

FLORIDA POWER CORPORATION
Crystal River Unit 3 Nuclear Power Plant

REACTOR CONTAINMENT BUILDING INTEGRATED
LEAKAGE RATE TEST REPORT

November 7, 1991

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I. INTRODUCTION

The Reactor Building Integrated Leakage Rate "Type A" Test is performed to demonstrate that leakage through the primary reactor containment systems and components penetrating primary reactor containment do not exceed the allowable leakage rates specified in the Plant Technical Specifications.

The purpose of this report is to provide information pertinent to the activities related to the preparation, test performance, and reporting of the Crystal River Unit 3 Nuclear Power Plant Integrated Leakage Rate Test (ILRT).

Highlights of activities and events which occurred prior to and during the ILRT are presented in Section II, Test Synopsis.

Section III, Test Data Summary, contains data and results necessary to demonstrate containment atmosphere stabilization, acceptable leakage rate, and successful verification test. In addition, plots provided in Appendices B and C supply a visual history of containment atmospheric conditions beginning with the 24 hour ILRT test period and ending with the verification test.

Information in Section IV, Analysis and Interpretation, supplies the technical details associated with the ILRT computer program and its associated hardware as well as the instrumentation used during the ILRT.

Section V, References, lists the documents used for the conduct of the ILRT.

The successful periodic Type A and verification test were performed according to the requirements of the Crystal River Unit 3 Technical Specifications and 10CFR50, Appendix J. The test method used was the Absolute Method, as described in ANSI/ANS 56.8-1987, "Containment System Leakage Testing Requirements".

Leakage rates were calculated using the mass point analysis technique described in ANSI/ANS 56.8-1987. Total Time Analysis equations from ANSI N45.4-1972, "Leakage-Rate Testing of Containment Structures for Nuclear Reactors" were run concurrently for informational purposes. The test results are reported in accordance with the requirements of 10CFR50, Appendix J, Section V.B.3.

II. TEST SYNOPSIS

Prior to containment pressurization on November 4, 1991, site personnel were engaged in prerequisite activities for the conduct of the ILRT. The ILRT was conducted at the end of the 8M midcycle outage. The following discussion highlights some of the activities that were essential to the successful and timely completion of the ILRT. These items are presented in chronological order.

A. Pre-pressurization Activities

These activities included: local leakage rate testing of penetrations which were to be isolated during the ILRT, "as found" and "as left" local leakage rate testing of penetrations which were scheduled for maintenance prior to the ILRT, ILRT procedure review and finalization, ILRT computer program check out and linkup to the Fluke 2285B Data Acquisition System, ILRT instrumentation installation and operability checks, and containment subvolume weighting factor and sensor failure analysis calculation.

The ILRT test procedure was reviewed against the requirements of the Plant Technical Specifications; 10CFR50, Appendix J; and ANSI/ANS 56.8-1987.

The ILRT instrumentation was calibrated prior to the ILRT as recommended by ANSI N45.4-1972, Sections 6.2 and 6.3. Final ILRT instrumentation operability checks and in-situ checks, as specified in ANSI/ANS 56.8-1987, Section 4.2.3.1, were performed to ensure that all instrumentation was operating correctly. Calibration records for the ILRT instrumentation system components are retained at the plant.

B. Test Summary Time-Line

<u>Phase</u>	<u>Time Frame</u>	<u>Duration</u>
Pressurization	From: 22:50 on 11/04/91 To: 23:40 on 11/05/91	24.83 hours
Stabilization	From: 23:45 on 11/05/91 To: 05:30 on 11/06/91	5.75 hours
ILRT Test	From: 05:30 on 11/06/91 To: 05:30 on 11/07/91	24.00 hours
Verification Test	From: 05:30 on 11/07/91 To: 09:45 on 11/07/91	4.25 hours

C. Containment Pressurization

Containment pressurization started at 22:50 on November 4, 1991 using six 1500 cfm diesel-driven 100% oil-free air compressors. The pressurization rate was maintained at approximately 3.6 psi per hour until containment pressure reached 48 psig. At this time, the pressurization rate was gradually reduced by reducing the number of operating compressors and increasing backpressure with LRV-24. All compressors were stopped when the containment pressure reached 54.5 psig. at 23:40 on November 5, 1991. This was within the procedural limits of 53.9 +1,-0 psig.

During pressurization an external containment walkdown was performed to identify potential leakage. During the walkdown a pressure buildup approximating building pressure was noted on the personnel airlock seals. Pressurization was stopped at 7 psig and the seals were inspected. The door seals were found to be in good condition and pressurization was resumed. No measurable leakage was observed from any other penetration in the test lineup. Pressurization was conducted with the use of the reactor building recirculation fans in slow speed. The fans were stopped at a pressure of 48.7 psig and were not used during the ILRT or verification test. Very little temperature stratification was observed.

D. Containment Atmospheric Stabilization

The stabilization phase was started at 23:45 on November 5, 1991. By 03:45 on November 6, 1991, the temperature stabilization criteria of ANSI/ANS 56.8-1987 had been met. The containment was declared stable at 05:30 of November 6, 1991 and the ILRT test period was begun.

E. ILRT Test Period

The ILRT was officially started after the 05:15 data point with the next data point at 05:30 on November 6, 1991 and was successfully completed at 05:30 on November 7, 1991. The maximum allowable leakage rate (L_m) for the containment is 0.25 % wt. per day with a test acceptance limit of 0.1875 % wt. per day ($0.75 L_m$). The Total Time and Mass Point Analyses were run concurrently on the General Physics ILRT Computer Program. The leakage rate results are as follows:

	Total Time Analysis <u>% wt./day</u>	Mass Point Analysis <u>% wt./day</u>
Calculated Leakage Rate	0.0871 *	0.0962 *
95 % Upper Confidence Leakage rate	0.0958 *	0.0968 *

* Does not include penalties for nonstandard alignments and water level changes

F. Verification Test

A successful verification test was conducted following the ILRT. At 05:30 on November 7, 1991, a leakage rate of 15.15 scfm leakage imposed on the primary containment. The 15.15 scfm leakage imposed (L_v) on the existing containment leakage was slightly less than L_m (0.25 % wt./day) at 0.2383 % wt. per day. The verification phase was completed at 09:45 of the same day.

As a twenty four hour test was performed, the mass point verification test results are presented below:

	Mass Point Analysis <u>% wt./day</u>
Leakage Rate (L_{am})	0.0962
Imposed Leak (L_o)	0.2383
Lower Limit: $L_o + L_{am} - 0.25 L_a$	0.2720
Composite Leakage (L_c)	0.2810
Upper Limit: $L_o + L_{am} + 0.25 L_a$	0.3970

G. Local Leakage Rate Testing

Prior to the start of the ILRT, "as found" local leakage rate testing (LLRT) was performed as required by 10CFR50, Appendix J. Results from this testing were required for those penetrations not exposed to the ILRT pressure to complete the analysis of the "as found" ILRT results. The "as found" local leakage rate testing was completed on October 26, 1991.

III. TEST DATA SUMMARY

A. Plant Information

Owner	Florida Power Corporation
Plant	Crystal River Unit 3 Nuclear Power Plant
Location	Approx. 5 miles north of Crystal River, FL
Docket No.	50-302
Containment Type	Reinforced concrete structure composed of cylindrical walls (prestressed with a post-tensioning tendon system in the vertical and horizontal directions), with a flat foundation mat (conventional reinforcing) and a shallow dome roof (prestressed utilizing a three-way post tensioning tendon system). The inside surface is lined with a carbon steel liner.
NSSS Supplier, Type	Babcock & Wilcox PWR
Date Test Completed	November 7, 1991.

B. Technical Data

Containment Net Free Volume	2,000,000 cubic feet
Design Pressure	55 psig
Design Temperature	281° F
Calculated Peak Accident Pressure	53.9 psig
Calculated Peak Accident Temperature	278° F

C. Test Results - Type A

Test Method	Absolute
Test Pressure	54.5 psig

Integrated Leakage Rate Total Time Analysis Test Results (Presented for information only):

Calculated Leakage Rate, L_{am}	0.0871 % wt./day
95 % Upper Confidence Limit Leakage Rate	0.0958 % wt./day

Integrated Leakage Rate Mass Point Analysis Test Results:

Calculated Leakage Rate, L_{am}	0.0962 % wt./day
95 % Upper Confidence Limit Leakage Rate	0.0986 % wt./day
Maximum Allowable Leakage Rate, L_a	0.25 % wt./day
ILRT Acceptance Criteria, $0.75 L_a$	0.1875 % wt./day
Verification Test Imposed Leakage Rate, L_o	15.15 scfm or 0.2383 % wt./day

Verification Test Mass Point Analysis Results and Limits:

Upper Limit ($L_o + L_{am} + 0.25 L_a$)	0.3970 % wt./day
Calculated Composite Leakage Rate, L_c	0.2810 % wt./day
Lower Limit ($L_o + L_{am} - 0.25 L_a$)	0.2720 % wt./day

Report Printouts

The report printouts of the ILRT and verification test calculations for the Total Time and Mass Point Analyses are provided in Appendices B and C. Stabilization data is provided in Appendix A.

D. Test Results - Type B and C Tests

A summary of local leakage rate test results since the ILRT in November 1987 are included in Appendix F.

E. Integrated Leakage Rate Measurement System

1. Absolute Pressure

Quantity	2
Manufacturer	Paroscientific
Type	DigiQuartz Model 740
Range	0 - 100 psia
Accuracy	± 0.01 % F.S.
Sensitivity	± 0.005 psia
Repeatability	± 0.005 psia
Resolution	± 0.0001 psia

2. Drybulb Temperature

Quantity	24
Manufacturer	Rosemount
Type	78N01N00N120 100 ohm platinum resistance temperature detectors (RTD)
Range, calibrated	75 - 125 ° F
Accuracy	± 0.5 ° F
Sensitivity	± 0.01 ° F

3. Water Vapor Pressure

Quantity	10
Manufacturer	Phys-Chem Scientific
Type	Humitemp-5 Precision Relative Humidity-Temperature Monitor, Model 2150 with PCRC-11 HPB probes

	Range	0 - 100% RH
	Accuracy	$\pm 1.8^{\circ}$ F (Dewpoint Temperature)
	Sensitivity	$\pm 0.1^{\circ}$ F (Dewpoint Temperature)
4.	Verification Flow	
	Quantity	2
	Manufacturer	Brooks
	Type	Model 1110-08 Rotometer
	Range	.76-7.6scfm @ 14.7 psig and 70° F
	Accuracy	$\pm 2\%$ F.S.
5.	Readout Device	
	Quantity	1
	Manufacturer	Fluke
	Type	Model 2285B
	Repeatability	
	Drybulb Temp	$\pm 0.054^{\circ}$ F
	Dewpoint Temp	$\pm 0.04^{\circ}$ F
	Resolution	$\pm 0.01^{\circ}$ F

The instrumentation Selection Guide (ISG) value from ANSI/ANS 56.8-1987 based on a 24 hour test and the above ILRT instrumentation configuration is 0.0108 % wt./day (Refer to Appendix D for calculations). The sensor locations and volume fractions as installed for the ILRT are shown in Appendix G.

G. Information Retained at Plant

The following information is available for review at Crystal River Unit 3 Nuclear Power Plant site:

1. A listing of all containment penetrations including the total number, size, and function.
2. A listing of normal operating instrumentation used for the leakage test.
3. A system lineup (at time of test) showing required valve positions and status of piping systems.
4. A continuous, sequential log of events from the initial survey of containment to restoration of tested systems.
5. Documentation of instrumentation calibrations and standards, including a sensor failure analysis.
6. Data to verify temperature stabilization criteria as established by test procedure (Appendix A).
7. The working copy of the test procedure that includes signature sign-offs of procedural steps.
8. The procedure and data that verifies completion of penetration and valve testing including as-found leak rates, corrective action, and final leak rates.
9. Computer printouts of ILRT data and automated data acquisition printouts along with a summary description of the computer program.
10. A review of confidence limits of test results with accompanying computer printouts.

11. Description of the method of leakage rate verification.
12. ILRT data plots obtained during the test.
13. The P&IDs of pertinent systems.

IV. ANALYSIS AND INTERPRETATION

The upper 95% confidence limit (UCL) Total Time and Mass Point leakage rates calculated during the ILRT were less than the test acceptance criteria of 0.75 L_v (0.1875% wt/day). Additions to the calculated leakage rates must be made to account for penetration paths not exposed to the ILRT pressure and for changes in the net free containment volume due to changes to containment water levels. These additions are discussed below.

A. Type C Penalties

Penetration paths not exposed to the ILRT pressure and the corresponding minimum pathway leakage rates are as follows:

<u>Per No.</u>	<u>System</u>	<u>Leakage Rate (sccm)</u>
116	RB Leak Rate	41
122	RB Leak Rate	15
202	RB Leak Rate	69.6
314	Main Steam	420
316	Main Steam	1030
318	Main Steam	20
320	Main Steam	20
427	Main Steam	605
428	Main Steam	1255

The total applicable local leakage rate Type C penalty addition is 3,475.6 sccm which is equivalent to 0.0019% wt. per day.

B. Volume Change Corrections

The following volumes were monitored for liquid level changes which would affect the containment net free volume:

<u>Volume Monitored</u>	<u>Level Change</u>	<u>Volume Change</u>
Pressurizer	-10 inches	+30.8 cu. ft.
Reactor Building Sump	+ 3 inches	-9.48 cu. ft.

Conservatively, level decreases can be disregarded since their effect is already included in the measured leakage rate. The increase in reactor building sump resulted in a decrease of 9.48 cubic feet in the containment net free volume. This is equivalent to a leakage rate of 0.0005 % wt. per day.

C. As Left ILRT Results

The as left ILRT leakage rate including the required additions is as follows:

	<u>Total Time Analysis (% wt./day)</u>	<u>Mass Point Analysis (% wt./day)</u>
95 % UCL Leakage Rate	0.0958	0.0986
Type C Penalties	0.0019	0.0019
Volume Change	0.0005	0.0005
As Left 95 % UCL Leakage Rate	0.0982	0.1010

The as left Total Time and Mass Point 95 % UCL leakage rates are less than the maximum allowable leakage rate value stated in the technical specifications of 0.75 L_a (0.1875 % wt./day).

D. As Found ILRT Results

Repairs or adjustments were made to the following penetrations which would require correction to the as left ILRT result.

<u>Penetration</u>	<u>Leakage Savings(ccm)</u>
113	595
439	105.7

The total leakage savings is 700.7 sccm based on minimum pathway analysis. This is equivalent to 0.0004 % wt. per day. The as found ILRT leakage is determined as follows:

	<u>Total Time Analysis (% wt./day)</u>	<u>Mass Point Analysis (% wt./day)</u>
As Left 95 % UCL Leakage Rate	0.0982	0.1010
Leakage Savings	0.0004	0.0004
As Found 95 % UCL Leakage Rate	0.0986	0.1014

V. REFERENCES

- A. Crystal River Unit 3 Nuclear Power Plant Surveillance Procedure SP-178 Rev. 17, Reactor Containment Building Integrated Leakage Rate Test.
- B. Crystal River Unit 3 Nuclear Power Plant Technical Specifications.
- C. Crystal River Unit 3 Nuclear Power Plant Updated Final Safety Analysis Report.
- D. Code of Federal Regulations, Title 10, Part 50, Appendix J, Primary Reactor Containment Leakage Testing for Water Cooled Power Reactors.
- E. ANSI N45.4-1972, Leakage-Rate Testing of Containment Structures for Nuclear Reactors.
- F. ANSI/ANS 56.8-1987, Containment System Leakage Testing Requirements.

