

ILLINOIS POWER

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U- 601847
L30- (07-10)LP
1A.120

July 10, 1991

10CFR50.54(o)
10CFR50 Appendix J, V.B

Docket No. 50-461

Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Clinton Power Station - Unit 1
Reactor Containment Building Integrated Leak Rate Test

Dear Sir:

Please find enclosed the Reactor Containment Building Integrated Leak Rate Test (ILRT) report for the ILRT completed at Clinton Power Station (CPS) on February 16, 1991 during the last refueling outage. The ILRT was successful in confirming the leak tightness of the containment. However, as explained further below, the test must technically be regarded as a failure because the as-found leakage rates for two containment penetrations, which should have been considered in the total integrated leakage, were not determined prior to reworking the penetrations during the refueling outage. Please note also that, via this letter, since the ILRT is regarded as a failure, IP is requesting NRC approval of the schedule for performance of the next ILRT in accordance with Technical Specification and 10CFR50 Appendix J requirements.

During the last refueling outage (RF-2) it was determined that a number of penetrations had not been properly tested in accordance with the Type B and C testing requirements of 10CFR50 Appendix J. These penetrations involved either (1) piping which did not terminate deep enough in the suppression pool such that it would remain submerged under accident conditions, or (2) piping containing flanged connections which also were not submerged or located deep enough in the suppression pool. These penetrations were not previously considered to be potential air leakage pathways. Since they were considered to be water sealed pathways, these penetrations had previously been tested only with water. During the RF-2 outage, it was determined that these penetrations did constitute potential air leakage pathways.* This determination required that these penetrations receive a local leak rate test with air to determine

* These discrepancies were subsequently addressed in NRC Inspection Reports 90-025 and 91-002, and in Licensee Event Report 90-018.

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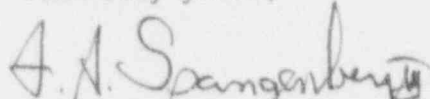
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their as-found (pre-ILRT) leakages prior to any rework or modification. However, maintenance was performed on certain potential leakage pathways associated with two of the penetrations, MC-18 and MC-87, prior to determining that the penetrations constituted air leakage pathways. No as-found leakage test data was therefore available for these two penetrations. Based upon this indeterminate leakage, the ILRT completed on February 16, 1991 is considered to be a failure relative to the as-found condition of the containment.

It should be noted that, notwithstanding the failure to obtain the as-found leakages described above, the RF-2 ILRT was generally regarded as successful as a relatively large margin was shown to exist between the as-found ILRT leakage and the allowable leakage limit (excluding the unknown as-found leakages). IP believes that if the above-noted, as-found leakages had been determined, the total as-found leakage would still have been well within the allowable leakage limit. This conclusion is based on past test experience with valves and flanges similar to those associated with penetrations MC-18 and MC-87, no visible indications of gross leakage from the affected valves and flanges (based on their general condition), and acceptable local leak rate test results obtained for the remaining leakage pathways associated with these penetrations.

Regarding ILRT failures, CPS Technical Specification 4.6.1.2.b and 10CFR50 Appendix J (Section III.A.6) require that the NRC approve the scheduling of the next ILRT after any failure and that the testing frequency be increased to at least once per 18 months after two consecutive failures, until two consecutive tests are completed with satisfactory results. With respect to the former, IP is hereby requesting NRC approval of the schedule for performance of the next ILRT. The next ILRT is scheduled to be performed during the fourth refueling outage (RF-4) which is currently scheduled to begin October 3, 1993. With respect to the latter, IP understands the potential impact of determining that the RF-2 ILRT was an unsatisfactory test. If the RF-4 ILRT yields unsatisfactory results, IP will address the requirement to perform subsequent ILRTs at an increased frequency at that time.

Sincerely yours,



F. A. Spangenberg, III
Manager, Licensing and Safety

TBE/alh

Enclosure

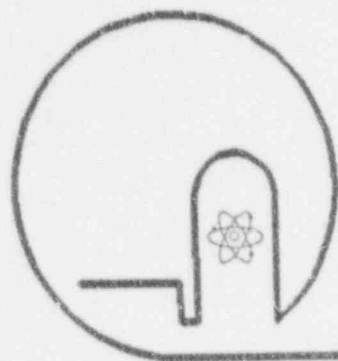
cc: NRC Clinton Licensing Project Manager
NRC Resident Office
NRC Region III, Regional Administrator
Illinois Department of Nuclear Safety

***Clinton
Power Station
Unit 1***

Illinois Power Company

*Reactor Containment Building
Integrated Leak Rate Test*

Final Report February 1991



NRC Docket No. 50-461

ILLINOIS POWER COMPANY

CLINTON POWER STATION

UNIT 1

REACTOR CONTAINMENT BUILDING

INTEGRATED LEAK RATE TEST

FINAL REPORT

NRC Docket No.
50-461

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ACRONYMS

ANS	American Nuclear Society
ANSI	American National Standard Institute
BWR	Boiling Water Reactor
cu.ft.	Cubic Foot (Feet)
F.S.	Full Scale
FC	Fuel Pool Cooling System
ILRT	Integrated Leak Rate Test
ISG	Instrument Selection Guide
La	Containment Allowable Leakage
Lam	Containment Measured Leakage
lbm	Pounds Mass
LLRT	Local Leak Rate Test
LOCA	Loss of Coolant Accident
LPCS	Low Pressure Core Spray
MOVATS	Motor Operated Valve Analysis and Testing System
MSIV	Main Steam Isolation Valve
MWR	Maintenance Work Request
Ops	Operations
P&IDs	Reference Drawings
PCC	Post Calibration Check
PMT	Post Maintenance Test
psia	Pounds per Square Inch Absolute
psig	Pounds per Square Inch Gauge
RF	Refueling Outage
RHR	Residual Heat Removal System
RTD	Temperature Element
sccm	Standard Cubic Centimeters per Minute
scfm	Standard Cubic Feet per Minute
TPD	Temporary Procedure Deviation
UCL	Upper Confidence Limit
USAR	Updated Safety Analysis Report
°F	Degrees Fahrenheit

2.0 TEST SYNOPSIS

Prior to performing the integrated leakage rate tests, all pressure, temperature, humidity, and flow sensors were calibrated, and all temperature and humidity sensors were installed in the drywell and containment at the locations tabulated in Table 1 of Section 3.0. An in-situ check was performed on all sensors per the requirements of ANSI/ANS 56.8 - 1981. Per the requirements of 10CFR50, Appendix J, the containment was isolated by aligning systems in their specified post-accident modes, with the exceptions listed in Section 3.C.12 of this report. On February 7 and 8, 1991, a pre-ILRT Containment and Drywell structural inspection was conducted. No abnormal degradation or change in appearance was noted.

Pressurization for the Containment ILRT began at 0145 hours on February 15, 1991. ILRT test pressure of 9 psig was reached at 0715 hours, February 15, 1991. Temperature stabilization commenced at 0715, February 15, 1991 and was completed 4.25 hours later. Temperature stabilization data is presented in Appendix B. Subsequent to the temperature stabilization period, an 8.00 hour ILRT was conducted from 1130 hours on February 15, 1991, to 1930 hours on February 15, 1991. The Mass Point calculated leakage rate was 0.1400%/day with an upper confidence limit of 0.1447%/day. The Total Time calculated leakage rate was 0.1339%/day with an upper confidence limit of 0.1865%/day. Both upper confidence limits were less than the allowable leakage rate of 0.4875%/day (75% of L_a). The Total Time calculations satisfied all short duration test requirements of BN-TOP-1, and the Mass Point calculations satisfied all short duration test requirements of ANSI/ANS 56.8-1981.

During the pressurization, the penetration LMC-52 (FC supply) vent path filled with water thus eliminating the drained vent path required by 10CFR50, Appendix J. The penetration was left in the test lineup and a local leakage rate test (LLRT) was performed following completion of the ILRT. The results of this LLRT are included in Section 4.0.

The verification test was initiated at 2000 hours on February 15, 1991 by continuously venting 13.10 scfm (97% of L_a) of air from the containment through a flowmeter and allowing test conditions to stabilize for one hour. A 4-hour verification test was conducted from 2100 hours on February 15, 1991 to 0100 hours on February 16, 1991. The Mass Point calculated and Total Time calculated verification leakage rates of 0.7390%/day and 0.7275%/day respectively, were within the required ranges of 0.6095 to 0.9345 and 0.6034 to 0.9284 %/day respectively, to verify the performance of the ILRT instrumentation.

Following the verification test, the drywell was depressurized to 3 psig and the containment was depressurized to 0 psig. The Drywell Bypass Leakage Rate Test was performed between 1545 and 2045 hours on February 16, 1991 at a test pressure of 3 psig. A drywell bypass leakage rate of 21.86 scfm was calculated from the pressure decay test. The calculated leakage satisfied the acceptance criteria of being less than 4,312 scfm. The data and pressure decay leakage rate calculations are presented in Appendix H. Following the Drywell Bypass Leakage Rate Test, the drywell was depressurized.

1.0 INTRODUCTION

Successful Integrated Leakage Rate (ILRT) and Drywell Bypass Leakage Rate (Bypass) tests were conducted on the Clinton Power Station Unit 1 reactor containment building between February 15 and 16, 1991, with restoration completed by March 2, 1991. These tests were performed to demonstrate that the containment leakage and drywell bypass leakage rates do not exceed the allowable values specified in the Clinton Power Station (CPS) Unit 1 Updated Safety Analysis Report (USAR) (Reference 1) and Technical Specifications (Reference 2).

The ILRT and Bypass tests were conducted in accordance with the requirements of the ILRT procedure (Reference 3), Appendix J to 10CFR50 (Reference 4), ANSI/ANS 56.8 (Reference 5), BN-TOP-1 (Reference 6), and ANSI N45.4 (Reference 7). Test pressures for the ILRT and Bypass tests were 9 psig and 3 psig, respectively. Test results, which satisfied all acceptance criteria, are summarized below. The Total Time calculated Upper Confidence Limit (UCL) provides the highest calculated leakage rate. As a result, the leakage rates calculated using the Total Time method have been chosen to represent the ILRT results.

	<u>Test Results</u>	<u>Allowable</u>
ILRT Mass Point Leakage Rate*	0.1826%/day	0.4875%/day
ILRT Mass Point UCL*	0.1873%/day	0.4875%/day
<u>ILRT Total Time Leakage Rate*</u>	0.1765%/day	0.4875%/day
<u>ILRT Total Time UCL*</u>	0.2291%/day	0.4875%/day
Verification Mass Point Rate	0.7390%/day	0.6095 to 0.9345%/day
<u>Verification Total Time Rate</u>	0.7275%/day	0.6034 to 0.9284%/day
Drywell Bypass Leakage Rate	21.86 scfm	4312 scfm

Note: UCL is 95% Upper Confidence Limit

- * Includes penalties for non-standard system alignment and water level changes. (See Section 4.0.)

A summary of the test events and test chronology is presented in Section 2.0, Test Synopsis. Plant information, technical data, test results, and measurement system information are presented in Section 3.0, Test Data Summary. Test results are compared to the acceptance criteria in Section 4.0, Analysis and Interpretation. Referenced documents are listed in Section 5.0, References.

Following completion of the above testing, calibration checks were performed on the test equipment. Temperature sensor RTD-19 was found to be outside of its tolerance by -0.289°F to -0.316°F .

The following actions were taken to determine the impact of RTD-19 on the test results.

- 1) A review of the test data was performed which indicated that no shift in temperature for RTD-19 occurred during the test.
- 2) Since RTD-19 measures temperature in an area similar to the area monitored by RTD-20, the test data from RTD-19 was compared with the test data from RTD-20. RTD-20 and RTD-19 produced similar temperature changes during the test.
- 3) Assuming a complete failure of RTD-19, a trend report was run deleting RTD-19 data from the test results and adding the volume fraction assigned to RTD-19 to RTD-20.

Based on the results of the above actions, no significant test results shifts were observed and as such, no adjustment was made to the reported leak rate in response to RTD-19 failing the Post Test Calibration Check.

3.0 TEST DATA SUMMARY

A. Plant Information

Owner:	Illinois Power Company
Docket No.:	50-461.
Plant:	Clinton Power Station, Unit 1
Location:	Clinton, IL
Containment Type:	Mark III
NSSS Supplier, Type:	General Electric, BWR
Date Test Completed:	February 16, 1991
Restoration Completed:	March 2, 1991

B. Technical Data

1. Containment Free Air Volume

a. Drywell Free Air Volume (Normal weir wall water level, el. 731'-5")	246,500 cu. ft.
b. Containment Less Drywell Volume (Suppression Pool water level, el. 731'-5")	1,550,800 cu. ft.
c. Total Volume (Suppression Pool level, el. 731'-5")	1,797,300 cu. ft.
d. Drywell Free Air Volume (Start of test weir wall water level, el. 731'-8")	245,413 cu. ft.
e. Total volume (Start of test Suppression Pool level, el. 731'-8")	1,793,400 cu. ft.

2. Containment Design Pressure	15 psig
Containment Design Temperature	185°F
3. Peak Accident Pressure, Pa	9 psig
4. Containment ILRT Average Temperature Limits	40 - 120°F

C. Test Results - Type A Test

1. Test Method	Absolute
2. Data Analysis Techniques	Mass Point Leakage Rate per ANSI/ANS 56.8-1981; <u>Total</u> <u>Time Leakage Rate</u> <u>per BN-TOP-1</u>

- | | | | |
|-----|--|----------------------------|--------------------|
| 3. | Test Pressure | 9 psig | |
| 4. | Maximum Allowable Leakage Rate, L_a | 0.65%/day | |
| 5. | 75% of L_a | 0.4875%/day | |
| 6. | Measured Integrated Leakage Rate Test Results
(Not including corrections, see Section 4.0) | <u>Leakage Rate</u> | <u>UCL*</u> |
| | Mass Point Analysis | 0.1400%/day | 0.1447%/day |
| | <u>Total Time Analysis</u> | <u>0.1339%/day</u> | <u>0.1865%/day</u> |
| | * 95% Upper Confidence Limit | | |
| 7. | Imposed Verification Leakage Rate (Pressure and temperature compensated value during verification test.) | 0.632%/day (13.10 scfm) | |
| 8. | Verification Test Results | <u>Leakage Rate, %/day</u> | |
| | Mass Point Analysis | 0.7390 (pg. 2) | |
| | <u>Total Time Analysis</u> | <u>0.7275</u> | |
| 9. | Verification Test Limits: | <u>Test Limits, %/day</u> | |
| | Mass Point Analysis | | |
| | Upper Limit ($L_o + L_{am} + 0.25 L_a$) | 0.9345 | |
| | Lower Limit ($L_o + L_{am} - 0.25 L_a$) | 0.6095 | |
| | <u>Total Time Analysis</u> | | |
| | Upper Limit ($L_o + L_{am} + 0.25 L_a$) | 0.9284 | |
| | Lower Limit ($L_o + L_{am} - 0.25 L_a$) | 0.6034 | |
| 10. | Report Printouts: | | |

The report printouts and data plots for the ILRT and verification test calculations are provided in Appendices B through F.

11. Containment Water Volume Changes during the ILRT

Level changes which occurred during the time between reaching test pressure and completing the verification test.

	<u>Volume</u>	<u>Level Change</u>
Drywell Floor Drain Sump	+435.77 cu.ft.	(+9.33')
Containment Floor Drain Sump	+18.67 cu.ft.	(+1.16')
Containment Equipment Drain Sump	+2.78 cu.ft.	(+2.5")
Reactor Pressure Vessel	-4.6 cu.ft.	(-2.5")

12. Penetrations not in Post-LOCA Alignment during ILRT.

a. The following penetrations were utilized during the ILRT

<u>Penetration</u>	<u>System</u>	<u>Leakage Rate</u>
1MC-67	Containment Pressurization	0 sccm*
1MC-152(1)	ILRT Instrumentation	5 sccm
1MC-152(2)	ILRT Instrumentation	30 sccm
1MC-152(3)	ILRT Instrumentation	20 sccm

* Leakage Rate as a result of post-ILRT Local Leak Rate Test

b. The following penetrations were in an operational line-up during the ILRT.

<u>Penetration</u>	<u>System</u>	<u>Leakage Rate (Minimum Path)</u>
1MC-9	Feedwater "A"	380 sccm
1MC-10	Feedwater "B"	35 sccm
1MC-15	RHR A	137.2 sccm
1MC-16	RHR B	3035.5 sccm
1MC-36	LPCS Injection	20 sccm
1MC-42	Valve 1E12-F023 only	140 sccm
1MC-52**	FC Supply to Containment	370 sccm
1MC-56	Fire Protection	95 sccm
1MC-81	Fire Protection	92.5 sccm
1MC-82	Fire Protection	350 sccm

**Vent path not drained

- c. The following penetrations were modified during the second refueling outage and no longer represent containment leakage pathways (reference CPS Licensee Event Report 90-018 for further details)

<u>Penetration</u>	<u>System</u>	<u>As-Found Leakage Rate</u>
1MC-89	RHR A	5 sccm
1MC-172	RHR B	0 sccm
1MC-18	RHR A	**
1MC-20	RHR B	410 sccm
1MC-24	RHR A	***
1MC-26	RHR B	***
1MC-87	RHR A	**

** Not tested, below normal suppression pool water level

*** 1MC-44 (1E51-F078) represents the minimum pathway leakage for these penetrations

D. Test Results - Drywell Bypass Leakage Rate Test

1. Test Method Absolute
2. Data Analysis Technique Pressure Decay per Procedure
CPS 9861.01D005
3. Test Pressure

Drywell	3.0 psig
Containment	0.0 psig
4. Maximum Allowable Bypass Leakage Rate 4,312 scfm
5. Calculated Bypass Leakage Rate 21.86 scfm
6. Report Printouts

The report printouts for the Drywell Bypass Leakage Rate Test are provided in Appendix H.

E. Test Results - Type B and C

A summary of local leakage rate test results is provided in Appendix I.

F. Integrated Leakage Rate Measurement System

Instrument (# of Sensors)	Description	Data	
1. Absolute Pressure (2)	Volumetric PPM 1000	Range:	0-30 psia
		Accuracy:	0.005% F.S.
		Sensitivity:	0.001% F.S.
		Repeatability:**	0.001 psia
		Calibration Date:	12/7/90
2. Drybulb Temperature (25)	Volumetric 100 ohm Platinum RTD Type A Model 385	Range:	60-100°F
		Accuracy:*	0.20°F
		Sensitivity:	0.01°F
		Repeatability:**	0.01°F
		Calibration Date:	12/5/90
3. Relative Humidity (9)	Phys. Chem. Research	Range:	10-100% R.H.
		Accuracy:	2°F dew point
		Sensitivity:	0.5°F dew point
		Repeatability:**	0.01% R.H. dew point
		Calibration Date:	12/6/90
4. Flow Meter (2)	Brooks Rotameter Model No. 316	Range:	0-17 scfm
		Accuracy:	1% Reading
		Sensitivity:	1% F.S.
		Repeatability:	1% F.S.
		Calibration Date:	11/19/90

* Accuracy is for the measurement system including the Fluke 2280B Data Logger used in the 3-wire accurate mode, provided that the data logger has been calibrated within the previous 90 days. The 2280B calibration date was 12/4/90.

** Repeatability (resolution) of Fluke 2280B Data Logger display.

Drybulb and dew point temperature sensor locations and volume fractions are provided in Table 1.

The calculated ISG for the test is 0.04005 %/day, as shown in Appendix G.

TABLE 1

Drybulb and Relative Humidity Sensor Location
and Volume Fraction

DRYBULB TEMPERATURE

<u>RTD Sensor</u>	<u>Elevation Feet*</u>	<u>Azimuth Degree*</u>	<u>Distance From Center, Feet*</u>	<u>Volume Fraction</u>
1	900	0	25	0.070
2	900	180	25	0.070
3	872	90	30	0.070
4	872	270	30	0.070
5	854	0	30	0.046
6	854	180	30	0.046
7	845	0	0	0.046
8	837	90	40	0.046
9	837	270	40	0.046
10	816	6	45	0.010
11	816	310	45	0.046
12	816	120	45	0.046
13	791	60	50	0.038
14	791	225	50	0.038
15	767	135	50	0.038
16	767	315	50	0.039
17	743	45	50	0.042
18	743	225	50	0.042
19	787	0	25	0.033
20	769	123	25	0.033
21	751	180	25	0.033
22	732	270	25	0.033
23	729	0	4	0.004
24	818	0	9	0.003
25	770	0	50	0.012

TABLE 1 (cont'd)

RELATIVE HUMIDITY**

<u>Humidity Sensor</u>	<u>Assigned RTD***</u>	<u>Elevation Feet*</u>	<u>Azimuth Degree*</u>	<u>Distance From Center, Feet*</u>	<u>Volume Fraction</u>
1	1,2,3,4	895	3	25	0.140
2	1,2,3,4	867	95	31	0.140
3	5,6,7,8,9	852	180	31	0.116
4	5,6,7,8,9	838	272	44	0.116
5	11,12	814	91	45	0.094
6	13,14,15,16	789	225	55	0.128
7	17,18	744	50	54	0.128
8	19,20,21,22	785	0	26	0.069
9	19,20,21,22	749	180	23	0.069

* Elevations and distances to nearest foot; azimuths to nearest degree. Sensor location tolerances: radius and elevation $\pm 3'-0"$, Azimuth $\pm 5^\circ$, except radius and elevation are $\pm 5'0"$ in the containment dome.

** Vapor Pressure = (%R.H.) (Saturation pressure at drybulb temperature)

T_i = RTD Temperature

*** Drybulb Temperature = $\sum \alpha_i T_i / \sum \alpha_i$

α_i = RTD Volume Fraction

F. Information Retained at Plant

The following information is available for review at the facility:

1. Access control procedures that were established to limit ingress to containment during testing.
2. A listing of all containment penetrations, including penetration size and function.
3. A listing of normal operating instrumentation used during the leakage rate test.
4. A system line-up (at time of test), showing required valve positions and status of piping systems.
5. A continuous, sequential log of events from initial survey of containment to restoration of all tested systems.
6. Documentation of instrumentation calibration and standards.
7. The working copies of test procedures that include signature sign-off of procedural steps.
8. The procedure and all data that will verify completion of local leakage testing (Type B&C tests).
9. Computer printouts of Integrated Leakage Rate Test Data.
10. The Quality Assurance Audit plan or checklist that was used to monitor ILRT with proper sign-off.
11. A listing of all test exceptions.
12. Description of sensor malfunctions.
13. Description of method of leak rate verification of instrument measuring system (superimposed leakage), with calibration information on flowmeters.
14. The P&IDs of pertinent systems penetrating the containment or affected by ILRT.
15. Drawings showing location of all temperature and humidity sensors.

4.0 ANALYSIS AND INTERPRETATION

4.1 ILRT Test

During the ILRT, the following penetrations were not in their post-LOCA alignment. The penetrations and their Type C minimum path leakage rates are given below:

<u>Penetration</u>	<u>System</u>	<u>Leakage Rate</u>	
LMC-9	Feedwater "A"	380	sccm
LMC-10	Feedwater "B"	35	sccm
LMC-15	RHR A	137.2	sccm
LMC-16	RHR B	3035.5	sccm
LMC-36	LPCS Injection	20	sccm
LMC-42	1E12-FO23 (only)	140	sccm
LMC-52*	FC Fuel Pool Cooling	370	sccm
LMC-56	Fire Protection	95	sccm
LMC-67	Containment Pressurization	0	sccm
LMC-81	Fire Protection	92.5	sccm
LMC-82	Fire Protection	350	sccm
LMC-152(1)	ILRT Instrumentation	5	sccm
LMC-152(2)	ILRT Instrumentation	30	sccm
LMC-152(3)	ILRT Instrumentation	20	sccm
NA**	MSIV Dash Pots	26.6	sccm

Total 4736.8 sccm
(0.1672 scfm)

* Penetration LMC-52's vent path filled with water during the test. Since the outboard vent path could not be drained during the test, a local leak rate test was performed following completion of the ILRT.

** MSIV Dash Pots were not vented prior to the test; therefore, the volume of the dash pots was converted to sccm leakage and added as potential containment inleakage.

$$\text{ILRT Correction} = \frac{(.1672)(2400)(60)(14.7)}{(1,795,400)(24.02)} \text{ \%/day}$$

$$= .0082\text{\%/day}$$

The following containment water volume increases were measured during the ILRT.

Drywell Floor Drain Sump	435.77 cu. ft.
Containment Floor Drain Sump	18.67 cu. ft.
Containment Equipment Drain Sump	<u>2.78 cu. ft.</u>
Total	457.22 cu. ft.

$$\text{ILRT Correction} = \frac{(457.22)(2400)}{(1,795,400)(17.75)} \text{ \%/day}$$

$$= .0344\text{ \%/day}$$

*** Based on the assumption that the entire water volume change occurred uniformly during the 17.75 hour period beginning with reaching test pressure and ending with completion of the verification test.

- 4.2 The total leakage rate for penetrations not in post-LOCA alignment and water volume changes is 0.0426%/day.

The calculated leakage rates during the ILRT were 0.1400%/day (mass point) and 0.1339%/day (total time). The calculated 95% upper confidence limits were 0.1447%/day (mass point) and 0.1865%/day (total time). Adding the total leakage rate correction for penetrations not in post-LOCA alignment and containment water volume changes yields the corrected leakage rates as follows:

Leakage Rates, %/day

	<u>Mass Point</u>		<u>Total Time</u>	
	<u>Leakage Rate</u>	<u>UCL</u>	<u>Leakage Rate</u>	<u>UCL</u>
Calculated	0.1400	0.1447	<u>0.1339</u>	<u>0.1865</u>
Corrections	0.0426	0.0426	<u>0.0426</u>	<u>0.0426</u>
Corrected	0.1826	0.1873	<u>0.1765</u>	<u>0.2291</u>

Since the corrected 95% upper confidence limits for both mass point and total time are less than 0.75 L_a (0.4875%/day), the test results demonstrate that the leakage through the primary containment and systems and components penetrating primary containment does not exceed the allowable leakage rate specified in the Clinton Power Station, Unit 1, USAR and Technical Specifications.

As-Found Additions

The "As-Found" Type B&C addition is 75687 sccm (2.67 scfm).

$$\text{As-Found Addition} = \frac{(2.67)(2400)(60)(14.7)}{(1,795,400)(24.02)}$$

$$= .1311\text{ \%/day}$$

This Type B & C addition consists of the difference between the as-found and as-left leakages for those penetrations for which repairs or adjustments were performed during the refueling outage prior to the ILRT. In addition, this Type B & C addition included the as-found leakage of the penetrations which were modified during the refueling outage. Excluded from the Type B & C addition were the as-found leakages for two penetrations, LMC-18 and LMC-87 which were reworked and subsequently modified during the outage. Specifically, one leakage barrier in each of these penetrations was reworked prior to obtaining as-found test leakage values. (Reference Licensee Event Report 90-018). Failure to obtain the as-found leakages prior to rework, however, constitutes a non-compliance with requirements of 10CFR50 Appendix J, section III as further amplified by Information Notice 85-71.

5.0 REFERENCES

1. Clinton Power Station, Updated Safety Analysis Report (USAR).
2. Clinton Power Station, Technical Specifications.
3. Clinton Power Station Surveillance Test Procedure CPS 9861.01, "INTEGRATED LEAK RATE TEST", Revision 21.
4. Code of Federal Regulations, Title 10, Part 50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors".
5. ANSI/ANS 56.8-1981, "Containment System Leakage Testing Requirements".
6. Bechtel Topical Report BN-TOP-1, "Testing Criteria for Integrated Leakage Rate Testing of Primary Containment Structures for Nuclear Power Plants", Revision 1, 1972.
7. ANSI/N45.4-1972, "Leakage-Rate Testing of Containment Structures for Nuclear Reactors".

APPENDIX A

ILRT Computer Program Summary

BCP TECHNICAL SERVICES, INC.
USER'S-PROGRAMMER'S MANUAL
FOR
ILLINOIS POWER COMPANY'S CLINTON POWER STATION
ILRT PROGRAM

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BCP Technical Services, Inc.
User's and Programmer's Manual
Illinois Power Company's Clinton Power Station
Integrated Leakage Rate Testing Computer Program
Revision 1 910315

1.0 PURPOSE

The purpose of this manual is to provide the users and programmers of the BCP Integrated Leakage Rate Testing program with an understanding of the program structure and coding methods. The level of detail provided is adequate for all required program modification and maintenance.

2.0 REFERENCES

- a) BCP Quality Assurance Manual
- b) Microsoft QuickBASIC, Version 4.5
- c) 10 CFR 50, Appendix J
- d) ANSI/ANS-56.8-1981
- e) BN-POP-1, Revision 1

3.0 DEFINITIONS

None.

4.0 PROGRAM DATA

4.1 User Information

4.1.1 Preliminary

Time is always entered as hhmm, or hmm for hour < 10, where

hh = hours (00-23)

mm = minutes (00-59)

Date is always entered as mmdd, or mdd for month < 10, where

mm = month (01-12)

dd = day (1 - number of days in month)

4.1.2 Starting the Program

The program is started by entering the command "ilrt". The program first displays a screen showing information about the program, including version number.

Note: In order to enable graphics output to the printer, \dos\graphics.com (or equivalent) must be executed before executing the ILRT program.

After pressing any key, the program displays this message:

Reload an existing data file ?

Press the [y] key if the data file for this test has already been created during a previous run and user wants to use or append to the existing data. Otherwise press the [n] key.

The program will now prompt the user for the data file name.
If user pressed [y] above, the program will ask:

Enter data file name ?

Or, if user pressed [n] above, the program will ask:

Enter new data file name ?

Enter the data file name in the format filename.extension, where, filename is 1 to 8 characters, and extension is 1 to 3 characters.

If the user is reloading an existing data file, the program will load the data from the file and then display the main menu.

If the user is starting a new data file the program will prompt the user for the following pre-data:

enter title (40 characters max.) - up to 40 characters which will be printed as a heading on reports and plots

leap year (y/n; default = n) - press [y] for yes, [n] for no

number of temperatures (1 - 40) - enter the number of temperature sensors

number of humidities (1 - 10) - enter the number of relative humidity sensors

number of pressures (1 - 2) - enter the number of pressure sensors

free air volume, cu.ft. - enter the containment free air volume to be used as the default value in all data sets.

La, %/day - enter the allowable leakage rate.

The program will then prompt the user to enter the temperature, relative humidity, and pressure sensor volume fractions.

After prompting the user through a correction routine (see "cp" option), the pre-data is saved and the program prompts the user to enter the number of pressure calibration points and the pressure calibration table (see "pt" option).

The user is then prompted to enter the humidity sensor-rtd table. (See "rh" option).

The PROGRAM OPTIONS are then displayed:

PROGRAM OPTIONS

DATA INPUT/DELETION

da = enter data set
de = delete a data set
un = undelete a data set
er = erase a deleted data set

CORRECTIONS

cd = correct a data set
cp = correct pre-data
cv = correct verification pre-data

UTILITIES

ti = change start/end time
bu = backup data file
do = branch to DOS
ve = verification (toggle on/off, or enter verification pre-data)
pt = review, print or edit pressure calibration table
rh = review, print or edit humidity sensor-rtd table

REPORTS

li = list all data sets (reduced)
dr = one data set (raw & reduced)
mp = mass point leak rate
tt = total time leak rate
tr = trend (mp & tt)
dr = data rejection
st = temperature stabilization

PLOTS

pl = Plot Options

ex = exit program
bn = BNTOP1 > = 24hr (toggle on/off)

Enter Option?

The desired option is selected by entering the two-letter code. If the "pl" option is selected, the PLOT OPTIONS are displayed. An explanation of each option follows.

Note : Reports and plots are generated in the range specified by the current start and end times. (See "ti" option).

4.1.3 Data Input and Deletion

The following commands are used to enter and delete information:

da - Enter a data set from the keyboard (i.e., time, date, free air volume, and sensor readings). After prompting the user through a correction routine (see "cd" option), a data set report is generated.

Note: The data set is automatically sorted into its correct chronological order.

de - The data set corresponding to the user input time and date is deleted from all leakage rate calculations. All reports will show that the data set has been deleted and the data point will not be plotted.

un - The data set corresponding to the user input time and date is restored (un-deleted).

er - Removes (erases) a deleted data. A removed data set does not show up on any reports or plots. Also, a removed data set cannot be recovered, except by editing the data file. (See iord%() variable in programmers manual.)

4.1.4 Reports

Generate reports using the following commands:

li - DATA SUMMARY REPORT. Displays data set number, time, date, temperature, pressure, vapor pressure and dry air mass for all data sets.

- dr - DATA SET REPORT, for the data set with user input time and date. Displays data set number, time, date, sensor data (raw data and calibrated values), weighted average temperature, pressure and vapor pressure, and volume and dry air mass.
- mp - MASS POINT LEAKAGE RATE REPORT (ANSI/ANS 56.8 - 1981). Displays data set number, time, date, elapsed time, dry air mass, mass point leakage rate and UCL for all data sets. Also displays allowable and 75% of allowable leakage rate (or upper and lower limits in verification mode).
- tt - TOTAL TIME LEAKAGE RATE REPORT (BN-TOP-1, rev 1.). Displays data set number, time, date, elapsed time, dry air mass, total time measured leakage rate, leakage rate (calculated) and UCL for all data sets. Also displays allowable and 75% of allowable (or upper and lower limits in verification mode).
- tr - TREND REPORT. Displays data set number, time, date, elapsed time, total time measured leakage rate, leakage rate (calculated) and UCL , and mass point leakage rate and UCL for all data sets.
- rj - DATA REJECTION REPORT (ANSI/ANS 56.8 - 1981). Displays data set number, time, air mass, linear least square fit (air mass), residual from least square fit, standard error of residual and standardized residual for all data sets. Data sets rejectable at the 1% and/or 5% rejection levels are marked by asterick (*). Also displayed are the 1% and 5% rejection level values.
- st - TEMPERATURE STABILIZATION REPORT (ANSI/ANS 56.8 - 1981 and BN-TOP-1, rev 1.). Displays start time and data, data set number, elapsed time, temperature, 1 hour and 4 hour average rates of temperature change and difference (ANSI criteria), and 2 hour average rate of temperature change and 2 hour average change in rate of temperature change, i.e., second derivative, (BN-TOP-1 criteria) for all data sets. Data points which satisfy temperature stabilization criteria are marked with an asterick (*).

4.1.5 Data Corrections

Use the following commands to correct the data set:

cd - Correct the data set with user entered time and date. Time, date, volume, sensor temperatures, and relative humidity and/or pressures can be changed for a data set. If time and/or date is changed, the data set will be re-sorted into its correct chronological order. Responses to the correction menu line are:

time - to change the time
date - to change date
volume - to change free air volume
t - to change a sensor temperature
h - to change a sensor relative humidity
p - to change a sensor pressure

After entering "t", "h", or "p", the user is prompted for the sensor number and sensor value.

cp - Correct pre-data. The following pre-data can be corrected: title, free air volume, allowable leakage rate (L_a), leap year (toggled on/off) and the sensor volume fractions. If the free air volume is changed, the user is asked if the volume should be changed for all existing data sets. The responses to the menu line are:

title - to change title
volume - to change free air volume.
la - to change allowable leakage rate.
leap - to toggle leap year yes/no
vf - to change a volume fraction; responses to next menu line are:

t - to change a temperature volume fraction
h - to change a relative humidity volume fraction
p - to change a pressure volume fraction

After entering "t", "h", or "p" the user is prompted for the sensor number and sensor volume fraction.

Note : The number of sensors cannot be changed. To delete a sensor, set its volume fraction to zero.

cv - Correct verification pre-data. The imposed leakage rate, the ILRT calculated mass point leakage rate and total time leakage rate can be changed. The responses to the menu line are:

lo - to change imposed leakage rate
lmp - to change mass point leakage rate
litt - to change total time leakage rate

After entering "lo", "lmp", or "litt", the user is prompted to enter the leakage rate.

4.1.6 Utilities

The following are the program's utility commands:

- ti - Change the current start and end time. The start and end time defines the time interval for all reports and plots.
- ve - Toggle the verification mode on/off. When toggled on, the user has the option to change the verification pre-data.
- bu - Backs up the data file to a floppy disk in drive A: and to the default drive subdirectory, \BACKUP. ¹

- do - Branches (shells) to DOS. The program is re-entered after the user types "exit" on the DOS command line. ¹
- pt - Review, print or edit the pressure calibration table. The user is first asked to enter or verify the number of pressure calibration points (2-25) in the table. The pressure calibration table is then displayed. The displayed pressure calibration table is fixed at 2 sensors. If the number of pressure sensors is 1, only enter values for pressure sensor 1.

To edit the table, press "e"; values can then be changed in the displayed cells.

Note: The edit mode is automatically turned on for the initial entry of the table.

To print the table, press "p". To exit the option, press "x". The curser is moved around the table by using the direction keys. The table scrolls on the screen if the number of calibration points is greater than 19.

- rh - Review, print or edit the relative humidity sensor-rtd table. The rtd numbers for a given humidity sensor are used to calculate the dry bulb temperature used in the vapor pressure calculation.

To edit the table, press "e"; values can then be changed in the display cells.

Note: The edit mode is automatically turned on for the initial entry of the table.

To print the table, press "p". To exit the option, press "x". The curser is moved around the table by using the direction keys.

- bn - Toggle on/off BNTOP1 95% UCL calculation for elapsed times greater than or equal to 24 hours.

¹ Warning -Data transmitted from the data acquisition system via the RS-232 interface cannot be read by the program and will be lost when the "bu" and "do" options are invoked.

OFF - Total time 95% UCL for elapsed times greater than or equal to 24 hours uses the formulation given in the Programmers Manual Total Time Leakage Rate. That is, the more conservative UCL calculation is turned off at 24 hours. (default = OFF)

ON - Total time 95% UCL for elapsed times greater than or equal to 24 hours uses the formulation given in the Programmers Manual Total Time Leakage Rate for elapsed times less than 24 hours. That is, the more conservative calculation is not turned on at 24 hours.

ex - Exit the program

4.1.7 Plots

The following are general guidelines for performing a plot:

pl - Displays the PLOT OPTIONS menu:

PLOT OPTIONS

AIR MASS

am = air mass

TEMPERATURE

te = one temperature or average

at = all temperatures + one highlighted

PRESSURE

pr = one pressure or average

ap = all pressures + one highlighted

HUMIDITY/VAPOR PRESSURE

hu = one humidity or average vapor pressure

ah = all humidities + one highlighted

Enter Option ?

LEAK RATES

mp = mass point

tt = total time

OVERLAY

ov = overlay of leak rates,
mass, temperature,
pressure, and/or vapor
pressure

UTILITIES

ti = change start/end time

ex = Program Options

The desired option is selected by entering the 2 letter code. An explanation of each option follows.

a) Air Mass

am - Plots the air mass (solid line), regression line (dotted line), and 75% La line (dashed line). In the verification mode the 75% La line is replaced by the upper and lower verification leakage rate limit lines.

b) Leakage Rate

- mp - Plots the mass point leakage rate, UCL and 75% La (dashed line). In the verification mode the UCL is not plotted and the 75% La line is replaced by the upper and lower verification leakage rate limit lines.
- tt - Plots the total time leakage rate, UCL and 75% La (dashed line). In the verification mode the UCL is not plotted and the 75% La line is replaced by the upper and lower verification leakage rate limit lines.

c) Temperature

- te - Plots the weighted average temperature or the temperature for one sensor.
- at - Plots the temperature for all sensors and the weighted average (dotted lines) and one highlighted temperature (solid line). The sensor temperature which is highlighted can be selected by number or by using the up/down direction keys to cycle through the sensors.

d) Pressure

- pr - Plots the weighted average pressure or the pressure for one sensor.
- ap - Plots the pressure for all sensors and the weighted average (dotted lines) and one highlighted pressure (solid line). The sensor pressure which is highlighted can be selected by number or by using the up/down direction keys to cycle through the sensors.

e) Humidity/Vapor Pressure

- hu - Plots the weighted average vapor pressure or the relative humidity for one sensor.

- ah - Plots the relative humidity for all sensors and the weighted average (dotted lines) and one highlighted relative humidity (solid line). The sensor relative humidity which is highlighted can be selected by number or by using the up/down direction keys to cycle through the sensors.
- f) Overlay
- ov - The air mass, and/or mass point leakage rate and UCL, and/or total time leakage rate and UCL, and/or weighted average temperature, and/or weighted average pressure and/or weighted average vapor pressure can be plotted on the same frame.

The responses to the menu line are:

- mp - to plot mass point leakage rate
- tt - to plot total time leakage rate
- m - to plot air mass
- t - to plot temperature
- p - to plot pressure
- vp - to plot vapor pressure
- c - to display title on menu line
- x - to return to main plot menu

Note: The user can change the plot scale (i.e., minimum and maximum values) on all plots except the overlay plot. The overlay plot scales are fixed at the minimum and maximum values for air mass, temperature, and pressure. The vapor pressure scale is adjusted to conform to the pressure scale. Leakage rate plot scales for mass point and total time are the same and are determined by the minimum leakage and maximum UCL of the first leakage rate type plotted.

4.1.8 Plot Utilities

The following commands are used for peripheral plotting functions:

- a) ti - Change start and end times.
- b) ex - Return to the PROGRAM OPTION menu.

4.2 Programmer Information

4.2.1 Programming Language

The ILRT program is written in Microsoft QuickBASIC, Version 4.5, for IBM Personal Computers and Compatibles.

4.2.2 Mass Point Leakage Rate

Mass point leakage rate is calculated in accordance with ANSI/ANS-56.8-1981 as follows:

$$L_m = -2400a/b$$

$$a = (n \sum Mt - \sum M \sum t) / (n \sum t^2 - \sum t^2)$$

$$b = (\sum M - a \sum t) / n$$

n = number of data sets

t = elapsed time, hr

M = air mass, lbm

Σ = summation over all data sets

Mass point 95% UCL is calculated as follows:

$$UCL = L_{\bar{m}} + 2400t_{95}S_a/b$$

$$t_{95} = \text{student-t function}$$

$$= (1.6449df + 3.5283 + .85602/df)/(df + 1.2209 - 1.5163/df)$$

$$df = n-2$$

$$S_a = \sqrt{[K^2 n]}$$

$$K^2 = S^2/(n \sum D^2 - \Sigma^2)$$

$$S^2 = (\sum M^2 - b \sum M - a \sum t)/df$$

4.2.3 Total Time Leakage Rate

Total time leakage rate, $L_{\bar{u}}$ %/day, is calculated per BN-TOP-1, Revision 1 as follows:

$$L_{\bar{u}} = at_{\bar{m}} + b$$

$$a = (m \sum t - \Sigma D)/(\sum D^2 - \Sigma^2)$$

$$b = (\Sigma L - a \Sigma D)/m$$

$$L = -2400(M - M_0)/t/M_1$$

$$m = \text{number of } L\text{'s calculated} \\ = n-1$$

Total time 95% UCL is calculated as follows for $t_m < 24$ hr:

$$UCL = L_{\bar{u}} + t_{95}\sqrt{[S^2 t]}$$

$$t_{95} = 1.95996 + 2.57226/df + 2.8225/df^2$$

$$S^2 = (\sum \bar{x}^2 - b \sum \bar{x} - a \sum \bar{x}t) / df$$

$$df = m - 2$$

$$f = 1 + 1/m + (t - \bar{x}/m)^2 / (m \sum \bar{x}^2 - \sum \bar{x}^2) / m$$

Total time 95% UCL will be calculated as follows for $t_m \geq 24$ hr:

$$UCL = Lt + t_{95} \sqrt{S^2 f}$$

$$t_{95} = (1.6449df + 3.5283 + .85602/df) / (df + 1.2209 - 1.5163/df)$$

$$S^2 = (\sum \bar{x}^2 - b \sum \bar{x} - a \sum \bar{x}t) / df$$

$$f = 1/m + (tm - \bar{x}/m)^2 / (m \sum \bar{x}^2 - \sum \bar{x}^2) / m$$

4.2.4 Air Mass

For both mass point and total time, air mass, M lbm, is calculated as follows:

$$M = 144(P - P_v)V / (RT)$$

P = weighted average pressure, psia

P_v = weighted average vapor pressure, psia

Note: sensor vapor pressures is obtained from the sensor dew point temperatures using the K-Function per ASME Steam Tables, 3rd edition with k8 and k9 term neglected (see below)

V = containment free air volume, cu. ft.

T = weighted average temperature, deg. R

$$R = 53.35 \text{ ft-lbf/lbm/deg. } R$$

Vapor pressure, P_v psia at dew point temperature, T_{dp} deg. F is calculated as follows:

$$P_v = p_{ci} e^z$$

$$z = \sum k_i (1-q)^{1/q} / (1 + k_i (1-q) + k_i (1-q)^2)$$

$$\Sigma = \text{summation over } i = 1 \text{ to } 5$$

$$q = (5/9(T_{dp} - 32) + 273.15) / t_{ci}$$

$$p_{ci} = (2212)(1.45038)$$

$$t_{ci} = 647.3$$

$$k_1 = -7.691235$$

$$k_2 = -26.08024$$

$$k_3 = -168.1707$$

$$k_4 = 64.23286$$

$$k_5 = -118.9646$$

$$k_6 = 4.167117$$

$$k_7 = 20.97507$$

Dewpoint temperature, T_{dp} deg. F, at relative humidity, % RH, is calculated as follows:

$$T_{sat} = (\sum T_i v_i) / (\sum v_i)$$

where \sum is over the RTD's assigned to the humidity sensor via the humidity sensor - rtd table, T_i and v_i are the temperature and volume fraction of the RTD.

P_{sat} = vapor pressure at dewpoint temperature T_{sat}

$$T_{dp} = (\% RH)(P_{sat})$$

4.2.5 Data Rejection

Data rejection criteria are calculated in accordance with ANSI/ANS-56.8-1981 as follows:

The standardized residual, r_i , for the i , data set is calculated as follows:

$$r_i = (M_i - at - b) / s_i$$

M_i = calculated air mass for i^{th} data set

a, b = regression constants for mass point leakage rate (see MASSPOINT LEAKAGE RATE)

t_i = elapsed time for i^{th} data set

$$s_i = S \sqrt{1 - 1/n - (t_i - \bar{t})^2 / ((n - 1) S^2 - \bar{t}^2)}$$

n = number of data sets

$$S = \sqrt{\sum (M_i - at - b)^2 / (n - 2)}$$

The critical values for the standardized residuals at the 1% and 5% rejection levels are given in Table D2 of ANSI/ANS-56.8-1981.

