INDIAN POINT UNIT NO. 2
NUCLEAR POWER PLANT
BUCHANAN, NEW YORK

DOCKET NUMBER 50-247

REACTOR CONTAINMENT BUILDING INTEGRATED LEAKAGE RATE TEST

FINAL REPORT

Prepared for:
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I. INTRODUCTION

A periodic Type "A" Integrated Leakage Rate Test (ILRT) was performed on the containment structure of the Consolidated Edison Company, Indian Point Nuclear Power Plant Unit No. 2 pressurized water reactor in September 1984.

This ILRT test was performed using the "Absolute Method" of testing in accordance with the Code of Federal Regulations, Title 10, Part 50, Appendix J, Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors; in accordance with ANSI N45.4, 1972 American National Standard, Leakage-Rate Testing of Containment Structures for Nuclear Reactors; and the calculations for leakage rate were performed as recommended in ANSI/ANS 56.8, Containment System Leakage Testing Requirements. The ILRT was performed at a pressure in excess of the calculated peak containment internal pressure related to the design basis accident as specified in the Final Safety Analysis Report (FSAR) and the Technical Specifications.

This report describes and presents the results of this periodic Type "A" leakage rate test, including the supplemental test method utilized for verification.

In addition, Con Edison performs Types "B" and "C" tests in accordance with the requirements of 10CFR50, Appendix J. As required by Appendix J, the results of the Type "B" and "C" tests performed since the last Type "A" test are provided in this report (Appendix E).

II. SUMMARY

Since conducting the last Integrated Leakage Rate Test (ILRT), three sets of Types "B" and "C" Local Leakage Rate Tests (LLRT) for penetrations and isolation valves were performed by Consolidated Edison station personnel. The LLRT tests were performed at pressures equal to or greater than the minimum test pressure delineated in the Indian Point Unit No. 2 Technical Specifications.

At the start of the Type "A" ILRT test, valves and systems were in their required position for accident conditions with the exception of those valves and systems required to maintain the plant in a safe shutdown condition.

Systems which were not in an operable condition for leakage rate testing were isolated for the ILRT. Appropriate corrections to the measured leakage for the isolated systems were made at the end of the ILRT.

The reactor containment building was pressurized to slightly above Pa, the containment design pressure, with dry air supplied by industrial air compressors. After allowing for containment air temperature to stabilize, the mass of air in the containment was calculated every 15 minutes during all phases of the leakage rate test. Straight line least squares analysis of the time rate of change of containment air mass was performed on the appropriate data base to determine the measured leakage rate (Lam). An upper limit of the 95 percent confidence level (UCL) was calculated using statistical methods to estimate the possible uncertainty in the measured leakage rate, Lam.

Lam was calculated to be 0.027 percent of the contained air mass per day during the ILRT. The UCL was determined to be 0.028 percent per day. A supplementary Verification Controlled Leakage Rate Test (CLRT) was performed to verify the results of the above measurements and was found to be within the allowable limits, and therefore acceptable.

Subsequent to the Type "A" ILRT Test, Local Leakage Rate Tests were performed on the appropriate isolated systems to determine the amount of leakage which must be added to Lam. Also tested were the test penetrations which were in use during the ILRT and not in the required post-accident position. After adding these additional leakages, the total equivalent "as-found" Lam was 0.031 percent of the contained air mass per day, with a UCL of 0.032 percent per day. After maintenance, the equivalent "as-left" Lam was 0.027 percent per day, with a UCL of 0.028 percent per day. The acceptance criteria for the Type "A" ILRT is that the measured leakage, including statistical uncertainties cannot exceed 75 percent of La, the design basis leakage. For Indian Point Unit No. 2, this acceptance criteria is equivalent to 0.075 percent of the contained air mass per day.

III. TEST DISCUSSION

A. Description of the Containment

The vapor containment building completely encloses the entire reactor and reactor coolant system to ensure no leakage of radioactive materials to the environment, even upon gross failure of the reactor coolant system and provides shielding for both normal and accident situations.

The Vapor Containment Vessel is a reinforced concrete shell in the form of a vertical right cylinder with a hemispherical dome and a generally flat base supported on rock. The inside surface of the structural concrete is lined with 1/4 inch minimum thickness steel plate anchored to the concrete shell. The liner is designed and fabricated to prevent leakage through it due to an accident resulting in the loss of a reactor coolant and release of radioactive material to the containment volume concurrent with an earthquake.

The containment has side walls which are 148 feet from the liner on the horizontal base to the spring line of the dome, and has a 135 foot inside diameter. The containment free volume is 2,610,000 cubic feet. The thickness of the reinforced concrete base is 9 feet, the side walls are 4.5 feet, and the dome is 3.5 feet thick. The bottom horizontal liner plate is covered with three feet of concrete, the top of which forms the floor of containment.

The liner is anchored to the concrete shell by means of Nelson studs so that it becomes part of the entire structure under all loadings in such a manner as to ensure leak tightness. The weld seams required to fabricate the steel liner were considered as potential leak sources and are barriered and pressurized by the Weld Channel and Penetration Pressurization System (WCPPS).

All penetrations through the structure which are considered as potential leakage sources are designed with double barriers and pressurized by the Isolation Valve Seal Water (IVSW) system or the WCPPS system. There are approximately 60 electrical penetration cannisters, 80 process piping penetrations, one personnel access airlock, one airlock/equipment hatch and one fuel transfer tube penetration.

All high-pressure equipment in the reactor coolant system is surrounded by barriers which will prevent any missile generated in a loss-of-coolant accident from reaching the vapor containment liner.

The design internal pressure transient following a loss-of-coolant accident for the free volume of 2,610,000 cubic feet within the containment is 47 psig.

Thermal expansion stresses due to an internal temperature increase caused by a loss-of-coolant accident are considered. The maximum temperature at the uninsulated section of the liner under accident conditions is 271°F.

The containment vessel, penetrations, and isolation valves are aligned to simulate accident conditions for the performance of the Integrated Leakage Rate Test. An extra degree of conservatism in testing is provided by not using the Isolation Valve Seal Water or the Weld Channel and Penetration Pressurization Systems during the Integrated Leakage Rate Test.

B. Description of ILRT Test Instrumentation

The containment system was equipped with instrumentation to permit leakage rate determination by the "Absolute Method." Utilizing this method, the actual mass of dry air within the containment is calculated. The leakage rate becomes the time rate of change of this value. The mass of air (Q) is calculated according to the Perfect Gas Law as follows:

$$Q = \frac{(P-Pv)\ V}{RT}$$

Where: P - Containment Total Absolute Pressure
Pv - Containment Water Vapor Pressure
V - Containment Net Free Volume
R - Gas Constant
T - Containment Absolute Temperature

The primary measurement variables required are containment absolute pressure, containment relative humidity and containment temperature as a function of time. Ancillary measurements include ambient outside air pressure and ambient temperature and temperature inside the instrument panel. During the supplementary verification test, containment bleed-off flow is also recorded. Instrument readings were output at 15-minute intervals via a data logger and RS-232 link to the Ebasco analysis computer.

The Instrument Selection Guide or ISG is used to determine the ability of the instrumentation system to measure the leakage rate. The calculated ISG for this test met all acceptance criteria for all test instrumentation systems.

1. Temperature Instrumentation

Temperature was measured using four wire precision platinun resistance temperature detectors (RTDs) in a constant current loop.

Forty RTDs were located throughout the containment to allow measurement of the weighted average air temperature. The location of the temperature detectors in the containment is depicted in Figure 1. Each RTD sensor was supplied with calibrated resistance versus temperature data accurate to ±0.5°F. The repeatability of each RTD sensor is less than ±0.01°F. The sensitivity of the RTDs is 0.218 ohm/°F. The signal conditioning circuit and readout for the RTD sensors was a Fluke 2280A data logger with a Fluke 2180 RTD digital thermometer as a back-up readout. The signal conditioning circuit and readout operating as a total loop with an RTD in the circuit had an accuracy of ±0.5°F, repeatability of ±0.015°F, and sensitivity of ±0.01°F.

2. Humidity Instrumentation

Ten precision relative humidity detectors (RHDs) were used during the ILRT to measure containment relative humidity. RHDs were located throughout the containment to allow measurement of the weighted average containment vapor pressure. The location of the RHDs in the containment is depicted in Figure 2. The calibrated accuracy of the RHDs is ±2.5 percent RH, the repeatability is ±0.25 percent RH, and the sensitivity is ±0.1 percent RH. An electronic signal conditioning module provided an interface between sensors and the readout devices. The readout device used was a Fluke 2280A data logger, with a Fluke 8810A digital multimeter as a back-up readout.

3. Pressure Instrumentation

Two precision quartz bourdon tube manometers were used to determine containment absolute pressure. The arrangement of the tubing connections between the containment and the manometers is shown in Figure 3. Either manometer could be used as the primary pressure sensor for leakage rate calculations with the remaining sensor being considered as a backup. The calibrated accuracy of the manometers is ±0.015 percent of reading or ±0.0098 psia. The sensitivity, repeatability, and resolution of the manometers is ±0.001 psi. The readout device for the manometers was a direct digital link to a Fluke 2280A data logger.

4. Verification Flow Instrumentation

Two variable area float-type rotameters were originally installed to superimpose a leakage during the supplementary verification test. Due to excessive moisture in the rotameter encountered during the test, an additional rotameter and moisture removal filter was added in series with one of the original rotamaters for verification purposes. The piping connection between the containment and the rotameters is shown in Figure 3. The range, accuracy, and repeatability for the rotameters in units of SCFM and converted to equivalent leakage values for actual test conditions is given below:

	Original Rotameters		Added Rotameter	
	SCFM	Equivalent Leakage	SCFM	Equivalent Leakage
Range	15.2	0.189%/day	16.4	0.201%/day
Accuracy	±.15	0.0019%/day	±.16	0.002%/day
Repeatability	±.04	0.0005%/day	±.08	0.001%/day

5. Instrument Selection Guide (ISG) Calculation

The Instrument Selection Guide is a method of compiling the instrumentation sensitivity and resolution for each process measurement variable used during the ILRT and evaluating the total instrumentation systems' ability to detect leakage rates in the range required. The ISG formula is described in American National Standard ANSI/ANS-56.8-1981. Although the ISG is a very conservative measure of sensitivity, the general industry practice as for this test, has been to require sensitivity at least four times better than the containment design leakage or ISG≤0.25La.

The ISG for the instrumentation system utilized for the ILRT is tabulated below as a pre-test ISG and post-test ISG. The difference between the two values is due to the failure of ten RTD temperature sensors during the test. Also tabulated is the contribution to the total ISG from the separate measurements of temperature, relative humidity, and pressure.

The ISG calculations given below meet all recommended criteria and demonstrate the ability of the ILRT test instrumentation system to measure containment leakage with a sensitivity exceeding that required by the appropriate industry standards.

	Pre-Test %/day	Post-Test %/day
Temperature Contribution	0.0007	0.0009
Relative Humidity Contribution	0.0003	0.0003
Pressure Contribution	0.0024	0.0024
Calculated ISG	0.0026	0.0026

NOTE: The calculated ISG shall be less than or equal to 25% La or .025%/day.

C. Containment Pressurization Equipment

The equipment used to pressurize the containment is shown in Figure 4. The nine on-line oil-free industrial diesel-driven air compressors had a total nominal capacity of 10,000 SCFM. The compressed air was then routed to the ILRT dryer package for processing prior to entering the containment vessel. This dryer package contained two water-cooled aftercoolers, two moisture separators, and two refrigerant air dryers. This package assured that clean and dry air was used to pressurize the containment.

D. Description of the Computer Program

The Ebasco ILRT computer program is an interactive program written specifically for fast, easy utilization during all phases of the ILRT and CLRT. The program is written in a high-level, compiled structured language and is operated on a portable CP/M-based microcomputer. The program has been verified and meets all requirements of the Ebasco Quality Assurance Program. The program was also subject to Con Edison Quality Assurance surveillance.

As necessary, data entry and modifications are readily accomplished by the data acquisition team. In addition to extensive data verification routines, the program calculates, on demand, total time and mass point leak rates as well as the 95 percent Upper Confidence Level for these leakage rate calculations. Calculations and methodology of the program are derived from American National Standard ANSI/ANS-56.8-1981. Containment air mass is determined from mass weighted sensor readings as described in EPRI report NP-2726, November 1982.

Sample rejection based upon the Chauvenet criterion may be utilized in the analysis, if required, due to recording errors, power failures, etc.

Input data may be deleted for a given instrument in the case of a sensor malfunction. This deletion of a given instrument is performed on all samples in the data base. Weighting factors, if applicable, are then recalculated for the remaining instrument sensors of that type.

Data evaluations are enhanced by the flexible display of either sensor variables or various computed values in tabular or graphical form on the computer screen or printer. Data is recorded on magnetic media to prevent loss during the testing. All data is stored on the computer system in use with retrieval capability to any desired data base throughout the testing.

Ancillary portions of the program assist the user in detection of temperature stabilization, performing ISG calculations, performing in-situ instrument loop performance calculations and detecting acceptable superimposed CLRT leakage verification.

Temperature, pressure and humidity data are transmitted from the ILRT instrumentation system to the computer via an RS-232 link at 15-minute intervals. Computer verification and checking routines supplement data verification by the data acquisition team. Modifications are promptly made when errors are detected. Prior to issuance of this report, further extensive data verification was performed.

E. Description of the Testing Sequence

On September 16, 1984, all necessary type "B" and "C" LLRT tests and all ILRT valve and breaker lineups were deemed complete.

A final cleanup and inspection of the interior and exterior of the containment building and internal components was made to prepare the containment for pressurization. The ILRT test instrumentation calibration verification and response checks were completed to ensure proper operation of all sensors and associated equipment.

Penetration R, the Steam Jet Air Ejector Discharge to Containment exhibited higher than normal ILRT leakage on the containment isolation valves. This leakage of .35 SCFM is well below the ILRT acceptance criteria, but was blanked off for the ILRT for conservatism.

The containment was declared ready for pressurization and the air compressors started at 0700 hours on September 16, 1984. The sequence of pressure testing for the containment is graphically depicted on Figure 5.

At 1016 hours the pressurization was halted at 10.5 psig containment pressure due to the observance of external leakage. Internal and external leakage surveys were conducted to identify and quantify the observed leaks. Leakage was observed on the following system penetrations. Service Water to the Fan Cooler Units; the 80' Airlock Weld Channel System; Nitrogen Supply to the Accumulators; and one Electrical Penetration Weld Channel Rack. Pressurization was restarted at 1830 hours to achieve a higher containment pressure to allow more accurate quantification of the observed leaks and to verify that no additional leakage was present. At 2120 hours, pressurization was halted at 18.6 psig containment pressure to perform additional external leakage surveys. Pressurization to full test pressure was resumed at 0430 hours on September 17, 1984.

Pressurization was secured at 1800 hours on September 17, 1984, at a containment pressure of 51.8 psig. This pressure was 4.8 psi above the minimum test pressure of 47 psig to account for the expected pressure decrease due to temperature stabilization and leakage during external leak surveys. External leakage surveys quantified the observed leakages and a determination was made to isolate the leakage from the following sources: Service Water to Fan Cooler Unit No. 22; the 80' Airlock Weld Channel System; and the Electrical Penetration H-32 Weld Channel System. In addition, a leak was discovered due to an improperly aligned valve on the Isolation Valve Seal Water System to the Auxiliary Steam Condensate Return Line. This valve was placed in its correct position.

The containment temperature stabilization criteria was met at 2215 hours on September 17, 1984, after analyzing four-and-one-quarter hours of data. The temperature stabilization data is presented in Appendix A.1.

After all changes to the containment boundary were completed, leakage rate measurements for the ILRT were initiated at 0400 hours on September 18, 1984.

During the ILRT, the computer program sensor verification routines determined that periodic digital shifts in temperature were occurring on ten of the 40 RTDs measuring containment temperature. These shifts were occurring on a two to four hour frequency and were determined large enough to cause a bias in the calculated leakage rates. The problem was narrowed down to one of four current loop excitation circuits in the data logger. RTDs Nos. 1, 3, 4, 9, 11, 12, 15, 17, 19, and 20 were deleted from leakage calculations and the temperature sensor volume fractions were recalculated. A revised ISG calculation was performed after the deletion, and a check was made to assure that no temperature sensor exhibited a volume fraction in excess of one-tenth of the containment volume. The maximum temperature sensor volume fraction was .063.

Twenty-four hours of ILRT data analysis was completed at 0400 hours on September 19, 1984. The data accumulated displayed the following leakage rates:

Simple Mass Point Leakage Rate = 0.045%/day

Fitted Mass Point Leakage Rate = 0.046%/day

95% Upper Confidence Level (UCL) = 0.047%/day

The verification controlled leakage rate test was initiated at 0401 hours on September 19, 1984, by superimposing a 7.3 SCFM leakage using one of the variable area rotameters. This superimposed leakage is equivalent to 0.089%/day containment leakage.

It was noted that a wet air flow passing through the rotameter and that the measured containment leakage was below the minimum acceptance criteria for the CLRT. The fitted leakage for the CLRT was 0.0998%/day while the ILRT leakage measured plus the superimposed rotameter flow should have yielded a leakage of 0.1351 $\pm$0.025%/day.

Another verification rotameter was placed in series with the initial rotameter and a demonstrated flow difference was observed between the two rotameters which was outside of the calibration tolerance. This difference in readings between the two rotameters was not sufficient to entirely explain the difference between the predicted CLRT leakage rate and the measured CLRT leakage rate. The ILRT data was re-evaluated and a slowly decreasing leakage rate was discovered. Surveys of the containment were made, and it was determined that the 80' elevation airlock was internally slowly pressurizing due to inner door seal leakage. The ILRT/CLRT was terminated and another sequence of testing initiated.

The ILRT was reinitiated at 1400 hours on September 19, 1984. At 2330 hours, it was noted that a momentary temperature jump was experienced from the data logger. The shift did not occur again during the test, and the leakage rates calculated were not significantly different whether the data point was rejected or not.

Twenty-four additional hours of ILRT data were completed at 1400 hours on September 20, 1984. The measured leakages for the test demonstrated the following values:

Simple Mass Point Leakage Rate = 0.025%/day

Fitted Mass Point Leakage Rate = 0.027%/day

95% Upper Confidence Level (UCL) = 0.028%/day

These values were determined with the sample taken at 2330 hours on September 19, 1984, rejected from the leakage calculations. The ILRT data and leakage calculations are presented in Appendix A.2. The acceptance criteria for this test is that the measured leakage at a 95 percent UCL is less than 0.075%/day.

To perform the CLRT, an additional rotameter was added in series with one of the original rotameters. In addition, the rotameter sensing line was blown down to remove any water present in the line, and a filter/moisture trap was added to the inlet of the rotameters.

The CLRT was initiated at 1515 hours on September 20, 1984, by imposing a leakage of 6.56 corrected SCFM which is equivalent to a containment leakage of 0.080%/day. During this CLRT, no moisture was evident in the air flow through the rotameters, and no moisture was present in the filter/moisture drain on the inlet to the rotameters. In addition, the two rotameters in series agreed within the accuracy of the meters. After five-and-one-quarter hours of leakage data, the measured CLRT leakage was determined as:

Simple Mass Point Leakage Rate = 0.0995%/day

Fitted Mass Point Leakage Rate = 0.0999%/day

The target CLRT leakage for this test was 0.1071 $\pm$0.025%/day or within the criteria as measured. The CLRT data and leakage calculations are presented in Appendix A.3. The ILRT and CLRT were declared successful at 2030 hours on September 20, 1984.

Additional local leakage measurements were made on the penetrations isolated for the ILRT and containment depressurization was initiated at 0145 hours on September 21, 1984. The containment depressurization was completed at 1900 hours on September 21, 1984. A post-test internal and external inspection of the containment was made; no anomalies were detected.

Inspections and repairs were made on the penetrations isolated during the ILRT. Description of the findings and corrective actions on the isolated penetrations is given in Appendix D. Of those penetrations isolated, pre- and post-maintenance leakage values for Penetration R, the Steam Jet Air Ejector Discharge to Containment, must be added to the leakage values determined during the ILRT.

The penetrations which were in service during the ILRT and not in the normal post-accident lineup must also be added to the measured ILRT leakage values. These penetrations are Penetration U-U and V-V, the penetrations used for containment pressure sensing, containment verification flow, and containment pressurization/depressurization.

The addition to the measured ILRT leakage rate are tabulated below:

As-Found

95% Upper Confidence Level (UCL)	= 0.028%/day
Penetration R (SJAE Discharge)	= 0.004%/day
Penetration U-U (ILRT Pressure/Flow)	= <.00003%/day
Penetration V-V (Pressurization/Depressurization)	= <.00003%/day
Total As-Found UCL	= 0.032%/day

As-Left

95% Upper Confidence Level (UCL)	= 0.028%/day
Penetration R (SJAE Discharge)	= 0.0003%/day
Penetration U-U (ILRT Pressure/Flow)	= < .00003%/day
Penetration V-V (Pressurization/Depressurization)	= < .00003%/day
Total As-Found UCL	= 0.028%/day

The as-found and as-left corrected Upper Confidence Levels are less than the acceptance criteria for the test of 0.75La or 0.075%/day.

Reporting

On September 19, 1984 Con Edison made a four hour report to NRC via dedicated phone line pursuant to 10CFR50.72(b)(2)(i) relating to the initial phase of the ILRT and indicating that a follow-up report would be made 90 days following completion of the ILRT as required by 10CFR50 Appendix J. Con Edison believes this report satisfies all applicable reporting requirements/commitments. No Licensee Event Report (LER) was issued pursuant to 10CFR50.73, as the ILRT results were determined to have satisfied the acceptance criteria for the test, hence the preparation and submittal of an LER is not required.

IV. ANALYSIS AND INTERPRETATION

The Type "A" Integrated Leakage Rate Test for the Indian Point Unit No. 2 Nuclear Power Plant was successfully completed on September 21, 1984. The final measured leakage rate was 0.027 percent of the contained mass per day with a 95 percent Upper Confidence Level of 0.028 percent per day. The acceptance criteria for this test (0.75 La) is 0.075 percent per day. The verification test induced a superimposed leak on the containment equivalent to 0.080 percent per day. The measured verification leakage rate was 0.100 percent per day; well within the verification criteria band of 0.082 percent per day and 0.132 percent per day. (Refer to Appendix A.2 and A.3)

During preparations for pressurization and during leakage surveys at pressure, containment penetrations were isolated for the leakage rate test due to observed or suspected leaks. These included one process piping system penetration, one of five Emergency Service Water System trains, and two Weld Channel and Penetration Pressurization System penetrations (WCPPS). Appendix D provides a complete description of the systems, a discussion of the findings, and the repairs made to the systems after the leakage rate test. As noted in Appendix D, the only isolated penetration for which the results of the Type "A" ILRT must be corrected is the Steam Jet Air Ejector Discharge to Containment. This correction is presented in Section III.E along with the final calculated As-Found and As-Left ILRT leakage rates. The Emergency Service Water and WCPPS systems are post-accident systems which were not in service for the ILRT. The leakage noted in these systems was identified due to the conservative valve lineup applied to the ILRT, as described in Appendix D. These leakages would not be expected to occur under accident conditions.

The test instrumentation system performance was established by computer analysis of the test data. Although 10 of the 40 RTD temperature detectors were deleted due to an erratic RTD excitation circuit, ample temperature sensors remained to complete the test. Due to judicious placement of the sensors, the RTDs on a given excitation card were not located in the same area and sensor failures could be easily accommodated. The balance of the temperature sensors demonstrated reliable and stable performance. During the test, the in-situ temperature loop repeatability averaged 0.02 degrees. This was determined by the Ebasco In-Situ Loop Error analysis program and consists of process measurement variations, as well as sensor noise. This value is very close to the instrumentation loop repeatability given in Section III.B.1. At the end of the ILRT, the maximum variation in temperature in the containment was less than 1.5 degrees in 2.6 million cubic feet of volume. The decrease in average containment temperature over the 24-hour ILRT was less than 0.6 degrees. The humidity and pressure sensors demonstrated reliable and repeatable performance during all phases of the leakage test. The in-situ humidity and pressure loop reliabilities were .02 percent RH and .0006 psi, respectively. These values compare well with the sensor only values of repeatability presented in Section III.B.2 and III.B.3 and demonstrate that the containment was very stable during the leakage test phases.

The initial phase of the ILRT/CLRT was analyzed. The measured leakage during the ILRT phase was within the acceptance limits, but was found to be decreasing during the test. The last 12 hours of initial phase data exhibited a leakage rate of .036 perent per day or .010 percent per day below the

24-hour value. This decrease was due to an inboard leakage on the airlock, allowing the airlock to pressurize slowly. As the airlock pressure increased, the "leak" across the bulkhead decreased in rate. This was additionally demonstrated by the lower measured leakage rate determined during the second ILRT. This decrease in measured leakage rate is in the correct direction but, by itself, did not explain the difference between the measured and predicted verification CLRT leakages.

The wet air passing through the verification rotameter during the unsuccessful CLRT was first suspected to be condensation due to cooling in the piping outside containment. As this has been experienced on other tests without adverse effects, the condition was not considered important. Analysis of the containment vapor pressure at the time demonstrates that the wet air was due to water in the line and not due to condensation, as the pressure drop and outside ambient conditions were at least 25 degrees above the dewpoint. The rotameters installed for the verification test were small-bore variable area meters with a one-quarter percent repeatability. Previous experience with the use of rotameters was with the larger bore one-half percent repeatable instruments. The lower surface area to volume ratio of the small bore meters made them more susceptible to experiencing an inflated reading when passing wet air. This is demonstrated by the lower flow setting during the final CLRT phases. The same measured CLRT leakage was obtained, while the ILRT leakage had decreased. The inflated rotameter reading in itself does not explain the failure to verify the initial ILRT. The combination of the decreasing ILRT leakage rate and the inflated rotameter reading due to wet air were large enough to preclude controlled leakage verification of the initial ILRT phase.

The final phase ILRT/CLRT progressed smoothly with stable and passing data. As noted in Appendix A.2, one data sample experienced a shift in mass and was rejected from leakage calculations as described in Appendix B. This shift was caused by a momentary increase in most of the temperature sensors, resulting in a .15 degree increase in average temperature. Although smaller in magnitude, a discernable shift of .04% RH was noted in the humidity sensors. The cause of the shift is unknown, but was possibly a power fluctuation in the data logger. Computer analysis of all data during the leakage test demonstrated that this fluctuation was a one-time phenomenon. No bias was observed in the readings of the sensors after the shift. The CLRT verified the ILRT with no problems noted.

