are 7.48 gallons/ft³
2½ Divided By 7.48 Yields 0.3342 ft³
Decrease in Containment Volume

This corresponds to:

$$\frac{0.3342 \text{ ft}^3 \cdot 28.0160 \text{ psia} \cdot 144 \text{ in}^2/\text{ft}^2}{53.357 \frac{\text{lb}_f \cdot \text{ft}}{\text{lb}_m \cdot \text{°R}} \cdot 520.07 \text{ °R}} = 0.0486 \text{ lb}_m$$

Total containment mass is:

$$\frac{1,192,220.0 \text{ ft}^3 \cdot 28.0160 \text{ psia} \cdot 144 \text{ in}^2/\text{ft}^2}{53.357 \frac{\text{lb}_f \cdot \text{ft}}{\text{lb}_m \cdot \text{°R}} \cdot 520.07 \text{ °R}} = 173,329.2341 \text{ lb}_m$$

The leak rate impact due to increase in sump level is:

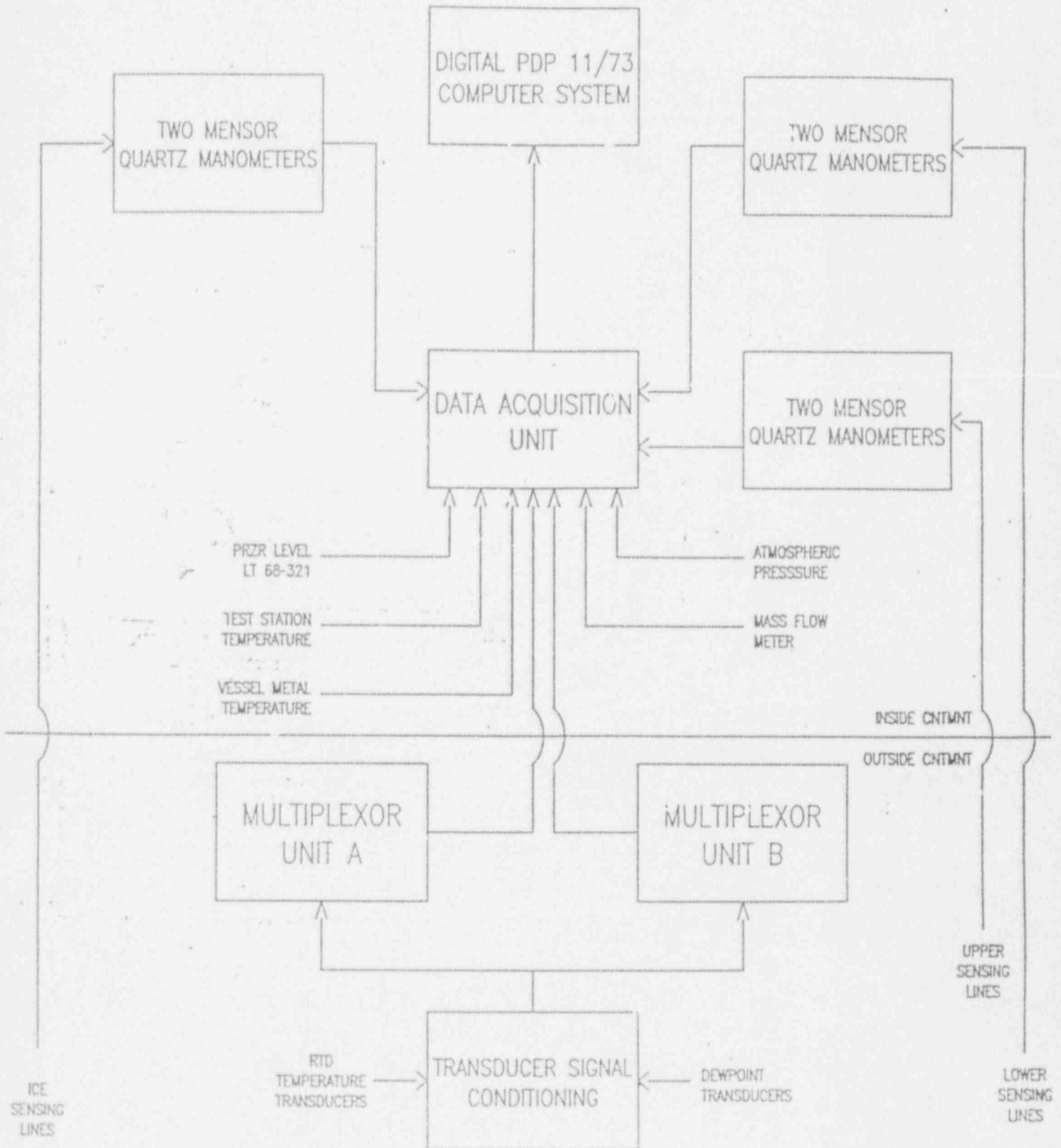
$$\frac{0.0486 \text{ lb}_m}{173,329.2341 \text{ lb}_m} \times 100 = 0.000028\%/\text{Day}$$

Since calculations for leak rate are reliable only to four decimal places, no addition to the CILRT or verification leak rates were required.

APPENDIX I

COMPUTER SYSTEM BLOCK DIAGRAM

COMPUTER BASE ACQUISITION AND DATA REDUCTION SYSTEM



APPENDIX J

COMPARTMENT PARAMETERS AND INSTRUMENT LOCATIONS

APPENDIX J

COMPARTMENT PARAMETERS AND INSTRUMENT LOCATIONS

<u>Temperature</u>	<u>Number of Transducers</u>	<u>Segment Volume (ft³)</u>	<u>Volumetric Weight Per Sensor By Compartment (Percent)</u>
I. Upper Compartment	14	651,000	7.1429
II. Lower Compartment	25	383,720	4.0000
III. Ice Compartment	9	157,500	11.1111
	—		
	48		
 <u>Dewpoint</u>			
I. Upper Compartment	3	651,000	33.3333
II. Lower Compartment	3	383,720	33.3333
III. Ice Compartment	6	157,500	16.6667
	—		
	12		

APPENDIX K

INSTRUMENT SPECIFICATIONS

APPENDIX K

<u>Measured Parameter</u>	<u>Manufacturer and Model No.</u>	<u>Number Used</u>	<u>Instrument Specification</u>
Containment Temperature	Leads & Northrup Model No. 178055	49	Range: 0-250°F Accuracy: ±0.1°F Repeatability: ±0.00°F
Containment Pressure	Mensor Corporation Model No. 10100-001	8	Range: 0-30 psia, 400,000 Counts F.S. Accuracy: ±0.015% Reading Repeatability: ±0.0005% Reading
Containment Dewpoint	Foxboro Corporation Model No. 2701 RG	12	Range: -50 to +142°F Accuracy: ±1°F Dewpoint Repeatability: ±0.10°F
Analog to Digital Converter	Acurex Corporation Autodata Ten/10	1	Accuracy: ±0.001°F Dewpoint ±0.001°F Temperature ±1 Count Pressure
Verification Flow	Teledyne-Hastings Mass Flow Meter Model AHL 25 With H-3M Transducer TVA No. 469936	1	Range: 0-5 SCFM Accuracy: ±2% Range Repeatability: ±1/2% of Range
Mensor Chamber Temperature	Princo ASTM 19L	8	Range: 49% to 57°C Accuracy: °0.12°C
Atmospheric Pressure	Mensor Corporation Model No. 10100-001	1	Range: 0-30 psia Accuracy: ±0.015% Reading
RCS Pressurizer Water Level	Plant Process Transmitter Model LT-68-321	1	Range: 0-100 Level Accuracy: ±5% F.S.