4.2.6 Verification Upper and Lower Limits

Upper and lower limits on the calculated mass point and total time leakage rates during the ILRT verification test (imposed leakage method) are calculated per ANSI/ANS-56.8-1981 as follows:

$$\text{Lower Limit} = L + L_0 + .25L_a$$

$$\text{Upper Limit} = L + L_0 + .25L_a$$

L = ILRT calculated leakage rate (total time or mass point)

L_0 = imposed leakage rate, %/day

L_a = allowable leakage rate, %/day

4.2.7 Temperature Stabilization

ANSI/ANS 56.8 - 1981 criteria

$$dT_4 - dT_1 < .5 \text{ deg. F}$$

$$dT_4 = (T - T_4)/4$$

$$dT_1 = (T - T_1)$$

T = current temperature

T_4 = temperature 4 hours ago; interpolated between 2 adjacent points if necessary

T_1 = temperature 1 hour ago; interpolated between 2 adjacent points if necessary

BN-TOP-1, rev. 1 (first criteria)

$$(T - T_2)/2 < 1 \text{ deg. F}$$

T_2 = temperature 2 hours ago; interpolated between 2 adjacent points if necessary

BN-TOP-1, rev. 1 (second criteria)

$$(dT - dT_2)/2 < .5 \text{ deg. F}$$

dT = first derivative of T at current time = $(T - T_{.01}) / .01$

dT_2 = first derivation of T two hours ago = $(T_{1.99} - T_2) / .01$

$T_{.01}$ = temperature .01 hours ago; interpolated between 2 adjacent points

$T_{1.99}$ = temperature 1.99 hours ago; interpolated between 2 adjacent points

T_2 = temperature 2 hours ago; interpolated between 2 adjacent points if necessary

4.2.8 Global Variables

The following is a list of the program's global variables:

$nt\%$ - number of temperature sensors, 40 max
 $ndp\%$ - number of dew-point sensors, 10 max
 $nd\%$ - number of pressure sensors, 2 max
 $vol!$ - containment free air volume, default value for $v!$, cu. ft.
 $vft!(i)$ - temperature sensor i volume fraction
 $vfdp!(i)$ - humidity sensor i volume fraction
 $vfp!(i)$ - pressure sensor i volume fraction
 $title\$$ - title printed on reports and plots, 40 characters max
 $leap\$$ - y(es)/n(o) switch for leap year
 $La!$ - allowable leakage rate, %/day
 $Lo!$ - verification imposed leakage rate, %/day
 $Lmp!$ - mass point leakage rate calculated during ILRT, %/day
 $Ltt!$ - total time leakage rate calculated during ILRT, %/day
 $verify\%$ - verification mode switch, = -1 if true
 $iord\%(n)$ - = r for data sets not deleted or erased
 = $-r$ for deleted data sets
 = 0 for erased data sets
 n = internal data set number (chronologically sorted)

r = external data set number (not sorted)
 time%(n) - time for data set n, hhmm
 date%(n) - date for data set n, mmdd
 temp!(i,n) - calibrated temperature of sensor i for data set n, deg. F
 dewpt!(i,n) - calibrated relative humidity of sensor i for data set n, deg. F
 press!(i,n) - calibrated pressure of sensor i for data set n
 rawt!(i) - raw data for temperature sensor i
 rawdp!(i) - raw data for humidity sensor i
 rawp!(i) - raw data for pressure sensor i
 rsrawt!(i) - raw data for temperature sensor i (data input via RS232)
 rsrawdp!(i) - raw data for humidity sensor i (data input via RS232)
 rsrawp!(i) - raw data for pressure sensor i (data input via RS232)
 h!(n) - elapsed time for data set n, hours
 note : h! = 0 at 0000 hours on date%(1)
 h#(n) - double precision value of h!(n)
 t!(n) - weighted average temperature for data set n, deg. F
 vp!(n) - weighted average vapor pressure for data set n, psia
 dp!(n) - weighted average relative humidity for data set n, deg. F
 p!(n) - weighted average total pressure for data set n, psia
 m!(n) - air mass for data set n, lbm
 m#(n) - double precision value of m!(n)
 v!(n) - free air volume for data set n, cu. ft.
 lr!(n) - mass point leakage rate calculated at data set n, %/day
 ucl!(n) - mass point upper confidence level at data set n, %/day
 lrttm!(n) - total time measured leakage rate at data set n, %/day
 lrtt!(n) - total time calculated leakage rate at data set n, %/day
 ucltt!(n) - total time upper confidence level at data set n, %/day
 rsdata!() - data set values read from RS232
 y!(),x!() - end point coordinates used to plot a straight line
 pt!(,i) - pressure calibration table array for pressure sensor i
 npoints% - number of pressure calibration points per sensor
 rswait% - = -1 if a data set is waiting in the RS232 port buffer
 rs232ok% - = -1 if program is ready to accept RS232 data
 maxpts% - maximum number of data sets (=400)
 pause% - = -1 to pause program while a message is being displayed
 scrnmode\$ - = "text" in screen text mode
 = "graphics" in screen graphics mode
 intable% - = -1 if pressure calibration table routine is executing

sort% - = -1 if data sets need to be resorted
 bntop1% - = -1 if BNTOP1 >= 24, calculation is turned ON
 fore%, back%, border% - foreground, background and border color in text mode
 traps\$ = used to indicate which key was trapped

4.2.9 Passed Variables

The following variables have the same name throughout the program:

datafile\$ - data file name
 n% - data set currently being processed
 nmax% - number of internal data sets
 rmax% - number of data sets on data file
 nfirst% - first data set used in calculations, reports and plots
 nlast% - last data set used in calculations, reports and plots
 a! - slope of regression line
 b! - intercept of regression line
 option\$ - user selected option

4.2.10 Data Storage Structure

The data is stored in the random access file, datafile\$. Each record having a fixed length of 102 bytes. The data items in each record are of variable length and separated by ","s. The record layouts are follows:

Record 1

nmax%, title\$, rmax%, leap\$, npoints%

nmax% = number of unerased data sets
 title\$ = title (40 characters max.)
 rmax% = number of data sets (erased and unerased)
 leap\$ = "y" for leap year, "n" for non leap year
 npoints% = number of pressure calibration points

Record 2

vol!, nt%, ndp%, np%, La!, Lo!, Lmp!, Ltt!
 vol! = default volume
 nt% = number of temperature sensors
 ndp% = number of humidity sensors
 np% = number of pressure sensors
 La! = allowable leakage rate
 Lo! = imposed leakage rate (verification test)
 Lmp! = ILRT calculated mass point leakage rate
 Ltt! = ILRT calculated total time leakage rate

Record 3 through $(nt\% + ndp\% + np\% - 1) \setminus 10 + 3$

vft!(1), ..., vft!(nt%), vfdp!(1), ..., vfdp!(ndp%), vfp!(1), ..., vfp!(np%)

10 values per record

vft!(i) = temperature sensor i volume fraction
 vfdp!(i) = humidity sensor i volume fraction
 vfp!(i) = pressure sensor i volume fraction

Records $(nt\% + dp\% + np\% - 1) \setminus 10 + 4$ through $(nt\% + dp\% + np\% - 1) \setminus 10 + 13$

pt!(1,1), pt!(1,2), pt!(1,3), pt!(1,4), pt!(2,1), ..., pt!(25,4)

pt!() = pressure sensor calibration table
 pt!(i,1) = pressure sensor 1 reading, counts, i = 1 to 25
 pt!(i,2) = pressure sensor 1 true pressure, psia
 pt!(i,3) = pressure sensor 2 reading, counts
 pt!(i,4) = pressure sensor 2 true pressure, psia

Note: pt!(0) = 0 for i > npoints%

10 values per record

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 Integrated Leakage Rate Testing Computer Program
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Records (nt%+ndp%+np%-1)/10+13 thru (nt%+ndp%+np%-1)/10+13+ndp%

rtd%(1,1)rtd%(1,5) = rtds assigned to humidity sensor 1

rtd%(2,1)rtd%(2,5) = rtds assigned to humidity sensor 2

.

rtd%(ndp%,1).....rtd%(ndp%,5) = rtds assigned to humidity sensor dp%

Data Set Records (one set for each data set, 1 through rmax%)

First record

iord%(n), time%(n), date%(n), v!(n)

iord%(n) = n for undeleted, unerased data set n

= -n for deleted data set

= 0 for erased data set; note: erased data sets are not read by
 the program

time%(n) = time

date%(n) = date

v!(n) = volume

Next (nt%+ndp%+n₁%) \ 10 records

rawt!(1), ...,rawt!(nt%), rawdp!(1), ...,rawdp!(ndp%), ...,
 rawp!(1), ...,rawp!(np%)

10 values per record

rawt!(i) = raw temperature data

rawdp!(i) = raw relative humidity data

rawp!(i) = raw pressure data

4.2.11 Compiling and Linking

The program is composed of the main module, ILRT.BAS, and 8 sub modules MOD1.BAS through MOD8.BAS. With quickBASIC in directory \qb45\ and the program in the default directory, and compile command for each module is:

```
copy \qb45\qb.bi qb.bi
\qb45\bc/e/x/v/w/o/t/c:1024    ilrt;
\qb45\bc/v/w/o/t/c:1024    mod1;
\qb45\bc/v/w/o/t/c:1024    mod2;
\qb45\bc/v/w/o/t/c:1024    mod3;
\qb45\bc/v/w/o/t/c:1024    mod4;
\qb45\bc/v/w/o/t/c:1024    mod5;
\qb45\bc/v/w/o/t/c:1024    mod6;
\qb45\bc/v/w/o/t/c:1024    mod7;
\qb45\bc/v/w/o/t/c:1024    mod8;
```

The link command is:

```
\qb45\link    ilrt+mod1+mod2+mod3+mod4+mod5+mod6+mod7+mod8,,,
               \qb45\bc\com45.lib+\qb45\qb.lib
```

5.0 Attachments

5.1 Program Verification Problems

Problem 1 - Air Mass hand calculation using data set 15 from data file CHECK24.

Problem 2 - 1 Hour Mass Point and Total Time leakage rates using data file CHECK24.

Problem 3 - 8 Hour Mass Point and Total Time leakage rates using data file CHECK24.

Problem 4 - 24 Hour Mass Point and Total Time leakage rates using data file CHECK24.

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Problem 5 - Data Rejection Report using data file REJECT.

Problem 6 - Temperature Stabilization Report using data file STABCHK.

Problem 7 - Air Mass hand calculation using data set 19 from data file
ILRT.SAT.

Problem 8 - 24 Hour Mass Point and Total Time leakage rates using data
file CHECK24, with BNTOP1 ON.

5.2 Program Listing

APPENDIX B

ILRT Stabilization Summary Data

- Temperature Stabilization Summary Report
- Weighted Average Temperature Plot

CLINTON POWER STATION RF-2 ILRT

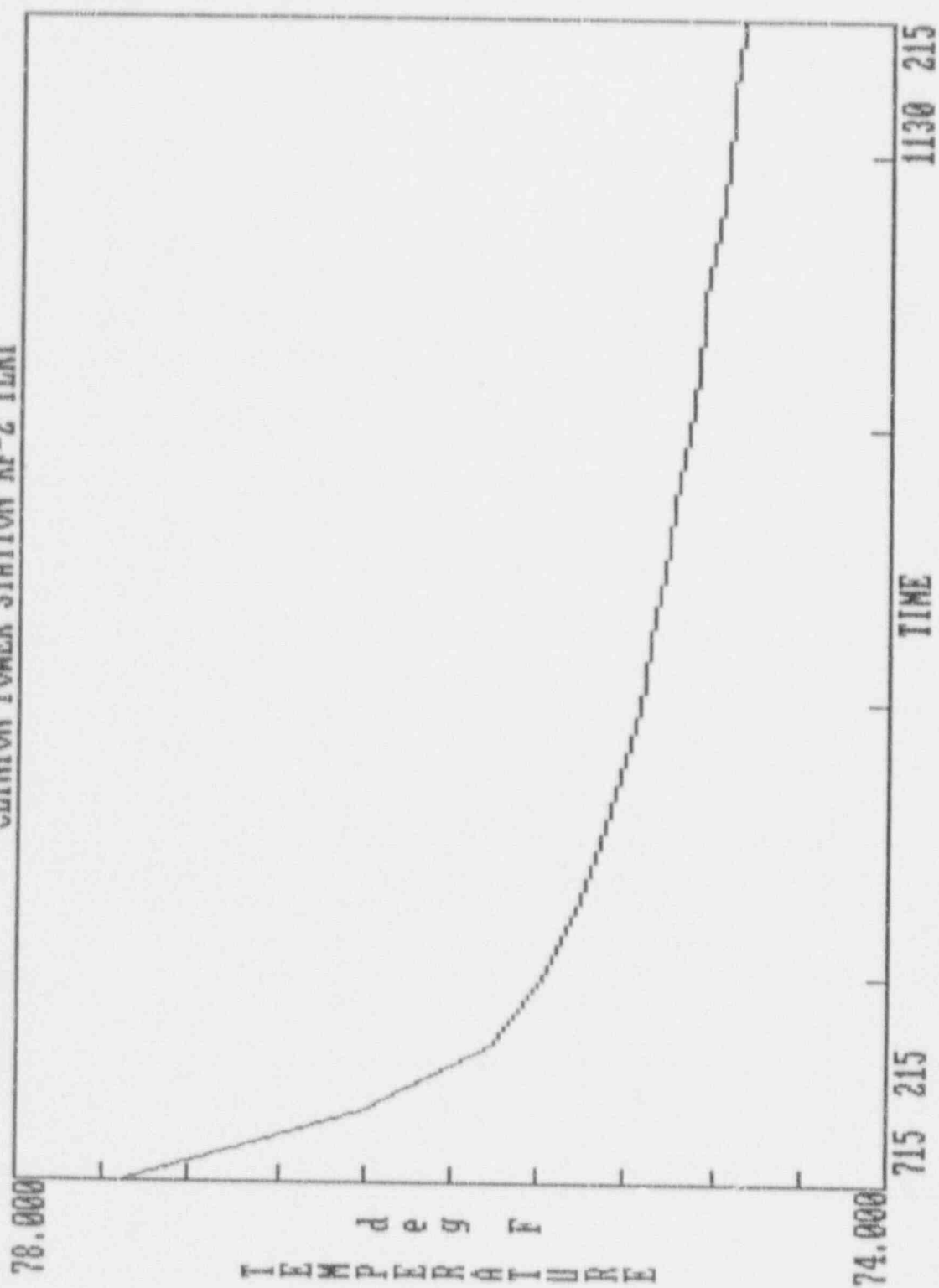
TEMPERATURE STABILIZATION REPORT

Start Time = 715 215

* = stabilization criterion satisfied

Sta	elapsed time, hr	temperature T, deg F	dT1 avg dT (1 hr)	dT4 avg dT (4 hr)	- ANSI - dT1-dT4	--- BN-TOP-1 ---	
						dT avg (2 hr)	or d(dT) avg (2 hr)
1	0.00	77.510					
2	0.25	76.446					
3	0.50	75.827					
4	0.75	75.576					
5	1.00	75.432	-2.078				
6	1.25	75.327	-1.119				
7	1.50	75.239	-0.588				
8	1.75	75.148	-0.428				
9	2.00	75.093	-0.339				
10	2.25	75.023	-0.304			-1.208	2.019
11	2.50	74.982	-0.256			-0.712*	1.097
12	2.75	74.919	-0.229			-0.422*	0.420*
13	3.00	74.880	-0.213			-0.329*	0.161*
14	3.25	74.848	-0.175			-0.276*	0.133*
15	3.50	74.796	-0.186			-0.240*	0.112*
16	3.75	74.750	-0.169			-0.221*	0.078*
17	4.00	74.720	-0.160	-0.697	0.537	-0.199*	0.017*
18	4.25	74.685	-0.163	-0.440	0.277*	-0.186*	0.083*
						-0.169*	0.009*

CLINTON POWER STATION RF-2 ILRT



APPENDIX C

ILRT Summary Data

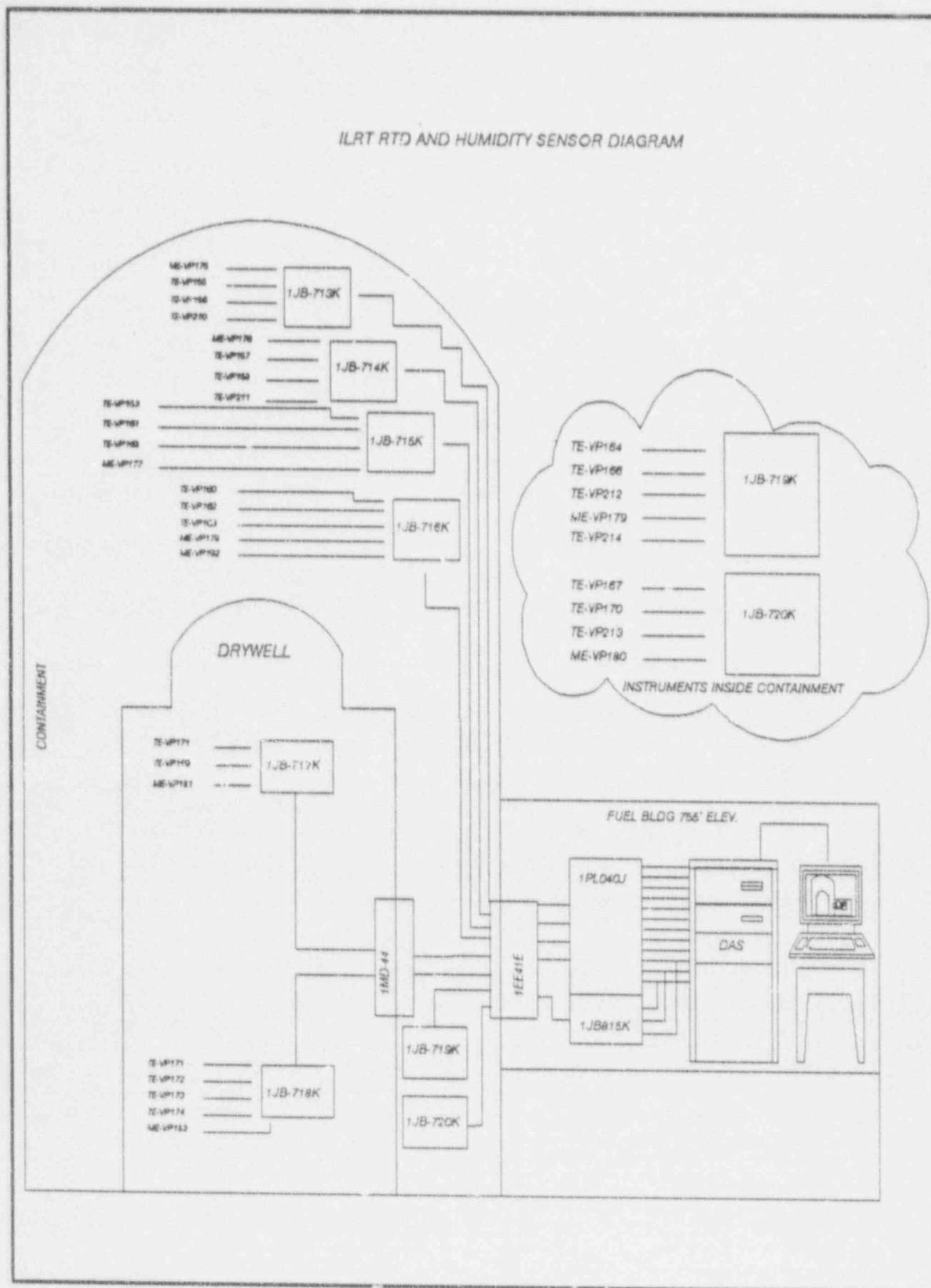
- Summary Data Report
- Instrumentation Schematic Arrangements

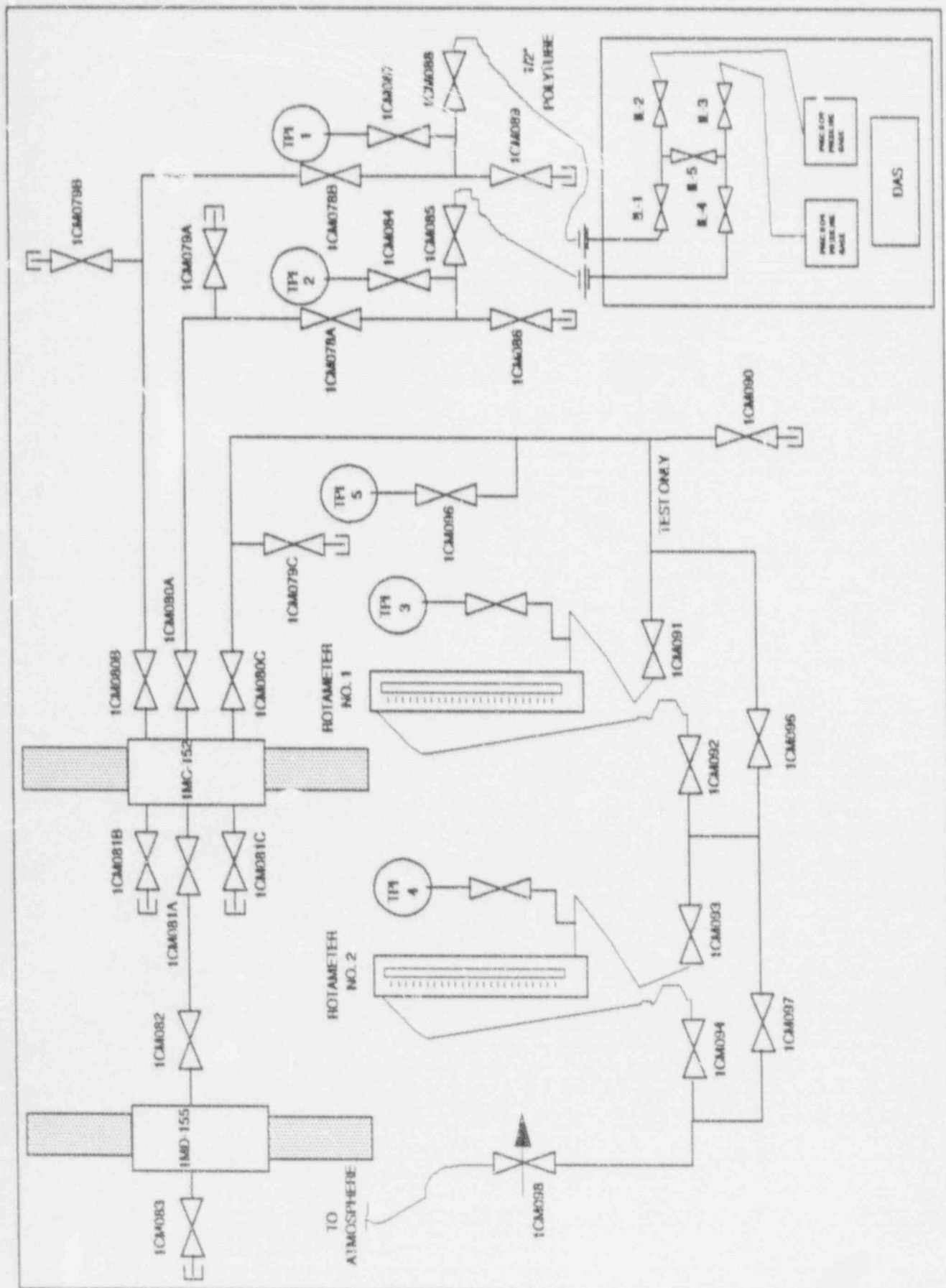
CLINTON POWER STATION RF-2 ILRT

DATA SUMMARY REPORT

data set	time	date	temperature deg F	pressure psia	vapor pressure psia	dry air mass lbm
1	715	215	77.5100	24.1990	0.3618	215042.25
2	730	215	76.4458	24.1340	0.3541	214951.61
3	745	215	75.8267	24.1130	0.3510	215037.99
4	800	215	75.5764	24.1030	0.3501	215056.27
5	815	215	75.4322	24.0970	0.3499	215061.94
6	830	215	75.3270	24.0920	0.3500	215058.08
7	845	215	75.2387	24.0830	0.3496	215060.53
8	900	215	75.1481	24.0840	0.3495	215061.56
9	915	215	75.0932	24.0800	0.3495	215047.55
10	930	215	75.0226	24.0770	0.3495	215048.71
11	945	215	74.9823	24.0750	0.3496	215045.79
12	1000	215	74.9188	24.0715	0.3495	215040.94
13	1015	215	74.8803	24.0690	0.3498	215030.80
14	1030	215	74.8478	24.0670	0.3498	215025.71
15	1045	215	74.7960	24.0645	0.3498	215024.33
16	1100	215	74.7497	24.0625	0.3498	215024.72
17	1115	215	74.7204	24.0605	0.3499	215017.06
18	1130	215	74.6848	24.0585	0.3499	215013.19

ILRT RTD AND HUMIDITY SENSOR DIAGRAM





APPENDIX D

ILRT Calculations

- Summary Data Report
- Trend Report
- Mass Point Analysis
- Total Time Analysis
- RTD-19 Volume Fraction Reassignments
- RTD-19 Trend Report

CLINTON POWER STATION PF-2 ILRT

DATA SUMMARY REPORT

data set	time	date	temperature deg F	pressure psia	vapor pressure psia	dry air mass lbm
13	1130	215	74.6848	24.0585	0.3499	215013.19
19	1145	215	74.6492	24.0565	0.3500	215008.49
20	1200	215	74.6206	24.0545	0.3499	215002.85
21	1215	215	74.5972	24.0530	0.3500	214998.15
22	1230	215	74.5437	24.0515	0.3501	215004.79
23	1245	215	74.5309	24.0495	0.3502	214990.66
24	1300	215	74.5082	24.0475	0.3502	214981.56
25	1315	215	74.4724	24.0465	0.3504	214985.62
26	1330	215	74.4374	24.0450	0.3504	214985.86
27	1345	215	74.4271	24.0435	0.3505	214975.74
28	1400	215	74.3853	24.0420	0.3504	214979.66
29	1415	215	74.3627	24.0405	0.3505	214974.05
30	1430	215	74.3424	24.0395	0.3507	214971.37
31	1445	215	74.3243	24.0380	0.3509	214963.60
32	1500	215	74.2977	24.0365	0.3507	214962.59
33	1515	215	74.2759	24.0355	0.3507	214961.61
34	1530	215	74.2642	24.0345	0.3509	214956.06
35	1545	215	74.2324	24.0330	0.3508	214955.71
36	1600	215	74.2158	24.0315	0.3509	214948.31
37	1615	215	74.1870	24.0300	0.3509	214945.97
38	1630	215	74.1668	24.0290	0.3508	214945.73
39	1645	215	74.1505	24.0280	0.3510	214941.97
40	1700	215	74.1249	24.0265	0.3509	214938.90
41	1715	215	74.1034	24.0255	0.3510	214937.90
42	1730	215	74.0850	24.0245	0.3510	214936.57
43	1745	215	74.0687	24.0235	0.3510	214933.85
44	1800	215	74.0499	24.0220	0.3510	214928.19
45	1815	215	74.0299	24.0205	0.3509	214923.11
46	1830	215	74.0141	24.0200	0.3510	214923.65
47	1845	215	73.9977	24.0185	0.3511	214916.35
48	1900	215	73.9829	24.0175	0.3513	214911.35
49	1915	215	73.9661	24.0165	0.3512	214909.79
50	1930	215	73.9541	24.0165	0.3513	214913.84

CLINTON POWER STATION RF-2 ILRT

TREND REPORT

data set	time	date	elapsed time (hrs)	measured rate (%/day)	leakage rates		mass point	
					total time leakage rate (%/day)	ucl rate (%/day)	leakage rate (%/day)	uc rat (%/day)
18	1130	215	0.00	0.0000	0.0000	0.0000	0.0000	0.000
19	1145	215	0.25	0.2096	0.2096	0.2096	0.2096	0.209
20	1200	215	0.50	0.2308	0.2308	0.2308	0.2308	0.335
21	1215	215	0.75	0.2238	0.2285	0.3397	0.2266	0.244
22	1230	215	1.00	0.0937	0.1363	0.4152	0.1211	0.264
23	1245	215	1.25	0.2012	0.1610	0.3871	0.1639	0.263
24	1300	215	1.50	0.2353	0.1926	0.3922	0.2051	0.287
25	1315	215	1.75	0.1758	0.1835	0.3474	0.1901	0.251
26	1330	215	2.00	0.1525	0.1682	0.3109	0.1697	0.221
27	1345	215	2.25	0.1858	0.1709	0.2986	0.1747	0.215
28	1400	215	2.50	0.1497	0.1605	0.2764	0.1615	0.197
29	1415	215	2.75	0.1589	0.1561	0.2623	0.1573	0.186
30	1430	215	3.00	0.1556	0.1521	0.2506	0.1536	0.178
31	1445	215	3.25	0.1703	0.1533	0.2466	0.1567	0.178
32	1500	215	3.50	0.1614	0.1520	0.2402	0.1560	0.174
33	1515	215	3.75	0.1535	0.1493	0.2328	0.1530	0.169
34	1530	215	4.00	0.1594	0.1485	0.2283	0.1528	0.167
35	1545	215	4.25	0.1510	0.1461	0.2225	0.1503	0.163
36	1600	215	4.50	0.1609	0.1463	0.2202	0.1513	0.163
37	1615	215	4.75	0.1580	0.1460	0.2174	0.1514	0.161
38	1630	215	5.00	0.1506	0.1444	0.2133	0.1497	0.159
39	1645	215	5.25	0.1514	0.1433	0.2100	0.1485	0.157
40	1700	215	5.50	0.1508	0.1422	0.2071	0.1476	0.155
41	1715	215	5.75	0.1461	0.1407	0.2036	0.1458	0.153
42	1730	215	6.00	0.1425	0.1388	0.2000	0.1436	0.150
43	1745	215	6.25	0.1417	0.1371	0.1967	0.1417	0.148
44	1800	215	6.50	0.1460	0.1363	0.1945	0.1411	0.147
45	1815	215	6.75	0.1490	0.1360	0.1932	0.1412	0.147
46	1830	215	7.00	0.1428	0.1350	0.1909	0.1402	0.145
47	1845	215	7.25	0.1491	0.1349	0.1900	0.1405	0.145
48	1900	215	7.50	0.1516	0.1352	0.1896	0.1413	0.146
49	1915	215	7.75	0.1489	0.1352	0.1887	0.1416	0.146
50	1930	215	8.00	0.1386	0.1339	0.1865	0.1400	0.144

CLINTON POWER STATION RF-2 ILRT

TREND REPORT

data set	time	date	elapsed time (hrs)	measured rate (%/day)	leakage rates			
					total time leakage rate (%/day)	ucl rate (%/day)	mass point leakage rate (%/day)	ucl rate (%/day)
18	1130	215	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
19	1145	215	0.25	0.2096	0.2096	0.2096	0.2096	0.2096
20	1200	215	0.50	0.2308	0.2308	0.2308	0.2308	0.3353
21	1215	215	0.75	0.2238	0.2285	0.3397	0.2266	0.2442
22	1230	215	1.00	0.0937	0.1363	0.4152	0.1211	0.2648
23	1245	215	1.25	0.2012	0.1610	0.3871	0.1639	0.2639
24	1300	215	1.50	0.2353	0.1926	0.3922	0.2051	0.2874
25	1315	215	1.75	0.1758	0.1835	0.3474	0.1901	0.2516
26	1330	215	2.00	0.1525	0.1682	0.3109	0.1697	0.2212
27	1345	215	2.25	0.1858	0.1709	0.2986	0.1747	0.2154
28	1400	215	2.50	0.1497	0.1605	0.2764	0.1615	0.1971
29	1415	215	2.75	0.1589	0.1561	0.2623	0.1573	0.1869
30	1430	215	3.00	0.1556	0.1521	0.2506	0.1536	0.1787
31	1445	215	3.25	0.1703	0.1533	0.2466	0.1567	0.1783
32	1500	215	3.50	0.1614	0.1520	0.2402	0.1560	0.1746
33	1515	215	3.75	0.1535	0.1493	0.2328	0.1530	0.1695
34	1530	215	4.00	0.1594	0.1485	0.2283	0.1528	0.1673
35	1545	215	4.25	0.1510	0.1461	0.2225	0.1503	0.1633
36	1600	215	4.50	0.1609	0.1463	0.2202	0.1513	0.1630
37	1615	215	4.75	0.1580	0.1460	0.2174	0.1514	0.1619
38	1630	215	5.00	0.1506	0.1444	0.2133	0.1497	0.1592
39	1645	215	5.25	0.1514	0.1433	0.2100	0.1485	0.1573
40	1700	215	5.50	0.1508	0.1422	0.2071	0.1476	0.1556
41	1715	215	5.75	0.1461	0.1407	0.2036	0.1458	0.1534
42	1730	215	6.00	0.1425	0.1388	0.2000	0.1436	0.1509
43	1745	215	6.25	0.1417	0.1371	0.1967	0.1417	0.1487
44	1800	215	6.50	0.1460	0.1363	0.1945	0.1411	0.1475
45	1815	215	6.75	0.1490	0.1360	0.1932	0.1412	0.1472
46	1830	215	7.00	0.1428	0.1350	0.1909	0.1402	0.1458
47	1845	215	7.25	0.1491	0.1349	0.1900	0.1405	0.1458
48	1900	215	7.50	0.1516	0.1352	0.1896	0.1413	0.1463
49	1915	215	7.75	0.1489	0.1352	0.1887	0.1416	0.1463
50	1930	215	8.00	0.1386	0.1339	0.1865	0.1400	0.1447

CLINTON POWER STATION RF-2 ILRT

MASS POINT LEAKAGE RATE REPORT

data set	time	date	elapsed time (hrs)	dry air mass (lbm)	leakage rate (%/day)	ucl rate (%/day)
18	1130	215	0.00	215013.19	0.0000	0.0000
19	1145	215	0.25	215008.49	0.2096	0.2096
20	1200	215	0.50	215002.85	0.2308	0.3353
21	1215	215	0.75	214998.15	0.2266	0.2442
22	1230	215	1.00	215004.79	0.1211	0.2648
23	1245	215	1.25	214990.66	0.1639	0.2639
24	1300	215	1.50	214981.56	0.2051	0.2874
25	1315	215	1.75	214985.62	0.1901	0.2516
26	1330	215	2.00	214985.86	0.1697	0.2212
27	1345	215	2.25	214975.74	0.1747	0.2154
28	1400	215	2.50	214979.66	0.1615	0.1971
29	1415	215	2.75	214974.05	0.1573	0.1869
30	1430	215	3.00	214971.37	0.1536	0.1787
31	1445	215	3.25	214963.60	0.1567	0.1783
32	1500	215	3.50	214962.59	0.1560	0.1746
33	1515	215	3.75	214961.61	0.1530	0.1695
34	1530	215	4.00	214956.06	0.1528	0.1673
35	1545	215	4.25	214955.71	0.1503	0.1633
36	1600	215	4.50	214948.31	0.1513	0.1630
37	1615	215	4.75	214945.97	0.1514	0.1619
38	1630	215	5.00	214945.73	0.1497	0.1592
39	1645	215	5.25	214941.97	0.1485	0.1573
40	1700	215	5.50	214938.90	0.1476	0.1556
41	1715	215	5.75	214937.90	0.1458	0.1534
42	1730	215	6.00	214936.57	0.1436	0.1509
43	1745	215	6.25	214933.85	0.1417	0.1487
44	1800	215	6.50	214928.19	0.1411	0.1475
45	1815	215	6.75	214923.11	0.1412	0.1472
46	1830	215	7.00	214923.65	0.1402	0.1458
47	1845	215	7.25	214916.35	0.1405	0.1458
48	1900	215	7.50	214911.35	0.1413	0.1463
49	1915	215	7.75	214909.79	0.1416	0.1463
50	1930	215	8.00	214913.84	0.1400	0.1447

Allowable leakage rate, La = 0.6500 %/day
 75% La = 0.4875 %/day
 Mass point leakage rate = 0.1400 %/day
 Mass point UCL = 0.1447 %/day

CLINTON POWER STATION RF-2 ILRT

TOTAL TIME LEAKAGE RATE REPORT

data set	time	date	elapsed time (hrs)	dry air mass (lbm)	measured rate (%/day)	leakage rate (%/day)	ucl rate (%/day)
18	1130	215	0.00	215013.19	0.0000	0.0000	0.0000
19	1145	215	0.25	215008.49	0.2096	0.2096	0.2096
20	1200	215	0.50	215002.85	0.2308	0.2308	0.2308
21	1215	215	0.75	214998.15	0.2238	0.2285	0.3397
22	1230	215	1.00	215004.79	0.0937	0.1363	0.4152
23	1245	215	1.25	214990.66	0.2012	0.1610	0.3871
24	1300	215	1.50	214981.56	0.2353	0.1926	0.3922
25	1315	215	1.75	214985.62	0.1758	0.1835	0.3474
26	1330	215	2.00	214985.86	0.1525	0.1682	0.3109
27	1345	215	2.25	214975.74	0.1858	0.1709	0.2986
28	1400	215	2.50	214979.66	0.1497	0.1605	0.2764
29	1415	215	2.75	214974.05	0.1589	0.1561	0.2623
30	1430	215	3.00	214971.37	0.1556	0.1521	0.2506
31	1445	215	3.25	214963.60	0.1703	0.1533	0.2466
32	1500	215	3.50	214962.59	0.1614	0.1520	0.2402
33	1515	215	3.75	214961.61	0.1535	0.1493	0.2328
34	1530	215	4.00	214956.06	0.1594	0.1485	0.2283
35	1545	215	4.25	214955.71	0.1510	0.1461	0.2225
36	1600	215	4.50	214948.31	0.1609	0.1463	0.2202
37	1615	215	4.75	214945.97	0.1580	0.1460	0.2174
38	1630	215	5.00	214945.73	0.1506	0.1444	0.2133
39	1645	215	5.25	214941.97	0.1514	0.1433	0.2100
40	1700	215	5.50	214938.90	0.1508	0.1422	0.2071
41	1715	215	5.75	214937.90	0.1461	0.1407	0.2036
42	1730	215	6.00	214936.57	0.1425	0.1388	0.2000
43	1745	215	6.25	214933.85	0.1417	0.1371	0.1967
44	1800	215	6.50	214928.19	0.1460	0.1363	0.1945
45	1815	215	6.75	214923.11	0.1490	0.1360	0.1932
46	1830	215	7.00	214923.65	0.1428	0.1350	0.1909
47	1845	215	7.25	214916.35	0.1491	0.1349	0.1900
48	1900	215	7.50	214911.35	0.1516	0.1352	0.1896
49	1915	215	7.75	214909.79	0.1489	0.1352	0.1887
50	1930	215	8.00	214913.84	0.1386	0.1339	0.1865

Allowable leakage rate, La = 0.6500 %/day
 75% La = 0.4875 %/day
 Total time leakage rate = 0.1339 %/day
 Total time UCL = 0.1865 %/day

2
title = CPS RF-2 ILRT (RTD 19 not used)

volume = 1795400 La = 0.6500

leap year : no

temperature volume fractions

7
t(1)=0.0700 t(2)=0.0700 t(3)=0.0700 t(4)=0.0700 t(5)=0.0460
t(6)=0.0460 t(7)=0.0460 t(8)=0.0460 t(9)=0.0460 t(10)=0.0100
t(11)=0.0460 t(12)=0.0460 t(13)=0.0380 t(14)=0.0380 t(15)=0.0380
t(16)=0.0390 t(17)=0.0420 t(18)=0.0420 t(19)=0.0000 t(20)=0.0660
t(21)=0.0330 t(22)=0.0330 t(23)=0.0040 t(24)=0.0030 t(25)=0.0120

dewpoint volume fractions

dp(1)=0.1400 dp(2)=0.1400 dp(3)=0.1160 dp(4)=0.1160 dp(5)=0.0940
dp(6)=0.1280 dp(7)=0.1280 dp(8)=0.0690 dp(9)=0.0690

pressure volume fractions

p(1)=0.5000 p(2)=0.5000

Is pre-data correct (y/n; default = n) ? _

TREND REPORT

data set	time	date	elapsed time (hrs)	measured rate (%/day)	total time leakage rate (%/day)	leakage rates		
						ucl rate (%/day)	mass leakage rate (%/day)	point uc rat (%/day)
18	1130	215	0.00	0.0000	0.0000	0.0000	0.0000	0.000
19	1145	215	0.25	0.2176	0.2176	0.2176	0.2176	0.217
20	1200	215	0.50	0.2307	0.2307	0.2307	0.2307	0.295
21	1215	215	0.75	0.2215	0.2252	0.3132	0.2237	0.239
22	1230	215	1.00	0.0936	0.1337	0.3954	0.1196	0.261
23	1245	215	1.25	0.1995	0.1579	0.3790	0.1617	0.260
24	1300	215	1.50	0.2342	0.1896	0.3884	0.2031	0.284
25	1315	215	1.75	0.1733	0.1799	0.3431	0.1875	0.248
26	1330	215	2.00	0.1493	0.1641	0.3059	0.1664	0.218
27	1345	215	2.25	0.1840	0.1670	0.2944	0.1718	0.212
28	1400	215	2.50	0.1480	0.1568	0.2722	0.1589	0.194
29	1415	215	2.75	0.1559	0.1522	0.2580	0.1544	0.184
30	1430	215	3.00	0.1536	0.1484	0.2465	0.1508	0.176
31	1445	215	3.25	0.1684	0.1497	0.2429	0.1542	0.175
32	1500	215	3.50	0.1584	0.1483	0.2364	0.1532	0.171
33	1515	215	3.75	0.1513	0.1456	0.2291	0.1503	0.166
34	1530	215	4.00	0.1563	0.1447	0.2246	0.1499	0.164
35	1545	215	4.25	0.1476	0.1422	0.2187	0.1471	0.160
36	1600	215	4.50	0.1573	0.1422	0.2162	0.1479	0.159
37	1615	215	4.75	0.1549	0.1418	0.2134	0.1480	0.158
38	1630	215	5.00	0.1481	0.1403	0.2095	0.1464	0.156
39	1645	215	5.25	0.1487	0.1392	0.2063	0.1453	0.154
40	1700	215	5.50	0.1482	0.1383	0.2035	0.1444	0.152
41	1715	215	5.75	0.1436	0.1367	0.2001	0.1427	0.150
42	1730	215	6.00	0.1392	0.1348	0.1964	0.1404	0.147
43	1745	215	6.25	0.1394	0.1332	0.1932	0.1386	0.145
44	1800	215	6.50	0.1426	0.1323	0.1910	0.1379	0.144
45	1815	215	6.75	0.1462	0.1321	0.1897	0.1381	0.144
46	1830	215	7.00	0.1402	0.1311	0.1875	0.1371	0.142
47	1845	215	7.25	0.1463	0.1310	0.1867	0.1374	0.142
48	1900	215	7.50	0.1488	0.1314	0.1863	0.1383	0.143
49	1915	215	7.75	0.1458	0.1313	0.1855	0.1385	0.143
50	1930	215	8.00	0.1355	0.1301	0.1832	0.1369	0.141

CPS RF-2 ILRT (RTD 19 not used)

TREND REPORT

data set	time	date	elapsed time (hrs)	measured rate (%/day)	total time leakage rate (%/day)	leakage rates		mass point	
						ucl rate (%/day)	leakage rate (%/day)	ucl rate (%/day)	leakage rate (%/day)
18	1130	215	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
19	1145	215	0.25	0.2176	0.2176	0.2176	0.2176	0.2176	0.2176
20	1200	215	0.50	0.2307	0.2307	0.2307	0.2307	0.2307	0.2307
21	1215	215	0.75	0.2215	0.2252	0.3132	0.2237	0.2391	0.2391
22	1230	215	1.00	0.0936	0.1337	0.3954	0.1196	0.2613	0.2613
23	1245	215	1.25	0.1995	0.1579	0.3790	0.1617	0.2605	0.2605
24	1300	215	1.50	0.2342	0.1896	0.3884	0.2031	0.2848	0.2848
25	1315	215	1.75	0.1733	0.1799	0.3431	0.1875	0.2488	0.2488
26	1330	215	2.00	0.1493	0.1641	0.3059	0.1664	0.2181	0.2181
27	1345	215	2.25	0.1840	0.1670	0.2944	0.1718	0.2127	0.2127
28	1400	215	2.50	0.1480	0.1568	0.2722	0.1589	0.1946	0.1946
29	1415	215	2.75	0.1559	0.1522	0.2580	0.1544	0.1841	0.1841
30	1430	215	3.00	0.1536	0.1484	0.2465	0.1508	0.1760	0.1760
31	1445	215	3.25	0.1684	0.1497	0.2429	0.1542	0.1758	0.1758
32	1500	215	3.50	0.1584	0.1483	0.2364	0.1532	0.1718	0.1718
33	1515	215	3.75	0.1513	0.1456	0.2291	0.1503	0.1668	0.1668
34	1530	215	4.00	0.1563	0.1447	0.2246	0.1499	0.1644	0.1644
35	1545	215	4.25	0.1476	0.1422	0.2187	0.1471	0.1602	0.1602
36	1600	215	4.50	0.1573	0.1422	0.2162	0.1479	0.1596	0.1596
37	1615	215	4.75	0.1549	0.1418	0.2134	0.1480	0.1585	0.1585
38	1630	215	5.00	0.1481	0.1403	0.2095	0.1464	0.1560	0.1560
39	1645	215	5.25	0.1487	0.1392	0.2063	0.1453	0.1541	0.1541
40	1700	215	5.50	0.1482	0.1383	0.2035	0.1444	0.1524	0.1524
41	1715	215	5.75	0.1436	0.1367	0.2001	0.1427	0.1502	0.1502
42	1730	215	6.00	0.1392	0.1348	0.1964	0.1404	0.1477	0.1477
43	1745	215	6.25	0.1394	0.1332	0.1932	0.1386	0.1456	0.1456
44	1800	215	6.50	0.1426	0.1323	0.1910	0.1379	0.1443	0.1443
45	1815	215	6.75	0.1462	0.1321	0.1897	0.1381	0.1440	0.1440
46	1830	215	7.00	0.1402	0.1311	0.1875	0.1371	0.1427	0.1427
47	1845	215	7.25	0.1463	0.1310	0.1867	0.1374	0.1427	0.1427
48	1900	215	7.50	0.1488	0.1314	0.1863	0.1383	0.1433	0.1433
49	1915	215	7.75	0.1458	0.1313	0.1855	0.1385	0.1431	0.1431
50	1930	215	8.00	0.1355	0.1301	0.1832	0.1369	0.1416	0.1416

APPENDIX E

Verification Test

- Summary Data
- Trend Report
- Mass Point Analysis
- Total Time Analysis

CLINTON POWER STATION RF-2 ILRT

DATA SUMMARY REPORT

data set	time	date	temperature deg F	pressure psia	vapor pressure psia	dry air mass lbm
51	1945	215	73.9205	24.0145	0.3511	214911.05
52	2000	215	73.9046	24.0135	0.3511	214908.31
53	2015	215	73.8767	24.0105	0.3510	214892.92
54	2030	215	73.8674	24.0085	0.3512	214876.61
55	2045	215	73.8533	24.0065	0.3514	214862.61
56	2100	215	73.8304	24.0035	0.3512	214846.38
57	2115	215	73.8212	24.0010	0.3513	214826.61
58	2130	215	73.7951	23.9985	0.3513	214814.38
59	2145	215	73.7849	23.9955	0.3514	214790.07
60	2200	215	73.7712	23.9935	0.3515	214776.83
61	2215	215	73.7505	23.9905	0.3513	214759.58
62	2230	215	73.7363	23.9885	0.3514	214746.42
63	2245	215	73.7211	23.9855	0.3513	214725.98
64	2300	215	73.7076	23.9835	0.3514	214711.87
65	2315	215	73.7028	23.9815	0.3515	214694.88
66	2330	215	73.6691	23.9785	0.3514	214682.72
67	2345	215	73.6581	23.9765	0.3515	214667.96
68	0	216	73.6526	23.9740	0.3516	214645.89
69	15	216	73.6397	23.9715	0.3516	214628.74
70	30	216	73.6254	23.9685	0.3515	214608.05
71	45	216	73.6085	23.9665	0.3515	214596.47
72	100	216	73.5948	23.9640	0.3515	214579.44

CLINTON POWER STATION RF-2 ILRT

TREND REPORT

data set	time	date	elapsed time (hrs)	measured rate (%/day)	leakage rates		mass point	
					total time leakage rate (%/day)	ucl rate (%/day)	leakage rate (%/day)	uc rate (%/day)
56	2100	215	0.00	0.0000	0.0000	0.0000	0.0000	0.0000
57	2115	215	0.25	0.8830	0.8830	0.8830	0.8830	0.8830
58	2130	215	0.50	0.7149	0.7149	0.7149	0.7149	1.5454
59	2145	215	0.75	0.8386	0.7900	1.9443	0.8095	1.0147
60	2200	215	1.00	0.7769	0.7742	1.1977	0.7848	0.8854
61	2215	215	1.25	0.7756	0.7673	1.0358	0.7758	0.8364
62	2230	215	1.50	0.7444	0.7480	0.9503	0.7524	0.8012
63	2245	215	1.75	0.7685	0.7488	0.9185	0.7561	0.7914
64	2300	215	2.00	0.7513	0.7426	0.8888	0.7494	0.7773
65	2315	215	2.25	0.7521	0.7392	0.8696	0.7466	0.7684
66	2330	215	2.50	0.7313	0.7301	0.8477	0.7353	0.7568
67	2345	215	2.75	0.7248	0.7218	0.8296	0.7266	0.7464
68	0	216	3.00	0.7465	0.7224	0.8249	0.7297	0.7465
69	15	216	3.25	0.7480	0.7235	0.8217	0.7326	0.7472
70	30	216	3.50	0.7606	0.7278	0.8241	0.7393	0.7536
71	45	216	3.75	0.7444	0.7274	0.8195	0.7389	0.7514
72	100	216	4.00	0.7455	0.7275	0.8161	0.7390	0.7500

CLINTON POWER STATION RF-2 ILRT

TREND REPORT

data set	time	date	elapsed time (hrs)	measured rate (%/day)	total time leakage rate (%/day)	leakage rates		mass point	
						ucl rate (%/day)	leakage rate (%/day)	ucl rate (%/day)	leakage rate (%/day)
56	2100	215	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
57	2115	215	0.35	0.8830	0.8830	0.8830	0.8830	0.8830	0.8830
58	2130	215	0.50	0.7149	0.7149	0.7149	0.7149	1.5454	1.5454
59	2145	215	0.75	0.8386	0.7900	1.9443	0.8095	1.0147	1.0147
60	2200	215	1.00	0.7769	0.7742	1.1977	0.7848	0.8854	0.8854
61	2215	215	1.25	0.7756	0.7673	1.0358	0.7758	0.8364	0.8364
62	2230	215	1.50	0.7444	0.7480	0.9503	0.7524	0.8012	0.8012
63	2245	215	1.75	0.7685	0.7488	0.9185	0.7561	0.7914	0.7914
64	2300	215	2.00	0.7513	0.7426	0.8888	0.7494	0.7771	0.7771
65	2315	215	2.25	0.7521	0.7392	0.8696	0.7466	0.7684	0.7684
66	2330	215	2.50	0.7313	0.7301	0.8477	0.7358	0.7568	0.7568
67	2345	215	2.75	0.7248	0.7218	0.8296	0.7266	0.7464	0.7464
68	0	216	3.00	0.7465	0.7224	0.8249	0.7297	0.7465	0.7465
69	15	216	3.25	0.7480	0.7235	0.8217	0.7326	0.7472	0.7472
70	30	216	3.50	0.7606	0.7278	0.8241	0.7393	0.7536	0.7536
71	45	216	3.75	0.7444	0.7274	0.8195	0.7389	0.7514	0.7514
72	100	216	4.00	0.7455	0.7275	0.8161	0.7390	0.7500	0.7500

CLINTON POWER STATION RF-2 ILRT
MASS POINT LEAKAGE RATE REPORT

VERIFICATION

data set	time	date	elapsed time (hrs)	dry air mass (lbm)	leakage rate (%/day)
56	2100	215	0.00	214846.38	0.0000
57	2115	215	0.25	214826.61	0.8830
58	2130	215	0.50	214814.38	0.7149
59	2145	215	0.75	214790.07	0.8095
60	2200	215	1.00	214776.83	0.7848
61	2215	215	1.25	214759.58	0.7758
62	2230	215	1.50	214746.42	0.7524
63	2245	215	1.75	214725.98	0.7561
64	2300	215	2.00	214711.87	0.7494
65	2315	215	2.25	214694.88	0.7466
66	2330	215	2.50	214682.72	0.7358
67	2345	215	2.75	214667.96	0.7266
68	0	216	3.00	214645.89	0.7297
69	15	216	3.25	214628.74	0.7326
70	30	216	3.50	214608.05	0.7393
71	45	216	3.75	214596.47	0.7389
72	100	216	4.00	214579.44	0.7390

Upper limit on leakage rate = 0.9345 %/day
 Mass point leakage rate = 0.7390 %/day
 Lower limit on leakage rate = 0.6095 %/day