FIGURES

CONSOLIDATED EDISON COMPANY OF NEW YORK
INDIAN POINT UNIT NO. 2
RTD LOCATION/VOLUME

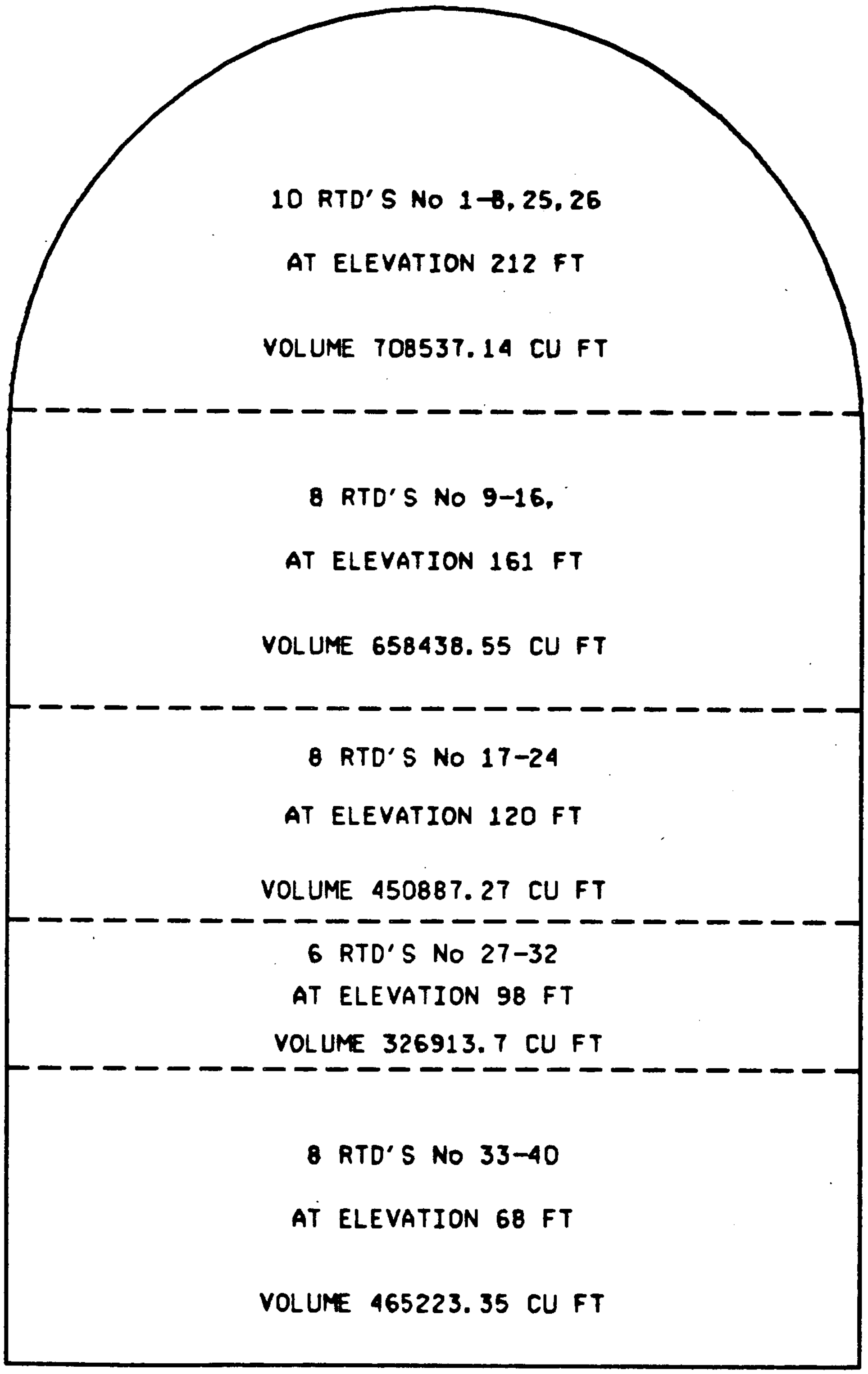


FIGURE 1

CONSOLIDATED EDISON COMPANY OF NEW YORK
INDIAN POINT UNIT NO. 2
RHD LOCATION/VOLUME

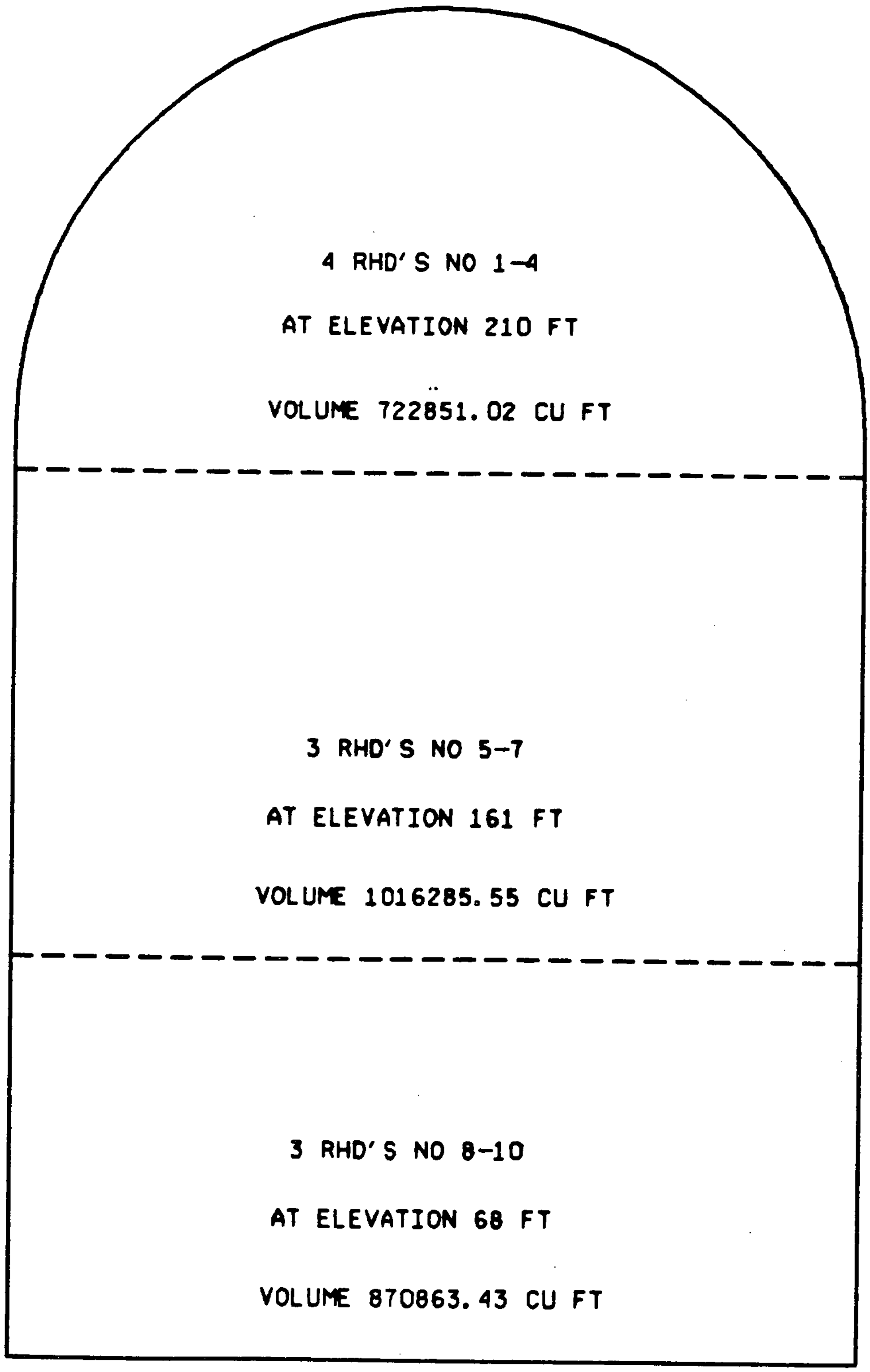


FIGURE 2

INDIAN POINT UNIT No. 2

FLOW DIAGRAM

ILRT PRESSURE SENSING & CLRT FLOW INSTRUMENTATION

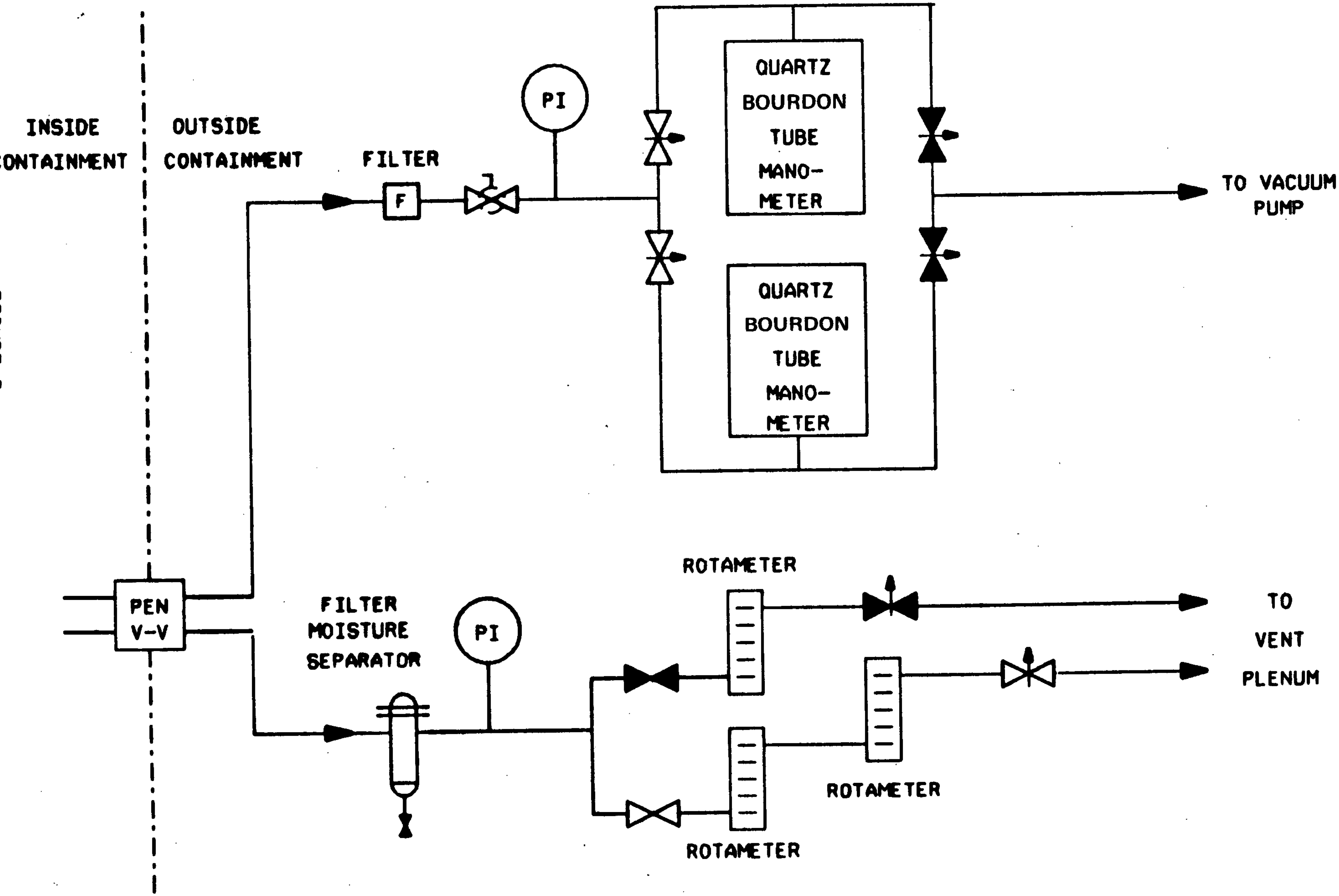


FIGURE 3

CONSOLIDATED EDISON COMPANY OF NEW YORK
INDIAN POINT UNIT No. 2
FLOW DIAGRAM
ILRT PRESSURIZATION AND DEPRESSURIZATION

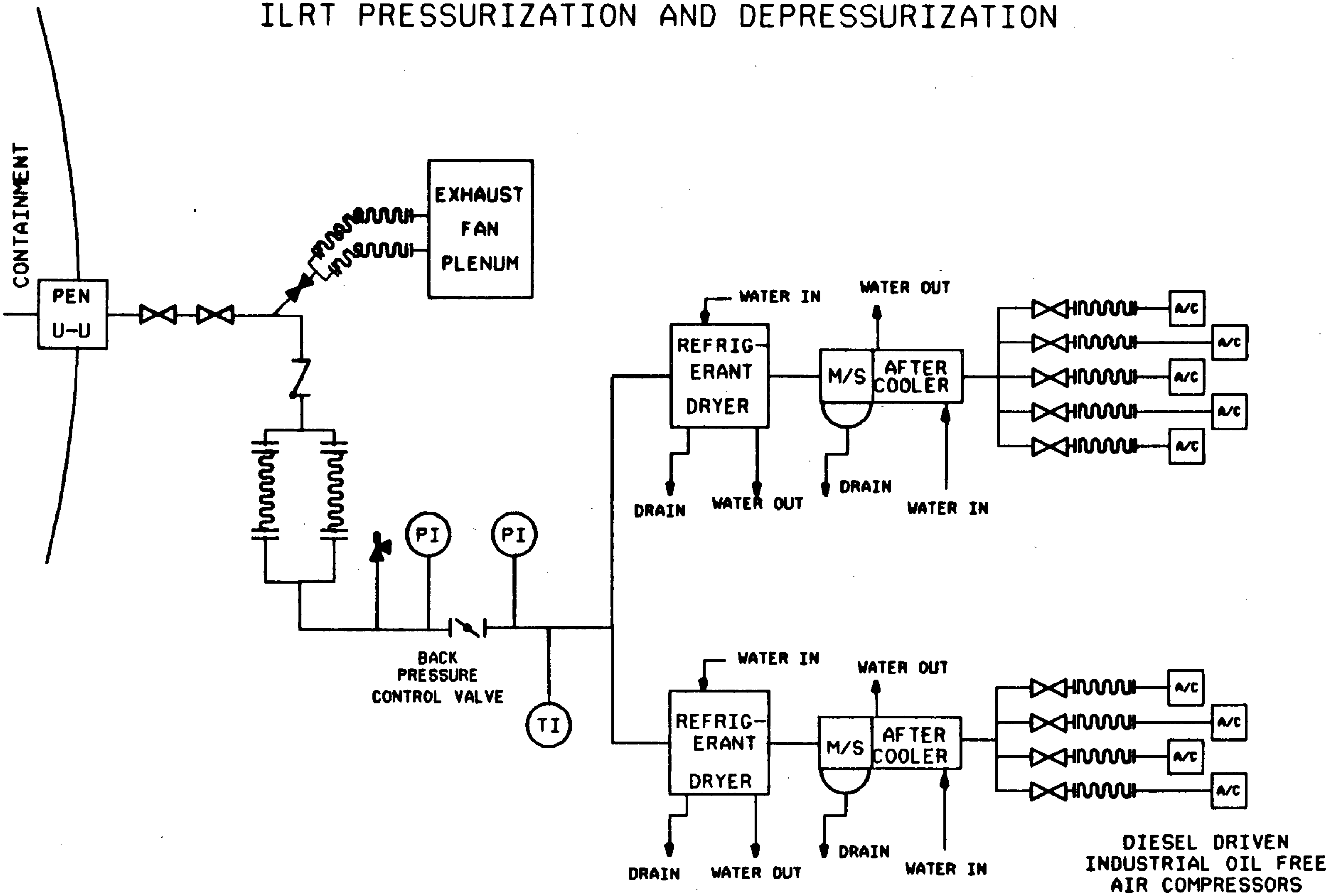


FIGURE 4

CONSOLIDATED EDISON COMPANY OF NEW YORK

INDIAN POINT UNIT No. 2

ILRT TEST SEQUENCE

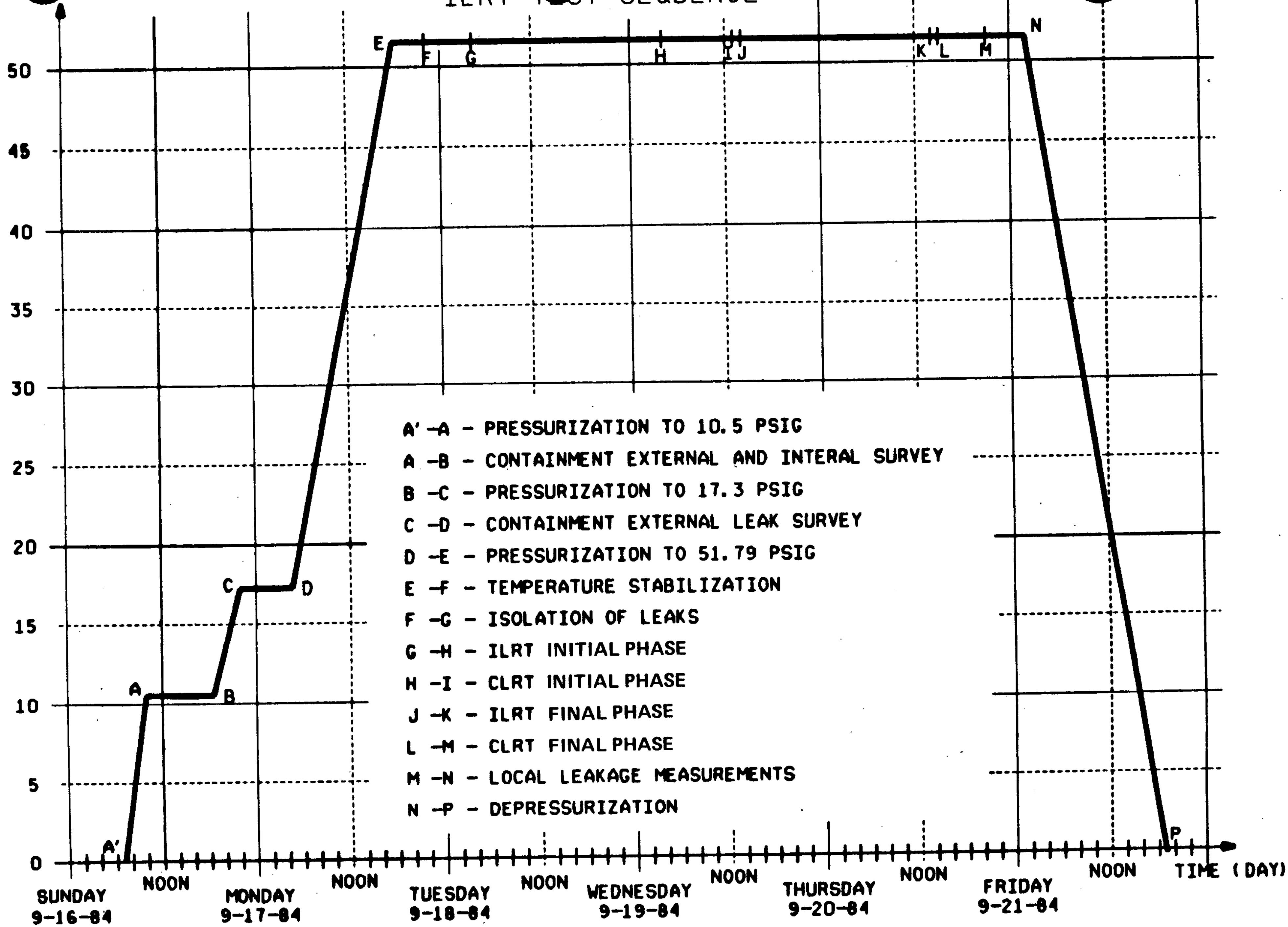


FIGURE 5

APPENDIX A.1

CONTAINMENT TEMPERATURE

STABILIZATION

CONTAINMENT INTEGRATED LEAKAGE RATE TEST REPORT

Indian Point II - 1984

EBASCO PLANT SERVICES INC.

ILRT Test Services

Indian Point II - 1984

STABILIZATION PERIOD STARTED AT 18: 0 HOURS ON 9/17/84

TEMPERATURE STABILIZATION

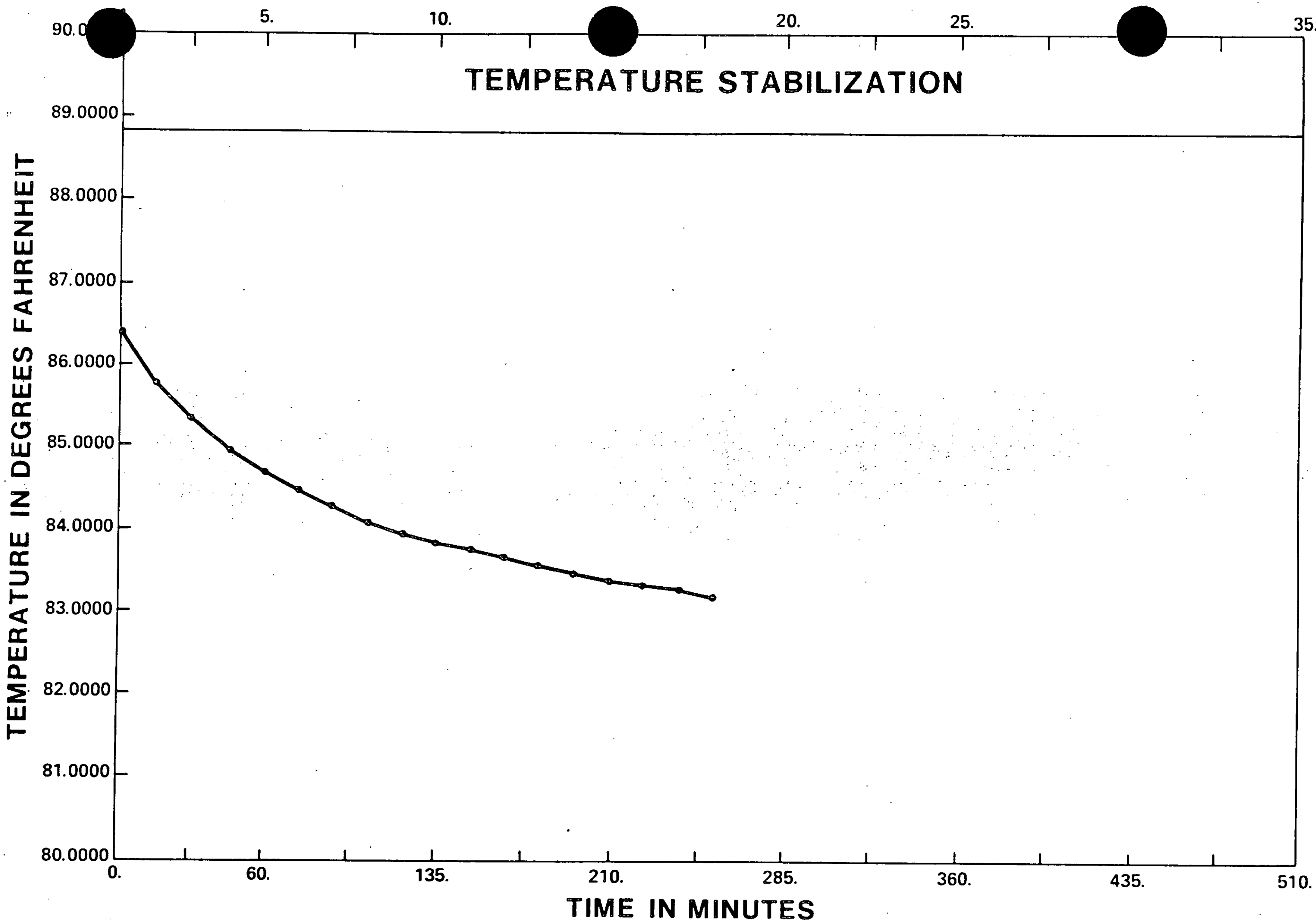
SAMPLE NUMBER	TIME HOURS	AVE TEMP DEG F	HOURLY DELTA T FOR LAST 1 HR	HOURLY DELTA T FOR LAST 4 HRS	FOUR HR DELTA T MINUS ONE HR DELTA T
1	0.00	86.372	0.000	0.000	0.000
2	.25	85.777	0.000	0.000	0.000
3	.50	85.332	0.000	0.000	0.000
4	.75	84.981	0.000	0.000	0.000
5	1.00	84.677	-1.695	0.000	0.000
6	1.25	84.449	-1.328	0.000	0.000
7	1.50	84.260	-1.072	0.000	0.000
8	1.75	84.094	-.887	0.000	0.000
9	2.00	83.955	-.722	0.000	0.000
10	2.25	83.839	-.610	0.000	0.000
11	2.50	83.730	-.530	0.000	0.000
12	2.75	83.632	-.462	0.000	0.000
13	3.00	83.537	-.418	0.000	0.000
14	3.25	83.451	-.389	0.000	0.000
15	3.50	83.397	-.333	0.000	0.000
1[illegible]	3.75	83.317	-.315	0.000	0.000
1[illegible]	4.00	83.256	-.281	-.779	.498 *
18	4.25	83.193	-.257	-.646	.388 *

NOTES:

1) THE ONE HOUR AND FOUR HOUR DELTA TEMPERATURE VALUES ARE NOT VALID UNTIL ONE HOUR AND FOUR HOURS RESPECTIVELY HAVE PASSED IN THE TEST.

2) THE STABILIZATION CRITERIA IS MET WHEN THE HOURLY AVERAGE DELTA T FOR THE PRECEDING HOUR DIFFERS FROM THE HOURLY AVERAGE DELTA T FOR THE PRECEDING FOUR HOURS BY LESS THAN 0.5 DEGREES F.

3) THE "*" INDICATES THAT THE STABILIZATION CRITERIA HAS BEEN MET.



TEMPERATURE STABILIZATION
90.0
89.0000
88.0000
87.0000
86.0000
85.0000
84.0000
83.0000
82.0000
81.0000
80.0000
5.
10.
20.
25.
35.
0.
60.
135.
210.
285.
360.
435.
510.
TEMPERATURE IN DEGREES FAHRENHEIT
TIME IN MINUTES

APPENDIX A.2.

INTEGRATED LEAKAGE

RATE TEST (ILRT)

CONTAINMENT INTEGRATED LEAKAGE RATE TEST REPORT

Indian Point II - 1984

EBASCO PLANT SERVICES INC.

ILRT Test Services

Indian Point II - 1984

CONTAINMENT INTEGRATED LEAKAGE RATE TEST

LEAKAGE RATE IS MEASURED USING THE ABSOLUTE METHOD AND IS COMPUTED USING THE MASS POINT METHOD IN STRICT ACCORDANCE WITH ANSI/ANS 56.8-1981.

TEST PERIOD STARTED AT 14: 0 HOURS ON 9/19/84
TEST CONDUCTED FOR 24.00 HOURS

FREE SPACE VOLUME OF CONTAINMENT IS 2,610,000 CU FT
CONTAINMENT WAS PRESSURIZED TO 65.58 PSIA

INITIAL CONTAINMENT FITTED AIR WEIGHT WAS 849,837 LBS
FINAL CONTAINMENT FITTED AIR WEIGHT WAS 849,609 LBS

FITTED MASS POINT ILRT LEAKAGE RATE	Lam	=	.027 % PER DAY
UPPER LIMIT OF 95% CONFIDENCE LEVEL	UCL	=	.028 % PER DAY
CONTAINMENT DESIGN LEAKAGE RATE	La	=	.100 % PER DAY
ILRT ACCEPTANCE CRITERIA	75% La	=	.075 % PER DAY

DESCRIPTION OF VARIABLES

AVE TEMP	-	CONTAINMENT MEAN TEMPERATURE CALCULATED FROM VOLUMETRICALLY WEIGHTED RTD SENSOR INDICATIONS.
PRESSURE	-	PRIMARY CONTAINMENT PRESSURE INDICATION.
VAPOR PRES	-	CONTAINMENT VAPOR PRESSURE CALCULATED FROM VOLUMETRICALLY WEIGHTED HUMIDITY/DEWPOINT SENSOR INDICATIONS.
LEAK SIM	-	SIMPLE MASS POINT LEAKAGE RATE.
LEAK FIT	-	LEAKAGE RATE COMPUTED FROM FIRST ORDER REGRESSION OF AIR MASS DATA.
95% UCL	-	UPPER LIMIT OF THE 95% CONFIDENCE LEVEL OF AIR MASS DATA.
AIR MASS	-	CONTAINMENT AIR MASS.

NOTE FOR TABULAR DATA -

1. TABLE VALUES OF ZERO SIGNIFY THE DATA IS NOT APPLICABLE TO THE CALCULATION.
2. 'REJECTED' SIGNIFIES THE SAMPLE WAS REJECTED.
3. 'DELETED' SIGNIFIES THE SENSOR WAS DELETED.

NOTE FOR THE CURVES -

1. NUMBERS CLOSEST TO LEFT MARGIN ALONG ABSCISSA REPRESENT SAMPLE NUMBERS.
2. NUMBERS CLOSEST TO ABSCISSA REPRESENT TIME FROM BEGINNING OF MODE IN MINUTES.
3. 'REJECTED' SIGNIFIES THE SAMPLE WAS REJECTED.

ILRT VARIABLE TABLE SUMMARY

NO.	TIME HOURS	AVE TEMP DEG F	PRESSURE PSIA	VAP PRES PSIA	LEAK SIM %/DAY	LEAK FIT %/DAY	UCL %/DAY	AIR MASS LBS
1	0.00	80.586	65.5820	.4049	0.000	0.000	0.000	849840
2	.25	80.579	65.5810	.4051	.071	0.000	0.000	849834
3	.50	80.572	65.5800	.4047	.014	.014	.293	849838
4	.75	80.560	65.5790	.4047	-.019	-.021	.053	849845
5	1.00	80.559	65.5770	.4049	.061	.036	.121	849818
6	1.25	80.548	65.5760	.4045	.033	.036	.086	849826
7	1.50	80.548	65.5750	.4046	.053	.048	.085	849812
8	1.75	80.524	65.5740	.4046	.005	.026	.062	849837
9	2.00	80.524	65.5730	.4043	.018	.021	.049	849827
10	2.25	80.507	65.5720	.4041	-.005	.007	.033	849844
11	2.50	80.520	65.5710	.4046	.040	.019	.044	849805
12	2.75	80.521	65.5700	.4044	.050	.031	.055	849792
13	3.00	80.488	65.5690	.4040	.004	.021	.044	849835
14	3.25	80.502	65.5690	.4041	.024	.022	.041	849813
15	3.50	80.491	65.5680	.4040	.017	.019	.036	849820
16	3.75	80.486	65.5660	.4039	.029	.022	.037	849801
17	4.00	80.476	65.5650	.4039	.025	.023	.036	849805
18	4.25	80.471	65.5640	.4038	.027	.024	.035	849800
19	4.50	80.479	65.5640	.4040	.034	.026	.037	849787
20	4.75	80.470	65.5630	.4039	.031	.028	.038	849787
21	5.00	80.463	65.5620	.4038	.030	.029	.037	849787
22	5.25	80.455	65.5620	.4037	.021	.027	.035	849801
23	5.50	80.458	65.5600	.4037	.036	.029	.037	849770
24	5.75	80.438	65.5590	.4034	.023	.028	.035	849793
25	6.00	80.439	65.5580	.4034	.029	.029	.035	849778
26	6.25	80.427	65.5570	.4034	.026	.028	.034	849783
27	6.50	80.419	65.5560	.4033	.024	.028	.033	849785
28	6.75	80.414	65.5540	.4031	.030	.028	.033	849769
29	7.00	80.411	65.5540	.4034	.028	.028	.033	849770
30	7.25	80.411	65.5520	.4032	.037	.030	.035	849745
31	7.50	80.398	65.5510	.4031	.032	.031	.035	849754
32	7.75	80.381	65.5500	.4030	.025	.030	.034	849771
33	8.00	80.377	65.5490	.4030	.027	.030	.034	849764
34	8.25	80.372	65.5480	.4028	.027	.029	.033	849760
35	8.50	80.372	65.5470	.4029	.031	.030	.034	849746
36	8.75	80.356	65.5460	.4028	.026	.029	.033	849760
37	9.00	80.351	65.5450	.4027	.026	.029	.032	849757
38	9.25	80.342	65.5440	.4026	.025	.029	.032	849759
39	9.50	80.487	65.5420	.4045	SAMPLE HAS BEEN REJECTED			849479
40	9.75	80.334	65.5410	.4025	.031	.029	.032	849732
41	10.00	80.331	65.5410	.4026	.029	.029	.032	849737
42	10.25	80.324	65.5400	.4025	.029	.029	.032	849735
43	10.50	80.329	65.5390	.4025	.033	.030	.033	849716
44	10.75	80.308	65.5380	.4023	.027	.030	.032	849737
45	11.00	80.305	65.5370	.4022	.028	.030	.032	849731
46	11.25	80.289	65.5360	.4020	.024	.029	.031	849746
47	11.50	80.287	65.5350	.4020	.026	.029	.031	849735
48	11.75	80.276	65.5340	.4020	.024	.028	.030	849740
49	12.00	80.268	65.5330	.4018	.023	.028	.030	849742
50	12.25	80.279	65.5320	.4020	.030	.028	.030	849708

ILRT VARIABLE TABLE SUMMARY

NO.	TIME HOURS	AVE TEMP DEG F	PRESSURE PSIA	VAP PRES PSIA	LEAK SIM %/DAY	LEAK FIT %/DAY	UCL %/DAY	AIR MASS LBS
51	12.50	80.262	65.5310	.4018	.026	.028	.030	849725
52	12.75	80.268	65.5290	.4018	.033	.028	.030	849691
53	13.00	80.254	65.5280	.4017	.030	.029	.031	849700
54	13.25	80.250	65.5270	.4017	.031	.029	.031	849693
55	13.50	80.233	65.5260	.4016	.028	.029	.031	849707
56	13.75	80.235	65.5240	.4016	.033	.029	.031	849679
57	14.00	80.224	65.5240	.4014	.028	.029	.031	849699
58	14.25	80.220	65.5230	.4015	.030	.029	.031	849691
59	14.50	80.211	65.5220	.4013	.028	.029	.031	849694
60	14.75	80.204	65.5200	.4011	.030	.030	.031	849682
61	15.00	80.207	65.5200	.4014	.032	.030	.031	849672
62	15.25	80.205	65.5200	.4012	.030	.030	.031	849679
63	15.50	80.187	65.5190	.4011	.026	.030	.031	849695
64	15.75	80.183	65.5180	.4011	.027	.029	.031	849688
65	16.00	80.185	65.5170	.4011	.030	.030	.031	849672
66	16.25	80.171	65.5160	.4010	.027	.029	.031	849683
67	16.50	80.168	65.5160	.4010	.026	.029	.030	849689
68	16.75	80.171	65.5150	.4009	.029	.029	.030	849671
69	17.00	80.158	65.5140	.4010	.027	.029	.030	849677
70	17.25	80.164	65.5140	.4009	.028	.029	.030	849669
71	17.50	80.144	65.5120	.4007	.026	.029	.030	849678
72	17.75	80.147	65.5110	.4008	.029	.029	.030	849658
73	18.00	80.151	65.5110	.4007	.029	.029	.030	849652
[illegible]	18.25	80.133	65.5100	.4006	.026	.029	.030	849670
[illegible]	18.50	80.135	65.5090	.4005	.029	.029	.030	849653
76	18.75	80.120	65.5080	.4004	.026	.028	.030	849666
77	19.00	80.117	65.5080	.4004	.025	.028	.029	849671
78	19.25	80.117	65.5070	.4004	.027	.028	.029	849658
79	19.50	80.109	65.5050	.4002	.028	.028	.029	849647
80	19.75	80.116	65.5050	.4003	.029	.028	.029	849636
81	20.00	80.104	65.5040	.4003	.028	.028	.029	849640
82	20.25	80.088	65.5030	.4002	.026	.028	.029	849654
83	20.50	80.095	65.5020	.4001	.029	.028	.029	849632
84	20.75	80.080	65.5020	.3999	.025	.028	.029	849658
85	21.00	80.087	65.5010	.4001	.028	.028	.029	849632
86	21.25	80.085	65.5000	.4000	.029	.028	.029	849623
87	21.50	80.073	65.4990	.4000	.028	.028	.029	849628
88	21.75	80.071	65.4980	.3999	.029	.028	.029	849620
89	22.00	80.068	65.4970	.3998	.029	.028	.029	849612
90	22.25	80.059	65.4980	.3996	.025	.028	.029	849643
91	22.50	80.053	65.4980	.3997	.024	.028	.029	849650
92	22.75	80.048	65.4970	.3997	.024	.027	.028	849645
93	23.00	80.050	65.4970	.3997	.024	.027	.028	849642
94	23.25	80.056	65.4960	.3997	.027	.027	.028	849619
95	23.50	80.041	65.4950	.3996	.025	.027	.028	849632
96	23.75	80.040	65.4940	.3995	.026	.027	.028	849621
97	24.00	80.037	65.4940	.3995	.025	.027	.028	849626

SENSOR VOLUME FRACTIONS

TEMPERATURE SENSORS

1 TO 5	0.0000000	.0387814	0.0000000	0.0000000	.0387814
6 TO 10	.0387814	.0387814	.0387814	0.0000000	.0630687
11 TO 15	0.0000000	0.0000000	.0630687	.0630687	0.0000000
16 TO 20	.0630687	0.0000000	.0345507	0.0000000	0.0000000
21 TO 25	.0345507	.0345507	.0345507	.0345507	.0387814
26 TO 30	.0387814	.0208757	.0208757	.0208757	.0208757
31 TO 35	.0208757	.0208757	.0222808	.0222808	.0222808
36 TO 40	.0222808	.0222808	.0222808	.0222808	.0222808

HUMIDITY/DP SENSORS

1 TO 5	.0692386	.0692386	.0692386	.0692386	.1297940
6 TO 10	.1297940	.1297940	.1112210	.1112210	.1112210

NOTE: VALUE OF ZERO INDICATES A DELETED SENSOR.