APPENDIX L

LOCAL LEAK RATE TESTS

CONDUCTED FROM CYCLE 5 TO CYCLE 6

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
FCV-26-240	10/19/91	0.00	AF
FCV-26-240	11/02/91	0.00	AL
FCV-26-240	04/12/93	0.1389	AF
FCV-26-240	12/14/93	0.00	AL
VLV-26-1260	10/19/91	0.00	AF/AL
VLV-26-1260	04/12/93	0.1595	AF
VLV-26-1260	12/14/93	0.00	AL
FCV-26-243	10/19/91	0.00	AF
FCV-26-243	11/12/91	0.00	AL
FCV-26-243	04/22/93	0.00	AF
FCV-26-243	05/22/93	0.00	After Maintenance
FCV-26-243	11/23/93	0.00	AL
VVL-26-1296	10/19/91	0.00	AF
VLV-26-1296	11/16/91	7.009	After Inspection
VLV-26-1296	11/07/91	1.4633	After Maintenance
VLV-26-1296	11/12/91	0.0907	AL
VLV-26-1296	04/22/93	0.0841	AF
VLV-26-1296	11/23/93	11.0338	After Inspection
VLV-26-1296	12/14/93	3.8355	After Maintenance
VLV-26-1296	12/16/93	0.2801	AL

Purge Valves

30-7/8, 9/10, 14/15,
16/17, 19/20, 37/40,
30-50/51, 52/53, 56/57,
58/59

All Valves	09/25/90	All Zeros
All Valves	03/06/91	All Zeros
All Valves	05/22/91	All Zeros
All Valves	08/14/91	All Zeros

30-9/10, 19/20, 37/40,
52/53, 58/59
30-7/8, 14/15, 16/17,
50/51, 56/57

All Valves	11/14/91	All Zeros
All Valves	11/16/91	All Zeros Except 56/57 = 0.0559
All Valves	02/05/92	All Zeros
All Valves	04/30/92	All Zeros
All Valves	07/23/92	All Zeros Except 58/59 (0.4783)
All Valves	10/22/92	All Zeros
All Valves	01/07/93	All Zeros

30-9/10, 14/15, 16/17,
19/20, 56/57, 58/59,
52/53
30-7/8, 50/51, 37/40

All Valves	04/26/93	All Zeros Except 14/15 = 0.1394
All Valves	05/24/93	All Zeros
All Valves	11/15/93	All Zeros Except 14/15 = 0.325

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
FCV-30-46/571	10/16/91	3.0486	AF
FCV-30-46/571	11/26/91	2.73	After Maintenance
FCV-30-46/571	11/26/91	1.3091	AL
FCV-30-46/571	04/15/93	4.3815	AF
FCV-30-46/571	12/07/93	4.8836	After Maintenance
FCV-30-46/571	12/11/93	2.1593	After Maintenance
FCV-30-46/571	12/13/93	0.7738	AL
FCV-30-47/572	10/16/91	0.3420	AF
FCV-30-47/572	11/26/91	0.6380	AL
FCV-30-47/572	04/14/93	22.6756	AF
FCV-30-47/572	04/15/93	0.6072	After Maintenance
FCV-30-47/572	12/07/93	21.8834	
FCV-30-47/572	12/13/93	0.6133	AL
FCV-30-48/573	10/16/91	0.00	AF
FCV-30-48/573	11/25/91	0.00	AL
FCV-30-48/573	04/14/93	0.00	AF
FCV-30-48/573	12/07/93	0.3546	AL
FSV-30-134	10/17/91	0.00	AF/AL
FSV-30-134	04/14/93	0.00	AF
FSV-30-134	11/29/93	0.00	AL
FSV-30-135	10/17/91	0.00	AF/AL
FSV-30-135	04/14/93	0.00	AF
FSV-30-135	11/29/93	0.00	AL
VLV-30-42Y	10/16/91	0.00	AF/AL
VLV-30-42Y	04/03/93	0.00	AF/AL
VLV-30-42X	10/16/91	0.00	AF/AL
VLV-30-42X	04/03/93	0.00	AF/AL
VLV-30-43Y	10/16/91	0.00	AF/AL
VLV-30-43Y	04/01/93	0.00	AF/AL
VLV-30-43Y	11/10/93	0.00	AF/AL
VLV-30-43X	10/16/91	0.00	AF/AL
VLV-30-43X	04/01/93	0.00	AF/AL
VLV-30-43X	11/10/93	0.00	AF/AL
VLV-30-44Y	10/16/91	0.00	AF/AL
VLV-30-44Y	04/01/93	0.00	AF/AL
VLV-30-44Y	11/11/93	0.00	AF/AL
VLV-30-44X	10/16/91	0.00	AF/AL
VLV-30-44X	04/01/93	0.00	AF/AL
VLV-30-44X	11/11/93	0.00	AF/AL
VLV-30-45Y	10/16/91	0.00	AF/AL
VLV-30-45Y	04/01/93	0.00	AF/AL
VLV-30-45Y	11/11/93	0.00	AF/AL
VLV-30-45X	10/16/91	0.00	AF/AL
VLV-30-45X	04/01/93	0.00	AF/AL
VLV-30-45X	11/11/93	0.00	AF/AL
VLV-30-46AY	10/16/91	0.00	AF/AL
VLV-30-46AY	04/03/93	0.00	AF/AL
VLV-30-46AX	10/16/91	0.00	AF/AL
VLV-30-46AX	04/03/93	0.00	AF/AL
VLV-30-47AY	10/16/91	0.00	AF/AL
VLV-30-47AY	04/03/93	0.00	AF/AL
VLV-30-47AX	10/16/91	0.00	AF/AL
VLV-30-47AX	04/03/93	0.00	AF/AL