VI APPENDICES

APPENDIX A
STABILIZATION PHASE DATA

STABLIZATION MODE
OPTIONS

TIME : 0515
MODE SUMMARY

- 1 - MANUAL DATA ENTRY
- 2 - PARAMATER GRAPHS
- 3 - SENSOR PLOTS
- 4 - SENSOR DIFFERENTIALS
- 5 - ANSI STABILIZATION CRITERIA
- 6 - BN-TOP-1 STAB.CRITERIA
- 7 - ANSI CRITERIA PRINTOUT
- 8 - BN-TOP-1 CRITERIA PRINTOUT
- 9 - REPRINT CURRENT DATA POINT
- P - PASS WORD MENU
- 0 - FLASH OFF

OF DATA POINTS = 23
MODE DURATION (IN HRS) = 5.5
TOT TIME MEASURED LEAK = 0.2696
TOT TIME CALCULATED LEAK = 0.1632
TOT TIME 95% UCL = 0.5072
MASS PT LEAK = 0.2415
MASS PT 95% UCL = 0.2551

ANSI TEMPERATURE STABLIZATION CRITERIA MET
BN-TOP TEMPERATURE STABLIZATION CRITERIA MET

POINT SUMMARY: CURRENT VALUE/DIFFERENCE FROM PREVIOUS POINT

AVG TEMP:	78.610/	-0.029	AVG PRESS:	68.618/	-0.005
MASS:	688156.50/	-10.000	AVG DEW PRESS:	0.4208/	-0.0013
			TOTAL PRESS:	69.039/	-0.006

LEAK RATE ANALYSIS UNIT # 3

	TOTAL TIME			MASS POINT		
	MEASURED	CALCULATED	UCL	CALC.	L95	
	LEAK RATE	LEAK RATE		LEAK RATE		
309	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
310	0.25	1.2029	0.0000	0.0000	0.0000	0.0000
310	0.50	0.7145	0.7145	0.0000	0.7157	3.1000
310	0.75	0.5437	0.4908	1.7472	0.5124	1.0188
310	1.00	0.4529	0.3654	1.0963	0.4060	0.6812
310	1.25	0.4143	0.2979	0.9158	0.3532	0.5281
310	1.50	0.4468	0.2884	0.8933	0.3625	0.4799
310	1.75	0.3699	0.2532	0.7948	0.3286	0.4213
310	2.00	0.3604	0.2319	0.7374	0.3098	0.3826
310	2.25	0.3403	0.2140	0.6911	0.2937	0.3533
310	2.50	0.3785	0.2177	0.6873	0.3046	0.3538
310	2.75	0.3194	0.2039	0.6508	0.2886	0.3325
310	3.00	0.3181	0.1953	0.6256	0.2798	0.3178
310	3.25	0.3186	0.1905	0.6082	0.2751	0.3077
310	3.50	0.2990	0.1831	0.5876	0.2664	0.2959
310	3.75	0.2963	0.1778	0.5715	0.2608	0.2871
310	4.00	0.2941	0.1741	0.5586	0.2563	0.2797
310	4.25	0.3017	0.1737	0.5513	0.2504	0.2772
310	4.50	0.2895	0.1715	0.5416	0.2534	0.2721
310	4.75	0.2837	0.1693	0.5322	0.2507	0.2677
310	5.00	0.2789	0.1671	0.5234	0.2475	0.2631
310	5.25	0.2758	0.1653	0.5153	0.2446	0.2591
310	5.50	0.2696	0.1632	0.5072	0.2415	0.2551

AVG. DATA VALUES UNIT # 3

DATE	TIME	T(I)	P(I)	DT(I)	VP(I)	MASS(I)
309	0.00	80.498	68.901	0.000	0.425	688582.00
310	0.25	80.245	68.830	0.000	0.424	688495.69
310	0.50	80.030	68.831	0.000	0.423	688479.50
310	0.75	79.858	68.808	0.000	0.423	688465.00
310	1.00	79.719	68.789	0.000	0.423	688452.00
310	1.25	79.601	68.772	0.000	0.423	688433.38
310	1.50	79.502	68.755	0.000	0.425	688389.69
310	1.75	79.401	68.743	0.000	0.424	688396.31
310	2.00	79.320	68.730	0.000	0.424	688375.19
310	2.25	79.241	68.719	0.000	0.423	688362.31
310	2.50	79.174	68.705	0.000	0.426	688310.50
310	2.75	79.102	68.698	0.000	0.423	688329.88
310	3.00	79.046	68.689	0.000	0.423	688308.13
310	3.25	78.997	68.680	0.000	0.423	688284.88
310	3.50	78.937	68.672	0.000	0.422	688281.69
310	3.75	78.889	68.664	0.000	0.422	688263.13
310	4.00	78.847	68.657	0.000	0.421	688244.38
310	4.25	78.801	68.648	0.000	0.423	688214.00
310	4.50	78.758	68.642	0.000	0.422	688208.19
310	4.75	78.716	68.635	0.000	0.422	688195.38
310	5.00	78.680	68.629	0.000	0.422	688181.88
310	5.25	78.640	68.623	0.000	0.422	688166.50
310	5.50	78.610	68.618	0.000	0.421	688156.7

80.498

UNIT 3

TEMPERATURE

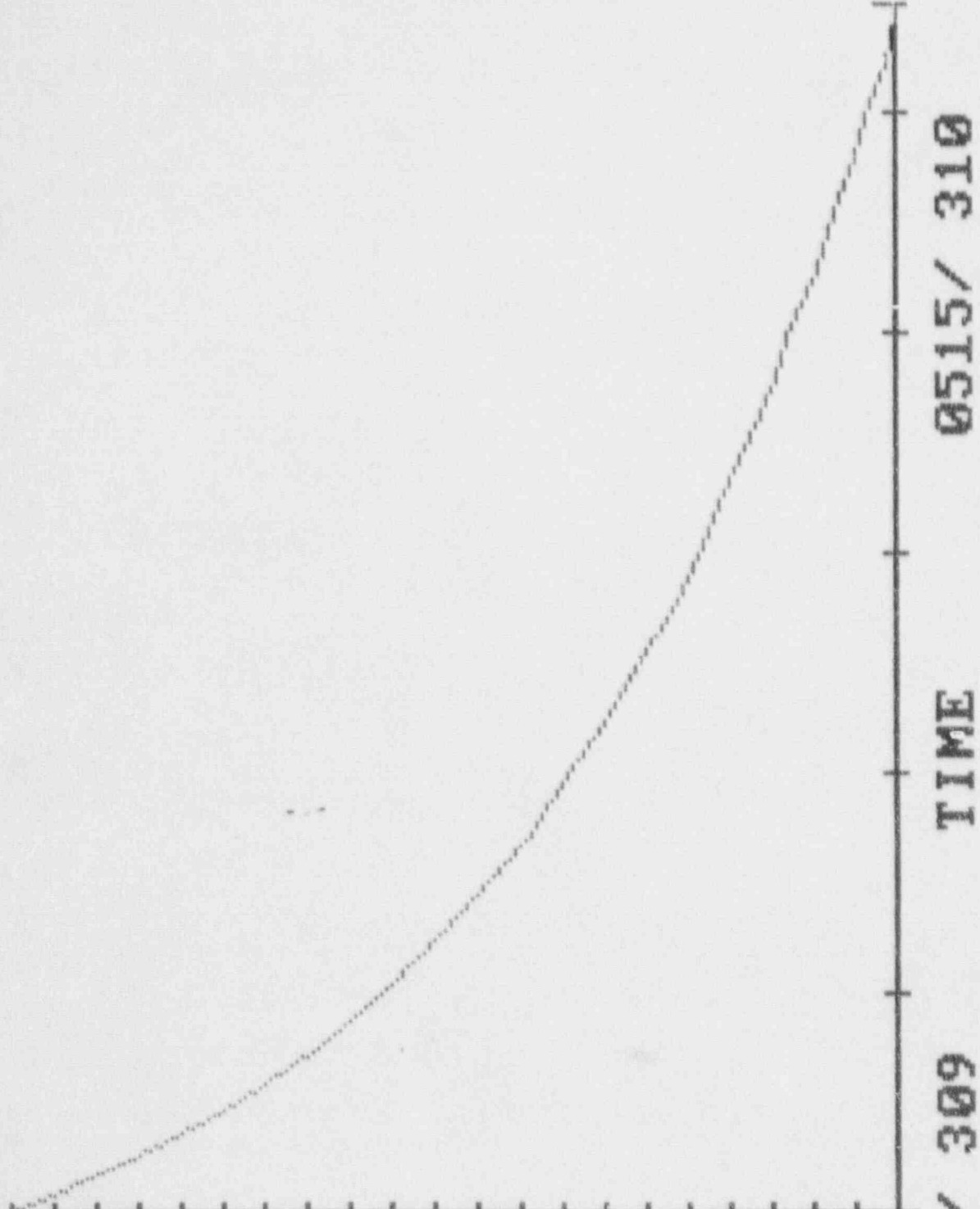
F

78.610

2345 / 309

TIME

0515 / 310



BN-10P-1 STABILIZATION CRITERIA

TIME	TEMP	BN dT	BN dT2
5.50	78.6103	-0.1634	0.0606
5.25	78.6396	-0.1785	0.0183
5.00	78.6803	-0.1831	0.0399
4.75	78.7162	-0.1931	0.0600
4.50	78.7579	-0.2081	0.0492
4.25	78.8005	-0.2204	0.0643
4.00	78.8474	-0.2365	0.0781
3.75	78.8893	-0.2560	0.1061
3.50	78.9370	-0.2825	0.0791
3.25	78.9966	-0.3023	0.1353
3.00	79.0465	-0.3361	0.1672
2.75	79.1023	-0.3779	0.1995
2.50	79.1741	-0.4278	0.2957
2.25	79.2413	-0.5017	0.3490
2.00	79.3203	-0.5890	0.0000
1.75	79.4013	0.0000	0.0000
1.50	79.5021	0.0000	0.0000
1.25	79.6012	0.0000	0.0000
1.00	79.7187	0.0000	0.0000
0.75	79.8582	0.0000	0.0000
0.50	80.0297	0.0000	0.0000
0.25	80.2447	0.0000	0.0000
0.00	80.4983	0.0000	0.0000

STABILIZATION ANSI56.8

TIME	TEMP	56.8	56.8	4-1
		1 HR F/HR	4 HR F/HR	HR
5.50	78.610	0.148	0.223	0.075
5.25	78.640	0.161	0.240	0.079
5.00	78.680	0.167	0.260	0.093
4.75	78.716	0.173	0.285	0.112
4.50	78.758	0.179	0.318	0.139
4.25	78.801	0.196	0.361	0.165
4.00	78.847	0.199	0.413	0.214
3.75	78.889	0.213	0.000	-0.211
3.50	78.927	0.237	0.000	-0.231
3.25	78.997	0.245	0.000	-0.245
3.00	79.046	0.274	0.000	-0.274
2.75	79.102	0.299	0.000	-0.299
2.50	79.174	0.328	0.000	-0.323
2.25	79.241	0.360	0.000	-0.360
2.00	79.320	0.398	0.000	-0.398
1.75	79.401	0.457	0.000	-0.457
1.50	79.502	0.528	0.000	-0.528
1.25	79.601	0.644	0.000	-0.644
1.00	79.719	0.780	0.000	-0.780
0.75	79.858	0.000	0.000	0.000
0.50	80.030	0.000	0.000	0.000
0.25	80.245	0.000	0.000	0.000

APPENDIX B

ILRT TEST DATA AND PLOTS

TEST MODE

PLEASE SELECT THE OPTION YOU WISH TO USE:

- 1 - MANUAL DATA ENTRY
- 2 - SUBSTANTIAL TEST REPORTS
- 3 - REFERENCE ANALYSIS
- 4 - REPRINT CURRENT DATA PT
- 5 - SENSOR DIFFERENTIALS

P - PASS WORD MENU

SELECTED OPTION=

TEST DATA 0530

# OF DATA POINTS	==	97
MODE DURATION (IN HOURS)	==	0.24
TOT TIME MEASURED LEAK	==	0.00
TOT TIME CALCULATED LEAK	==	0.00
TOT TIME 95% LEAK	==	0.00
MASS POINT	==	687461.19

POINT SUMMARY: CURRENT VALUE/DIFFERENCE FROM PREVIOUS POINT

AVG TEMP:	77.069 / -0.014	AVG PRESS:	68.352 / -0.001
MASS:	687461.19 / +4.375	AVG DEW PRESS:	0.4010 / -0.0003
		TOTAL PRESS:	68.753 / -0.002

0.2597

UNIT 3

MASS
ANAL.