CLINTON POWER STATION RF-2 ILRT
TOTAL TIME LEAKAGE RATE REPORT

VERIFICATION

data set	time	date	elapsed time (hrs)	dry air mass (lbm)	measured rate (%/day)	leakage rate (%/day)
56	2100	215	0.00	214846.38	0.0000	0.0000
57	2115	215	0.25	214826.61	0.8830	0.8830
58	2130	215	0.50	214814.38	0.7149	0.7149
59	2145	215	0.75	214790.07	0.8386	0.7900
60	2200	215	1.00	214776.83	0.7769	0.7742
61	2215	215	1.25	214759.58	0.7756	0.7673
62	2230	215	1.50	214746.42	0.7444	0.7480
63	2245	215	1.75	214725.98	0.7685	0.7488
64	2300	215	2.00	214711.87	0.7513	0.7420
65	2315	215	2.25	214694.88	0.7521	0.7392
66	2330	215	2.50	214682.72	0.7313	0.7301
67	2345	215	2.75	214667.96	0.7248	0.7218
68	0	216	3.00	214645.89	0.7465	0.7224
69	15	216	3.25	214628.74	0.7480	0.7235
70	30	216	3.50	214608.05	0.7606	0.7278
71	45	216	3.75	214596.47	0.7444	0.7274
72	100	216	4.00	214579.44	0.7455	0.7275

Upper limit on leakage rate = 0.9284 %/day
Total time leakage rate = 0.7275 %/day
Lower limit on leakage rate = 0.6034 %/day

APPENDIX F

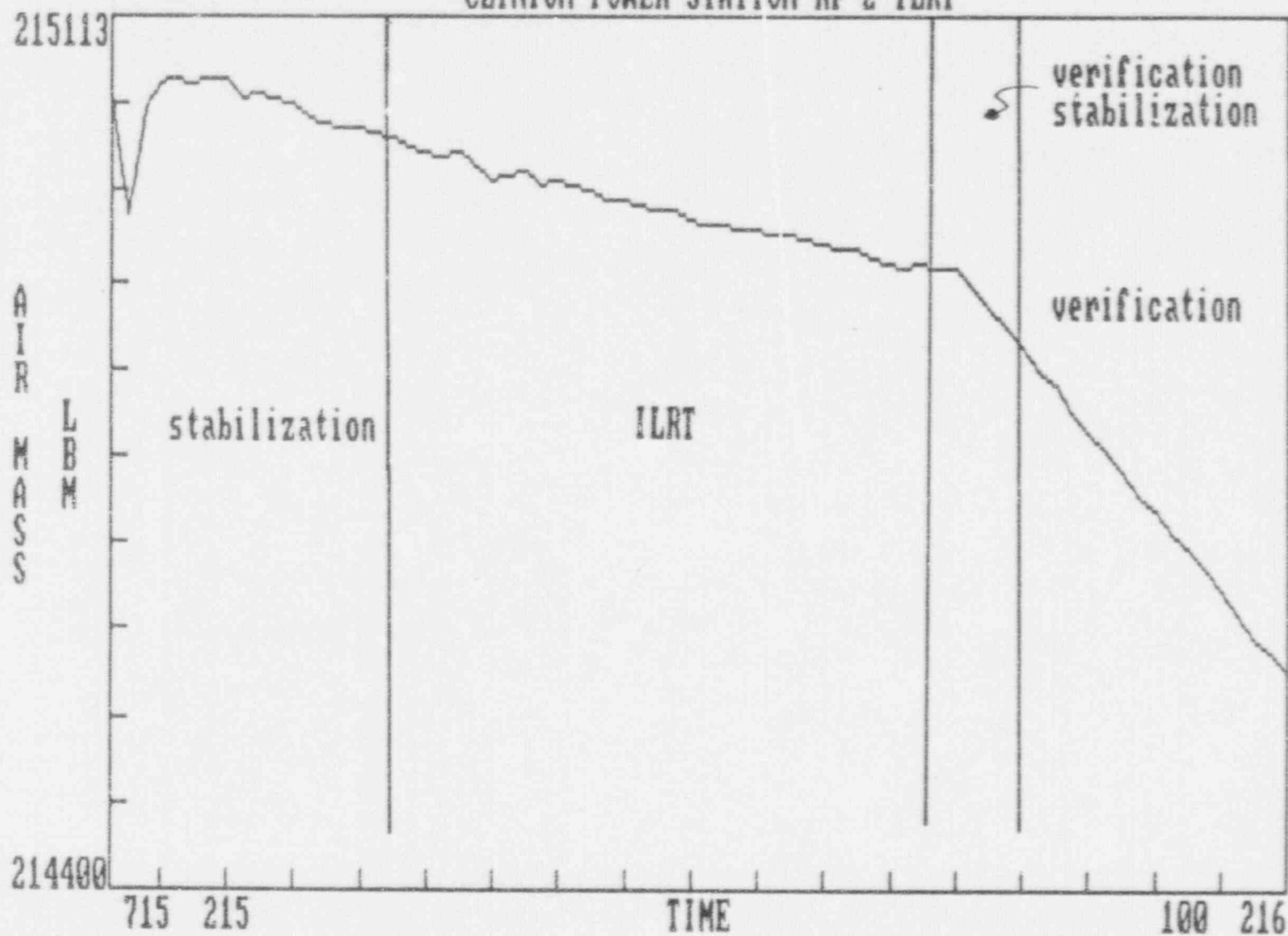
PLOTS

PLOTS ENTIRE TEST

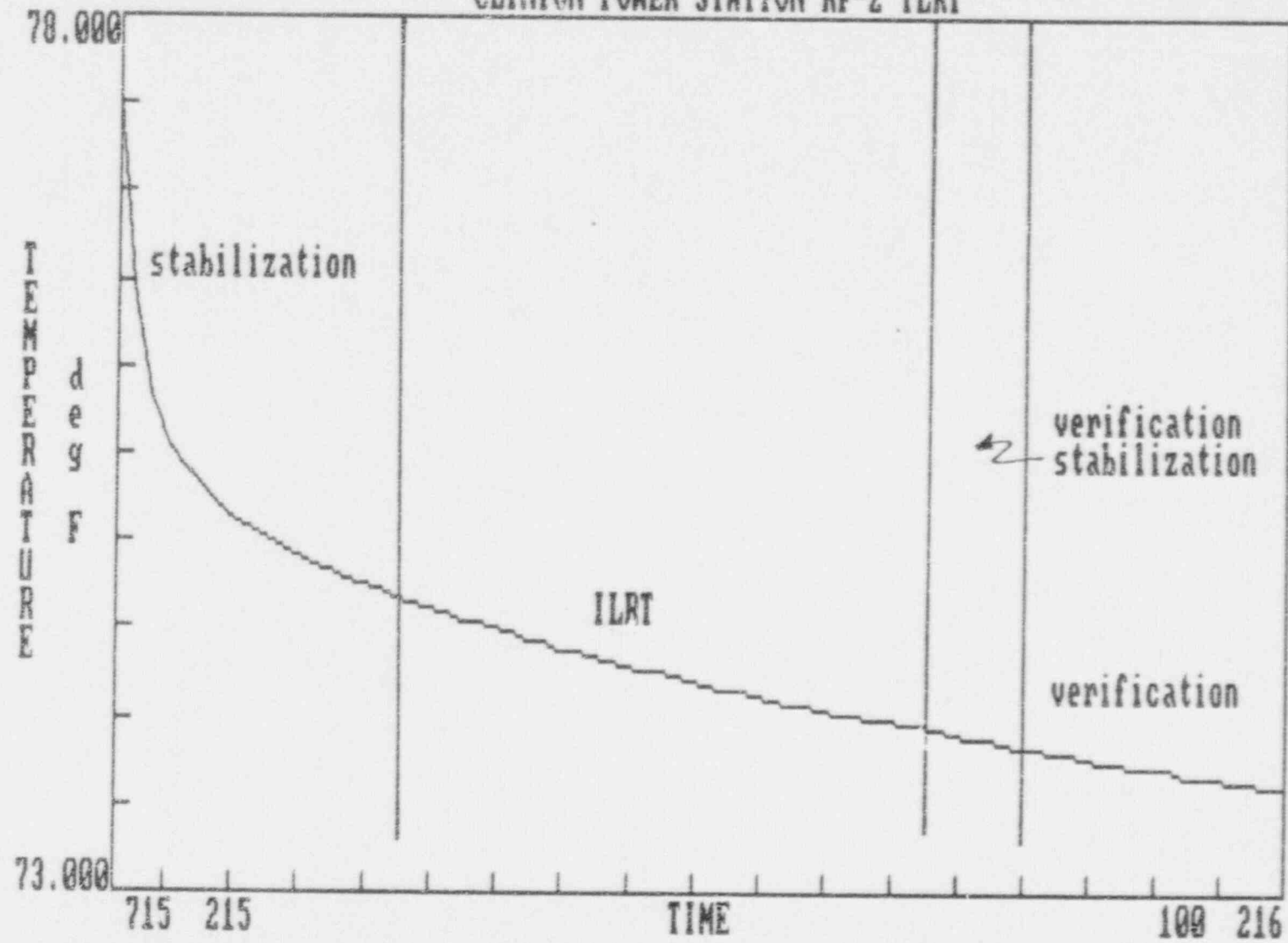
(Stabilization, ILRT, Verification)

- AIR MASS
- TEMPERATURE
- PRESSURE
- VAPOR PRESSURE

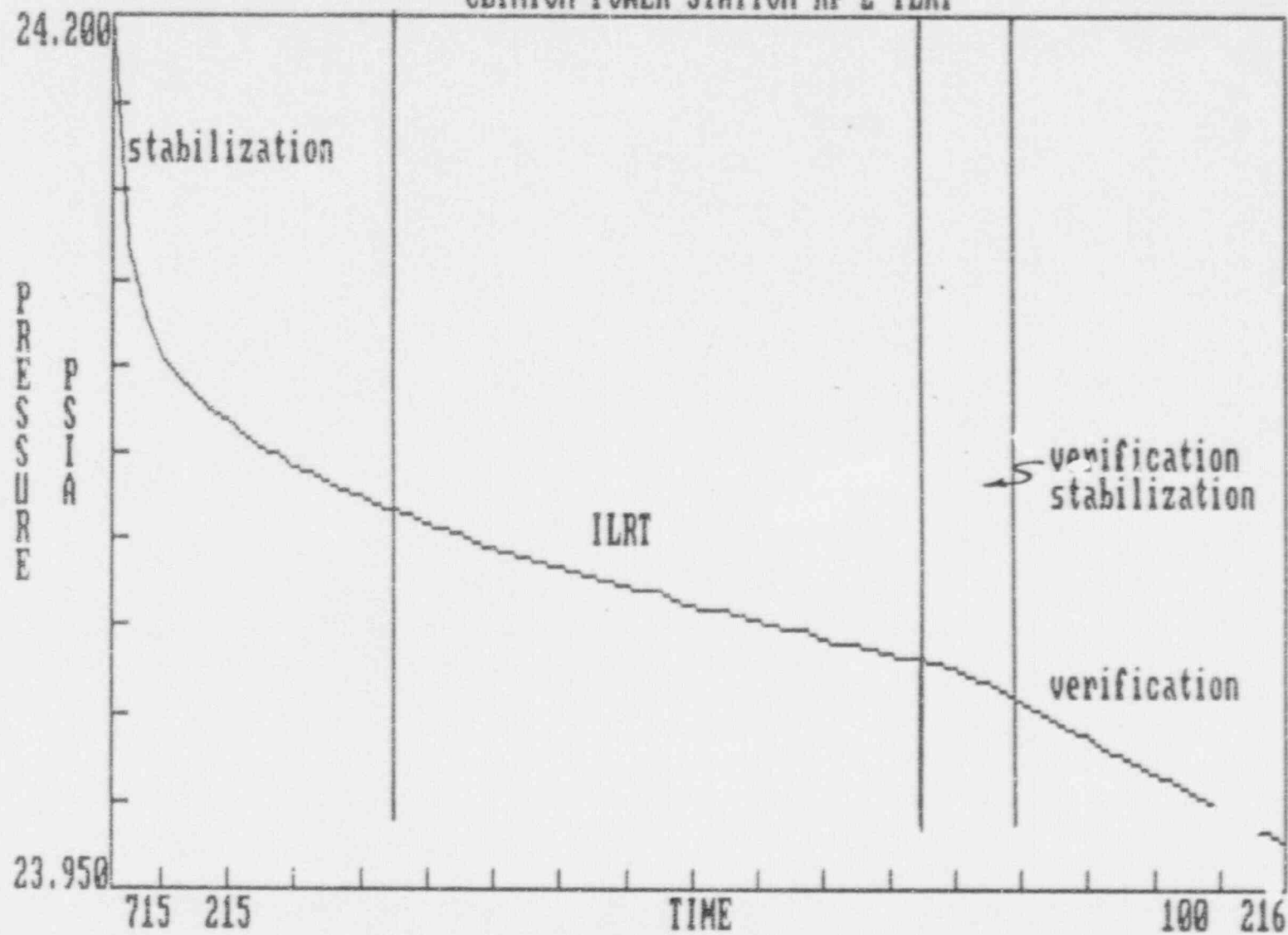
CLINTON POWER STATION RF-2 ILRT

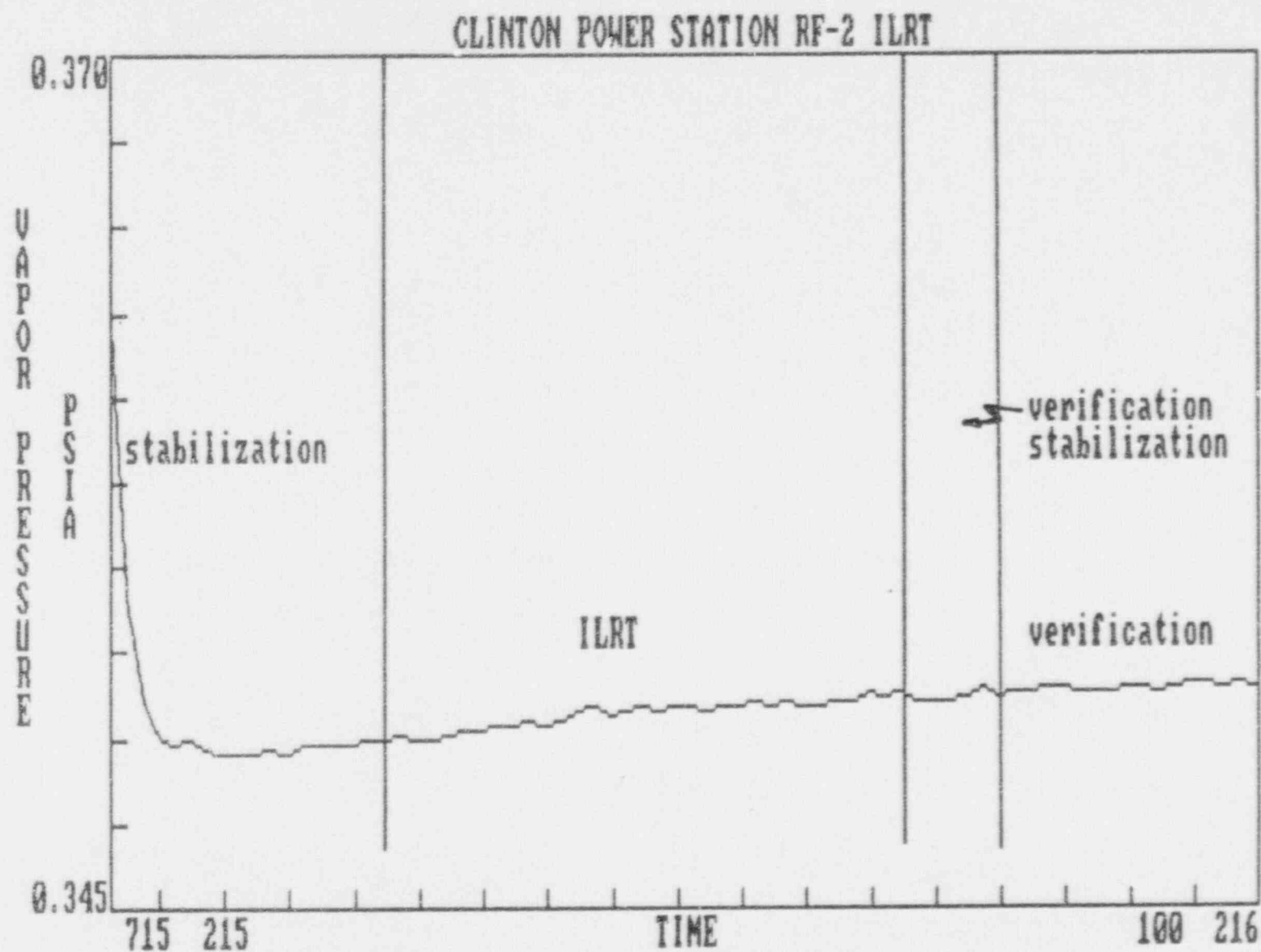


CLINTON POWER STATION RF-2 ILRT



CLINTON POWER STATION RF-2 ILRT

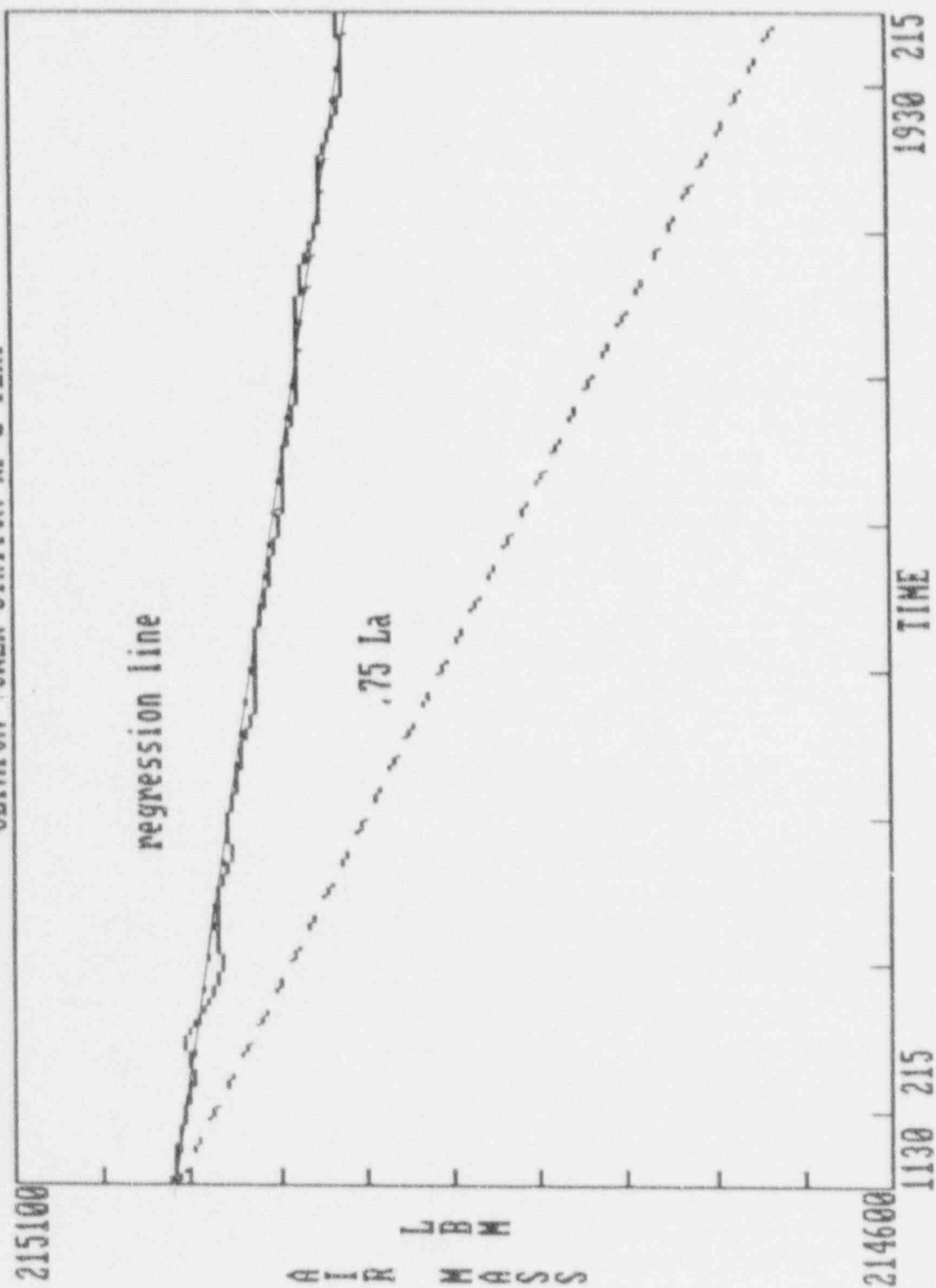




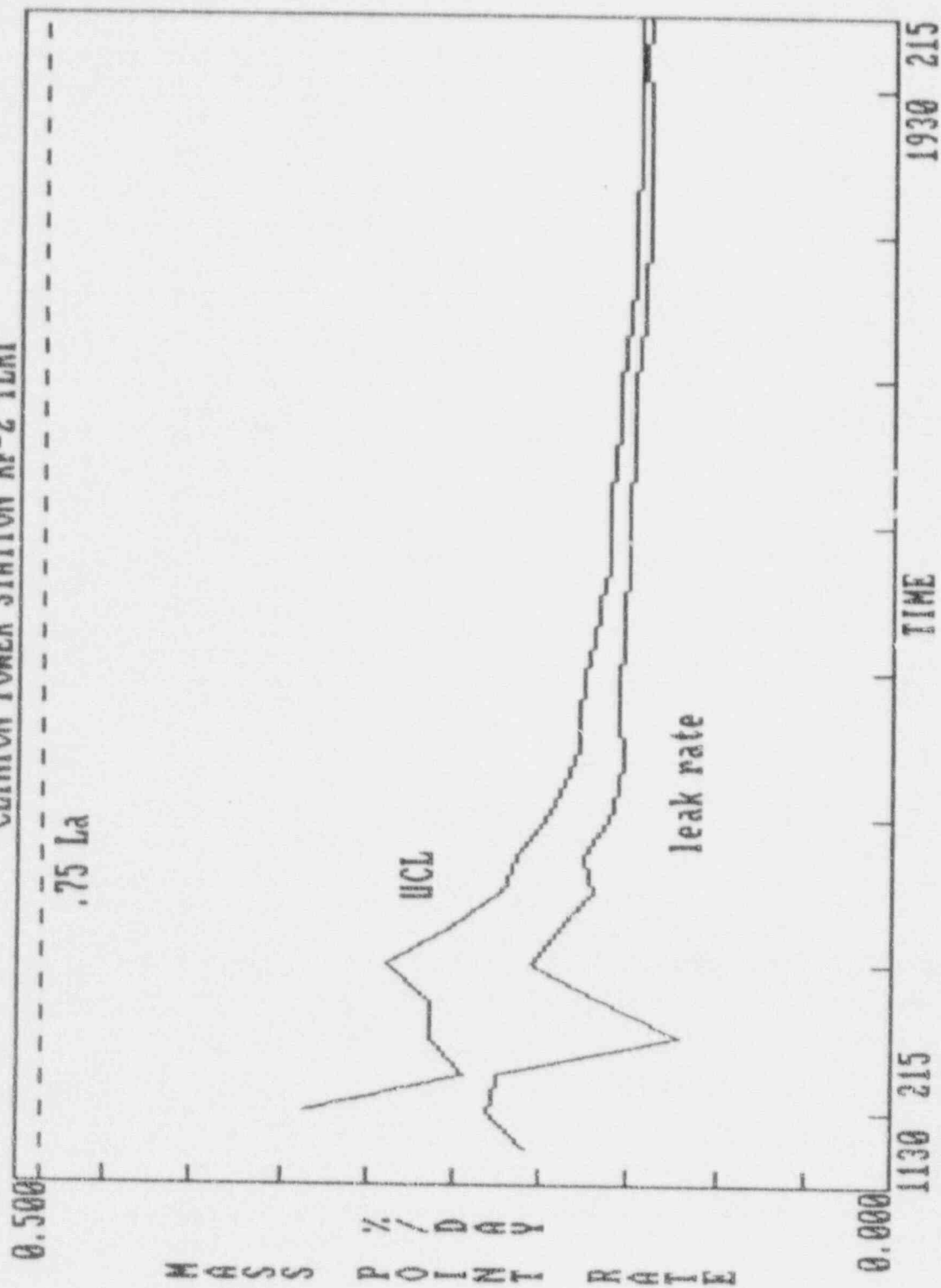
Plots - ILRT

- Air Mass
- Mass Point Leakage Rate and UCL
- Total Time Leakage Rate and UCL
- Weighted Average Temperature
- Weighted Average Pressure
- Weighted Average Vapor Pressure

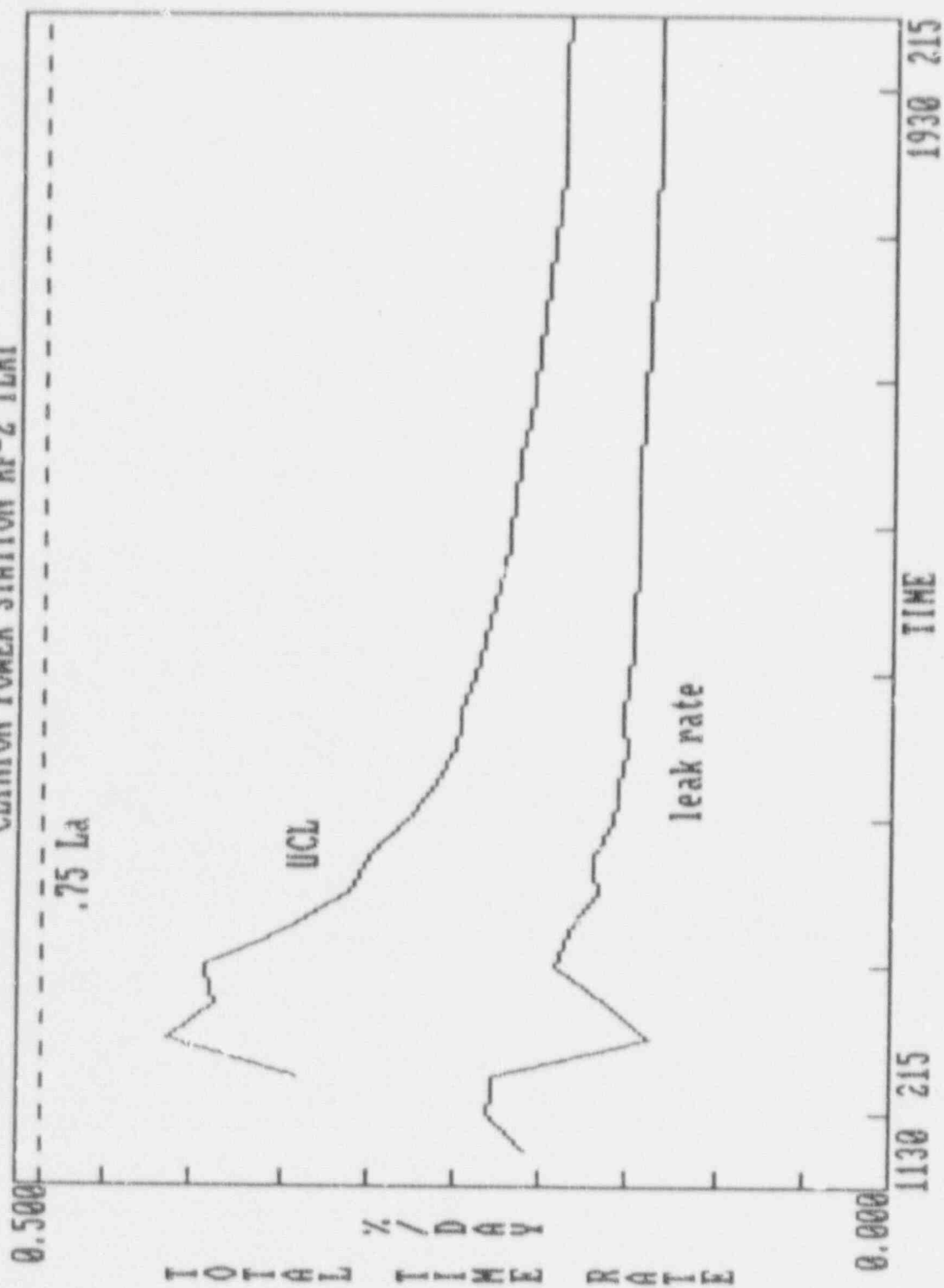
CLINTON POWER STATION RF-2 ILRT



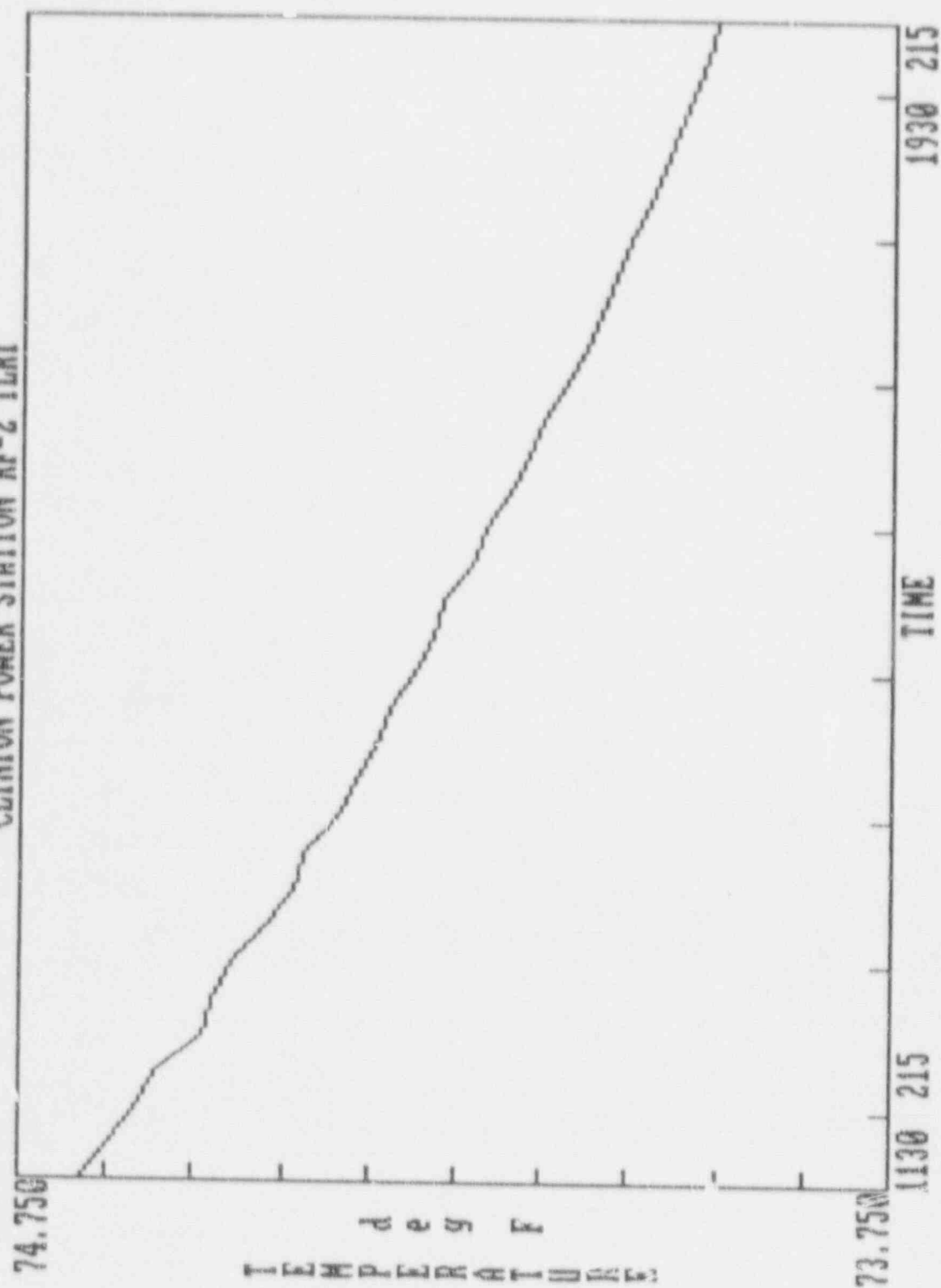
CLINTON POWER STATION RF-2 ILRT



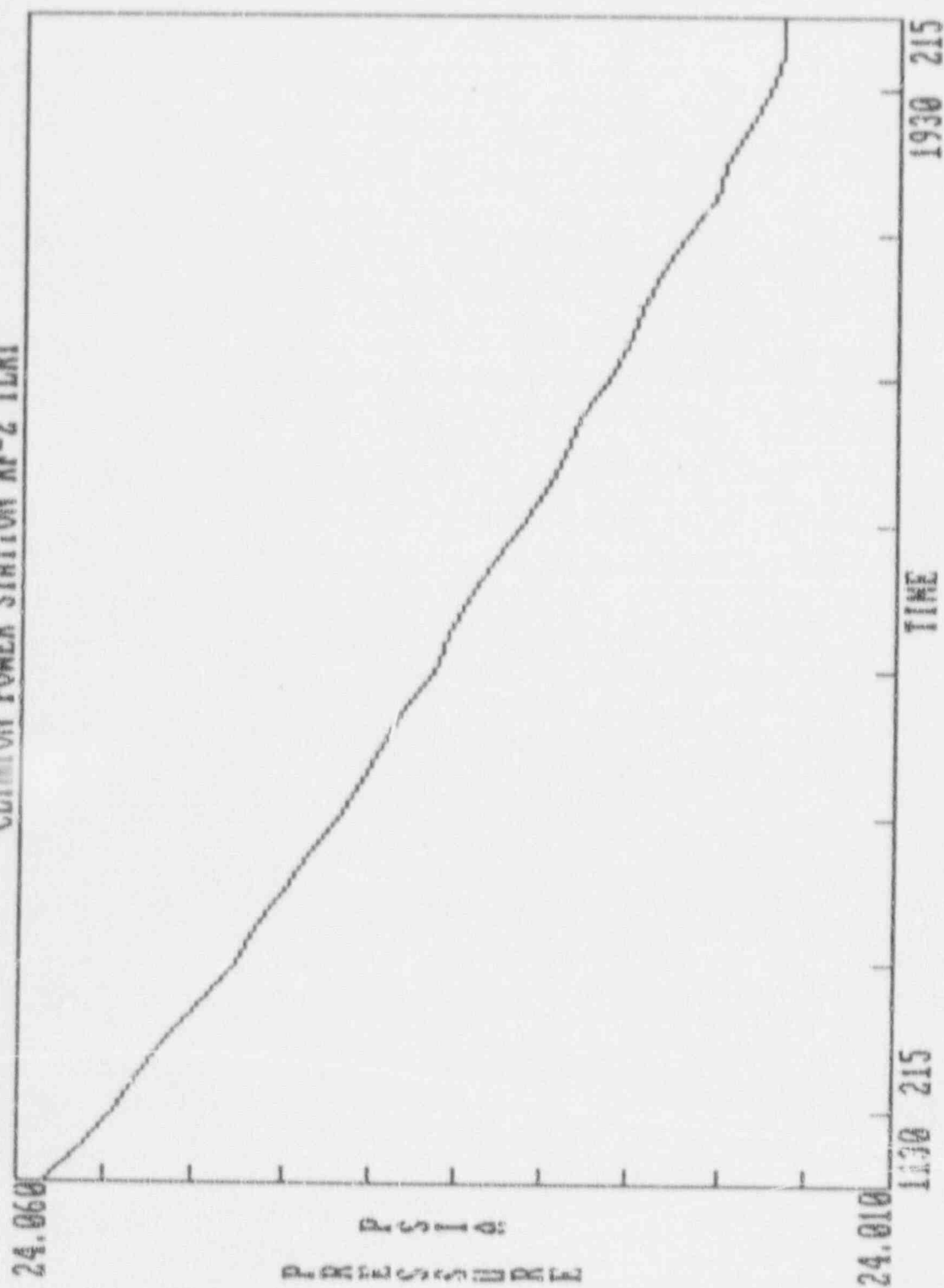
CLINTON POWER STATION RF-2 ILRT



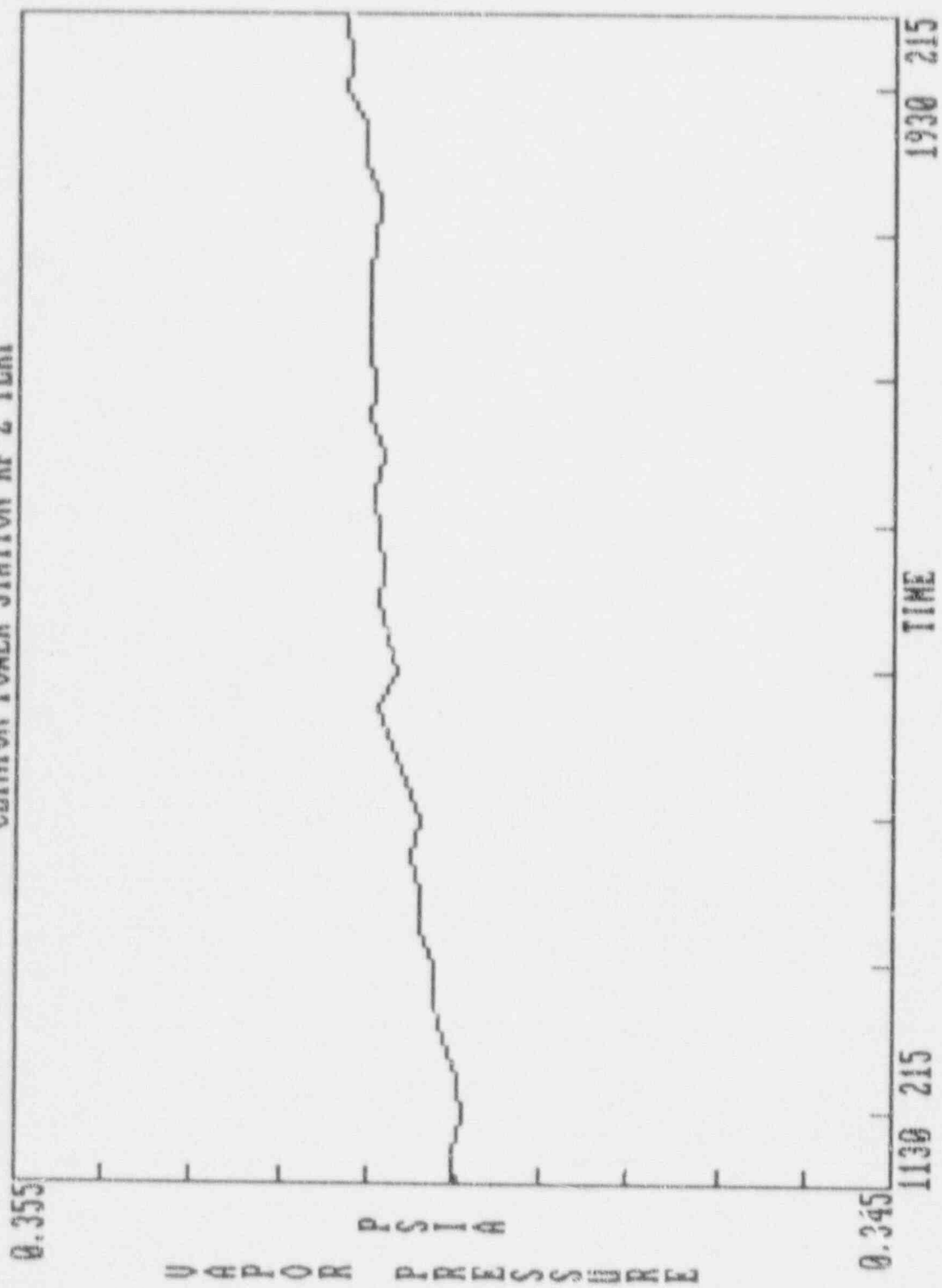
CLINTON POWER STATION RF-2 ILRT



CLINTON POWER STATION RF-2 ILRT



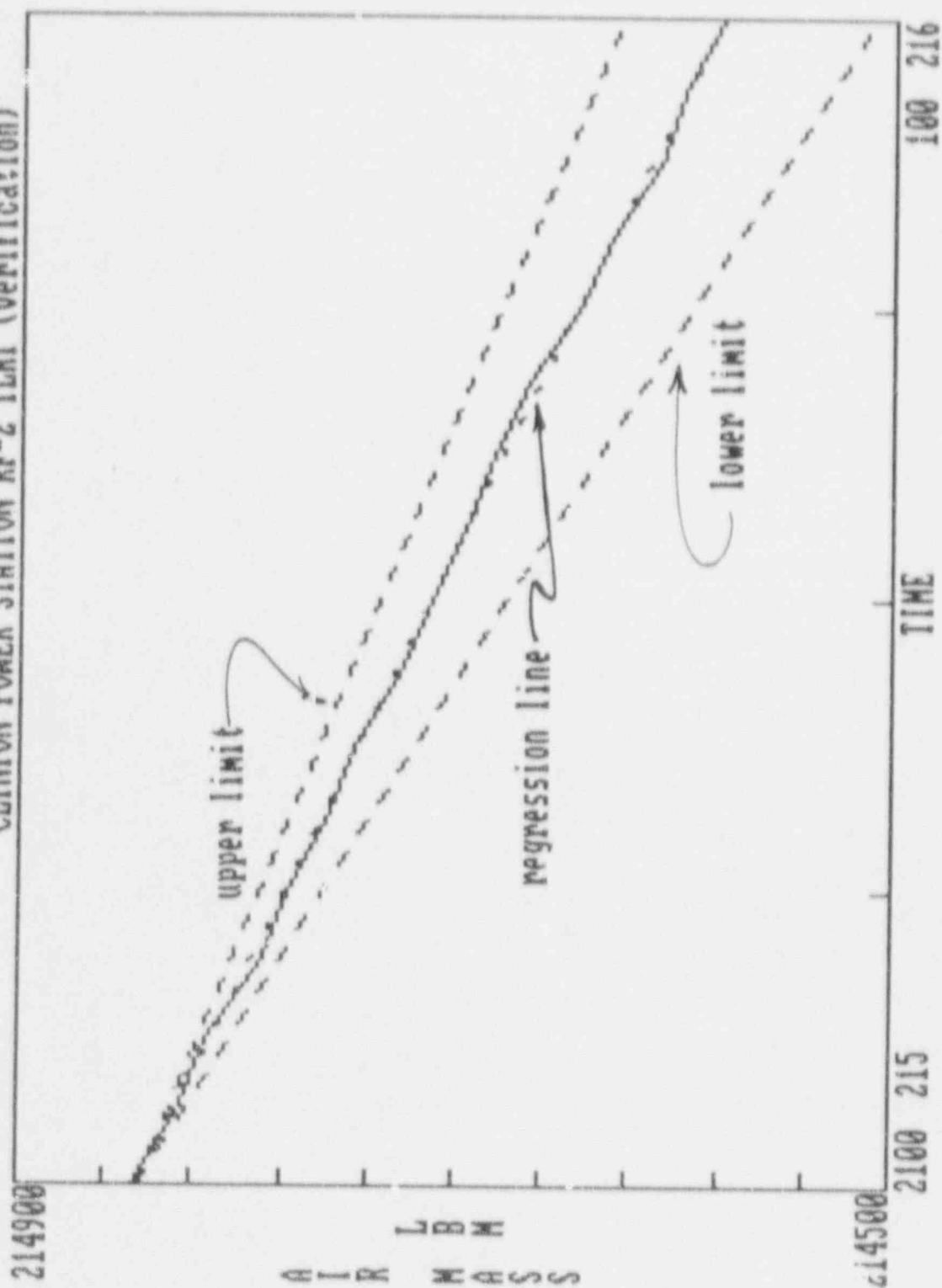
CLINTON POWER STATION RF-2 ILRI

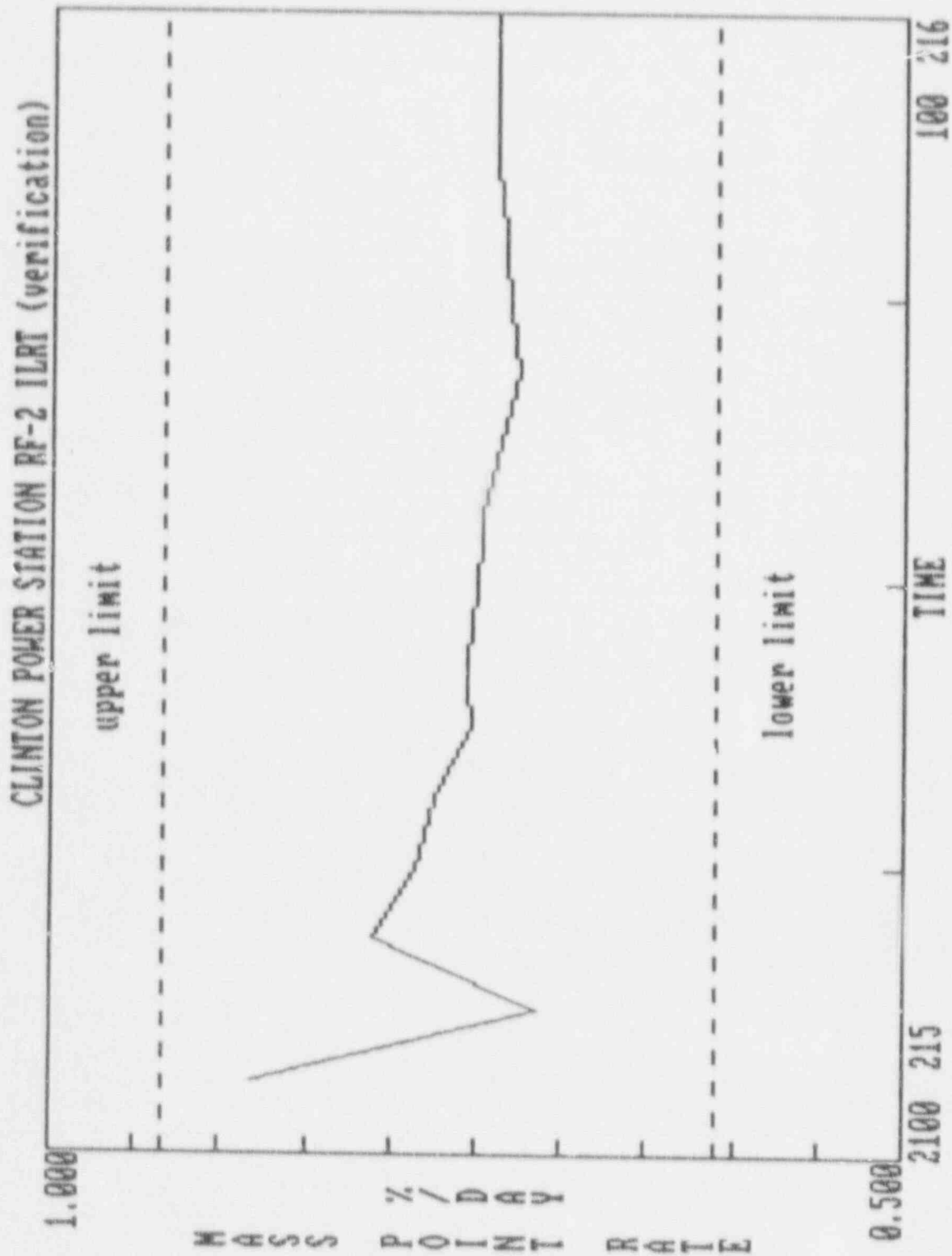


Plots - Verification (RF-2)