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
VLV-30-48AY	10/16/91	0.00	AF/AL
VLV-30-48AY	04/03/93	0.00	AF/AL
VLV-30-48AX	10/16/91	0.00	AF/AL
VLV-30-48AX	04/03/93	0.00	AF/AL
VLV-30-30CY	10/16/91	0.00	AF/AL
VLV-30-30CY	04/03/93	0.00	AF/AL
VLV-30-30CX	10/16/91	0.00	AF/AL
VLV-30-30CX	04/03/93	0.00	AF/AL
VLV-30-310Y	10/16/91	0.00	AF/AL
VLV-30-310Y	04/01/93	0.00	AF/AL
VLV-30-310Y	11/11/93	0.00	AF/AL
VLV-30-310X	10/16/91	0.00	AF/AL
VLV-30-310X	04/01/93	0.00	AF/AL
VLV-30-310X	11/11/93	0.00	AF/AL
VLV-30-311Y	10/16/91	0.00	AF/AL
VLV-30-311Y	04/01/93	0.00	AF/AL
VLV-30-311Y	11/11/93	0.00	AF/AL
VLV-30-311X	10/16/91	0.00	AF/AL
VLV-30-311X	04/01/93	0.00	AF/AL
VLV-30-311X	11/11/93	0.00	AF/AL
FCV-31C-222	07/09/90	0.8787	AF
FCV-31C-222	07/09/90	0.7125	AL
FCV-31C-222	10/18/91	0.00	AF/AL
FCV-31C-222	04/15/93	0.00	AF/AL
FCV-31C-223/752	10/18/91	0.00	AF/AL
FCV-31C-223/752	04/15/93	0.00	AF/AL
FCV-31C-224	10/18/91	0.00	AF/AL
FCV-31C-224	04/15/93	0.00	AF/AL
FCV-31C-225/734	10/18/91	0.00	AF/AL
FCV-31C-225/734	04/15/93	0.00	AF/AL
FCV-31C-229	10/18/91	0.00	AF/AL
FCV-31C-229	11/13/93	0.00	AF/AL
FCV-31C-230/715	10/18/91	0.00	AF/AL
FCV-31C-230/715	11/13/93	0.00	AF/AL
FCV-31C-231	10/18/91	0.00	AF/AL
FCV-31C-231	11/13/93	0.00	AF/AL
FCV-31C-232/697	10/18/91	0.00	AF/AL
FCV-31C-232/697	11/13/93	0.00	AF/AL
FCV-32-80/285	10/17/91	0.00	AF/AL
FCV-32-80/285	04/21/93	0.0555	AF/AL
VLV-32-287	10/17/91	0.00	AF/AL
VLV-32-287	04/21/93	0.00	AF/AL
FCV-32-102/295	10/13/91	0.00	AF/AL
FCV-32-102/295	11/15/93	0.2527	AF/AL
VLV-32-297	10/13/91	0.0543	AF/AL
VLV-32-297	04/21/93	3.8425	AF
VLV-32-297	11/15/93	0.00	AL
FCV-32-110/375	11/01/91	0.1163	AF/AL
FCV-32-110/375	11/30/93	0.00	AF/AL
VLV-32-377	11/01/91	0.0943	AF/AL
VLV-32-377	11/30/93	0.00	AF/AL
VLV-33-704	10/07/91	0.0814	AF/AL

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
VLV-33-704	03/16/93	0.00	AF
VLV-33-704	10/05/93	0.00	AL
VLV-33-740	10/07/91	0.00	AF
VLV-33-740	10/07/91	0.00	AL
VLV-33-740	03/16/93	0.00	AF
VLV-33-740	10/05/93	0.00	AL
FSV-43-2	10/20/91	0.00	AF/AL
FSV-43-2	04/20/93	0.00	AF/AL
FSV-43-3	10/20/91	1.0025	AF
FSV-43-3	11/21/91	0.00	AL
FSV-43-3	04/20/93	0.00	AF/AL
FSV-43-11	10/20/91	0.00	AF/AL
FSV-43-11	04/20/93	0.00	AF/AL
FSV-43-12	10/20/91	0.00	AF/AL
FSV-43-12	04/20/93	0.00	AF/AL
FSV-43-22	10/20/91	0.00	AF/AL
FSV-43-22	04/20/93	0.00	AF/AL
FSV-43-23	06/07/91	0.00	AF/AL
FSV-43-23	10/20/91	0.00	AF/AL
FSV-43-23	04/20/93	0.00	AF/AL
FSV-43-34	10/28/91	0.00	AF/AL
FSV-43-34	04/20/93	0.00	AF/AL
FSV-43-35	10/22/91	0.00	AF/AL
FSV-43-35	04/20/93	0.00	AF/AL
FSV-43-75	10/20/91	0.00	AF/AL
FSV-43-75	04/20/93	0.00	AF/AL
FSV-43-77	10/20/91	0.00	AF/AL
FSV-43-77	04/20/93	0.00	AF/AL
FSV-43-201	10/21/91	0.00	AF/AL
FSV-43-201	04/21/93	0.00	AF/AL
FSV-43-202	10/21/91	0.00	AF/AL
FSV-43-202	04/21/93	0.00	AF/AL
FSV-43-207	10/19/91	0.00	AF/AL
FSV-43-207	04/21/93	0.00	AF/AL
FSV-43-208	10/19/91	0.00	AF/AL
FSV-43-208	04/21/93	0.00	AF/AL
FSV-43-450	10/21/91	0.1499	AF/AL
FSV-43-450	04/21/93	0.00	AF/AL
FSV-43-451	10/21/91	0.00	AF/AL
FSV-43-451	04/21/93	0.00	AF/AL
FSV-43-452	10/19/91	0.0841	AF/AL
FSV-43-452	04/21/93	0.00	AF/AL
FSV-43-453	10/19/91	0.00	AF/AL
FSV-43-453	04/21/93	0.00	AF/AL
VLV-52-500	10/08/91	0.00	AF/AL
VLV-52-500	03/26/93	0.00	AF
VLV-52-500	11/11/93	0.00	AL
VLV-52-501	10/08/91	0.00	AF/AL
VLV-52-501	03/26/93	0.00	AF
VLV-52-501	11/11/93	0.00	AL
VLV-52-502	10/08/91	0.00	AF/AL
VLV-52-502	03/26/93	0.00	AF