WT%/
DAY

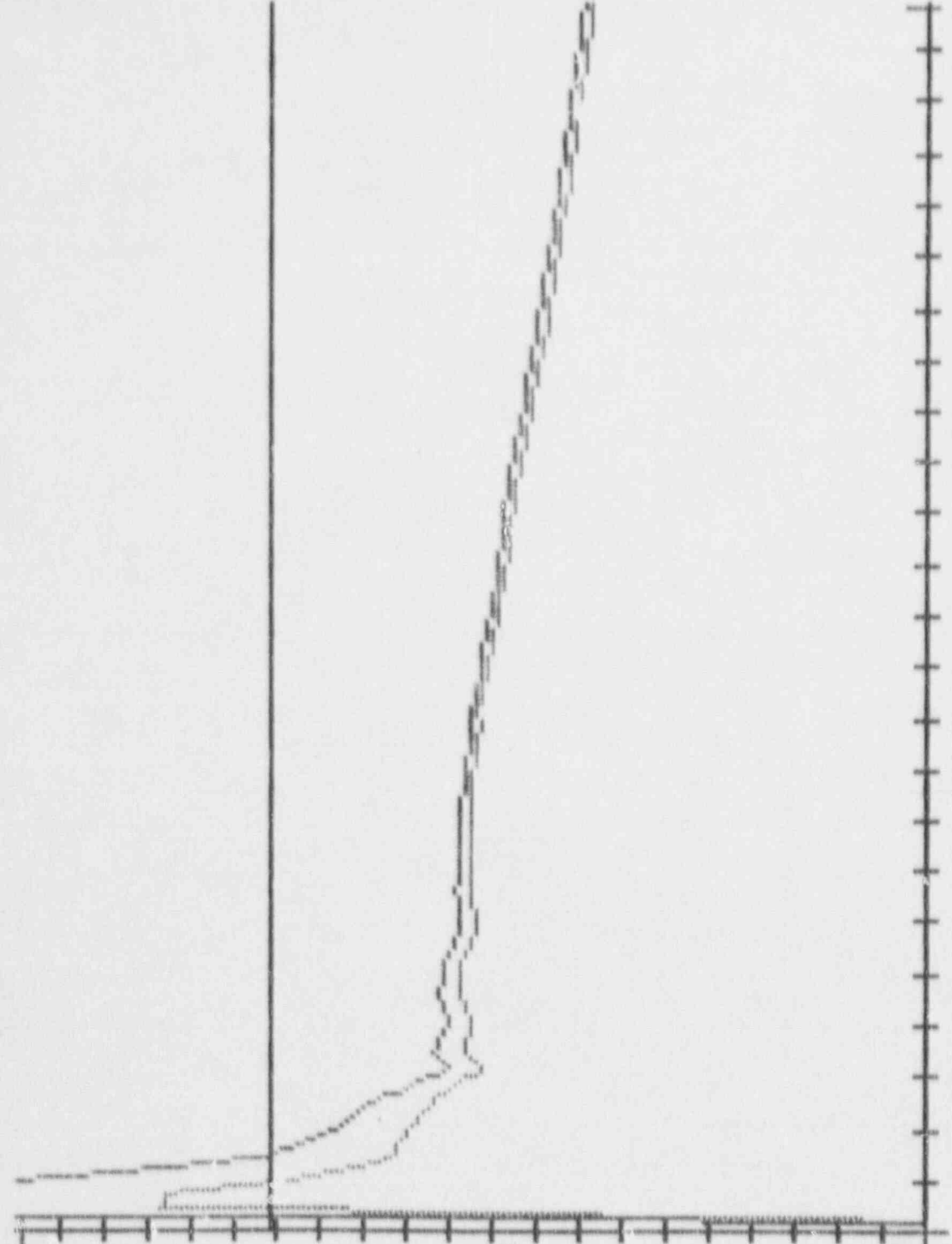
LEGEND
= L

0.0000

0530 / 310

TIME

0530 / 311



0.3932

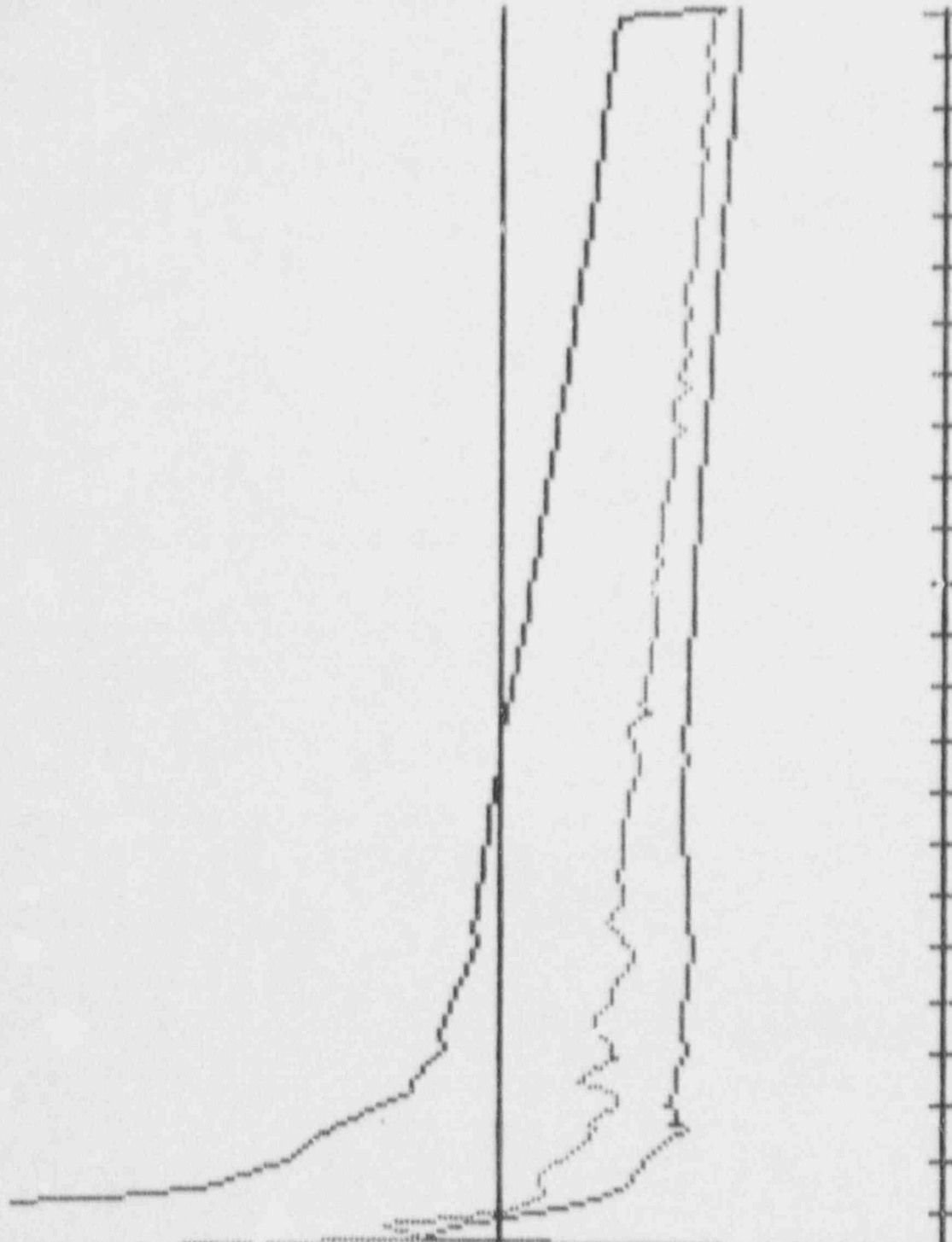
UNIT 3

TOT.
TIME
ANAL.

WT%/
DAY

LEGEND
= L

0.0000



0530/ 310

TIME

0530/ 311

TOTAL TIME/MASS POINT UNIT # 3

DATE	TIME	TLM	LMCALC	SL	LAM	L95
310	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
310	0.25	0.3932	0.0000	0.0000	0.0000	0.0000
310	0.50	0.2223	0.2223	0.0000	0.2209	1.0630
310	0.75	0.2380	0.2069	0.9452	0.2190	0.3486
310	1.00	0.1867	0.1695	0.4623	0.1808	0.2597
310	1.25	0.1725	0.1471	0.3523	0.1610	0.2140
310	1.50	0.1707	0.1367	0.3120	0.1537	0.1901
310	1.75	0.1713	0.1327	0.2935	0.1528	0.1790
310	2.00	0.1631	0.1280	0.2762	0.1496	0.1698
310	2.38	0.1498	0.1086	0.2581	0.1408	0.1570
310	2.75	0.1505	0.1161	0.2536	0.1383	0.1514
310	3.00	0.1417	0.1134	0.2421	0.1329	0.1447
310	3.05	0.1393	0.1178	0.2365	0.1295	0.1403
310	3.25	0.1404	0.1148	0.2279	0.1277	0.1373
310	3.53	0.1549	0.1132	0.2253	0.1314	0.1408
310	3.75	0.1467	0.1129	0.2221	0.1321	0.1403
310	4.00	0.1399	0.1104	0.2167	0.1307	0.1381
310	4.27	0.1419	0.1088	0.2130	0.1305	0.1371
310	4.50	0.1492	0.1100	0.2131	0.1326	0.1389
310	4.75	0.1483	0.1107	0.2126	0.1341	0.1399
310	5.00	0.1408	0.1102	0.2102	0.1336	0.1389
310	5.25	0.1409	0.1099	0.2082	0.1330	0.1379
310	5.50	0.1384	0.1094	0.2060	0.1324	0.1369
310	5.75	0.1336	0.1084	0.2030	0.1308	0.1353
310	6.00	0.1328	0.1075	0.2004	0.1293	0.1336
310	6.25	0.1362	0.1073	0.1989	0.1291	0.1331

TOTAL TIME/MASS POINT UNIT # 3

DATE	TIME	TFLM	LMCALC	SL	LAM	L95
310	6.50	0.1429	0.1082	0.1991	0.1302	0.1341
310	6.75	0.1416	0.1090	0.1989	0.1311	0.1347
310	7.00	0.1366	0.1090	0.1973	0.1308	0.1342
310	7.25	0.1366	0.1091	0.1968	0.1305	0.1337
310	7.50	0.1403	0.1097	0.1966	0.1312	0.1342
310	7.75	0.1367	0.1099	0.1957	0.1312	0.1340
310	8.00	0.1362	0.1100	0.1949	0.1309	0.1336
310	8.25	0.1362	0.1102	0.1941	0.1308	0.1333
310	8.50	0.1368	0.1105	0.1935	0.1308	0.1332
310	8.75	0.1336	0.1104	0.1925	0.1302	0.1325
310	9.00	0.1357	0.1106	0.1919	0.1303	0.1324
310	9.25	0.1331	0.1105	0.1909	0.1298	0.1319
310	9.50	0.1288	0.1101	0.1895	0.1290	0.1312
310	9.75	0.1310	0.1099	0.1885	0.1284	0.1305
310	10.00	0.1331	0.1100	0.1878	0.1282	0.1302
310	10.25	0.1347	0.1103	0.1874	0.1283	0.1302
310	10.50	0.1257	0.1097	0.1860	0.1272	0.1293
310	10.75	0.1307	0.1096	0.1852	0.1268	0.1289
310	11.00	0.1274	0.1093	0.1841	0.1262	0.1283
310	11.25	0.1273	0.1090	0.1831	0.1256	0.1277
310	11.50	0.1250	0.1086	0.1819	0.1249	0.1270
310	11.75	0.1262	0.1083	0.1809	0.1244	0.1265
310	12.00	0.1242	0.1079	0.1798	0.1236	0.1257
310	12.25	0.1228	0.1074	0.1786	0.1228	0.1250
310	12.50	0.1240	0.1071	0.1777	0.1224	0.1245
310	12.75	0.1218	0.1066	0.1766	0.1214	0.1236

TOTAL TIME/MASS POINT UNIT # 3

DATE	TIME	TTLM	LMCALC	SL	LAM	L95
310	13.00	0.1241	0.1064	0.1757	0.1209	0.1231
310	13.25	0.1238	0.1062	0.1750	0.1206	0.1227
310	13.50	0.1208	0.1057	0.1739	0.1199	0.1220
310	13.75	0.1228	0.1055	0.1732	0.1195	0.1216
310	14.00	0.1209	0.1052	0.1723	0.1191	0.1211
310	14.25	0.1211	0.1049	0.1715	0.1187	0.1207
310	14.50	0.1205	0.1045	0.1707	0.1181	0.1201
310	14.75	0.1187	0.1041	0.1697	0.1176	0.1196
310	15.00	0.1187	0.1038	0.1689	0.1170	0.1191
310	15.25	0.1166	0.1033	0.1679	0.1164	0.1184
310	15.50	0.1159	0.1028	0.1670	0.1156	0.1177
310	15.75	0.1162	0.1024	0.1661	0.1151	0.1173
310	16.00	0.1118	0.1018	0.1649	0.1142	0.1165
310	16.25	0.1158	0.1014	0.1641	0.1137	0.1159
310	16.50	0.1153	0.1010	0.1633	0.1131	0.1154
310	16.75	0.1096	0.1003	0.1622	0.1122	0.1146
310	17.00	0.1137	0.0999	0.1613	0.1117	0.1140
310	17.25	0.1107	0.0994	0.1604	0.1110	0.1134
310	17.50	0.1100	0.0988	0.1594	0.1103	0.1127
310	17.75	0.1111	0.0984	0.1586	0.1096	0.1120
310	18.00	0.1118	0.0980	0.1578	0.1092	0.1116
310	18.25	0.1097	0.0975	0.1570	0.1086	0.1109
311	18.50	0.1101	0.0971	0.1562	0.1081	0.1105
311	18.75	0.1103	0.0967	0.1554	0.1077	0.1100
311	19.00	0.1084	0.0963	0.1546	0.1070	0.1094
311	19.25	0.1069	0.0958	0.1538	0.1064	0.1086

TOTAL TIME/MASS POINT UNIT # 3

DATE	TIME	TTLM	LMCALC	SL	LAM	L95
311	19.50	0.1057	0.0952	0.1529	0.1057	0.1081
311	19.75	0.1068	0.0948	0.1521	0.1052	0.1076
311	20.00	0.1061	0.0943	0.1513	0.1046	0.1070
311	20.25	0.1045	0.0938	0.1505	0.1040	0.1064
311	20.50	0.1035	0.0933	0.1496	0.1033	0.1058
311	20.75	0.1050	0.0928	0.1489	0.1029	0.1053
311	21.00	0.1040	0.0924	0.1481	0.1024	0.1048
311	21.25	0.1026	0.0919	0.1473	0.1018	0.1042
311	21.50	0.1031	0.0914	0.1466	0.1012	0.1037
311	21.75	0.1043	0.0911	0.1459	0.1008	0.1032
311	22.00	0.1026	0.0906	0.1452	0.1003	0.1027
311	22.25	0.1005	0.0901	0.1444	0.0998	0.1022
311	22.50	0.1016	0.0897	0.1437	0.0993	0.1017
311	22.75	0.1008	0.0893	0.1430	0.0988	0.1012
311	23.00	0.1004	0.0888	0.1423	0.0983	0.1007
311	23.25	0.1009	0.0885	0.1417	0.0979	0.1002
311	23.50	0.0994	0.0880	0.1410	0.0973	0.0997
311	23.75	0.0985	0.0876	0.1403	0.0968	0.0992
311	24.00	0.0968	0.0871	0.0958	0.0962	0.0986