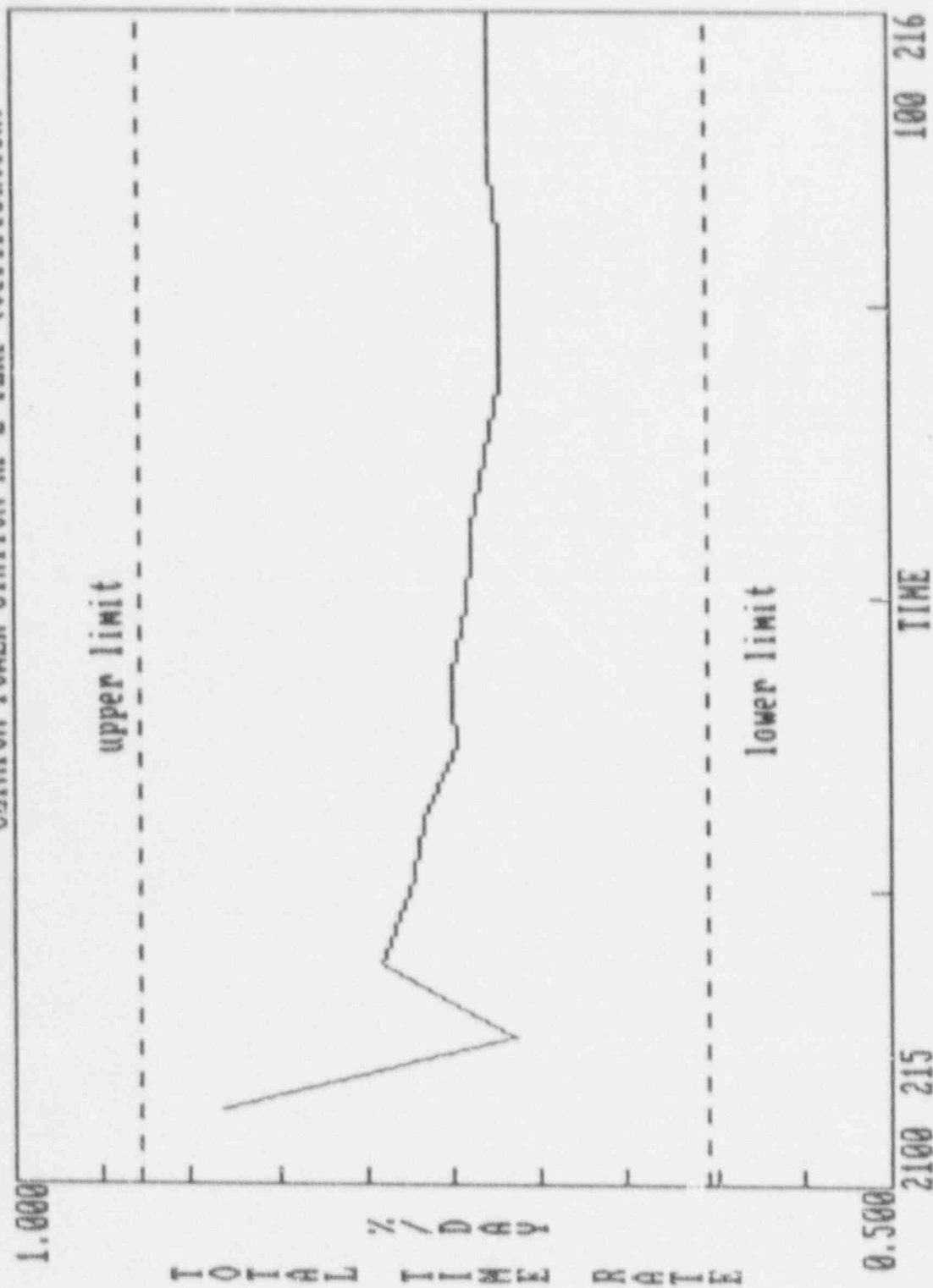
- Air Mass
- Mass Point Leakage Rate and UCL
- Total Time Leakage Rate and UCL
- Weighted Average Temperature
- Weighted Average Pressure
- Weighted Average Vapor Pressure

CLINTON POWER STATION RF-2 ILRT (verification)

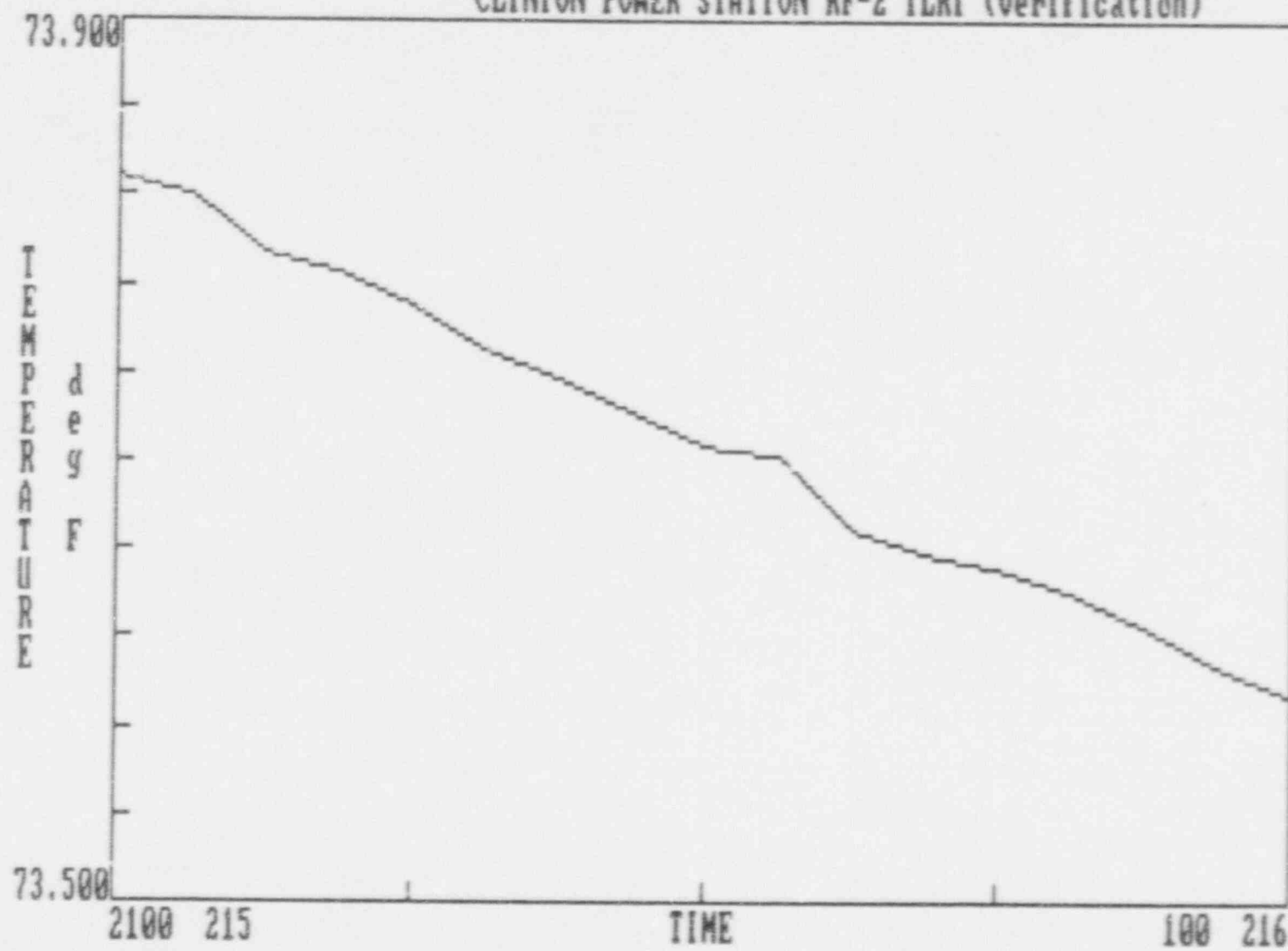


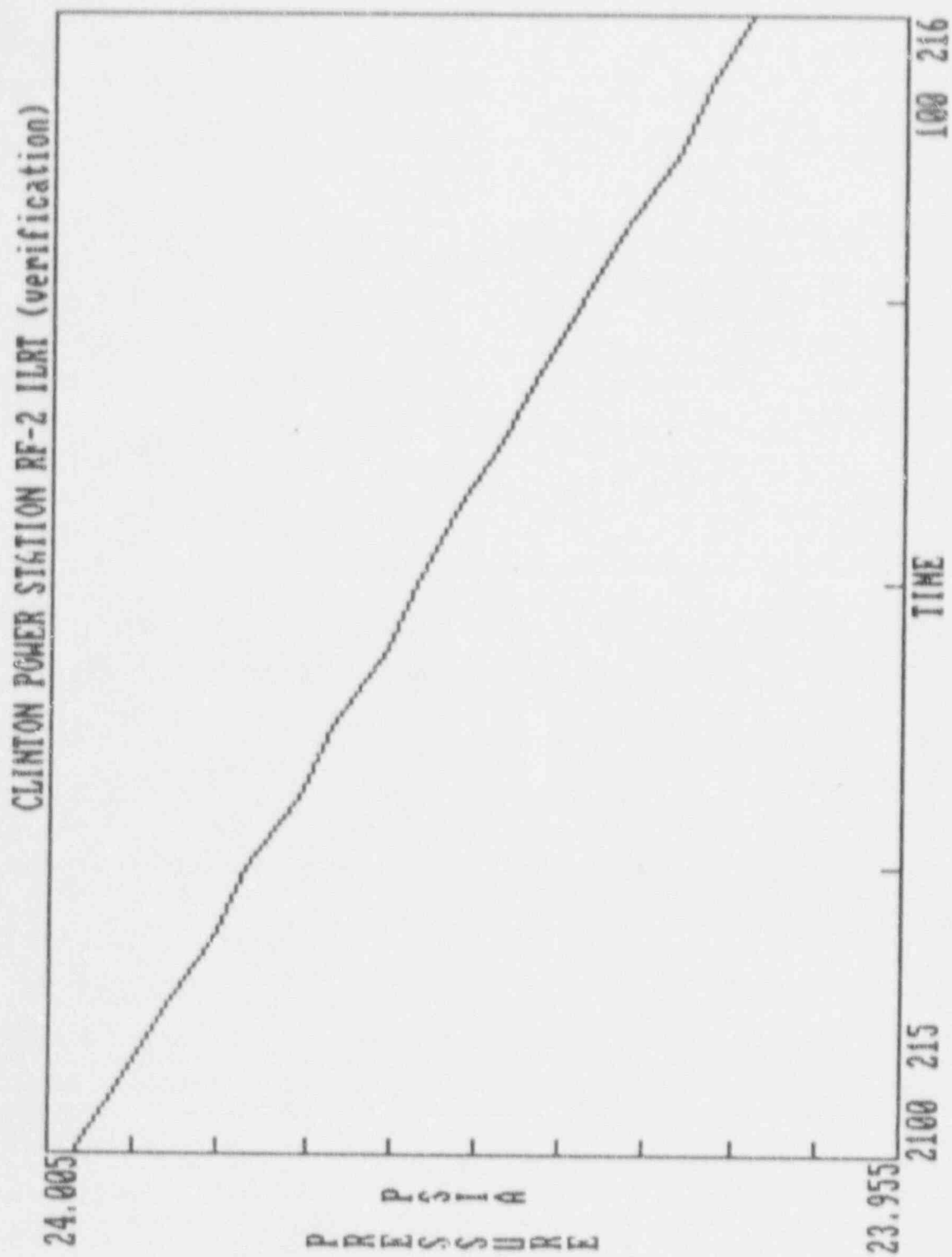


CLINTON POWER STATION RF-2 ILRT (verification)

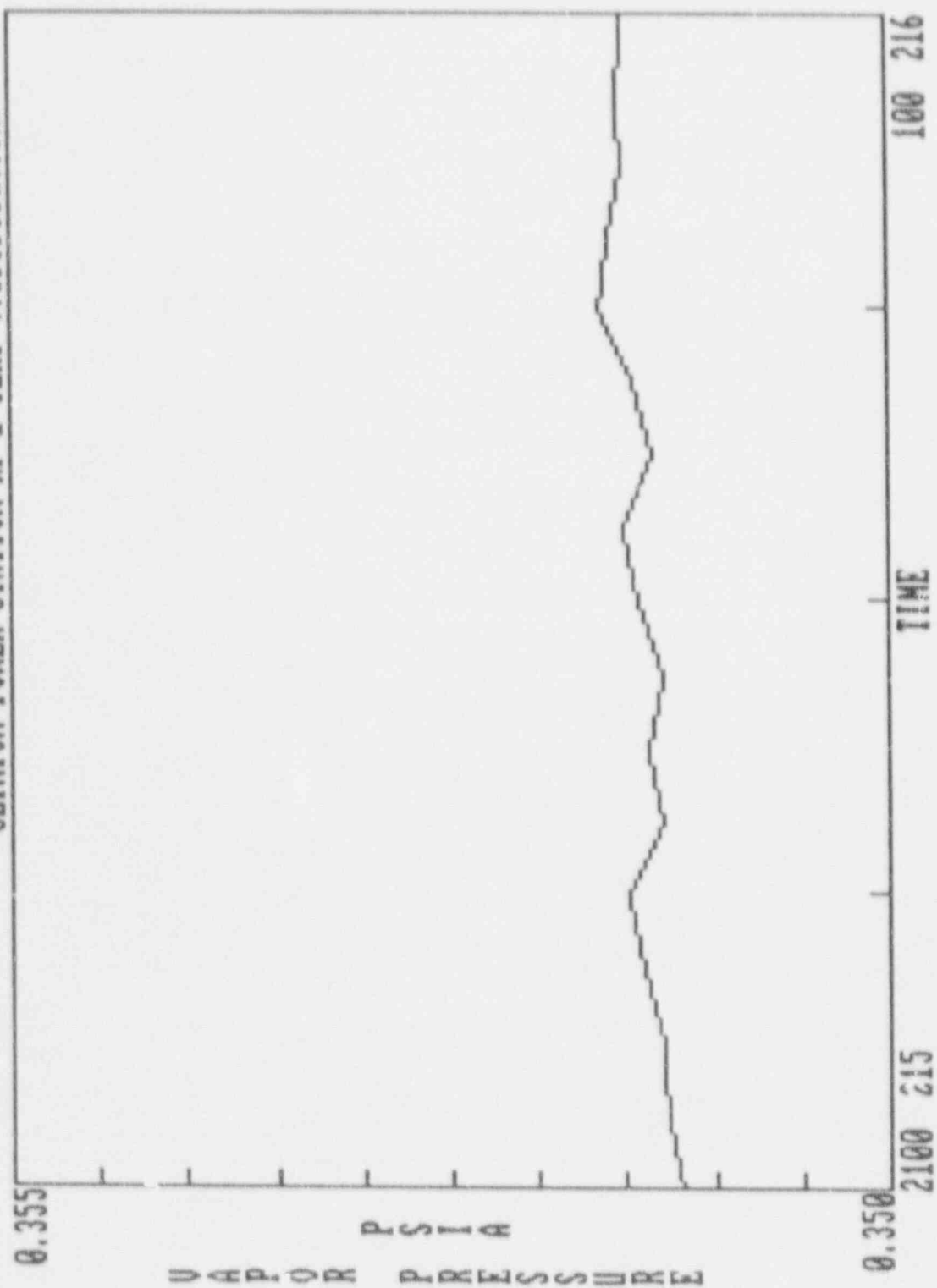


CLINTON POWER STATION RF-2 ILRT (verification)





CLINTON POWER STATION RF-2 ILRT (verification)



Plots - Data Rejection

(RF-2)

- Data Rejection Report

CLINTON POWER STATION RF-2 ILRT

DATA REJECTION REPORT

** data points rejectable at 1% rejection level
 ,i.e., standardized residual ≥ 3.32

* data points rejectable at 5% rejection level
 ,i.e., standardized residual ≥ 3.00

set	time	date	air mass	linear least square fit	residual from least square fit	standand error of residual	standardized residual
1	1130	215	215013.19	215008.58	4.61	3.16	1.46
2	1145	215	215008.50	215005.44	3.06	3.18	0.96
3	1200	215	215002.84	215002.31	0.53	3.19	0.17
4	1215	215	214998.16	214999.17	-1.02	3.21	-0.32
5	1230	215	215004.80	214996.03	8.77	3.22	2.72
6	1245	215	214990.66	214992.89	-2.23	3.24	-0.69
7	1300	215	214981.56	214989.77	-8.20	3.25	-2.52
8	1315	215	214985.63	214986.63	-1.00	3.26	-0.31
9	1330	215	214985.86	214983.48	2.38	3.27	0.73
10	1345	215	214975.75	214980.34	-4.59	3.28	-1.40
11	1400	215	214979.66	214977.22	2.44	3.29	0.74
12	1415	215	214974.05	214974.08	-0.03	3.29	-0.01
13	1430	215	214971.38	214970.94	0.44	3.30	0.13
14	1445	215	214963.61	214967.80	-4.19	3.30	-1.27
15	1500	215	214962.59	214964.67	-2.08	3.30	-0.63
16	1515	215	214961.61	214961.53	0.08	3.31	0.02
17	1530	215	214956.06	214958.39	-2.33	3.31	-0.70
18	1545	215	214955.72	214955.25	0.47	3.31	0.14
19	1600	215	214948.31	214952.13	-3.81	3.30	-1.15
20	1615	215	214945.97	214948.98	-3.02	3.30	-0.91
21	1630	215	214945.73	214945.84	-0.11	3.30	-0.03
22	1645	215	214941.97	214942.70	-0.73	3.29	-0.22
23	1700	215	214938.91	214939.58	-0.67	3.29	-0.20
24	1715	215	214937.91	214936.44	1.47	3.28	0.45
25	1730	215	214936.56	214933.30	3.27	3.27	1.00
26	1745	215	214933.86	214930.16	3.70	3.26	1.14
27	1800	215	214928.19	214927.03	1.16	3.25	0.36
28	1815	215	214923.11	214923.89	-0.78	3.24	-0.24
29	1830	215	214923.64	214920.75	2.89	3.22	0.90
30	1845	215	214916.36	214917.61	-1.25	3.21	-0.39
31	1900	215	214911.34	214914.48	-3.14	3.19	-0.98
32	1915	215	214909.80	214911.34	-1.55	3.18	-0.49
33	1930	215	214913.84	214908.20	5.64	3.16	1.79

NOTE: No data points were rejected during the ILRT.

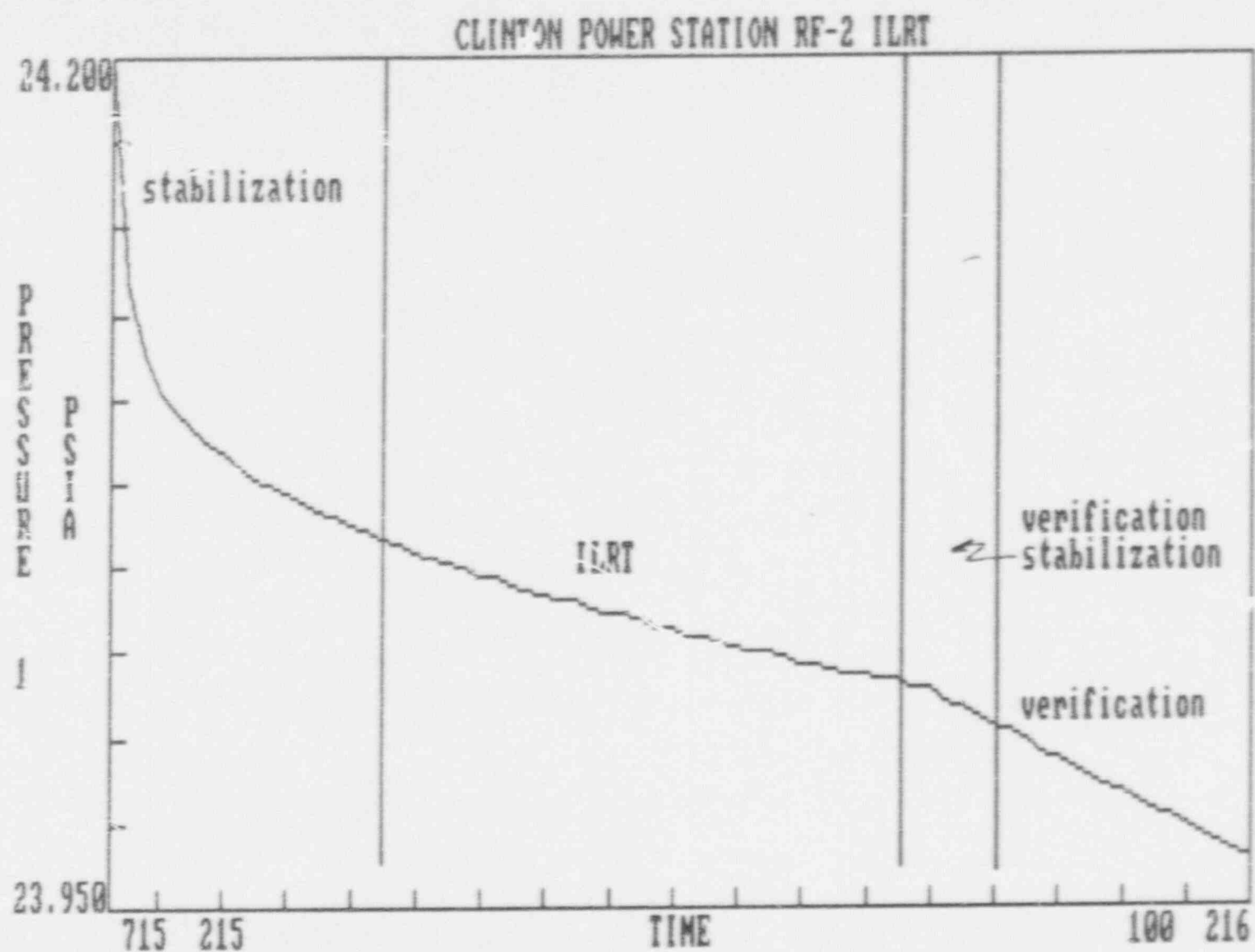
Plots - Individual Sensors

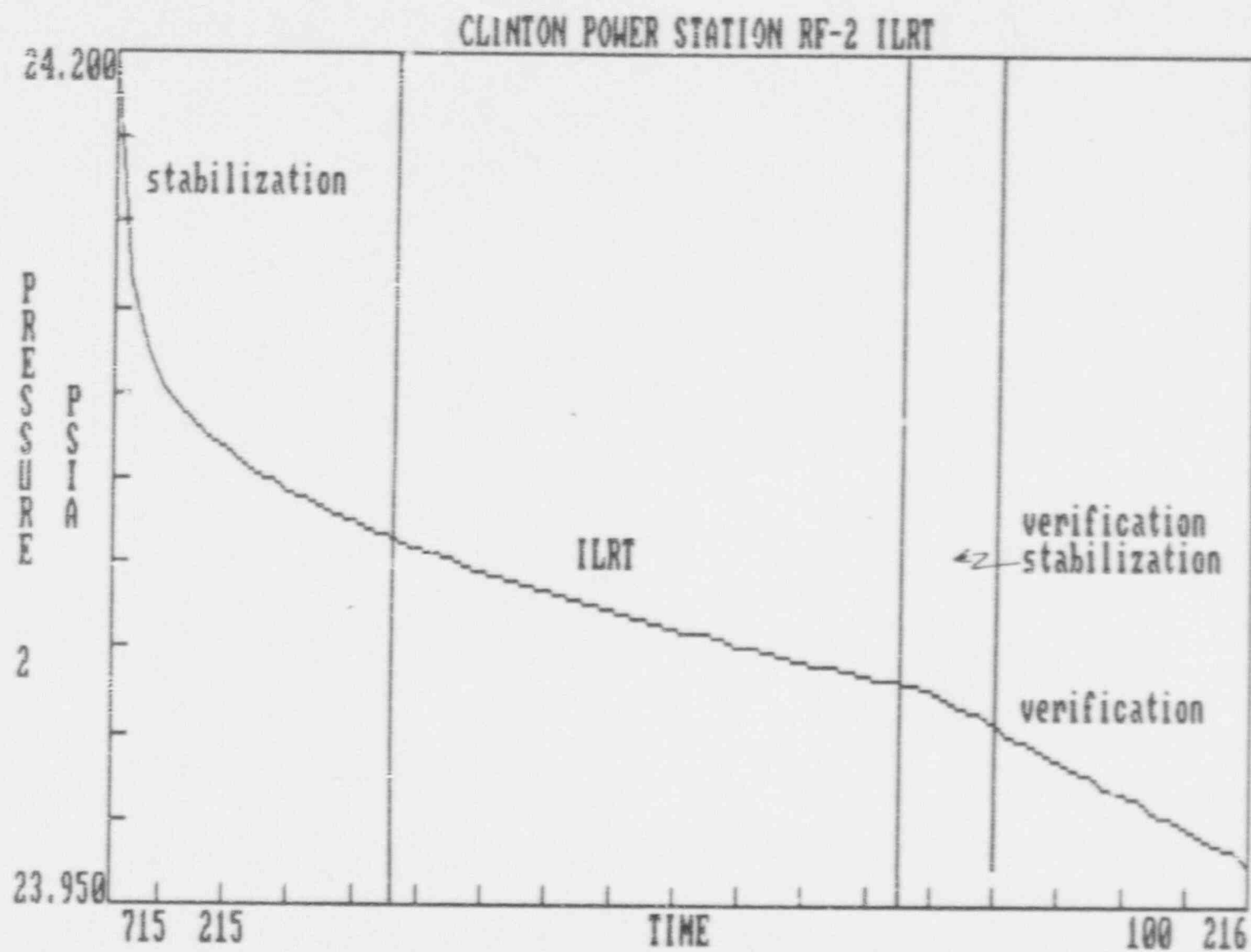
(RF-2)

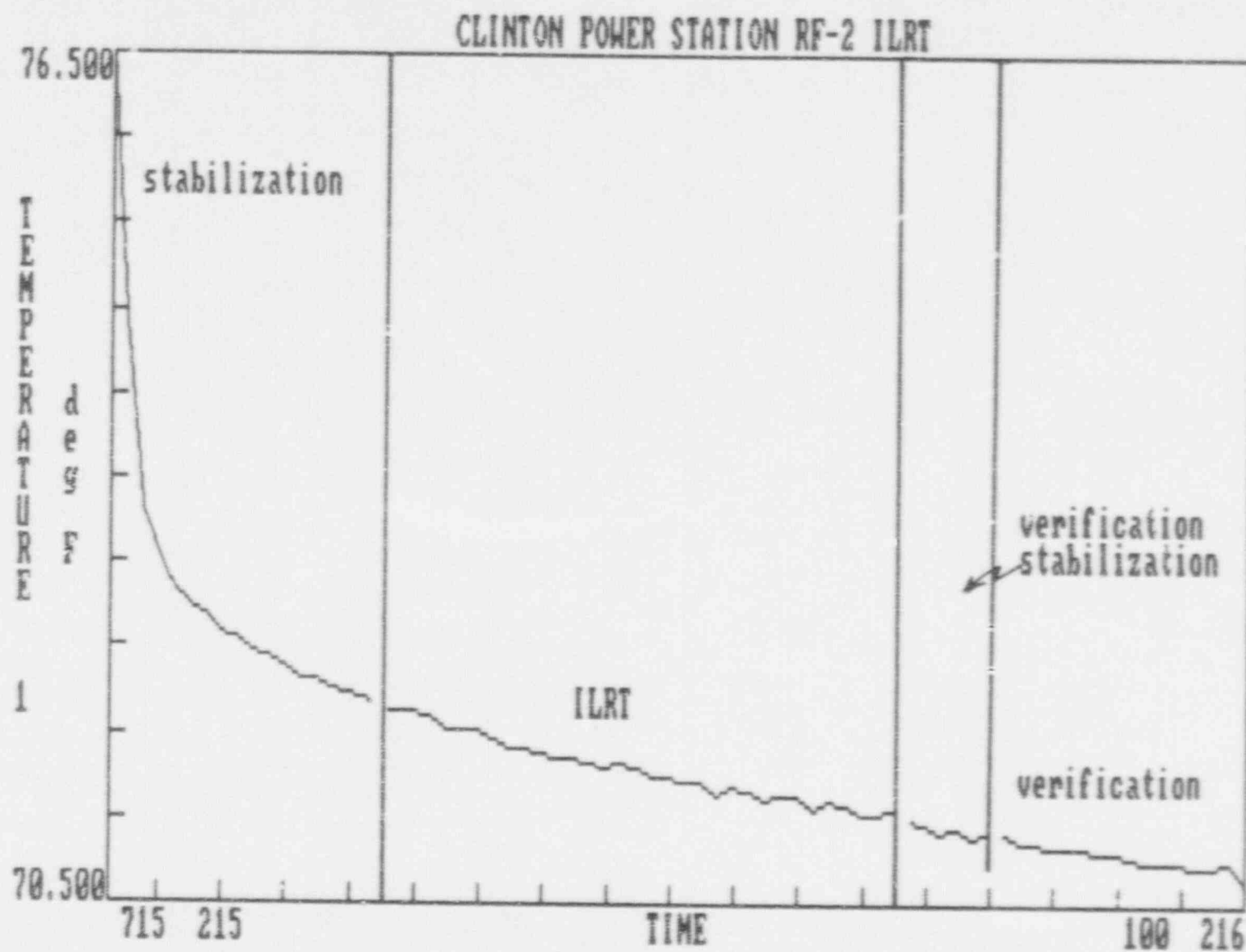
Entire Test (Stabilization, ILRT and Verification)

- Pressure Sensors 1 & 2
- RTD 1 through RTD 25
- Humidity 1 through Humidity 9

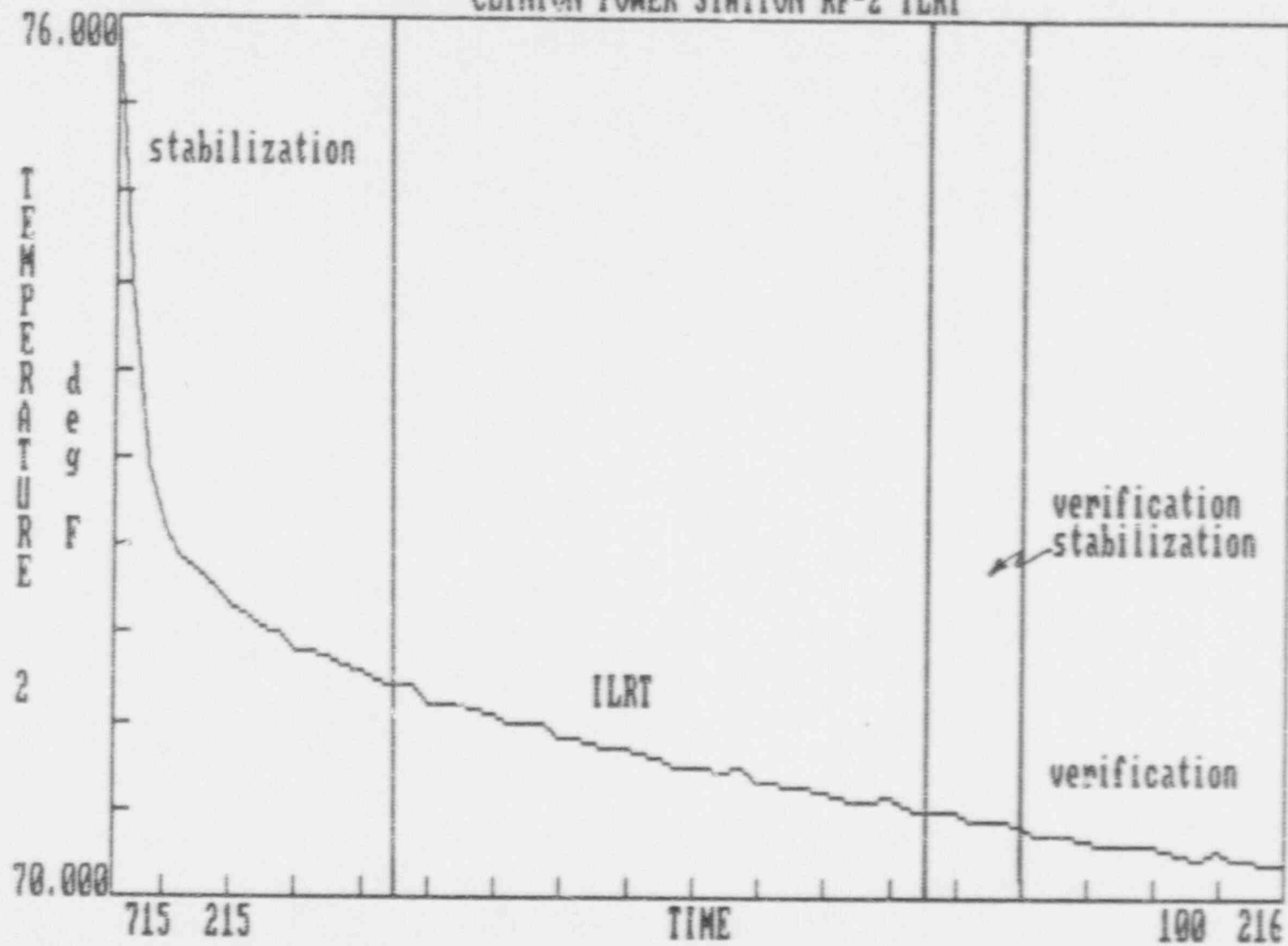
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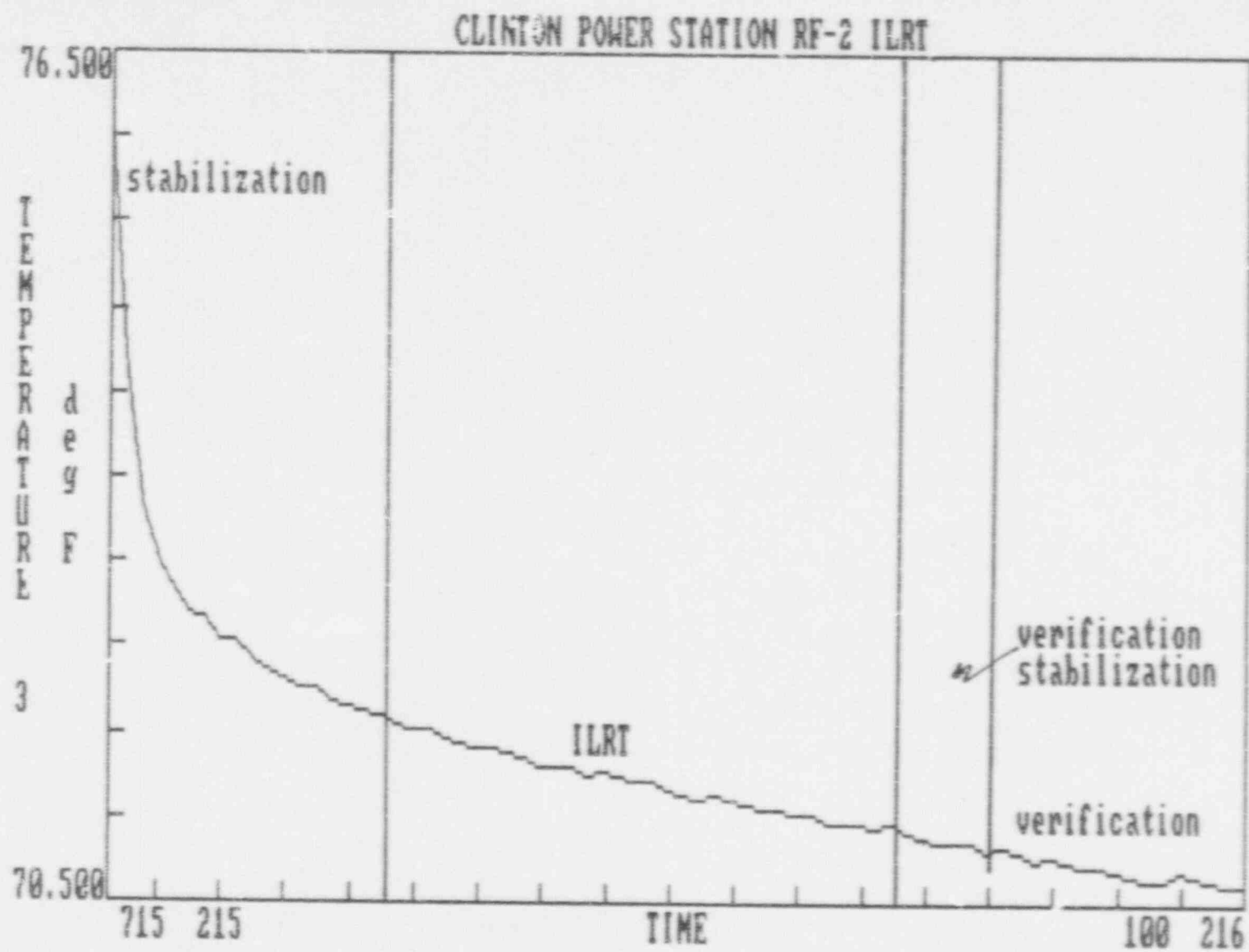