ILRT VARIABLE TABLE SUMMARY

S[illegible]E NU[illegible]ER	DELTA HOURS	TEMP 1 DEG F	TEMP 2 DEG F	TEMP 3 DEG F	TEMP 4 DEG F	TEMP 5 DEG F	TEMP 6 DEG F
1	0.00	DELETED	80.350	DELETED	DELETED	80.230	80.370
2	.25	DELETED	80.340	DELETED	DELETED	80.210	80.420
3	.50	DELETED	80.310	DELETED	DELETED	80.240	80.400
4	.75	DELETED	80.310	DELETED	DELETED	80.240	80.370
5	1.00	DELETED	80.290	DELETED	DELETED	80.190	80.400
6	1.25	DELETED	80.290	DELETED	DELETED	80.200	80.370
7	1.50	DELETED	80.290	DELETED	DELETED	80.210	80.360
8	1.75	DELETED	80.280	DELETED	DELETED	80.210	80.320
9	2.00	DELETED	80.280	DELETED	DELETED	80.190	80.340
10	2.25	DELETED	80.250	DELETED	DELETED	80.170	80.340
11	2.50	DELETED	80.280	DELETED	DELETED	80.190	80.340
12	2.75	DELETED	80.280	DELETED	DELETED	80.190	80.360
13	3.00	DELETED	80.240	DELETED	DELETED	80.180	80.310
14	3.25	DELETED	80.240	DELETED	DELETED	80.160	80.310
15	3.50	DELETED	80.240	DELETED	DELETED	80.160	80.310
16	3.75	DELETED	80.240	DELETED	DELETED	80.110	80.250
17	4.00	DELETED	80.220	DELETED	DELETED	80.110	80.260
18	4.25	DELETED	80.230	DELETED	DELETED	80.140	80.270
19	4.50	DELETED	80.240	DELETED	DELETED	80.140	80.260
20	4.75	DELETED	80.220	DELETED	DELETED	80.110	80.280
21	5.00	DELETED	80.190	DELETED	DELETED	80.110	80.260
22	5.25	DELETED	80.180	DELETED	DELETED	80.090	80.220
23	5.50	DELETED	80.200	DELETED	DELETED	80.100	80.240
[illegible]	5.75	DELETED	80.160	DELETED	DELETED	80.110	80.220
[illegible]	6.00	DELETED	80.200	DELETED	DELETED	80.090	80.220
26	6.25	DELETED	80.180	DELETED	DELETED	80.070	80.240
27	6.50	DELETED	80.170	DELETED	DELETED	80.080	80.240
28	6.75	DELETED	80.150	DELETED	DELETED	80.080	80.190
29	7.00	DELETED	80.150	DELETED	DELETED	80.070	80.220
30	7.25	DELETED	80.190	DELETED	DELETED	80.080	80.210
31	7.50	DELETED	80.140	DELETED	DELETED	80.070	80.180
32	7.75	DELETED	80.130	DELETED	DELETED	80.020	80.150
33	8.00	DELETED	80.110	DELETED	DELETED	80.030	80.160
34	8.25	DELETED	80.110	DELETED	DELETED	80.020	80.150
35	8.50	DELETED	80.110	DELETED	DELETED	80.050	80.180
36	8.75	DELETED	80.090	DELETED	DELETED	79.980	80.140
37	9.00	DELETED	80.110	DELETED	DELETED	80.010	80.160
38	9.25	DELETED	80.090	DELETED	DELETED	80.010	80.140
39	9.50	DELETED	80.250	DELETED	DELETED	80.190	80.340
40	9.75	DELETED	80.060	DELETED	DELETED	79.980	80.130
41	10.00	DELETED	80.060	DELETED	DELETED	79.980	80.130
42	10.25	DELETED	80.060	DELETED	DELETED	79.980	80.130
43	10.50	DELETED	80.070	DELETED	DELETED	79.980	80.130
44	10.75	DELETED	80.070	DELETED	DELETED	79.980	80.090
45	11.00	DELETED	80.050	DELETED	DELETED	79.970	80.090
46	11.25	DELETED	80.020	DELETED	DELETED	79.940	80.110
47	11.50	DELETED	80.050	DELETED	DELETED	79.960	80.090
48	11.75	DELETED	80.020	DELETED	DELETED	79.950	80.080
[illegible]	12.00	DELETED	80.000	DELETED	DELETED	79.920	80.050
[illegible]	12.25	DELETED	80.050	DELETED	DELETED	79.950	80.100

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 1 DEG F	TEMP 2 DEG F	TEMP 3 DEG F	TEMP 4 DEG F	TEMP 5 DEG F	TEMP 6 DEG F
51	12.50	DELETED	80.020	DELETED	DELETED	79.900	80.050
52	12.75	DELETED	80.030	DELETED	DELETED	79.920	80.050
53	13.00	DELETED	80.020	DELETED	DELETED	79.910	80.040
54	13.25	DELETED	79.980	DELETED	DELETED	79.920	80.020
55	13.50	DELETED	80.000	DELETED	DELETED	79.900	80.050
56	13.75	DELETED	79.980	DELETED	DELETED	79.900	80.020
57	14.00	DELETED	79.970	DELETED	DELETED	79.900	80.010
58	14.25	DELETED	79.990	DELETED	DELETED	79.900	80.030
59	14.50	DELETED	79.970	DELETED	DELETED	79.860	80.010
60	14.75	DELETED	79.970	DELETED	DELETED	79.880	80.010
61	15.00	DELETED	79.940	DELETED	DELETED	79.860	80.010
62	15.25	DELETED	79.970	DELETED	DELETED	79.860	80.010
63	15.50	DELETED	79.940	DELETED	DELETED	79.870	80.000
64	15.75	DELETED	79.920	DELETED	DELETED	79.840	79.980
65	16.00	DELETED	79.910	DELETED	DELETED	79.830	79.980
66	16.25	DELETED	79.920	DELETED	DELETED	79.840	79.980
67	16.50	DELETED	79.930	DELETED	DELETED	79.820	79.990
68	16.75	DELETED	79.920	DELETED	DELETED	79.840	79.980
69	17.00	DELETED	79.910	DELETED	DELETED	79.830	79.950
70	17.25	DELETED	79.910	DELETED	DELETED	79.820	79.980
71	17.50	DELETED	79.870	DELETED	DELETED	79.810	79.940
72	17.75	DELETED	79.910	DELETED	DELETED	79.800	79.910
73	18.00	DELETED	79.910	DELETED	DELETED	79.810	79.950
[illegible]	18.25	DELETED	79.880	DELETED	DELETED	79.800	79.900
[illegible]	18.50	DELETED	79.890	DELETED	DELETED	79.780	79.940
76	18.75	DELETED	79.870	DELETED	DELETED	79.800	79.910
77	19.00	DELETED	79.870	DELETED	DELETED	79.780	79.910
78	19.25	DELETED	79.860	DELETED	DELETED	79.770	79.930
79	19.50	DELETED	79.860	DELETED	DELETED	79.750	79.900
80	19.75	DELETED	79.880	DELETED	DELETED	79.790	79.940
81	20.00	DELETED	79.870	DELETED	DELETED	79.780	79.910
82	20.25	DELETED	79.850	DELETED	DELETED	79.760	79.890
83	20.50	DELETED	79.850	DELETED	DELETED	79.760	79.910
84	20.75	DELETED	79.820	DELETED	DELETED	79.760	79.890
85	21.00	DELETED	79.820	DELETED	DELETED	79.740	79.890
86	21.25	DELETED	79.850	DELETED	DELETED	79.760	79.870
87	21.50	DELETED	79.850	DELETED	DELETED	79.740	79.870
88	21.75	DELETED	79.840	DELETED	DELETED	79.750	79.880
89	22.00	DELETED	79.840	DELETED	DELETED	79.750	79.860
90	22.25	DELETED	79.800	DELETED	DELETED	79.710	79.860
91	22.50	DELETED	79.790	DELETED	DELETED	79.710	79.840
92	22.75	DELETED	79.790	DELETED	DELETED	79.710	79.840
93	23.00	DELETED	79.790	DELETED	DELETED	79.680	79.850
94	23.25	DELETED	79.810	DELETED	DELETED	79.710	79.850
95	23.50	DELETED	79.770	DELETED	DELETED	79.710	79.860
96	23.75	DELETED	79.770	DELETED	DELETED	79.690	79.800
97	24.00	DELETED	79.800	DELETED	DELETED	79.710	79.820

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 7 DEG F	TEMP 8 DEG F	TEMP 9 DEG F	TEMP 10 DEG F	TEMP 11 DEG F	TEMP 12 DEG F
1	0.00	80.400	80.270	DELETED	80.530	DELETED	DELETED
2	.25	80.420	80.280	DELETED	80.490	DELETED	DELETED
3	.50	80.420	80.270	DELETED	80.500	DELETED	DELETED
4	.75	80.390	80.280	DELETED	80.450	DELETED	DELETED
5	1.00	80.400	80.280	DELETED	80.510	DELETED	DELETED
6	1.25	80.400	80.240	DELETED	80.460	DELETED	DELETED
7	1.50	80.360	80.280	DELETED	80.470	DELETED	DELETED
8	1.75	80.360	80.210	DELETED	80.450	DELETED	DELETED
9	2.00	80.360	80.230	DELETED	80.450	DELETED	DELETED
10	2.25	80.360	80.210	DELETED	80.380	DELETED	DELETED
11	2.50	80.360	80.210	DELETED	80.450	DELETED	DELETED
12	2.75	80.380	80.230	DELETED	80.470	DELETED	DELETED
13	3.00	80.330	80.200	DELETED	80.390	DELETED	DELETED
14	3.25	80.330	80.200	DELETED	80.440	DELETED	DELETED
15	3.50	80.310	80.180	DELETED	80.390	DELETED	DELETED
16	3.75	80.320	80.170	DELETED	80.410	DELETED	DELETED
17	4.00	80.280	80.180	DELETED	80.390	DELETED	DELETED
18	4.25	80.310	80.160	DELETED	80.370	DELETED	DELETED
19	4.50	80.330	80.200	DELETED	80.390	DELETED	DELETED
20	4.75	80.300	80.180	DELETED	80.390	DELETED	DELETED
21	5.00	80.300	80.180	DELETED	80.370	DELETED	DELETED
22	5.25	80.260	80.130	DELETED	80.390	DELETED	DELETED
23	5.50	80.290	80.140	DELETED	80.420	DELETED	DELETED
[illegible]	5.75	80.260	80.160	DELETED	80.370	DELETED	DELETED
[illegible]	6.00	80.260	80.160	DELETED	80.330	DELETED	DELETED
26	6.25	80.260	80.110	DELETED	80.370	DELETED	DELETED
27	6.50	80.250	80.110	DELETED	80.340	DELETED	DELETED
28	6.75	80.240	80.110	DELETED	80.340	DELETED	DELETED
29	7.00	80.240	80.090	DELETED	80.320	DELETED	DELETED
30	7.25	80.240	80.130	DELETED	80.320	DELETED	DELETED
31	7.50	80.220	80.090	DELETED	80.310	DELETED	DELETED
32	7.75	80.190	80.090	DELETED	80.260	DELETED	DELETED
33	8.00	80.180	80.050	DELETED	80.260	DELETED	DELETED
34	8.25	80.190	80.070	DELETED	80.300	DELETED	DELETED
35	8.50	80.190	80.070	DELETED	80.280	DELETED	DELETED
36	8.75	80.160	80.030	DELETED	80.220	DELETED	DELETED
37	9.00	80.180	80.070	DELETED	80.240	DELETED	DELETED
38	9.25	80.180	80.030	DELETED	80.240	DELETED	DELETED
39	9.50	80.380	80.300	DELETED	80.470	DELETED	DELETED
40	9.75	80.150	80.040	DELETED	80.190	DELETED	DELETED
41	10.00	80.150	80.040	DELETED	80.210	DELETED	DELETED
42	10.25	80.150	80.020	DELETED	80.210	DELETED	DELETED
43	10.50	80.150	80.050	DELETED	80.220	DELETED	DELETED
44	10.75	80.140	80.030	DELETED	80.200	DELETED	DELETED
45	11.00	80.140	80.010	DELETED	80.200	DELETED	DELETED
46	11.25	80.110	80.000	DELETED	80.150	DELETED	DELETED
47	11.50	80.110	79.980	DELETED	80.150	DELETED	DELETED
48	11.75	80.110	79.980	DELETED	80.150	DELETED	DELETED
[illegible]	12.00	80.110	79.980	DELETED	80.070	DELETED	DELETED
[illegible]	12.25	80.120	79.970	DELETED	80.140	DELETED	DELETED

ILRT VARIABLE TABLE SUMMARY

SA[illegible]E NUMBER	DELTA HOURS	TEMP 7 DEG F	TEMP 8 DEG F	TEMP 9 DEG F	TEMP 10 DEG F	TEMP 11 DEG F	TEMP 12 DEG F
51	12.50	80.070	79.960	DELETED	80.110	DELETED	DELETED
52	12.75	80.090	79.970	DELETED	80.160	DELETED	DELETED
53	13.00	80.080	79.940	DELETED	80.150	DELETED	DELETED
54	13.25	80.070	79.960	DELETED	80.070	DELETED	DELETED
55	13.50	80.070	79.940	DELETED	80.110	DELETED	DELETED
56	13.75	80.070	79.940	DELETED	80.110	DELETED	DELETED
57	14.00	80.050	79.920	DELETED	80.070	DELETED	DELETED
58	14.25	80.050	79.930	DELETED	80.070	DELETED	DELETED
59	14.50	80.030	79.920	DELETED	80.030	DELETED	DELETED
60	14.75	80.050	79.920	DELETED	80.050	DELETED	DELETED
61	15.00	80.030	79.900	DELETED	80.070	DELETED	DELETED
62	15.25	80.030	79.880	DELETED	80.070	DELETED	DELETED
63	15.50	80.020	79.890	DELETED	80.060	DELETED	DELETED
64	15.75	80.030	79.900	DELETED	80.030	DELETED	DELETED
65	16.00	80.000	79.910	DELETED	80.020	DELETED	DELETED
66	16.25	80.010	79.880	DELETED	80.010	DELETED	DELETED
67	16.50	80.010	79.840	DELETED	79.970	DELETED	DELETED
68	16.75	79.980	79.880	DELETED	80.010	DELETED	DELETED
69	17.00	80.000	79.890	DELETED	80.020	DELETED	DELETED
70	17.25	79.990	79.850	DELETED	80.040	DELETED	DELETED
71	17.50	79.980	79.870	DELETED	79.980	DELETED	DELETED
72	17.75	79.980	79.870	DELETED	79.990	DELETED	DELETED
[illegible]	18.00	79.980	79.850	DELETED	80.000	DELETED	DELETED
[illegible]	18.25	79.970	79.840	DELETED	79.970	DELETED	DELETED
[illegible]	18.50	79.950	79.830	DELETED	79.980	DELETED	DELETED
76	18.75	79.930	79.820	DELETED	79.930	DELETED	DELETED
77	19.00	79.950	79.800	DELETED	79.990	DELETED	DELETED
78	19.25	79.940	79.820	DELETED	79.970	DELETED	DELETED
79	19.50	79.940	79.820	DELETED	79.940	DELETED	DELETED
80	19.75	79.940	79.830	DELETED	79.960	DELETED	DELETED
81	20.00	79.940	79.810	DELETED	79.980	DELETED	DELETED
82	20.25	79.910	79.780	DELETED	79.940	DELETED	DELETED
83	20.50	79.950	79.810	DELETED	80.000	DELETED	DELETED
84	20.75	79.910	79.780	DELETED	79.950	DELETED	DELETED
85	21.00	79.910	79.780	DELETED	79.980	DELETED	DELETED
86	21.25	79.910	79.780	DELETED	79.980	DELETED	DELETED
87	21.50	79.910	79.760	DELETED	79.950	DELETED	DELETED
88	21.75	79.920	79.810	DELETED	79.960	DELETED	DELETED
89	22.00	79.900	79.800	DELETED	79.900	DELETED	DELETED
90	22.25	79.880	79.730	DELETED	79.860	DELETED	DELETED
91	22.50	79.900	79.750	DELETED	79.900	DELETED	DELETED
92	22.75	79.850	79.750	DELETED	79.880	DELETED	DELETED
93	23.00	79.870	79.720	DELETED	79.900	DELETED	DELETED
94	23.25	79.900	79.790	DELETED	79.940	DELETED	DELETED
95	23.50	79.880	79.730	DELETED	79.840	DELETED	DELETED
96	23.75	79.840	79.710	DELETED	79.820	DELETED	DELETED
97	24.00	79.860	79.710	DELETED	79.900	DELETED	DELETED

ILRT VARIABLE TABLE SUMMARY

S[illegible]LE NUMBER	DELTA HOURS	TEMP 13 DEG F	TEMP 14 DEG F	TEMP 15 DEG F	TEMP 16 DEG F	TEMP 17 DEG F	TEMP 18 DEG F
1	0.00	80.590	80.270	DELETED	80.670	DELETED	80.590
2	.25	80.620	80.250	DELETED	80.660	DELETED	80.510
3	.50	80.570	80.230	DELETED	80.650	DELETED	80.540
4	.75	80.560	80.260	DELETED	80.650	DELETED	80.560
5	1.00	80.550	80.190	DELETED	80.660	DELETED	80.490
6	1.25	80.540	80.230	DELETED	80.610	DELETED	80.500
7	1.50	80.550	80.210	DELETED	80.640	DELETED	80.530
8	1.75	80.530	80.210	DELETED	80.590	DELETED	80.550
9	2.00	80.510	80.170	DELETED	80.620	DELETED	80.530
10	2.25	80.510	80.150	DELETED	80.590	DELETED	80.420
11	2.50	80.530	80.190	DELETED	80.590	DELETED	80.470
12	2.75	80.510	80.190	DELETED	80.620	DELETED	80.490
13	3.00	80.500	80.160	DELETED	80.580	DELETED	80.480
14	3.25	80.480	80.160	DELETED	80.580	DELETED	80.500
15	3.50	80.500	80.160	DELETED	80.560	DELETED	80.440
16	3.75	80.470	80.110	DELETED	80.550	DELETED	80.470
17	4.00	80.480	80.110	DELETED	80.560	DELETED	80.480
18	4.25	80.440	80.120	DELETED	80.570	DELETED	80.480
19	4.50	80.480	80.140	DELETED	80.560	DELETED	80.450
20	4.75	80.490	80.130	DELETED	80.540	DELETED	80.430
21	5.00	80.480	80.130	DELETED	80.560	DELETED	80.450
22	5.25	80.520	80.110	DELETED	80.520	DELETED	80.480
[illegible]	5.50	80.530	80.120	DELETED	80.540	DELETED	80.460
[illegible]	5.75	80.410	80.090	DELETED	80.500	DELETED	80.370
[illegible]	6.00	80.440	80.070	DELETED	80.520	DELETED	80.450
26	6.25	80.410	80.070	DELETED	80.540	DELETED	80.440
27	6.50	80.430	80.040	DELETED	80.510	DELETED	80.450
28	6.75	80.380	80.040	DELETED	80.490	DELETED	80.340
29	7.00	80.410	80.070	DELETED	80.480	DELETED	80.410
30	7.25	80.380	80.060	DELETED	80.490	DELETED	80.410
31	7.50	80.390	80.070	DELETED	80.480	DELETED	80.350
32	7.75	80.370	80.020	DELETED	80.480	DELETED	80.390
33	8.00	80.390	80.030	DELETED	80.450	DELETED	80.370
34	8.25	80.350	80.000	DELETED	80.450	DELETED	80.350
35	8.50	80.370	80.050	DELETED	80.450	DELETED	80.320
36	8.75	80.410	80.010	DELETED	80.450	DELETED	80.370
37	9.00	80.370	79.980	DELETED	80.440	DELETED	80.330
38	9.25	80.350	79.980	DELETED	80.410	DELETED	80.330
39	9.50	80.620	80.300	DELETED	80.710	DELETED	80.620
40	9.75	80.380	80.020	DELETED	80.430	DELETED	80.340
41	10.00	80.410	80.020	DELETED	80.380	DELETED	80.360
42	10.25	80.360	80.000	DELETED	80.410	DELETED	80.340
43	10.50	80.370	80.000	DELETED	80.410	DELETED	80.320
44	10.75	80.330	80.010	DELETED	80.410	DELETED	80.280
45	11.00	80.310	79.970	DELETED	80.370	DELETED	80.280
46	11.25	80.260	79.920	DELETED	80.370	DELETED	80.280
47	11.50	80.320	79.940	DELETED	80.370	DELETED	80.300
[illegible]	11.75	80.300	79.950	DELETED	80.340	DELETED	80.210
[illegible]	12.00	80.280	79.920	DELETED	80.350	DELETED	80.320
[illegible]	12.25	80.330	79.990	DELETED	80.330	DELETED	80.270

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 13 DEG F	TEMP 14 DEG F	TEMP 15 DEG F	TEMP 16 DEG F	TEMP 17 DEG F	TEMP 18 DEG F
51	12.50	80.260	79.940	DELETED	80.350	DELETED	80.300
52	12.75	80.260	79.920	DELETED	80.370	DELETED	80.240
53	13.00	80.250	79.910	DELETED	80.360	DELETED	80.190
54	13.25	80.280	79.900	DELETED	80.350	DELETED	80.260
55	13.50	80.240	79.920	DELETED	80.350	DELETED	80.190
56	13.75	80.220	79.880	DELETED	80.320	DELETED	80.240
57	14.00	80.240	79.900	DELETED	80.310	DELETED	80.260
58	14.25	80.270	79.880	DELETED	80.330	DELETED	80.240
59	14.50	80.200	79.880	DELETED	80.310	DELETED	80.200
60	14.75	80.220	79.860	DELETED	80.280	DELETED	80.220
61	15.00	80.260	79.900	DELETED	80.280	DELETED	80.180
62	15.25	80.220	79.880	DELETED	80.280	DELETED	80.180
63	15.50	80.210	79.870	DELETED	80.280	DELETED	80.210
64	15.75	80.200	79.840	DELETED	80.260	DELETED	80.200
65	16.00	80.210	79.850	DELETED	80.250	DELETED	80.130
66	16.25	80.180	79.810	DELETED	80.280	DELETED	80.110
67	16.50	80.180	79.840	DELETED	80.270	DELETED	80.140
68	16.75	80.160	79.840	DELETED	80.220	DELETED	80.140
69	17.00	80.170	79.830	DELETED	80.250	DELETED	80.150
70	17.25	80.170	79.820	DELETED	80.250	DELETED	80.150
71	17.50	80.170	79.780	DELETED	80.210	DELETED	80.110
72	17.75	80.230	79.760	DELETED	80.250	DELETED	80.120
[illegible]	18.00	80.170	79.810	DELETED	80.250	DELETED	80.130
[illegible]	18.25	80.140	79.750	DELETED	80.220	DELETED	80.120
[illegible]	18.50	80.150	79.780	DELETED	80.210	DELETED	80.110
76	18.75	80.120	79.780	DELETED	80.210	DELETED	80.120
77	19.00	80.100	79.760	DELETED	80.210	DELETED	80.150
78	19.25	80.140	79.770	DELETED	80.200	DELETED	80.100
79	19.50	80.100	79.750	DELETED	80.200	DELETED	80.100
80	19.75	80.110	79.720	DELETED	80.220	DELETED	80.180
81	20.00	80.130	79.760	DELETED	80.190	DELETED	80.080
82	20.25	80.110	79.780	DELETED	80.190	DELETED	80.080
83	20.50	80.080	79.760	DELETED	80.170	DELETED	80.020
84	20.75	80.080	79.690	DELETED	80.170	DELETED	80.060
85	21.00	80.080	79.760	DELETED	80.170	DELETED	80.080
86	21.25	80.080	79.740	DELETED	80.170	DELETED	80.040
87	21.50	80.100	79.740	DELETED	80.190	DELETED	80.080
88	21.75	80.030	79.710	DELETED	80.150	DELETED	80.050
89	22.00	80.070	79.730	DELETED	80.160	DELETED	80.050
90	22.25	80.050	79.730	DELETED	80.120	DELETED	80.010
91	22.50	80.070	79.710	DELETED	80.150	DELETED	80.010
92	22.75	80.050	79.670	DELETED	80.110	DELETED	80.050
93	23.00	80.070	79.720	DELETED	80.110	DELETED	80.000
94	23.25	80.030	79.710	DELETED	80.140	DELETED	79.980
95	23.50	80.030	79.710	DELETED	80.140	DELETED	80.010
96	23.75	80.030	79.730	DELETED	80.120	DELETED	80.010
97	24.00	80.030	79.690	DELETED	80.140	DELETED	79.990

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 19 DEG F	TEMP 20 DEG F	TEMP 21 DEG F	TEMP 22 DEG F	TEMP 23 DEG F	TEMP 24 DEG F
1	0.00	DELETED	DELETED	80.710	80.960	80.940	80.900
2	.25	DELETED	DELETED	80.690	81.010	80.900	80.860
3	.50	DELETED	DELETED	80.730	80.940	80.940	80.880
4	.75	DELETED	DELETED	80.690	80.920	80.830	80.860
5	1.00	DELETED	DELETED	80.660	80.880	80.860	80.880
6	1.25	DELETED	DELETED	80.660	80.990	80.820	80.860
7	1.50	DELETED	DELETED	80.690	80.900	80.940	80.830
8	1.75	DELETED	DELETED	80.620	80.860	80.820	80.830
9	2.00	DELETED	DELETED	80.670	80.900	80.840	80.820
10	2.25	DELETED	DELETED	80.670	80.880	80.880	80.840
11	2.50	DELETED	DELETED	80.660	80.880	80.820	80.820
12	2.75	DELETED	DELETED	80.620	80.820	80.830	80.820
13	3.00	DELETED	DELETED	80.620	80.750	80.690	80.820
14	3.25	DELETED	DELETED	80.640	80.820	80.880	80.790
15	3.50	DELETED	DELETED	80.640	80.830	80.770	80.790
16	3.75	DELETED	DELETED	80.600	80.830	80.860	80.820
17	4.00	DELETED	DELETED	80.620	80.880	80.770	80.790
18	4.25	DELETED	DELETED	80.620	80.710	80.820	80.790
19	4.50	DELETED	DELETED	80.620	80.790	80.820	80.790
20	4.75	DELETED	DELETED	80.620	80.920	80.710	80.770
21	5.00	DELETED	DELETED	80.600	80.790	80.820	80.790
22	5.25	DELETED	DELETED	80.580	80.770	80.750	80.770
23	5.50	DELETED	DELETED	80.560	80.790	80.790	80.770
[illegible]	5.75	DELETED	DELETED	80.580	80.830	80.790	80.730
25	6.00	DELETED	DELETED	80.580	80.790	80.770	80.730
26	6.25	DELETED	DELETED	80.560	80.690	80.770	80.730
27	6.50	DELETED	DELETED	80.560	80.710	80.730	80.730
28	6.75	DELETED	DELETED	80.540	80.880	80.750	80.730
29	7.00	DELETED	DELETED	80.520	80.730	80.690	80.710
30	7.25	DELETED	DELETED	80.540	80.820	80.750	80.730
31	7.50	DELETED	DELETED	80.540	80.830	80.710	80.710
32	7.75	DELETED	DELETED	80.540	80.750	80.730	80.710
33	8.00	DELETED	DELETED	80.540	80.710	80.750	80.660
34	8.25	DELETED	DELETED	80.470	80.790	80.710	80.710
35	8.50	DELETED	DELETED	80.520	80.770	80.730	80.690
36	8.75	DELETED	DELETED	80.490	80.750	80.690	80.660
37	9.00	DELETED	DELETED	80.470	80.820	80.660	80.660
38	9.25	DELETED	DELETED	80.520	80.710	80.640	80.640
39	9.50	DELETED	DELETED	80.540	80.830	80.790	80.750
40	9.75	DELETED	DELETED	80.450	80.710	80.640	80.620
41	10.00	DELETED	DELETED	80.480	80.690	80.610	80.610
42	10.25	DELETED	DELETED	80.470	80.750	80.580	80.640
43	10.50	DELETED	DELETED	80.450	80.790	80.640	80.620
44	10.75	DELETED	DELETED	80.450	80.690	80.560	80.620
45	11.00	DELETED	DELETED	80.450	80.730	80.610	80.580
46	11.25	DELETED	DELETED	80.430	80.660	80.640	80.600
47	11.50	DELETED	DELETED	80.450	80.640	80.560	80.580
48	11.75	DELETED	DELETED	80.410	80.670	80.620	80.580
[illegible]	12.00	DELETED	DELETED	80.430	80.710	80.620	80.580
[illegible]	12.25	DELETED	DELETED	80.410	80.690	80.560	80.580