68.611

UNIT 3

PRESSURE

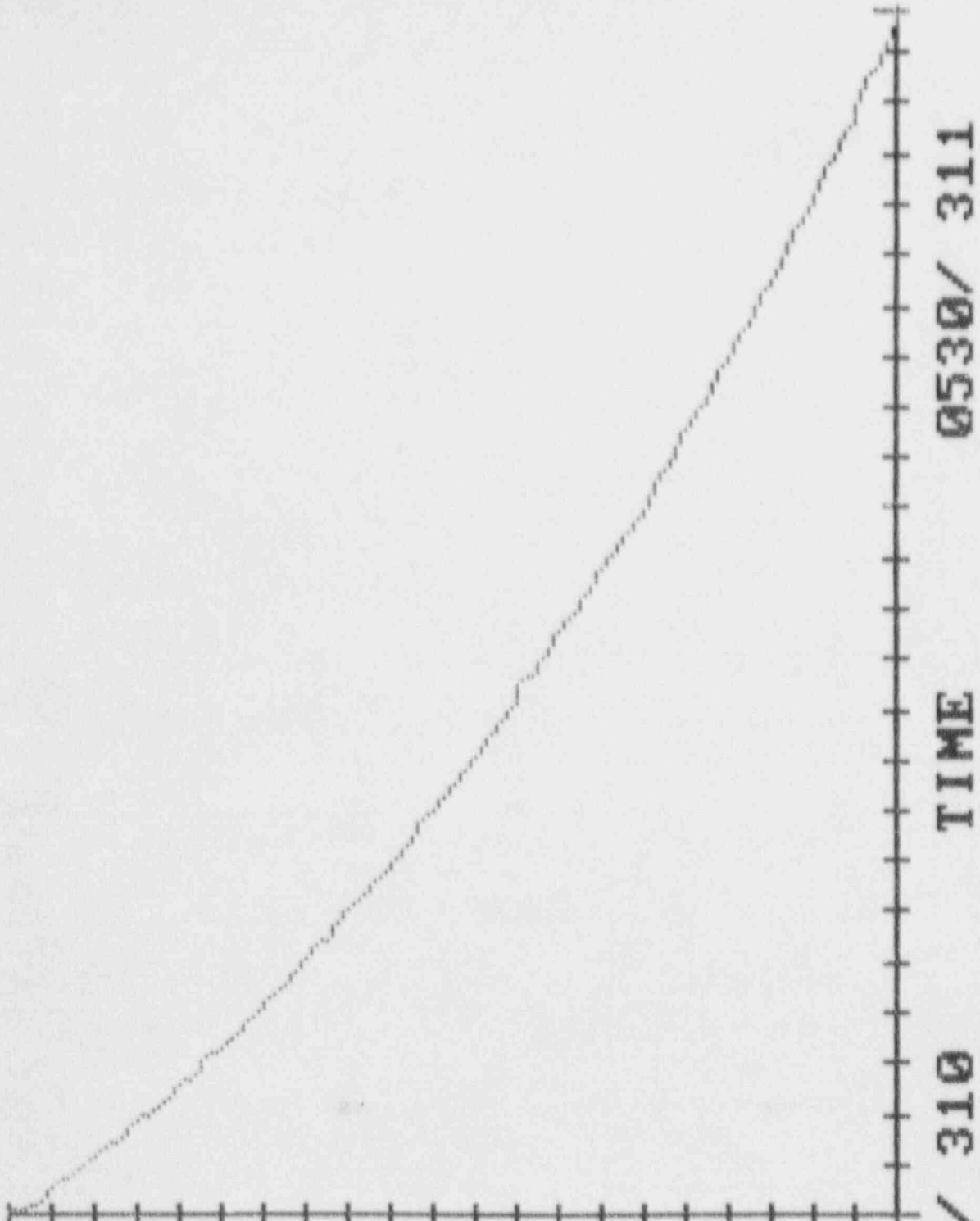
PSIA

68.352

0530/ 310

TIME

0530/ 311



0.423

UNIT 3

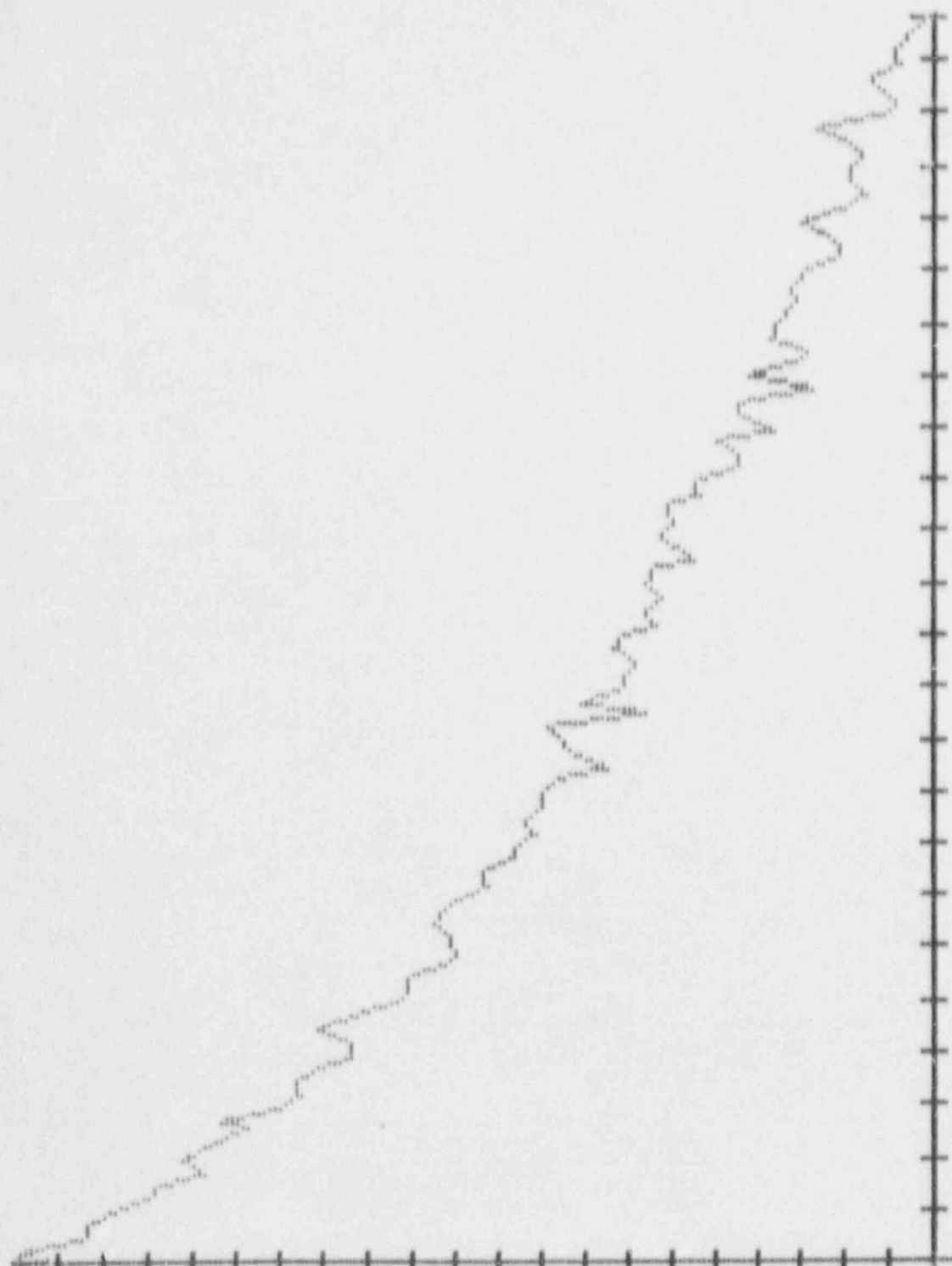
AUG UPR PRESS

0.401

0530 / 310

TIME

0530 / 311



78.575

UNIT 3

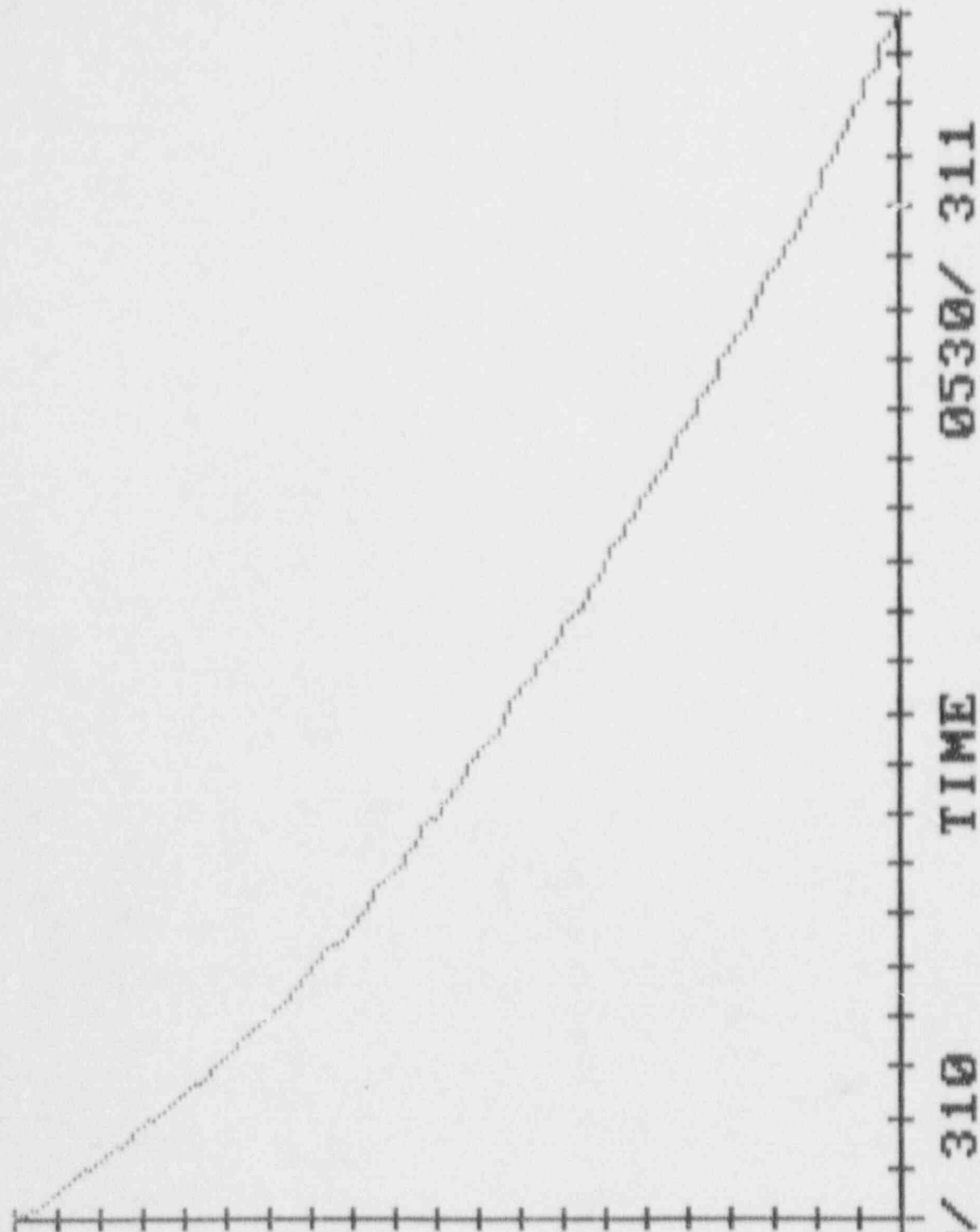
TEMPERATURE · F

77.069

0530/ 310

TIME

0530/ 311



6.88131

UNIT 3

MASS

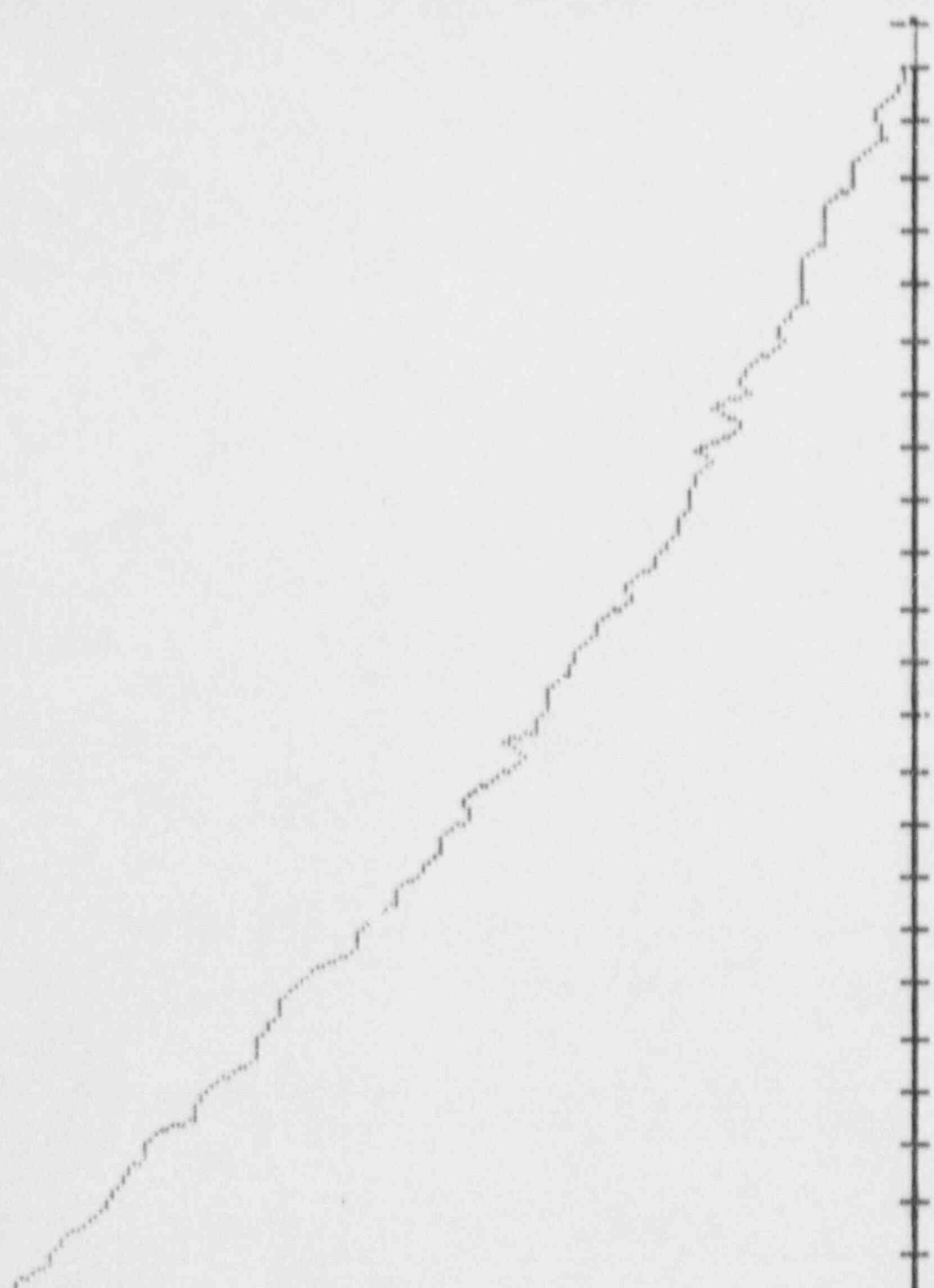
LBM
 $\times 10^5$

6.8745

0530/ 310

TIME

0530/ 311



APPENDIX C

VERIFICATION TEST DATA AND PLOTS

VERIFICATION MODE
OPTIONS:

TIME= 0945
TEST SUMMARY

- 1 - MANUAL DATA ENTRY
- 2 - PARAMETER GRAPHS
- 3 - SENSOR PLOTS
- 4 - TREND ANALYSIS
- 5 - REPRINT CURRENT DATA PT
- 6 - SENSOR DIFFERENTIALS

- F - PASS WORD MENU

OF DATA POINTS = 19
MODE DURATION (IN HOURS) = 4.25
TOT TIME MEASURED LEAK = 0.2937
TOT TIME CALCULATED LEAK = 0.2620
MASS PT LEAK = 0.2810
IMPOSED LEAK = 0.2383
TOT TIME UPPER LIMIT = 0.3879
TOT TIME LOWER LIMIT = 0.2620
MASS PT UPPER LIMIT = 0.3970
MASS PT LOWER LIMIT = 0.2720

SELECTED OPTION =

TOT TIME VERIFICATION CRITERIA HAS NOT BEEN MET

MASS PT VERIFICATION CRITERIA HAS BEEN MET

POINT SUMMARY: CLARENT VALUE/DIFFERENCE FROM PREVIOUS POINT

AVG TEMP:	78.813/ -0.007	AVG PRESS:	68.297 / -0.003
MASS:	687103.63/ -21.750	AVG DEW PRESS:	0.4000/ -0.0002
		TOTAL PRESS:	68.697 / -0.003

0.5970

UNIT 3

MASS
ANAL.