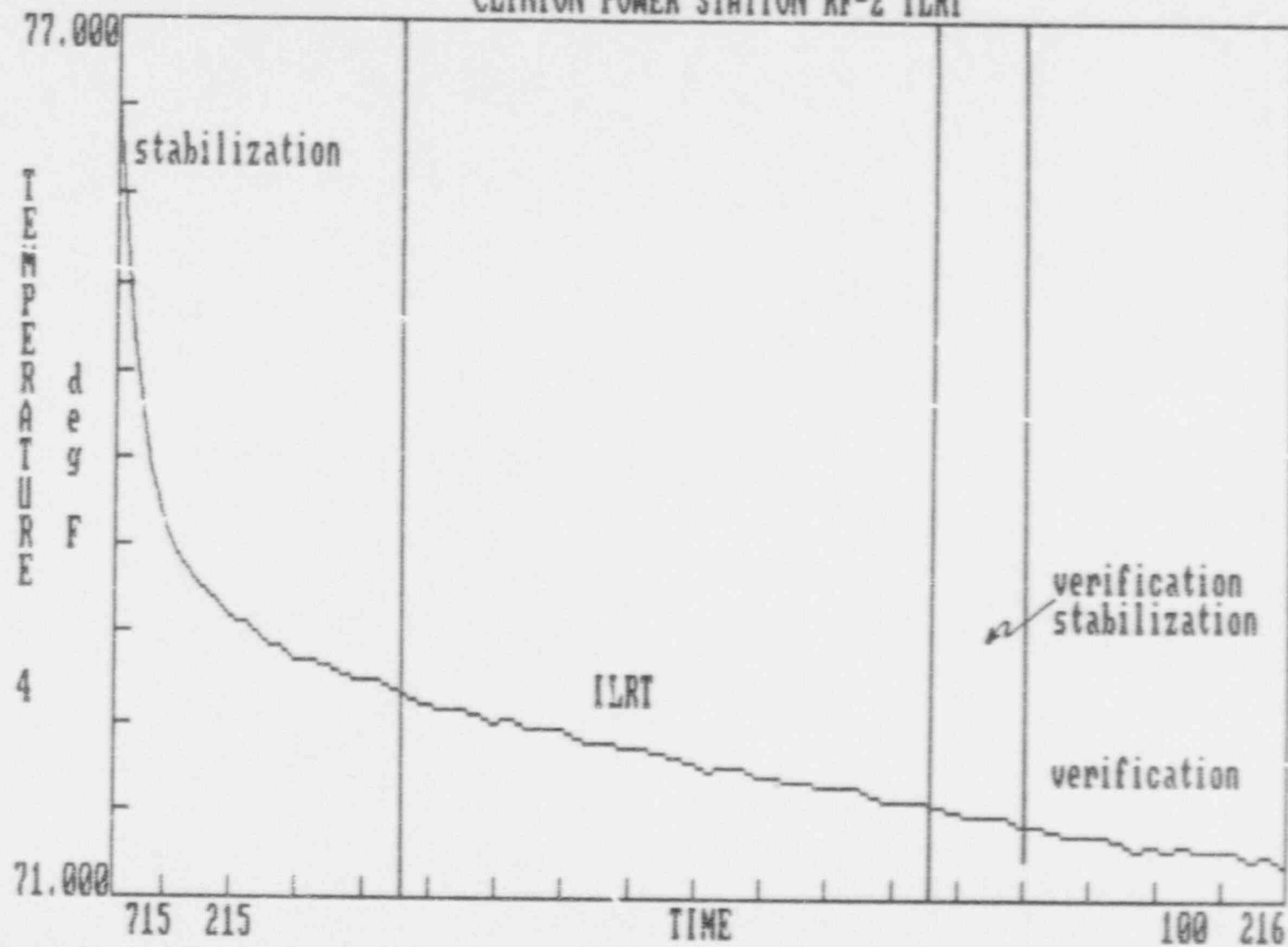


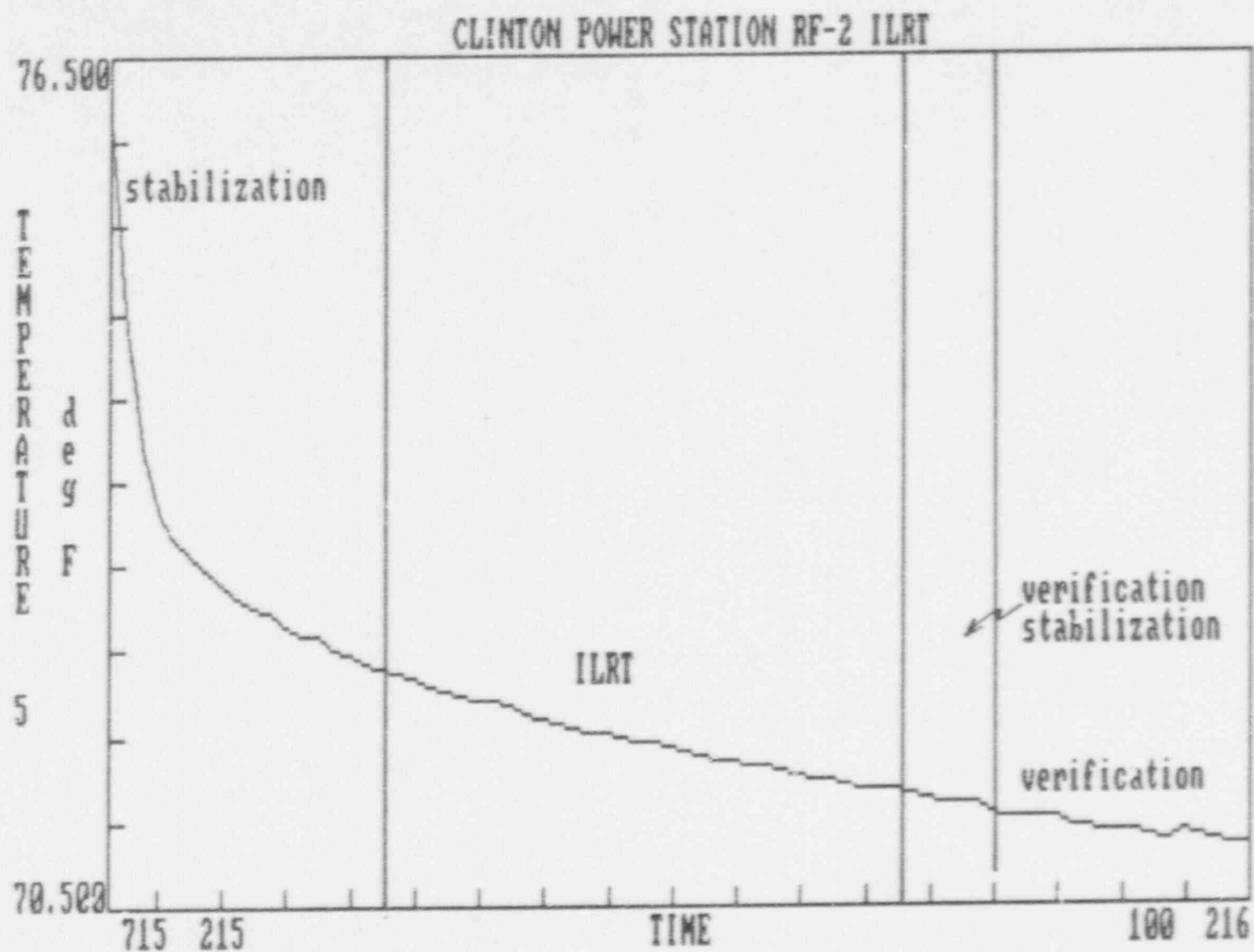
CLINTON POWER STATION RF-2 ILRT



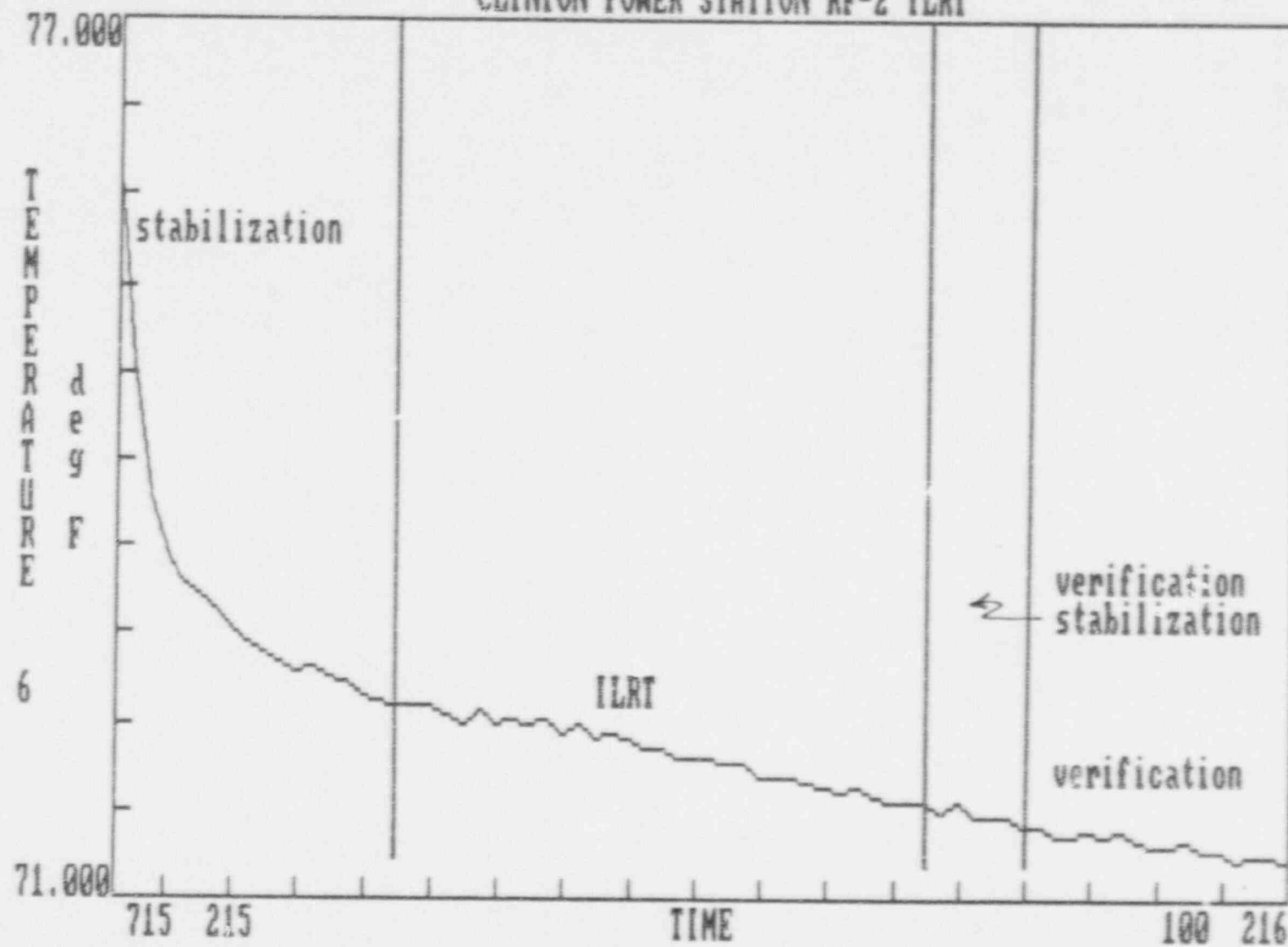


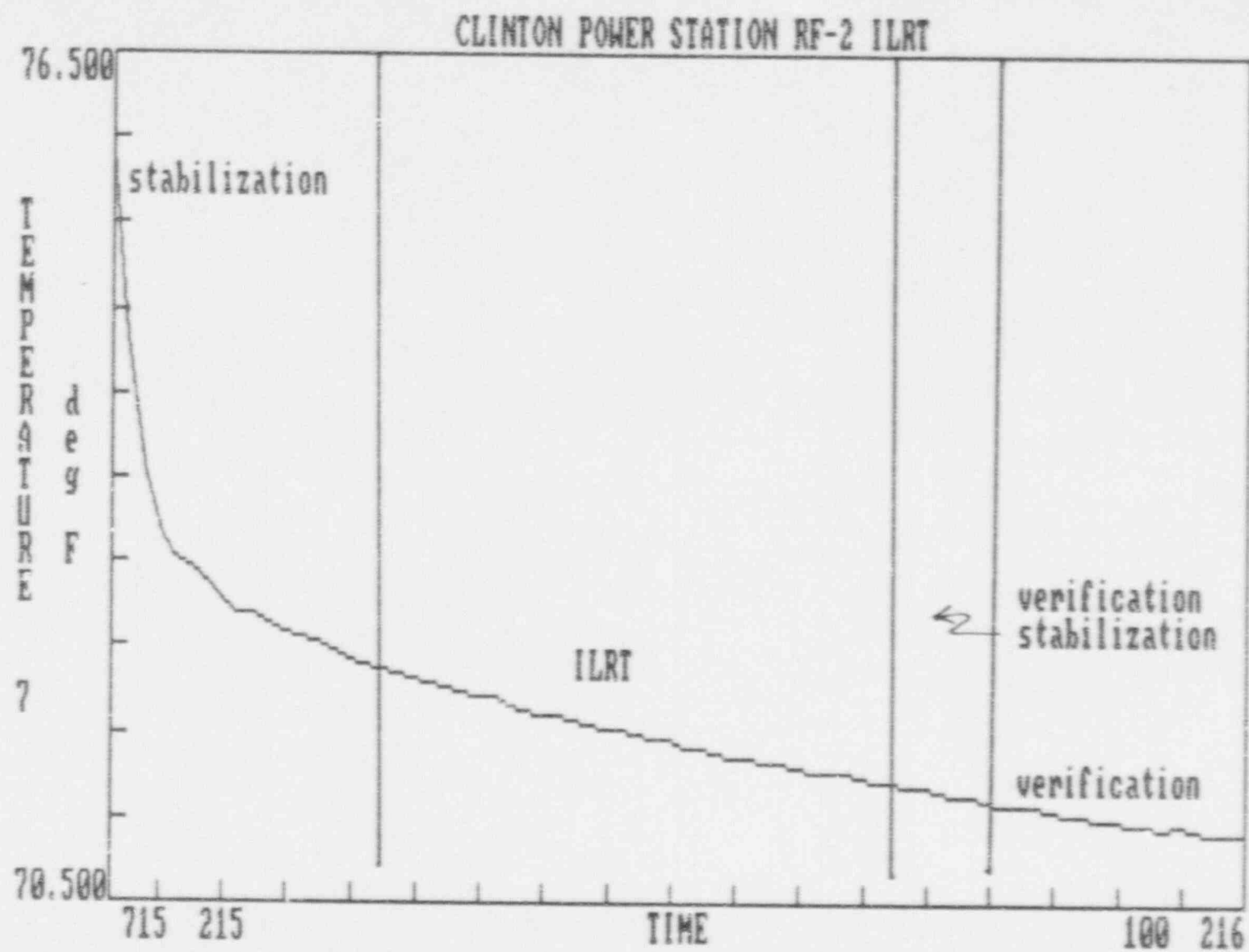
CLINTON POWER STATION RF-2 ILRT



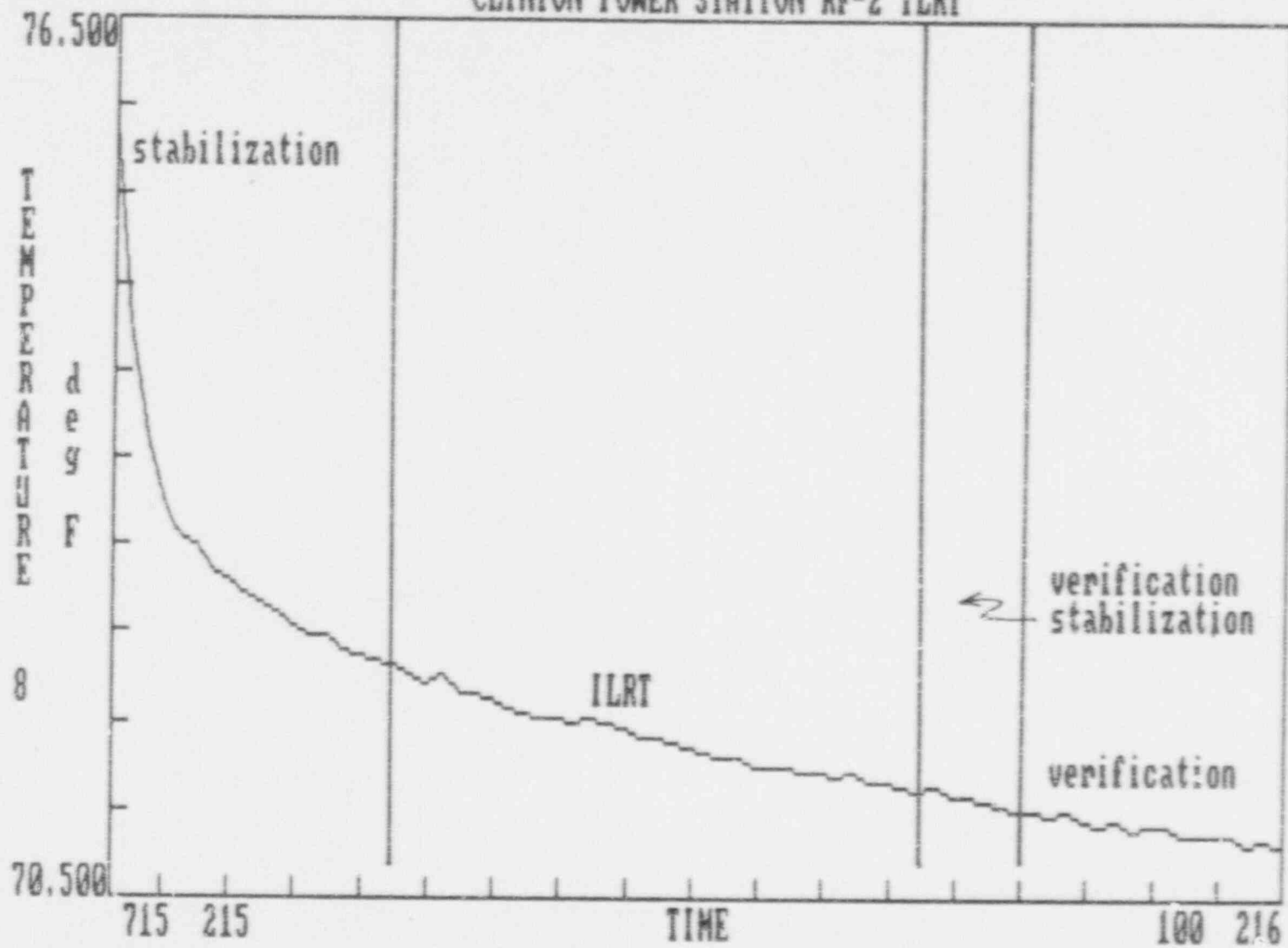


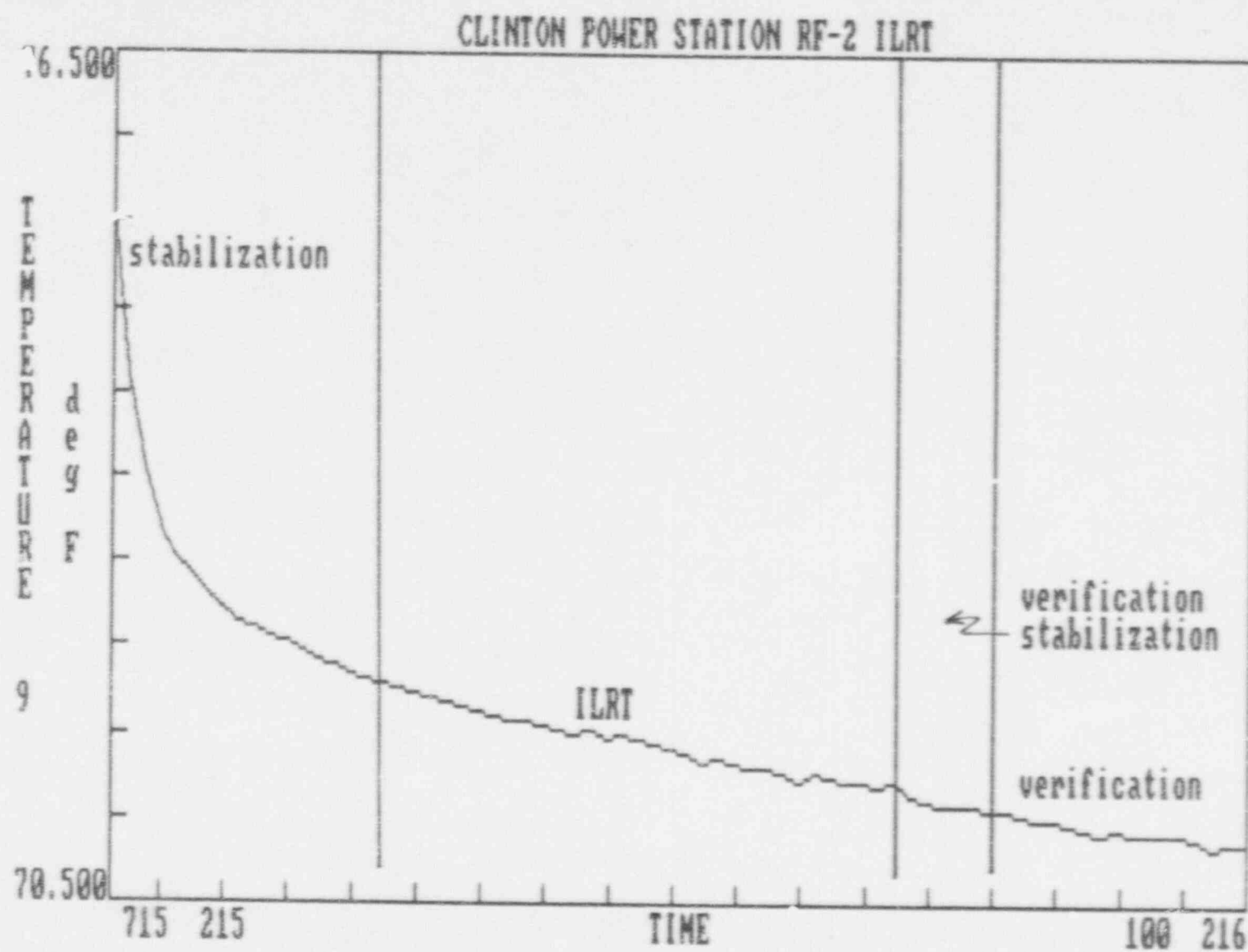
CLINTON POWER STATION RF-2 ILRT

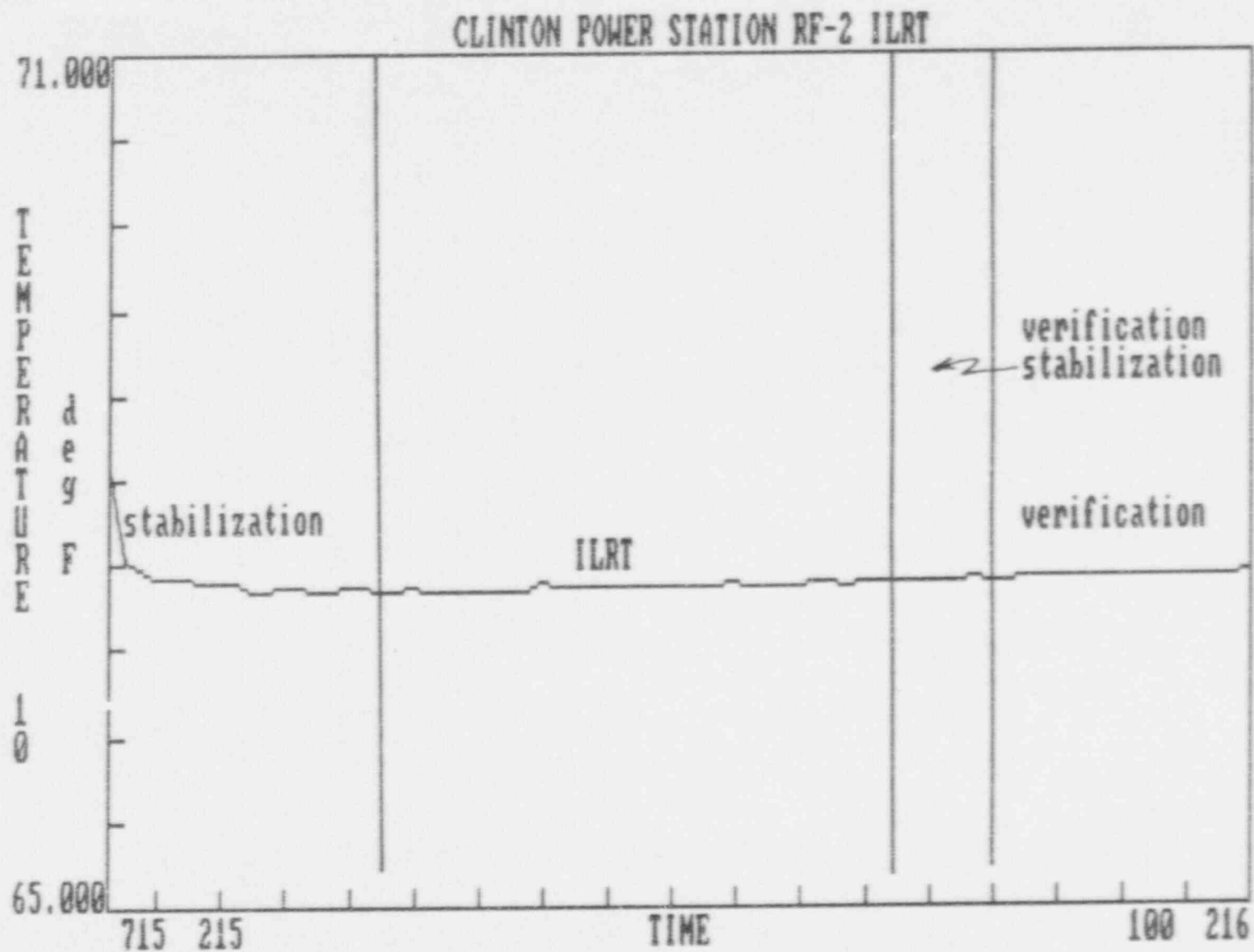


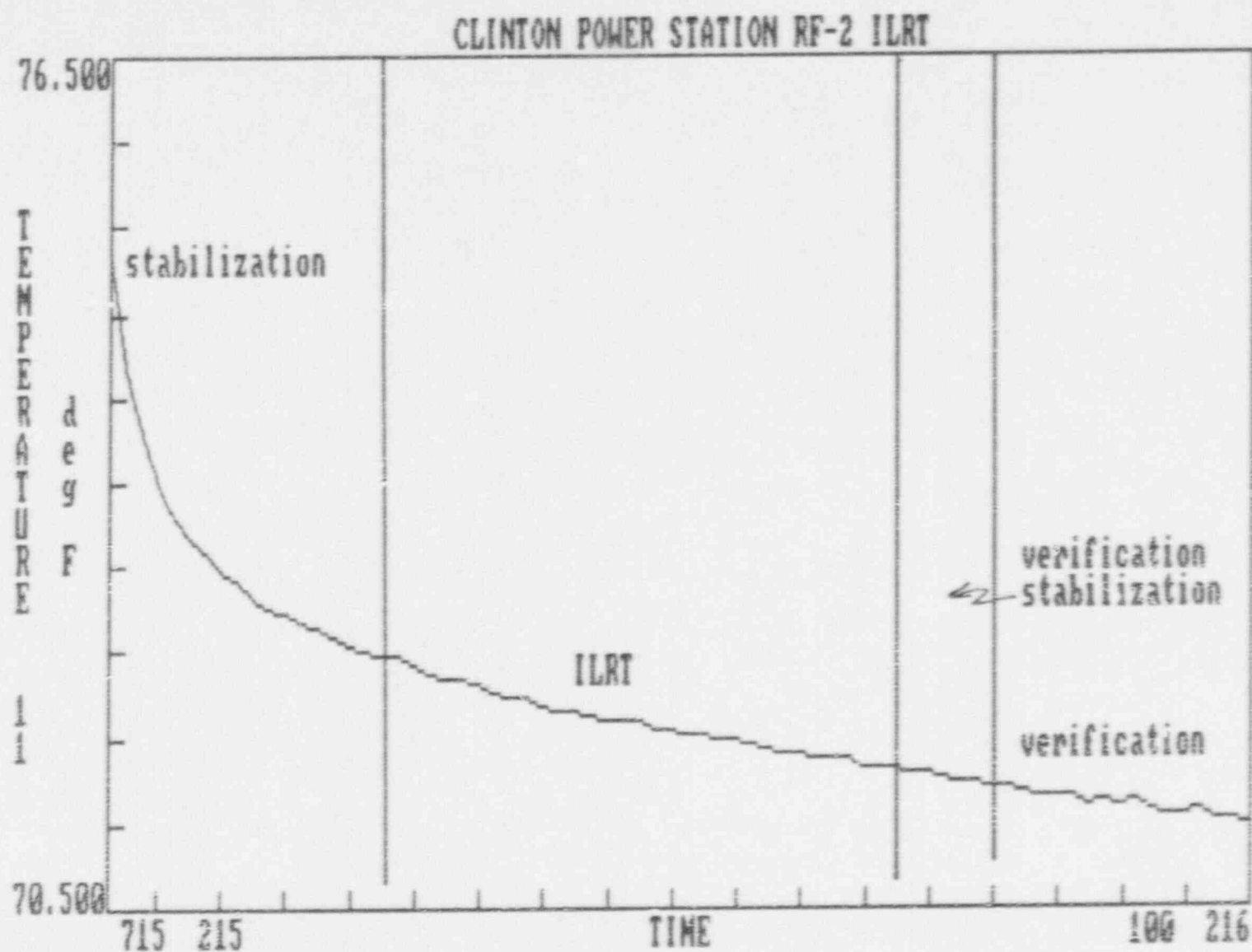


CLINTON POWER STATION RF-2 ILRT

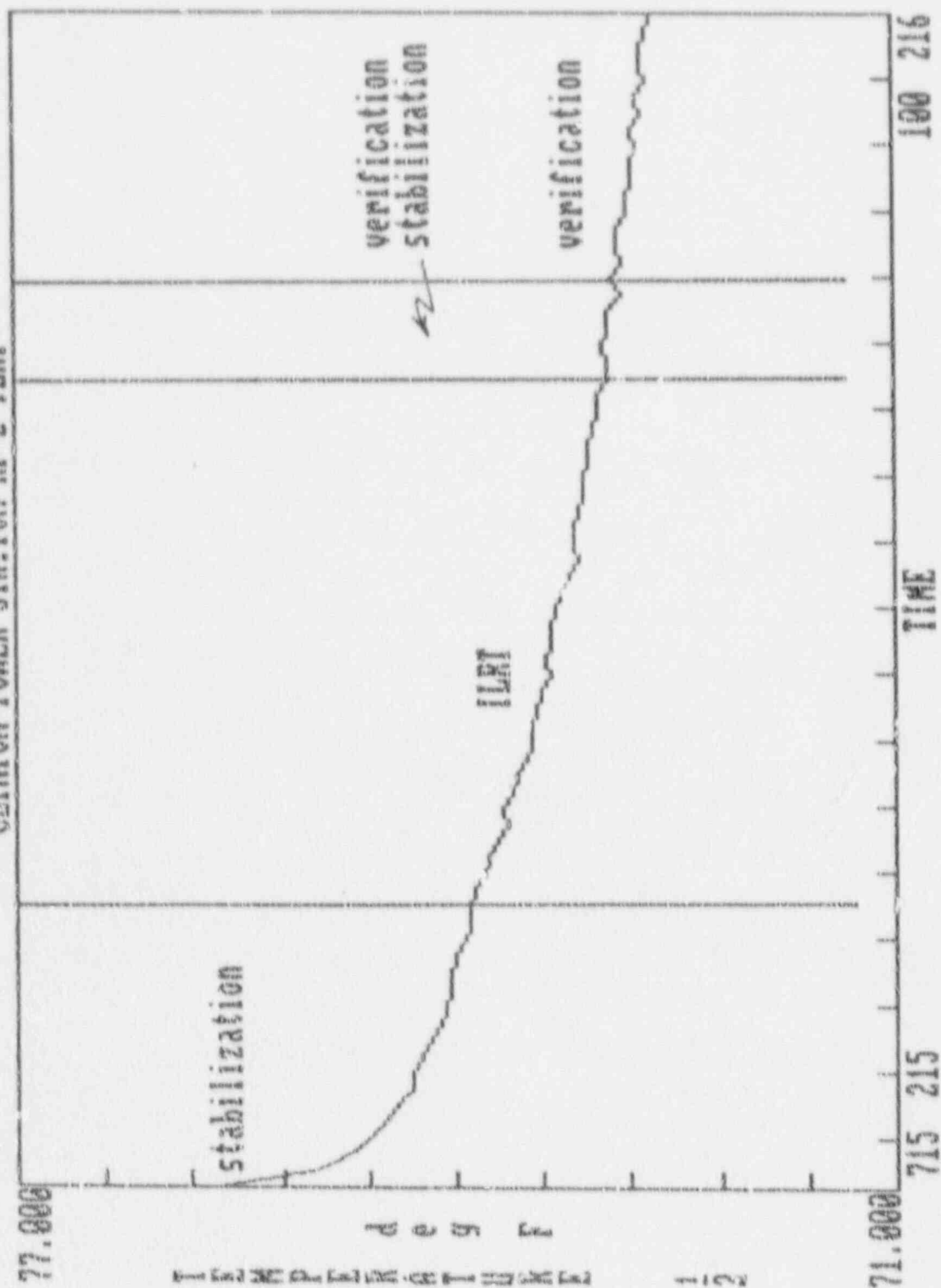


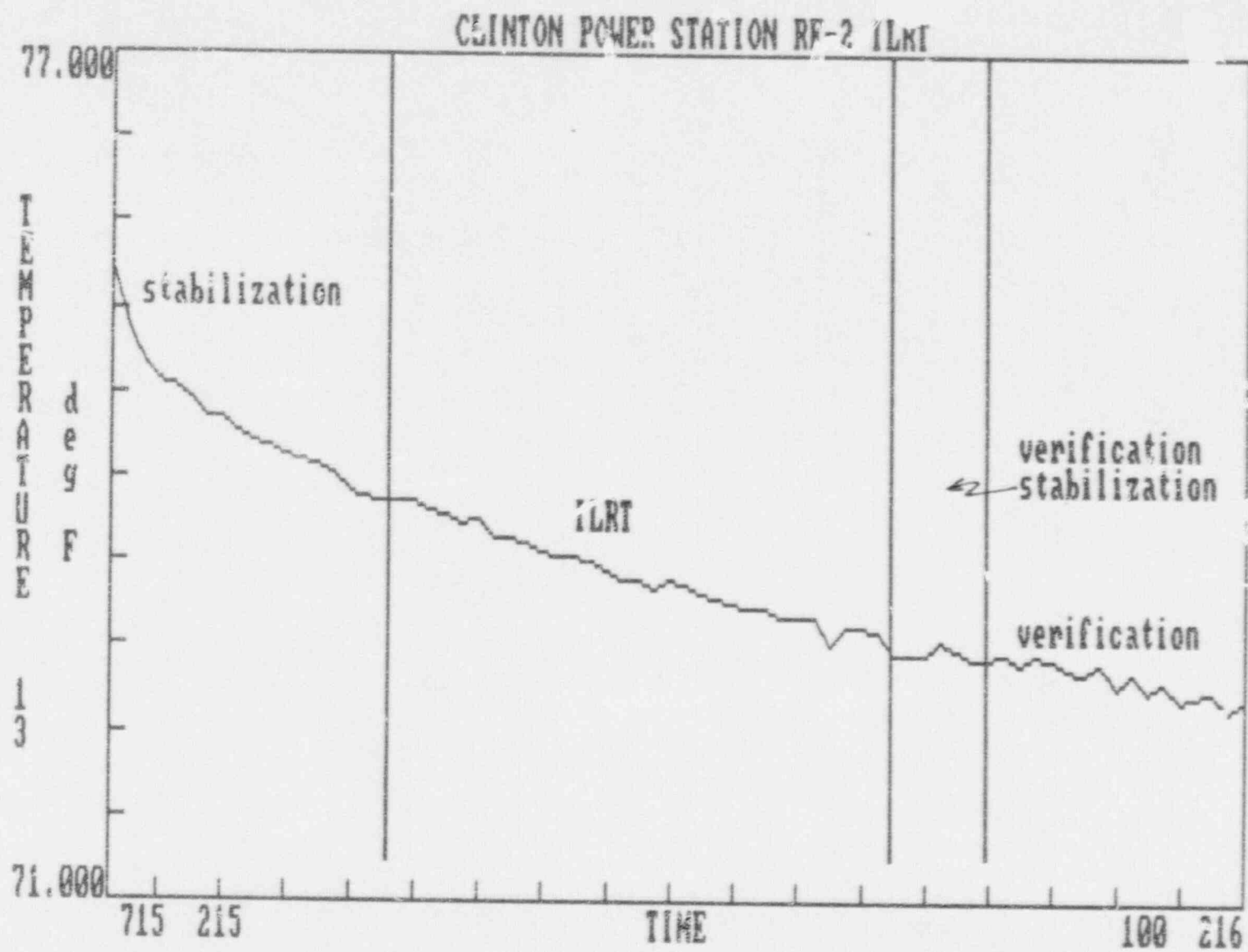




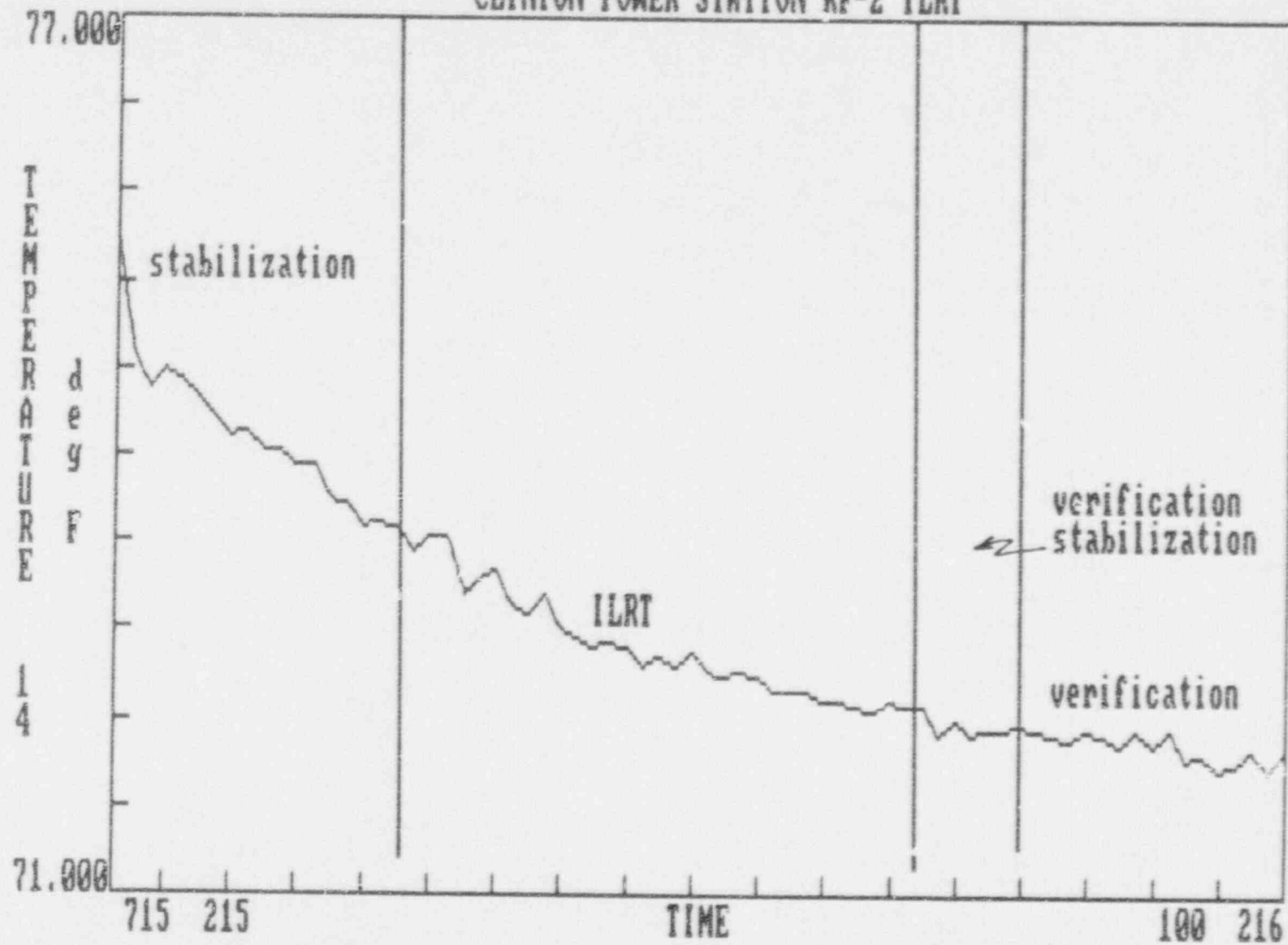


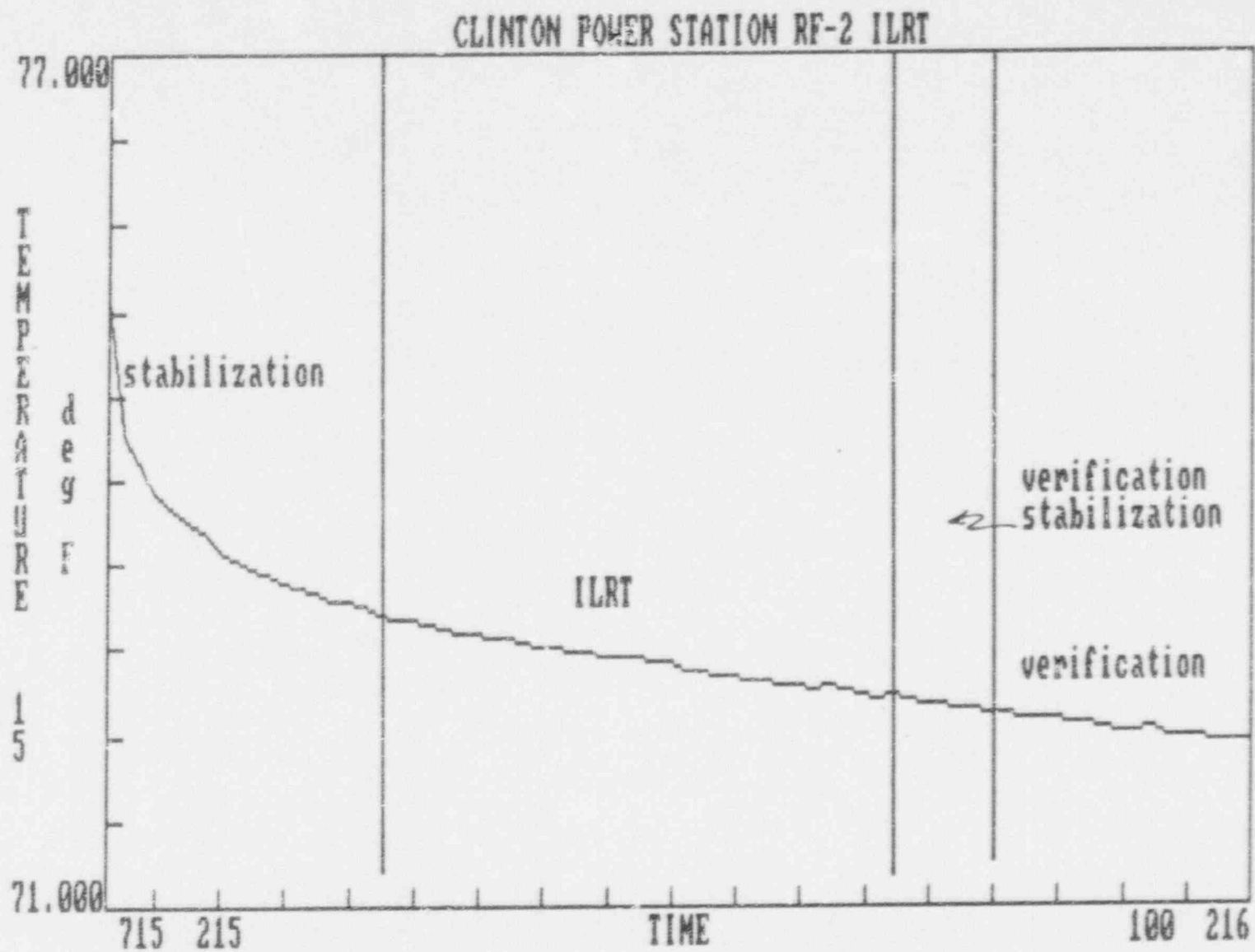
CLINTON POWER STATION RF-2 ILRT



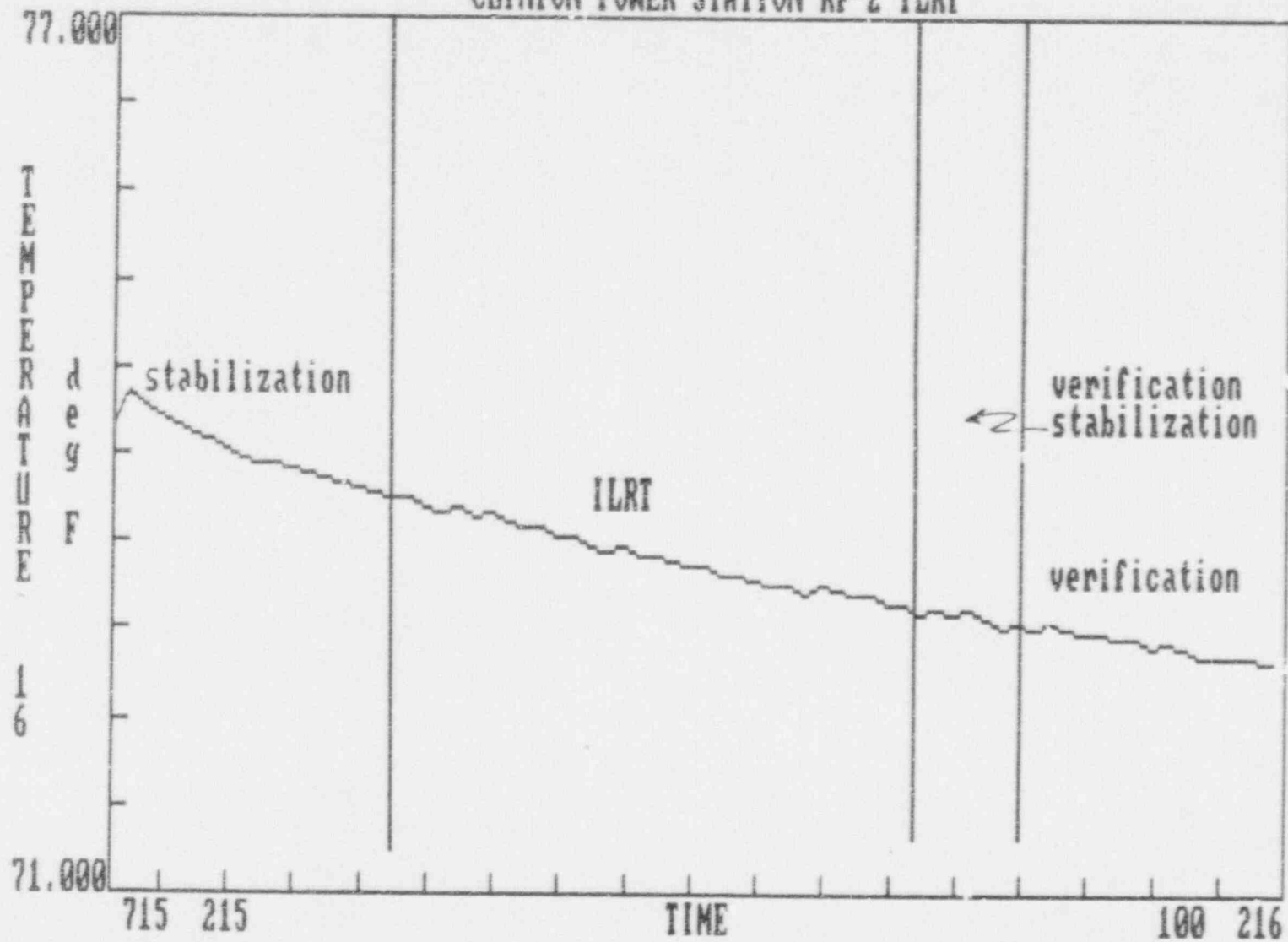


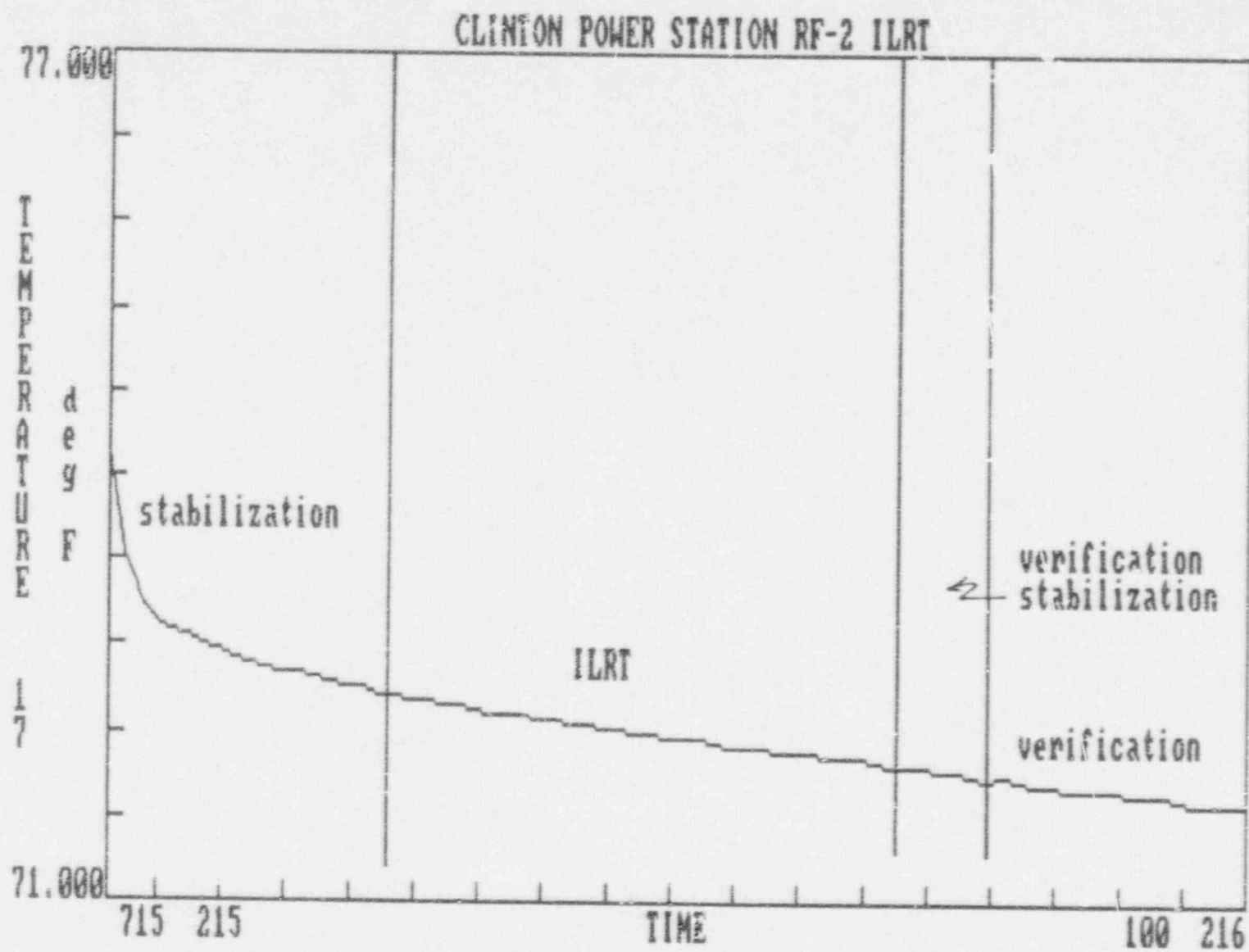
CLINTON POWER STATION RF-2 ILRT



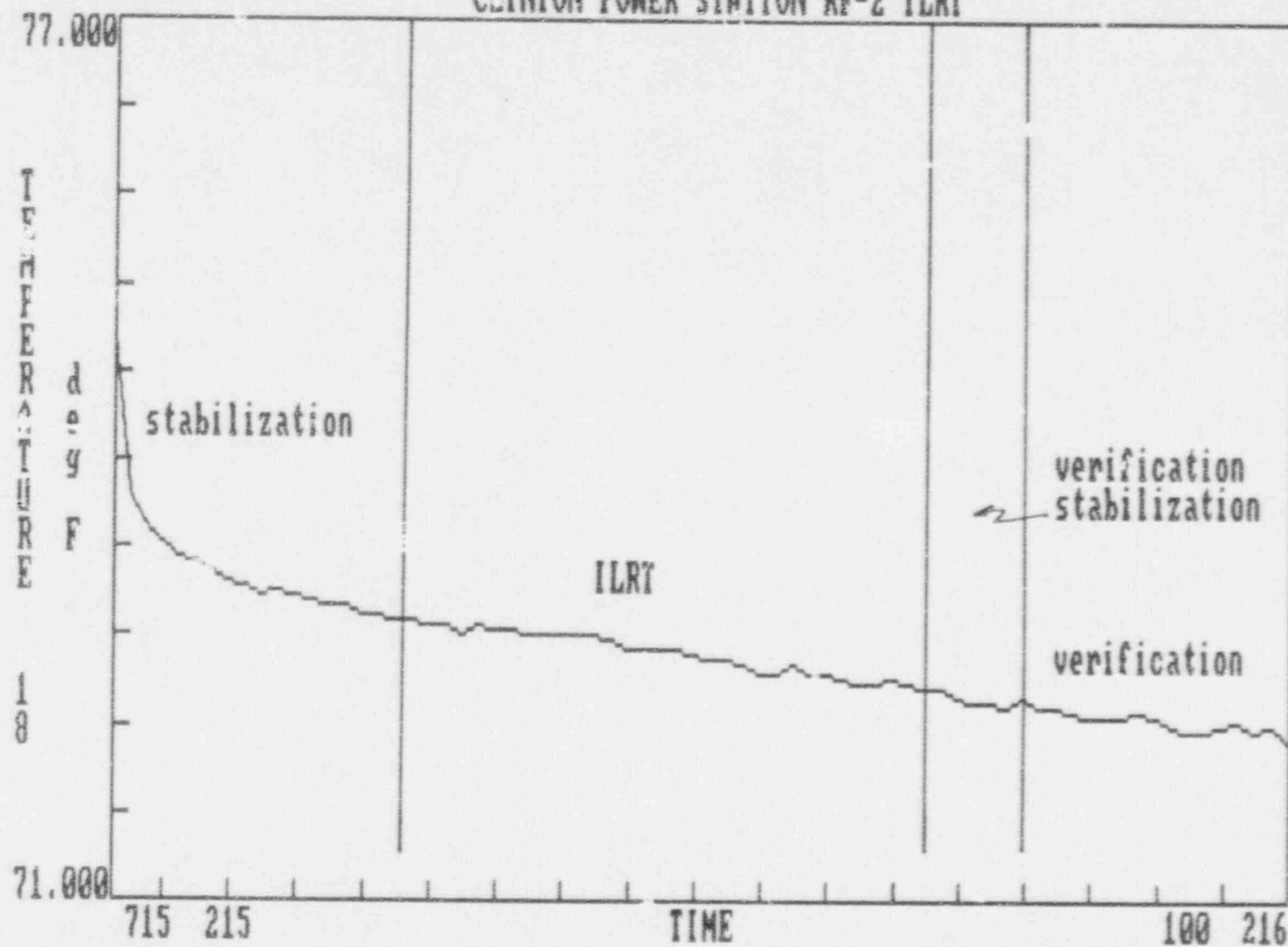


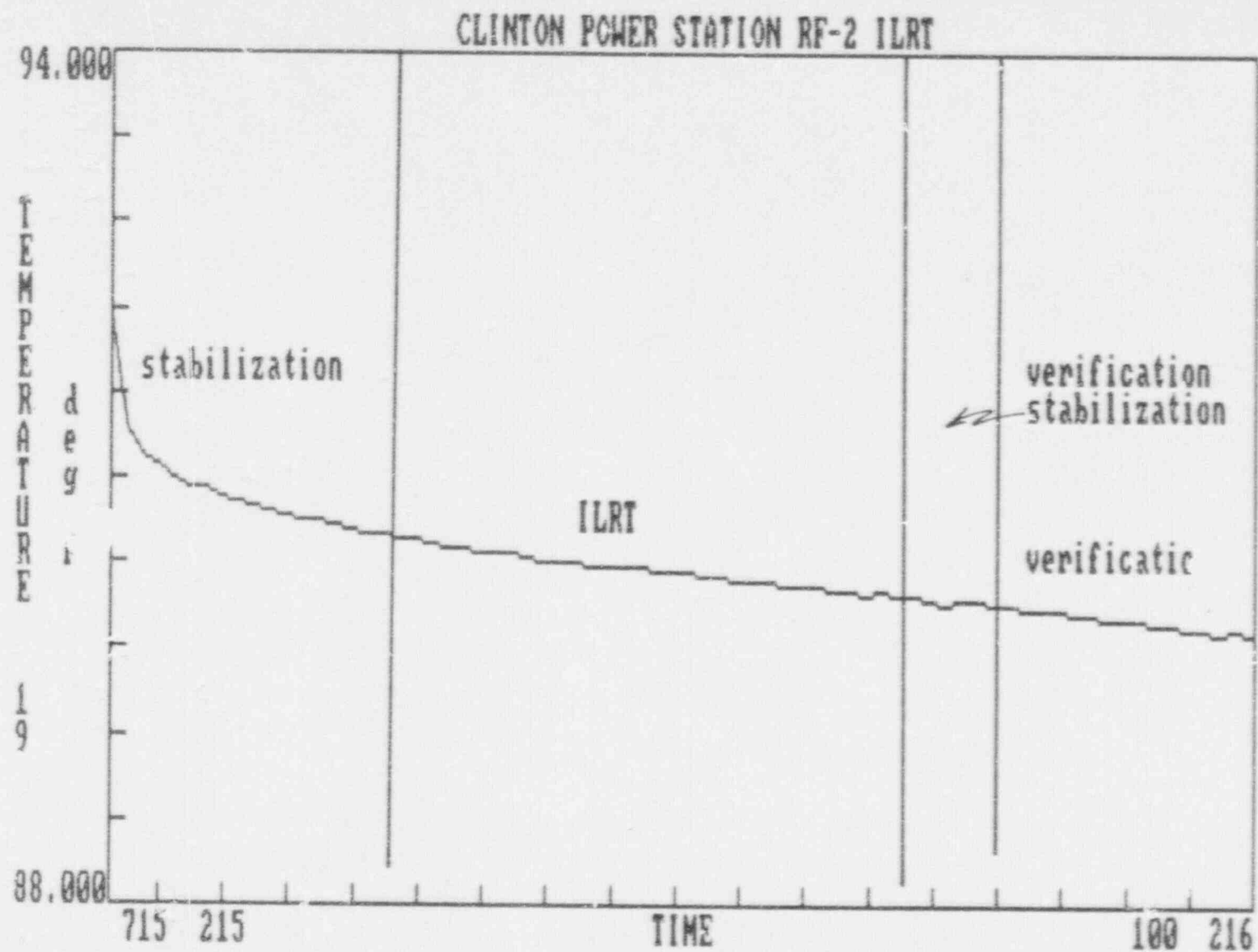
CLINTON POWER STATION RF-2 ILRT