ILRT VARIABLE TABLE SUMMARY

S[illegible]E NUMBER	DELTA HOURS	TEMP 19 DEG F	TEMP 20 DEG F	TEMP 21 DEG F	TEMP 22 DEG F	TEMP 23 DEG F	TEMP 24 DEG F
51	12.50	DELETED	DELETED	80.410	80.640	80.560	80.560
52	12.75	DELETED	DELETED	80.410	80.660	80.640	80.580
53	13.00	DELETED	DELETED	80.390	80.660	80.600	80.600
54	13.25	DELETED	DELETED	80.410	80.660	80.600	80.560
55	13.50	DELETED	DELETED	80.350	80.600	80.520	80.540
56	13.75	DELETED	DELETED	80.390	80.620	80.520	80.580
57	14.00	DELETED	DELETED	80.360	80.560	80.560	80.540
58	14.25	DELETED	DELETED	80.350	80.660	80.490	80.540
59	14.50	DELETED	DELETED	80.330	80.690	80.500	80.520
60	14.75	DELETED	DELETED	80.360	80.600	80.470	80.520
61	15.00	DELETED	DELETED	80.330	80.670	80.560	80.520
62	15.25	DELETED	DELETED	80.350	80.660	80.520	80.520
63	15.50	DELETED	DELETED	80.300	80.580	80.430	80.520
64	15.75	DELETED	DELETED	80.300	80.490	80.560	80.490
65	16.00	DELETED	DELETED	80.360	80.560	80.600	80.490
66	16.25	DELETED	DELETED	80.310	80.580	80.480	80.520
67	16.50	DELETED	DELETED	80.300	80.580	80.520	80.490
68	16.75	DELETED	DELETED	80.300	80.620	80.490	80.490
69	17.00	DELETED	DELETED	80.300	80.450	80.450	80.470
70	17.25	DELETED	DELETED	80.280	80.540	80.560	80.490
71	17.50	DELETED	DELETED	80.280	80.520	80.410	80.450
72	17.75	DELETED	DELETED	80.280	80.640	80.450	80.450
[illegible]	18.00	DELETED	DELETED	80.260	80.560	80.500	80.450
[illegible]	18.25	DELETED	DELETED	80.300	80.490	80.470	80.470
[illegible]	18.50	DELETED	DELETED	80.260	80.620	80.540	80.430
76	18.75	DELETED	DELETED	80.260	80.540	80.430	80.430
77	19.00	DELETED	DELETED	80.260	80.430	80.480	80.450
78	19.25	DELETED	DELETED	80.240	80.490	80.410	80.430
79	19.50	DELETED	DELETED	80.260	80.470	80.430	80.430
80	19.75	DELETED	DELETED	80.260	80.520	80.450	80.430
81	20.00	DELETED	DELETED	80.280	80.410	80.390	80.430
82	20.25	DELETED	DELETED	80.240	80.410	80.350	80.410
83	20.50	DELETED	DELETED	80.240	80.540	80.360	80.410
84	20.75	DELETED	DELETED	80.240	80.470	80.390	80.410
85	21.00	DELETED	DELETED	80.240	80.390	80.410	80.410
86	21.25	DELETED	DELETED	80.190	80.410	80.430	80.430
87	21.50	DELETED	DELETED	80.190	80.360	80.360	80.410
88	21.75	DELETED	DELETED	80.220	80.450	80.350	80.390
89	22.00	DELETED	DELETED	80.190	80.470	80.410	80.390
90	22.25	DELETED	DELETED	80.240	80.560	80.390	80.390
91	22.50	DELETED	DELETED	80.190	80.350	80.390	80.390
92	22.75	DELETED	DELETED	80.190	80.470	80.390	80.390
93	23.00	DELETED	DELETED	80.220	80.360	80.360	80.360
94	23.25	DELETED	DELETED	80.190	80.410	80.390	80.390
95	23.50	DELETED	DELETED	80.220	80.410	80.350	80.390
96	23.75	DELETED	DELETED	80.170	80.490	80.390	80.360
97	24.00	DELETED	DELETED	80.170	80.450	80.350	80.360

ILRT VARIABLE TABLE SUMMARY

S[illegible]E NUMBER	DELTA HOURS	TEMP 25 DEG F	TEMP 26 DEG F	TEMP 27 DEG F	TEMP 28 DEG F	TEMP 29 DEG F	TEMP 30 DEG F
1	0.00	80.130	80.300	80.690	80.750	81.520	80.560
2	.25	80.130	80.280	80.660	80.730	81.520	80.640
3	.50	80.110	80.280	80.660	80.730	81.520	80.600
4	.75	80.110	80.280	80.660	80.710	81.430	80.580
5	1.00	80.130	80.240	80.660	80.690	81.670	80.580
6	1.25	80.110	80.260	80.640	80.730	81.540	80.600
7	1.50	80.090	80.240	80.640	80.690	81.540	80.560
8	1.75	80.110	80.240	80.620	80.690	81.330	80.540
9	2.00	80.070	80.240	80.620	80.690	81.420	80.560
10	2.25	80.090	80.220	80.620	80.650	81.420	80.520
11	2.50	80.070	80.220	80.620	80.660	81.500	80.520
12	2.75	80.070	80.220	80.600	80.690	81.520	80.520
13	3.00	80.050	80.190	80.600	80.640	81.390	80.490
14	3.25	80.070	80.220	80.600	80.660	81.480	80.490
15	3.50	80.050	80.240	80.600	80.640	81.500	80.490
16	3.75	80.050	80.220	80.600	80.640	81.520	80.470
17	4.00	80.050	80.190	80.600	80.640	81.410	80.470
18	4.25	80.050	80.190	80.580	80.640	81.430	80.470
19	4.50	80.020	80.190	80.580	80.640	81.410	80.490
20	4.75	80.020	80.220	80.580	80.640	81.290	80.470
21	5.00	80.020	80.170	80.560	80.600	81.330	80.450
22	5.25	80.020	80.170	80.560	80.600	81.370	80.470
[illegible]	5.50	80.020	80.150	80.560	80.600	81.460	80.490
[illegible]	5.75	80.000	80.130	80.560	80.600	81.430	80.450
[illegible]	6.00	80.000	80.150	80.540	80.600	81.460	80.450
26	6.25	79.980	80.130	80.540	80.580	81.370	80.450
27	6.50	79.980	80.130	80.520	80.600	81.410	80.450
28	6.75	79.980	80.130	80.520	80.580	81.480	80.450
29	7.00	79.980	80.150	80.520	80.580	81.540	80.430
30	7.25	79.980	80.130	80.490	80.560	81.240	80.450
31	7.50	79.960	80.110	80.490	80.560	81.370	80.410
32	7.75	79.960	80.110	80.490	80.540	81.180	80.410
33	8.00	79.960	80.110	80.470	80.540	81.260	80.410
34	8.25	79.940	80.090	80.470	80.540	81.310	80.390
35	8.50	79.940	80.090	80.490	80.520	81.220	80.390
36	8.75	79.940	80.090	80.450	80.520	81.240	80.360
37	9.00	79.940	80.070	80.450	80.490	81.120	80.390
38	9.25	79.920	80.070	80.430	80.520	81.290	80.360
39	9.50	80.000	80.150	80.560	80.600	81.240	80.470
40	9.75	79.920	80.050	80.450	80.490	81.180	80.360
41	10.00	79.900	80.030	80.450	80.520	81.140	80.350
42	10.25	79.900	80.050	80.430	80.490	81.220	80.350
43	10.50	79.900	80.050	80.430	80.470	81.130	80.320
44	10.75	79.850	80.020	80.430	80.470	81.130	80.350
45	11.00	79.850	80.050	80.410	80.480	81.160	80.350
46	11.25	79.880	80.020	80.390	80.450	81.240	80.300
47	11.50	79.850	80.000	80.410	80.430	81.220	80.320
[illegible]	11.75	79.880	80.010	80.390	80.430	81.140	80.280
[illegible]	12.00	79.850	79.980	80.390	80.450	81.090	80.280
[illegible]	12.25	79.850	79.980	80.390	80.430	81.200	80.280

ILRT VARIABLE TABLE SUMMARY

S[illegible]E NUMBER	DELTA HOURS	TEMP 25 DEG F	TEMP 26 DEG F	TEMP 27 DEG F	TEMP 28 DEG F	TEMP 29 DEG F	TEMP 30 DEG F
51	12.50	79.830	80.000	80.390	80.430	81.120	80.300
52	12.75	79.850	79.980	80.360	80.410	81.240	80.280
53	13.00	79.830	79.980	80.360	80.430	81.130	80.280
54	13.25	79.810	79.980	80.350	80.390	81.290	80.280
55	13.50	79.810	79.920	80.350	80.390	81.120	80.280
56	13.75	79.790	79.960	80.350	80.390	81.130	80.280
57	14.00	79.790	79.940	80.350	80.390	81.070	80.260
58	14.25	79.790	79.920	80.350	80.390	80.990	80.190
59	14.50	79.790	79.940	80.350	80.390	81.180	80.220
60	14.75	79.770	79.940	80.320	80.360	81.030	80.280
61	15.00	79.770	79.940	80.310	80.350	81.010	80.260
62	15.25	79.770	79.920	80.320	80.360	81.220	80.220
63	15.50	79.770	79.920	80.300	80.350	81.010	80.220
64	15.75	79.750	79.920	80.280	80.320	81.220	80.190
65	16.00	79.770	79.900	80.280	80.350	81.240	80.190
66	16.25	79.750	79.900	80.310	80.350	81.010	80.220
67	16.50	79.750	79.920	80.300	80.320	81.030	80.220
68	16.75	79.750	79.880	80.300	80.320	81.180	80.190
69	17.00	79.720	79.900	80.300	80.320	81.090	80.190
70	17.25	79.750	79.850	80.280	80.320	81.130	80.190
71	17.50	79.730	79.880	80.260	80.310	81.120	80.150
72	17.75	79.720	79.880	80.260	80.300	81.010	80.150
[illegible]	18.00	79.730	79.880	80.260	80.310	81.080	80.140
[illegible]	18.25	79.700	79.880	80.260	80.300	81.090	80.150
[illegible]	18.50	79.720	79.880	80.240	80.280	80.990	80.150
76	18.75	79.700	79.830	80.260	80.300	81.030	80.170
77	19.00	79.710	79.840	80.240	80.280	80.900	80.140
78	19.25	79.720	79.850	80.240	80.280	81.070	80.130
79	19.50	79.680	79.830	80.240	80.280	81.180	80.130
80	19.75	79.680	79.810	80.240	80.280	81.010	80.140
81	20.00	79.680	79.830	80.240	80.280	81.050	80.130
82	20.25	79.680	79.810	80.240	80.260	80.820	80.150
83	20.50	79.680	79.810	80.220	80.240	80.990	80.110
84	20.75	79.660	79.810	80.190	80.260	80.940	80.150
85	21.00	79.680	79.810	80.190	80.260	81.030	80.130
86	21.25	79.680	79.810	80.190	80.260	81.030	80.190
87	21.50	79.660	79.790	80.190	80.240	80.900	80.130
88	21.75	79.660	79.810	80.220	80.240	80.960	80.090
89	22.00	79.640	79.790	80.190	80.240	80.880	80.110
90	22.25	79.640	79.810	80.190	80.240	80.990	80.090
91	22.50	79.660	79.790	80.170	80.240	80.960	80.110
92	22.75	79.660	79.790	80.170	80.190	80.920	80.070
93	23.00	79.640	79.770	80.170	80.240	81.200	80.070
94	23.25	79.640	79.770	80.170	80.240	81.070	80.130
95	23.50	79.640	79.770	80.170	80.220	80.860	80.070
96	23.75	79.620	79.790	80.170	80.240	81.030	80.090
97	24.00	79.620	79.770	80.170	80.220	80.830	80.070

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 31 DEG F	TEMP 32 DEG F	TEMP 33 DEG F	TEMP 34 DEG F	TEMP 35 DEG F	TEMP 36 DEG F
1	0.00	80.490	80.600	81.070	80.750	80.860	80.750
2	.25	80.430	80.600	81.070	80.770	80.830	80.730
3	.50	80.470	80.600	81.070	80.750	80.830	80.730
4	.75	80.490	80.580	81.070	80.750	80.830	80.710
5	1.00	80.450	80.600	81.050	80.730	80.830	80.730
6	1.25	80.430	80.580	81.050	80.730	80.830	80.710
7	1.50	80.450	80.540	81.050	80.730	80.820	80.730
8	1.75	80.410	80.540	81.030	80.710	80.790	80.710
9	2.00	80.410	80.540	81.030	80.710	80.800	80.670
10	2.25	80.410	80.540	81.030	80.710	80.800	80.670
11	2.50	80.410	80.560	81.030	80.710	80.820	80.660
12	2.75	80.390	80.540	81.030	80.730	80.820	80.660
13	3.00	80.430	80.520	81.010	80.710	80.790	80.660
14	3.25	80.390	80.490	81.010	80.690	80.790	80.640
15	3.50	80.390	80.490	81.010	80.660	80.790	80.660
16	3.75	80.410	80.520	80.990	80.690	80.770	80.660
17	4.00	80.360	80.490	80.990	80.690	80.750	80.620
18	4.25	80.360	80.490	80.990	80.690	80.770	80.640
19	4.50	80.360	80.470	80.990	80.660	80.770	80.660
20	4.75	80.360	80.490	80.990	80.660	80.750	80.600
21	5.00	80.320	80.450	80.960	80.690	80.750	80.640
22	5.25	80.390	80.490	80.960	80.640	80.730	80.620
23	5.50	80.350	80.470	80.940	80.640	80.730	80.580
[illegible]	5.75	80.320	80.520	80.960	80.660	80.730	80.620
[illegible]	6.00	80.390	80.450	80.940	80.620	80.730	80.620
26	6.25	80.360	80.430	80.940	80.620	80.710	80.580
27	6.50	80.280	80.450	80.940	80.620	80.710	80.580
28	6.75	80.320	80.450	80.920	80.620	80.710	80.560
29	7.00	80.320	80.430	80.920	80.600	80.710	80.580
30	7.25	80.350	80.430	80.920	80.600	80.690	80.580
31	7.50	80.300	80.410	80.900	80.580	80.690	80.560
32	7.75	80.280	80.430	80.900	80.580	80.660	80.560
33	8.00	80.300	80.430	80.900	80.580	80.660	80.540
34	8.25	80.280	80.430	80.880	80.560	80.660	80.540
35	8.50	80.280	80.390	80.880	80.540	80.640	80.540
36	8.75	80.240	80.390	80.880	80.560	80.660	80.490
37	9.00	80.260	80.360	80.860	80.540	80.620	80.490
38	9.25	80.280	80.360	80.860	80.540	80.640	80.520
39	9.50	80.240	80.350	80.860	80.540	80.620	80.490
40	9.75	80.280	80.360	80.830	80.540	80.620	80.490
41	10.00	80.240	80.350	80.840	80.520	80.620	80.480
42	10.25	80.190	80.320	80.830	80.490	80.600	80.430
43	10.50	80.220	80.350	80.830	80.540	80.600	80.450
44	10.75	80.220	80.320	80.820	80.490	80.600	80.430
45	11.00	80.220	80.330	80.820	80.500	80.580	80.450
46	11.25	80.190	80.320	80.820	80.520	80.560	80.470
47	11.50	80.150	80.320	80.820	80.470	80.560	80.470
48	11.75	80.150	80.310	80.800	80.480	80.540	80.430
[illegible]	12.00	80.220	80.260	80.770	80.470	80.560	80.410
[illegible]	12.25	80.130	80.320	80.790	80.470	80.560	80.390

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 31 DEG F	TEMP 32 DEG F	TEMP 33 DEG F	TEMP 34 DEG F	TEMP 35 DEG F	TEMP 36 DEG F
51	12.50	80.220	80.300	80.770	80.450	80.560	80.410
52	12.75	80.130	80.280	80.770	80.430	80.520	80.430
53	13.00	80.130	80.260	80.750	80.430	80.540	80.410
54	13.25	80.150	80.260	80.750	80.410	80.520	80.410
55	13.50	80.110	80.220	80.750	80.430	80.490	80.410
56	13.75	80.150	80.240	80.750	80.430	80.520	80.390
57	14.00	80.110	80.240	80.730	80.390	80.490	80.390
58	14.25	80.130	80.220	80.730	80.410	80.490	80.360
59	14.50	80.110	80.200	80.730	80.390	80.500	80.370
60	14.75	80.130	80.240	80.730	80.360	80.490	80.360
61	15.00	80.090	80.220	80.710	80.370	80.480	80.350
62	15.25	80.070	80.220	80.710	80.390	80.470	80.350
63	15.50	80.090	80.130	80.690	80.390	80.450	80.350
64	15.75	80.090	80.190	80.690	80.390	80.450	80.320
65	16.00	80.090	80.190	80.690	80.360	80.450	80.320
66	16.25	80.030	80.220	80.690	80.350	80.450	80.330
67	16.50	80.050	80.170	80.690	80.350	80.430	80.300
68	16.75	80.110	80.190	80.660	80.350	80.430	80.300
69	17.00	80.050	80.170	80.660	80.350	80.430	80.300
70	17.25	80.070	80.170	80.660	80.320	80.410	80.300
71	17.50	80.050	80.200	80.670	80.310	80.450	80.310
72	17.75	80.020	80.150	80.660	80.300	80.430	80.280
73	18.00	80.050	80.180	80.670	80.330	80.410	80.280
[illegible]	18.25	80.070	80.150	80.640	80.320	80.410	80.280
[illegible]	18.50	80.050	80.170	80.640	80.300	80.410	80.320
76	18.75	80.070	80.110	80.620	80.280	80.410	80.300
77	19.00	80.030	80.180	80.620	80.310	80.390	80.260
78	19.25	80.020	80.150	80.620	80.300	80.390	80.260
79	19.50	80.020	80.130	80.600	80.280	80.390	80.280
80	19.75	80.050	80.090	80.620	80.280	80.370	80.280
81	20.00	79.960	80.150	80.600	80.280	80.360	80.240
82	20.25	80.030	80.110	80.610	80.280	80.370	80.240
83	20.50	80.000	80.150	80.600	80.260	80.360	80.240
84	20.75	80.020	80.110	80.580	80.280	80.360	80.240
85	21.00	80.000	80.110	80.580	80.260	80.360	80.240
86	21.25	80.020	80.110	80.580	80.260	80.360	80.240
87	21.50	80.000	80.110	80.580	80.260	80.350	80.190
88	21.75	80.000	80.090	80.580	80.260	80.360	80.190
89	22.00	79.960	80.110	80.560	80.260	80.350	80.190
90	22.25	79.980	80.090	80.580	80.260	80.350	80.190
91	22.50	79.980	80.090	80.580	80.260	80.350	80.190
92	22.75	79.980	80.090	80.560	80.260	80.350	80.170
93	23.00	79.980	80.110	80.560	80.220	80.350	80.190
94	23.25	79.960	80.070	80.560	80.260	80.350	80.190
95	23.50	79.960	80.070	80.560	80.240	80.320	80.220
96	23.75	80.000	80.070	80.540	80.240	80.350	80.190
97	24.00	79.940	80.090	80.540	80.240	80.320	80.220

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 37 DEG F	TEMP 38 DEG F	TEMP 39 DEG F	TEMP 40 DEG F
1	0.00	80.730	81.070	80.730	80.300
2	.25	80.750	81.050	80.710	80.350
3	.50	80.730	81.030	80.710	80.280
4	.75	80.730	81.010	80.730	80.300
5	1.00	80.730	81.050	80.710	80.320
6	1.25	80.710	81.010	80.690	80.280
7	1.50	80.690	81.010	80.690	80.260
8	1.75	80.710	81.030	80.690	80.260
9	2.00	80.690	81.010	80.670	80.260
10	2.25	80.690	80.970	80.620	80.220
11	2.50	80.690	80.990	80.660	80.260
12	2.75	80.660	81.010	80.660	80.240
13	3.00	80.690	80.990	80.600	80.240
14	3.25	80.690	81.010	80.640	80.260
15	3.50	80.690	80.990	80.620	80.260
16	3.75	80.660	81.010	80.660	80.240
17	4.00	80.660	81.010	80.640	80.220
18	4.25	80.690	80.960	80.600	80.240
19	4.50	80.660	81.010	80.620	80.220
20	4.75	80.660	80.990	80.620	80.220
21	5.00	80.660	80.990	80.620	80.170
22	5.25	80.660	80.990	80.620	80.190
23	5.50	80.620	80.920	80.580	80.150
[illegible]	5.75	80.620	80.920	80.580	80.150
[illegible]	6.00	80.620	80.940	80.600	80.170
26	6.25	80.640	80.940	80.580	80.150
27	6.50	80.580	80.920	80.560	80.130
28	6.75	80.600	80.900	80.540	80.110
29	7.00	80.560	80.900	80.560	80.150
30	7.25	80.580	80.900	80.580	80.090
31	7.50	80.580	80.880	80.540	80.130
32	7.75	80.600	80.880	80.540	80.110
33	8.00	80.580	80.900	80.540	80.110
34	8.25	80.580	80.880	80.520	80.110
35	8.50	80.560	80.830	80.490	80.110
36	8.75	80.580	80.830	80.490	80.110
37	9.00	80.580	80.830	80.490	80.070
38	9.25	80.490	80.820	80.450	80.070
39	9.50	80.540	80.820	80.470	80.090
40	9.75	80.540	80.790	80.470	80.090
41	10.00	80.520	80.820	80.500	80.070
42	10.25	80.490	80.790	80.470	80.090
43	10.50	80.520	80.790	80.470	80.070
44	10.75	80.490	80.790	80.450	80.020
45	11.00	80.500	80.780	80.480	80.050
46	11.25	80.470	80.820	80.450	80.020
47	11.50	80.470	80.750	80.430	80.070
48	11.75	80.450	80.750	80.450	79.980
[illegible]	12.00	80.470	80.730	80.430	80.020
[illegible]	12.25	80.450	80.750	80.430	79.980

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 37 DEG F	TEMP 38 DEG F	TEMP 39 DEG F	TEMP 40 DEG F
51	12.50	80.450	80.730	80.410	80.020
52	12.75	80.450	80.770	80.450	79.960
53	13.00	80.430	80.730	80.410	79.980
54	13.25	80.430	80.710	80.410	79.980
55	13.50	80.430	80.730	80.390	79.940
56	13.75	80.470	80.710	80.410	79.960
57	14.00	80.450	80.710	80.410	79.960
58	14.25	80.410	80.660	80.360	79.960
59	14.50	80.410	80.670	80.370	79.960
60	14.75	80.390	80.660	80.360	79.900
61	15.00	80.390	80.690	80.350	79.920
62	15.25	80.350	80.660	80.360	79.920
63	15.50	80.390	80.660	80.320	79.900
64	15.75	80.390	80.660	80.350	79.920
65	16.00	80.390	80.690	80.300	79.920
66	16.25	80.370	80.670	80.310	79.880
67	16.50	80.360	80.660	80.320	79.900
68	16.75	80.390	80.690	80.350	79.920
69	17.00	80.360	80.660	80.300	79.900
70	17.25	80.390	80.640	80.320	79.880
71	17.50	80.390	80.650	80.310	79.900
72	17.75	80.350	80.640	80.300	79.880
73	18.00	80.350	80.650	80.310	79.880
[illegible]	18.25	80.360	80.620	80.300	79.880
[illegible]	18.50	80.360	80.600	80.280	79.830
76	18.75	80.350	80.600	80.280	79.880
77	19.00	80.350	80.620	80.310	79.850
78	19.25	80.320	80.600	80.280	79.880
79	19.50	80.320	80.600	80.300	79.850
80	19.75	80.350	80.620	80.260	79.850
81	20.00	80.260	80.580	80.260	79.850
82	20.25	80.310	80.580	80.220	79.810
83	20.50	80.320	80.560	80.240	79.790
84	20.75	80.260	80.580	80.240	79.770
85	21.00	80.280	80.560	80.240	79.830
86	21.25	80.260	80.580	80.220	79.770
87	21.50	80.260	80.560	80.220	79.790
88	21.75	80.260	80.560	80.220	79.790
89	22.00	80.300	80.580	80.220	79.770
90	22.25	80.260	80.520	80.190	79.790
91	22.50	80.240	80.560	80.190	79.750
92	22.75	80.260	80.560	80.220	79.810
93	23.00	80.220	80.560	80.220	79.790
94	23.25	80.240	80.520	80.190	79.790
95	23.50	80.260	80.520	80.220	79.790
96	23.75	80.280	80.560	80.190	79.750
97	24.00	80.260	80.520	80.190	79.770

ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	PRES 1 PSIA	PRES 2 PSIA	HUM 1 % RH	HUM 2 % RH	HUM 3 % RH	HUM 4 % RH
1	0.00	65.5820	65.5680	78.77	78.39	78.83	79.48
2	.25	65.5810	65.5670	78.85	78.45	78.83	79.56
3	.50	65.5800	65.5660	78.80	78.32	78.85	79.49
4	.75	65.5790	65.5640	78.79	78.37	78.82	79.48
5	1.00	65.5770	65.5630	78.83	78.44	78.89	79.55
6	1.25	65.5760	65.5620	78.77	78.39	78.87	79.48
7	1.50	65.5750	65.5610	78.82	78.40	78.85	79.55
8	1.75	65.5740	65.5600	78.85	78.46	78.94	79.57
9	2.00	65.5730	65.5590	78.84	78.40	78.85	79.53
10	2.25	65.5720	65.5570	78.82	78.45	78.87	79.52
11	2.50	65.5710	65.5560	78.89	78.46	78.93	79.51
12	2.75	65.5700	65.5560	78.85	78.36	78.90	79.54
13	3.00	65.5690	65.5550	78.83	78.44	78.90	79.50
14	3.25	65.5690	65.5540	78.83	78.40	78.88	79.52
15	3.50	65.5680	65.5530	78.82	78.44	78.89	79.45
16	3.75	65.5660	65.5520	78.86	78.46	78.93	79.53
17	4.00	65.5650	65.5510	78.86	78.44	78.93	79.58
18	4.25	65.5640	65.5500	78.83	78.46	78.90	79.51
19	4.50	65.5640	65.5490	78.88	78.49	78.93	79.54
20	4.75	65.5630	65.5490	78.82	78.45	78.92	79.55
21	5.00	65.5620	65.5480	78.87	78.47	78.90	79.56
22	5.25	65.5620	65.5460	78.88	78.42	78.90	79.58
23	5.50	65.5600	65.5460	78.92	78.46	78.94	79.55
[illegible]	5.75	65.5590	65.5450	78.90	78.43	78.92	79.61
[illegible]	6.00	65.5580	65.5440	78.91	78.46	78.94	79.60
26	6.25	65.5570	65.5430	78.89	78.47	78.95	79.56
27	6.50	65.5560	65.5410	78.87	78.51	78.96	79.63
28	6.75	65.5540	65.5400	78.90	78.48	78.95	79.62
29	7.00	65.5540	65.5400	78.99	78.55	78.98	79.66
30	7.25	65.5520	65.5380	78.93	78.49	78.98	79.58
31	7.50	65.5510	65.5370	78.95	78.53	78.97	79.62
32	7.75	65.5500	65.5360	78.94	78.57	78.98	79.66
33	8.00	65.5490	65.5350	78.94	78.55	79.05	79.66
34	8.25	65.5480	65.5340	78.91	78.57	79.03	79.63
35	8.50	65.5470	65.5330	78.95	78.56	79.02	79.65
36	8.75	65.5460	65.5320	78.98	78.57	79.01	79.68
37	9.00	65.5450	65.5310	78.94	78.54	78.97	79.64
38	9.25	65.5440	65.5300	78.94	78.54	79.02	79.68
39	9.50	65.5420	65.5260	78.97	78.49	79.01	79.62
40	9.75	65.5410	65.5270	78.97	78.60	79.00	79.63
41	10.00	65.5410	65.5260	79.01	78.57	79.05	79.69
42	10.25	65.5400	65.5260	79.01	78.56	79.06	79.68
43	10.50	65.5390	65.5240	78.99	78.55	79.06	79.70
44	10.75	65.5380	65.5240	78.99	78.54	79.06	79.66
45	11.00	65.5370	65.5230	78.98	78.61	79.08	79.67
46	11.25	65.5360	65.5220	78.98	78.53	79.03	79.72
47	11.50	65.5350	65.5200	79.01	78.61	79.06	79.74
48	11.75	65.5340	65.5200	79.03	78.61	79.05	79.75
[illegible]	12.00	65.5330	65.5190	79.05	78.64	79.06	79.73
[illegible]	12.25	65.5320	65.5180	79.02	78.59	79.08	79.72