WT%/
DAY

LEGEND
= L

0.0000

0530/ 311

TIME

0945/ 311

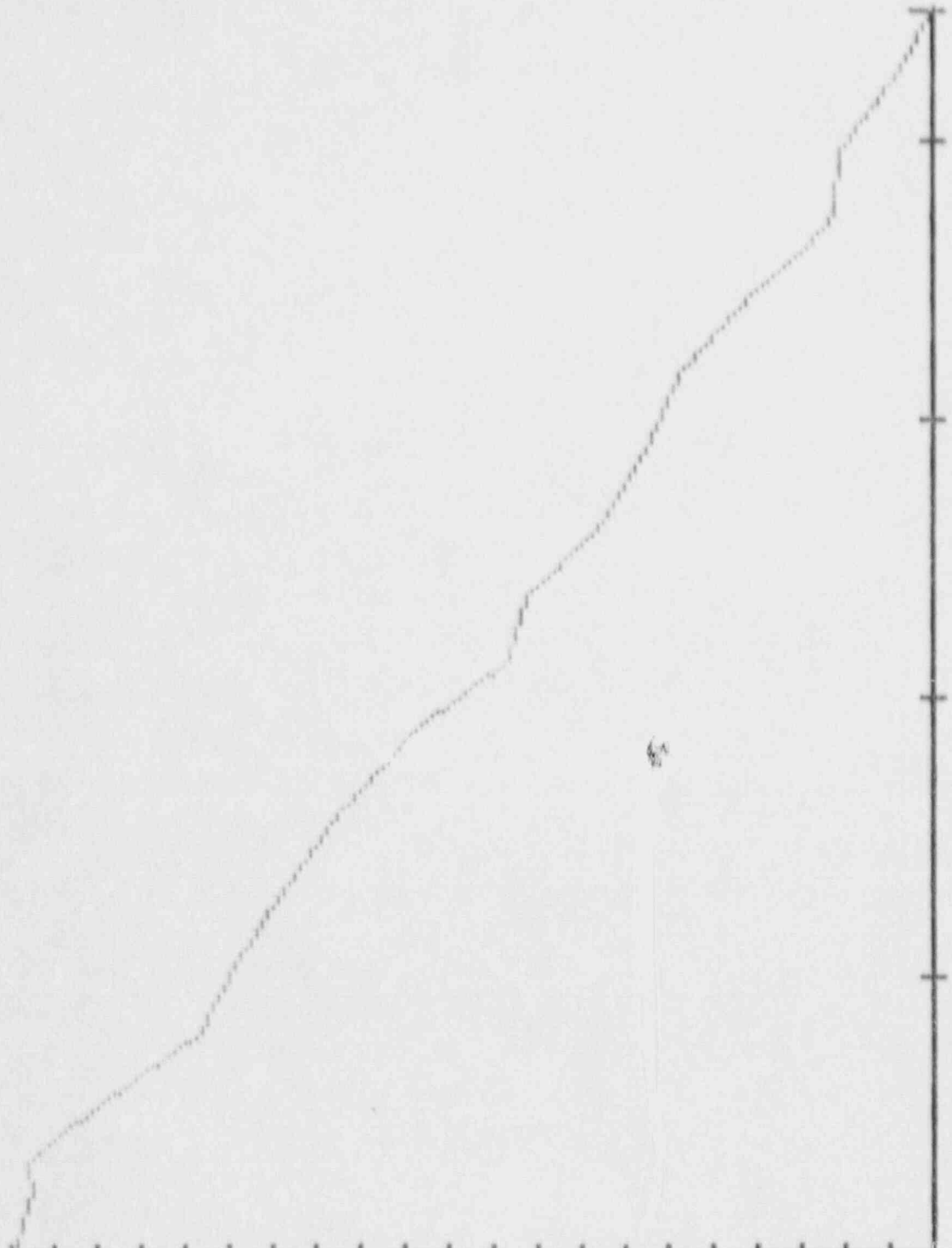


77.069

UNIT 3

TEMPERATURE · F

76.913



0530/ 311

TIME

0945/ 311

0.402

UNIT 3

AUG UPR PRESS

0.400

0530/ 311

TIME

0945/ 311



68.753

UNIT 3

PRESSURE
PSIA

68.697

0530 / 311

TIME

0945 / 311



6.8746

UNIT 3

MASS

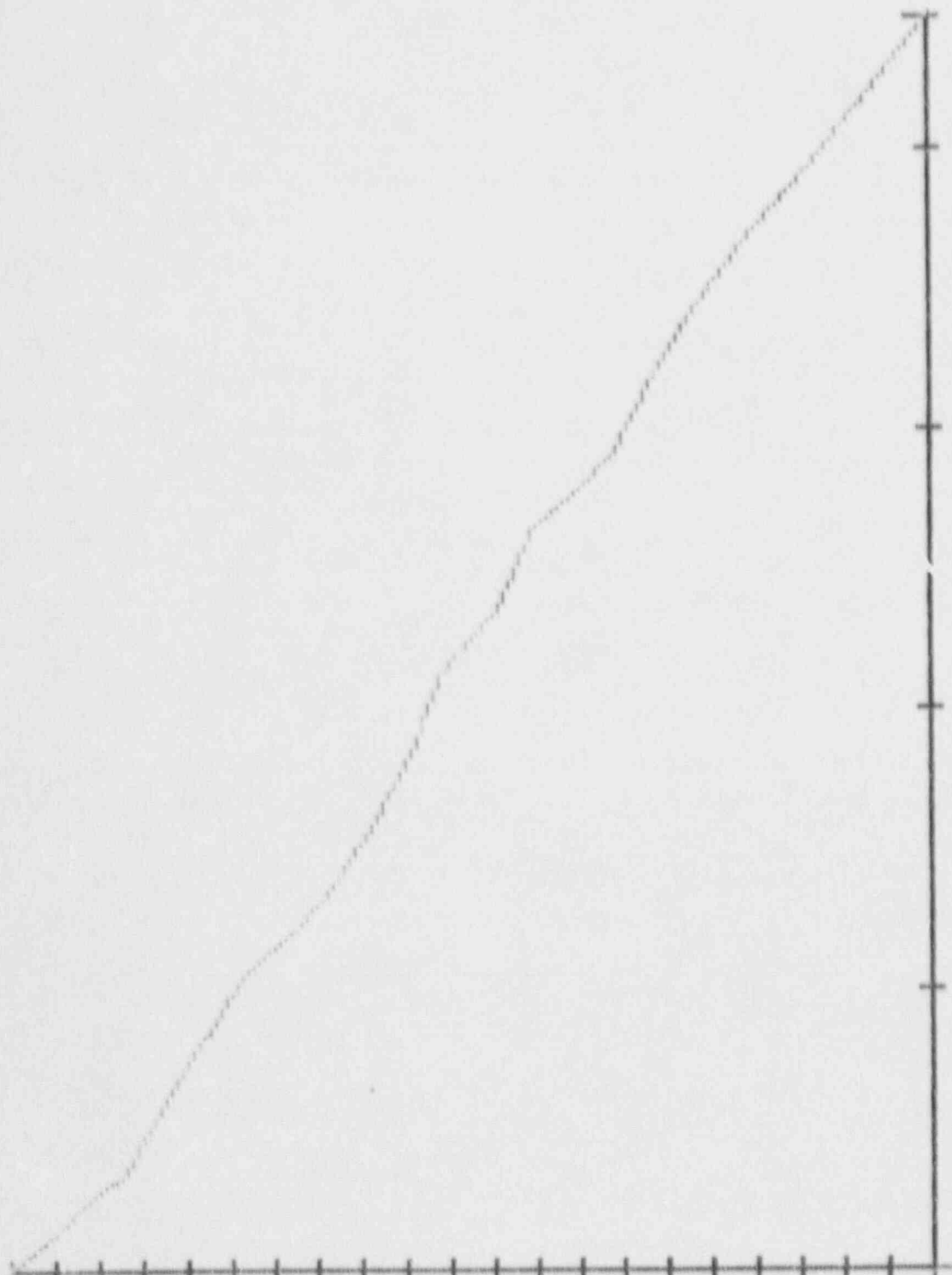
LBM
 $\times 10^5$

6.8710

0530 / 311

TIME

0945 / 311



AVG. DATA VALUES UNIT # 3

DATE	TIME	T(I)	P(I)	DT(I)	VP(I)	MASS(I)
311	0.00	77.069	68.352	0.000	0.401	687461.19
311	0.25	77.066	68.349	0.000	0.401	687432.38
311	0.32	77.067	68.348	0.000	0.401	687420.19
311	0.50	77.056	68.346	0.000	0.401	687410.06
311	0.75	77.038	68.342	0.000	0.401	687392.56
311	1.00	77.031	68.339	0.000	0.401	687372.06
311	1.25	77.023	68.334	0.000	0.402	687340.75
311	1.50	77.014	68.331	0.000	0.401	687321.38
311	1.75	77.003	68.329	0.000	0.401	687306.63
311	2.00	76.986	68.325	0.000	0.401	687296.94
311	2.25	76.982	68.323	0.000	0.400	687273.81
311	2.50	76.969	68.320	0.000	0.400	687260.56
311	2.75	76.962	68.316	0.000	0.401	687228.25
311	3.00	76.956	68.313	0.000	0.400	687213.06
311	3.25	76.945	68.310	0.000	0.400	687195.94
311	3.50	76.931	68.306	0.000	0.400	687174.75
311	3.75	76.929	68.304	0.000	0.400	687149.81
311	4.00	76.920	68.300	0.000	0.400	687125.38
311	4.25	76.913	68.297	0.000	0.400	687103.63

MASS POINT UNIT # 3

DATE	TIME	LAM	L95
311	0.00	0.0000	0.0000
311	0.25	0.0000	0.0000
311	0.32	0.4384	0.7872
311	0.50	0.3672	0.5085
311	0.75	0.3145	0.3987
311	1.00	0.2967	0.3458
311	1.25	0.3115	0.3460
311	1.50	0.3132	0.3370
311	1.75	0.3046	0.3240
311	2.00	0.2903	0.3111
311	2.25	0.2844	0.3018
311	2.50	0.2772	0.2932
311	2.75	0.2788	0.2922
311	3.00	0.2779	0.2892
311	3.25	0.2764	0.2862
311	3.50	0.2760	0.2845
311	3.75	0.2770	0.2845
311	4.00	0.2789	0.2857
311	4.25	0.2810	0.2873

APPENDIX D

INSTRUMENT SELECTION GUIDE CALCULATION

INSTRUMENT SELECTION GUIDE CALCULATION

Page 1 of 2

A. TEST PARAMETERS

$$L_a = 0.25\%/day$$

$$P = 68.6 \text{ psia}$$

$$T = 538^\circ \text{ R}$$

$$T_{dp} = 74.4^\circ \text{ F}$$

$$t = 24 \text{ hours}$$

B. INSTRUMENT PARAMETERS

1. Total Absolute Pressure

$$\text{No. of Sensors} = 2$$

$$\text{Range: } 0 - 100 \text{ psia}$$

$$\text{Sensor sensitivity error (E): } 0.005 \text{ psia}$$

$$\text{Measurement system error (e):}$$

$$\text{Resolution: } 0.0001 \text{ psia}$$

$$\text{Repeatability: } 0.005 \text{ psia}$$

$$e = \pm \sqrt{((0.0001)^2 + (0.005)^2)^{1/2}}$$

$$e = \pm 0.005001 \text{ psia}$$

$$e_p = \pm \sqrt{((0.005)^2 + (0.005001)^2)^{1/2}} / (2)^{1/2}$$

$$e_p = \pm 0.005001 \text{ psia}$$

2. Water Vapor Pressure

$$\text{No. of Sensors} = 10$$

$$\text{Sensor sensitivity error (E): } 0.1^\circ \text{ F}$$

$$\text{Measurement system error (e):}$$

$$\text{Resolution: } 0.01^\circ \text{ F}$$

$$\text{Repeatability: } 0.04^\circ \text{ F}$$

$$e = \pm \sqrt{((0.01)^2 + (0.04)^2)^{1/2}}$$

$$e = \pm 0.041^\circ \text{ F}$$

At a dewpoint of 74.4° F , the equivalent water vapor pressure change (as determined from steam tables, is $0.0142 \text{ psia}/^\circ \text{ F}$).

$$E = +/- 0.1^{\circ} \text{ F (0.0142 psia}/^{\circ} \text{ F)}$$

$$E = +/- 0.00142 \text{ psia}$$

$$e = +/- 0.041^{\circ} \text{ F (0.0142 psia}/^{\circ} \text{ F)}$$

$$e = +/- 0.00058 \text{ psia}$$

$$e_{pw} = +/- ((0.00142)^2 + (0.00058)^2)^{1/2} / (10)^{1/2}$$

$$e_{pw} = +/- 0.00048 \text{ psia}$$

3. Temperature

$$\text{No. of Sensors} = 24$$

$$\text{Sensor sensitivity error (E):} \quad 0.01^{\circ} \text{ F}$$

$$\text{Measurement system error (e):}$$

$$\text{Resolution:} \quad 0.01^{\circ} \text{ F}$$

$$\text{Repeatability:} \quad 0.054^{\circ} \text{ F}$$

$$e = +/- ((0.01)^2 + (0.054)^2)^{1/2}$$

$$e = +/- 0.055^{\circ} \text{ F} = +/- 0.055^{\circ} \text{ R}$$

$$e_T = +/- ((0.01)^2 + (0.055)^2)^{1/2} / (24)^{1/2}$$

$$e_T = +/- 0.011^{\circ} \text{ R}$$

4. Instrumentation Selection Guide Formula

$$\text{ISG} = +/- 2400/t (2(e_p/P)^2 + 2(e_{pw}/P)^2 + 2(e_T/T)^2)^{1/2}$$

$$\text{ISG} = +/- (2400/24) (2(0.005001/68.6)^2 + 2(0.00048/68.6)^2 + 2(0.011/538)^2)^{1/2}$$

$$\text{ISG} = +/- 0.0108 \%/\text{day}$$

APPENDIX E
GENERAL PHYSICS ILRT COMPUTER PROGRAM DESCRIPTION

DESCRIPTION OF GENERAL PHYSICS ILRT COMPUTER PROGRAM

The following paragraphs describe the various features and attributes of the General Physics ILRT Computer Program and the process used to certify it for each application.

REDUNDANCY

The General Physics ILRT team was equipped with two fully operational IBM compatible microcomputers during the ILRT and for on site data reduction and analysis. The computer software and hardware interfaced directly with the ILRT Measurement System Data Acquisition System (Fluke 2285B).

Two computers were brought on site for 100% redundancy, as each computer and its software is capable of independently performing the ILRT. The General Physics ILRT Computer Software is also capable of accepting manual input of raw sensor data and performing all required sensor data conversions if the data logger should cease to function. Each computer was equipped with back-up disks in the unlikely event of a disk "crash."

SECURITY

The General Physics ILRT Computer Program is written in QUICK BASIC. QUICK BASIC is a high level programming language which combines programming ease with user oriented command functions to create an easy to use and understand program. In order to increase speed of operation the program was then compiled into an executable command file. Compiling was accomplished using the Quick Basic Compiler. In addition to execution speed, this had the added benefit of making the program more secure as compiled programs cannot be edited or changed. The program requires a password to change modes of operation, start times, or enter the data editing routine to safeguard the integrity of the raw data files.