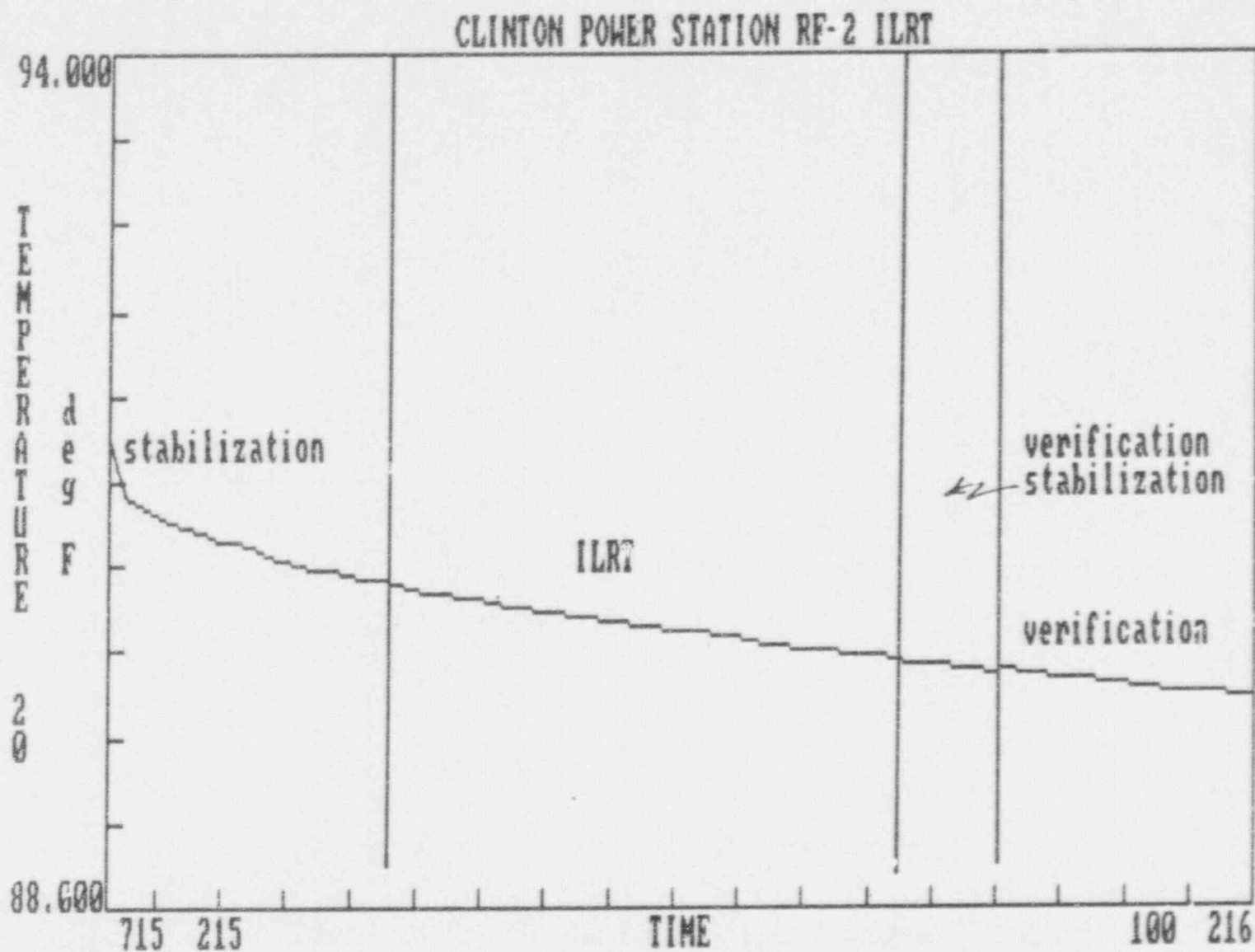




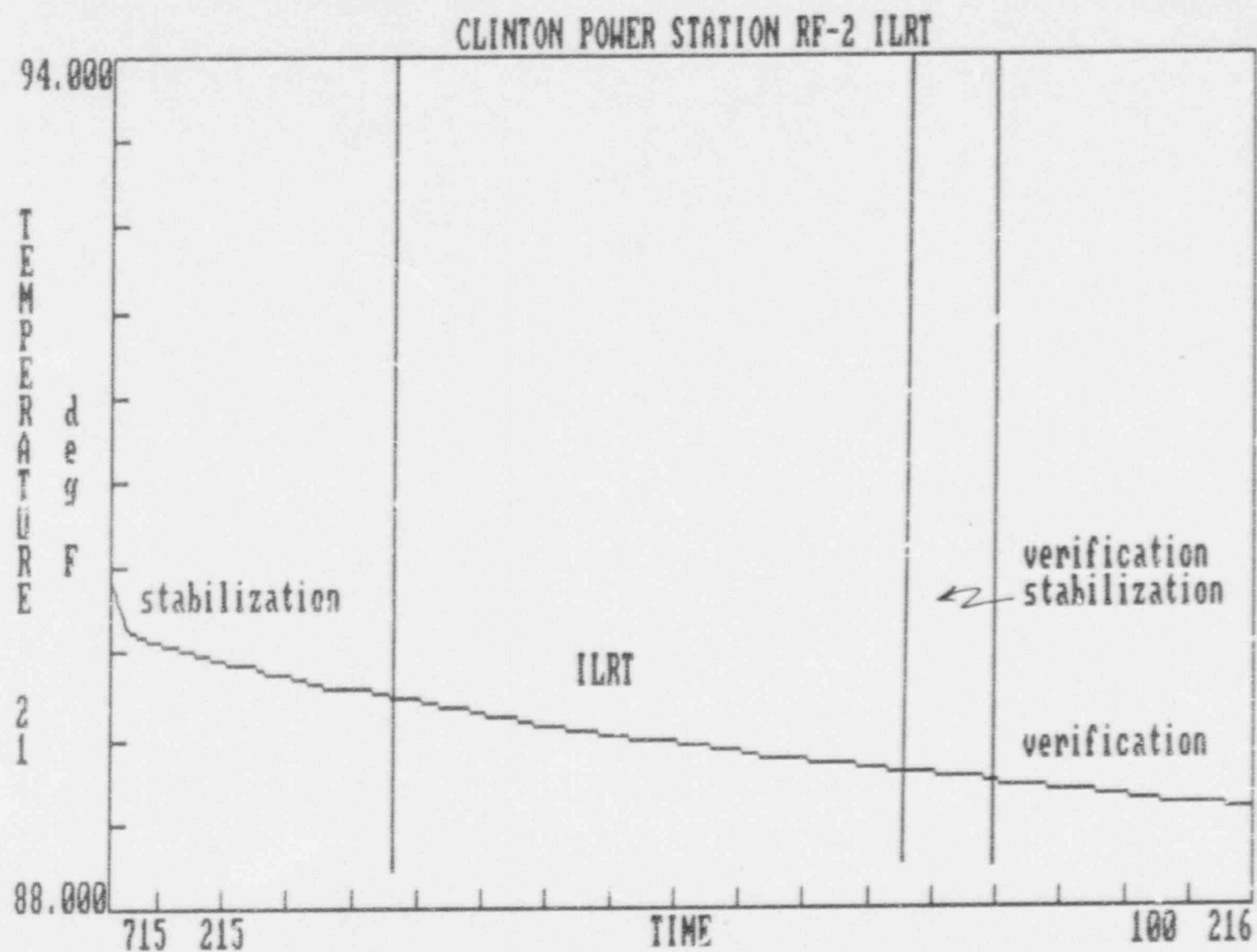
CLINTON POWER STATION RF-2 ILRT



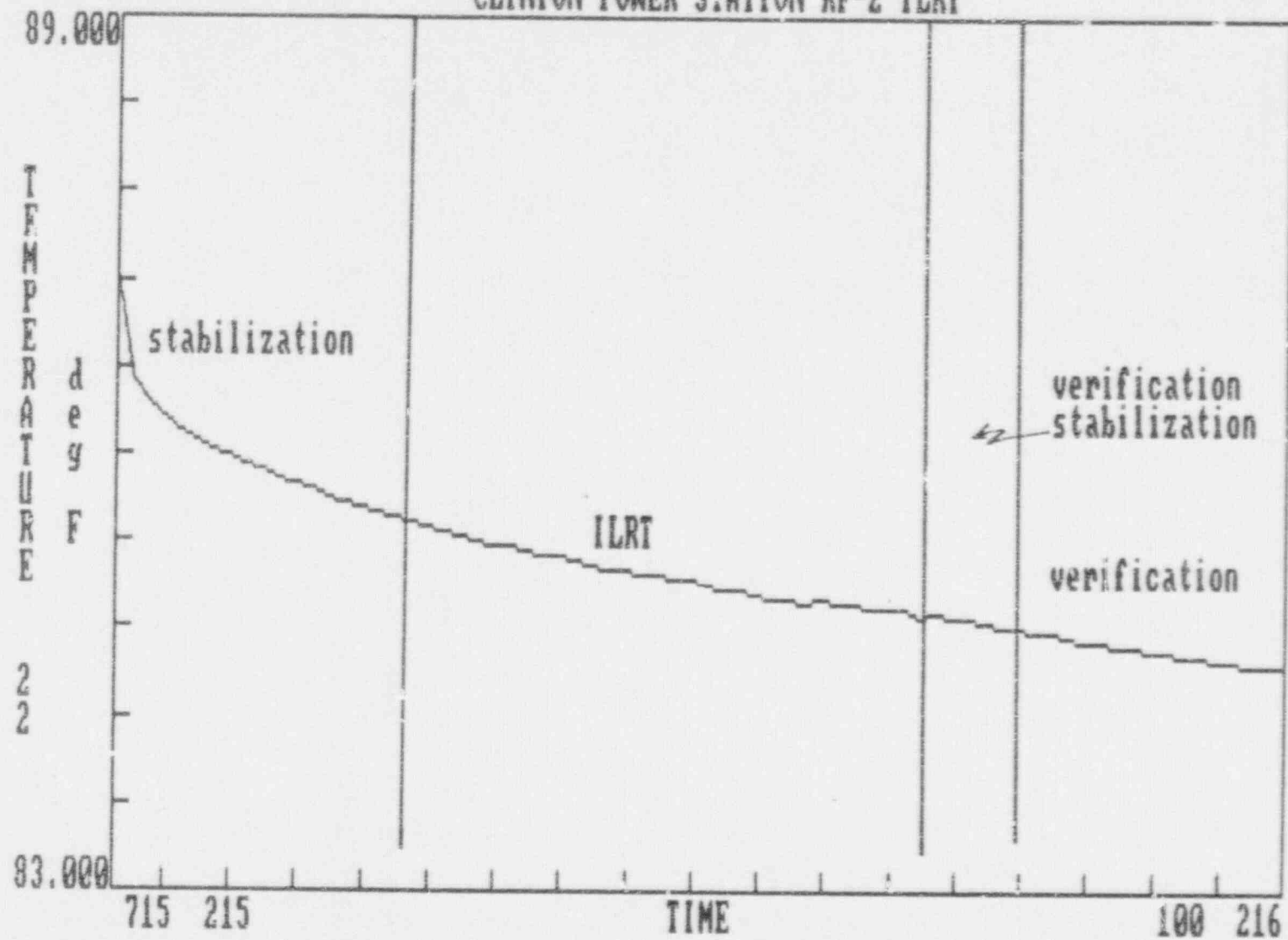




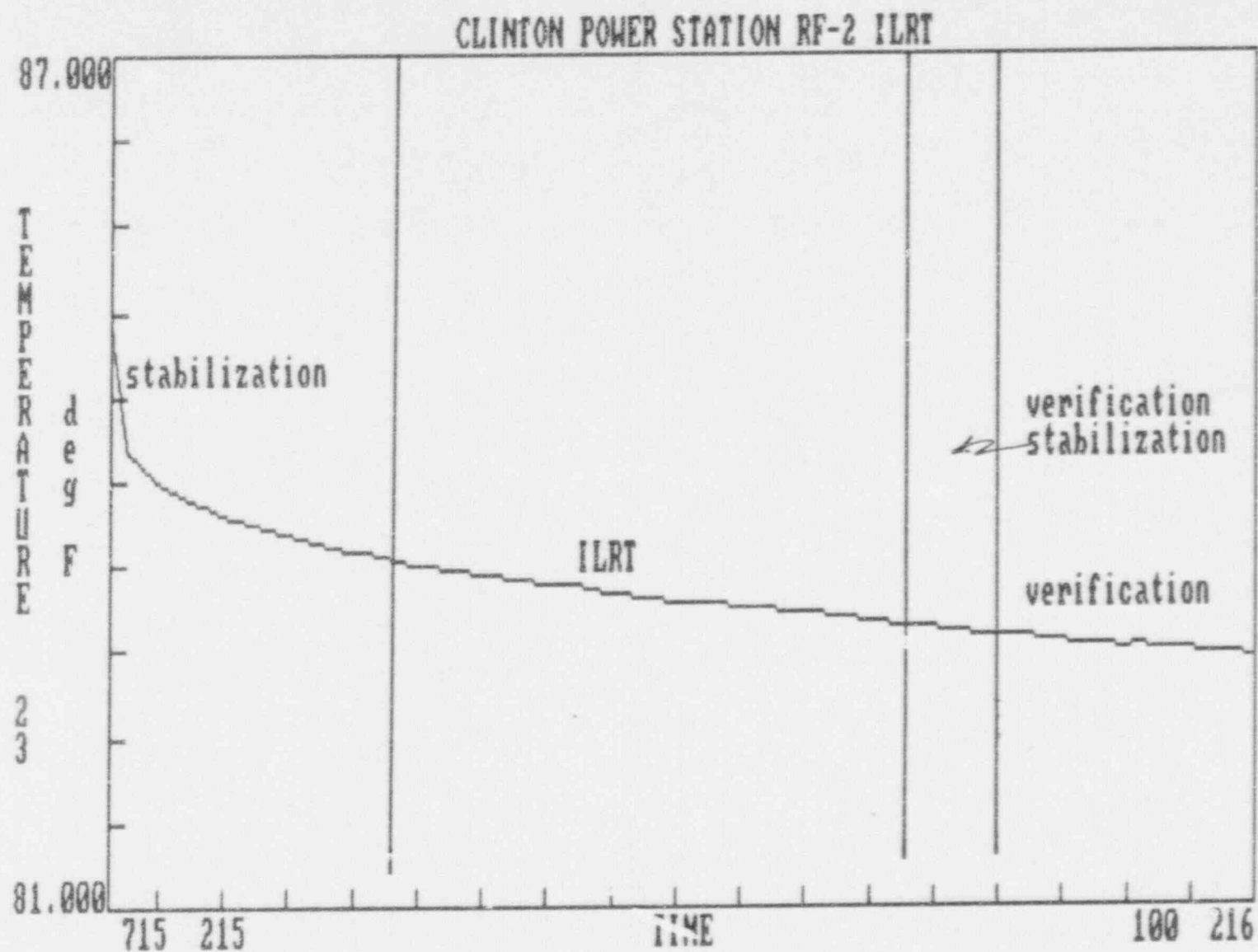
F-40



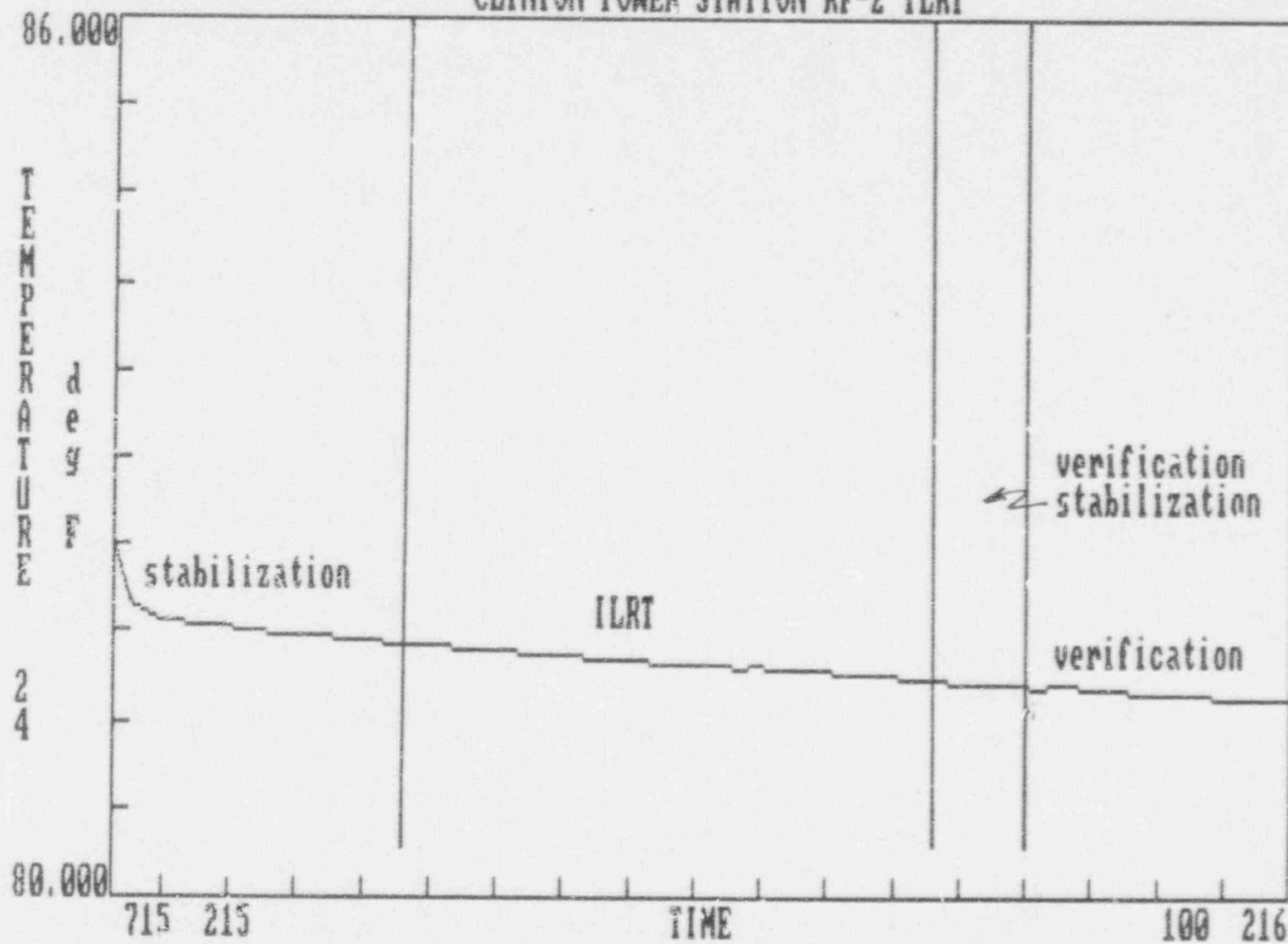
CLINTON POWER STATION RF-2 ILRT



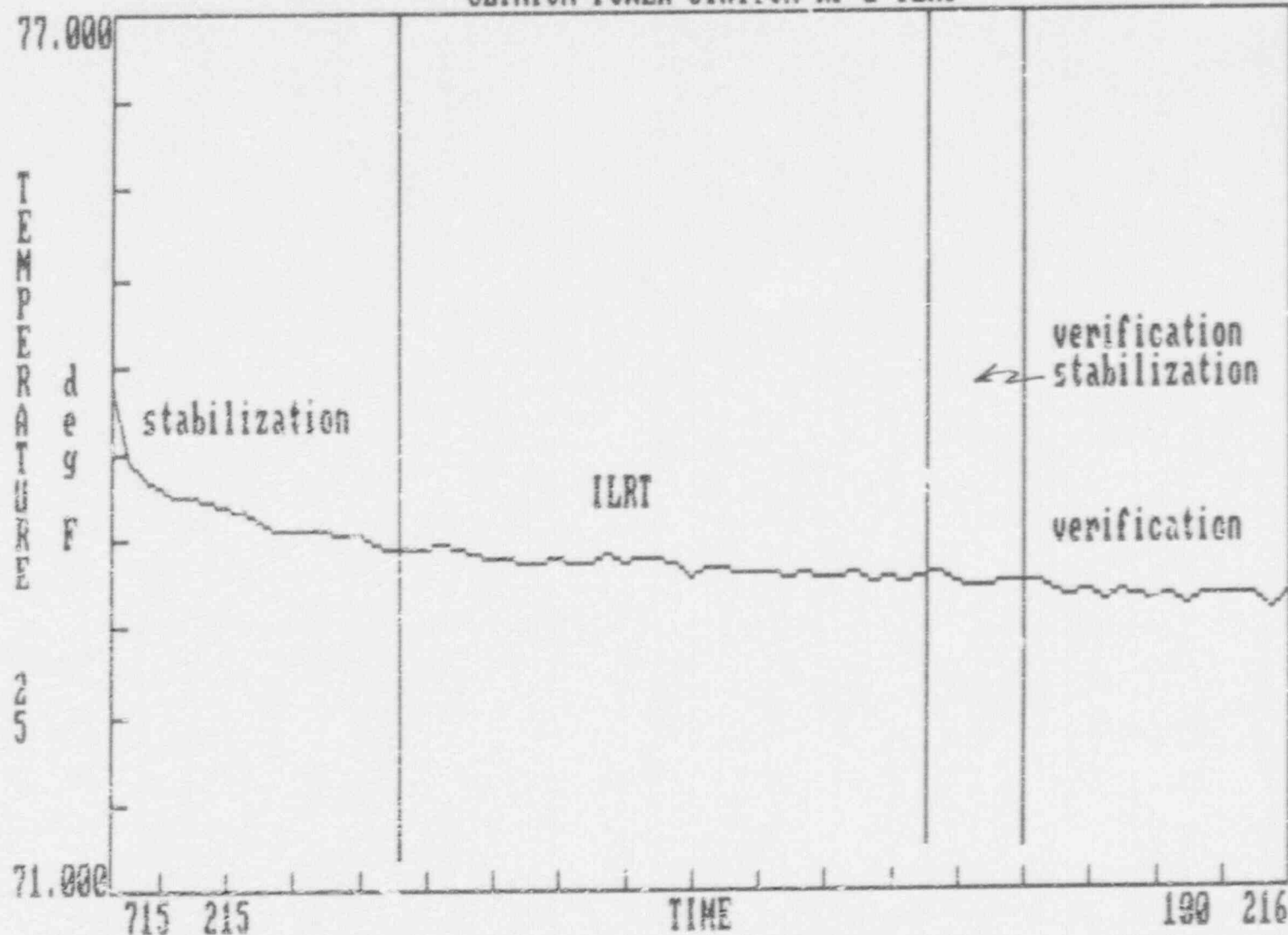
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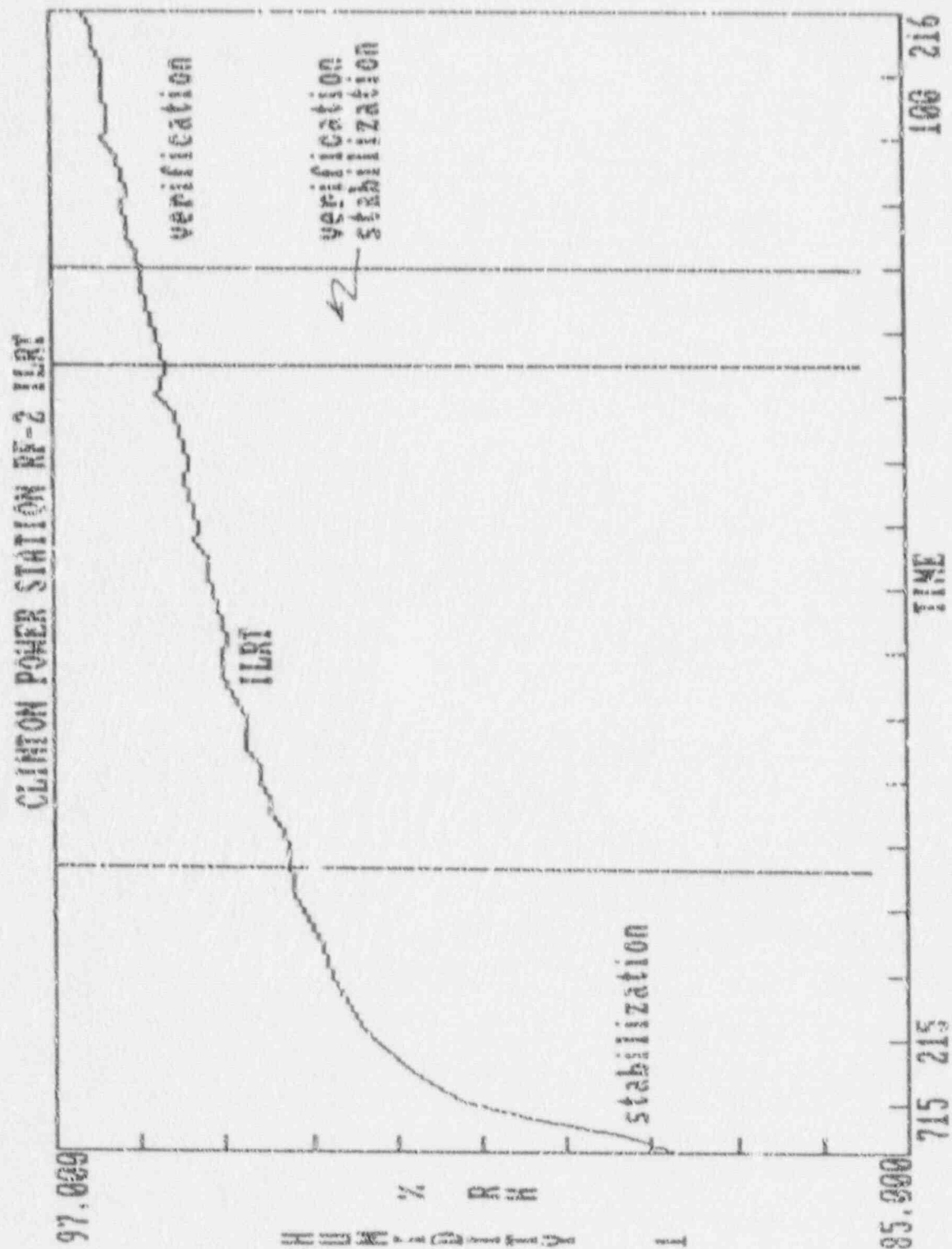


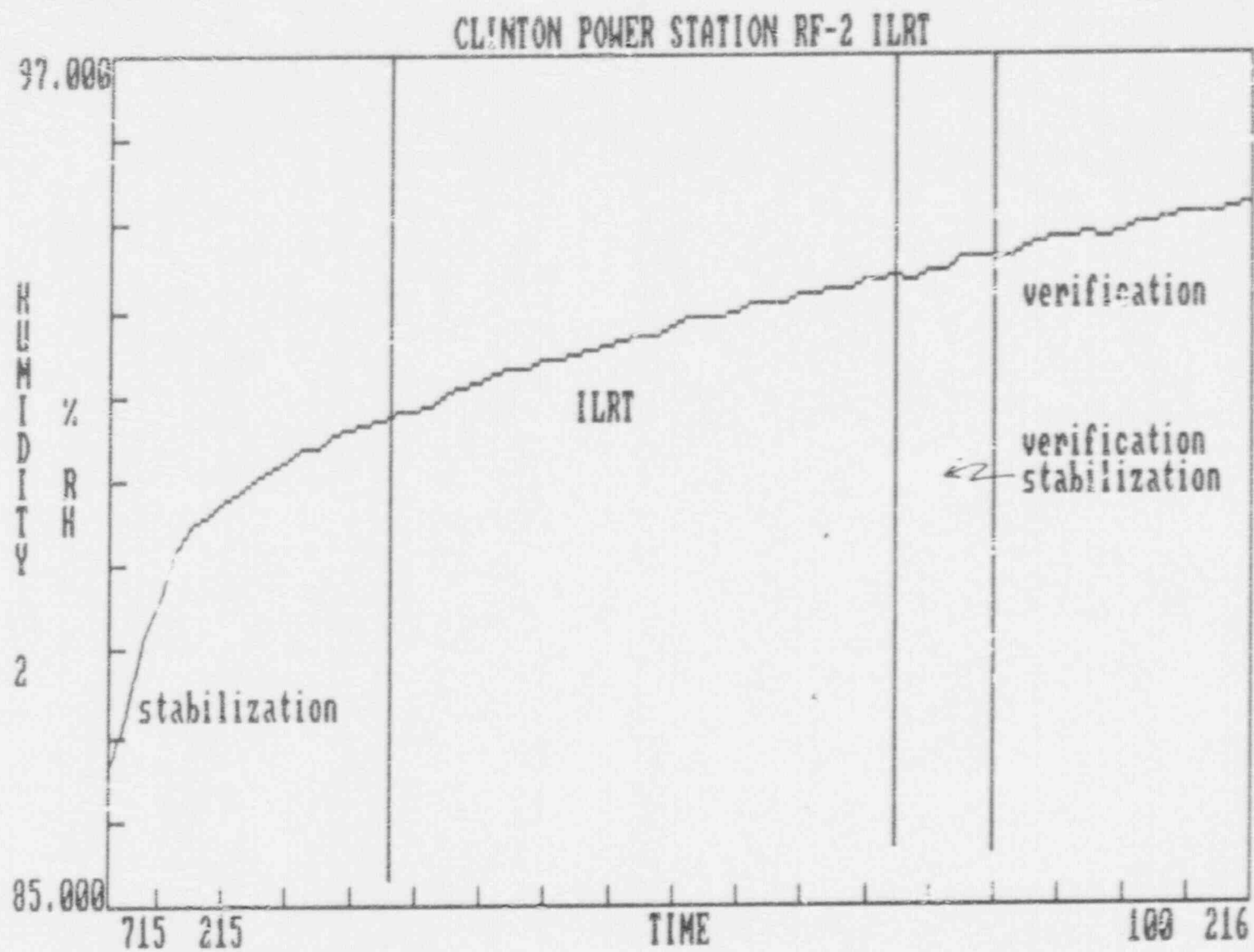
CLINTON POWER STATION RF-2 ILRT



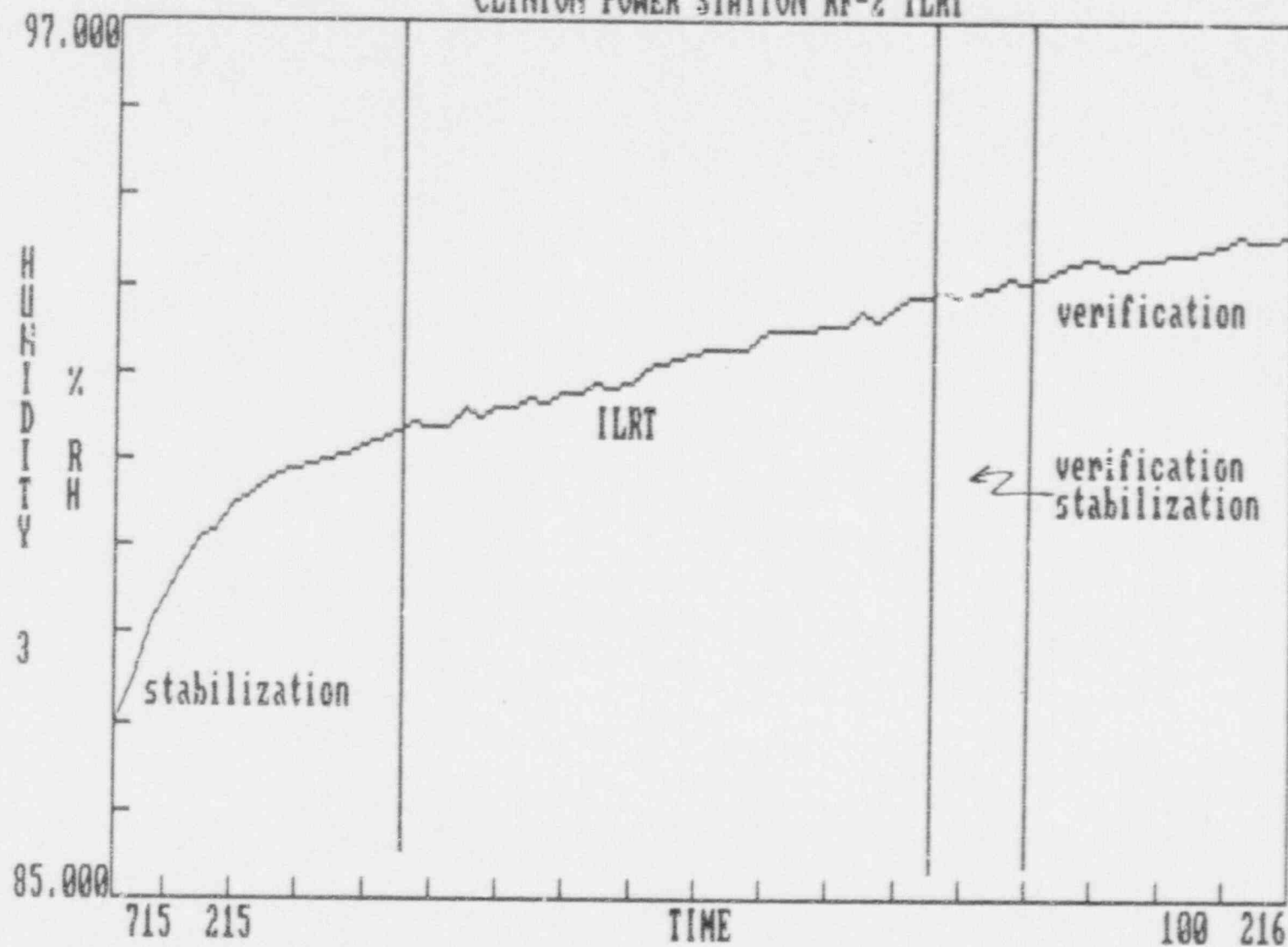
CLINTON POWER STATION RF-2 ILRT

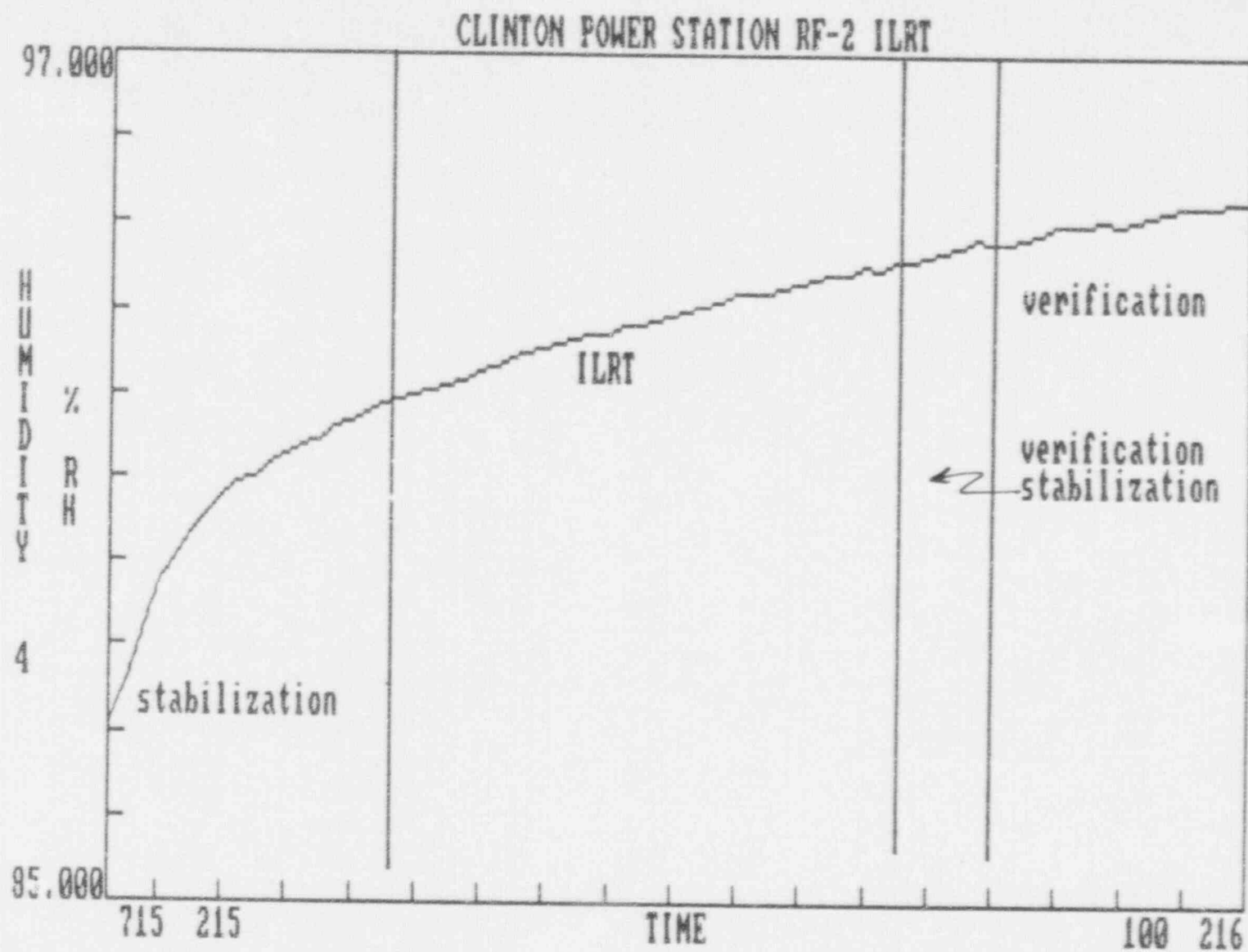




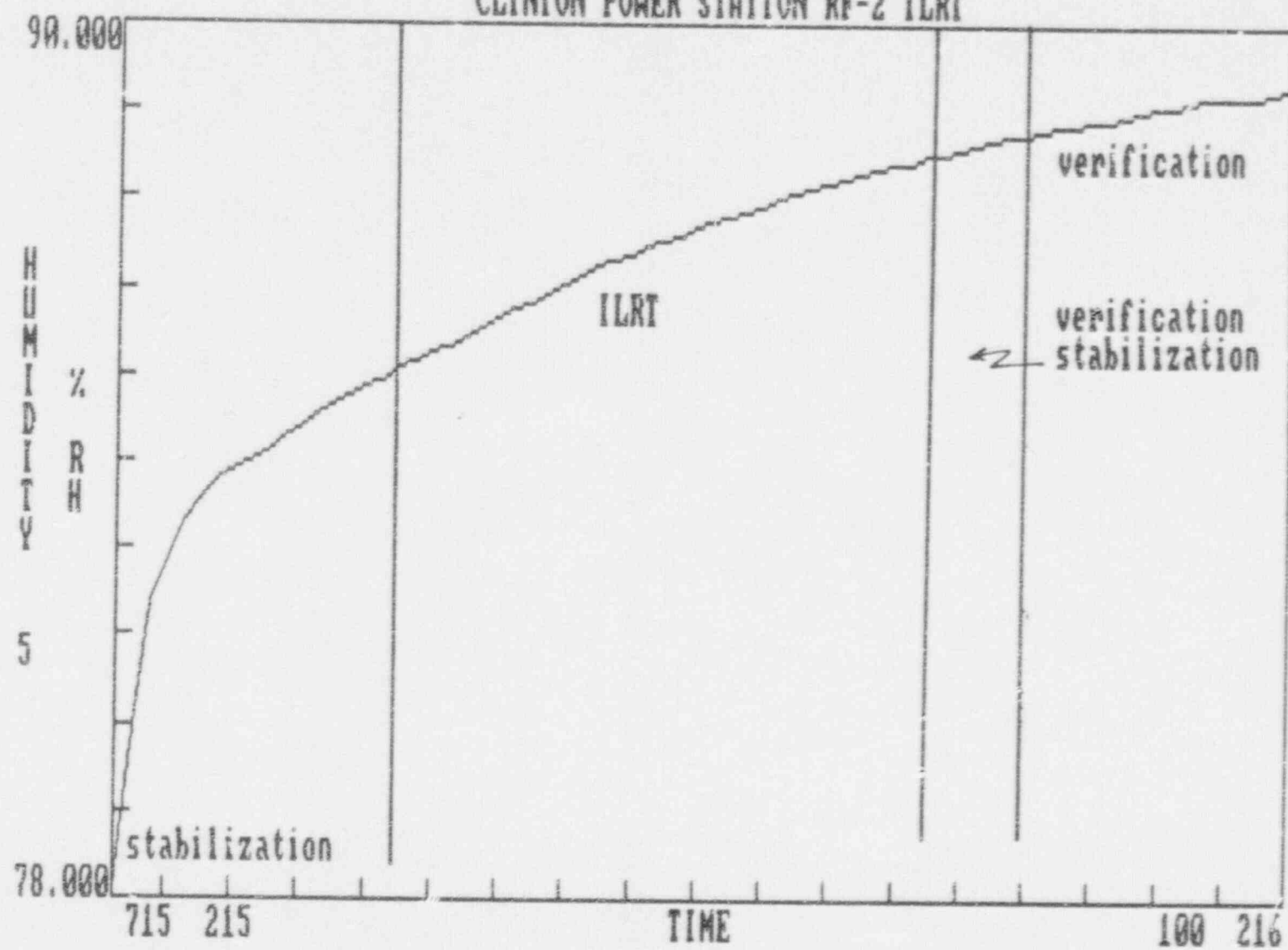


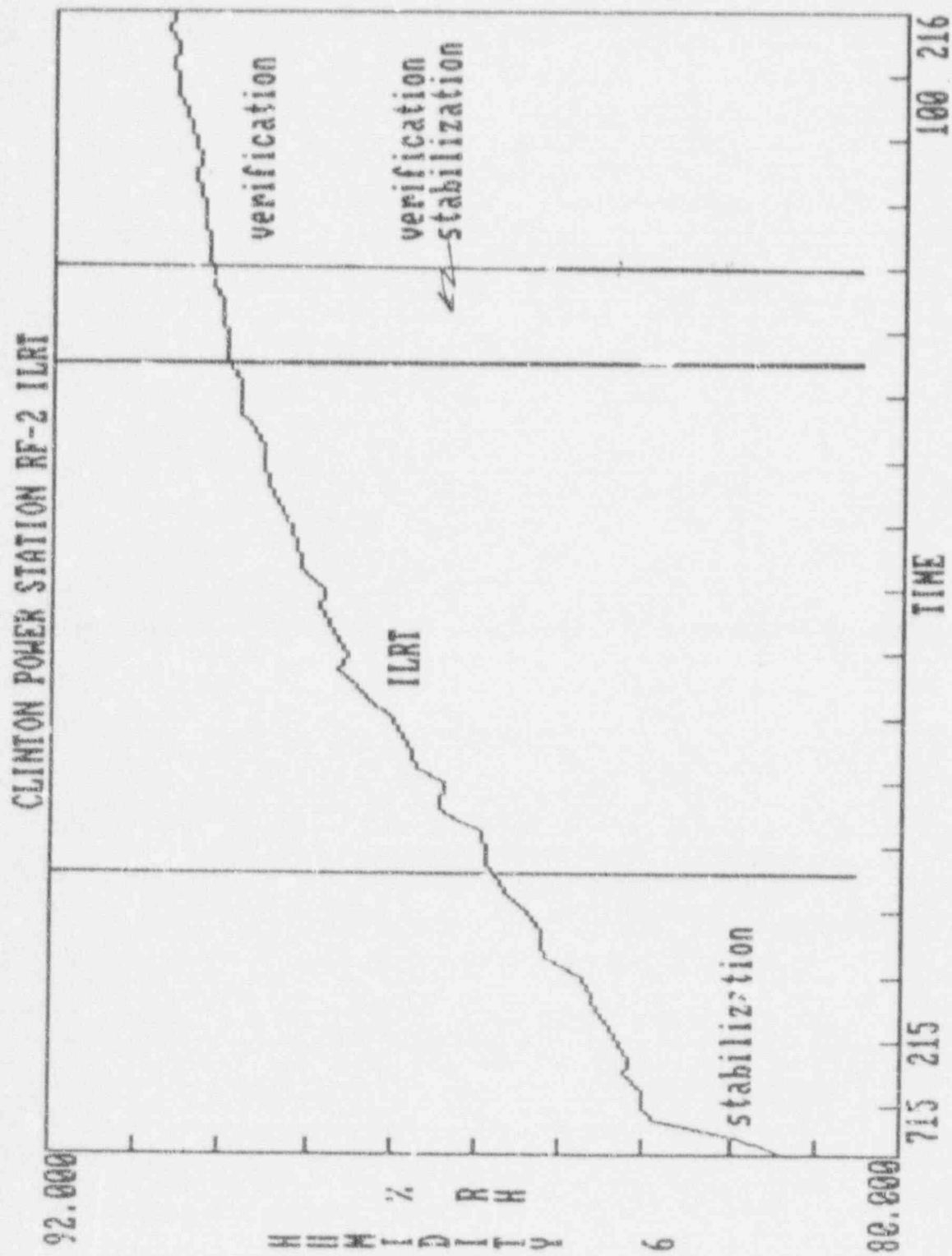
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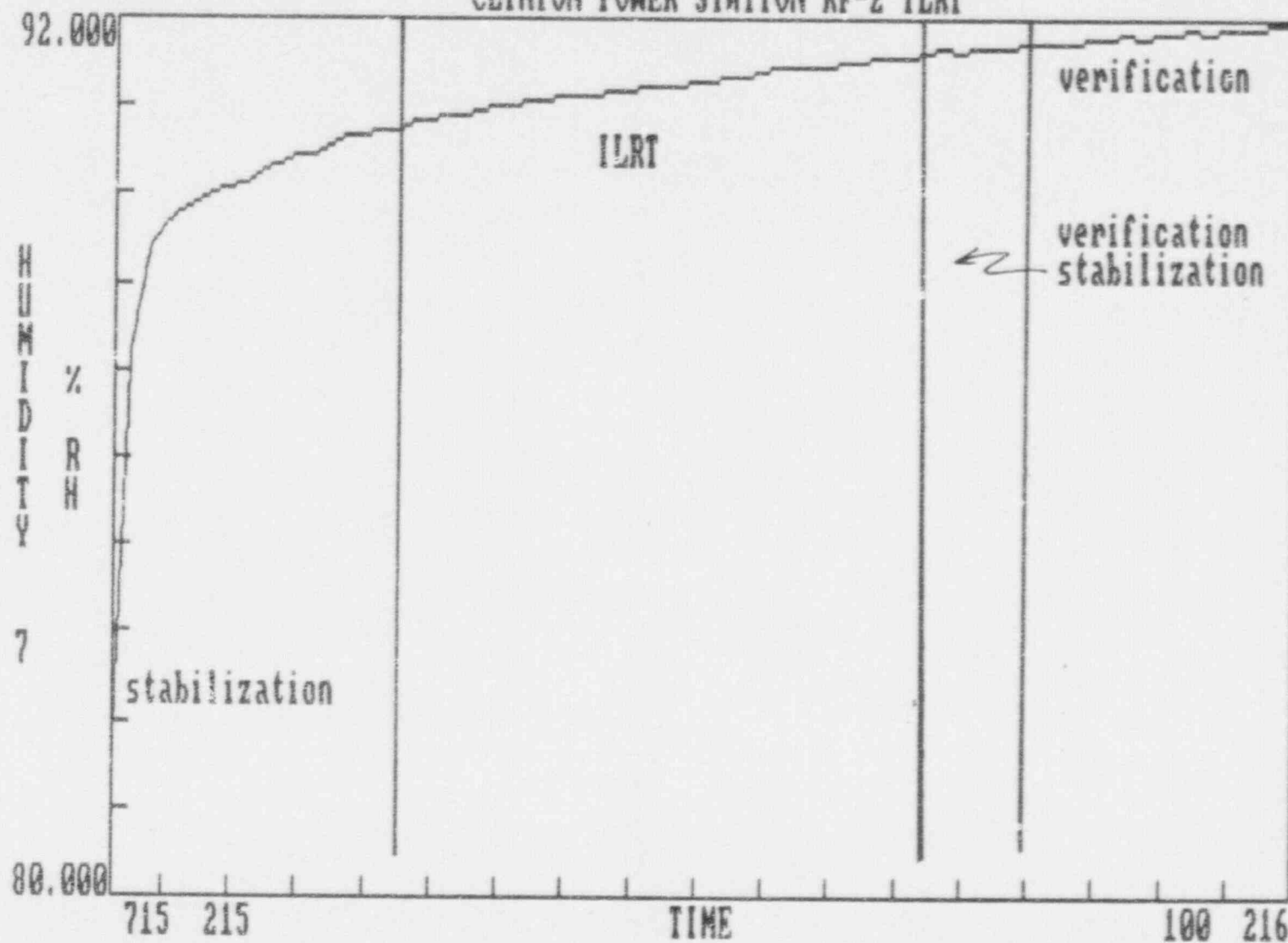


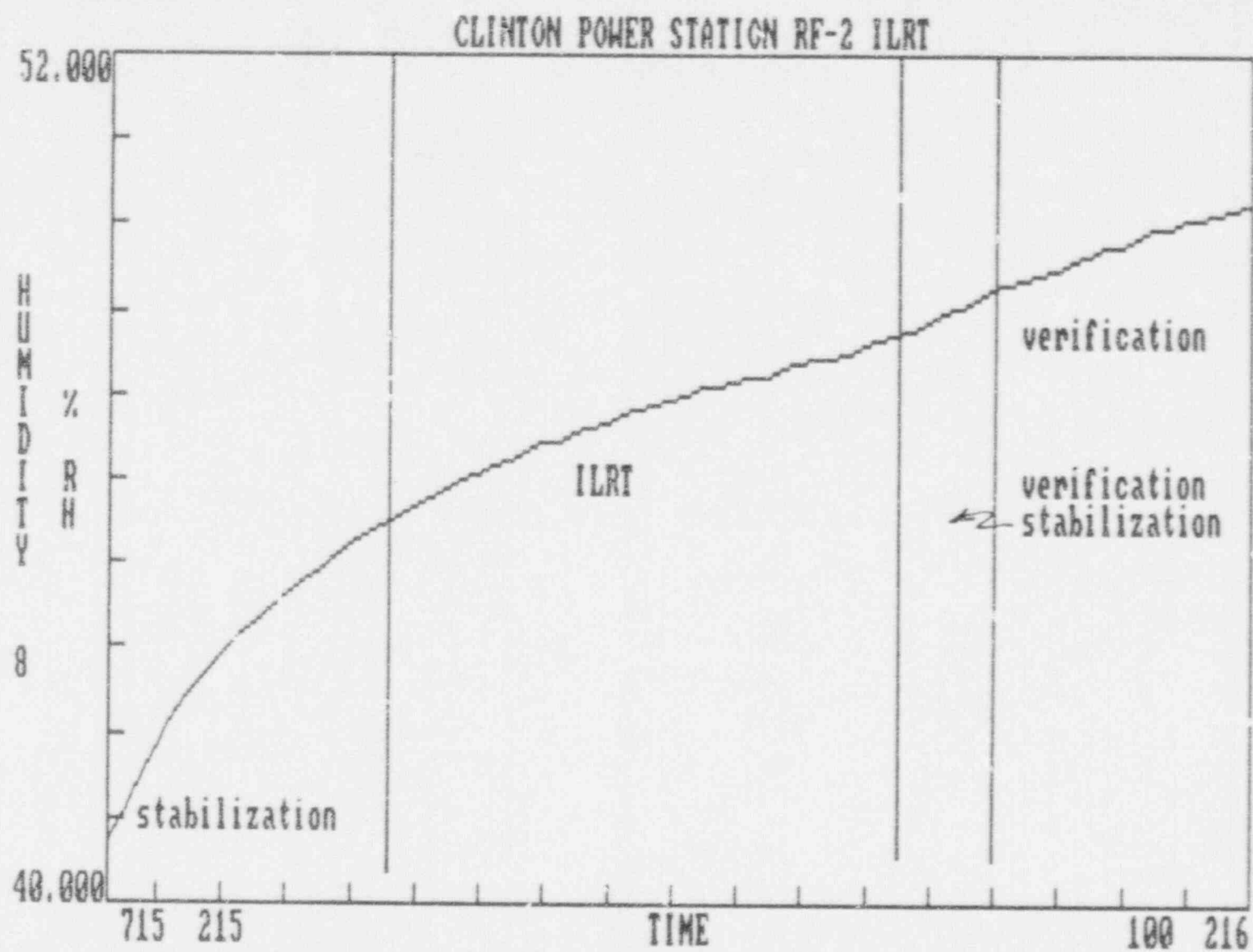
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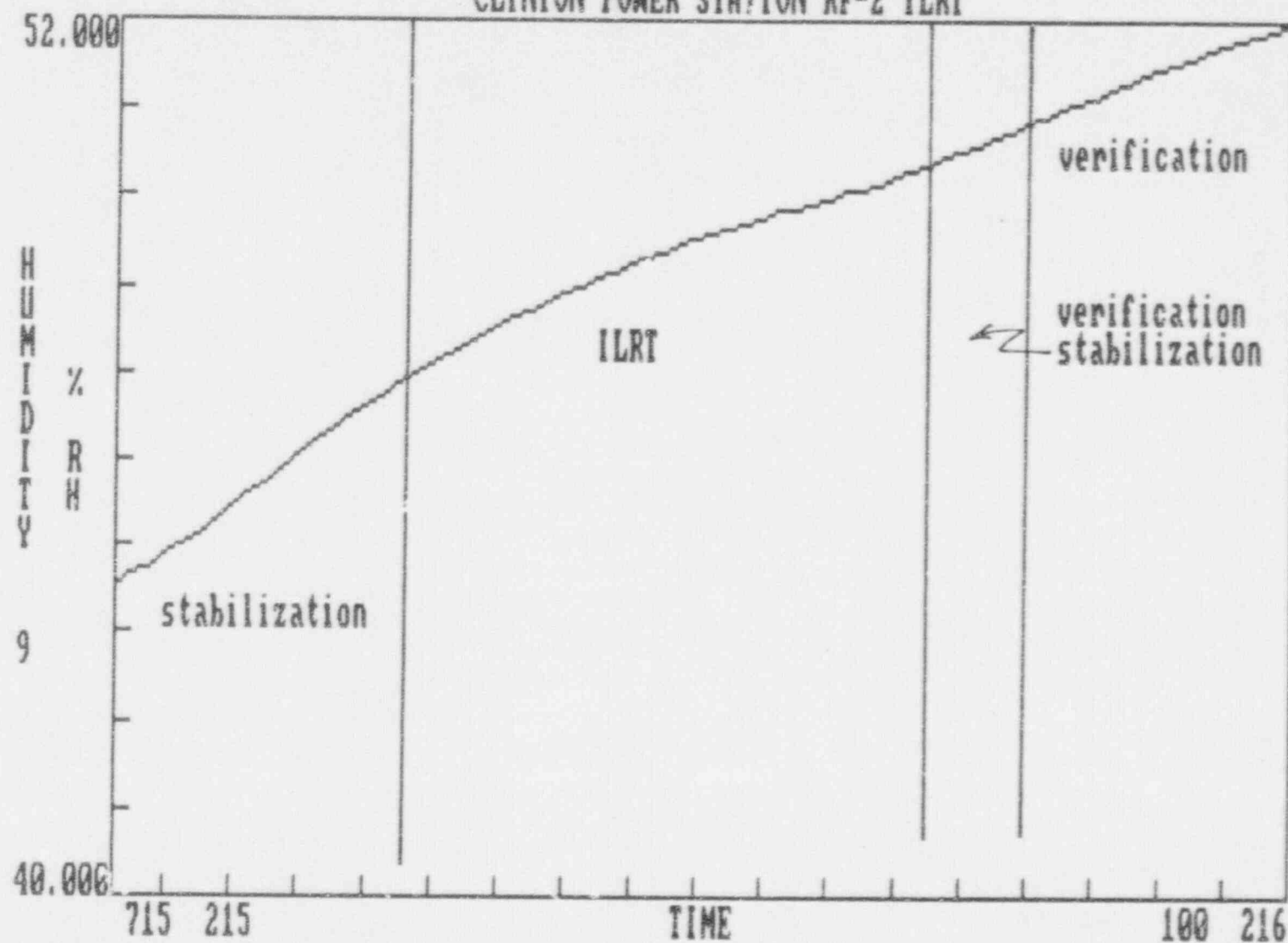