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
VLV-52-502	11/11/93	0.00	AL
VLV-52-503	10/08/91	0.00	AF/AL
VLV-52-503	03/26/93	0.00	AF
VLV-52-503	11/11/93	0.00	AL
VLV-52-504	10/09/91	0.00	AF/AL
VLV-52-504	03/26/93	0.0563	AF
VLV-52-504	11/11/93	0.00	AL
VLV-52-505	10/09/91	0.00	AF/AL
VLV-52-505	03/26/93	0.00	AF
VLV-52-505	11/11/93	0.00	AL
VLV-52-506	10/09/91	0.00	AF/AL
VLV-52-506	03/26/93	0.00	AF
VLV-52-506	11/11/93	0.00	AL
VLV-52-507	10/09/91	0.00	AF/AL
VLV-52-507	03/26/93	0.00	AF
VLV-52-507	11/11/93	0.00	AL
VLV-59-522/529	10/08/91	0.00	AF/AL
VLV-59-522/529	03/16/93	0.9349	AF
VLV-59-522/529	03/29/93	0.00	After Maintenance
VLV-59-522/529	10/07/93	0.00	AL
VLV-59-633	10/08/91	0.00	AF/AL
VLV-59-633	03/16/93	0.00	AF/AL
VLV-59-633	10/07/93	0.00	AF/AL
FCV-61-96	10/23/91	0.00	AF/AL
FCV-61-96	05/26/93	0.00	AF/AL
FCV-61-96	05/29/93	0.00	AF/AL
FCV-61-97/692	10/23/91	0.00	AF/AL
FCV-61-97/692	05/26/93	0.00	AF/AL
FCV-61-97/692	05/29/93	0.00	AF/AL
FCV-61-110	10/23/91	0.00	AF/AL
FCV-61-110	05/26/93	0.00	AF/AL
FCV-61-110	05/29/93	0.00	AF/AL
FCV-61-122/745	10/23/91	0.00	AF/AL
FCV-61-122/745	05/26/93	0.00	AF/AL
FCV-61-122/745	05/29/92	0.00	AF/AL
FCV-61-191	10/15/91	0.00	AF/AL
FCV-61-191	05/26/93	0.00	AF/AL
FCV-61-191	05/29/93	0.00	AF/AL
FCV-61-192/533	10/15/91	0.00	AF/AL
FCV-61-192/533	05/26/93	0.1135	AF/AL
FCV-61-192/533	05/29/93	0.00	AF/AL
FCV-61-193	10/15/91	0.00	AF/AL
FCV-61-193	05/26/93	0.00	AF
FCV-61-193	05/28/93	0.00	AL
FCV-61-194/680	10/14/91	0.00	AF/AL
FCV-61-194/680	05/26/93	0.00	AF
FCV-61-194/680	05/28/93	0.00	AL
FCV-62-61/639	10/15/91	0.00	AF
FCV-62-61/639	10/25/91	0.00	AL
FCV-62-61/639	04/08/93	0.00	AF
FCV-62-61/639	06/01/93	0.00	After Maintenance
FCV-62-61/639	11/22/93	0.00	AL

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
FCV-62-63	10/15/91	0.2089	AF
FCV-62-63	10/25/91	0.00	AL/After Maintenance
FCV-62-63	04/08/93	0.1378	AF
FCV-62-63	06/01/93	0.00	After Maintenance
FCV-62-63	11/22/93	0.00	AL
FCV-62-72/73/74	10/13/91	0.0624	AF
FCV-62-72/73/74	11/01/91	0.00	AL
FCV-62-72/73/74	04/01/92	0.00	AF
FCV-62-72/73/74	04/08/92	0.00	AL
FCV-62-72/73/74	04/16/93	0.00	AF
FCV-62-72/73/74	12/08/93	0.00	AL
FCV-62-77/662	10/13/91	0.1576	AF/AL
FCV-62-77/662	01/21/92	0.2838	AF
FCV-62-77/662	01/21/92	0.00	AL
FCV-62-77/662	04/16/93	0.0555	AF
FCV-62-77/662	12/08/93	0.00	AL
FCV-63-64	10/12/91	0.00	AF/AL
FCV-63-64	04/13/93	0.00	AF/AL
VLV-77-868	10/12/91	0.0540	AF/AL
VLV-77-868	04/02/92	>471.1009	AF
VLV-77-868	04/06/92	0.00	AL
VLV-77-868	04/13/93	150.7667	AF
VLV-77-868	07/19/93	0.00	AL
FCV-63-71	10/23/91	0.00	AF
FCV-63-71	11/09/91	0.9520	After Maintenance
FCV-63-71	11/09/91	0.3057	AL
FCV-63-71	05/10/93	1.5873	AF
FCV-63-71	06/12/93	0.00	AL
FCV-63-84/23/344E	09/15/90	0.3864	AF/AL
FCV-63-84/23/344E	10/23/91	1.0882	AF
FCV-63-84/23/344E	11/09/91	0.00	AL
FCV-63-84/23/344E	05/10/93	0.00	AF/AL
FCV-67-107	10/08/91	0.00	AF/AL
FCV-67-107	04/12/93	0.00	AF/AL
FCV-67-106/1523A	10/08/91	0.00	AF
FCV-67-106/1523A	11/27/91	1.4996	AL
FCV-67-106/1523A	04/10/93	0.00	AF/AL
FCV-67-99	10/08/91	0.0974	AF/AL
FCV-67-99	04/13/93	0.00	AF/AL
FCV-67-105/1523C	10/08/91	0.6145	AF
FCV-67-105/1523C	11/25/91	0.00	AL
FCV-67-105/1523C	04/13/93	0.00	AF/AL
FCV-67-91	10/30/91	0.00	AF/AL
FCV-67-91	05/06/93	0.00	AF/AL
FCV-67-90/1523B	10/30/91	0.00	AF/AL
FCV-67-90/1523B	05/06/93	0.00	AF/AL
FCV-67-83	10/30/91	0.00	AF/AL
FCV-67-83	05/04/93	0.00	AF/AL
FCV-67-89/1523D	10/30/91	0.00	AF/AL
FCV-67-89/1523D	05/04/93	0.00	AF/AL
FCV-67-130	10/10/91	0.00	AF/AL
FCV-67-130	12/13/93	0.00	AF/AL

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
VLV-67-580A	10/10/91	0.00	AF/AL
VLV-67-580A	12/13/93	0.00	AF/AL
FCV-67-133	10/10/91	0.00	AF/AL
FCV-67-133	04/09/93	0.00	AF/AL
VLV-67-580C	10/10/91	0.00	AF/AL
VLV-67-580C	04/09/93	0.00	AF/AL
FCV-67-138	11/12/91	0.00	AF/AL
FCV-67-138	05/01/93	0.00	AF/AL
VLV-67-580B	11/12/91	0.2254	AF/AL
VLV-67-580B	05/01/93	0.00	AF/AL
FCV-67-141	11/13/91	0.00	AF/AL
FCV-67-141	05/01/93	0.00	AF/AL
VLV-67-580D	11/12/91	0.00	AF/AL
VLV-67-580D	05/01/93	0.00	AF/AL
FCV-67-87/575A	10/08/91	6.9290	AF
FCV-67-87/575A	11/26/91	0.00	AL
FCV-67-87/575A	04/12/93	11.6914	AF
FCV-67-87/575A	12/16/93	0.1385	AL
FCV-67-88	10/08/91	0.9228	AF
FCV-67-88	11/26/91	0.00	AL
FCV-67-88	04/12/93	10.2711	AF
FCV-67-88	12/16/93	0.1385	AL
FCV-67-95/575C	10/08/91	0.0539	AF/AL
FCV-67-95/575C	04/13/93	0.00	AF
FCV-67-95/575C	12/16/93	0.00	AL
FCV-67-96	10/08/91	0.00	AF/AL
FCV-67-96	04/13/93	0.00	AF
FCV-67-96	12/16/93	0.00	AL
FCV-67-103/575B	10/30/91	0.00	AF/AL
FCV-67-103/575B	05/06/93	0.00	AF
FCV-67-103/575B	12/16/93	0.00	AL
FCV-67-104	10/30/91	0.00	AF/AL
FCV-67-104	05/06/93	0.00	AF
FCV-67-104	12/16/93	0.00	AL
FCV-67-111/575D	10/30/91	0.00	AF/AL
FCV-67-111/575D	05/04/93	0.00	AF
FCV-67-111/575D	12/16/93	0.00	AL
FCV-67-112	10/30/91	0.00	AF/AL
FCV-67-112	05/04/93	0.00	AF
FCV-67-112	12/16/93	0.00	AL
FCV-67-131	10/10/91	0.00	AF/AL
FCV-67-131	04/08/93	0.00	AF/AL
FCV-67-295/585A	10/10/91	0.00	AF/AL
FCV-67-295/585A	04/08/93	0.00	AF/AL
FCV-67-134	10/10/91	0.00	AF/AL
FCV-67-134	04/08/93	0.00	AF/AL
FCV-67-296/585C	10/10/91	0.00	AF/AL
FCV-67-296/585C	04/08/93	0.00	AF/AL
FCV-67-139	11/12/91	0.00	AF/AL
FCV-67-139	05/01/93	0.00	AF/AL
FCV-67-297/585B	11/12/91	0.00	AF/AL
FCV-67-297/585B	05/01/93	0.00	AF/AL