FEATURES

The program itself is designed to be a menu driven program consisting of five separate, menu driven operating modes. These are the:

1. Pressurization Mode
2. Stabilization Mode
3. Test Mode
4. Verification Mode
5. Depressurization Mode

These modes also correspond to the phases of the ILRT. Menu driven means that the user is presented with a list of options that the program can perform and from which the user can choose. It allows for interactive information exchange between the user and the computer and prevents invalid information or user mistakes from crashing the program. Program organization consists of a master menu which controls access to the seven operating modes chained to the individual menus which control these modes. The data processing, information display capabilities and function of each mode is as follows:

1. Pressurization Mode: All data reduction, graphic displays of average temperature, dewpoint, and corrected pressure.
2. Stabilization Mode: All data reduction, automatic comparison of data against ANSI 56.8 and BN-TOP-1 temperature stabilization criteria, notification when criteria is met, graphic displays of average temperature, dewpoint, and corrected pressure.
3. Test Mode: All data reduction, calculation of leakage rates using mass point, total time and point-to-point analysis techniques, display of trend report information required by BN-TOP-1, graphic display of average temperature, dewpoint, pressure and mass, as well as graphic display of mass point measured leakage, 95% UCL; total time measured and calculated leakage and the total time leakage rate at the 95% UCL (as calculated by BN-TOP-1), including a superimposed acceptance criteria line).
4. Verification Test Mode: With input of imposed leakage in SCFM automatically calculates and displays on graph and trend report the acceptance criteria band, plus all graphics displays available in test mode.
5. Depressurization Mode: All data and graphics capabilities of Pressurization Mode.

Other reduction and analysis capabilities of the General Physics ILRT computer program include:

1. Containment total pressure conversion from counts to psia (if required), and averaging.
2. Containment drybulb temperature weighted averaging and conversion to absolute units.
3. Containment dewpoint temperature weighted averaging (conversion from Foxboro dewcell element temperature to dewpoint temperature if required) and conversion to partial pressure of water vapor (psia).
4. Data storage of ILRT measurement system inputs for each data point.
5. Weight (mass) point calculations using the ideal gas law.
6. Automated Data Acquisition and/or Manual Data Entry.
7. Sensor performance and deviation information for sensor failure criteria, graphic display of individual sensor performance for selected operating mode.
8. Calculation of ISG formula at beginning of test; acceptance criteria based on number of sensors remaining and actual test duration.
9. Computer System Error Functions automatically checks for error in incoming data, printer or disk drive faults.

The computer program used by General Physics has been previously certified for six tests at the San Onofre Nuclear Generating Station and over a dozen other ILRTs. The initial certification required verification of the program through hand calculations and an independent review by Bechtel Power Corporation.

After modification for the Crystal River Unit 3 ILRT was completed, a calibration set of raw data was used to verify the program calculations prior to usage. Additionally, once the computer was linked to the data acquisition system and a complete data stream was available, the input function of each mode of the program was verified by comparing the data acquisition system output to the computer printout data point summary. A data set of known values were manually entered to verify proper calculation of average temperatures and relative humidities using the installed volume weighting fractions.

APPENDIX F

LOCAL LEAKAGE RATE TEST SUMMARIES

LEAK RATE TESTING SUMMARY			
DATE	DESCRIPTION	AS FOUND TOTAL OF TYPE B & C (sccm)	AS LEFT TOTAL OF TYPE B & C (sccm)
10/30/87	RF 6 "As Left"	-----	26,930.1
5/26/89	RCP Outage	58,290.8	40,076.7
6/13/89	Purge Valve Testing	40,076.7	37,583.7
6/30/89	As Found Purge Valve Testing	36,962.6	-----
7/10/89	As Left Purge Valve Testing	-----	37,417.7
8/28/89	As Found Purge Valve Testing	37,628.7	-----
10/2/89	As Left Purge Valve Testing	-----	37,672.7
11/16/89	Personnel Air Lock Testing	35,112.7	35,112.7
2/21/90	As Found & As Left Purge Valve Testing	36,176.7	35,348.7
6/14/90	RF 7 Testing	50,839.94	38,998.46
10/19/90	As Found & As Left Purge Valve Testing	38,920.46	39,204.46
12/17/90	As Found & As Left Purge Valve and Personnel Air Lock Testing	27,681.46	28,071.46
1/28/91	Update Total for Addition of Electrical Penetrations	28,464.43	28,464.43
6/10/91	Personnel Air Lock Testing	28,822.43	28,822.43
11/15/91	8M Outage Testing	45,699.57	46,958.27
11/19/91	Post Maintenance Testing of Personnel Air Lock	46,958.27	46,348.27

Note: $0.60 L_a = 265,286$ sccm

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

PENETRATION	SYSTEM	INBOARD ISOLATION VALVES (Leakage in sccm)					OUTBOARD ISOLATION VALVES (Leakage in sccm)					PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE
		VALVE #	AS FOUND	LEAKAGE / LEFT	ACTION VALUE	STATUS	VALVE #	AS FOUND	LEAKAGE / LEFT	ACTION VALUE	STATUS	AS FOUND VALUE	AS LEFT VALUE	
0305	RB LEAK RATE	LRV-73	30.0	30.0	9576	PASS	LRV-72	35.0	35.0	9576	PASS	35	35	3/27/90
0306L	RB LEAK RATE	LRV-70	57.7	57.7	9576	PASS	LRV-71	59.8	59.8	9576	PASS	60	60	3/25/90
110	STATION AIR	SAV-24	96.9	96.9	4786	PASS	SAV-122	1701.1	1701.1	4786	PASS	1701	1701	3/17/90
110	STATION AIR	SAV-24	1442.0	1442.0	4786	PASS	SAV-122	6300.0	471.0	4786	FAIL	6300	1442	5/5/89
111	INSTRUMENT AIR						IAV-28	20.0	20.0	3192	PASS	20	20	3/17/90
111	INSTRUMENT AIR						IAV-28	20.0	20.0	3192	PASS	20	20	3/17/89
112	INSTRUMENT AIR						IAV-29	49.2	49.2	3192	PASS	49	49	3/7/90
112	INSTRUMENT AIR						IAV-29	43.8	43.8	3192	PASS	44	44	2/26/89
113	AIR HANDLING	AHV-1C	590.0	1002.0	2500	PASS	AHV-1D			2500	PASS	590	1002	11/12/91
113	AIR HANDLING	AHV-1C	1185.0	590.0	2500	PASS	AHV-1D			2500	PASS	1185	590	11/02/91
113	AIR HANDLING	AHV-1C		912	2500	PASS	AHV-1D			2500	PASS		912	12/16/90
113	AIR HANDLING	AHV-1C	925.0		2500	PASS	AHV-1D			2500	PASS	925		12/12/90
113	AIR HANDLING	AHV-1C	657.0	913.0	2500	PASS	AHV-1D			2500	PASS	657	913	10/12/90
113	AIR HANDLING	AHV-1C	891.0	888.0	2500	PASS	AHV-1D			2500	PASS	891	888	6/11/90
113	AIR HANDLING	AHV-1C	988.0	1759.0	2500	PASS	AHV-1D			2500	PASS	988	1059	9/29/89
113	AIR HANDLING	AHV-1C		988.0	2500	PASS	AHV-1D			2500	PASS		988	9/2/89
113	AIR HANDLING	AHV-1C	993.0		2500	PASS	AHV-1D			2500	PASS	993		8/27/89
113	AIR HANDLING	AHV-1C		1008.0	2500	PASS	AHV-1D			2500	PASS		1008	7/3/89
113	AIR HANDLING	AHV-1C	972.0		2500	PASS	AHV-1D			2500	PASS	972		6/29/89
113	AIR HANDLING	AHV-1C	2250.0	829.0	2500	PASS	AHV-1D			2500	PASS	2250	829	6/12/89

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

TYPE C LLRT (valves, flanges)

TYPE C LLRT (valves, flanges)		INBOARD ISOLATION VALVES (Leakage in sccm)					OUTBOARD ISOLATION VALVES (Leakage in sccm)					PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE
PENETRATION	SYSTEM	VALVE #	LEAKAGE		ACTION VALUE	STATUS	VALVE #	LEAKAGE		ACTION VALUE	STATUS	AS FOUND VALUE	AS LEFT VALUE	
			AS FOUND	AS LEFT				AS FOUND	AS LEFT					
113	AIR HANDLING	AHV-1C		2250.0	2500	PASS	AHV-1D						2250	5/25/89
113	AIR HANDLING	AHV-1C	1400.0		2500	PASS	AHV-1D					1460		2/27/89
116	RB LEAK RATE	LRV-45	41.0	41.0	3192	PASS	LRV-46	221.0	221.0	1596	PASS	221	221	10/26/91
116	RB LEAK RATE	LRV-45	2.0	2.0	3192	PASS	LRV-46	69.4	69.4	1596	PASS	69	69	3/27/90
116	RB LEAK RATE	LRV-45	20.0	20.0	3192	PASS	LRV-46	295.0	295.0	1596	PASS	295	295	3/15/89
117	DEMIN WATER	DWV-162			4788	PASS	DWV-160	258.0	700.0	4788	PASS	258	700	11/1/91
117	DEMIN WATER	DWV-162	2.0	2.0	4788	PASS	DWV-160	188.2	188.2	4788	PASS	188	188	4/3/90
117	DEMIN WATER	DWV-162	6570.0	2190.0	4788	FAIL	DWV-160	537.0	281.0	4788	PASS	6570	2190	3/30/89
121	RB LEAK RATE						LRV-50	331.0	331.0	12768	PASS			
121	RB LEAK RATE						LRV-36	324.0	324.0	12768	PASS			
121	RB LEAK RATE						LRV-90	128.7	128.7	4788	PASS			
121	RB LEAK RATE						LRV-89	124.1	124.1	4788	PASS	460	460	3/27/90
121	RB LEAK RATE						LRV-50	116.0	116.0	12768	PASS			
121	RB LEAK RATE						LRV-36	134.9	134.9	12768	PASS			
121	RB LEAK RATE						LRV-90	117.6	117.6	4788	PASS			
121	RB LEAK RATE						LRV-89	118.6	118.6	4788	PASS	254	254	3/15/89
122	RB LEAK RATE						LRV-88			4788	PASS			
122	RB LEAK RATE						LRV-87	15.0	117.6	4788	PASS	15	118	11/11/91
122	RB LEAK RATE						LRV-88	20.0	20.0	4788	PASS			
122	RB LEAK RATE						LRV-87	20.0	20.0	4788	PASS	20	20	3/26/90
122	RB LEAK RATE						LRV-88	42.6	42.6	4788	PASS			
122	RB LEAK RATE						LRV-87	51.6	51.6	4788	PASS	52	52	3/15/89
123	CORE FLOOD	CFV-20	3820.0	374.0	1596	FAIL	CFV-28	13.0	13.0	1596	PASS	3820	374	3/21/90
123	CORE FLOOD	CFV-20	1587.0	1587.0	1596	PASS	CFV-28	41.4	41.4	1396	PASS	1587	1587	3/14/89
124	CORE FLOOD	CFV-17	336.0	189.0	1596	PASS	CFV-27	20.0	20.0	1596	PASS	336	189	3/21/90

LEAK RATE TESTING TRENIDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

TYPE C LLRT (valves, flanges)

PENETRATION	SYSTEM	INBOARD ISOLATION VALVES (Leakage in sccm)					OUTBOARD ISOLATION VALVES (Leakage in sccm)					PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE
		VALVE #	LEAKAGE		ACTION VALUE	STATUS	VALVE #	LEAKAGE		ACTION VALUE	STATUS	AS FOUND VALUE	AS LEFT VALUE	
			AS FOUND	AS LEFT			AS FOUND	AS LEFT						
124	CORE FLOOD	CFV-17	202.0	202.0	1596	PASS	CFV-27	20.0	20.0	1596	PASS	202	202	3/14/89
125	RB LEAK RATE						LRV-94	665.0	665.0	4788	PASS			
125	RB LEAK RATE						LRV-93	655.0	655.0	4788	PASS			
125	RB LEAK RATE						LRV-92	87.0	87.0	4788	PASS			
125	RB LEAK RATE						LRV-91	65.0	65.0	4788	PASS	752	752	3/28/90
125	RB LEAK RATE						LRV-94	1536.0	1536.0	4788	PASS			
125	RB LEAK RATE						LRV-93	1575.0	1575.0	4788	PASS			
125	RB LEAK RATE						LRV-92	286.0	286.0	4788	PASS			
125	RB LEAK RATE						LRV-91	285.0	285.0	4788	PASS	1861	1861	3/15/89
202	RB LEAK RATE						LRV-44	69.6	1089.0	3192	PASS	70	1089	11/11/91
202	RB LEAK RATE						LRV-44	20.2	20.2	3192	PASS	20	20	3/24/90
202	RB LEAK RATE						LRV-44	20.0	20.0	3192	PASS	20	20	3/15/89
206	INDUST. COOLING						CIV-41	82.0	82.0	3990	PASS	82	82	3/23/90
206	INDUST. COOLING						CIV-41	300.0	300.0	3990	PASS	300	300	3/1/89
207	INDUST. COOLING						CIV-40	15.0	15.0	3990	PASS	15	15	3/27/90
207	INDUST. COOLING						CIV-40	20.0	20.0	3990	PASS	20	20	3/1/89
305	RB LEAK RATE	LRV-70	20.6	20.6	9576	PASS	LRV-72	27.7	27.7	9576	PASS	26	26	3/29/89
306L	RB LEAK RATE	LRV-73	47.5	47.5	9576	PASS	LRV-71	52.5	52.5	9576	PASS	52	52	3/30/89
306W	CONT MONITORING	WSV-32	21.0	21.0	798	PASS	WSV-33	19.4	19.4	798	PASS			
306W	CONT MONITORING	WSV-28	18.3	18.3	798	PASS	WSV-29	14.5	14.5	798	PASS			
306W	CONT MONITORING	WSV-26	14.9	14.9	798	PASS	WSV-27	14.8	14.8	798	PASS	54	54	3/28/90
306W	CONT MONITORING	WSV-32	20.0	20.0	798	PASS	WSV-33	20.0	20.0	798	PASS			
306W	CONT MONITORING	WSV-28	20.0	20.0	798	PASS	WSV-29	20.0	20.0	798	PASS			
306W	CONT MONITORING	WSV-26	20.0	20.0	798	PASS	WSV-27	20.0	20.0	798	PASS	60	60	3/17/89