ILRT VARIABLE TABLE SUMMARY

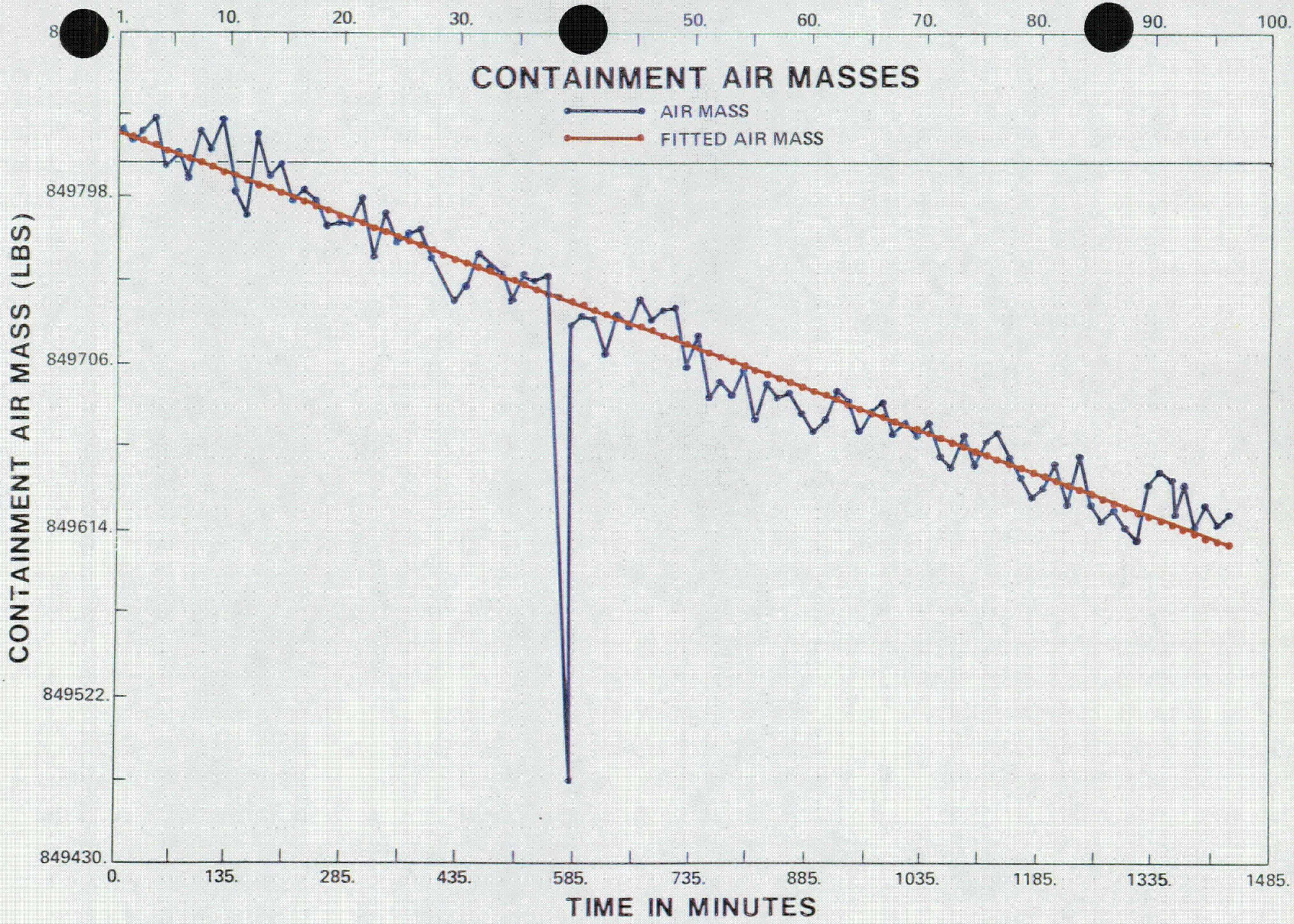
SAMPLE NUMBER	DELTA HOURS	PRES 1 PSIA	PRES 2 PSIA	HUM 1 % RH	HUM 2 % RH	HUM 3 % RH	HUM 4 % RH
51	12.50	65.5310	65.5160	79.01	78.65	79.12	79.77
52	12.75	65.5290	65.5150	78.98	78.63	79.09	79.73
53	13.00	65.5280	65.5140	79.06	78.59	79.09	79.70
54	13.25	65.5270	65.5130	79.03	78.66	79.10	79.75
55	13.50	65.5260	65.5120	79.06	78.64	79.13	79.80
56	13.75	65.5240	65.5110	79.01	78.64	79.18	79.78
57	14.00	65.5240	65.5100	79.07	78.65	79.14	79.77
58	14.25	65.5230	65.5090	79.05	78.68	79.15	79.75
59	14.50	65.5220	65.5080	79.06	78.67	79.15	79.77
60	14.75	65.5200	65.5070	79.06	78.65	79.16	79.78
61	15.00	65.5200	65.5060	79.08	78.71	79.20	79.79
62	15.25	65.5200	65.5050	79.09	78.65	79.15	79.79
63	15.50	65.5190	65.5040	79.11	78.70	79.13	79.79
64	15.75	65.5180	65.5040	79.10	78.69	79.18	79.77
65	16.00	65.5170	65.5020	79.14	78.73	79.17	79.83
66	16.25	65.5160	65.5020	79.10	78.72	79.17	79.82
67	16.50	65.5160	65.5010	79.13	78.76	79.17	79.81
68	16.75	65.5150	65.5000	79.10	78.72	79.15	79.80
69	17.00	65.5140	65.5000	79.09	78.71	79.21	79.85
70	17.25	65.5140	65.4980	79.10	78.79	79.17	79.86
71	17.50	65.5120	65.4980	79.11	78.75	79.21	79.85
72	17.75	65.5110	65.4980	79.11	78.72	79.20	79.84
73	18.00	65.5110	65.4970	79.10	78.71	79.17	79.83
[illegible]	18.25	65.5100	65.4960	79.15	78.72	79.22	79.87
[illegible]	18.50	65.5090	65.4950	79.15	78.77	79.21	79.84
76	18.75	65.5080	65.4940	79.15	78.68	79.25	79.88
77	19.00	65.5080	65.4940	79.12	78.73	79.24	79.86
78	19.25	65.5070	65.4930	79.14	78.66	79.19	79.86
79	19.50	65.5050	65.4910	79.15	78.71	79.23	79.81
80	19.75	65.5050	65.4910	79.13	78.69	79.19	79.87
81	20.00	65.5040	65.4910	79.13	78.74	79.19	79.87
82	20.25	65.5030	65.4900	79.14	78.78	79.23	79.89
83	20.50	65.5020	65.4890	79.15	78.75	79.19	79.84
84	20.75	65.5020	65.4880	79.13	78.73	79.21	79.79
85	21.00	65.5010	65.4870	79.13	78.70	79.21	79.83
86	21.25	65.5000	65.4860	79.15	78.75	79.21	79.88
87	21.50	65.4990	65.4850	79.12	78.71	79.20	79.86
88	21.75	65.4980	65.4840	79.13	78.71	79.19	79.88
89	22.00	65.4970	65.4840	79.14	78.74	79.23	79.87
90	22.25	65.4980	65.4830	79.16	78.75	79.24	79.85
91	22.50	65.4980	65.4820	79.17	78.76	79.20	79.83
92	22.75	65.4970	65.4820	79.15	78.77	79.24	79.89
93	23.00	65.4970	65.4810	79.18	78.79	79.23	79.91
94	23.25	65.4960	65.4800	79.17	78.76	79.22	79.91
95	23.50	65.4950	65.4790	79.20	78.77	79.23	79.94
96	23.75	65.4940	65.4780	79.18	78.78	79.25	79.90
97	24.00	65.4940	65.4780	79.19	78.76	79.26	79.94

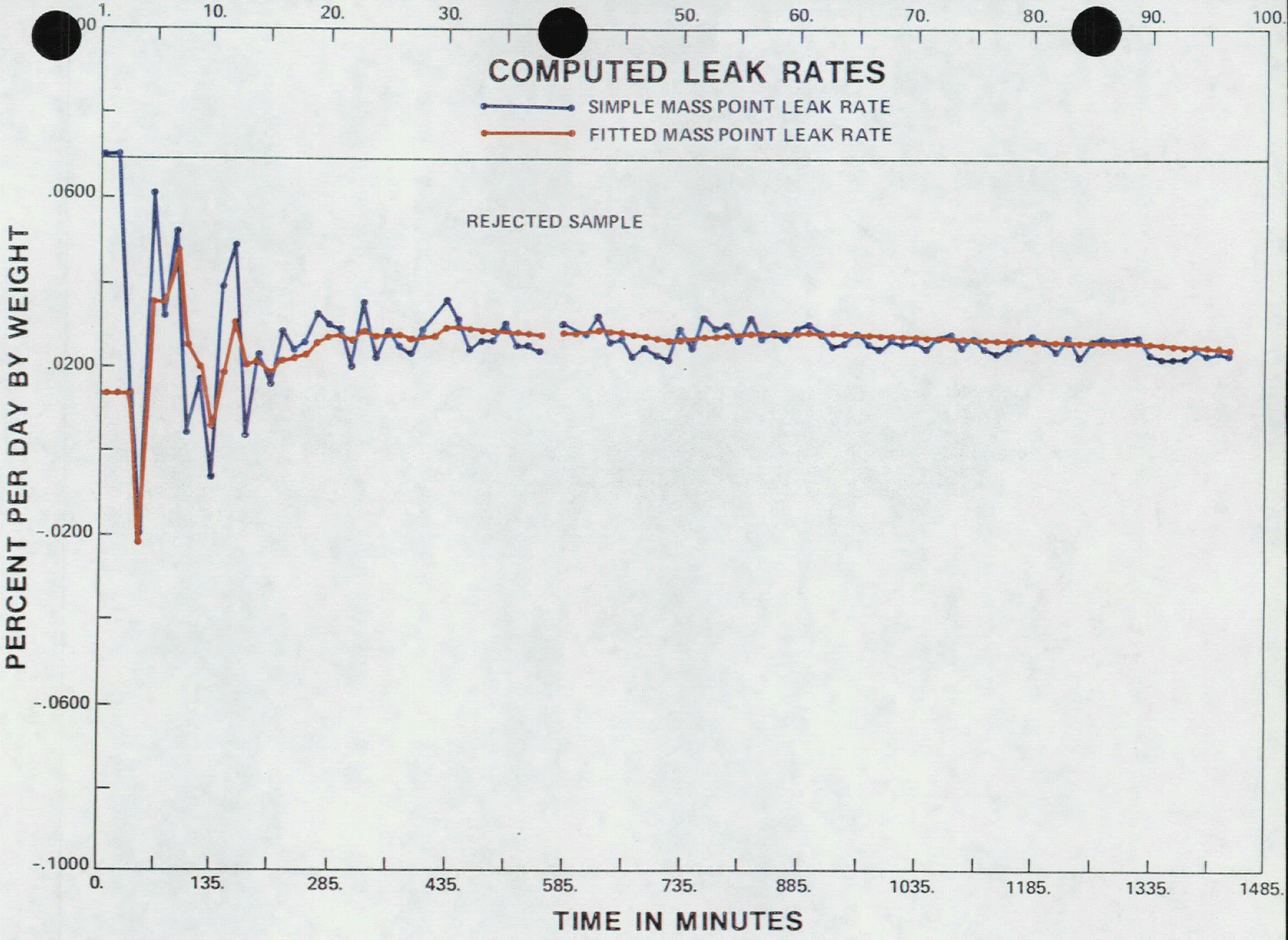
ILRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	HUM 5 % RH	HUM 6 % RH	HUM 7 % RH	HUM 8 % RH	HUM 9 % RH	HUM 10 % RH
1	0.00	78.85	78.14	78.00	76.64	81.55	76.76
2	.25	78.94	78.22	78.01	76.66	81.60	76.84
3	.50	78.88	78.19	77.97	76.63	81.56	76.79
4	.75	78.91	78.16	77.99	76.61	81.55	76.81
5	1.00	78.97	78.22	78.00	76.66	81.60	76.80
6	1.25	78.90	78.23	77.98	76.66	81.58	76.81
7	1.50	78.90	78.25	78.05	76.65	81.59	76.79
8	1.75	78.95	78.32	78.04	76.68	81.61	76.80
9	2.00	78.87	78.23	78.02	76.61	81.59	76.83
10	2.25	78.96	78.18	77.98	76.66	81.61	76.85
11	2.50	78.97	78.33	78.06	76.71	81.63	76.89
12	2.75	78.92	78.20	78.01	76.67	81.61	76.87
13	3.00	78.94	78.28	78.00	76.65	81.59	76.84
14	3.25	78.93	78.28	77.99	76.67	81.60	76.84
15	3.50	78.94	78.27	78.00	76.65	81.61	76.83
16	3.75	78.99	78.25	78.02	76.66	81.61	76.86
17	4.00	78.98	78.28	78.00	76.66	81.61	76.89
18	4.25	78.99	78.26	78.00	76.67	81.62	76.84
19	4.50	78.97	78.22	78.11	76.66	81.62	76.81
20	4.75	78.97	78.33	78.03	76.69	81.62	76.88
21	5.00	78.94	78.32	78.06	76.67	81.64	76.80
22	5.25	78.95	78.32	78.02	76.65	81.61	76.87
23	5.50	78.98	78.26	78.04	76.67	81.66	76.89
[illegible]	5.75	78.97	78.33	78.05	76.68	81.64	76.83
[illegible]	6.00	78.95	78.28	78.03	76.67	81.61	76.82
26	6.25	78.98	78.34	78.04	76.69	81.64	76.89
27	6.50	78.94	78.35	78.08	76.69	81.64	76.85
28	6.75	78.98	78.33	78.06	76.69	81.68	76.89
29	7.00	79.06	78.35	78.08	76.74	81.68	76.85
30	7.25	79.01	78.36	78.08	76.72	81.65	76.85
31	7.50	79.03	78.32	78.10	76.73	81.64	76.89
32	7.75	79.01	78.36	78.09	76.73	81.69	76.91
33	8.00	79.02	78.38	78.11	76.74	81.70	76.96
34	8.25	79.02	78.32	78.11	76.74	81.71	76.90
35	8.50	79.06	78.41	78.08	76.74	81.71	76.93
36	8.75	79.06	78.39	78.13	76.74	81.68	76.94
37	9.00	79.06	78.46	78.12	76.74	81.66	76.94
38	9.25	79.05	78.49	78.13	76.75	81.69	76.95
39	9.50	79.03	78.41	78.02	76.74	81.67	76.93
40	9.75	79.05	78.40	78.15	76.74	81.71	76.91
41	10.00	79.06	78.46	78.10	76.74	81.69	76.93
42	10.25	79.11	78.46	78.11	76.76	81.70	77.00
43	10.50	79.08	78.37	78.12	76.73	81.71	76.98
44	10.75	79.07	78.48	78.12	76.77	81.72	76.99
45	11.00	79.11	78.39	78.10	76.74	81.72	76.98
46	11.25	79.12	78.47	78.13	76.77	81.71	76.89
47	11.50	79.10	78.45	78.14	76.74	81.72	76.91
48	11.75	79.10	78.49	78.18	76.76	81.72	76.95
[illegible]	12.00	79.12	78.49	78.13	76.77	81.75	77.00
[illegible]	12.25	79.12	78.48	78.14	76.78	81.73	77.02

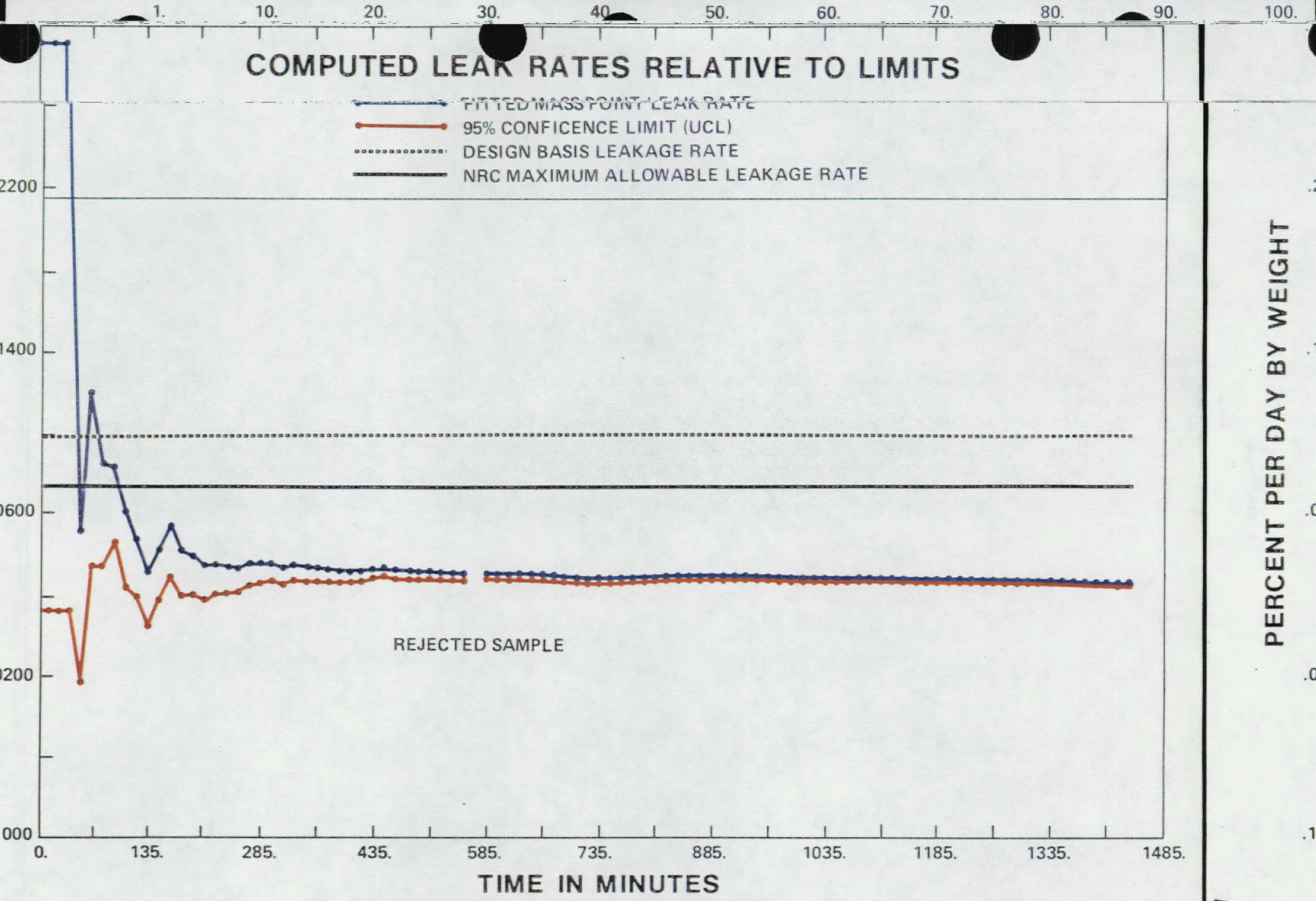
ILRT VARIABLE TABLE SUMMARY

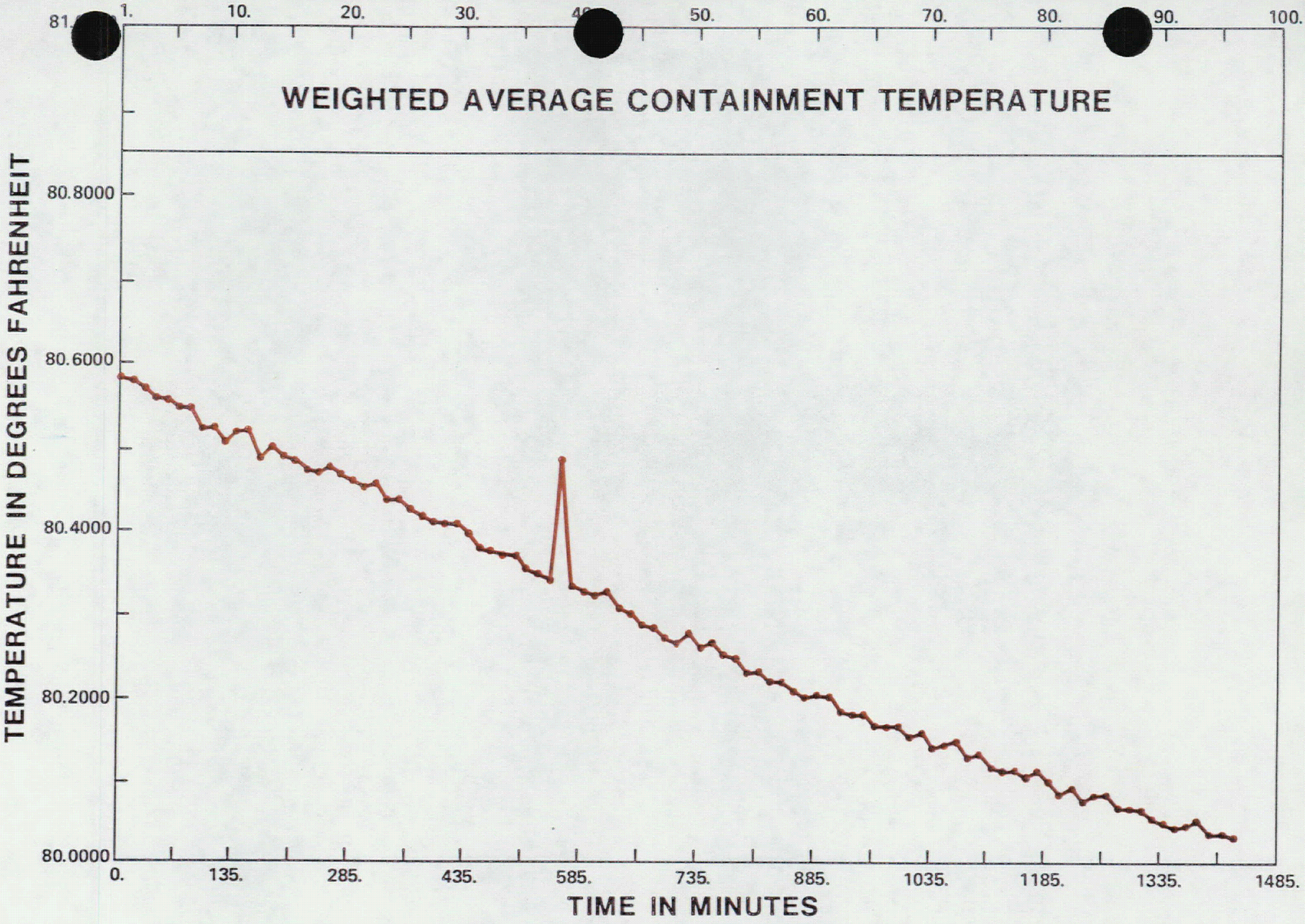
SAMPLE NUMBER	DELTA HOURS	HUM 5 % RH	HUM 6 % RH	HUM 7 % RH	HUM 8 % RH	HUM 9 % RH	HUM 10 % RH
51	12.50	79.14	78.41	78.15	76.79	81.74	76.99
52	12.75	79.09	78.42	78.14	76.78	81.73	76.95
53	13.00	79.12	78.40	78.21	76.80	81.75	76.99
54	13.25	79.19	78.49	78.19	76.80	81.76	76.98
55	13.50	79.17	78.45	78.21	76.81	81.75	76.97
56	13.75	79.17	78.50	78.18	76.83	81.75	77.01
57	14.00	79.11	78.47	78.18	76.81	81.77	76.99
58	14.25	79.18	78.51	78.16	76.83	81.78	77.00
59	14.50	79.16	78.53	78.22	76.81	81.76	76.99
60	14.75	79.15	78.47	78.17	76.83	81.75	77.00
61	15.00	79.22	78.48	78.18	76.86	81.80	77.03
62	15.25	79.20	78.51	78.20	76.83	81.78	77.05
63	15.50	79.15	78.52	78.19	76.84	81.78	77.01
64	15.75	79.15	78.60	78.21	76.85	81.80	77.07
65	16.00	79.22	78.54	78.24	76.85	81.80	77.03
66	16.25	79.27	78.58	78.21	76.85	81.80	77.02
67	16.50	79.30	78.47	78.23	76.84	81.81	77.07
68	16.75	79.28	78.53	78.22	76.89	81.78	77.06
69	17.00	79.25	78.58	78.23	76.87	81.80	77.09
70	17.25	79.27	78.55	78.22	76.87	81.79	77.07
71	17.50	79.24	78.51	78.23	76.88	81.81	77.03
72	17.75	79.21	78.57	78.21	76.88	81.81	77.09
73	18.00	79.27	78.48	78.21	76.84	81.82	77.08
[illegible]	18.25	79.28	78.55	78.23	76.88	81.82	77.10
[illegible]	18.50	79.25	78.52	78.24	76.89	81.83	77.01
76	18.75	79.25	78.61	78.21	76.87	81.82	77.06
77	19.00	79.25	78.55	78.23	76.84	81.80	77.08
78	19.25	79.24	78.53	78.25	76.90	81.82	77.08
79	19.50	79.24	78.59	78.24	76.87	81.81	77.08
80	19.75	79.22	78.59	78.23	76.89	81.83	77.03
81	20.00	79.26	78.58	78.29	76.89	81.82	77.11
82	20.25	79.24	78.64	78.23	76.86	81.80	77.10
83	20.50	79.21	78.61	78.22	76.87	81.83	77.10
84	20.75	79.27	78.57	78.29	76.89	81.82	77.07
85	21.00	79.26	78.61	78.31	76.90	81.83	77.11
86	21.25	79.25	78.53	78.23	76.89	81.84	77.04
87	21.50	79.24	78.64	78.26	76.91	81.81	77.11
88	21.75	79.25	78.61	78.26	76.89	81.85	77.14
89	22.00	79.29	78.56	78.23	76.89	81.85	77.13
90	22.25	79.30	78.57	78.25	76.89	81.84	77.11
91	22.50	79.29	78.60	78.24	76.91	81.87	77.09
92	22.75	79.30	78.66	78.31	76.93	81.84	77.12
93	23.00	79.30	78.61	78.24	76.91	81.86	77.13
94	23.25	79.26	78.59	78.25	76.94	81.83	77.08
95	23.50	79.34	78.59	78.26	76.94	81.83	77.06
96	23.75	79.32	78.60	78.31	76.93	81.86	77.09
97	24.00	79.25	78.59	78.28	76.91	81.86	77.06


CONTAINMENT AIR MASSES
AIR MASS
FITTED AIR MASS
CONTAINMENT AIR MASS (LBS)
849798.
849706.
849614.
849522.
849430.
1.
10.
20.
30.
50.
60.
70.
80.
90.
100.
0.
135.
285.
435.
585.
735.
885.
1035.
1185.
1335.
1485.
TIME IN MINUTES

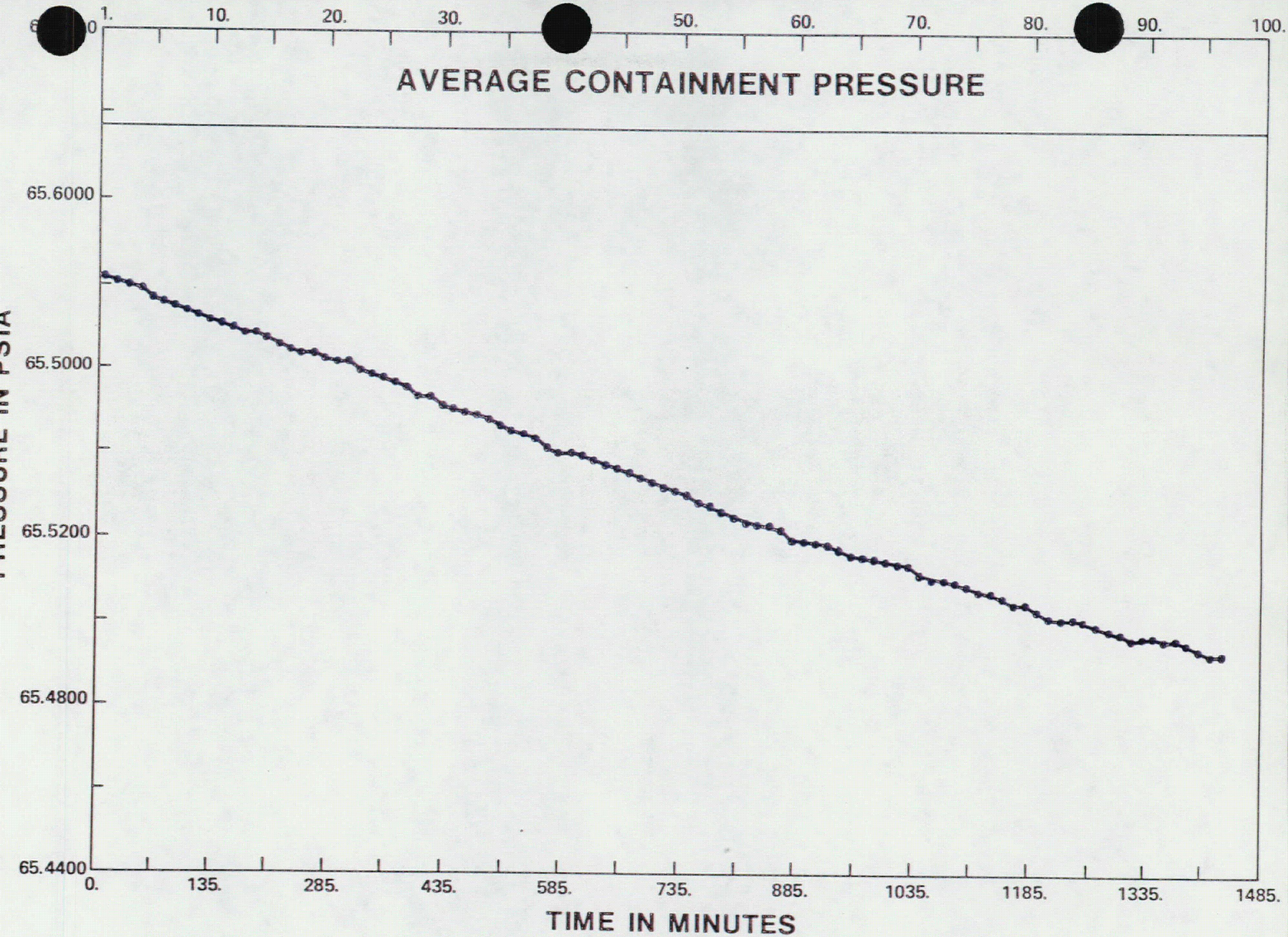


1. 10. 20. 30. 50. 60. 70. 80. 90. 100.
COMPUTED LEAK RATES
SIMPLE MASS POINT LEAK RATE
FITTED MASS POINT LEAK RATE
REJECTED SAMPLE
.0600
.0200
-.0200
-.0600
-.1000
PERCENT PER DAY BY WEIGHT
0. 135. 285. 435. 585. 735. 885. 1035. 1185. 1335. 1485.
TIME IN MINUTES

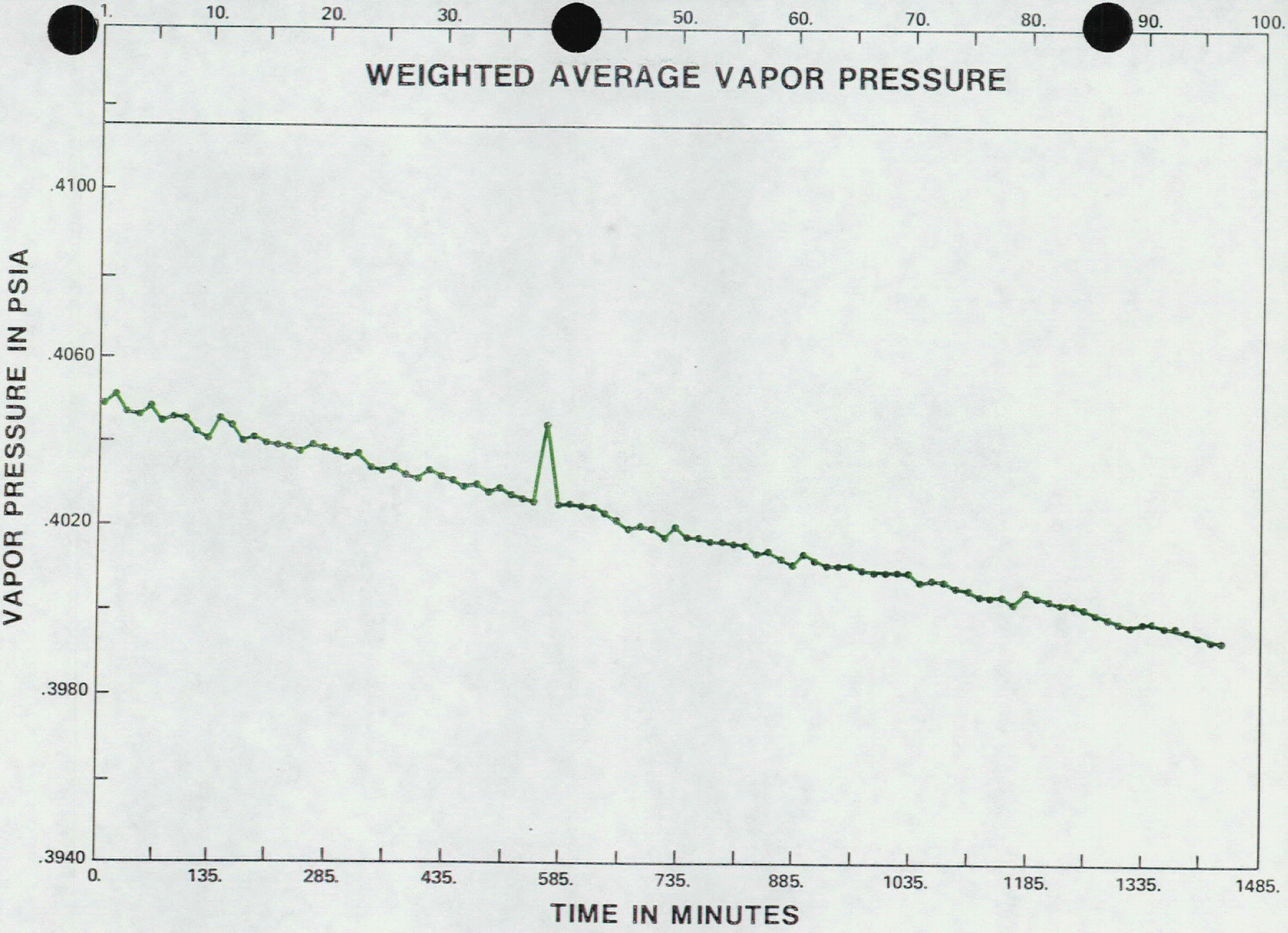

COMPUTED LEAK RATES RELATIVE TO LIMITS
FITTED MASS POINT LEAK RATE
95% CONFICENCE LIMIT (UCL)
DESIGN BASIS LEAKAGE RATE
NRC MAXIMUM ALLOWABLE LEAKAGE RATE
REJECTED SAMPLE
1. 10. 20. 30. 40. 50. 60. 70. 80. 90. 100.
2200
1400
0600
0200
000
0. 135. 285. 435. 585. 735. 885. 1035. 1185. 1335. 1485.
TIME IN MINUTES
PERCENT PER DAY BY WEIGHT



WEIGHTED AVERAGE CONTAINMENT TEMPERATURE
TEMPERATURE IN DEGREES FAHRENHEIT
TIME IN MINUTES
80.0000
80.2000
80.4000
80.6000
80.8000
0.
135.
285.
435.
585.
735.
885.
1035.
1185.
1335.
1485.
1.
10.
20.
30.
50.
60.
70.
80.
90.
100.