CLINTON POWER STATION RF-2 ILRT





CLINTON POWER STATION RF-2 ILRT



APPENDIX G

Instrument Selection Guide Calculations

ISG CALCULATION
(ANSI/ANS 56.8 - 1981)

CALIBRATION DATA

	<u># OF SENSORS</u>	<u>SENSITIVITY(E)</u>	<u>REPEATABILITY(r)</u>
TEMPERATURE(T)	25	0.0100 deg. F	0.0100 deg. F
PRESSURE(P)	2	0.0003 psia	0.0010 psia
VAPOR PRESS(Pv)	9	0.5000 deg. F	0.1000 deg. F

Length of Test(t)	8.00 hrs
Test Pressure(P)	9.70 psig -- 24.0165 psia
Test Temperature(T)	533 deg. R
From Steam Table	.01259 psi/deg. F (at 70 deg. F dp) 0.3415 deg. F/% R.H. (at 85% R.H., 75°F dp)
L_a	0.6500 wt%/day

INSTRUMENT MEASUREMENT ERRORS

$$eT = [(ET)^2 + (rP)^2]^{1/2} / [\# \text{ of sensors}]^{1/2}$$

$$eT = 0.002828 \text{ deg. R}$$

$$eP = [(ET)^2 + (rP)^2]^{1/2} / [\# \text{ of sensors}]^{1/2}$$

$$eP = 0.000738 \text{ psia}$$

$$ePv = [(EPv)^2 + (rPv)^2]^{1/2} / [\# \text{ of sensors}]^{1/2}$$

$$ePv = 0.002139 \text{ psia}$$

INSTRUMENT SELECTION GUIDE

$$ISG = 2400/t[2(eP/P)^2 + 2(ePv/P)^2 + 2(eT/T)^2]^{1/2}$$

$$ISG = 0.04005 \text{ wt\%/day}$$

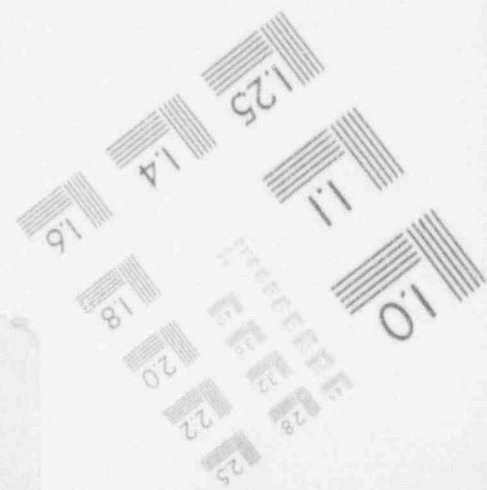
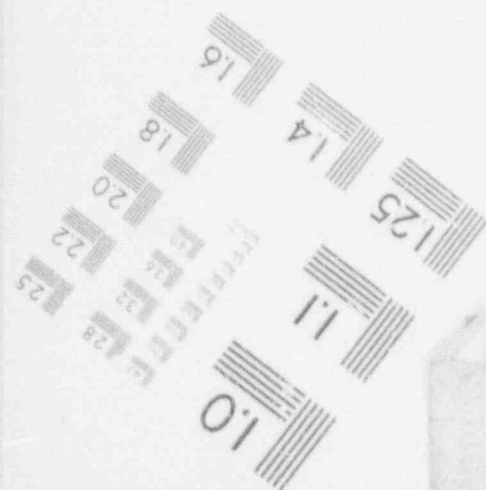
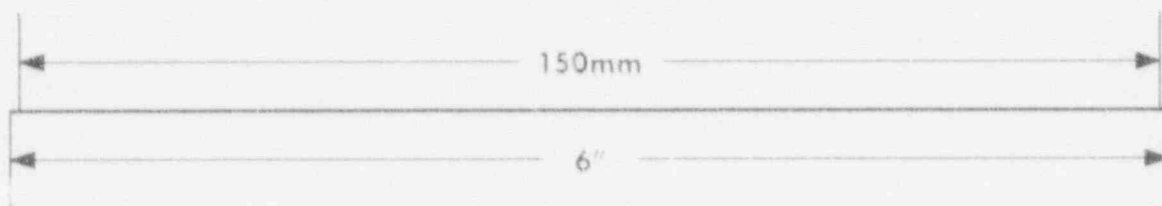
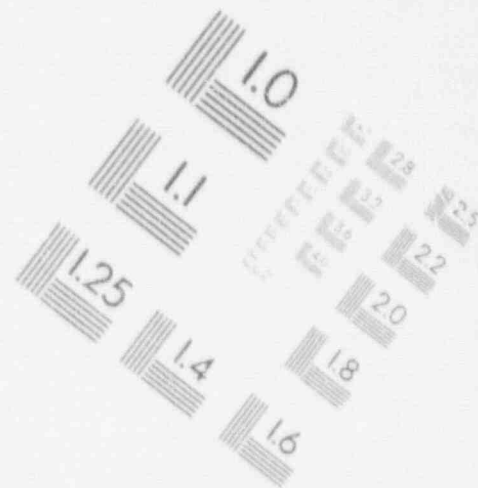
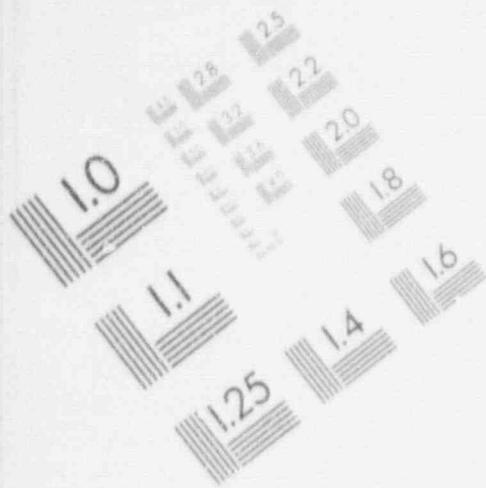
25% of L_a 0.1625 wt%/day

APPENDIX H

Drywell Bypass Leakage Rate Test

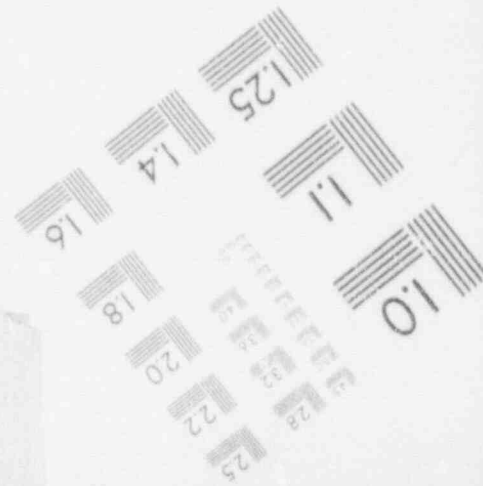
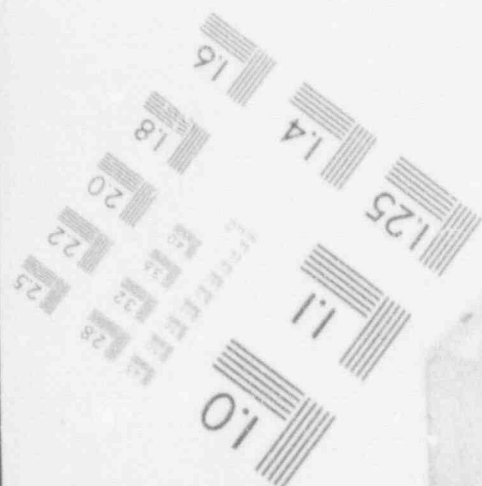
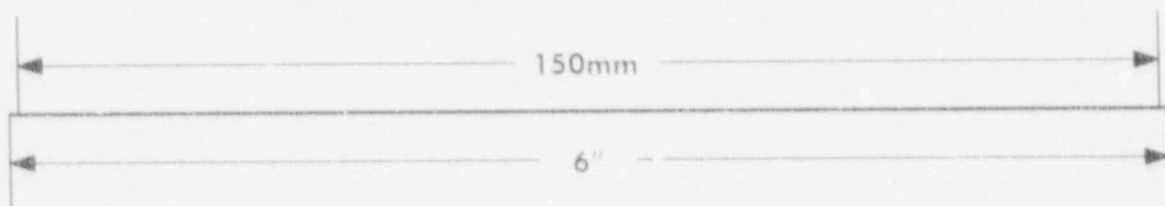
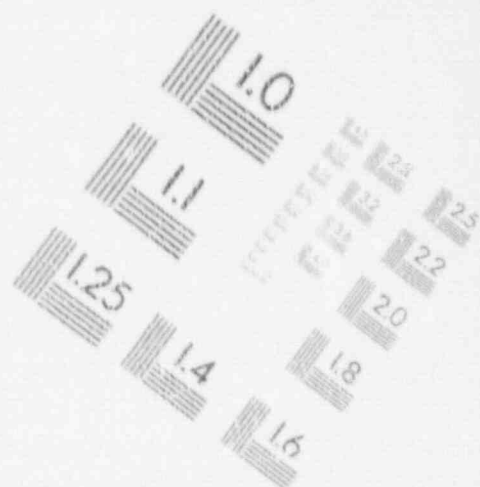
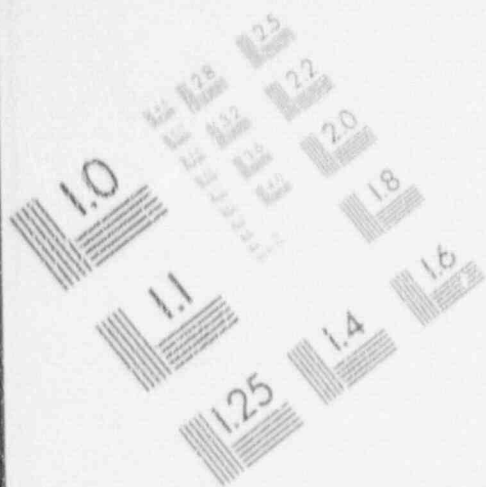
1

IMAGE EVALUATION
TEST TARGET (MT-3)



1

IMAGE EVALUATION
TEST TARGET (MT-3)



DRYWELL BYPASS LEAKAGE RATE TEST

START: 16:45

END: 20:45

MARCH 13, 1991

t (HRS) : 4.00

I. WEIGHTED AVERAGE DRYWELL TEMPERATURE

INITIAL TEMPERATURE			
RTD	T1	VOL FRAC	(T1+460) X VF1
T19 =	89.417	0.033	2.9507
T20 =	88.957	0.033	2.9355
T21 =	88.336	0.033	2.9150
T22 =	85.696	0.033	2.8279
T23 =	83.788	0.004	0.3351
T24 =	80.263	0.003	0.2410
SUMS =	VF1 =	0.139	T1, 1VF1 = 12.2056
WT AVG	T1 =	547.81 DEG R OR	37.81 DEG F

FINAL TEMPERATURE			
RTD	T1	VOL FRAC	(T1+460) X VF1
T19 =	89.301	0.033	2.9469
T20 =	88.852	0.033	2.9321
T21 =	88.292	0.033	2.9136
T22 =	85.728	0.033	2.8290
T23 =	83.788	0.004	0.3351
T24 =	80.344	0.003	0.2407
SUMS ==	VF1 =	0.139	T1, 2VF1 = 12.1975
WT AVG	T2 =	547.75 DEG R OR	87.75 DEG F

II. ABSOLUTE DRYWELL PRESSURES (PPM - 1000 GR 9104)

INITIAL		FINAL	
P1 =	17.3290 psia	P2 =	17.2280 psia
P0 =	14.2350 psia	P0 =	14.2770
V =	245413.85		

III. DRYWELL LEAKAGE RATE CALCULATION (COMPENSATED FOR WEIR LEVEL)

$$L_L = \frac{P_1[V + (P_1 - P_0) \times 2.31 \times 473]}{T_1} - \frac{P_2[V + (P_2 - P_0) \times 2.31 \times 473]}{T_2} \times \frac{T_s}{60 \text{ tPs}}$$

$$L_L = \frac{17.529[245,413.85 + ((17.5290 - 14.2350) \times 1092.63)]}{547.81035} - \frac{17.228[245,413.85 + ((17.2280 - 14.2770) \times 1092.63)]}{547.75247} \times \frac{529}{882(4)}$$

$$L_L = 21.86 \text{ scfm}$$

APPENDIX I

Type B and C Leakage Rate Test Results

APPENDIX I

LOCAL LEAK RATE SUMMARY ANALYSIS

This appendix includes a summary of the local leak rate test results as of March 2, 1991. This appendix also contains a summary of all local leak rate Type B and C tests completed since the last Type A test (November 1986), including those that failed to meet the acceptance criteria. This summary contains the valves tested, leakage rate, tolerance of test equipment, date tested and remarks concerning maintenance activities associated with the valves. The analysis of the as-found and as-left leakage rate results for the Type A test are contained in Section 4.0 of the ILRT report.

Local Leakage Rate Test Results Summary (as of 3/2/91)

	Leakage Rate sccm	Tolerance sccm
Type C	63,169.39	1037.9
Type B	<u>551.01</u>	<u>24.5</u>
Total B & C (excluding MSIV and water tests)	63,720.40	1062.4
Total MSIV	13,205.1	713.4
Total Water Test	1.890 gpm	0.080 gpm

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC001

1MC001 1CM099	0.0	0.0	01/23/87	
1MC001 HATCH	0.0	0.0	02/03/87	
1MC001 1CM099	0.0	0.0	10/18/87	
1MC001 HATCH	0.0	0.0	11/13/87	
1MC001 HATCH	0.0	0.0	04/19/88	
1MC001 1CM099	20.0	10.0	04/07/89	
1MC001 HATCH	0.0	10.0	04/27/89	
1MC001 HATCH	0.0	10.0	06/18/89	
1MC001 1CM099	0.0	2.0	03/13/90	
1MC001 HATCH	0.0	2.0	03/13/90	
1MC001 HATCH	0.0	2.0	03/13/90	PMT FOR MWR D07065 HATCH REMOVAL.
1MC001 HATCH	0.0	2.0	03/26/90	PMT FOR MWR D14174 HATCH REMOVAL.
1MC001 HATCH	0.0	10.0	07/25/90	PMT FOR MWR D07011 HATCH REMOVAL.
1MC001 HATCH	1.9	2.0	10/15/90	PRETEST FOR ILRT PRIOR TO HATCH REMOVAL
1MC001 1CM099	20.0	10.0	01/31/91	
1MC001 HATCH	0.0	10.0	02/10/91	PMT FOR MWR D07569 HATCH REMOVAL

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC002				
1MC002 LOWER BARREL	8000.0	0.0	01/23/87	MWR C27927 EQUALIZING VALVE LINKAGE SHEARED
1MC002 LOWER BARREL	280.0	10.3	02/03/87	PMT FOR MWR C27927 EQUALIZING VALVE LINKAGE SHEARED
1MC002 LOWER BARREL	510.0	10.3	07/31/87	
1MC002 LOWER BARREL	640.0	27.6	09/05/87	PMT FOR MWR C51084 SEAL SEPARATED FROM OUTER DOOR.
1MC002 LOWER BARREL	40.0	10.3	03/01/88	
1MC002 LOWER BARREL	3000.0	22.5	05/04/88	MWR C54021 WRITTEN TO REPAIR SHAFT SEAL.
1MC002 LOWER BARREL	420.0	10.3	05/04/88	PMT FOR MWR C54021
1MC002 LOWER BARREL	4000.0	200.0	05/18/88	BEGAN TESTING AIRLOCKS ON AN INCREASED FREQUENCY TO DETERMINE CAUSE OF RECURRENT FAILURES. MWR C28179 ADJUSTED SHAFT SEALS
1MC002 LOWER BARREL	1720.0	27.6	05/24/88	PMT FOR MWR C28179
1MC002 LOWER BARREL	40.0	10.3	06/08/88	
1MC002 LOWER AIRLOCK	40.0	10.3	06/22/88	
1MC002 LOWER BARREL	5000.0	0.0	09/14/88	MWR C57309 WRITTEN TO REPAIR SHAFT SEAL.
1MC002 LOWER BARREL	320.0	10.0	09/14/88	PMT FOR MWR C57309. TEST INTERVAL REDUCED TO 3 MONTHS.
1MC002 LOWER BARREL	40.0	20.0	12/15/88	
1MC002 LOWER BARREL	40.0	20.0	04/10/89	
1MC002 LOWER BARREL	1000000	0.0	09/11/89	MWR D14064 TO REPAIR EQUALIZING VALVE
1MC002 LOWER BARREL	420.0	55.0	09/12/89	PMT FOR MWR D14064
1MC002 LOWER BARREL	620.0	65.0	02/14/90	
1MC002 LOWER BARREL	4500.0	400.0	07/19/90	MWR D07847 WRITTEN TO REPAIR THE EQUALIZATION VALVE THAT WAS IDENTIFIED TO BE LEAKING.
1MC002 LOWER BARREL	40.0	20.0	07/20/90	PMT FOR MWR D07847
1MC002 LOWER BARREL	20.0	10.0	11/04/90	AS FOUND FOR ILRT
1MC002 LOWER	1620.0	14.1	02/09/91	AS LEFT FOR ILRT

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM TOLER ANCE	DATE	COMMENTS:
BARREL			
** 1MC003			
1MC003 UPPER BARREL	1220.0	27.6 01/27/87	
1MC003 UPPER BARREL	1420.0	27.6 07/15/87	
1MC003 UPPER BARREL	1220.0	27.6 01/05/88	
1MC003 UPPER BARREL	18000.0	210.0 05/02/88	MWR C46275 TO REPAIR EQUALIZING VALVE
1MC003 UPPER BARREL	1970.0	27.6 05/03/88	PMT FOR MWR C46275
1MC003 UPPER BARREL	520.0	27.6 05/11/88	
1MC003 UPPER BARREL	820.0	22.5 06/01/88	
1MC003 UPPER BARREL	360.0	10.3 06/15/88	
1MC003 UPPER BARREL	100.0	10.0 09/21/88	
1MC003 UPPER BARREL	40.0	20.0 11/23/88	
1MC003 UPPER BARREL	40.0	20.0 04/13/89	
1MC003 UPPER BARREL	900.0	55.0 09/18/89	
1MC003 UPPER BARREL	1620.0	20.0 02/20/90	
1MC003 UPPER BARREL	30.0	15.0 07/16/90	
1MC003 UPPER BARREL	400.0	10.0 11/01/90	AS FOUND FOR ILRT
1MC003 UPPER BARREL	330.0	14.1 02/07/91	AS LEFT FOR ILRT. NO WORK PERFORMED

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC004

1MC004 IFTS

100.0 25.7 10/31/87

1MC004 IFTS

12.0 10.0 03/15/89 PMT FOR MWR C56310 ROTATE
SPECTACLE FLANGE

1MC004 IFTS

0.0 50.0 03/09/90 PMT FOR MWR D07174

1MC004 IFTS

0.0 100.0 10/10/90 AS FOUND FOR ILRT

1MC004 IFTS

26.8 10.0 12/22/90 AS LEFT FOR ILRT

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC005

1MC005 MSIV C 1E32F330A	20.0	5.1	01/10/87	TESTED 1E32F330A ONLY. PMT FOR IS-7 MODIFICATION
1MC005 MSIV C 1E32F330A	20.0	5.1	03/24/87	PMT FOR MWR C32331
1MC005 MSIV C	750.0	22.6	11/10/87	PMT FOR MWR C52618 AND MWRC38147. REPAIRED SEAT FO F022C AND MWR C38147 REPAIRE F028C.
1MC005 MSIV C	1000000	0.0	01/05/89	MWR C52137 LAPPED F022C. M C52141 LAPPED F028C.
1MC005 MSIV C 1B21F028C 1B21F022C	900.0	0.0	02/22/89	
1MC005 1B21F026C MSIV C	20.0	0.0	02/22/89	
1MC005 1B21F022C 1B21F028C MSIV C	900.0	0.0	02/22/89	
1MC005 1B21F026C MSIV C	20.0	0.0	02/22/89	
1MC005 MSIV C	920.0	55.0	02/23/89	
1MC005 1B21F022C 1B21F028C MSIV C	361.0	20.0	10/21/90	

RF-2 ILRT/LIRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC006
1MC006 MSIV A 45.0 5.1 01/10/87 TESTED 1E32F329A ONLY
1E32F329A RETEST FOR IS-7 MODIFICATION
1MC006 MSIV A 20.0 5.1 03/24/87 PMT FOR MWR C32331
1E32F329A
1MC006 MSIV A 3020.0 206.1 11/07/87 PMT FOR MWR C48983 AND C38144
REPAIRED SEAT FOR F022A AND
F028A
1MC006 MSIV A 1000000 0.0 01/05/89 MWR C52139 LAPPED 28A
1MC006 MSIV A 2070.0 410.0 02/19/89 PMT FOR MWR C52135 INSPECT
ACTUATOR SPRINGS (CHANGED),
AND MWR C52139 LAPPED SEATS
ON 1B21F028.
1MC006 1B21F022A 12750.0 400.0 10/25/90 THIS IS A TEST OF THE INBOARD
MSIV. THE OUTBOARD VALVE
WOULD NOT HOLD PRESSURE. MWR
D09910 PERFORMED MODIFICATION
MSF012 AND REPAIRED SEAT OF
1B21F028C.
1MC006 MSIV A 5130.0 420.0 11/16/90 THIS IS THE POST MAINTENANCE
TEST (PMT) FOR MWR D09910
(MSF012 MODIFICATION).

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC007

1MC007 MSIV D	20.0	5.1	01/10/87	TESTED 1E32F330C ONLY
1E32F330C				RETEST FOR IS-7 MODIFICATION
1MC007 MSIV D	20.0	5.1	03/24/87	PMT FOR MWR C32331
1E32F330C				
1MC007 MSIV D	12270.0	206.1	10/22/87	
1MC007 MSIV D	1000000	0.0	03/19/88	
1MC007 MSIV D	1000000	0.0	01/03/89	MWRS C52138 AND C52142 WRITT
				TO REPAIR SEATS.
1MC007 MSIV D	2070.0	20.0	02/19/89	PMT FOR MWR C52138 & C52142.
1MC007 MSIV D	6060.0	420.0	10/21/90	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC008

1MC008 MSIV B 1E32F329C	20.0	5.1	01/10/87	TESTED 1E32F330C ONLY RETEST FOR IS-7 MODIFICATION
1MC008 MSIV B 1E32F329C	20.0	5.1	03/24/87	PMT FOR MWR C32331
1MC008 MSIV B	420.0	27.6	11/07/87	PMT FOR MWR C48983 AND C48984 REPAIRED SEAT
1MC008 MSIV B	3020.0	410.0	01/03/89	TOTAL LEAKAGE INCLUDING TEST CONNECTION
1MC008 MSIV B	1975.0	65.0	10/21/90	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC009

1MC009	1B21F010A	1000000	0.0	04/06/88	
1MC009	1B21F032A	350.0	5.1	04/06/88	
1MC009	1B21F063A	20.0	5.1	04/06/88	
1MC009	1E12F053A	20.0	5.1	04/06/88	
	1B21F065A				
	1E12F058A				
	1E12F349A				
1MC009	1B21F030A	20.0	5.1	04/06/88	
1MC009	1B21F010A	7000.0	400.0	03/07/89	
1MC009	1B21F010A	7000.0	400.0	03/07/89	
1MC009	1B21F063A	20.0	10.0	03/08/89	
1MC009	1B21F063A	20.0	10.0	03/08/89	
1MC009	1B21F010A	7000.0	400.0	03/19/89	FAILED NON TECH SPEC ACCEPTANCE CRITERIA. RETEST ON 3-28-89
1MC009	1B21F063A	20.0	10.0	03/19/89	
1MC009	1B21F010A	750.0	45.0	03/27/89	
1MC009	1B21F010A	750.0	45.0	03/27/89	
1MC009	1B21F010A	75.0	45.0	03/28/89	PMT FOR MWR C02067
1MC009	1B21F032A	0.0	0.0	03/29/89	TROUBLE SHOOTING F032A NO DATA TAKEN.
1MC009	1B21F032A	1000000	0.0	03/31/89	
1MC009	1B21F065A	3000.0	400.0	03/31/89	
	1E12F053A				
	1E12F058A				
	1E12F349A				
	1B21F030A				
1MC009	1B21F030A	0.0	0.0	03/31/89	
1MC009	1B21F032A	1000000	0.0	10/20/90	D06674 WRITTEN TO REPAIR THE EXCESSIVE LEAKAGE IDENTIFIED IN THE PRE-LLRT. MWRs D15151 and D07911 WERE WORKED IN THE OUTAGE ALSO.
1MC009	1B21F010A	360.0	10.0	10/20/90	
1MC009	1B21F063A	20.0	10.0	10/20/90	
1MC009	1B21F065A	950.0	45.0	11/20/90	
	1E12F053A				
	1E12F349A				
	1E12F058A				
1MC009	1B21F030A	0.0	10.0	11/20/90	
1MC009	1B21F032A	1000000	0.0	12/16/90	PMT FOR MWR D06674 TO REPAIR SEAT LEAKAGE. EXEMPTION APPROVED TO EXCLUDE THIS VALVE FROM THE LEAKAGE TOTALS UNTIL REFUELING OUTAGE NUMBER 3.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC010				
1MC010 1B21F030B	20.0	10.0	03/31/88	
1MC010 1G33F057	20.0	10.0	03/31/88	
1MC010 1E31N077A	20.0	10.0	03/31/88	
1E31N077B				
1MC010 1B21F010B	20000.0	0.0	03/31/88	FAILED NO RETEST AS 1B21F032B PASSED.
1MC010 1B21F032B	450.0	27.5	03/31/88	
1MC010 1B21F063B	45.0	5.1	03/31/88	
1MC010 1B21F065B	20.0	5.1	03/31/88	
1E12F053B				
1E12F058B				
1E12F349B				
1MC010 1B21F010B	20.0	10.0	03/06/89	
1MC010 1B21F063B	30.0	10.0	03/06/89	
1MC010 1B21F030B	20.0	10.0	03/06/89	
1MC010 1E31N077A	20.0	10.0	03/06/89	
1E31N077B				
1MC010 1G33F057	20.0	10.0	03/06/89	
1MC010 1B21F032B	1000000	0.0	03/15/89	NO WORK PERFORMED F010B PASSED.
1MC010 1E12F053B	1000.0	45.0	03/16/89	
1E12F058B				
1E12F349B				
1B21F065B				
1MC010 1B21F063B	20.0	10.0	10/17/90	
1MC010 1B21F032B	1000000	0.0	10/17/90	T. S. EXEMPTION TO EXCLUDE THIS VALVE FROM THE LEAKAGE TOTALS UNTIL REFUELING OUTAGE NUMBER 3
1MC010 1B21F010B	10500.0	400.0	10/18/90	MWR D15624 TO REPAIR SEAT.
1MC010 1B21F065B	5.0	10.0	12/15/90	
1E12F053B				
1E12F058B				
1E12F349B				
1MC010 1B21F030B	10.0	10.0	12/15/90	
1MC010 1G33F057	0.0	10.0	12/15/90	
1MC010 1E31N077A	5.0	10.0	12/15/90	
1E31N077B				
1MC010 1B21F010B	15.0	10.0	12/16/90	PMT FOR MWR D15624.
1MC010 1B21F032B	1000000	0.0	12/16/90	PMT FOR MWR D07813 LAPPED SEAT. EXEMPT FROM LEAKAGE TOTALS.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC011

1MC011 1E12F335A

0.1 0.0 08/02/90

1MC011 1E12F334A

0.1 0.0 08/02/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC012

1MC012 1E12F335B 0.1 0.0 07/31/90

1MC012 1E12F334B 0.1 0.0 07/31/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC013

1MC013 1E12F335C

0.1 0.0 07/31/90

1MC013 1E12F334C

0.1 0.0 07/31/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC014				
1MC014 1E12F009	190.0	5.1	04/12/88	
1E12F475				
1MC014 1E12F001	650.0	22.5	04/12/88	
1E12F008				
1MC014 1E12F009	370.0	10.0	02/21/89	
1E12F475				
1MC014 1E12F008	172.0	10.0	02/21/89	
1E12F001				
1MC014 1E12F475	2050.0	45.0	12/21/90	TEST PERFORMED AT 1800 HRS AFTER CYCLING FOR THE F008 AND F001 TEST.
1E12F009				
1MC014 1E12F008	90.0	45.0	12/21/90	
1E12F001				
1MC014 1E12F475	3000.0	450.0	12/21/90	PRETEST FOR MWR D19177 (REPACKED 1E12F009 AND PERFORM MOVATS). TEST PERFORMED AT 12:45.
1E12F009				
1MC014 1E12F009	1150.0	45.0	12/27/90	PMT FOR MWR D19177 (CHESTERTON PACKING AND MOVATS).
1E12F475				
1MC014 1E12F008	100.0	10.0	12/27/90	
1E12F001				

RF-2 ILRT/_ RT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC015

1MC015 1E12F027A 20.0 5.1 04/10/88

1E12F042A

1E12F037A

1E12F044A

1E12F329A

1E12F025A

1E12F028A

1E12F107A

1MC015 1E12F331A 20.0 5.1 04/10/88

1MC015 1E12F331A 20.0 10.0 01/21/89

1MC015 1E12F027A 20.0 10.0 01/21/89

1E12F025A

1E12F042A

1E12F107A

1E12F044A

1E12F329A

1E12F037A

1E12F028A

1MC015 1E12F027A 330.0 10.0 10/27/90 PRETEST FOR MISC. PM'S TO BE
 1E12F025A PERFORMED ON ALL VALVES (MOTOR
 1E12F042A REPLACEMENT, SHAFT KEYS, CLEAN
 1E12F107A INSPECT, ETC.)
 1E12F329A
 1E12F044A
 1E12F037A
 1E12F028A

1MC015 1E12F027A 254.4 10.0 11/24/90 PMT FOR BENCH TEST OF
 1E12F025A & REASSEMBLY OF
 1E12F042A 1F12F028A AFTER REMOVAL FROM
 1E12F107A SYSTEM FOR THE CONTAINMENT
 1E12F329A SPRAY TEST.
 1E12F044A
 1E12F037A
 1E12F028A

1MC015 1E12F331A 20.0 10.0 11/24/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLERANCE
DATE

COMMENTS:

** 1MC016

1MC016 1E12F027B 1600.0 22.5 03/29/88

1E12F042B

1E12F329B

1E12F028B

1E12F044B

1E12F037B

1E12F025B

1E12F107B

1MC016 1E12F331B 20.0 5.1 03/29/88

1MC016 1E12F027B 8000.0 400.0 03/04/89

1E12F042B

1E12F329B

1E12F037B

1E12F025B

1E12F107B

1E12F044B

1E12F028B

1MC016 1E12F331B 20.0 10.0 03/04/89

1MC016 1E12F027B 10237.6 400.0 12/05/90 PRETEST FOR MISC. PM'S TO BE
PERFORMED (SHAFT KEY
REPLACEMENT, MOTOR
REPLACEMENT, CLEAN AND INSPECT
ETC.)

1E12F042B

1E12F329B

1E12F037B

1E12F025B

1E12F107B

1E12F044B

1E12F028B

1MC016 1E12F331B 20.0 10.0 12/05/90

1MC016 1E12F027B 6071.0 400.0 12/30/90 PMT FOR BENCH TEST OF

1E12F042B

1E12F329B

1E12F037B

1E12F025B

1E12F107B

1E12F044B

1E12F028B

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC017

1MC017 1E12F042C 20.0 5.1 03/27/88

1E12F058C

1E12F047C

1MC017 1E12F056C 20.0 5.1 03/27/88

1MC017 1E12F057C 20.0 5.1 03/27/88

1MC017 1E12F042C 20.0 10.0 02/18/89

1E12F456B

1E12F351

1E12F056C

1E12N058C

1E12N047C

1MC017 1E12F041C 1000000 0.0 02/19/89 FAILED. MWR C18395 PERFORMED
1E12F301C REWORK (REPLACED OUTER AND
INNER ACTUATOR SHAFT AND INNER
SEAL SHAFT).

1MC017 1E12F042C 20.0 10.0 02/19/89

1E12F351

1E12F056C

1E12N058

1E12F456B

1E12N047C

1MC017 1E12F041C 9000.0 400.0 02/23/89

1E12F301C

1MC017 1E12F041C 9000.0 400.0 02/23/89

1E12F301C

1MC017 1E12F057C 20.0 10.0 03/27/90 THIS TESTED 1E12F057C ONLY.
THIS VALVE WILL NOT REQUIRE
TESTING AFTER THE REVISION TO
THE TECH SPEC IS APPROVED
DELETING THIS VALVE AS A CIV.

1MC017 1E12F042C 100.0 10.0 12/15/90 THIS WAS A PRETEST FOR MWR
1E12F456B D03825 (REPACK INSTALL
1E12F351 CHESTERON AND MOVATS OF
1E12F056C 1E12F042C).

1MC017 1E12F041C 1000000 0.0 12/15/90 MWR D07907 WAS WRITTEN TO
1E12F301C REPAIR THE EXCESSIVE LEAKAGE
THROUGH 1E12F041C.

1MC017 1E12F042C 15.0 10.0 01/01/91 PMT FOR MWR D03825 REPACK AND
1E12F456B MOVATS OF 1E12F042C.

1MC017 1E12F056C
1MC017 1E12F041C 14500.0 450.0 01/01/91 PMT FOR MWR D07907 (LAPPED
1E12F301C SEAT AND DISC, INSTALLED
CHESTERTON PACKING, ADJUSTED
HINGE PINS).

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC018

1MC018 1E12F420	20.0	5.1	10/19/87
1MC018 1E12F421	20.0	5.1	10/19/87
1MC018 1E12F418	20.0	5.1	10/19/87
1MC018 1E12F419	20.0	5.1	10/19/87
1MC018 1E12F415	20.0	5.1	10/19/87
1MC018 1E12F414	20.0	5.1	10/19/87
1MC018 1E12F347	20.0	5.1	10/19/87
1MC018 1E12F346	20.0	5.1	10/19/87
1MC018 1E12F366A	20.0	5.1	10/19/87
1MC018 1E12F365A	20.0	5.1	10/19/87
1MC018 1E12F421	20.0	10.0	01/20/89
1MC018 1E12F420	20.0	10.0	01/20/89
1MC018 1E12F419	20.0	10.0	01/20/89
1MC018 1E12F418	20.0	10.0	01/20/89
1MC018 1E12F415	20.0	10.0	01/20/89
1MC018 1E12F414	20.0	10.0	01/20/89
1MC018 1E12F347	20.0	10.0	01/20/89
1MC018 1E12F346	20.0	10.0	01/20/89
1MC018 1E12F366A	20.0	10.0	01/20/89
1MC018 1E12F365A	20.0	10.0	01/20/89
1MC018 1E12F421	10.3	10.0	11/23/90
1MC018 1E12F420	41.2	10.0	11/23/90
1MC018 1E12F419	10.3	10.0	11/23/90
1MC018 1E12F418	41.2	10.0	11/23/90
1MC018 1E12F414	41.2	10.0	11/23/90
1MC018 1E21F347	41.2	10.0	11/23/90
1MC018 1E12F415	41.2	10.0	11/23/90
1MC018 1E21F346	41.2	10.0	11/23/90
1MC018 1E12F366A	0.0	10.0	11/23/90
1MC018 1E12F365A	0.0	10.0	11/23/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC019

1MC019 1E12F354	20.0	5.1	09/29/87
1MC019 1E12F353	20.0	5.1	09/29/87
1MC019 1E12F428	20.0	5.1	09/29/87
1MC019 1E12F429	20.0	5.1	09/29/87
1MC019 1E12F354	20.0	10.0	09/08/89
1MC019 1E12F353	20.0	10.0	09/08/89
1MC019 1E12F428	20.0	10.0	09/08/89
1MC019 1E12F429	20.0	10.0	09/08/89
1MC019 1E12F354	10.0	10.0	02/19/91
1MC019 1E12F353	150.0	10.0	02/19/91
1MC019 1E12F428	0.0	10.0	02/20/91
1MC019 1E12F429	0.0	10.0	02/20/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC020

1MC020 1E12F426	20.0	5.1	09/29/87
1MC020 1E12F427	20.0	5.1	09/29/87
1MC020 1E12F366B	20.0	5.1	09/29/87
1MC020 1E12F365B	20.0	5.1	09/29/87
1MC020 1E12F366B	20.0	4.0	09/12/89
1MC020 1E12F365B	20.0	4.0	09/12/89
1MC020 1E12F427	20.0	4.0	09/12/89
1MC020 1E12F426	20.0	4.0	09/12/89
1MC020 1E12F365B	0.0	10.0	02/20/91
1MC020 1E12F366B	0.0	10.0	02/20/91
1MC020 1E12F427	10.0	10.0	02/20/91
1MC020 1E12F426	10.0	10.0	02/20/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

CC MENTS:

** 1MC024

1MC024 1E12F432A	20.0	5.1	09/24/87
1MC024 1E12F433A	20.0	5.1	09/24/87
1MC024 1E12F433A	20.0	4.0	09/12/89
1MC024 1E12F432A	20.0	4.0	09/12/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC026

1MC026 1E12F433B	20.0	4.0	09/12/89
1MC026 1E12F432B	20.0	4.0	09/12/89
1MC026 1E12F433B	0.0	10.0	03/27/91
1MC026 1E12F432B	0.0	10.0	03/27/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC031

1MC031 1E12F436

20.0 5.1 11/08/87 CHANGED TO WATER TEST

1MC031 1E12F437

20.0 5.1 11/08/87 CHANGED TO WATER TEST

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC033

1MC033 1E22F376

20.0 5.1 10/12/87

1MC033 1E22F376

20.0 10.0 06/13/89 CHANGED TO WATER TEST

1MC033 1E22F376

0.1 0.0 07/18/90 WATER TEST

1MC033 1E22F376

20.0 10.0 07/18/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC034

1MC034 1SF004

120.0

5.1

11/08/87

USAR TEST REQUIREMENTS CHANGE
DUE TO LINE BEING SEALED BY
SUPPRESSION POOL.

1MC034 1SF034

20.0

5.1

11/08/87

USAR TEST REQUIREMENTS CHANGE
DUE TO THE LINE BEING SEALED
BY SUPPRESSION POOL.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLERANCE	DATE	COMMENTS:
** 1MC035				
1MC035 1E22F004	20.0	5.1	03/20/88	
1MC035 1E22F022	20.0	5.1	03/20/88	
1MC035 1E22F021	20.0	5.1	03/20/88	
1MC035 1E22F004	300.0	10.0	01/14/89	
1E22F021				
1E22F366B				
1MC035 1E22F005	1000000	0.0	01/14/89	FAILED MWR C52754 (WRITTEN TO
1E22F304				LAP SEAT AND DISC ON F005).
1MC035 1E22F004	300.0	10.0	01/14/89	
1E22F021				
1E22F366B				
1MC035 1E22F005	4500.0	400.0	01/22/89	THIS TEST IS PMT FOR MWR
1E22F304				C52754 (LAPPED SEAT ON F005).
				ORIGINAL TEST ON 1-14-89.
1MC035 1E22F005	4500.0	400.0	01/24/89	
1E22F304				
1MC035 1E22F022	20.0	10.0	03/09/90	THIS IS A TEST OF 1E22F022
				ONLY TO ALLOW TECH SPEC
				COMPLIANCE UNTIL THE TECH SPEC
				REVISION IS APPROVED.
1MC035 1E22F004	130.0	10.0	10/30/90	
1E22F366B				
1E22F021				
1MC035 1E22F005	1000000	0.0	10/30/90	MWR D07886 WAS WRITTEN TO
1E22F304				REPAIR 1E22F005 (LAPPED SEAT
				AND DISC).
1MC035 1E22F005	414.4	10.0	11/18/90	PMT FOR MWR D07886. PCC
1E22F304				PERFORMED ON 12/6/90.
				INDICATED THAT ACTUAL LEAKAGE
				OF 414.4 SCCM FOR THE RECORDED
				LEAKAGE OF 400 SCCM FOR
				FM103%. THE RECORDED LEAK
				RATE FOR THIS PENETRATION WAS
				CORRECTED TO THE ACTUAL LEAK
				RATE.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC036

1MC036 1E21F013 50.2 2.0 03/07/86 PACKING LEAK ON 1E21F013
1E21F006
1E21F005
1E21N050
1E21N049

1MC036 1E21F013 20.0 2.0 03/07/86 PMT FOR REPAIRING PACKING LE
ON 1E21F013

1MC036 1E21F005 20.0 5.1 10/19/87
1E21F356A
1E21F013
1E21F358

1MC036 1E21F014 20.0 5.1 10/19/87

1MC036 1E21F006 1000000 0.0 01/14/89 MWR C18392 WRITTEN TO REPAIR
1E21F006

1MC036 1E21F005 160.0 10.0 01/14/89
1E21F013
1E21F358
1E

1MC036 1E12F006 3000.0 400.0 02/09/89 PMT FOR MWR C18392 REPLACED
SHAFT ON 1E21F006

1MC036 1E21F014 0.0 10.0 04/10/89

1MC036 1E21F005 20.0 10.0 10/28/90

1E21F356A
1E21F358
1E21F013
1E21N049
1E21N050

1MC036 1E21F006 1000000 10.0 10/28/90 MWR D07885 WRITTEN TO REPAIR
1E21F006. LAP SEAT/DISC.

1MC036 1E21F006 500.0 45.0 11/16/90 PMT FOR MWR D07885
1E21F340

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC041

1MC041 1E51F077 210.0 5.1 05/26/88

1MC041 1E51F041 20.0 5.1 05/26/88

1MC041 1E51F040 0.1 4.0 04/15/89 PMT FOR MWR D04150 NEW SHAFT
KEY

1MC041 1E51F077 60.0 10.0 03/19/90

1MC041 1E51F041 20.0 10.0 03/19/90

1MC041 1E51F077 280.0 10.0 01/26/91

1MC041 1E51F041 10.0 5.0 01/26/91

1MC041 1E51F068 12000.0 400.0 02/04/91 PMT FOR PM MWR PMMRIM010
1E51F040 (REMOVED BONNET, INSPECTED
HINGE PINS, REASSEMBLED). AS
LEFT TEST RESULT FOR ILRT.
AS FOUND TEST RESULTS WERE
DETERMINED BY TESTING THE
FLANGED CONNECTION INSIDE THE
CONTAINMENT. REFERENCE LER
90-018 FOR DETAILS.

RF-2 ILRT/LLRT LEAKAGE REPORT

PISTON VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** LMC042

LMC042	1E12F023	0.0	0.0	11/05/86	THE REQUIREMENTS OF TECHNICAL SPECIFICATION J.6.1.2, PRIMA CONTAINMENT LEAKAGE, FOR THE LISTED VALVES WAS NOT COMPLETED UNTIL PRIOR TO STARTUP FOLLOWING THE FIRST REFUELING OUTAGE. EXEMPTION ON FILE IN TECH SPEC.
	1E51F034				
	1E51F035				
	1E51F390				
	1E51F391				
	1E12F061				
	1E12F062				
	1E51F013				
LMC042	1E51F316	0.0	10.0	01/29/89	INFORMATION ONLY TEST NO CREDIT TAKEN. PMT FOR MWR D49652
LMC042	1E51F066	5500.0	400.0	02/02/89	PMT FOR MWR C49652 (REPLACED 1E51F066).
	1E51F316				
LMC042	1E51F367	2.0	1.0	02/20/89	
LMC042	1E51F013	600.0	45.0	03/12/89	
	1E12F023				
	1E51F391				
	1E12F061				
LMC042	1E51F034	20.0	10.0	03/12/89	
LMC042	1E12F062	20.0	10.0	04/11/89	
LMC042	1E51F390	20.0	10.0	04/11/89	
LMC042	1E51F035	20.0	10.0	04/11/89	
LMC042	1E51F034	20.0	10.0	03/12/90	
LMC042	1E51F013	600.0	45.0	10/25/90	PRETEST FOR ILRT ADJUSTMENTS
	1E12F061				
	1E51F391				
	1E12F023				
LMC042	1E51F316	1000000	0.0	11/02/90	D07889 WRITTEN TO REPAIR THE FAILURE. LAPPED SEAT & DISC.
	1E51F066				
LMC042	1E51F316	1000000	450.0	12/11/90	
	1E51F066				
LMC042	1E51F316	3750.0	400.0	12/27/90	PMT FOR MWR D07889
	1E51F066				
LMC042	1E51F367	20.0	10.0	12/27/90	
LMC042	1E51F013	140.0	10.0	12/29/90	PMT FOR MWR D13652 [REPACK (CHESTERTON) AND MOVATS OF 1E51-F013].
	1E51F391				
	1E12F061				
	1E12F023				
LMC042	1E51F034	20.0	10.0	12/29/90	

RF-2 ILRT/1E51 LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLERANCE
ANCE

CLOSURES:

** 1MC043

1MC043 1E51F064 7500.0 201.0 04/17/88

1E51F401

1E51F399

1E51F063

1E51F076

1MC043 1E51F072 30.0 5.1 04/17/88

1MC043 1E51F064 400.0 20.0 02/04/89

1E51F401

1E51F399

1E51F063

1E51F076

1MC043 1E51F072 20.0 4.0 02/04/89

1MC043 1E51F072 10.0 5.0 03/14/90

1MC043 1E51F064 3500.0 45.0 03/14/90

1E51F063

1E51F076

1E51F399

1E51F401

1MC043 1E51F064 1350.0 45.0 05/13/90 PMT FOR REPACK AND MOVATS OF
1E51F064 PER MWR D13570.

1E51F063

1E51F076

1E51F399

1E51F401

1MC043 1E51F072 10.0 5.0 05/13/90

1MC043 1E51F063 1800.0 45.0 10/26/90 THIS IS A PRETEST TO ADJUST
THE TYPE A TEST RESULTS PRIOR
TO PERFORMING MAINTENANCE.
MWR D16985 REPAIRED A PACKING
LEAK ON 1E51F064. MWR D10598
REPLACED THE MOTOR ON
1E51F063. MWR D04210 REPAIRED
A PACKING LEAK ON 1E51F063.

1E51F076

1E51F399

1E51F401

1E51F064

1MC043 1E51F072 20.0 10.0 10/26/90

1MC043 1E51F063 1500.0 45.0 01/17/91 PMT FOR MAINTENANCE.

1E51F064

1E51F076

1E51F401

1E51F399

1MC043 1E51F072 15.0 10.0 01/17/91

1MC043 1E51F063 1850.0 45.0 01/31/91 PMT FOR MAINTENANCE REPACK
(CHESTERTON) AND MOVATS.