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
FCV-67-142	11/12/91	0.00	AF/AL
FCV-67-142	05/01/93	0.00	AF/AL
FCV-67-298/585D	11/12/91	0.00	AF/AL
FCV-67-298/585D	05/01/93	0.00	AF/AL
FCV-68-305	10/11/91	0.00	AF/AL
FCV-68-305	04/13/93	0.00	AF
FCV-68-305	06/10/93	0.00	AL
VLV-77-849	10/11/91	0.00	AF/AL
VLV-77-849	04/13/93	0.0843	AF/AL
FCV-68-307	10/09/91	0.00	AF/AL
FCV-68-307	04/07/93	0.00	AF
FCV-68-307	12/09/93	0.00	AL
FCV-68-308	10/09/91	0.00	AF/AL
FCV-68-308	04/07/93	0.00	AF
FCV-68-308	12/09/93	0.00	AL
FCV-70-85/143/703	10/12/91	0.00	AF/AL
FCV-70-85/143/703	04/07/93	0.1112	AF
FCV-70-85/143/703	12/15/93	0.00	AL
FCV-70-87/687	10/12/91	0.00	AF
FCV-70-87/687	11/21/91	0.00	AL
FCV-70-87/687	04/07/93	0.00	AF/AL
FCV-70-90	10/12/91	0.00	AF
FCV-70-90	11/21/91	0.00	AL
FCV-70-90	04/07/93	0.00	AF/AL
FCV-70-89/698	10/12/91	0.3791	AF
FCV-70-89/698	11/06/91	0.00	AL
FCV-70-89/698	04/06/93	0.00	AF/AL
FCV-70-92	10/12/91	0.00	AF/AL
FCV-70-92	04/06/93	0.00	AF/AL
FCV-70-134	10/11/91	0.0622	AF/AL
FCV-70-134	04/05/93	0.0987	AF
FCV-70-134	12/15/93	0.00	AL
VLV-70-679	10/12/91	2.9345	AF
VLV-70-679	10/30/91	0.4060	AL
VLV-70-679	04/05/93	440.7095	AF
VLV-70-679	12/15/93	0.00	AL
FCV-70-140	10/12/91	0.00	AF/AL
FCV-70-140	04/07/93	0.00	AF/AL
FCV-70-141/791	10/12/91	0.1177	AF/AL
FCV-70-141/791	04/07/93	0.00	AF/AL
FCV-77-9	10/18/91	0.00	AF
FCV-77-9	10/30/91	0.00	AL
FCV-77-9	04/15/93	0.00	AF
FCV-77-9	12/04/93	0.00	AL
FCV-77-10/84-511	10/18/91	0.00	AF
FCV-77-10/84-511	10/30/91	0.00	AL
FCV-77-10/84-511	04/15/93	0.00	AF
FCV-77-10/84-511	12/04/93	0.00	AL
FCV-77-18	10/17/91	0.00	AF/AL
FCV-77-18	04/13/93	0.00	AF
FCV-77-18	10/08/93	0.00	After Maintenance
FCV-77-18	12/04/93	0.00	AL

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
FCV-77-19/20	10/17/91	0.00	AF/AL
FCV-77-19/20	04/13/93	0.0655	AF
FCV-77-19/20	10/08/93	0.0421	AL
FCV-77-127	10/23/91	0.00	AF/AL
FCV-77-127	04/15/93	0.00	AF
FCV-77-127	11/19/93	0.00	AL
FCV-77-128	10/23/91	0.00	AF/AL
FCV-77-128	04/15/93	0.00	AF
FCV-77-128	11/19/93	0.00	AL
VLV-78-557	10/09/91	0.00	AF/AL
VLV-78-557	03/31/93	0.00	AF
VLV-78-557	11/20/93	0.00	AL
VLV-78-558	10/09/91	0.00	AF/AL
VLV-78-558	03/31/93	0.00	AF
VLV-78-558	11/20/93	0.00	AL
VLV-78-560	10/09/91	0.0532	AF/AL
VLV-78-560	03/31/93	0.00	AF
VLV-78-560	11/20/93	0.00	AL
VLV-78-561	10/09/91	0.00	AF/AL
VLV-78-561	03/31/93	0.00	AF
VLV-78-561	11/20/92	0.00	AL
FCV-81-12	10/09/91	0.00	AF/AL
FCV-81-12	04/13/93	0.00	AF
FCV-81-12	11/20/93	0.00	AL
VLV-81-502	10/09/91	0.00	AF/AL
VLV-81-502	04/13/93	0.00	AF
VLV-81-502	11/20/93	0.00	AL
FCV-90-107	10/24/91	0.00	AF/AL
FCV-90-107	05/12/93	0.00	AF/AL
FCV-90-108	10/24/91	0.00	AF/AL
FCV-90-108	05/12/93	0.00	AF/AL
FCV-90-109	10/24/91	0.00	AF/AL
FCV-90-109	05/12/93	0.00	AF/AL
FCV-90-110	10/24/91	0.00	AF/AL
FCV-90-110	05/12/93	0.00	AF/AL
FCV-90-111	10/24/91	0.00	AF/AL
FCV-90-111	05/12/93	0.00	AF/AL
FCV-90-113	10/25/91	0.00	AF/AL
FCV-90-113	04/30/93	0.00	AF/AL
FCV-90-114	10/25/91	0.00	AF/AL
FCV-90-114	04/30/93	0.00	AF/AL
FCV-90-115	10/25/91	0.00	AF/AL
FCV-90-115	04/30/93	0.00	AF/AL
FCV-90-116	10/25/91	0.00	AF/AL
FCV-90-116	04/30/93	0.00	AF/AL
FCV-90-117	10/25/91	0.0377	AF/AL
FCV-90-117	04/30/93	0.00	AF/AL
FSV-43-309	10/10/91	0.00	AF/AL
FSV-43-309	04/09/93	0.00	AF/AL
FSV-43-310	10/10/91	0.00	AF/AL
FSV-43-310	04/09/93	0.00	AF/AL
FSV-43-250	10/10/91	0.00	AF/AL