1.
10.
20.
30.
50.
60.
70.
80.
90.
100.
AVERAGE CONTAINMENT PRESSURE
65.6000
65.5000
65.5200
65.4800
65.4400
PRESSURE IN PSIA
0.
135.
285.
435.
585.
735.
885.
1035.
1185.
1335.
1485.
TIME IN MINUTES


WEIGHTED AVERAGE VAPOR PRESSURE
1.
10.
20.
30.
50.
60.
70.
80.
90.
100.
VAPOR PRESSURE IN PSIA
.4100
.4060
.4020
.3980
.3940
0.
135.
285.
435.
585.
735.
885.
1035.
1185.
1335.
1485.
TIME IN MINUTES

APPENDIX A.3.

VERIFICATION CONTROLLED LEAKAGE

RATE TEST (CLRT)

CONTAINMENT INTEGRATED LEAKAGE RATE TEST REPORT

Indian Point II - 1984

EBASCO PLANT SERVICES INC.
ILRT Test Services

Indian Point II - 1984

CONTAINMENT INTEGRATED LEAKAGE RATE TEST
SUPPLEMENTAL VERIFICATION TEST

LEAKAGE RATE IS MEASURED USING THE ABSOLUTE METHOD AND IS COMPUTED USING THE MASS POINT METHOD IN STRICT ACCORDANCE WITH ANSI/ANS 56.8-1981.

TEST PERIOD STARTED AT 15:15 HOURS ON 9/20/84
TEST CONDUCTED FOR 5.25 HOURS

FREE SPACE VOLUME OF CONTAINMENT IS 2,610,000 CU FT
CONTAINMENT WAS PRESSURIZED TO 65.49 PSIA

INITIAL CONTAINMENT FITTED AIR WEIGHT WAS 849,616 LBS
FINAL CONTAINMENT FITTED AIR WEIGHT WAS 849,430 LBS

FITTED MASS POINT ILRT LEAKAGE RATE	Lam	=	.027 % PER DAY
CONTAINMENT DESIGN LEAKAGE RATE	La	=	.100 % PER DAY
SUPERIMPOSED CLRT LEAKAGE RATE	Lo	=	.080 % PER DAY
FITTED CLRT MASS POINT LEAKAGE RATE	Lc	=	.100 % PER DAY

Lo + Lam - La/4 =< Lc =< Lo + Lam + La/4

.080 + .027 - .025 =< .100 =< .080 + .027 + .025

.082 =< .100 =< .132

DESCRIPTION OF VARIABLES

AVE TEMP	-	CONTAINMENT MEAN TEMPERATURE CALCULATED FROM VOLUMETRICALLY WEIGHTED RTD SENSOR INDICATIONS.
PRESSURE	-	PRIMARY CONTAINMENT PRESSURE INDICATION.
VAPOR PRES	-	CONTAINMENT VAPOR PRESSURE CALCULATED FROM VOLUMETRICALLY WEIGHTED HUMIDITY/DEWPOINT SENSOR INDICATIONS.
LEAK SIM	-	SIMPLE MASS POINT LEAKAGE RATE.
LEAK FIT	-	LEAKAGE RATE COMPUTED FROM FIRST ORDER REGRESSION OF AIR MASS DATA.
95% UCL	-	UPPER LIMIT OF THE 95% CONFIDENCE LEVEL OF AIR MASS DATA.
AIR MASS	-	CONTAINMENT AIR MASS.

NOTE FOR TABULAR DATA -

1. TABLE VALUES OF ZERO SIGNIFY THE DATA IS NOT APPLICABLE TO THE CALCULATION.
2. 'REJECTED' SIGNIFIES THE SAMPLE WAS REJECTED.
3. 'DELETED' SIGNIFIES THE SENSOR WAS DELETED.

NOTE FOR THE CURVES -

1. NUMBERS CLOSEST TO LEFT MARGIN ALONG ABSCISSA REPRESENT SAMPLE NUMBERS.
2. NUMBERS CLOSEST TO ABSCISSA REPRESENT TIME FROM BEGINNING OF MODE IN MINUTES.
3. 'REJECTED' SIGNIFIES THE SAMPLE WAS REJECTED.

CLRT VARIABLE TABLE SUMMARY

NO.	TIME HOURS	AVE TEMP DEG F	PRESSURE PSIA	VAP PRES PSIA	LEAK SIM %/DAY	LEAK FIT %/DAY	UCL %/DAY	AIR MASS LBS
1	0.00	80.017	65.4920	.3993	0.000	0.000	0.000	849634
2	.25	80.016	65.4910	.3992	.116	0.000	0.000	849623
3	.50	80.007	65.4890	.3993	.124	.124	.166	849612
4	.75	80.017	65.4880	.3993	.192	.186	.291	849583
5	1.00	80.005	65.4870	.3992	.129	.149	.219	849588
6	1.25	80.013	65.4850	.3992	.189	.178	.233	849550
7	1.50	80.002	65.4840	.3992	.150	.164	.204	849554
8	1.75	79.985	65.4820	.3989	.120	.140	.180	849560
9	2.00	79.994	65.4810	.3990	.147	.142	.172	849530
10	2.25	79.994	65.4800	.3991	.147	.143	.166	849517
11	2.50	79.973	65.4790	.3987	.105	.125	.152	849541
12	2.75	79.985	65.4770	.3990	.145	.130	.153	849493
13	3.00	79.977	65.4760	.3989	.132	.129	.148	849494
14	3.25	79.971	65.4760	.3988	.112	.121	.139	849505
15	3.50	79.967	65.4740	.3988	.120	.118	.134	849485
16	3.75	79.962	65.4740	.3986	.105	.112	.127	849494
17	4.00	79.950	65.4720	.3984	.102	.106	.121	849490
18	4.25	79.952	65.4720	.3985	.099	.101	.115	849485
19	4.50	79.963	65.4700	.3985	.119	.103	.116	849444
20	4.75	79.946	65.4690	.3984	.105	.101	.113	849456
21	5.00	79.958	65.4680	.3985	.118	.103	.114	849425
22	5.25	79.943	65.4680	.3984	.100	.100	.110	849449

SENSOR VOLUME FRACTIONS

TEMPERATURE SENSORS

1 TO 5	0.0000000	.0387814	0.0000000	0.0000000	.0387814
6 TO 10	.0387814	.0387814	.0387814	0.0000000	.0630687
11 TO 15	0.0000000	0.0000000	.0630687	.0630687	0.0000000
16 TO 20	.0630687	0.0000000	.0345507	0.0000000	0.0000000
21 TO 25	.0345507	.0345507	.0345507	.0345507	.0387814
26 TO 30	.0387814	.0208757	.0208757	.0208757	.0208757
31 TO 35	.0208757	.0208757	.0222808	.0222808	.0222808
36 TO 40	.0222808	.0222808	.0222808	.0222808	.0222808

HUMIDITY/DP SENSORS

1 TO 5	.0692386	.0692386	.0692386	.0692386	.1297940
6 TO 10	.1297940	.1297940	.1112210	.1112210	.1112210

NOTE: VALUE OF ZERO INDICATES A DELETED SENSOR.

CLRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 1 DEG F	TEMP 2 DEG F	TEMP 3 DEG F	TEMP 4 DEG F	TEMP 5 DEG F	TEMP 6 DEG F
1	0.00	DELETED	79.750	DELETED	DELETED	79.690	79.820
2	.25	DELETED	79.770	DELETED	DELETED	79.670	79.810
3	.50	DELETED	79.750	DELETED	DELETED	79.640	79.790
4	.75	DELETED	79.770	DELETED	DELETED	79.660	79.830
5	1.00	DELETED	79.750	DELETED	DELETED	79.670	79.810
6	1.25	DELETED	79.750	DELETED	DELETED	79.680	79.810
7	1.50	DELETED	79.770	DELETED	DELETED	79.680	79.810
8	1.75	DELETED	79.720	DELETED	DELETED	79.640	79.770
9	2.00	DELETED	79.740	DELETED	DELETED	79.640	79.790
10	2.25	DELETED	79.740	DELETED	DELETED	79.640	79.780
11	2.50	DELETED	79.700	DELETED	DELETED	79.620	79.750
12	2.75	DELETED	79.740	DELETED	DELETED	79.640	79.770
13	3.00	DELETED	79.740	DELETED	DELETED	79.610	79.760
14	3.25	DELETED	79.720	DELETED	DELETED	79.610	79.740
15	3.50	DELETED	79.730	DELETED	DELETED	79.630	79.760
16	3.75	DELETED	79.710	DELETED	DELETED	79.580	79.730
17	4.00	DELETED	79.690	DELETED	DELETED	79.600	79.710
18	4.25	DELETED	79.690	DELETED	DELETED	79.590	79.720
19	4.50	DELETED	79.680	DELETED	DELETED	79.610	79.740
20	4.75	DELETED	79.670	DELETED	DELETED	79.590	79.710
21	5.00	DELETED	79.670	DELETED	DELETED	79.600	79.730
22	5.25	DELETED	79.680	DELETED	DELETED	79.610	79.720

CLRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 7 DEG F	TEMP 8 DEG F	TEMP 9 DEG F	TEMP 10 DEG F	TEMP 11 DEG F	TEMP 12 DEG F
1	0.00	79.840	79.710	DELETED	79.860	DELETED	DELETED
2	.25	79.850	79.730	DELETED	79.850	DELETED	DELETED
3	.50	79.810	79.680	DELETED	79.840	DELETED	DELETED
4	.75	79.850	79.700	DELETED	79.870	DELETED	DELETED
5	1.00	79.840	79.680	DELETED	79.840	DELETED	DELETED
6	1.25	79.840	79.730	DELETED	79.840	DELETED	DELETED
7	1.50	79.840	79.730	DELETED	79.840	DELETED	DELETED
8	1.75	79.810	79.660	DELETED	79.830	DELETED	DELETED
9	2.00	79.810	79.720	DELETED	79.810	DELETED	DELETED
10	2.25	79.810	79.700	DELETED	79.810	DELETED	DELETED
11	2.50	79.790	79.660	DELETED	79.830	DELETED	DELETED
12	2.75	79.810	79.660	DELETED	79.830	DELETED	DELETED
13	3.00	79.780	79.680	DELETED	79.760	DELETED	DELETED
14	3.25	79.780	79.610	DELETED	79.780	DELETED	DELETED
15	3.50	79.820	79.670	DELETED	79.840	DELETED	DELETED
16	3.75	79.770	79.620	DELETED	79.750	DELETED	DELETED
17	4.00	79.750	79.630	DELETED	79.730	DELETED	DELETED
18	4.25	79.730	79.610	DELETED	79.800	DELETED	DELETED
19	4.50	79.780	79.640	DELETED	79.740	DELETED	DELETED
20	4.75	79.760	79.650	DELETED	79.780	DELETED	DELETED
21	5.00	79.760	79.630	DELETED	79.730	DELETED	DELETED
22	5.25	79.760	79.610	DELETED	79.760	DELETED	DELETED

CLRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 13 DEG F	TEMP 14 DEG F	TEMP 15 DEG F	TEMP 16 DEG F	TEMP 17 DEG F	TEMP 18 DEG F
1	0.00	80.050	79.670	DELETED	80.100	DELETED	79.970
2	.25	80.010	79.620	DELETED	80.090	DELETED	79.980
3	.50	80.070	79.680	DELETED	80.090	DELETED	79.960
4	.75	80.020	79.660	DELETED	80.090	DELETED	80.040
5	1.00	80.010	79.640	DELETED	80.090	DELETED	79.940
6	1.25	80.050	79.640	DELETED	80.090	DELETED	80.010
7	1.50	80.030	79.640	DELETED	80.090	DELETED	80.010
8	1.75	80.000	79.660	DELETED	80.070	DELETED	79.960
9	2.00	79.980	79.660	DELETED	80.070	DELETED	80.020
10	2.25	80.000	79.650	DELETED	80.080	DELETED	80.020
11	2.50	79.940	79.620	DELETED	80.040	DELETED	79.920
12	2.75	79.960	79.660	DELETED	80.070	DELETED	79.960
13	3.00	79.980	79.640	DELETED	80.060	DELETED	79.950
14	3.25	79.950	79.640	DELETED	80.060	DELETED	79.950
15	3.50	79.930	79.560	DELETED	80.060	DELETED	79.880
16	3.75	79.970	79.620	DELETED	80.030	DELETED	79.880
17	4.00	79.930	79.580	DELETED	80.030	DELETED	79.930
18	4.25	79.970	79.610	DELETED	80.030	DELETED	79.910
19	4.50	79.960	79.570	DELETED	80.040	DELETED	79.910
20	4.75	79.900	79.590	DELETED	79.990	DELETED	79.930
21	5.00	79.930	79.600	DELETED	80.030	DELETED	79.880
22	5.25	79.930	79.570	DELETED	80.060	DELETED	79.930

CLRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 19 DEG F	TEMP 20 DEG F	TEMP 21 DEG F	TEMP 22 DEG F	TEMP 23 DEG F	TEMP 24 DEG F
1	0.00	DELETED	DELETED	80.140	80.330	80.390	80.370
2	.25	DELETED	DELETED	80.190	80.450	80.300	80.360
3	.50	DELETED	DELETED	80.170	80.300	80.300	80.350
4	.75	DELETED	DELETED	80.150	80.410	80.320	80.320
5	1.00	DELETED	DELETED	80.150	80.360	80.280	80.320
6	1.25	DELETED	DELETED	80.150	80.410	80.410	80.350
7	1.50	DELETED	DELETED	80.130	80.350	80.300	80.320
8	1.75	DELETED	DELETED	80.130	80.300	80.280	80.320
9	2.00	DELETED	DELETED	80.110	80.430	80.320	80.300
10	2.25	DELETED	DELETED	80.150	80.360	80.360	80.350
11	2.50	DELETED	DELETED	80.110	80.360	80.300	80.350
12	2.75	DELETED	DELETED	80.110	80.430	80.330	80.310
13	3.00	DELETED	DELETED	80.110	80.370	80.330	80.310
14	3.25	DELETED	DELETED	80.130	80.390	80.360	80.300
15	3.50	DELETED	DELETED	80.130	80.360	80.220	80.320
16	3.75	DELETED	DELETED	80.110	80.450	80.320	80.320
17	4.00	DELETED	DELETED	80.110	80.280	80.320	80.300
18	4.25	DELETED	DELETED	80.110	80.300	80.280	80.300
19	4.50	DELETED	DELETED	80.110	80.430	80.350	80.280
20	4.75	DELETED	DELETED	80.110	80.300	80.260	80.300
21	5.00	DELETED	DELETED	80.110	80.410	80.350	80.300
22	5.25	DELETED	DELETED	80.090	80.260	80.240	80.300

CLRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 25 DEG F	TEMP 26 DEG F	TEMP 27 DEG F	TEMP 28 DEG F	TEMP 29 DEG F	TEMP 30 DEG F
1	0.00	79.600	79.750	80.140	80.200	80.880	80.070
2	.25	79.600	79.770	80.150	80.190	80.920	80.070
3	.50	79.620	79.750	80.150	80.220	80.860	80.000
4	.75	79.600	79.720	80.150	80.190	81.120	80.050
5	1.00	79.620	79.750	80.130	80.170	81.090	80.070
6	1.25	79.600	79.750	80.130	80.190	80.880	79.980
7	1.50	79.600	79.750	80.110	80.170	80.820	80.070
8	1.75	79.580	79.720	80.130	80.190	80.790	80.050
9	2.00	79.580	79.750	80.130	80.170	80.790	80.050
10	2.25	79.580	79.720	80.130	80.170	80.790	80.020
11	2.50	79.580	79.720	80.110	80.170	80.920	80.070
12	2.75	79.560	79.710	80.090	80.150	80.970	80.010
13	3.00	79.540	79.710	80.110	80.150	81.220	80.010
14	3.25	79.550	79.750	80.110	80.170	80.830	80.000
15	3.50	79.550	79.750	80.130	80.170	80.830	79.980
16	3.75	79.580	79.700	80.110	80.150	80.790	80.020
17	4.00	79.550	79.700	80.110	80.150	80.860	80.000
18	4.25	79.550	79.700	80.090	80.130	80.730	80.020
19	4.50	79.550	79.700	80.090	80.150	81.050	80.000
20	4.75	79.550	79.700	80.110	80.170	80.830	79.980
21	5.00	79.550	79.700	80.090	80.150	81.240	80.000
22	5.25	79.530	79.720	80.090	80.130	80.790	80.000

CLRT VARIABLE TABLE SUMMARY

SAMPLE NUMBER	DELTA HOURS	TEMP 31 DEG F	TEMP 32 DEG F	TEMP 33 DEG F	TEMP 34 DEG F	TEMP 35 DEG F	TEMP 36 DEG F
1	0.00	79.940	80.070	80.520	80.240	80.310	80.150
2	.25	79.920	80.070	80.520	80.240	80.300	80.170
3	.50	79.940	80.050	80.520	80.220	80.300	80.150
4	.75	79.920	80.050	80.520	80.240	80.320	80.110
5	1.00	79.920	80.020	80.520	80.240	80.300	80.150
6	1.25	79.960	80.020	80.490	80.220	80.280	80.150
7	1.50	79.900	80.020	80.490	80.190	80.300	80.150
8	1.75	79.900	80.020	80.490	80.190	80.300	80.150
9	2.00	79.920	80.020	80.490	80.220	80.300	80.150
10	2.25	79.920	80.070	80.490	80.220	80.280	80.110
11	2.50	79.920	80.000	80.470	80.190	80.280	80.110
12	2.75	79.920	80.010	80.480	80.180	80.280	80.110
13	3.00	79.850	80.010	80.480	80.180	80.260	80.090
14	3.25	79.880	80.020	80.470	80.190	80.280	80.130
15	3.50	79.880	80.020	80.490	80.190	80.280	80.110
16	3.75	79.900	80.000	80.470	80.190	80.280	80.110
17	4.00	79.850	80.020	80.470	80.220	80.280	80.090
18	4.25	79.940	80.020	80.450	80.190	80.260	80.110
19	4.50	79.920	80.020	80.470	80.190	80.260	80.110
20	4.75	79.900	79.980	80.470	80.170	80.260	80.110
21	5.00	79.850	80.020	80.450	80.170	80.260	80.110
22	5.25	79.900	80.000	80.450	80.170	80.260	80.130

CLRT VARIABLE TABLE SUMMARY

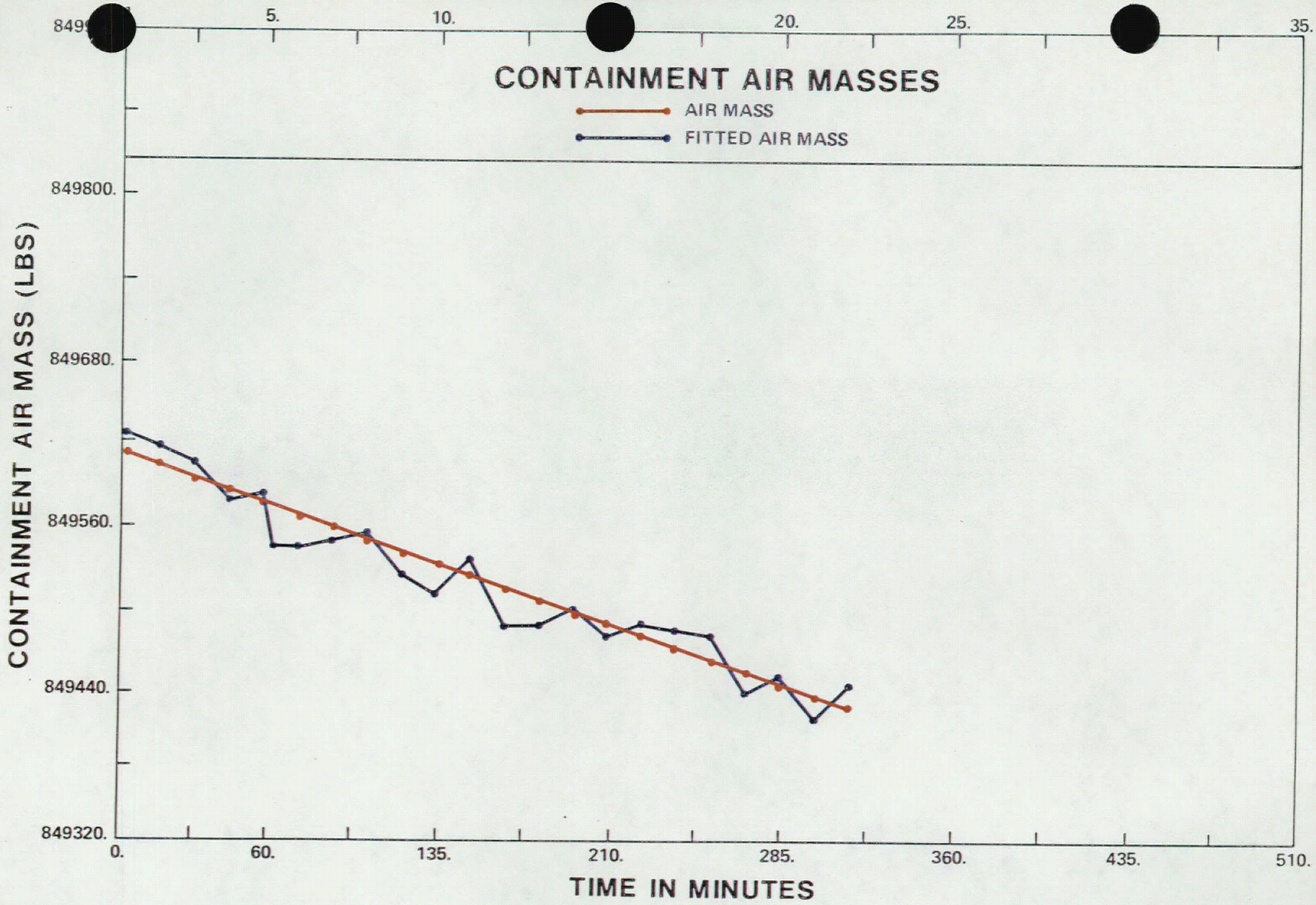
SAMPLE NUMBER	DELTA HOURS	TEMP 37 DEG F	TEMP 38 DEG F	TEMP 39 DEG F	TEMP 40 DEG F
1	0.00	80.240	80.520	80.150	79.710
2	.25	80.240	80.520	80.150	79.770
3	.50	80.240	80.540	80.130	79.750
4	.75	80.190	80.520	80.150	79.720
5	1.00	80.190	80.540	80.170	79.700
6	1.25	80.190	80.520	80.170	79.720
7	1.50	80.240	80.540	80.130	79.660
8	1.75	80.220	80.520	80.150	79.680
9	2.00	80.220	80.490	80.110	79.750
10	2.25	80.220	80.540	80.130	79.660
11	2.50	80.170	80.520	80.110	79.660
12	2.75	80.200	80.520	80.140	79.640
13	3.00	80.180	80.520	80.110	79.660
14	3.25	80.220	80.490	80.110	79.660
15	3.50	80.190	80.520	80.110	79.660
16	3.75	80.220	80.520	80.090	79.700
17	4.00	80.240	80.520	80.130	79.660
18	4.25	80.190	80.520	80.110	79.660
19	4.50	80.190	80.490	80.130	79.660
20	4.75	80.190	80.520	80.130	79.700
21	5.00	80.150	80.490	80.110	79.640
22	5.25	80.190	80.490	80.090	79.640

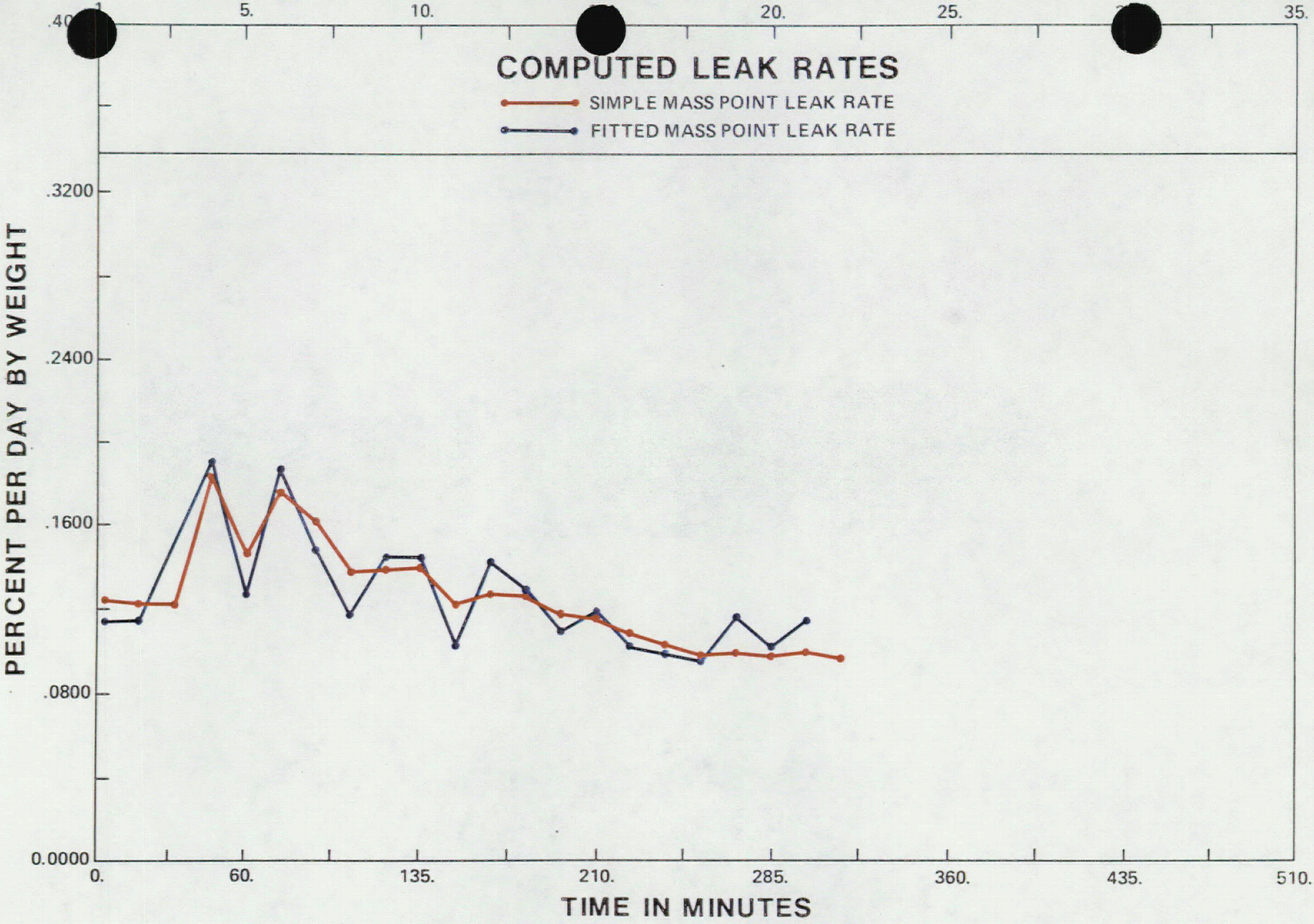
CLRT VARIABLE TABLE SUMMARY

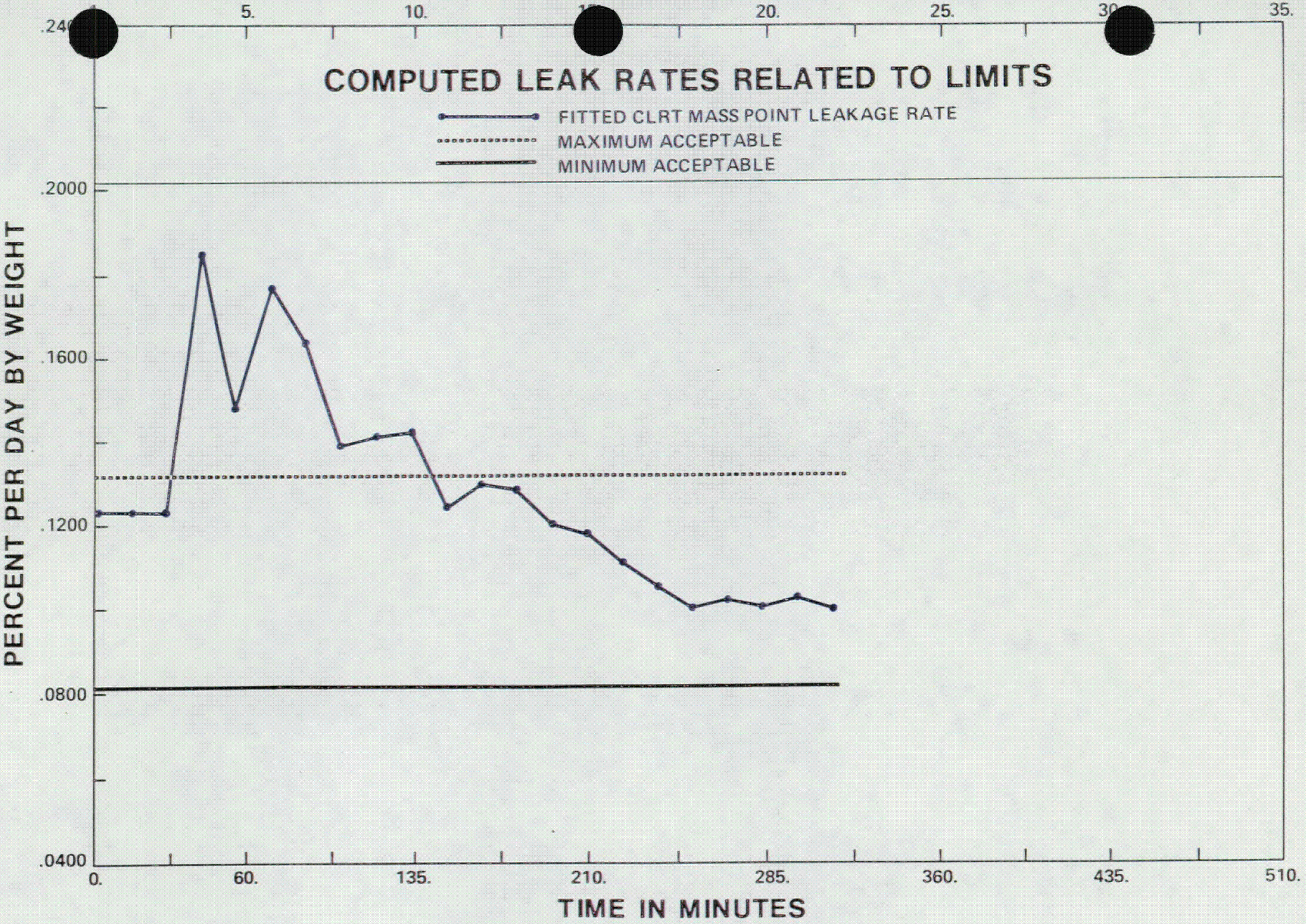
SAMPLE NUMBER	DELTA HOURS	PRES 1 PSIA	PRES 2 PSIA	HUM 1 % RH	HUM 2 % RH	HUM 3 % RH	HUM 4 % RH
1	0.00	65.4920	65.4750	79.17	78.76	79.23	79.88
2	.25	65.4910	65.4730	79.18	78.75	79.14	79.82
3	.50	65.4890	65.4710	79.17	78.75	79.26	79.90
4	.75	65.4880	65.4700	79.18	78.80	79.22	79.91
5	1.00	65.4870	65.4680	79.18	78.75	79.21	79.91
6	1.25	65.4850	65.4670	79.18	78.79	79.26	79.89
7	1.50	65.4840	65.4660	79.19	78.79	79.23	79.91
8	1.75	65.4820	65.4640	79.16	78.79	79.24	79.84
9	2.00	65.4810	65.4630	79.21	78.82	79.29	79.85
10	2.25	65.4800	65.4620	79.17	78.81	79.26	79.89
11	2.50	65.4790	65.4610	79.19	78.80	79.29	79.89
12	2.75	65.4770	65.4600	79.21	78.86	79.29	79.91
13	3.00	65.4760	65.4580	79.21	78.85	79.30	79.91
14	3.25	65.4760	65.4580	79.21	78.80	79.26	79.91
15	3.50	65.4740	65.4570	79.19	78.85	79.30	79.88
16	3.75	65.4740	65.4560	79.21	78.79	79.27	79.84
17	4.00	65.4720	65.4550	79.15	78.81	79.26	79.88
18	4.25	65.4720	65.4540	79.17	78.81	79.25	79.85
19	4.50	65.4700	65.4530	79.17	78.78	79.23	79.91
20	4.75	65.4690	65.4520	79.19	78.80	79.25	79.91
21	5.00	65.4680	65.4510	79.17	78.79	79.25	79.93
22	5.25	65.4680	65.4500	79.14	78.77	79.23	79.87