1E51F064

1E51F076

1E51F401

1E51F399

1MC043 1E51F072 100.0 10.0 01/31/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** LMC044

LMC044	1E51F078	470.0	5.1	04/28/88
LMC044	1E51F375	20.0	5.1	04/28/88
LMC044	1E51F376	20.0	5.1	04/28/88
LMC044	1E51F082	470.0	5.1	04/28/88
	1E51F080			
	1E51F083			
LMC044	1E51F078	120.0	10.0	03/19/90
LMC044	1E51F080	130.0	10.0	03/19/90
	1E51F082			
	1E51F083			
LMC044	1E51F375	20.0	10.0	03/19/90
LMC044	1E51F376	20.0	10.0	03/19/90
LMC044	1E51F082	280.0	10.0	01/26/91
	1E51F080			
	1E51F083			
LMC044	1E51F375	10.0	5.0	01/26/91
LMC044	1E51F078	310.0	10.0	01/26/91
LMC044	1E51F376	10.0	5.0	01/26/91

PMT FOR MWR D15221. THIS MWR
REMOVED THE 1E12F102 VALVE
FROM THE SYSTEM AND REPLACED
IT WITH A BLIND COUPLING. (R
LER 90-018)

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC045

1MC045 1B21F013 240.0 5.1 10/20/87

1B21F019

1MC045 1B21F016 60.0 5.1 10/20/87

1MC045 1B21F016 500.0 45.0 02/24/89

1MC045 1B21F019 160.0 10.0 02/24/89

1B21F017

1MC045 1B21F016 550.0 45.0 03/07/90

1MC045 1B21F019 220.0 10.0 03/07/90

1B21F017

1MC045 1B21F016 1300.0 45.0 10/18/90

PMT FOR MWR D05158 (CHESTERTON
PACKING AND MOVATS).

PRETEST FOR MWR D10697
(INSTALL CHESTERTON PACKING
AND MOVATS). BOUNDARY VALVES
LEAKING, NO ATTEMPT MADE TO
QUANTIFY (ALARA CONCERN).

1MC045 1B21F019 1850.0 45.0 10/18/90

1B21F017

1MC045 1B21F016 240.0 10.0 01/15/91 PMT FOR MWR D10697

1MC045 1B21F017 10.0 10.0 01/15/91

1B21F019

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC046

1MC046 1CC050 550.0 22.5 04/03/88

1CC049

1CC164

1CC266

1MC046 1CC127 20.0 5.1 04/03/88

1MC046 1CC050 550.0 45.0 02/15/89

1CC049

1CC164

1CC266

1MC046 1CC127 40.0 10.0 02/15/89

1MC046 1CC050 2100.0 45.0 11/28/90

1CC049

1CC164

1CC266

1MC046 1CC127 20.0 10.0 11/28/90

1MC046 1CC050 1700.0 45.0 12/04/90

1CC049

1CC164

1CC266

1MC046 1CC127 20.0 10.0 12/04/90

PRETEST FOR PM'S TO REPLACE
MOTOR (EVERY 84 MONTHS),
TORQUE SWITCH, PACKING
(CHESTERTON), AND INSPECT.PMT FOR MWR C43770 [REPACK
(CHESTERTON) AND MOVATS].

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC047

1MC047	1CC053	390.0	5.1	04/03/88
	1CC054			
	1CC165			
1MC047	1CC060	240.0	5.1	04/03/88
1MC047	1CC053	350.0	45.0	02/13/89
	1CC054			
	1CC165			
1MC047	1CC060	260.0	10.0	02/13/89
1MC047	1CC053	100.0	10.0	11/28/90
	1CC054			
	1CC165			
1MC047	1CC060	90.0	10.0	11/28/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC048

1MC048 1SX089A	20.0	5.1	02/10/88
1MC048 1SX088A	260.0	5.1	02/10/88
1MC048 1SX089A	20.0	10.0	02/14/89
1MC048 1SX088A	20.0	10.0	02/14/89
1MC048 1SX089A	20.0	10.0	10/09/90
1MC048 1SX088A	20.0	10.0	10/09/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC049			
1MC049 ORA026	1000000	0.0	10/08/87 AS FOUND LEAKAGE FOR ORA026 COULD NOT BE DETERMINED. MWR C44364 REPLACED ORA045 AND MADE ADJUSTMENTS TO ORA026.
1MC049 ORA027	20.0	5.1	10/08/87
1MC049 ORA026	160.0	5.1	11/12/87 PMT MWR C44364
ORA027			
1MC049 ORA026	400.0	10.0	05/05/89
1MC049 ORA027	400.0	10.0	05/05/89
1MC049 ORA027	40.0	10.0	04/10/91
1MC049 ORA026	30.0	10.0	04/10/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC050

1MC050 OMC009

182.6 2.0 03/17/86

1MC011

1MC050 OMC009

20.0 5.1 12/18/86 PMT FOR MAINTENANCE

1MC011

1MC050 OMC010

20.0 5.1 12/18/86 PMT FOR MAINTENANCE

1MC050 OMC010

20.0 10.0 09/15/88

1MC050 1MC011

20.0 10.0 09/15/88

OMC009

1MC050 OMC010

0.0 10.0 08/21/90

1MC050 OMC009

0.0 10.0 08/21/90

1MC011

1MC050 OMC010

0.0 10.0 08/22/90 PMT FOR MWR D03615. REPAIRE
PACKING LEAK ON OMC010.

1MC050 OMC009

0.0 10.0 08/22/90

1MC011

RF-2 ILRT/LLKT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** LMC052

LMC052 1FC037 37.2 2.0 03/04/86

LMC052 1FC036 40.8 2.0 03/06/86

1FC092

LMC052 1FC037 40.0 5.1 08/02/88

LMC052 1FC036 180.0 5.1 08/02/88

1FC092

LMC052 1FC037 20.0 10.0 03/10/90

LMC052 1FC036 20.0 10.0 03/10/90

1FC092

LMC052 1FC037 140.0 10.0 04/02/90 PMT FOR MWR D15033. CHANGED
GEARS IN THE MOTOR.

LMC052 1FC036 20.0 10.0 04/02/90

1FC092

LMC052 1FC036 370.0 10.0 02/21/91

LMC052 1FC037 390.0 10.0 02/21/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC053

1MC053 1FC036 2.0 0.2 03/05/86

1FC092

1MC053 1FC007 20.0 5.1 08/23/88

1FC008

1MC053 1FC093 20.0 5.1 08/23/88

1MC053 1FC093 20.0 10.0 03/15/90

1MC053 1FC007 20.0 10.0 03/15/90

1FC008

1MC053 1FC007 20.0 10.0 04/06/90 PMT FOR MWR D13056 (CHANGED
1FC008 GEAR RATIO AND MOVATS).

1MC053 1FC093 11.5 5.0 04/06/90

1MC053 1FC007 10.0 10.0 02/21/91

1FC008

1MC053 1FC093 0.0 10.0 02/21/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC056		
1MC056 1FP051	20.0	5.1 05/18/88
1FP052		
1MC056 1FP127	20.0	5.1 05/18/88
1MC056 1FP127	20.0	5.1 04/06/90
1MC056 1FP052	20.0	5.1 04/06/90
1FP052		
1MC056 1FP051	190.0	10.0 01/25/91
1FP052		
1MC056 1FP127	10.0	8.0 01/25/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC057

1MC057 1IA175	750.0	22.5	11/08/87
1MC057 1IA005	180.0	5.1	11/08/87
1IA006			
1MC057 1IA039	320.0	5.1	11/08/87
1MC057 1IA005	350.0	10.0	02/15/89
1IA006			
1MC057 1IA039	0.0	10.0	02/15/89
1MC057 1IA175	500.0	45.0	02/15/89
1MC057 1IA005	138.0	10.0	12/19/90
1IA006			
1MC057 1IA039	562.2	45.0	12/19/90
1MC057 1IA175	725.0	45.0	12/19/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC058
1MC058 1IA042B 8000.0 201.0 04/11/88 AS FOUND LEAKAGE 8000 SCCM.
MWR C23731 WRITTEN TO REPLACE
VALVE. AS LEFT 950 SCCM.

1MC058 1IA012B 20.0 5.1 04/11/88
1MC058 1IA012A 200.0 5.1 04/11/88 PMT FOR MWR C48865 REPACKED
AND PERFORMED MOVATS ON
1IA012A. WORK FINISHED
4/3/88, TEST PERFORMED
4/11/88.

1MC058 1IA042B 950.0 22.5 04/20/88 PMT FOR MWR C28731 REPLACED
VALVE AS LEFT 950 SCCM.

1MC058 1IA042B 650.0 45.0 02/02/89
1MC058 1IA012B 20.0 10.0 03/02/89
1MC058 1IA012A 100.0 10.0 03/02/89
1PSIA084
1PTIA078

1MC058 1IA042B 1625.0 45.0 01/16/91
1MC058 1IA012B 180.0 10.0 01/16/91
1MC058 1IA012A 1050.0 45.0 01/16/91 THIS WAS A PRETEST TO ADJUST
TYPE A TEST RESULTS PRIOR TO
WORKING MWR D10852 (REPACK
1IA012A).

1MC058 1IA012A 1300.0 45.0 01/29/91
1MC058 1IA012A 1000.0 45.0 01/30/91
1MC058 1IA012A 110.0 10.0 01/31/91 PMT FOR MWR D10852 (REPACK &
MOVATS). THIS TEST WAS USED
TO ADJUST TYPE A TEST RESULTS.

RF-2 ILRT/LLRT LEAKAGE RFPRT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC059

1MC059	1SA030	820.0	22.5	09/21/87
1MC059	1SA029	540.0	22.5	09/21/87
	1SA046			
1MC059	1SA030	275.0	10.0	08/24/89
1MC059	1SA029	346.0	10.0	08/24/89
	1SA046			

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC060

1MC060 1G33F004	20.0	5.1	04/06/88	PMT FOR MWR C52455. REPACKED
1G33F002				VALVE 1G33F004 3/14/88
1MC060 1G33F001	20.0	5.1	04/06/88	PMT FOR MWR C37272. REPACKED
				VALVE 1G33F001 4/3/88.

1MC060 1G33F001	20.0	10.0	02/16/89	
1MC060 1G33F002	20.0	10.0	02/16/89	
1G33F004				
1MC060 1G33F004	20.0	10.0	11/26/90	
1G33F002				
1MC060 1G33F001	20.0	10.0	11/26/90	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC061

1MC061	1G33F053	190.0	5.1	04/05/88
	1G33F054			
1MC061	1G33F061	20.0	5.1	04/05/88
1MC061	1G33F053	20.0	10.0	02/17/89
	1G33F054			
1MC061	1G33F061	20.0	10.0	02/17/89
1MC061	1G33F061	20.0	10.0	11/27/90
1MC061	1G33F053	70.0	10.0	11/27/90
	1G33F054			

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC062			
1MC062 1HG008	50.1	2.0	03/05/86
1HG019			
1MC062 1HG008	20.0	5.1	10/22/87
1HG019			
1MC062 1HG008	20.0	10.0	08/03/89
1MC062 1HG019	20.0	10.0	08/03/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC063

1MC063 1C11F122	30.0	5.1	04/10/88	
1MC063 1C11F083	20.0	5.1	04/10/88	
1MC063 1C11F128	20.0	5.1	04/10/88	
1MC063 1C11F122	20.0	10.0	02/23/89	
1MC063 1C11F083	20.0	10.0	02/23/89	
1MC063 1C11F128	20.0	10.0	02/23/89	
1MC063 1C11F083	20.0	10.0	12/19/90	PRETEST FOR REPACK (CHESTERTON) AND MOVATS.
1MC063 1C11F128	20.0	10.0	12/19/90	
1MC063 1C11F122	750.0	45.0	12/20/90	
1MC063 1C11F122	400.0	10.0	01/03/91	
1MC063 1C11F083	10.0	10.0	01/04/91	PMT FOR MWR D14124 (REPACK & MOVATS).
1MC063 1C11F128	0.0	10.0	01/04/91	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC064

1MC064 1G33F055 20.0 5.1 04/05/88

1MC064 1G33F039 40.0 5.1 04/05/88

1G33F040

1MC06 1G33F039 50.0 10.0 02/17/89

1G33F040

1MC0 4 1G33F055 20.0 10.0 02/17/89

1MC064 1G33F039 289.6 10.0 11/26/90

1G33F040

THE PCC PERFORMED ON 12/6/90
INDICATED AN ACTUAL LEAKAGE
RATE OF 289.6 SCCM FOR THE
RECORDED LK RATE OF 275. THE
RECORDED LEAK RATE WAS
CORRECTED TO REFLECT THE
ACTUAL LEAK RATE.

1MC064 1G33F055 40.9 10.0 11/27/90

THE PCC PERFORMED ON 12/6/90
INDICATED AN ACTUAL LEAKAGE
RATE OF 40.9 SCCM FOR THE
RECORDED LEAK RATE OF 30 SCCM.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC065

1MC065 1WX019	20.0	5.1	07/25/87
1MC065 1WX020	20.0	5.1	07/25/87
1MC065 1WX019	20.0	10.0	02/09/89
1MC065 1WX020	20.0	10.0	02/09/89
1MC065 1WX019	20.0	10.0	11/26/90
1MC065 1WX020	20.0	10.0	11/26/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC067				
1MC067 1SA129	70.0	2.0	10/30/85	
1MC067 FLANGE	60.0	5.1	12/09/86	
1MC067 FLANGE	20.0	5.1	06/03/87	
1MC067 1SA129	34.7	3.1	10/19/87	FLOW RATE CORRECTED DUE TO POST CALIBRATION CHECK.
1MC067 FLANGE	34.7	5.1	10/19/87	CORRECTED FLOW RATE DUE TO POST CALIBRATION CHECK
1MC067 1SA129	20.0	10.0	04/03/89	
1MC067 FLANGE	20.0	10.0	04/04/89	
1MC067 1SA129	0.0	10.0	11/01/90	
1MC067 FLANGE	10.0	10.0	11/01/90	PRETEST FOR MWR D05469 (FOR ILRT ADJUSTMENTS)
1MC067 FLANGE	0.0	10.0	02/25/91	PMT FOR MWR D05469

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC068

1MC068 1PS069	237.0	20.0	03/10/86
1MC068 1PS070	2.0	0.2	03/10/86
1MC068 1PS016	20.0	5.1	10/05/87
1MC068 1PS017	20.0	5.1	10/05/87
1MC068 1PS022	20.0	5.1	10/05/87
1MC068 1PS023	20.0	5.1	10/05/87
1MC068 1PS034	20.0	5.1	10/05/87
1MC068 1PS035	20.0	5.1	10/05/87
1MC068 1PS055	20.0	5.1	10/05/87
1MC068 1PS056	20.0	5.1	10/05/87
1MC068 1PS070	20.0	5.1	10/05/87
1MC068 1PS069	490.0	5.1	10/05/87
1MC068 1PS034	20.0	10.0	08/09/89
1MC068 1PS035	20.0	10.0	08/09/89
1MC068 1PS069	20.0	10.0	08/09/89
1MC068 1PS070	20.0	10.0	08/09/89
1MC068 1PS055	280.0	10.0	08/09/89
1MC068 1PS056	270.0	10.0	08/09/89
1MC068 1PS016	20.0	10.0	08/16/89
1MC068 1PS017	20.0	10.0	08/16/89
1MC068 1PS022	20.0	10.0	08/16/89
1MC068 1PS023	20.0	10.0	08/16/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC069

1MC069 1RE022	290.0	5.1	10/13/87
1MC069 1RE021	80.0	5.1	10/13/87
1MC069 1RE021	90.0	10.0	06/21/89
1MC069 1RE022	300.0	10.0	06/21/89
1MC069 1RF021	90.0	10.0	06/27/89
1MC069 1RE022	300.0	10.0	06/27/89
1MC069 1RE021	220.0	10.0	01/05/91
1MC069 1RE022	2250.0	400.0	01/05/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC070

1MC070 1RF021	170.0	5.1	10/13/87
1MC070 1RF022	20.0	5.1	10/13/87
1MC070 1RF021	190.0	10.0	06/15/89
1MC070 1RF022	110.0	10.0	06/15/89
1MC070 1RF021	110.0	10.0	01/05/91
1MC070 1RF022	120.0	10.0	01/05/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC071

1MC071 1HG001	190.0	5.1	01/12/88
1MC071 1HG016	20.0	5.1	01/12/88
1MC071 1HG001	120.0	10.0	08/28/89
1MC071 1HG016	20.0	10.0	08/28/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC072

1MC072 1HG00	1032.0	20.0	03/03/86
1MC072 1HG004	920.0	22.5	10/23/87
1MC072 1HG017	20.0	5.1	10/23/87
1MC072 1HG004	500.0	45.0	08/08/89
1MC072 1HG017	20.0	10.0	08/08/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC078

1MC078 1CC073	10.0	5.1	11/08/87
1CC074			
1MC078 1CC170	10.0	5.1	11/08/87
1MC078 1CC073	20.0	10.0	02/12/89
1CC074			
1MC078 1CC170	20.0	10.0	02/12/89
1MC078 1CC073	20.0	10.0	12/06/90
1CC074			
1MC078 1CC070	20.0	10.0	12/06/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC079

1MC079 1SF002	1000000	0.0	02/28/86
1SF001			
1MC079 1SF023	20.0	2.0	03/14/86
1MC079 1SF002	20.0	2.0	03/14/86
1SF001			
1MC079 1SF001	20.0	5.1	04/13/87
1SF002			
1MC079 1SF023	20.0	5.1	04/13/87
1MC079 1SF001	20.0	10.0	01/26/89
1SF002			
1MC079 1SF023	90.0	10.0	01/26/89
1MC079 1SF001	20.0	10.0	09/05/90
1SF002			
1MC079 1SF023	20.0	10.0	09/05/90

RI-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC081

1MC081 1FP050	600.0	22.5	02/17/88
1FP092			
1MC081 1FP129	20.0	5.1	02/17/88
1MC081 1FP129	20.0	10.0	01/23/90
1MC081 1FP050	150.0	10.0	01/23/90
1FP092			
1MC081 1FP050	150.0	10.0	01/24/90
1FP092			
1MC081 1FP129	20.0	10.0	01/24/90
1MC081 1FP129	10.0	5.0	01/26/91
1MC081 1FP050	185.0	10.0	01/26/91
1FP092			

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC082

1MC082 1FP054	65.0	5.1	09/17/87	PMT FOR MWR C37657
1FP053				
1MC082 1FP128	350.0	5.1	09/17/87	FOR MWR C37657
1MC082 1FP053	70.0	10.0	08/17/89	
1FP054				
1MC082 1FP128	170.0	10.0	08/17/89	
1MC082 1FP053	700.0	45.0	01/25/91	
1FP054				
1MC082 1FP128	290.0	10.0	01/25/91	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC085				
1MC085 1CY015	3000.0	201.0	12/16/87	
1CY017				
1MC085 1CY019	20.0	5.1	12/16/87	
1MC085 1CY019	20.0	10.0	02/10/89	
1MC085 1CY016	400.0	45.0	02/10/89	PMT FOR MWR C49978
1CY017				
1MC085 1CY016	1750.0	45.0	09/20/90	
1CY017				
1MC085 1CY019	20.0	10.0	09/20/90	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC086

1MC086 1G33F028 100.0 5.1 04/07/88

1MC086 1G33F034 60.0 5.1 04/07/88

1G33F070

1MC086 1G33F028 2.0 1.0 02/15/89

1G33F034

1MC086 1G33F070 2.0 1.0 02/15/89

1MC086 1G33F028 20.0 10.0 11/26/90

1MC086 1G33F034 20.0 10.0 11/26/90

1G33F070

PRETEST FOR MWR D16468 [REPACK
(CHESTERTON) AND MOVATS OF
1G33-F034].

1MC086 1G33F034 25.0 10.0 12/06/90 PMT FOR MWR D16468.

1G33F070

1MC086 1G33F028 10.0 10.0 12/07/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC088				
1MC088 1CC071	20.0	5.1	04/03/88	
1CC072				
1MC088 1CC171	20.0	5.1	04/03/88	
1MC088 1CC171	20.0	10.0	02/13/89	
1MC088 1CC071	20.0	10.0	02/13/89	
1CC072				
1MC088 1CC171	45.3	10.0	12/06/90	ADJUSTED FOR PCC RESULTS.
1MC088 1CC071	142.9	10.0	12/06/90	PCC PERFORMED ON 12/6/90
1CC072				INDICATES THAT ROTAMETER
				FM1055 WAS READING 5.27 SCCM
				LOW AT 20 SCCM AND 12.895 SCCM
				LOW AT 130 SCCM. THE RECORDED
				LEAKAGES FOR THIS TEST WERE
				CORRECTED TO REFLECT THE
				ACTUAL LEAKAGES.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC089

1MC089 1E12F074A

5.0 10.0 01/20/91 MWR D15219 MODIFIED THIS
PENETRATION BY INSTALLING A
BLIND COUPLING AND CONVERTING
THIS PENETRATION TO A SPARE.
THE AS-FOUND DATA FOR
ADJUSTING THE TYPE A TEST
RESULTS WAS DETERMINED BY THI
TEST. (REFERENCE LER
90-018).

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC101				
1MC101 1VR001A	15000.0	22.5	12/09/86	FAILED
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR001A	2150.0	22.5	12/15/86	PMT FOR MWR C15546 (PACKING ADJUSTMENT TO 1VR002A).
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR003	20.0	5.1	12/15/86	
1MC101 1VR001A	6400.0	22.5	03/17/87	FAILED. MWR C30516 WAS WRITTEN TO ADJUST PACKING ON 1VR001A.
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR001A	1060.0	22.5	03/17/87	PMT FOR MWR C30516 (ADJUSTED PACKING ON 1VR001A).
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR001A	800.0	22.5	06/16/87	
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR001A	1200.0	22.5	09/08/87	
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR001A	1000.0	22.5	12/08/87	
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR002A	1300.0	22.5	03/08/88	
1VR002B				
1VR001A				
1VR001B				
1MC101 1VR003	20.0	5.1	06/09/88	
1MC101 1VR001A	1150.0	22.5	06/09/88	
1VR002A				
1VR001B				
1VR002B				
1MC101 1VR001A	1000.0	22.5	09/07/88	
1VR002A				
1VR001B				
1VR002B				
1MC101 1VR001A	1100.0	45.0	12/07/88	
1VR001B				
1VR002A				
1VR002B				
1MC101 1VR001A	700.0	45.0	02/08/89	
1VR002A				
1VR001B				

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR NUMBER	VALVE EIN	SCCM	TOLER ANCE	DATE	COMMENTS:
	1VR002B				
1MC101	1VR003	20.0	10.0	02/08/89	
1MC101	1VR003	20.0	10.0	05/10/89	
1MC101	1VR001A	1850.0	45.0	05/10/89	
	1VR001B				
	1VR002A				
	1VR002B				
1MC101	1VR001A	1400.0	45.0	08/09/89	
	1VR002A				
	1VR001B				
	1VR002B				
1MC101	1VR003	20.0	10.0	08/09/89	
1MC101	1VR001A	1450.0	45.0	11/08/89	
	1VR002A				
	1VR001B				
	1VR002B				
1MC101	1VR001A	1650.0	45.0	02/08/90	
	1VR001B				
	1VR002A				
	1VR002B				
1MC101	1VR001A	3500.0	400.0	03/12/90	
	1VR001B				
	1VR002A				
	1VR002B				
1MC101	1VR001A	2500.0	400.0	03/14/90	PMT FOR CLEANING SEAT OF 1VR001A (MWR D15012)
	1VR001B				
	1VR002A				
	1VR002B				
1MC101	1VR001A	2500.0	400.0	06/14/90	
	1VR002A				
	1VR001B				
	1VR002B				
1MC101	1VR001A	2250.0	400.0	09/11/90	
	1VR001B				
	1VR002A				
	1VR002B				
1MC101	1VR001A	2300.0	400.0	10/15/90	
	1VR002A				
	1VR002B				
	1VR001B				
1MC101	1VR003	20.0	10.0	10/15/90	
1MC101	1VR003	5.0	10.0	01/15/91	
1MC101	1VR001A	3000.0	400.0	01/15/91	
	1VR001B				
	1VR002A				
	1VR002B				
1MC101	1VR001A	2500.0	400.0	02/09/91	
	1VR002A				
	1VR001B				
	1VR002B				

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

1MC101 1VR003 0.0 10.0 02/09/91
1MC101 1VR001A 2500.0 400.0 03/01/91

1VR001B
1VR002A
1VR002B

1MC101 1VR001A 2500.0 400.0 03/02/91 THIS TEST WAS PERFORMED DUE TO
1VR001B OPS OPENING THE 36" VALVES
1VR002A IMMEDIATELY AFTER COMPLETION
1VR002B OF THE TEST. IT WAS INTENDED
TO LEAVE THESE VALVES SHUT
UNTIL RF-3 AT THE COMPLETION
OF THIS TEST

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC102

1MC102 1VQ004A 1400.0 22.5 12/09/86

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ007 20.0 5.1 12/09/86

1MC102 1VQ007 20.0 5.1 03/11/87

1MC102 1VQ004A 1600.0 22.5 03/11/87

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ004A 1420.0 22.5 09/03/87

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ004A 1350.0 22.5 12/04/87

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ004A 1500.0 22.5 03/03/88

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ004A 1400.0 22.5 06/02/88

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ007 20.0 5.1 06/02/88

1MC102 1VQ007 20.0 5.1 09/06/88

1MC102 1VQ004A 1360.0 22.5 09/06/88

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ006A 1400.0 45.0 12/06/88

1VQ006B

1VQ004A

1VQ004B

1MC102 1VQ007 20.0 10.0 02/07/89

1MC102 1VQ004A 5000.0 400.0 02/07/89 MWR D2602 (ADJUSTED 1VQ004A
PACKING).

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ004A 3000.0 400.0 02/11/89

1VQ004B

1VQ006A

1VQ006B

1MC102 1VQ004A 2000.0 400.0 05/15/89

1VQ004B

1VQ006A

1VQ006B

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLERANCE	DATE	COMMENTS:
1MC102 1VQ007	20.0	10.0	05/15/89	
1MC102 1VQ006A	1500.0	45.0	08/14/89	
1VQ006B				
1VQ004A				
1VQ004B				
1MC102 1VQ004A	1150.0	45.0	11/13/89	
1VQ004B				
1VQ006A				
1VQ006B				
1MC102 1VQ004A	19000.0	400.0	02/12/90	CR 1-90-02-029 WRITTEN FOR
1VQ004B				1MC102 FAILURE. THIS EXCEEDED
1VQ006A				BYPASS LEAKAGE AND THE TECH
1VQ006B				SPEC FOR THE VQ 36 INCH VALVE.
				MWR D12948 WRITTEN TO REPAIR
				THE VALVE.
1MC102 1VQ004A	20.0	10.0	02/20/90	THIS TEST WAS CONSIDERED TO BE
1VQ004B				A FAILURE DUE TO PRESERVATIVE
1VQ006A				(COSMOLINE) LEFT ON THE
1VQ006B				SEATING SURFACE. VALVE SEAT
				CLEANED BY MWR D12948.
1MC102 1VQ004A	20.0	10.0	03/12/90	PMT FOR MWR D12948. (REWORKED
1VQ004B				ACTUATORS AND LIMIT SWITCH).
1VQ006A				
1VQ006B				
1MC102 1VQ004A	20.0	10.0	06/13/90	
1VQ006A				
1VQ004B				
1VQ006B				
1MC102 1VQ004A	20.0	10.0	09/11/90	
1VQ004B				
1VQ006A				
1VQ006B				
1MC102 1VQ004A	20.0	10.0	10/16/90	AS FOUND LEAK RATE TEST AT THE
1VQ004B				START OF RF-2
1VQ006A				
1VQ006B				
1MC102 1VQ007	20.0	10.0	10/16/90	
1MC102 1VQ006A	6000.0	400.0	01/15/91	
1VQ006B				
1VQ004A				
1VQ004B				
1MC102 1VQ006A	350.0	10.0	01/15/91	AFTER PERFORMING THE VALVE
1VQ006B				LINEUP TO TEST, TESTING
1VQ004A				1VQ007, AND BEGINING TO
1VQ004B				TROUBLE SHOOT THESE VALVES, IT
				WAS DISCOVERED THAT THE
				LEAKAGE DIMINISHED. TEST DATA
				WAS TAKEN AND NO WORK WAS
				PERFORMED.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM TOLERANCE	DATE	COMMENTS:
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1MC102 1VQ007	0.0	10.0	01/15/91
1MC102 1VQ004A	520.0	45.0	02/09/91
1VQ006A			
1VQ004B			
1VR006B			
1MC102 1VQ007	0.0	10.0	02/09/91
1MC102 1VQ004A	450.0	10.0	03/01/91
1VQ004B			
1VQ006A			
1VQ006B			

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC103

1MC103 1WO001B 20.0 5.1 04/14/88

1MC103 1WO001A 20.0 5.1 04/14/88

1MC103 1WO001B 20.0 10.0 03/23/89

1MC103 1WO001A 20.0 10.0 03/23/89

1MC103 1WO001A 20.0 10.0 03/16/90

1MC103 1WC001B 80.0 10.0 03/16/90

1MC103 1WO001A 105.0 10.0 11/22/90

THIS PRETEST WAS PERFORMED TO
ADJUST THE TYPE A TEST
RESULTS. MWR D03762 REPACKED
1WO001A.

1MC103 1WO001B 0.0 10.0 11/22/90

1MC103 1WO001B 210.0 10.0 12/03/90

1MC103 1WO001A 250.0 10.0 12/03/90 PMT FOR MWR D03762

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC104

1MC104 1W0002B	31.0	5.1	04/14/88
1MC104 1W0002A	31.0	5.1	04/14/88
1MC104 1W0002A	20.0	10.0	03/23/89
1MC104 1W0002B	20.0	10.0	03/23/89
1MC104 1W0002B	20.0	10.0	12/04/90
1MC104 1W0002A	20.0	10.0	12/04/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC106

1MC106 1VR007A 115.0 5.1 04/14/88

1VR007B

1MC106 1VR011 35.0 5.1 04/14/88

1MC106 1VR011 20.0 10.0 02/26/89

1MC106 1VR007A 3000.0 400.0 02/26/89

1VR007B

1MC106 1VR007A 17500.0 400.0 12/01/90

1VR007B

AS FOUND LEAKAGE USED TO
ADJUST TYPE A TEST RESULTS.
THIS WAS A PRETEST FOR MWR
D15884 WRITTEN FOR EXCESSIVE
LEAKAGE THROUGH 1VR007A.

1MC106 1VR007A 6900.0 400.0 12/02/90

1VR007B

THIS TEST WAS PERFORMED AS
TROUBLE SHOOTING TO DETERMINE
WHICH VALVE NEEDED REPAIR.
THIS TEST WAS PERFORMED
IMMEDIATELY AFTER THE THE
FIRST TEST. NO CREDIT WAS
TAKEN FOR THIS TEST IN
ADJUSTING THE ILRT LEAKAGE
RATE.

1MC106 1VR011 0.0 10.0 12/02/90

1MC106 1VR007A 170.0 10.0 01/10/91

1VR007B

PMT FOR MWR D15884

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC107

1MC107 1VP004B 20.0 5.1 04/16/88

1VP044B

1VP023B

1VP077D

1MC107 1VP005B 20.0 5.1 04/16/88 PMT FOR 1VP005B PER MWR C3095
(REPLACED BODY TO BONNET
GASKETS). FINISHED WORK
4/12/88.

1MC107 1VP005B 40.0 10.0 03/11/89

1MC107 1VP004B 40.0 10.0 03/11/89

1VP044B

1VP023B

1VP077D

1MC107 1VP005B 25.0 10.0 12/05/90

1MC107 1VP004B 60.0 10.0 12/06/90

1VP044B

1VP023B

1VP077D

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC108

1MC108	1VP015B	20.0	5.1	04/16/88
	1VP047B			
	1VP027B			
	1VP077B			
1MC108	1VP014B	20.0	5.1	04/16/88
1MC108	1VP015B	40.0	10.0	03/11/89
	1VP047B			
	1VP027B			
	1VP077B			
1MC108	1VP014B	70.0	10.0	03/11/89
1MC108	1VP027B	40.0	10.0	03/11/89
	1VP047B			
1MC108	1VP077B	40.0	10.0	03/11/89
	1VP015B			
1MC108	1VP015B	50.0	10.0	12/06/90
	1VP047B			
	1VP027B			
	1VP077B			
1MC108	1VP014B	50.0	10.0	12/06/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC109

1MC109 1VP004A 31.0 5.1 04/14/88

1VP044A

1VP023A

1VP077C

1MC109 1VP005A 20.0 10.0 03/11/89

1MC109 1VP004A 300.0 10.0 03/11/89

1VP044A

1VP023A

1VP077C

1MC109 1VP005A 330.0 10.0 11/06/90

1MC109 1VP004A 400.0 10.0 11/06/90

1VP044A

1VP023A

1VP077C

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
** 1MC110				
1MC110 1VP014A	20.0	2.0	04/04/86	
1MC110 1VP015A	2.0	0.2	04/04/86	
1VP047A				
1VP027A				
1VP077A				
1MC110 1VP014A	20.0	5.1	04/14/88	
1MC110 1VP015A	20.0	5.1	04/14/88	
1VP047A				
1VP027A				
1VP077A				
1MC110 1VP015A	20.0	10.0	03/11/89	
1VP047A				
1VP027A				
1VP077A				
1MC110 1VP014A	20.0	10.0	03/11/89	
1MC110 1VP015A	175.0	10.0	11/06/90	
1VP047A				
1VP027A				
1VP077A				
1MC110 1VP014A	190.0	10.0	11/06/90	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC113

1MC113 1VR006A 8000.0 201.0 04/18/88

1VR006B

1MC113 1VR012 20.0 5.1 04/18/88

1MC113 1VR006A 2500.0 400.0 02/26/89

1VR006B

1MC113 1VR012 20.0 10.0 02/26/89

1MC113 1VR006A 1000000 0.0 01/03/91

1VR006B

AS FOUND LEAKAGE DETERMINED TO
BE 34000 SCCM THROUGH 1VR006B.
TPD WRITTEN TO PROCEDURE TO
DETERMINE MIN PATH LEAKAGE
RATE. MWR'S WRITTEN TO REPAIR
BOTH VALVES.

1MC113 1VR012 0.0 10.0 01/03/91

1MC113 1VR006A 60.0 10.0 01/16/91

1VR006B

PMT FOR MWR D23157 (REPLACED
SEAT, CHESTERTON PACKING,
MOVATS FOR 1VR006A) & MWR
D16973 (CLEANED SEAT AND
CHESTERTON PACKING, MOVATS OF
1VR006B).

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC116

1MC116 1C41F340B 20.0 10.0 01/04/88

1C41F340A

1C41339

1C41F342

1MC116 1C41F341B 20.0 10.0 01/04/88

1MC116 1C41F322 20.0 5.1 01/04/88

1MC116 1C41F341B 20.0 10.0 08/11/89

1MC116 1C41F339 20.0 10.0 08/11/89

1C41F340B

1C41F342

1C41F340A

1MC116 1C41F322 30.0 10.0 08/11/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC151

1MC151 1CM076	20.0	5.1	09/08/88
1MC151 1CM072	20.0	5.1	09/08/88
1MC151 1CM073	20.0	5.1	09/08/88
1MC151 1CM072	20.0	10.0	07/17/90
1MC151 1CM073	20.0	10.0	07/17/90
1MC151 1CM076	20.0	10.0	07/17/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC152

1MC152 1CM081B	20.0	5.1	10/08/87
1MC152 1CM080B	20.0	5.1	10/08/87
1MC152 1CM080C	20.0	5.1	10/08/87
1MC152 1CM081C	20.0	5.1	10/08/87
1MC152 1CM080A	20.0	5.1	10/28/87
1MC152 1CM081A	20.0	5.1	10/28/87
1MC152 1CM081A	20.0	10.0	01/28/89
1MC152 1CM080A	20.0	10.0	01/28/89
1MC152 1CM080B	23.0	4.0	07/27/89
1MC152 1CM081B	20.0	4.0	07/27/89
1MC152 1CM080C	31.0	4.0	07/27/89
1MC152 1CM081C	38.0	4.0	07/27/89
1MC152 1CM081A	5.0	10.0	10/30/90
1MC152 1CM080A	5.0	10.0	10/30/90
1MC152 1CM081B	30.0	10.0	10/30/90
1MC152 1CM080B	10.0	10.0	10/30/90
1MC152 1CM080C	20.0	10.0	10/30/90
1MC152 1CM081C	20.0	10.0	10/30/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC153

1MC153 1CM022	55.0	5.1	10/29/87
1MC153 1CM023	45.0	5.1	10/29/87
1MC153 1CM025	20.0	5.1	10/29/87
1MC153 1CM026	20.0	5.1	10/29/87
1MC153 1CM023	21.3	2.0	08/30/89
1MC153 1CM022	21.0	2.0	08/30/89
1MC152 1CM025	20.0	2.0	08/30/89
1MC153 1CM026	20.0	2.0	08/30/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC160

1MC160 1CM074	20.0	10.0	09/20/88
1MC160 1CM074	20.0	10.0	09/20/88
1MC160 1CM074	5.4	0.2	07/18/90
1MC160 1CM075	3.2	0.2	07/18/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC166

1MC166 1HG005 1000000 0.0 03/05/86 MWR C00034 DECLUTCH LEVER
STUCK VALVE DID NOT CLOSE
FULLY

1MC166 1HG005	110.0	5.1	03/15/88
1MC166 1HG018	20.0	5.1	03/20/88
1MC166 1HG005	20.0	10.0	02/07/90
1MC166 1HG018	20.0	10.0	02/07/90
1MC166 1HG005	20.0	10.0	02/09/90
1MC166 1HG018	20.0	10.0	02/09/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SUCM TOLER DATE
ANCE

COMMENTS:

** 1MC169

1MC169 1VR035	20.0	5.1	10/18/87
1MC169 1VR036	30.0	5.1	10/18/87
1MC169 1VR040	120.0	5.1	06/10/88
1MC169 1VR041	20.0	5.1	06/10/88
1MC169 1VR041	10.0	5.0	03/12/89
1MC169 1VR040	120.0	10.0	03/12/89
1MC169 1VR036	130.0	10.0	03/18/89
1MC169 1VR035	120.0	10.0	03/18/89
1MC169 1VR040	10.0	5.0	03/12/90
1MC169 1VR041	120.0	10.0	03/12/90
1MC169 1VR035	20.0	10.0	01/07/91
1MC169 1VR036	20.0	10.0	01/07/91
1MC169 1VR040	20.0	10.0	01/07/91
1MC169 1VR041	20.0	10.0	01/07/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC172

1MC172 1E12F074B

0.0 10.0 02/05/91 AS FOUND TEST FOR ADJUSTING
TYPE A TEST RESULTS. MWR
D15220 MODIFIED THIS
PENETRATION FOR LER 90-018.

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** 1MC173

1MC173 1CM047	20.0	5.1	10/29/87
1MC173 1CM048	20.0	5.1	10/29/87
1MC173 1CM011	20.0	5.1	10/29/87
1MC173 1CM047	9.4	0.2	09/23/89
1MC173 1CM048	7.3	0.2	09/23/89
1MC173 1CM011	2.0	0.2	09/23/89
1MC173 1CM012	2.0	0.2	09/23/89

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC177

1MC177 1E51F437B	20.0	5.1	04/11/88
1MC177 1E51F437A	20.0	5.1	04/11/88
1MC177 1E51F437B	20.0	10.0	03/21/90
1MC177 1E51F437A	20.0	10.0	03/21/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC179

1MC179 1SM027B	110.0	10.0	04/02/88	
1MC179 1SM027A	80.0	5.1	04/02/88	MODIFICATION M-2
1MC179 1E22F381B	20.0	5.1	04/02/88	MODIFICATION M-2
1MC179 1E22F381A	20.0	5.1	04/02/88	MODIFICATION M-2
1MC179 1E22F381A	20.0	10.0	01/31/90	
1MC179 1E22F381B	20.0	10.0	01/31/90	
1MC179 1SM027A	20.0	10.0	01/31/90	
1MC179 1SM027B	20.0	10.0	01/31/90	
1MC179 1E22F381A	20.0	10.0	02/02/90	
1MC179 1E22F381B	20.0	10.0	02/02/90	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC181

1MC181 1SM026A	20.0	5.1	04/09/88
1MC181 1SM026B	20.0	5.1	04/09/88
1MC181 1SM026A	20.0	10.0	02/21/90
1MC181 1SM026B	20.0	10.0	02/21/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC183

1MC183 1CM100B	20.0	5.1	03/27/88
1MC183 1CM100A	20.0	5.1	03/27/88
1MC183 1CM100A	20.0	10.0	02/05/90
1MC183 1CM100B	20.0	10.0	02/05/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC203

1MC203 1CM077

13.4 0.2 09/22/88

1MC203 1CM077

9.0 2.0 07/17/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC204

1MC204 1SX096B 20.0 5.1 02/16/88

1MC204 1SX097B 20.0 5.1 02/16/88

1MC204 1SX096B 20.0 10.0 03/02/89

PMT FOR MWR D03272 (REPLACE
TORQUE SWITCHCH AND MOVATS).

1MC204 1SX097B 20.0 10.0 03/02/89

PMT FOR MWR D03272 (MOVATS AND
REPLACED TORQUE SWITCH).

1MC204 1SX096B 0.0 10.0 02/10/91

1MC204 1SX09CE 10.0 10.0 02/10/91

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC205

1MC205 1SX088B 20.0 5.1 09/20/87

1MC205 1SX089B 20.0 5.1 09/20/87

1MC205 1SX089B 20.0 10.0 03/02/89 PMT FOR MWR D03271 (REPLACED
TORQUE SWITCH AND MOVATS).

1MC205 1SX088B 20.0 10.0 03/02/89

1MC205 1SX089 0.0 10.0 02/10/91

1MC205 1SX088 10.0 10.0 02/10/91

-2 ILRT/LLRT LEAKAGE REPORT

JCM TOLER DATE COMMENTS:
ANCE

	99.5	2.0	03/18/87	
20000.0	0.0	04/12/88	AS FOUND TEST RESULTS MWR C46034 WRITTEN TO REPLACE VALVE 4/16/88	
IB	20.0	5.1	04/12/88	
A	110.0	5.1	04/12/88	
079				
A085				
042A	850.0	5.1	04/16/88	PMT FOR MWR C46034 (REPLACED 1IA042A).
A042A	950.0	45.0	03/01/89	
A013B	30.0	10.0	03/01/89	
IA013A	170.0	10.0	03/01/89	
1PSIA085				
1PTIA079				
06 1IA013B	30.0	10.0	03/01/89	
06 1PSIA085	0.0	0.0	09/23/89	
1-206 1IA042A	18000.0	400.0	01/30/91	MWR D10161 WRITTEN TO REPAIR THE 1B21F041D 'B' SOLENOID THIS IS NOT A CONTAINMENT ISOLATION VALVE.
1MC206 1IA013B	55.0	10.0	01/30/91	
1MC206 1IA013A	16250.0	400.0	01/30/91	MWR D10161 WAS WRITTEN TO REPAIR THE LEAKING 'B' SRV SOLENOID FOR THE 1B21F041D SRV. THIS WAS A LARGE PORTION OF THE LEAKAGE FOR THIS TEST AND IS NOT A PART OF THE CONTAINMENT PENETRATION BOUNDARY ONLY THE TEST BOUNDARY.
1MC206 1IA013A	100.0	10.0	02/05/91	PMT FOR MWR D10161
1MC206 1IA013B	30.0	10.0	02/05/91	
1MC206 1IA042A	1900.0	45.0	02/05/91	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBER

SCCM TOLER DATE
ANCE

COMMENTS:

** 1MC208

1MC208 1SX097A	320.0	5.1	02/10/88
1MC208 1SX096A	20.0	5.1	02/10/88
1MC208 1SX096A	20.0	10.0	09/19/89
1MC208 1SX097A	20.0	10.0	09/19/89
1MC208 1SX096A	20.0	10.0	10/09/90
1MC208 1SX097A	20.0	10.0	10/09/90

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN NUMBER	SCCM	TOLER ANCE	DATE	COMMENTS:
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** 1MC210

1MC210 1PS004	20.0	5.1	10/21/87	
1MC210 1PS005	20.0	5.1	10/21/87	
1MC210 1PS009	20.0	5.1	10/21/87	
1MC210 1PS010	20.0	5.1	10/21/87	
1MC210 1PS037	20.0	5.1	10/21/87	
1MC210 1PS038	20.0	5.1	10/21/87	
1MC210 1PS047	20.0	5.1	10/21/87	
1MC210 1PS048	20.0	5.1	10/21/87	
1MC210 1PS031	20.0	5.1	10/21/87	
1MC210 1PS032	20.0	5.1	10/21/87	
1MC210 1PS047	20.0	10.0	01/18/89	
1MC210 1PS048	20.0	10.0	01/18/89	
1MC210 1PS037	20.0	10.0	01/18/89	
1MC210 1PS038	20.0	10.0	01/18/89	
1MC210 1PS004	20.0	10.0	01/22/89	
1MC210 1PS005	20.0	10.0	01/22/89	
1MC210 1PS009	20.0	10.0	01/22/89	
1MC210 1PS010	20.0	10.0	01/22/89	
1MC210 1PS031	20.0	10.0	01/22/89	
1MC210 1PS032	20.0	10.0	01/22/89	
1MC210 1PS004	40.0	10.0	01/11/91	
1MC210 1PS005	40.0	10.0	01/11/91	
1MC210 1PS009	10.0	10.0	01/11/91	
1MC210 1PS010	10.0	10.0	01/11/91	
1MC210 1PS037	10.0	10.0	01/11/91	
1MC210 1PS038	170.0	10.0	01/11/91	
1MC210 1PS047	10.0	10.0	01/11/91	
1MC210 1PS048	5.0	10.0	01/11/91	
1MC210 1PS031	15.0	10.0	01/12/91	
1MC210 1PS032	10.0	10.0	01/12/91	

RF-2 ILRT/LLRT LEAKAGE REPORT

PENETR VALVE EIN
NUMBERSCCM TOLER DATE
ANCE

COMMENTS:

** SPL

SPL	1E22F330	10.0	10.0	11/04/90	THE FOLLOWING TEST ARE SPECI ONE TIME TEST PERFORMED IN RF-2. PRETEST FOR REPLACEMENT 1E22F330 EXCESS FLOW CHECK VALVE.
SPL	1E22F330	0.0	10.0	12/09/90	THIS IS A POSTEST FOR REPLACEMENT OF 1E22F330 EXCE FLOW CHECK VALVE.
SPL	1PTCM063	30.8	10.0	01/11/91	THIS IS A PRETESS FOR TH PERFORMANCE OF REPLACEMENT O THE 1CM051 EXCESS FLOW CHECK VALVE. PER MWR D23160.
SPL	1PTCM063T	0.0	10.0	01/11/91	THIS IS A PRETEST FOR TH PERFORMANCE OF REPLACEMENT O THE 1CM051 EXCESS FLOW CHECK VALVE. PER MWR D23160.
SPL	1PTCM064	36.0	10.0	01/11/91	THIS IS A PRETEST FOR MW D23161 REPLACEMENT OF 1CM053 EXCESS FLOW CHECK VALVE. PE MWR D23161.
SPL	1PTCM064T	0.0	10.0	01/11/91	THIS IS A PRETEST FOR TH REPLACEMENT OF 1CM053 EXCESS FLOW CHECK VALVE. PER MWR D23161.
SPL	1E12F011B 1E12F064B 1E12F024B 1E12F426	410.0	10.0	02/03/91	THIS IS AN AS FOUND TEST FOR 1MC020 AND WILL NOT BE REPERFORMED ON A ROUTINE BASES. THIS WAS USED TO DETERMINE THE AS FOUND LEAKA FOR THE ILRT PERFORMED IN RF-2.
SPL	1PTCM063	30.8	10.0	02/08/91	THIS IS THE POST TEST FOR THE REWORK OF 1CM051.
SPL	1PTCM063T	20.5	10.0	02/08/91	THIS IS THE POST TEST FOR THE REWORK OF 1CM051.
SPL	1PTCM064T	0.0	10.0	02/08/91	THIS IS THE POST TEST FOR THE REWORK OF 1CM053.
SPL	1PTCM064	15.4	10.0	02/08/91	THIS IS THE POST TEST FOR THE REWORK OF 1CM053.

TYPE B ELECTRICAL PENETRATION SUMMARY

ALL LEAK RATES BELOW ARE AS-LEFT LEAKAGE RATES

ELECTRICAL PENETRATION	TEST DATE	LEAK RATE SCCM FLOW±TOL	TEST DATE	LEAK RATE SCCM FLOW±TOL	TEST DATE	LEAK RATE SCCM FLOW±TOL
1EE01E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE02E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE03E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE04E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE05E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE06E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE07E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE08E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE09E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE10E	10/11/86	0±0	02/15/88	.0±.2	08/23/90	.5±.2
1EE11E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE12E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE13E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE14E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE15E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE16E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE17E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE18E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE19E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE20E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE21E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE22E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE23E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE24E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE25E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE26E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE27E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE28E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE29E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE30E	10/11/86	0±0	09/14/88	.01±.2	08/15/90	.55±.2
1EE31E	10/11/86	0±0	09/16/88	.15±.2	08/23/90	.5±.2
1EE32E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE33E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE34E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE35E	10/11/86	0±0	09/15/88	.0±.2	08/23/90	.5±.2
1EE36E	10/11/86	0±0	09/13/88	.02±.2	08/15/90	.55±.2
1EE37E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE38E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE39E	10/11/86	0±0	09/15/88	.2±.2	08/24/90	.43±.2
1EE40E	10/11/86	0±0	09/14/88	.23±.2	08/21/90	.45±.2
1EE41E	10/11/86	0±0	09/15/88	.2±.2	08/22/90	.44±.2
1EE42E	10/11/86	0±0	09/15/88	.2±.2	08/22/90	.44±.2
1EE43E	10/11/86	0±0	09/14/88	.07±.2	08/21/90	.49±.2
1EE44E	10/11/86	0±0	10/06/88	.1±.2	08/21/90	.49±.2
1EE45E	10/11/86	0±0	09/19/88	.08±.2	08/23/90	.5±.2
1EE46E	10/12/86	0±0	09/16/88	.08±.2	08/24/90	.4±.2
1EE47E	10/12/86	0±0	09/16/88	.08±.2	08/24/90	.4±.2
1EE48E	10/12/86	0±0	09/16/88	.07±.2	08/24/90	.35±.2
1EE49E	10/12/86	0±0	09/16/88	.07±.2	08/24/90	.35±.2