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>	
FSV-43-250	04/09/93	0.00	AF
FSV-43-250	05/21/93	0.00	AL
FSV-43-251	10/10/91	0.00	AF/AL
FSV-43-251	04/09/93	0.00	AF
FSV-43-251	05/21/93	0.3545	AL
FSV-43-318	10/10/91	0.0827	AF/AL
FSV-43-318	04/09/93	0.00	AF/AL
FSV-43-319	10/10/91	0.00	AF/AL
FSV-43-319	04/09/93	0.00	AF/AL
VLV-43-461	10/10/91	0.00	AF/AL
VLV-43-461	04/09/93	30.547	AF
VLV-43-461	07/13/93	0.00	AL
FSV-43-317/341	10/10/91	0.00	AF/AL
FSV-43-317/341	04/09/93	0.00	AF
FSV-43-317/341	12/10/93	0.00	AL
FSV-43-287	10/10/91	0.0827	AF/AL
FSV-43-287	04/09/93	0.00	AF/AL
FSV-43-288	10/10/91	0.00	AF/AL
FSV-43-288	04/09/93	0.0557	AF/AL
VLV-43-460	10/10/91	0.00	AF/AL
VLV-43-460	04/09/93	0.00	AF/AL
FSV-43-325/307	10/10/91	0.0617	AF/AL
FSV-43-325/307	04/09/93	0.0571	AF/AL
FCV-72-39	10/10/91	0.0254	CFH
FCV-72-39	10/15/91	0.0254	CFH
FCV-72-39	04/22/93	0.0127	CFH
FCV-72-39	12/03/93	0.0254	CFH
FCV-72-2	10/10/91	0.0254	
FCV-72-2	10/10/91	0.0254	
FCV-72-2	04/22/93	0.0127	
FCV-72-2	12/03/93	0.0254	
FCV-72-40/215E/215F/ 216E/216F	10/17/91	0.0113	CFH
FCV-72-40/215E/215F/ 216E/216F	10/31/91	0.0113	
FCV-72-40/215E/215F/ 216E/216F	04/28/93	0.0113	
FCV-72-40/215E/215F/ 216E/216F	06/09/93	0.0112	
FCV-72-41/217E/217F/ 218E/218F	10/26/91	0.0113	
FCV-72-41/217E/217F/ 218E/218F	11/02/91	0.0113	
FCV-72-41/217E/217F/ 218E/218F	04/29/93	0.0113	
FCV-72-41/217E/217F/ 218E/218F	05/15/93	0.0113	

COMPONENT	DATE	LEAK RATE	
690' Airlock	08/30/90	0.1667	AF/AL
690' Airlock	01/24/91	7.4452	AF/AL
690' Airlock	06/25/91	7.9753	AF/AL
690' Airlock	11/24/91	18.67	AF
690' Airlock	11/25/91	0.0611	AL
690' Airlock	04/22/92	17.3727	AF
690' Airlock	04/22/92	5.5014	AL
690' Airlock	09/09/92	1.3183	AF/AL
690' Airlock	02/09/93	0.9897	AF/AL
690' Airlock	12/04/93	4.2494	AF/AL
734' Airlock	08/31/90	1.1363	AF/AL
734' Airlock	01/22/91	8.4127	AF/AL
734' Airlock	06/20/91	5.0964	AF/AL
734' Airlock	11/20/91	14.1737	AF
734' Airlock	11/22/91	4.2807	AL
734' Airlock	04/21/92	1.1444	AF/AL
734' Airlock	09/08/92	2.4650	AF/AL
734' Airlock	02/16/93	2.9828	AF/AL
734' Airlock	11/10/93	2.8427	AF/AL
<u>SI-159.3.3</u>	"A" H ₂ Analyzer	10/28/91	0.00 AF
	"A" H ₂ Analyzer	12/04/91	0.0459 After Maintenance
	"A" H ₂ Analyzer	12/06/91	0.00 AL
	"A" H ₂ Analyzer	04/24/93	0.3918 AF
	"A" H ₂ Analyzer	05/07/93	0.00 AL
	"A" H ₂ Analyzer	11/18/93	0.00 AF/AL
<u>SI-159.3.4</u>	"B" H ₂ Analyzer	09/02/90	0.00 AF
	"B" H ₂ Analyzer	09/04/90	0.00 AL
	"B" H ₂ Analyzer	10/28/91	0.00 AF
	"B" H ₂ Analyzer	12/04/91	0.0500 After Maintenance
	"B" H ₂ Analyzer	12/06/91	0.00 AL
	"E" H ₂ Analyzer	04/24/93	0.0623 AF
	"B" H ₂ Analyzer	05/05/93	0.00 AL
	"B" H ₂ Analyzer	12/06/93	0.00 AF/AL
<u>SI-159.5.1</u>	Cont. Pressure Taps		
	PS-30-46A	11/19/91 0.00	12/05/93 0.00
	PS-30-46B	11/19/91 0.00	12/05/93 0.00
	PS-30-47A	11/19/91 0.00	12/05/93 0.00
	PS-30-47B	11/19/91 0.00	12/05/93 0.00
	PS-30-48A	11/19/91 0.00	12/05/93 0.00
	PS-30-48B	11/19/91 0.00	12/05/93 0.00
	PDT-30-30C	11/19/91 0.00	12/05/93 0.00
	PT-30-310	11/19/91 0.00	12/05/93 0.00
	PT-30-311	11/19/91 0.00	12/05/93 0.00
	PDT-30-42	11/19/91 0.00	12/05/93 0.00
	PDT-30-43	11/19/91 0.00 30-43 02/28/92	12/05/93 0.00
	PDT-30-44	11/19/91 0.00 0.00	12/05/93 0.00
	PDT-30-45	11/19/91 0.00	12/05/93 0.00