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

TYPE C LLRT (valves, flanges)		INBOARD ISOLATION VALVES (Leakage in sccm)					OUTBOARD ISOLATION VALVES (Leakage in sccm)					PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE
PENETRATION	SYSTEM	VALVE #	LEAKAGE AS FOUND / AS LEFT	ACTION VALUE	STATUS	VALVE #	LEAKAGE AS FOUND / AS LEFT	ACTION VALUE	STATUS	AS FOUND VALUE	AS LEFT VALUE			
314	MAIN STEAM					MSV-146	420.0 / 420.0	6384	PASS	420	420	10/19/91		
314	MAIN STEAM					MSV-146	12050.0 / 2100.0	6384	FAIL	12050	2100	3/21/90		
314	MAIN STEAM					MSV-146	1606.0 / 1606.0	6384	PASS	1606	1606	3/10/89		
315	CONT MONITORING	WSV-3	91.3 / 91.3	1596	PASS	WSV-4	73.3 / 73.3	1596	PASS	91	91	4/5/90		
315	CONT MONITORING	WSV-3	20.0 / 20.0	1596	PASS	WSV-4	20.0 / 20.0	1596	PASS	20	20	3/17/89		
316	MAIN STEAM					MSV-114	1030.0 / 1030.0	2394	PASS	1030	1030	10/18/91		
316	MAIN STEAM					MSV-114	5.0 / 5.0	2394	PASS	5	5	3/22/90		
316	MAIN STEAM					MSV-114	20.0 / 20.0	2394	PASS	20	20	3/9/89		
317	NITROGEN					NGV-81	750.0 / 750.0	2394	PASS	750	750	3/20/90		
317	NITROGEN					NGV-81	362.0 / 362.0	2394	PASS	362	362	3/17/89		
318	MAIN STEAM					MSV-128	20.0 / 20.0	6384	PASS	20	20	10/19/91		
318	MAIN STEAM					MSV-128	20.0 / 20.0	6384	PASS	20	20	3/20/90		
318	MAIN STEAM					MSV-128	20.0 / 20.0	6384	PASS	20	20	3/10/89		
320	MAIN STEAM					MSV-132	20.0 / 20.0	2394	PASS	20	20	10/18/91		
320	MAIN STEAM					MSV-132	1015.0 / 1015.0	2394	PASS	1015	1015	3/23/90		
320	MAIN STEAM					MSV-132	312.0 / 312.0	2394	PASS	312	312	3/9/89		
329	DECAY HEAT	DHV-93			3192	PASS	DHV-91	649.0 / 790.0	3192	PASS	649	790	11/1/91	
329	DECAY HEAT	DHV-93	20.0 / 20.0	3192	PASS	DHV-91	20.0 / 20.0	3192	PASS	20	20	3/22/90		
329	DECAY HEAT	DHV-93	20.0 / 20.0	3192	PASS	DHV-91	2.0 / 20.0	3192	PASS	20	20	4/3/89		
332	CONT MONITORING	WSV-5	7.8 / 7.8	1596	PASS	WSV-6	23.9 / 23.9	1596	PASS	24	24	4/5/90		
332	CONT MONITORING	WSV-5	20.0 / 20.0	1596	PASS	WSV-6	20.0 / 20.0	1596	PASS	20	20	3/17/89		

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
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TYPE C LLRT (valves, flanges)

PENETRATION	SYSTEM	INBOARD ISOLATION VALVES (Leakage in sccm)					OUTBOARD ISOLATION VALVES (Leakage in sccm)					PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE
		VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS	VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS	AS FOUND VALUE	AS LEFT VALUE	
333	MAKE UP	MUV-40	220.0	20.0	3900	PASS	MUV-49	1976.0	1976.0	3990	PASS			
333	MAKE UP	MUV-41	2340.0	1860.0	3990	PASS								
333	MAKE UP	MUV-505	353.0	23.8	4788	PASS						2913	1976	5/24/90
333	MAKE UP	MUV-40	160.0	175.3	3900	PASS	MUV-49	274.0	90.2	3990	PASS			
333	MAKE UP	MUV-41	100.0	256.0	3990	PASS								
333	MAKE UP	MUV-505	1857.0	1857.0	4788	PASS						2117	2288	5/10/89
339	WASTE DISPOSAL	WDV-3	1825.0	1178.0	6384	PASS	WDV-4	152.4	152.4	6384	PASS	1825	1178	6/7/90
339	WASTE DISPOSAL	WDV-3	2190.0	2190.0	6384	PASS	WDV-4	680.0	680.0	6384	PASS	2190	2190	3/21/89
347	SPENT FUEL	SFV-18			15960	PASS	SFV-19	13.6	13.6	15960	PASS	14	14	3/28/90
347	SPENT FUEL	SFV-18	62.7	62.7	15960	PASS	SFV-19	83.7	83.7	15960	PASS	84	84	3/11/89
349	WASTE DISPOSAL	WDV-60	227.0	1083.0	3192	PASS	WDV-61	234.0	234.0	3192	PASS	234	1083	5/9/90
349	WASTE DISPOSAL	WDV-60	20.0	20.0	3192	PASS	WDV-61	20.0	20.0	3192	PASS	20	20	3/21/89
350	CORE FLOOD	CFV-18	275.0	325.0	1596	PASS	CFV-26	172.0	172.0	1596	PASS	275	325	3/21/90
350	CORE FLOOD	CFV-18	649.0	649.0	1596	PASS	CFV-26	176.2	176.2	1596	PASS	649	649	3/14/89
351	CORE FLOOD	CFV-15	413.0	548.0	1596	PASS	CFV-29	431.0	431.0	2394	PASS			
351	CORE FLOOD	CFV-16	145.3	70.6	1596	PASS						558	619	3/21/90
351	CORE FLOOD	CFV-15	20.0	20.0	1596	PASS	CFV-23	20.0	20.0	2394	PASS			
351	CORE FLOOD	CFV-16	20.0	20.0	1596	PASS						40	40	3/11/89
352	CORE FLOOD	CFV-11	435.0	20.0	1596	PASS	CFV-42	640.0	20.0	1596	PASS			
352	CORE FLOOD	CFV-12	740.0	20.0	1596	PASS						1175	40	3/20/90
352	CORE FLOOD	CFV-11	20.0	20.0	1596	PASS	CFV-42	20.0	20.0	1596	PASS			
352	CORE FLOOD	CFV-12	20.0	20.0	1596	PASS						40	40	3/11/89
354	WASTE DISPOSAL	WDV-406	1130.0	237.0	2394	PASS	WDV-405	1172.0	227.0	2394	PASS	1172	237	5/25/90
354	WASTE DISPOSAL	WDV-406	1574.0	1574.0	2394	PASS	WDV-405	749.0	749.0	2394	PASS	1574	1574	3/20/89

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PENETRATION	SYSTEM	INBOARD ISOLATION VALVES (Leakage in sccm)					OUTBOARD ISOLATION VALVES (Leakage in sccm)					PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE
		VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS	VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS	AS FOUND VALUE	AS LEFT VALUE	
355	NITROGEN						NGV-62	1670.0	1670.0	2394	PASS	1670	1670	3/20/90
355	NITROGEN						NGV-62	877.0	877.0	2394	PASS	877	877	3/17/89
356	CONT MONITORING	WSV-1	16.0	16.0	1596	PASS	WSV-2	15.4	15.4	1596	PASS			
356	CONT MONITORING	WSV-34	16.1	16.1	798	PASS	WSV-35	15.7	15.7	798	PASS			
356	CONT MONITORING	WSV-30	16.0	16.0	798	PASS	WSV-31	15.6	15.6	798	PASS			
356	CONT MONITORING	WSV-38	15.7	15.7	798	PASS	WSV-39	15.8	15.8	798	PASS	64	64	3/28/90
356	CONT MONITORING	WSV-1	20.0	20.0	1596	PASS	WSV-2	20.0	20.0	1596	PASS			
356	CONT MONITORING	WSV-34	20.0	20.0	798	PASS	WSV-35	20.0	20.0	798	PASS			
356	CONT MONITORING	WSV-30	20.0	20.0	798	PASS	WSV-31	20.0	20.0	798	PASS			
356	CONT MONITORING	WSV-38	20.0	20.0	798	PASS	WSV-39	20.0	20.0	798	PASS	80	80	3/16/89
357	AIR HANDLING	AHV-1B	978.0	710.0	2550	PASS	AHV-1A					978	710	11/13/91
357	AIR HANDLING	AHV-1B	866.0	978.0	2550	PASS	AHV-1A					866	978	11/04/91
357	AIR HANDLING	AHV-1B		1317.0	2550	PASS	AHV-1A						1317	12/16/90
357	AIR HANDLING	AHV-1B	914.0		2550	PASS	AHV-1A					914		12/12/90
357	AIR HANDLING	AHV-1B	1003.0	1031.0	2550	PASS	AHV-1A					1003	1031	10/12/90
357	AIR HANDLING	AHV-1B	775.0	850.0	2550	PASS	AHV-1A					775	850	6/10/90
357	AIR HANDLING	AHV-1B	819.0	797.0	2500	PASS	AHV-1A					819	797	9/29/89
357	AIR HANDLING	AHV-1B		1143.0	2500	PASS	AHV-1A						1143	9/2/89
357	AIR HANDLING	AHV-1B	819.0		2500	PASS	AHV-1A					819		8/27/89
357	AIR HANDLING	AHV-1B		593.0	2500	PASS	AHV-1A						593	7/3/89
357	AIR HANDLING	AHV-1B	173.9		2500	PASS	AHV-1A					174		6/29/89
357	AIR HANDLING	AHV-1B	2010.0	938.0	2500	PASS	AHV-1A					2010	938	6/12/89
357	AIR HANDLING	AHV-1B		2010.0	2500	PASS	AHV-1A						2010	5/25/89
357	AIR HANDLING	AHV-1B	1017.0		2500	PASS	AHV-1A					1017		2/27/89

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PENETRATION	SYSTEM	INBOARD ISOLATION VALVES (Leakage in sccm)				OUTBOARD ISOLATION VALVES (Leakage in sccm)				PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE		
		VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS	VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS		AS FOUND VALUE	AS LEFT VALUE
366	INDUST. COOLING						CV-34	15.0	15.0	3990	PASS	15	15	3/23/90
366	INDUST. COOLING						CV-34	100.0	100.0	3990	PASS	100	100	3/2/89
367	INDUST. COOLING						CV-35	650.0	650.0	3990	PASS	650	650	3/23/90
367	INDUST. COOLING						CV-35	326.0	326.0	3990	PASS	326	326	3/2/89
372	NITROGEN						NGV-82	37.0	37.0	1596	PASS	37	37	3/20/90
372	NITROGEN						NGV-82	167.4	167.4	2394	PASS	167	167	3/17/89
373	CORE FLOOD	CFV-19	1472.0	236.0	1596	PASS	CFV-25	190.4	190.4	1596	PASS	1472	236	3/21/90
373	CORE FLOOD	CFV-19	312.0	312.0	1596	PASS	CFV-25	470.0	470.0	1596	PASS	470	470	3/14/89
374	WASTE DISPOSAL	WDV-94	20.0	885.0	4788	PASS	WDV-62	20.0	20.0	4788	PASS	20	885	3/26/90
374	WASTE DISPOSAL	WDV-94	20.0	20.0	4788	PASS	WDV-62	255.0	255.0	4788	PASS	255	255	3/18/89
376	CONT MONITORING	WSV-41	7.3	7.3	798	PASS	WSV-40	8.1	8.1	798	PASS			
376	CONT MONITORING	WSV-42	5.2	5.2	798	PASS	WSV-43	7.0	7.0	798	PASS	15	15	3/28/90
376	CONT MONITORING	WSV-41	20.0	20.0	798	PASS	WSV-40	20.0	20.0	798	PASS			
376	CONT MONITORING	WSV-42	20.0	20.0	798	PASS	WSV-43	20.0	20.0	798	PASS	40	40	3/17/89
377	MAKE UP	MUV-260			1596	PASS	MUV-253	20.0	20.0	1596	PASS			
377	MAKE UP	MUV-261			1596	PASS								
377	MAKE UP	MUV-259			1596	PASS								
377	MAKE UP	MUV-258			1596	PASS						1451	1451	10/14/91
377	MAKE UP	MUV-260	146.7	1088.0	1596	PASS	MUV-253	564.0	564.0	1596	PASS			
377	MAKE UP	MUV-261	20.0	194.7	1596	PASS								
377	MAKE UP	MUV-259	2.0	20.0	1596	PASS								
377	MAKE UP	MUV-258	122.4	147.8	1596	PASS						564	1451	5/4/90
377	MAKE UP	MUV-260	65.2	20.0	1596	PASS	MUV-253	126.0	126.0	1596	PASS			
377	MAKE UP	MUV-261	20.0	20.0	1596	PASS								
377	MAKE UP	MUV-259	22.4	22.4	1596	PASS								
377	MAKE UP	MUV-258	411.0	411.0	1596	PASS						519	473	3/30/89

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

TYPE C LLRT (valves, flanges)

PENETRATION		SYSTEM		INBOARD ISOLATION VALVES (Leakage in sccm)				OUTBOARD ISOLATION VALVES (Leakage in sccm)				PENETRATION PATH LEAKAGE (sccm)		ACTUAL DATE
				VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS	VALVE #	AS FOUND	AS LEFT	ACTION VALUE	STATUS	
425	CHEM. ADDITION	CAV-433	32.0	32.0	598	PASS	CAV-435	30.0	30.0	598	PASS			
425	CHEM. ADDITION	CAV-434	250.0	250.0	598	PASS	CAV-436	250.0	250.0	598	PASS	282	282	3/22/90
425	CHEM. ADDITION	CAV-433	108.6	108.6	598	PASS	CAV-435	106.8	106.8	598	PASS			
425	CHEM. ADDITION	CAV-434	109.9	109.9	598	PASS	CAV-436	109.2	109.2	598	PASS	219	219	3/8/89
427	MAIN STEAM						MSV-130	605.0	605.0	4788	PASS	605	605	10/17/91
427	MAIN STEAM						MSV-130	200.0	200.0	4788	PASS	200	200	3/19/90
427	MAIN STEAM						MSV-130	106.2	106.2	4788	PASS	106	106	3/6/89
428	MAIN STEAM						MSV-148	1255.0	1255.0	4788	PASS	1255	1255	10/17/91
428	MAIN STEAM						MSV-148	345.0	345.0	4788	PASS	345	345	3/19/90
428	MAIN STEAM						MSV-148	882.0	882.0	4788	PASS	882	882	3/6/89
430	FIRE SERVICE	FSV-262	1400.0	1400.0	6384	PASS	FSV-261	1850.0	1850.0	6384	PASS	1850	1850	3/19/90
430	FIRE SERVICE	FSV-262	25.4	25.4	6384	PASS	FSV-261	40.5	40.5	6384	PASS	40	40	3/25/89
439	CHEM. ADDITION	CAV-126			598	PASS	CAV-2	760.0	210.0	1596	PASS			
439	CHEM. ADDITION	CAV-1			598	PASS	CAV-431	20.0	20.0	598	PASS			
439	CHEM. ADDITION	CAV-3			598	PASS	CAV-432	20.0	20.0	598	PASS			
439	CHEM. ADDITION	CAV-429	129.0	129.0	598	PASS								
439	CHEM. ADDITION	CAV-430	14.0	14.0	598	PASS						800	356	10/17/91
439	CHEM. ADDITION	CAV-126	20.0	47.4	598	PASS	CAV-2	20.0	20.0	1596	PASS			
439	CHEM. ADDITION	CAV-1	20.0	96.4	598	PASS	CAV-431	20.0	20.0	598	PASS			
439	CHEM. ADDITION	CAV-3	20.0	68.9	598	PASS	CAV-432	20.0	20.0	598	PASS			
439	CHEM. ADDITION	CAV-429	48.0	48.0	598	PASS								
439	CHEM. ADDITION	CAV-430	260.0	260.0	598	PASS						368	521	4/4/90
439	CHEM. ADDITION	CAV-126	100.0	20.0	598	PASS	CAV-2	412.0	412.0	1596	PASS			
439	CHEM. ADDITION	CAV-1	1678.0	20.0	598	FAIL	CAV-431	1194.0	580.0	598	FAIL			
439	CHEM. ADDITION	CAV-3	2670.0	190.0	598	FAIL	CAV-432	10200.0	136.0	598	FAIL			
439	CHEM. ADDITION	CAV-429	100.0	100.0	598	PASS								
439	CHEM. ADDITION	CAV-430	100.0	100.0	598	PASS						11806	1128	4/23/89