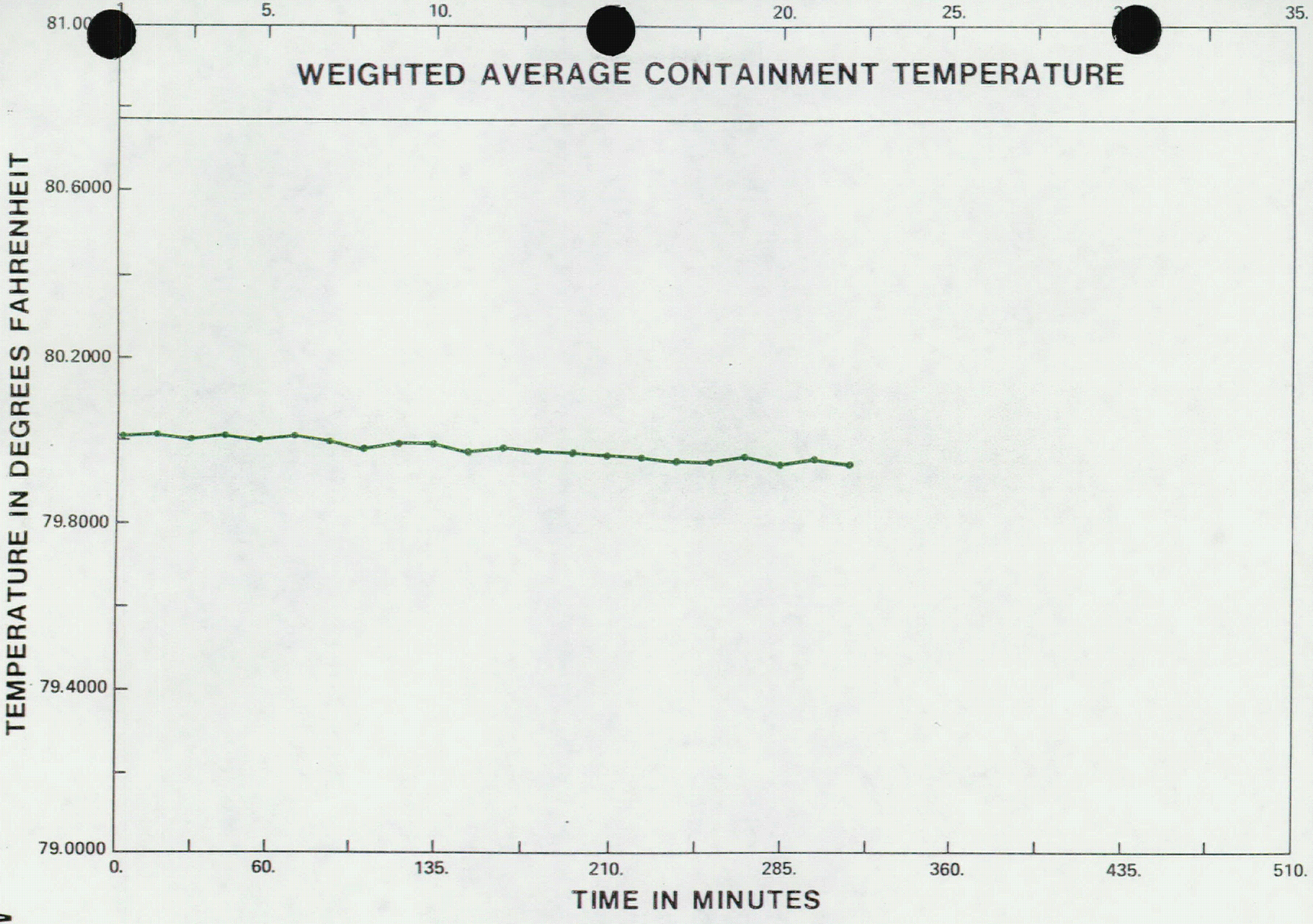
CLRT VARIABLE TABLE SUMMARY

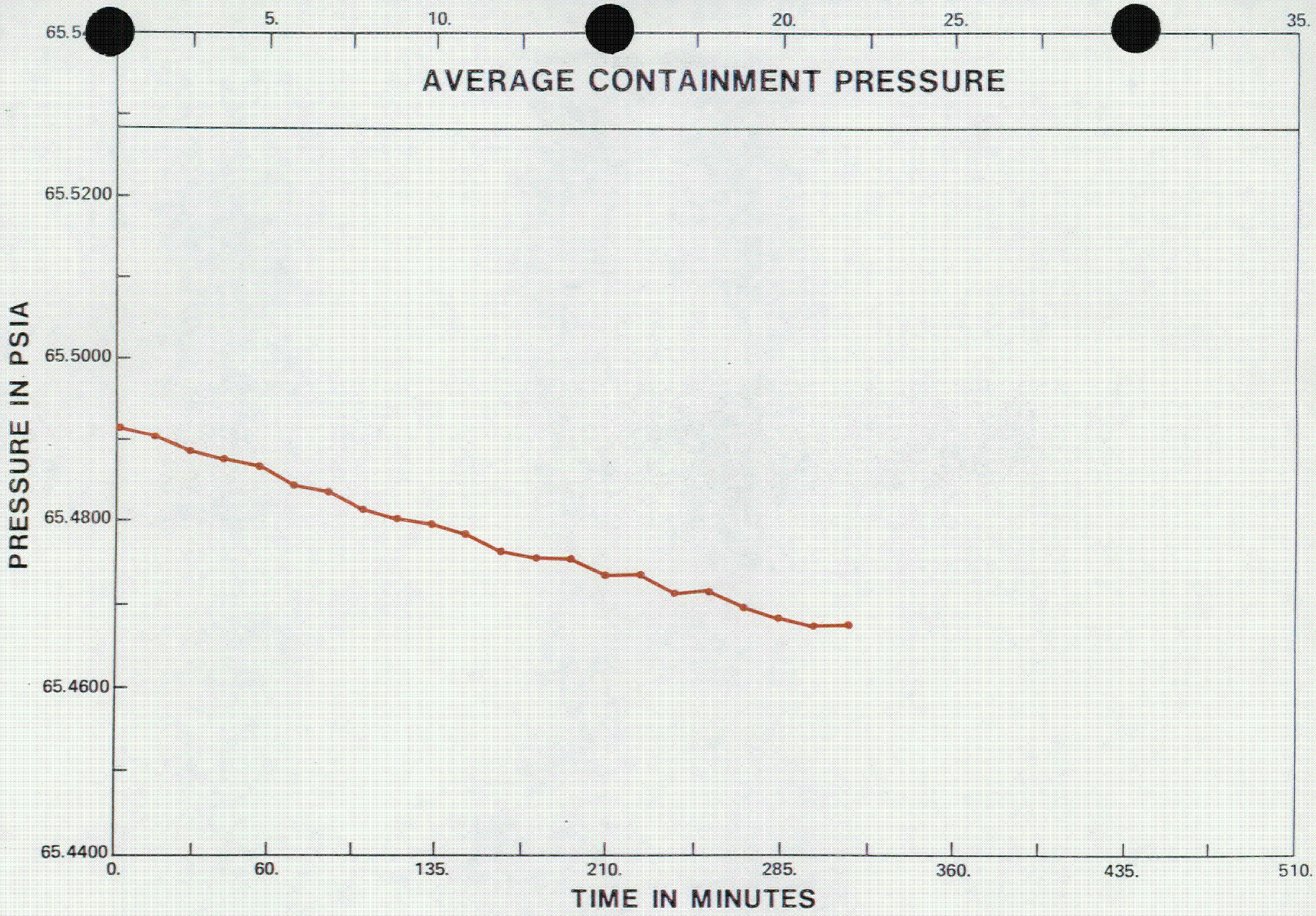
SAMPLE NUMBER	DELTA HOURS	HUM 5 % RH	HUM 6 % RH	HUM 7 % RH	HUM 8 % RH	HUM 9 % RH	HUM 10 % RH
1	0.00	79.30	78.64	78.26	76.91	81.86	77.12
2	.25	79.29	78.66	78.29	76.92	81.86	77.10
3	.50	79.33	78.56	78.26	76.92	81.88	77.14
4	.75	79.33	78.58	78.29	76.92	81.85	77.18
5	1.00	79.33	78.70	78.29	76.95	81.84	77.12
6	1.25	79.33	78.62	78.27	76.92	81.85	77.13
7	1.50	79.30	78.67	78.27	76.93	81.88	77.11
8	1.75	79.33	78.61	78.25	76.93	81.86	77.12
9	2.00	79.34	78.57	78.25	76.94	81.86	77.13
10	2.25	79.34	78.64	78.32	76.95	81.87	77.17
11	2.50	79.32	78.60	78.28	76.97	81.89	77.15
12	2.75	79.31	78.72	78.28	76.95	81.88	77.14
13	3.00	79.39	78.62	78.35	76.96	81.89	77.17
14	3.25	79.35	78.62	78.32	76.96	81.89	77.13
15	3.50	79.32	78.63	78.28	76.94	81.88	77.18
16	3.75	79.32	78.59	78.27	76.95	81.89	77.16
17	4.00	79.31	78.55	78.28	76.95	81.88	77.17
18	4.25	79.31	78.61	78.28	76.93	81.87	77.15
19	4.50	79.29	78.65	78.26	76.93	81.88	77.13
20	4.75	79.31	78.59	78.28	76.93	81.87	77.17
21	5.00	79.35	78.69	78.31	76.92	81.86	77.17
22	5.25	79.33	78.68	78.30	76.94	81.86	77.11

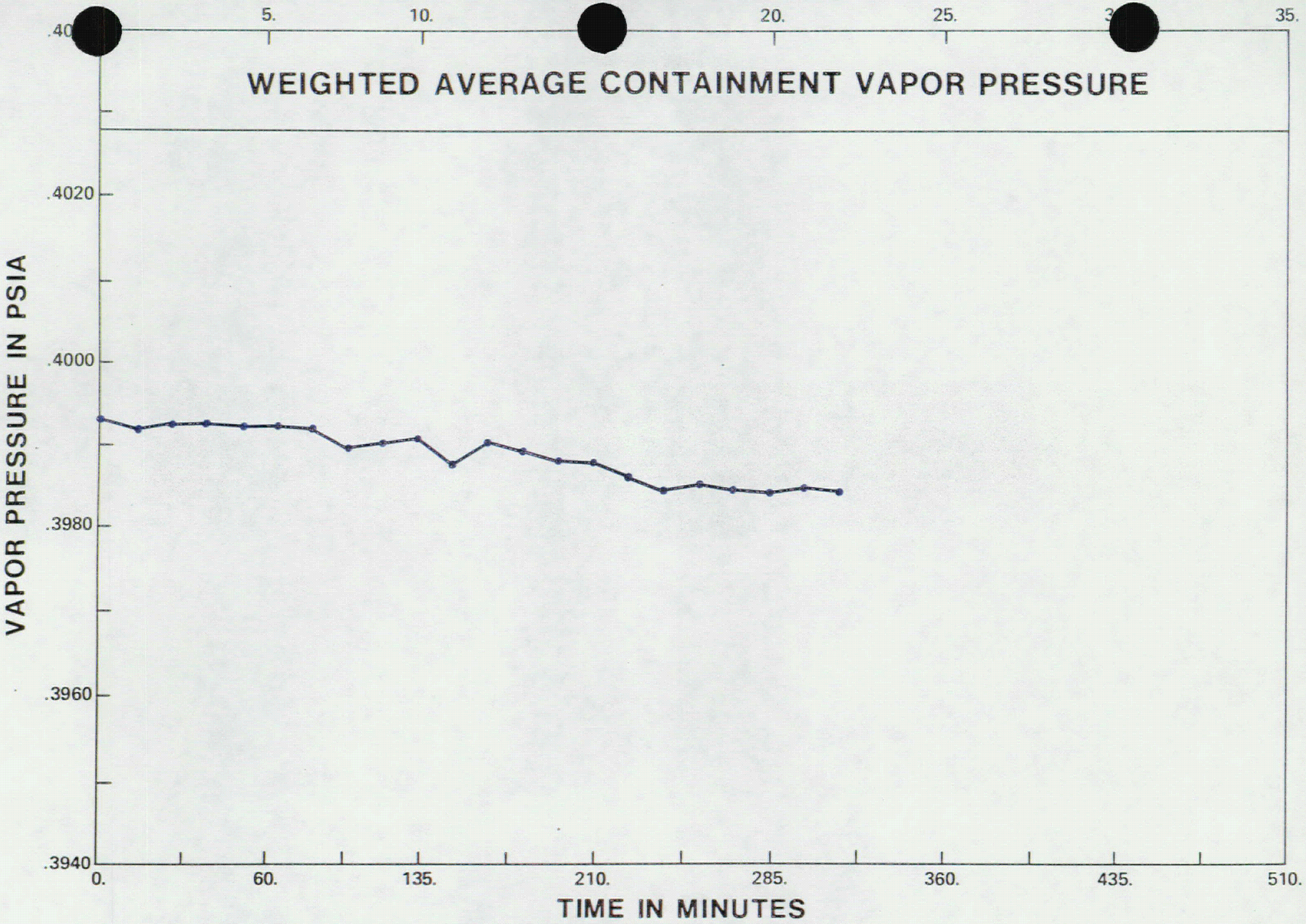

CONTAINMENT AIR MASSES
AIR MASS
FITTED AIR MASS
CONTAINMENT AIR MASS (LBS)
849800.
849680.
849560.
849440.
849320.
5.
10.
20.
25.
35.
0.
60.
135.
210.
285.
360.
435.
510.
TIME IN MINUTES


COMPUTED LEAK RATES
SIMPLE MASS POINT LEAK RATE
FITTED MASS POINT LEAK RATE
PERCENT PER DAY BY WEIGHT
TIME IN MINUTES
.3200
.2400
.1600
.0800
0.0000
0.
60.
135.
210.
285.
360.
435.
510.
1
5.
10.
20.
25.
35.


COMPUTED LEAK RATES RELATED TO LIMITS
FITTED CLRT MASS POINT LEAKAGE RATE
MAXIMUM ACCEPTABLE
MINIMUM ACCEPTABLE
PERCENT PER DAY BY WEIGHT
.2400
.2000
.1600
.1200
.0800
.0400
5.
10.
15.
20.
25.
30.
35.
0.
60.
135.
210.
285.
360.
435.
510.
TIME IN MINUTES


WEIGHTED AVERAGE CONTAINMENT TEMPERATURE
TEMPERATURE IN DEGREES FAHRENHEIT
81.00
80.6000
80.2000
79.8000
79.4000
79.0000
1.
5.
10.
20.
25.
35.
0.
60.
135.
210.
285.
360.
435.
510.
TIME IN MINUTES


AVERAGE CONTAINMENT PRESSURE
PRESSURE IN PSIA
TIME IN MINUTES
65.5200
65.5000
65.4800
65.4600
65.4400
0.
60.
135.
210.
285.
360.
435.
510.
5.
10.
20.
25.
35.



WEIGHTED AVERAGE CONTAINMENT VAPOR PRESSURE
VAPOR PRESSURE IN PSIA
.4020
.4000
.3980
.3960
.3940
0.
60.
135.
210.
285.
360.
435.
510.
5.
10.
20.
25.
35.
TIME IN MINUTES

APPENDIX B

SAMPLE REJECTION CRITERIA

AND CALCULATIONS

SAMPLE REJECTION CRITERIA AND CALCULATIONS

The rejection of data points is sometimes necessary when a data point differs widely from the remaining observations in the data base. The plot of air mass versus time in Appendix A.2 for the ILRT is an example of this behavior. Sample 39 in the ILRT exhibits a mass 260 pounds below other samples taken during that time period. The balance of the mass curve displays a much smaller scatter, the average deviation being less than 12 pounds. Qualitative inspection of this data base of mass values versus time predicts that sample 39 is an extreme outlier and would bias any further analysis of this data base.

To quantitatively reject this sample, the procedure given in ANSI/ANS 56.8-1981 is used. This method is an application of the methods proposed by Chauvenet and was developed by Tietjen, Moore, and Bechman (Technometrics, Vol. 15, No. 4, November 1973). The following is a table of standardized residuals for the ILRT data base of Appendix A.2:

Table of r_i Values

Sample Decade	0	1	2	3	4	5	6	7	8	9
0	-	0.25	0.13	0.31	0.66	-0.18	0.17	-0.22	0.68	0.48
1	1.10	-0.14	-0.50	1.06	0.36	0.64	0.12	0.33	0.24	-0.15
2	-0.005	0.07	0.59	-0.41	0.48	0.05	0.30	0.44	-0.02	0.10
3	-0.63	-0.28	0.36	0.18	0.15	-0.24	0.28	0.29	0.43	-8.85
4	-0.31	-0.07	-0.06	-0.65	0.17	0.04	0.62	0.33	0.58	0.72
5	-0.33	0.31	-0.78	-0.37	-0.52	-0.01	-0.83	-0.09	-0.31	-0.10
6	-0.42	-0.68	-0.36	0.25	0.09	-0.36	0.08	0.33	0.07	0.12
7	-0.07	0.31	-0.29	-0.41	0.27	-0.22	0.30	0.54	0.18	-0.14
8	-0.40	-0.18	0.36	-0.33	0.69	-0.17	-0.40	-0.12	-0.34	-0.53
9	0.63	0.94	0.85	0.83	0.13	0.62	0.36	0.61	-	-

As expected, sample 39 exhibits the largest deviation, -8.85. The sample with the next largest deviation, sample 10, has a deviation eight times smaller than sample 39. All samples other than sample 39 exhibit small random deviations normal for type type of data base.

For a data base as large as the ILRT, a sample must have a standardized residual larger than the critical residual. The critical residuals for a 97 sample data base at a 95 percent confidence level and at a 99 percent confidence level have been calculated by the methods of Tietjen, et al:

For a 95 percent level - 3.38

For a 99 percent level - 3.73

It should be noted that for either level of rejection, one and only one sample in the data base may be rejected, sample 39.

The rejected sample in the ILRT data base is ignored for all further calculations of leakage rate, least squares fit or upper confidence level. It should be noted, however, that the leakage results for the ILRT with or without sample rejection are not significantly different and do not affect the outcome of the verification phase or the acceptance of the test.

No samples in the verification CLRT data base exhibit abnormal deviations or should be rejected.

APPENDIX C

RAW TEST DATA FOR

NON-TEST PERIODS

SAMPLE 1 WAS TAKEN AT 2215 HOURS ON 09-17-84

SAMPLE 155 WAS TAKEN AT 1245 HOURS ON 09-19-84

CONTAINMENT INTEGRATED LEAKAGE RATE
TEST REPORT

Indian Point II - 1984

EBASCO PLANT SERVICES INC.

ILRT Test Services

SAMPLE	DELTA HR	AVE TEMP	PRESSURE	VAP PRES	AIR MASS
1	0.000	83.193	65.9880	.4258	850756
2	.250	83.137	65.9790	.4255	850730
3	.500	83.071	65.9710	.4250	850737
4	.750	83.024	65.9630	.4248	850708
5	1.000	82.965	65.9560	.4244	850716
6	1.250	82.920	65.9480	.4243	850685
7	1.500	82.873	65.9410	.4238	850673
8	1.750	82.831	65.9340	.4236	850652
9	2.000	82.774	65.9280	.4231	850668
10	2.250	82.724	65.9230	.4229	850684
11	2.500	82.687	65.9180	.4226	850681
12	2.750	82.647	65.9110	.4224	850657
13	3.000	82.618	65.9050	.4221	850628
14	3.250	82.586	65.9010	.4220	850628
15	3.500	82.539	65.8950	.4216	850628
16	3.750	82.519	65.8900	.4215	850595
17	4.000	82.478	65.8860	.4212	850612
18	4.250	82.446	65.8800	.4211	850586
19	4.500	82.416	65.8760	.4207	850585
20	4.750	82.391	65.8720	.4206	850575
21	5.000	82.348	65.8680	.4202	850595
22	5.250	82.322	65.8630	.4201	850574
23	5.500	82.290	65.8600	.4198	850588
24	5.750	82.274	65.8570	.4197	850574
25	6.000	82.240	65.8530	.4195	850579
26	6.250	82.226	65.8500	.4194	850564
27	6.500	82.203	65.8470	.4192	850563
28	6.750	82.182	65.8440	.4190	850559
29	7.000	82.158	65.8400	.4188	850548
30	7.250	82.147	65.8380	.4188	850539
31	7.500	82.125	65.8350	.4185	850539
32	7.750	82.098	65.8310	.4184	850529
33	8.000	82.071	65.8290	.4180	850552
34	8.250	82.061	65.8260	.4180	850529
35	8.500	82.047	65.8230	.4179	850514
36	8.750	82.030	65.8200	.4179	850501
37	9.000	82.016	65.8180	.4179	850497
38	9.250	81.991	65.8160	.4176	850513
39	9.500	81.977	65.8130	.4175	850498
40	9.750	81.954	65.8100	.4173	850498
41	10.000	81.943	65.8080	.4171	850491
42	10.250	81.926	65.8050	.4170	850482
43	10.500	81.903	65.8030	.4168	850493
44	10.750	81.888	65.8000	.4166	850480
45	11.000	81.857	65.7970	.4163	850494
46	11.250	81.850	65.7950	.4162	850480
47	11.500	81.820	65.7920	.4159	850492
48	11.750	81.802	65.7900	.4156	850497
49	12.000	81.791	65.7880	.4157	850488
50	12.250	81.768	65.7850	.4154	850490
51	12.500	81.753	65.7830	.4153	850488
52	12.750	81.749	65.7810	.4153	850468
53	13.000	81.719	65.7790	.4150	850493
54	13.250	81.706	65.7770	.4149	850489
55	13.500	81.692	65.7750	.4148	850486
56	13.750	81.678	65.7720	.4148	850469

SAMPLE	DELTA HR	AVE TEMP	PRESSURE	VAP PRES	AIR MASS
[illegible]7	14.000	81.664	65.7700	.4146	850469
[illegible]8	14.250	81.638	65.7680	.4143	850486
59	14.500	81.626	65.7660	.4142	850481
60	14.750	81.634	65.7630	.4146	850423
61	15.000	81.611	65.7610	.4142	850440
62	15.250	81.597	65.7580	.4141	850424
63	15.500	81.582	65.7560	.4141	850422
64	15.750	81.565	65.7540	.4138	850425
65	16.000	81.560	65.7510	.4138	850395
66	16.250	81.540	65.7490	.4136	850403
67	16.500	81.527	65.7470	.4134	850399
68	16.750	81.508	65.7440	.4133	850392
69	17.000	81.512	65.7420	.4134	850358
70	17.250	81.487	65.7410	.4131	850387
71	17.500	81.470	65.7390	.4130	850391
72	17.750	81.459	65.7370	.4128	850382
73	18.000	81.454	65.7340	.4128	850351
74	18.250	81.442	65.7330	.4127	850360
75	18.500	81.432	65.7310	.4127	850349
76	18.750	81.427	65.7300	.4127	850344
77	19.000	81.418	65.7280	.4127	850333
78	19.250	81.412	65.7260	.4125	850318
79	19.500	81.395	65.7240	.4125	850318
80	19.750	81.384	65.7220	.4124	850311
81	20.000	81.362	65.7200	.4122	850323
82	20.250	81.355	65.7180	.4121	850308
[illegible]3	20.500	81.344	65.7160	.4120	850301
[illegible]4	20.750	81.332	65.7150	.4119	850310
85	21.000	81.300	65.7130	.4117	850337
86	21.250	81.311	65.7110	.4117	850293
87	21.500	81.289	65.7090	.4116	850303
88	21.750	81.273	65.7080	.4113	850318
89	22.000	81.280	65.7050	.4114	850268
90	22.250	81.272	65.7040	.4115	850265
91	22.500	81.240	65.7020	.4110	850296
92	22.750	81.235	65.7000	.4109	850279
93	23.000	81.227	65.6990	.4110	850278
94	23.250	81.210	65.6970	.4108	850281
95	23.500	81.208	65.6960	.4109	850270
96	23.750	81.193	65.6940	.4107	850268
97	24.000	81.171	65.6920	.4104	850281
98	24.250	81.162	65.6900	.4102	850271
99	24.500	81.135	65.6880	.4099	850293
100	24.750	81.135	65.6860	.4101	850263
101	25.000	81.137	65.6850	.4100	850249
102	25.250	81.121	65.6830	.4103	850246
103	25.500	81.104	65.6810	.4098	850252
104	25.750	81.091	65.6790	.4098	850246
105	26.000	81.078	65.6780	.4096	850255
106	26.250	81.061	65.6760	.4095	850257
107	26.500	81.060	65.6740	.4096	850233
[illegible]8	26.750	81.053	65.6730	.4094	850233
[illegible]9	27.000	81.047	65.6710	.4094	850217
110	27.250	81.022	65.6690	.4092	850232
111	27.500	81.014	65.6680	.4089	850235
112	27.750	81.007	65.6660	.4090	850219

SAMPLE	DELTA HR	AVE TEMP	PRESSURE	VAP PRES	AIR MASS
113	28.000	80.990	65.6640	.4087	850223
114	28.250	80.988	65.6630	.4089	850210
115	28.500	80.969	65.6610	.4087	850217
116	28.750	80.967	65.6600	.4086	850208
117	29.000	80.945	65.6580	.4084	850221
118	29.250	80.937	65.6560	.4083	850207
119	29.500	80.935	65.6550	.4083	850198
120	29.750	80.929	65.6540	.4084	850193
121	30.000	80.924	65.6520	.4083	850177
122	30.250	80.902	65.6500	.4081	850189
123	30.500	80.895	65.6470	.4080	850161
124	30.750	80.891	65.6460	.4079	850156
125	31.000	80.878	65.6440	.4078	850152
126	31.250	80.870	65.6420	.4078	850137
127	31.500	80.857	65.6400	.4077	850133
128	31.750	80.847	65.6380	.4076	850124
129	32.000	80.835	65.6350	.4074	850107
130	32.250	80.827	65.6330	.4074	850093
131	32.500	80.824	65.6310	.4074	850072
132	32.750	80.803	65.6300	.4072	850095
133	33.000	80.809	65.6280	.4071	850059
134	33.250	80.805	65.6260	.4071	850039
135	33.500	80.793	65.6240	.4069	850035
136	33.750	80.767	65.6230	.4068	850065
137	34.000	80.769	65.6210	.4067	850037
138	34.250	80.759	65.6190	.4067	850026
139	34.500	80.750	65.6170	.4064	850018
140	34.750	80.748	65.6160	.4065	850007
141	35.000	80.738	65.6130	.4064	849985
142	35.250	80.711	65.6120	.4060	850021
143	35.500	80.706	65.6100	.4061	850000
144	35.750	80.704	65.6080	.4061	849978
145	36.000	80.693	65.6070	.4058	849986
146	36.250	80.687	65.6050	.4058	849969
147	36.500	80.673	65.6030	.4056	849968
148	36.750	80.664	65.6010	.4055	849956
149	37.000	80.667	65.6000	.4057	849937
150	37.250	80.651	65.5980	.4056	849937
151	37.500	80.644	65.5960	.4054	849925
152	37.750	80.628	65.5940	.4055	849923
153	38.000	80.627	65.5920	.4052	849901
154	38.250	80.626	65.5900	.4053	849875
155	38.500	80.616	65.5880	.4051	849868

APPENDIX D

PENETRATIONS ISOLATED

DURING THE ILRT

PENETRATIONS ISOLATED DURING THE ILRT

Penetration R - Steam Jet Air Ejector Discharge to Containment

This system is shown on Con Edison Drawing 9321-F-2025.