	<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>
Resilient Seal	X-1	10/06/91	0.00
Resilient Seal	X-1	12/03/91	0.00
Resilient Seal	X-1	03/24/92	0.00
Resilient Seal	X-1	03/20/93	0.00
Resilient Seal	X-1	12/15/93	0.00
Resilient Seal	X-1	10/07/91	0.00
Resilient Seal	X-1	11/29/91	0.00
Resilient Seal	X-1	03/20/93	0.00
Resilient Seal	X-1	11/03/93	0.00
Bellows	X-12A Inboard	10/26/91	0.0003
Bellows	X-12A Inboard	05/04/93	0.00
Bellows	X-12A Inboard	10/22/93	0.00
Bellows	X-12A Outboard	10/26/91	0.00
Bellows	X-12A Outboard	05/04/93	0.00
Bellows	X-12A Outboard	10/22/93	0.00
Bellows	X-12B Inboard	10/26/91	0.0003
Bellows	X-12B Inboard	04/23/93	0.00
Bellows	X-12B Inboard	10/19/93	0.00
Bellows	X-12B Outboard	10/26/91	0.0016
Bellows	X-12B Outboard	04/23/93	0.00
Bellows	X-12B Outboard	10/19/93	0.0336
Bellows	X-12C Inboard	10/26/91	0.0012
Bellows	X-12C Inboard	04/22/93	0.00
Bellows	X-12C Inboard	10/19/93	0.00
Bellows	X-12C Outboard	10/25/91	0.0011
Bellows	X-12C Outboard	04/22/93	0.00
Bellows	X-12C Outboard	10/19/93	0.00
Bellows	X-12D Inboard	10/26/91	0.00
Bellows	X-12D Inboard	05/03/93	0.00
Bellows	X-12D Inboard	10/22/93	0.00
Bellows	X-12D Outboard	10/26/91	0.00
Bellows	X-12D Outboard	05/03/93	0.00
Bellows	X-12D Outboard	10/22/93	0.00
Bellows	X-13A Inboard	10/26/91	0.0002
Bellows	X-13A Inboard	05/03/93	0.00
Bellows	X-13A Inboard	10/22/93	0.00
Bellows	X-13A Outboard	10/26/91	0.00
Bellows	X-13A Outboard	05/03/93	0.00
Bellows	X-13A Outboard	10/22/93	0.00
Bellows	X-13B Inboard	10/26/91	0.0006
Bellows	X-13B Inboard	05/04/93	0.00
Bellows	X-13B Inboard	10/26/93	0.00
Bellows	X-13B Outboard	10/26/91	0.0001
Bellows	X-13B Outboard	05/04/93	0.00
Bellows	X-13B Outboard	10/26/93	0.00
Bellows	X-13C Inboard	10/26/91	0.012
Bellows	X-13C Inboard	05/05/93	0.00
Bellows	X-13C Inboard	10/22/93	0.00
Bellows	X-13C Outboard	10/26/91	0.0005
Bellows	X-13C Outboard	05/05/93	0.00
Bellows	X-13C Outboard	10/22/93	0.00

	<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>
Bellows	X-13D Inboard	10/26/91	0.00
Bellows	X-13D Inboard	05/03/93	0.00
Bellows	X-13D Inboard	10/22/93	0.00
Bellows	X-13D Outboard	10/26/91	0.00
Bellows	X-13D Outboard	05/03/93	0.00
Bellows	X-13D Outboard	10/22/93	0.00
Bellows	X-14A	10/26/91	0.0006
Bellows	X-14A	05/04/93	0.00
Bellows	X-14A	10/22/93	0.00
Bellows	X-14B	10/26/91	0.0004
Bellows	X-14B	05/03/93	0.00
Bellows	X-14B	10/22/93	0.00
Bellows	X-14C	10/26/91	0.0001
Bellows	X-14C	05/04/93	0.00
Bellows	X-14C	10/22/93	0.00
Bellows	X-14D	10/26/91	0.00
Bellows	X-14D	05/03/93	0.00
Bellows	X-14D	10/22/93	0.00
Bellows	X-15	10/26/91	0.0006
Bellows	X-15	04/24/93	0.00
Bellows	X-15	10/20/93	0.00
Bellows	X-17	10/26/91	0.00
Bellows	X-17	04/23/93	0.00
Bellows	X-17	10/20/93	0.00
Bellows	X-20A	10/26/91	0.0004
Bellows	X-20A	04/24/93	0.00
Bellows	X-20A	10/20/93	0.00
Bellows	X-20B	10/26/91	0.0005
Bellows	X-20B	04/24/93	0.00
Bellows	X-20B	10/20/93	0.00
Bellows	X-21	10/26/91	0.0001
Bellows	X-21	04/24/93	0.00
Bellows	X-21	10/20/93	0.00
Bellows	X-22	10/26/91	0.00
Bellows	X-22	04/24/93	0.00
Bellows	X-22	10/21/93	0.00
Bellows	X-24	10/26/91	0.0004
Bellows	X-24	04/24/93	0.00
Bellows	X-24	10/20/93	0.00
Bellows	X-30	10/27/91	0.0001
Bellows	X-30	04/24/93	0.00
Bellows	X-30	10/22/93	0.00
Bellows	X-32	10/26/91	0.0005
Bellows	X-32	04/24/93	0.00
Bellows	X-32	10/21/93	0.00
Bellows	X-33	10/26/91	0.00
Bellows	X-33	04/24/93	0.00
Bellows	X-33	10/21/93	0.00
Resilient Seal	X-40D	10/17/91	0.00
Resilient Seal	X-40D	03/26/93	0.00
Resilient Seal	X-40D	10/25/93	0.00

	<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>
Bellows	X-45	10/26/91	0.002
Bellows	X-45	04/24/93	0.00
Bellows	X-45	10/21/93	0.00
Bellows	X-46	10/26/91	0.0008
Bellows	X-46	04/24/93	0.00
Bellows	X-46	10/21/93	0.00
Bellows	X-47A Inboard	10/27/91	0.0002
Bellows	X-47A Inboard	05/05/93	0.00
Bellows	X-47A Inboard	10/19/93	0.00
Bellows	X-47A Outboard	10/27/91	0.0002
Bellows	X-47A Outboard	05/05/93	0.00
Bellows	X-47A Outboard	10/19/93	0.00
Bellows	X-47B Outboard	10/27/91	0.0003
Bellows	X-47B Inboard	05/05/93	0.00
Bellows	X-47B Inboard	10/19/93	0.00
Bellows	X-47B Outboard	10/27/91	0.0002
Bellows	X-47B Outboard	05/05/93	0.00
Bellows	X-47B Outboard	10/19/93	0.00
Resilient Seals	X-54	10/06/91	0.00
Resilient Seals	X-54	11/26/91	0.00
Resilient Seals	X-54	03/24/93	0.00
Resilient Seals	X-54	10/20/93	0.00
Resilient Seals	X-79A	10/06/91	0.1695
Resilient Seals	X-79A	11/20/91	0.0003
Resilient Seals	X-79A	03/25/93	0.00
Resilient Seals	X-79A	12/07/93	0.00
Resilient Seals	X-79B	10/06/91	0.00
Resilient Seals	X-79B	11/20/91	0.0928
Resilient Seals	X-79B	11/21/91	0.00
Resilient Seals	X-79B	03/25/93	0.00
Resilient Seals	X-79B	12/07/93	0.00
Bellows	X-81	10/27/91	0.0004
Bellows	X-81	04/24/93	0.00
Bellows	X-81	10/21/93	0.00
Bellows	X-88	10/06/91	0.0011
Bellows	X-88	11/29/91	0.00
Bellows	X-88	03/24/93	0.00
Bellows	X-88	10/20/93	0.00
Bellows	X-88	12/10/93	0.00
Bellows	X-107	10/26/91	0.0006
Bellows	X-107	04/24/93	0.00
Bellows	X-107	10/22/93	0.00
Bellows	X-108	10/27/91	0.0008
Bellows	X-108	05/04/93	0.00
Bellows	X-108	10/21/93	0.00
Bellows	X-109	10/27/91	0.0002
Bellows	X-109	05/04/93	0.00
Bellows	X-109	10/21/93	0.00