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

TYPE B LLRT (Resilient seals, gaskets, sealant compounds, expandable bellows and flexible seal assemblies)

PENETRATION	DESCRIPTION	MEASURED VALUES				TEST TYPE	ACCEPTANCE CRITERIA ACTION VALUE (sccm)	ACTUAL DATE
		AS FOUND	STATUS	AS-LEFT	STATUS			
348	FUEL TRANSFER TUBE GASKET - 3B	20	PASS	20	PASS	INLK	100	3/1/89
436	FUEL TRANSFER TUBE GASKET - 3A	20	PASS	20	PASS	INLK	100	3/1/89
120	SG CHEMICAL CLEANING GASKETS	48	PASS	48	PASS	INLK	100	3/1/89
119	SG CHEMICAL CLEANING GASKETS	20	PASS	20	PASS	INLK	100	3/28/89
EHR5	EQUIPMENT HATCH RESILIENT SEALS	212	PASS	5	PASS	INLK	500	5/23/89
RAX-2	EQUIPMENT HATCH	10240	PASS	10240	PASS	INLK	10721	5/24/89
RAX-1	PERSONNEL HATCH	1940	PASS	1940	PASS	INLK	10721	5/26/89
RAX-1	PERSONNEL HATCH	8500	PASS	8500	PASS	INLK	20721	11/15/89
RAX-2	EQUIPMENT HATCH	1120	PASS	1120	PASS	INLK	20721	11/16/89
134	LOW VOLTAGE DC INSTRUMENT CONTROL RODS	2	PASS	2	PASS	INLK	100	4/18/90
135	RB LIGHTS SMALL AC-DC MOTORS	2	PASS	2	PASS	INLK	100	4/18/90
301	CRD POWER SUPPLY	20	PASS	20	PASS	INLK	100	4/18/90
302	CRD POWER SUPPLY	20	PASS	20	PASS	INLK	100	4/18/90
303	CRD POWER SUPPLY	20	PASS	20	PASS	INLK	100	4/18/90
309	VENT FAN 3C	20	PASS	20	PASS	INLK	100	4/18/90
127	CRANE/ELEVATOR POWER SUPPLY	6	PASS	6	PASS	INLK	100	4/19/90
130	MISC. INSTRUMENTATION	6	PASS	6	PASS	INLK	100	4/19/90
133	MISC. INSTRUMENTATION	5	PASS	5	PASS	INLK	100	4/19/90
208	RCP-3B1 POWER SUPPLY	2	PASS	2	PASS	INLK	100	4/19/90
209	RCP-3B1 POWER SUPPLY	4	PASS	4	PASS	INLK	100	4/19/90
210	RCP-3B2 POWER SUPPLY	4	PASS	4	PASS	INLK	100	4/19/90
211	RCP-3B2 POWER SUPPLY	4	PASS	4	PASS	INLK	100	4/19/90

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

TYPE B LLRT (Resilient seals, gaskets, sealant compounds, expandable bellows and flexible seal assemblies)

PENETRATION	DESCRIPTION	MEASURED VALUES				TEST TYPE	ACCEPTANCE CRITERIA ACTION VALUE (ccm)	ACTUAL DATE
		AS FOUND	STATUS	AS-LEFT	STATUS			
212	LOW VOLTAGE DC INSTRUMENT CONTROL RODS	4	PASS	4	PASS	INLK	100	4/19/90
213	LOW VOLTAGE DC INSTRUMENT CONTROL RODS	4	PASS	4	PASS	INLK	100	4/19/90
214	LOW VOLTAGE DC INSTRUMENT CONTROL RODS	2	PASS	2	PASS	INLK	100	4/19/90
215	LOW VOLTAGE DC INSTRUMENT CONTROL RODS	2	PASS	2	PASS	INLK	100	4/19/90
307	CRD POWER SUPPLY	20	PASS	20	PASS	INLK	100	4/19/90
308	ES A-B CONTROL CIRCUIT	20	PASS	20	PASS	INLK	100	4/19/90
101	PZR. HEATER POWER SUPPLY	6	PASS	6	PASS	INLK	100	4/20/90
102	PZR. HEATER POWER SUPPLY	5	PASS	5	PASS	INLK	100	4/20/90
103	PZR. HEATER POWER SUPPLY	2	PASS	2	PASS	INLK	100	4/20/90
104	E.S. "B" CONTROL CIRCUITS	4	PASS	4	PASS	INLK	100	4/20/90
126	VENT FAN 3B	3	PASS	3	PASS	INLK	100	4/20/90
126	THERMOCOUPLES	2	PASS	2	PASS	INLK	100	4/20/90
129	MISC. INSTRUMENTATION	2	PASS	2	PASS	INLK	100	4/20/90
132	MISC. INSTRUMENTATION	5	PASS	5	PASS	INLK	100	4/20/90
401	RCP-3A2 POWER SUPPLY	2	PASS	2	PASS	INLK	100	4/20/90
402	RCP-3A2 POWER SUPPLY	4	PASS	4	PASS	INLK	100	4/20/90
403	RCP-3A1 POWER SUPPLY	6	PASS	6	PASS	INLK	100	4/20/90
404	RCP-3A1 POWER SUPPLY	2	PASS	2	PASS	INLK	100	4/20/90
405	INCORE INSTRUMENTATION	20	PASS	20	PASS	INLK	100	4/20/90
407	INCORE & OUT OR CORE INSTRUMENTATION	20	PASS	20	PASS	INLK	100	4/20/90
408	IN-CORE COAX CABLES	20	PASS	20	PASS	INLK	100	4/20/90
409	THERMOCOUPLES	20	PASS	20	PASS	INLK	100	4/20/90

LEAK RATE TESTING TRENDING PROGRAM
FOR FLORIDA POWER CORPORATION - CRYSTAL RIVER UNIT 3
(2ND INTERVAL)

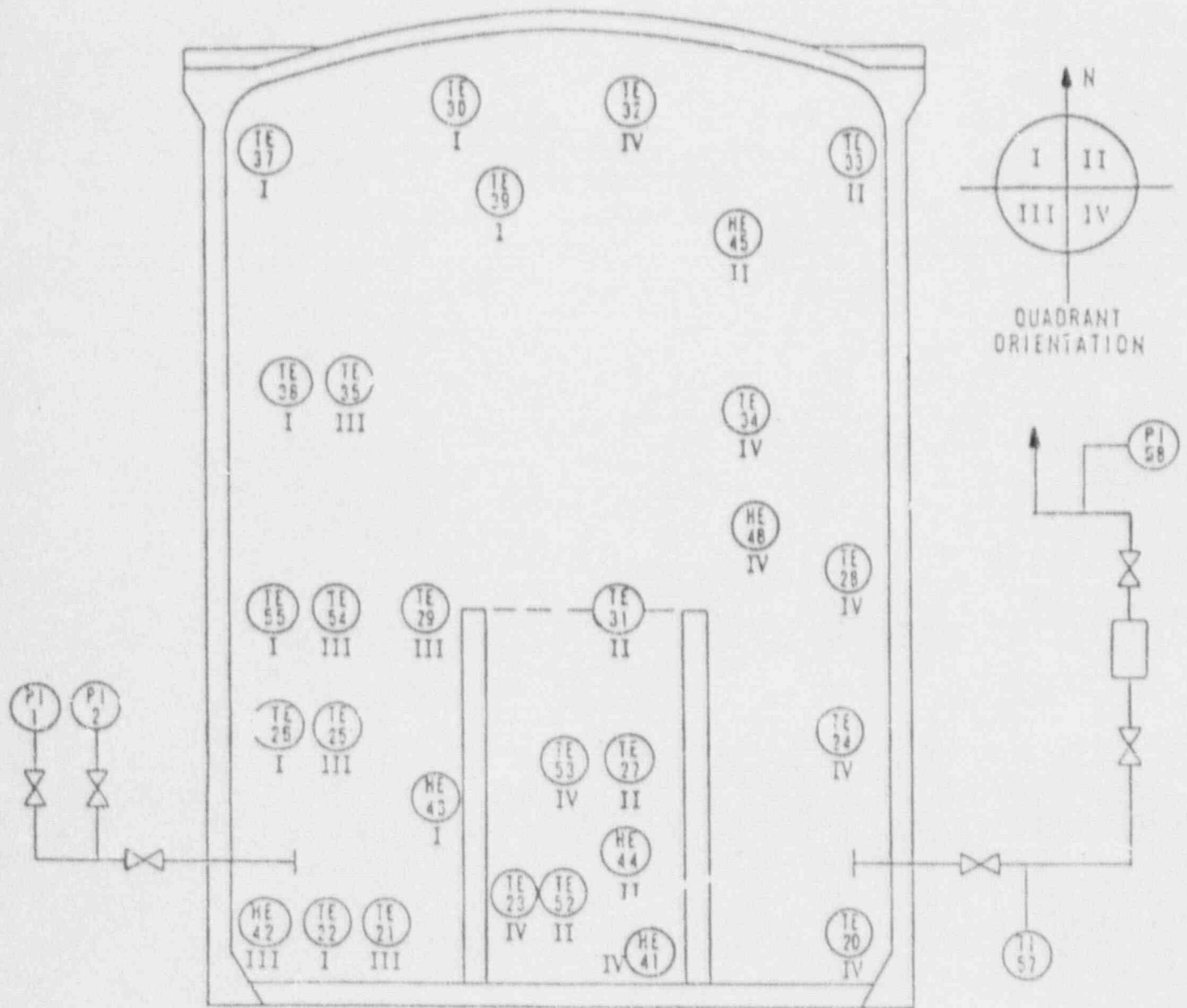
TYPE B LLRT (Resilient seals, gaskets, sealant compounds, expandable bellows and flexible seal assemblies)

PENETRATION	DESCRIPTION	MEASURED VALUES				TEST TYPE	ACCEPTANCE CRITERIA ACTION VALUE (sccm)	ACTUAL DATE
		AS FOUND	STATUS	AS-LEFT	STATUS			
410	ES 'A' CONTROL CIRCUITS	20	PASS	20	PASS	INLK	100	4/20/90
411	ES 'A' CONTROL CIRCUITS	20	PASS	20	PASS	INLK	100	4/20/90
412	VENT FAN 3A	20	PASS	20	PASS	INLK	100	4/20/90
406	ELECTRICAL PENETRATION	40	PASS	40	PASS	INLK	100	4/25/90
413	THERMOCOUPLES	2	PASS	2	PASS	INLK	100	4/25/90
RAX-1	PERSONNEL HATCH	8500	PASS	1042	PASS	INLK	20721	6/12/90
RAX-2	EQUIPMENT HATCH	1120	PASS	12380	PASS	INLK	20721	6/13/90
119	SG CHEMICAL CLEANING GASKETS	62	PASS	20	PASS	INLK	100	6/1/90
120	SG CHEMICAL CLEANING GASKETS	87	PASS	27	PASS	INLK	100	6/4/90
348	FUEL TRANSFER TUBE GASKET - 3B	15	PASS	20	PASS	INLK	100	6/8/90
436	FUEL TRANSFER TUBE GASKET - 3A	7	PASS	20	PASS	INLK	100	6/8/90
EHR5	EQUIPMENT HATCH RESILIENT SEALS	20	PASS	20	PASS	INLK	500	6/12/90
RAX-2	EQUIPMENT HATCH	982	PASS	982	PASS	INLK	20721	12/10/90
RAX-1	PERSONNEL HATCH	1022	PASS	1022	PASS	INLK	20721	12/11/90
RAX-1	PERSONNEL HATCH	1404	PASS	1404	PASS	INLK	20721	6/5/91
RAX-2	EQUIPMENT HATCH	958	PASS	958	PASS	INLK	20721	6/6/91
EHR5	EQUIPMENT HATCH RESILIENT SEALS	20	PASS	170	PASS	INLK	500	11/4/91
348	FUEL TRANSFER TUBE GASKET - 3B	20	PASS	20	PASS	INLK	100	10/13/91
436	FUEL TRANSFER TUBE GASKET - 3A	20	PASS	20	PASS	INLK	100	10/13/91
119	SG CHEMICAL CLEANING GASKETS	20	PASS	20	PASS	INLK	100	10/13/91
120	SG CHEMICAL CLEANING GASKETS	20	PASS	20	PASS	INLK	100	10/13/91
EHR5	EQUIPMENT HATCH RESILIENT SEALS	170	PASS	362	PASS	INLK	500	11/13/91

APPENDIX C

SENSOR LOCATIONS AND VOLUME FRACTIONS

APPENDIX A
SCHEMATIC ARRANGEMENT OF TEST INSTRUMENTATION



INSTALLED CONSTANTS

RTD WEIGHT FACTORS

RTD 1	WEIGHT FACTOR	= 0.036800
RTD 2	WEIGHT FACTOR	= 0.036800
RTD 3	WEIGHT FACTOR	= 0.036700
RTD 4	WEIGHT FACTOR	= 0.013500
RTD 5	WEIGHT FACTOR	= 0.058800
RTD 6	WEIGHT FACTOR	= 0.058800
RTD 7	WEIGHT FACTOR	= 0.058800
RTD 8	WEIGHT FACTOR	= 0.016500
RTD 9	WEIGHT FACTOR	= 0.054700
RTD 10	WEIGHT FACTOR	= 0.054700
RTD 11	WEIGHT FACTOR	= 0.063800
RTD 12	WEIGHT FACTOR	= 0.054700
RTD 13	WEIGHT FACTOR	= 0.063700
RTD 14	WEIGHT FACTOR	= 0.036100
RTD 15	WEIGHT FACTOR	= 0.036100
RTD 16	WEIGHT FACTOR	= 0.036100
RTD 17	WEIGHT FACTOR	= 0.036100
RTD 18	WEIGHT FACTOR	= 0.036100
RTD 19	WEIGHT FACTOR	= 0.036000
RTD 20	WEIGHT FACTOR	= 0.036000
RTD 21	WEIGHT FACTOR	= 0.016500
RTD 22	WEIGHT FACTOR	= 0.013500
RTD 23	WEIGHT FACTOR	= 0.054600
RTD 24	WEIGHT FACTOR	= 0.054600

RTD WEIGHTING FACTOR SUM		= 1.000000

PRESSURE GAUGE WEIGHT FACTORS

PRESS. GAUGE # 1	WEIGHT FACTOR	= 0.5000
PRESS. GAUGE # 2	WEIGHT FACTOR	= 0.5000

PRESS. GAUGE WEIGHTING FACTOR SUM		= 1.0000

DEW CELL WEIGHT FACTORS

DEW CELL 1	WEIGHT FACTOR	= 0.027000
DEW CELL 2	WEIGHT FACTOR	= 0.110300
DEW CELL 3	WEIGHT FACTOR	= 0.176400
DEW CELL 4	WEIGHT FACTOR	= 0.033000
DEW CELL 5	WEIGHT FACTOR	= 0.126700
DEW CELL 6	WEIGHT FACTOR	= 0.126700
DEW CELL 7	WEIGHT FACTOR	= 0.126600
DEW CELL 8	WEIGHT FACTOR	= 0.091100
DEW CELL 9	WEIGHT FACTOR	= 0.091100
DEW CELL 10	WEIGHT FACTOR	= 0.091100

DEW CELL WEIGHTING FACTOR SUM		= 1.000000

CONTAINMENT VOLUME	= 2000000
LA	= 0.25