	<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>
Resilient Seals	X-111	10/17/91	0.00
Resilient Seals	X-111	04/14/93	0.00
Resilient Seals	X-111	10/18/93	0.00
Resilient Seals	X-112	10/17/91	0.00
Resilient Seals	X-112	04/14/93	0.00
Resilient Seals	X-112	10/18/93	0.00
Resilient Seals	X-113	10/17/91	0.00
Resilient Seals	X-113	04/14/93	0.00
Resilient Seals	X-113	10/18/93	0.00
Resilient Seals	X-117	10/07/91	0.00
Resilient Seals	X-117	11/26/91	0.00
Resilient Seals	X-117	03/24/93	0.00
Resilient Seals	X-117	12/10/93	0.00
Resilient Seals	X-118	10/06/91	0.00
Resilient Seals	X-118	11/26/91	0.00
Resilient Seals	X-118	03/24/93	0.00
Resilient Seals	X-118	10/20/93	0.00
Resilient Seals	X-108	10/06/91	0.00
Resilient Seals	X-108	11/22/91	0.00
Resilient Seals	X-108	03/25/93	0.0302
Resilient Seals	X-108	10/25/93	0.00
Resilient Seals	X-109	10/06/91	0.00
Resilient Seals	X-109	11/22/91	0.00
Resilient Seals	X-109	03/25/93	0.00
Resilient Seals	X-109	10/25/93	0.00

Electricals

X-120E	10/25/91	0.00
X-120E	04/02/93	0.00
X-120E	11/04/93	0.00
X-121E	10/24/91	0.3889
X-121E	04/10/93	0.00
X-121E	04/14/93	0.00
X-121E	11/04/93	0.00
X-122E	10/25/91	0.00
X-122E	04/17/93	0.00
X-122E	10/28/93	0.00
X-123E	10/25/91	0.00
X-123E	04/19/93	0.00
X-123E	11/05/93	0.00
X-124E	10/25/91	0.00
X-124E	04/21/93	0.00
X-124E	11/04/93	0.00
X-126E	10/22/91	2.9020
X-126E	11/26/91	3.1290
X-126E	03/29/93	3.3718
X-126E	11/02/93	0.00
X-127E	10/24/91	0.00
X-127E	04/17/93	11.4673
X-127E	10/28/93	11.4867

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>
X-128E	10/24/91	0.00
X-128E	11/26/91	0.00
X-128E	04/03/93	0.00
X-128E	10/26/93	0.00
X-129E	10/25/91	0.3417
X-129E	03/27/93	0.6124
X-129E	04/14/93	0.00
X-129E	10/28/93	0.3495
X-131E	10/25/91	0.00
X-131E	04/19/93	0.00
X-131E	11/09/93	0.00
X-132E	10/25/91	0.00
X-132E	04/02/93	0.00
X-132E	11/05/93	0.00
X-133E	10/25/91	0.00
X-133E	04/02/93	0.00
X-133E	11/05/93	0.00
X-134E	10/23/91	0.00
X-134E	04/03/93	0.00
X-134E	10/28/93	0.00
X-135E	10/23/91	0.00
X-135E	04/03/93	0.00
X-135E	10/28/93	0.00
X-136E	10/25/91	0.00
X-136E	04/03/93	0.7266
X-136E	10/28/93	0.00
X-137E	10/24/91	0.0284
X-137E	04/18/93	0.0992
X-137E	10/28/93	0.0978
X-138E	10/23/91	0.06965
X-138E	04/03/93	0.7266
X-138E	10/28/93	0.4991
X-139E	10/23/91	0.00
X-139E	03/29/93	0.00
X-139E	10/28/93	0.00
X-140E	10/25/91	0.00
X-140E	04/18/93	0.00
X-140E	10/28/93	0.00
X-141E	10/25/91	0.00
X-141E	04/19/93	0.00
X-141E	11/05/93	0.00
X-142E	10/23/91	0.00
X-142E	04/19/93	0.00
X-142E	10/28/93	0.00
X-143E	10/25/91	0.0489
X-143E	04/01/93	0.3969
X-143E	11/05/93	0.3680
X-144E	10/25/91	0.00
X-144E	04/02/93	0.00
X-144E	11/05/93	0.00
X-145E	10/25/91	0.00

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>
X-145E	04/19/93	0.00
X-145E	11/09/93	0.00
X-146E	10/25/91	1.5848
X-146E	04/19/93	2.0249
X-146E	05/18/93	1.4448
X-146E	11/09/93	1.3292
X-147E	10/22/91	0.00
X-147E	03/29/93	0.0393
X-147E	11/02/93	0.00
X-148E	10/22/91	0.0032
X-148E	03/29/93	0.00
X-148E	11/04/93	0.00
X-149E	10/23/91	0.00
X-149E	03/29/93	0.00
X-149E	11/04/93	0.00
X-150E	10/23/91	0.00
X-150E	03/29/93	0.00
X-150E	11/02/93	0.00
X-151E	10/22/91	0.00
X-151E	03/29/93	0.00
X-151E	11/04/93	0.00
X-152E	10/23/91	0.00
X-152E	03/29/93	0.00
X-152E	11/04/93	0.00
X-153E	10/24/91	0.0286
X-153E	04/17/93	0.00
X-153E	10/28/93	0.00
X-154E	10/24/91	0.00
X-154E	04/17/93	0.00
X-154E	10/28/93	0.00
X-156E	10/24/91	21.9532
X-156E	04/03/93	57.0714
X-156E	05/12/93	0.00
X-156E	11/05/93	0.00
X-157E	10/24/91	0.00
X-157E	04/17/93	0.00
X-157E	10/26/93	0.00
X-158E	10/24/91	0.00
X-158E	04/17/93	0.0992
X-158E	10/26/93	1.3912
X-159E	10/24/91	0.00
X-159E	04/03/93	0.00
X-159E	10/26/93	0.00
X-160E	10/25/91	0.0489
X-160E	04/03/93	0.1464
X-160E	10/26/93	0.00
X-161E	10/22/91	0.00
X-161E	04/03/93	0.00
X-161E	10/26/93	0.00
X-163E	10/24/91	1.0602

<u>COMPONENT</u>	<u>DATE</u>	<u>LEAK RATE</u>
X-163E	04/03/93	1.3014
X-163E	10/27/93	0.5383
X-164E	10/24/91	0.00
X-164E	04/03/93	16.9270
X-164E	10/26/93	3.7722
X-165E	10/24/91	0.00
X-165E	04/03/93	0.00
X-165E	10/26/93	0.00
X-166E	10/24/91	0.00
X-166E	04/17/93	0.00
X-166E	10/26/93	0.00
X-167E	10/25/91	0.00
X-167E	03/23/93	0.00
X-167E	10/28/93	0.00
X-168E	10/22/91	0.00
X-168E	11/26/91	0.00
X-168E	03/27/93	0.00
X-168E	10/28/93	0.00
X-169E	10/22/91	0.00
X-169E	03/27/93	0.00
X-169E	10/28/93	0.00
X-170E	10/25/91	0.00
X-170E	03/27/93	0.00
X-170E	10/28/93	0.00