The Steam Jet Air Ejector (SJAE) serves to divert condenser gases to the containment during normal plant operation. Under accident conditions, the containment isolation valves in the line from the SJAE are signaled to close by the Phase A containment isolation signal.

Local Leakage Rate Testing on this penetration prior to the ILRT measured a leakage of 9890.3 SCCM. Due to the schedule for the ILRT, normal maintenance repairs to this sytem could not be completed. Although this measured leakage was well below ILRT or LLRT limits, the penetration was conservatively isolated for the ILRT by installing a plumber's plug in the open line inside of containment. After the ILRT, the maintenance work request (MWR) on the penetration was completed and an LLRT retest was performed with 27.17 SCCM as a result. The pre-and post-maintenance leakages for this penetration are added to the ILRT measured leakage since the SJAE is not required to function during an accident and the isolation valves are required to close and remain leaktight.

Service Water to Fan Cooler Unit No. 22

This system is shown on Con Edison Drawings A-209762 and A9321-F-2722.

Five fan cooler units inside containment are supplied from the service water system. These units are redundant to the containment spray system and serve to remove heat from containment under accident conditions. Each fan cooler unit has its own service water supply and return penetrations. Supply and return lines are headered together outside of containment. The fan cooler units and associated service water piping form a closed system inside containment. Although the system is designed to remain water filled and functioning under accident conditions, a conservative test philosophy dictated venting the closed fan cooler units and service water system piping outside containment for the purpose of identifying potential leak paths through the boundary.

A vent on the service water piping to Fan Cooler Unit (FCU) 22 was found to be leaking by survey teams during pressurization for the ILRT. An as-found leakge of 4.91 SCFM was measured on this system while the containment was at pressure. After the ILRT, inspection of the system determined that there were two leaking tubes in the FCU. After these tubes were repaired, an as-left leakage rate on the entire service water system to FCU 22 was measured as 0.002 SCFM.

An investigation into the cause of the leakage was made. During the prior operating cycle, no leakage of this magnitude was noted during plant operation. In addition, the 10-year ISI hydrostatic test had been performed on the system prior to the ILRT with no leakage observed. It was noted that MWRs were being worked on the FCUs just prior to the ILRT and the post-maintenance retest had not been completed since the system had not been filled with water. The maintenance performed on the FCUs is believed to have resulted in the leakage. This would have been discovered during post-maintenance testing prior to operation. Discovery of FCU 22 leakage during the ILRT was not related to the leakage characteristics of the containment system, and therefore no correction to the ILRT measured leakage is necessary for this system.

WCPPS to the 80' Airlock and Electrical Penetration H-32

This system is shown on Con Edison drawing 9321-F-2726.

The Weld Channel and Penetration Pressurization System (WCPPS) provides a means for continuously pressurizing the positive pressure zones incorporated into the containment penetrations and the channels over the welds in the steel inner liner and certain containment isolation valves. The system maintains a pressure in excess of containment design presure continuously during normal operation as well as accident conditions, thereby ensuring that there will be no out-leakage of the containment atmosphere through the penetrations and liner welds duing an accident. Although no credit is taken for system operation in calculation of off-site accident doses, it is designed as an engineered safety feature and does provide assurance that the containment leak rate in the event of an accident is lower than that assumed in the accident analysis. As a practical matter, performing the ILRT with the WCPPS pressurized could interfere with performance of the test due to the potential for in-leakage to containment from the WCPPS during the test. Since no credit is taken for system operation in the calculation of off-site radiological consequences during an accident, the system is conservatively depressurized and vented for the ILRT.

The WCPPS is arranged in four separate zones. Certain zones supply air to penetrations and containment isolation valves from outside containment. Air supply to the weld channels, other penetrations and isolation valves from inside containment is via a dedicated penetration from compressors and air receivers located outside containment.

Two WCPPS vents were found to be leaking by survey teams during pressurization for the ILRT. One leak was found at the WCPPS vent on the 80' elevation airlock. The second leak was found at the WCPPS vent on electrical penetration H-32. Measurements on these vents while the containment was pressurized determined leakages of 4.76 SCFM for the 80' airlock and 4.43 SCFM for electrical penetration H-32.

The leak on the 80' airlock was found to be the result of a damaged inner door gasket allowing air to enter the WCPPS. The airlock doors are each provided with a double gasketed seal arrangement with a WCPPS supply serving to pressurize the space between the seals. The WCPPS supply to the inner door is from an outside zone which was vented externally to containment for the ILRT. In the normal system configuration, with the WCPPS pressurized, a leaking door seal would result in WCPPS flow into containment due to the WCPPS being maintained at a pressure in excess of containment design pressure. Such a situation would be readily evident during normal operation as each zone is provided with flow and pressure indication and alarm. A leaking door seal would cause a high flow-low pressure condition to exist in the WCPPS zone supplying the door seal.

By conservatively depressurizing the WCPPS for the ILRT, a path was established that would permit the escape of pressurizing medium from containment in the presence of a damaged door seal. A more appropriate test alignment would have vented the WCPPS supply to the inner door seal inside containment rather than outside. The leak in the airlock door seal was noted due only to the WCPPS line up used for the ILRT. A review of the records for the zone in question was initiated. No evidence of unusual leakage (of the magnitude identified during the ILRT) was identified during the last cycle from that review. It is believed that the damage to the inner door seal occurred during the cycle 6/7 refueling and maintenance outage prior to performing the ILRT, probably due to frequent use of the door during the outage. Following repair of the door gasket, an overall airlock leakage test was performed with a result of 0.6 SCFM.

The leakage attributed to the WCPPS at electrical penetration H-32 was caused by a tubing change associated with the installation of new electrical penetrations during the 1982 refueling outage not considered during preparation for the ILRT. This change resulted in redundant WCPPS supplies to electrical penetration H-32, one supply from a WCPPS zone outside containment, the other from a zone inside containment. As previously noted, these zones were depressurized and vented for the performance of the test. Venting the zone inside containment permitted containment atmosphere to enter penetration H-32. Since the redundant zone outside containment was also vented to the outside atmosphere for the ILRT, the test alignment permitted the escape of pressurizing medium. This condition is directly attributable to the system alignment for the ILRT and would not have occurred during normal operation or accident conditions.

Pressure testing at penetration H-32 showed no leakage at the cannister or penetration itself. As previously noted, during normal operation all WCPPS zones are required to be pressurized by Technical Specification, to at least containment design pressure, thereby preventing any potential out leakage. With the WCPPS pressurized, the effect of providing redundant WCPPS supplies to a single penetration is inconsequential. The WCPPS was subsequently modified prior to start-up to eliminate the redundant supply.

Neither of these leaks noted during the ILRT are an indication of containment systems leakage and no correction to the measured ILRT leakage is necessary.

APPENDIX E

LOCAL LEAKAGE RATE TEST

(LLRT),

TYPE B AND C RESULTS

LOCAL LEAK RATE TEST RESULTS SINCE THE LAST ILRT

		1980-81			1982			1984		
Valve No.	**System**	**Test**	**As-Found**	**As-Left**	**Test**	**As-Found**	**As-Left**	**Test**	**As-Found**	**As-Left**
549	PRT to Gas Anal.	R26	*	-	R26	0.0	0.0	R26A	.166	.166
538	PRT to Gas Anal.	R26	*	-	R26	0.0	0.0	R26A	.166	.166
518	PRT N_2 Supply	R27	64	64	R27	10,000	0.0	R27	0	0
550	PRT N_2 Supply	R27	10	10	N/A	N/A	N/A	N/A	N/A	N/A
3418	PRT N_2 Supply	N/A	N/A	N/A	R27	1.0	1.0	R27	57.29	57.29
3419	PRT N_2 Supply	N/A	N/A	N/A	R27	1.0	1.0	R27	57.29	57.29
4136	PRT N_2 Supply	N/A	N/A	N/A	R27	1.0	1.0	R27	57.29	57.29
552	PRT Makeup N_2O	R26	*	-	R26	0.0	0.0	R26A	0.0	0.0
519	PRT Makeup N_2O	R26	*	-	R26	0.0	0.0	R26A	0.0	0.0
741/741A	RHR to RCS	R27	2,687	2,687	R27	20,820	0.0	R27A	0.0	0.0
744	RHR to RCS	R26	13.0	13.0	R26	200	200	R26B	72.3	0.0
888A	RHR to SIS	R26	12.0	12.0	R26	100	100	R26B	69.81	34.71
888B	RHR to SIS	R26	4.0	4.0	R26	100	100	R26B	29.2	42.15
958	RHR Sampling	R26	16.0	16.0	R26	150	150	R26B	319.13	21.0
959	RHR Sampling	R26	16.0	16.0	R26	150	150	R26B	319.13	21.0
990C/990D	RHR Sampling	R26	16.0	16.0	R26	150	150	R26B	319.13	21.0
1870	RHR from RCS	R26	9.0	9.0	R26	0.0	0.0	R26B	11.47	11.47
743	RHR from RCS	R26	9.0	9.0	R26	0.0	0.0	R26B	11.47	11.47

LOCAL LE[illegible] RATE TEST RESULTS
SIN[illegible] THE LAST ILRT

		1980-81			1982			1984		
Valve No.	System	Test	As-Found	As-Left	Test	As-Found	As-Left	Test	As-Found	As-Left
732	RHR from RCS	R26	13.0	13.0	R26	200	200	R26B	172.03	172.03
885A	VC Sump Recirc	R27	36.0	36.0	R27	5.3	5.3	R26A	0.70	0.70
885B	VC Sump Recirc	R27	36.0	36.0	R27	5.3	5.3	R26A	0.97	0.97
201	Letdown	R26	*	-	R26	0.0	0.0	R26A	2.06	2.06
202	Letdown	R26	*	-	R26	0.0	0.0	R26A	2.06	2.06
205	Charging	R26	*	-	R26	7.0	7.0	R26A	1.37	1.37
226	Charging	R26	*	-	R26	7.0	7.0	R26A	1.37	1.37
227	Charging	R26	*	-	R26	7.0	7.0	R26A	1.37	1.37
250A	RCP Seal Injection	R26	*	-	R26	0.0	0.0	R26A	1.33	1.33
4925	RCP Seal Injection	N/A	N/A	N/A	R26	0.0	0.0	R26A	1.33	1.33
241A	RCP Seal Injection	R26	*	-	N/A	N/A	N/A	N/A	N/A	N/A
250B	RCP Seal Injection	R26	*	-	R26	0.0	0.0	R26A	0	0
4926	RCP Seal Injection	N/A	N/A	N/A	R26	0.0	0.0	R26A	0	0
241B	RCP Seal Injection	R26	*	-	N/A	N/A	N/A	N/A	N/A	N/A
250C	RCP Seal Injection	R26	*	-	R26	0.0	0.0	R26A	4.66	4.66
4927	RCP Seal Injection	N/A	N/A	N/A	R26	0.0	0.0	R26A	4.66	4.66
241C	RCP Seal Injection	R26	*	-	N/A	N/A	N/A	N/A	N/A	N/A
350D	RCP Seal Injection	R26	*	-	R26	0.0	0.0	R26A	.133	.133

LOCAL LEAKAGE RATE TEST RESULTS SINCE THE LAST ILRT

Valve No.	System	1980-81 Test	1980-81 As-Found	1980-81 As-Left	1982 Test	1982 As-Found	1982 As-Left	1984 Test	1984 As-Found	1984 As-Left
4928	RCP Seal Injection	N/A	N/A	N/A	R26	0.0	0.0	R26A	.133	.133
241D	RCP Seal Injection	R26	*	-	N/A	N/A	N/A	N/A	N/A	N/A
222	RCP Seal Return	R26	*	-	R26	0.0	0.0	R26A	.66	.66
956E	RCS Sampling	R26	*	-	R26	0.0	0.0	R26A	0.0	0.0
956F	RCS Sampling	R26	*	-	R26	0.0	0.0	R26A	0.0	0.0
869A	VC Spray	R26	*	-	R26	0.5	0.5	R26A	0.7	0.7
867A	VC Spray	R27	10.0	10.0	R27	27.0	27.0	R27	783.51	783.51
878A	VC Spray	R27	10.0	10.0	R27	27.0	27.0	R27	269.39	269.39
869B	VC Spray	R26	*	-	R26	.67	.67	R26A	.27	.27
867B	VC Spray	R27	10.0	10.0	R27	2000	2000	R27	54.28	54.28
878B	VC Spray	R27	10.0	10.0	N/A	N/A	N/A	N/A	N/A	N/A
851A	SIS	R26	*	-	R26	0.0	0.0	R26A	0.6	0.6
850A	SIS	R26	*	-	R26	0.0	0.0	R26A	.13	.13
851B	SIS	R26	*	-	R26	0.0	0.0	R26A	2.5	2.5
850B	SIS	R26	*	-	R26	75.0	.83	R26A	.83	.83
859A	SIS Test	R26	*	-	R26	0.0	0.0	R26A	.33	.33
859C	SIS Test	R26	*	-	R26	0.0	0.0	R26A	.33	.33
4312	OPS & ACC N_2	N/A	N/A	N/A	R27	8.0	8.0	R27	9.89	9.89

LOCAL LE[illegible] RATE TEST RESULTS
SIN[illegible] THE LAST ILRT

		1980-81			1982			1984		
Valve No.	System	Test	As-Found	As-Left	Test	As-Found	As-Left	Test	As-Found	As-Left
863	OPS & ACC N_2	R27	44.0	44.0	R27	50.0	50.0	R27	12.36	12.36
891A	ACC N_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
891B	ACC N_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
891C	ACC N_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
891D	ACC N_2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
956G	Accum Sampling	R26	*	-	R26	0.0	0.0	R26A	.33	.33
956H	Accum Sampling	R26	*	-	R26	0.0	0.0	R26A	.33	.33
1786	RCDT to VH	R26	*	-	R26	.1	.1	R26A	.166	.166
1787	RCDT to VH	R26	*	-	R26	.1	.1	R26A	.166	.166
1610	RCDT N_2 Supply	R27	10.0	10.0	N/A	N/A	N/A	N/A	N/A	N/A
1616	RCDT N_2 Supply	R27	10.0	10.0	R27	0	0	R27	0.0	0.0
3417	RCDT N_2 Supply	N/A	N/A	N/A	R27	0	0	R27	0.0	0.0
3416	RCDT N_2 Supply	N/A	N/A	N/A	R27	0	0	R27	0.0	0.0
5459	RCDT N_2 Supply	N/A	N/A	N/A	R27	0	0	R27	0.0	0.0
1788	RCDT to G.A.	R27	*	-	R26	0	0	R26A	0.5	0.5
1789	RCDT to G.A.	R26	*	-	R26	0	0	R26A	0.5	0.5
1702	RCDT to WHOT	R26	*	-	R26	0	0	R26A	4.5	0
1705	RCDT to WHOT	R26	*	-	R26	0	0	R26A	4.5	0

LOCAL LEAKAGE RATE TEST RESULTS
SINCE THE LAST ILRT

		1980-81			1982			1984		
Valve No.	System	Test	As-Found	As-Left	Test	As-Found	As-Left	Test	As-Found	As-Left
797	CCW to RCP	R26	*	-	R26	0	0	R26A	8.66	8.66
784	CCW to RCP	R26	*	-	R26	0	0	R26A	1.66	1.66
FCV-625	CCW to RCP	R26	*	-	R26	0	0	R26A	12.8	12.8
791	Excess Letdown	R26	*	-	R26	0	0	R26A	0	0
798	Excess Letdown	R26	*	-	R26	0	0	R26A	0	0
796	Excess Letdown	R26	*	-	R26	14.7	14.7	R26A	.33	.33
793	Excess Letdown	R26	*	-	R26	14.7	14.7	R26A	.33	.33
1778	VC Sump Discharge	R26	*	-	R26	0.0	0.0	R26A	1.23	1.06
1723	VC Sump Discharge	R26	*	-	R26	0.0	0.0	R26A	1.23	1.06
1234	VC Air Sample	R11	*	-	R11	*	-	R27C	0	0
1235	VC Air Sample	R11	*	-	R11	*	-	R27C	0	0
1236	VC Air Sample	R11	*	-	R11	*	-	R27C	13.57	13.92
1237	VC Air Sample	R11	*	-	R11	*	-	R27C	13.92	13.92
PCV-1229	Air Ejection	R11	*	-	R11	*	-	R27C	9890.3	27.17
PCV-1230	Air Ejection	R11	*	-	R11	*	-	R27C	9890.3	27.17
PCV-1214/14A	S/G Blowdown	R26	*	-	R26	0	0	R26A	0	0
PCV-1215/15A	S/G Blowdown	R26	*	-	R26	.005	0	R26A	0	0
PCV-1216/16A	S/G Blowdown	R26	*	-	R26	100	0	R26A	0	0

LOCAL LEAK RATE TEST RESULTS SINCE THE LAST ILRT

Valve No.	System	1980-81 Test	1980-81 As-Found	1980-81 As-Left	1982 Test	1982 As-Found	1982 As-Left	1984 Test	1984 As-Found	1984 As-Left
PCV-1217/17A	S/G Blowdown	R26	*	-	R26	0	0	R26A	0	0
PCV-1223/23A	S/G Sample	R26	*	-	R26	0	0	R26A	0	0
PCV-1224/24A	S/G Sample	R26	*	-	R26	0	0	R26A	0	0
PCV-1225/25A	S/G Sample	R26	*	-	R26	0	0	R26A	0	0
PCV 1226/26A	S/G Sample	R26	*	-	R26	0	0	R26A	.4	.4
SA-24	Station Air to VC	R26	*	-	R26	0	0	R26A	9972.69	.3
SA-24-1	Station Air to VC	R26	*	-	R26	0	0	R26A	9972.69	.3
580A	Dead Weight Test	R27	0.0	0.0	R27	1.0	1.0	R27	12.43	12.43
580B	Dead Weight Test	R27	0.0	0.0	R27	1.0	1.0	R27	9.94	9.94
UH-43	Aux Steam	R26	*	-	R26	1.2	1.2	R26A	75	0.9
UH-44	Aux Steam	R26	*	-	R26	0	0	R26A	133.33	.866
MW-17	City Water	R26	*	-	R26	0	0	R26A	0	0
MW-17	City Water	R26	*	-	R26	0	0	R26A	0	0
1170	VC Purge	R11	*	-	R11	*	-	R27C	1995	1995
1171	VC Purge	R11	*	-	R11	*	-	R27C	1995	1995
1172	VC Purge	R11	*	-	R11	*	-	R27C	6045	598
1173	VC Purge	R11	*	-	R11	*	-	R27C	6045	598
1190	VC Press Reheat	R27	1000	1000	R11	18	18	R27C	2185	3490.49

LOCAL LEAKAGE RATE TEST RESULTS
SINCE THE LAST ILRT

Valve No.	System	1980-81 Test	1980-81 As-Found	1980-81 As-Left	1982 Test	1982 As-Found	1982 As-Left	1984 Test	1984 As-Found	1984 As-Left
1191	VC Pressure Reheat	R27	1000	1000	R27	18	18	R27C	0	54.84
1192	VC Pressure Reheat	R11	*	-	R11	*	-	R27C	0	54.84
990A	Recird Sump Sample	R26	91	91	R26	0	0	R26B	109.6	109.6
990B	Recird Sump Sample	R26	91	91	R26	0	0	R26B	109.6	109.6
956A	Pressure Sample	R26	*	-	R26	0	0	R26A	0	0
956B	Pressure Sample	R26	*	-	R26	0	0	R26A	0	0
956C	Pressure Sample	R26	*	-	R26	0	0	R26A	5.83	.066
956D	Pressure Sample	R26	*	-	R26	0	0	R26A	5.83	.066
1814A	VC Pressure	R27	10	10	R27	10	10	R27	0	0
1814B	VC Pressure	R27	34	34	R27	0	0	R27	0	0
1814C	VC Pressure	R27	10	10	R27	0	0	R27	0	0
1875A	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
1875B	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
1875C	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
1875D	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
1875E	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A

LOCAL LEAK RATE TEST RESULTS
SINCE THE LAST ILRT

Valve No.	System	1980-81			1982			1984		
		Test	As-Found	As-Left	Test	As-Found	As-Left	Test	As-Found	As-Left
1875F	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
1875G	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
1875H	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
1875J	Post-Accident Containment Air Sampling				N/A	N/A	N/A	N/A	N/A	N/A
5018	Post-Accident Containment Air Sampling	N/A	N/A	N/A	R27	.75	.75	R27	45.91	45.91
5019	Post-Accident Containment Air Sampling	N/A	N/A	N/A	R27	0	0	R27	29.78	29.78
5020	Post-Accident Containment Air Sampling	N/A	N/A	N/A	R27	1.0	1.0	R27	24.86	47.15
5021	Post-Accident Containment Air Sampling	N/A	N/A	N/A	R27	1.0	1.0	R27	1246.59	81.3
5022	Post-Accident Containment Air Sampling	N/A	N/A	N/A	R27	1.85	1.85	R27	52.19	52.19
5023	Post-Accident Sampling	N/A	N/A	N/A	R27	1.0	1.0	R27	9.94	9.94
5024	Post-Accident Sampling	N/A	N/A	N/A	R27	1.85	1.85	R27	52.19	52.19
5025	Post-Accident Sampling	N/A	N/A	N/A	R27	1.6	1.6	R27	19.13	19.13
IV-1A	O_2 Supply to VC	*	-	-	R27	0	0	R27	0	0
IV-1B	O_2 Supply to VC	*	-	-	R27	0	0	R27	0	0

LOCAL LEA RATE TEST RESULTS
SINC HE LAST ILRT

		1980-81			1982			1984		
Valve No.	System	Test	As-Found	As-Left	Test	As-Found	As-Left	Test	As-Found	As-Left
IV-2A	O_2 Supply to VC	R27	600	10	R27	0	0	R27	0	0
IV-2B	O_2 Supply to VC	R27	600	10	R27	0	0	R27	0	0
3420	H_2 Supply to H_2 Recomb.	N/A	N/A	N/A	R27	0	0	R27	0	0
IV-3A	H_2 Supply to H_2 Recomb.	R27	10	10	R27	0	0	R27	0	0
3421	H_2 Supply to H_2 Recomb.	N/A	N/A	N/A	R27	0	0	R27	5584.7	0
IV-5A	H_2 Supply to H_2 Recomb.	R27	140	140	R27	5000	17	R27	0	0
3422	H_2 Supply to H_2 Recomb.	N/A	N/A	N/A	R27	0	0	R27	0	0
IV-3B	H_2 Supply to H_2 Recomb.	R27	180	180	R27	0	0	R27	0	0
3423	H_2 Supply to H_2 Recomb.	N/A	N/A	N/A	R27	5000	6.16	R27	9571.2	
IV-5B	H_2 Supply to H_2 Recomb.	R27	12	12	R27	5000	6.16	R27	0	0
IA-39	Instrument Air to VC	R27	600	600	R27	13.5	13.5	R27	38.54	38.54
PCV-1228	Instrument Air to VC	R27	2.4	2.4	R27	28.5	28.5	R27	19.13	19.13
E-2	Post-Accident VC Vent	R11	*	-	R11	*	-	R27C	100.65	100.65
E-1	Post-Accident VC Vent	R11	*	-	R11	*	-	R27C	100.65	100.65
E-3	Post-Accident VC Vent	R11	*	-	R11	*	-	R27C	100.65	100.65
E-5	Post-Accident VC Vent	R11	*	-	R11	*	-	R27C	100.65	100.65
85A	Personnel Airlock	R27	50	50	R27	2	2	R27	11.68	0
85B	Personnel Airlock	R27	50	50	R27	8	8	R27	10.44	0

LOCAL LE[illegible] RATE TEST RESULTS
SINCE THE LAST ILRT

		1980-81			1982			1984		
Valve No.	System	Test	As-Found	As-Left	Test	As-Found	As-Left	Test	As-Found	As-Left
85C	Personnel Airlock	R27	0	0	R27	10	10	R27C	14.83	14.83
85D	Personnel Airlock	R27	0	0	R27	2	2	R27C	124.8	124.8
95A	Equipment Airlock	R27	10	10	R27	1	1	R27	23.36	0
95B	Equipment Airlock	R27	10	10	R27	0	0	R27	19.13	0
95C	Equipment Airlock	R27	10	10	R27	0	0	R27C	19.8	19.8
95D	Equipment Airlock	R27	10	10	R27	3	3	R27C	0	0
4399	HRSS to VC Sump	N/A	N/A	N/A	R26	0	0	R26	.66	.66
5132	HRSS to VC Sump	N/A	N/A	N/A	R26	0	0	R26	.66	.66
500	Safe Shutdown	N/A	N/A	N/A	R27	0	0	R27	0	0
501	Safe Shutdown	N/A	N/A	N/A	R27	0	0	R27	0	0
502	Safe Shutdown	N/A	N/A	N/A	R27	0	0	R27	0	0
503	Safe Shutdown	N/A	N/A	N/A	R27	0	0	R27	0	0
504	Safe Shutdown	N/A	N/A	N/A	R27	29.88	29.88	R27	30	30
505	Safe Shutdown	N/A	N/A	N/A	R27	39.84	39.84	R27	40	40
506	Safe Shutdown	N/A	N/A	N/A	R27	9.96	9.96	R27	35	35
507	Safe Shutdown	N/A	N/A	N/A	R27	9.96	9.96	R27	40	40
41-1-A	FCU SW	R27	*	-	R27	*	-	R27B	40	0.0
44-1-A	FCU SW	R27	*	-	R27	*	-	R27B	30	0

LOCAL LEAK RATE TEST RESULTS
SINCE THE LAST ILRT

		1980-81			1982			1984		
Valve No.	System	Test	As-Found	As-Left	Test	As-Found	As-Left	Test	As-Found	As-Left
71-1-A	FCU SW	R27	*	-	R27	*	-	R27B	0	50
42-1&43-1	FCU SW	R27	*	-	R27	*	-	R27B	1430.0	28.0
41-2-A	FCU SW	R27	*	-	R27	*	-	R27B	0	30
44-2-A	FCU SW	R27	*	-	R27	*	-	R27B	0	0
71-2-A	FCU SW	R27	*	-	R27	8	-	R27B	48	0
42-2&43-2	FCU SW	R27	*	-	R27	*	-	R27B	17.0	17.3
41-3-A	FCU SW	R27	*	-	R27	*	-	R27B	0	0
44-3-A	FCU SW	R27	*	-	R27	*	-	R27B	3060	0
71-3-A	FCU SW	R27	*	-	R27	*	-	R27B	0	0
42-3&43-3	FCU SW	R27	*	-	R27	*	-	R27B	14.5	32.0
41-4-A	FCU SW	R27	*	-	R27	*	-	R27B	0	27
44-4-A	FCU SW	R27	*	-	R27	*	-	R27B	85.0	85.0
71-4A	FCU SW	R27	*	-	R27	*	-	R27B	25	0
42-4&43-4	FCU SW	R27	*	-	R27	*	-	R27B	50	23.7
41-5-A	FCU SW	R27	*	-	R27	*	-	R27B	1.0	215
44-5-A	FCU SW	R27	*	-	R27	*	-	R27B	130	0
71-5-A	FCU SW	R27	*	-	R27	*	-	R27B	0	0
42-5&43-5	FCU SW	R27	*	-	R27	*	-	R27B	25.6	31.93

NOTES: 1. All leakages are in SCCM.

2. * indicates individual valve leakage was not determined.

3. N/A indicates valve was not a C.I.V. at time of test.

INDIAN POINT UNIT NO. 2

1984 REFUELING OUTAGE

TYPE "B" AND "C" TEST RESULTS

A. SUMMARY

Type "B" and "C" testing was performed on the Containment Isolation Valves listed in Table 4.4-1 (attached) between June and October 1984. The following Acceptance Criteria was used:

1. The Combined Leakage Rate for valves listed in Table 4.4-1 subject to gas or nitrogen pressurization testing, air lock testing and portions of the Sensitive Leakage Rate Test which pertain to Containment penetrations and Double Gasketed Seals shall be less than 0.6 LA as per Appendix J to 10CFR50. 0.6 LA is equivalent to 4.56 SCFM.

2. The Leakage Rate into Containment for the Isolation Valves sealed with the Service Water System shall nct exceed 0.36 GPM per fan cooler.

3. The Leakage Rate for the Isolation Valve Seal Water System shall not exceed 14,700 cc/Hr.

4. The Allowable Leakage from the Residual Heat Removal System components located outside of Containment shall not exceed two gallons per hour.

The "As Left" conditions per the above criteria are:

1. The Combined Leakage Rate per criterion A.1 was 3.266 SCFM.

2. The Leakage Rate into Containment for those valves sealed by Service Water was .021 gpm, .015 gpm, .0085 gpm, .028 gpm and .066 gpm for Fan Cooler Units 21, 22, 23, 24 and 25, respectively.

3. The Leakage Rate for the Isolation Valve Seal Water System was 2686 cc/hr.

4. The leakage rate from RHR system components outside of Containment was considered to be zero since absolutely no physical leakage was observed.

B. DESCRIPTION

Seven tests were used to fulfill the requirements of Appendix J to 10CFR50 and Technical Specifications.

1. PT-R27 Containment Isolation Valves Leakage Rate Determination

2. PT-R27B Service Water Containment Isolation Valve Leak Rate Test

3. PT-R26A Local IVSWS Test Type B&C

4. PT-R26B Local IVSWS Test Type B&C (Nitrogen)

5. PT-SA10 Containment Air Lock Test

6. PT-R11 Sensitive Leakage Rate Test

7. PT-R12 Residual Heat Removal System Test

PT-R27

The combined "As Found" Leakage Rate for two Containment Isolation Valves subject to gas or nitrogen pressurization testing was in excess of 15,100 cc/min. These valves were found to be installed and tested in a manner in which they would unseat under pressure. The valves were rotated 180° and retested. The "As Left" leak was 0 cc/min for valves SOV 3421, and 3423. The combined "As Left" leak rate for the Containment Isolation Valves subject to gas or nitrogen pressurization testing was .038 SCFM. This is considered acceptable.

PT-R27B

The "As Found" leakage rates from 21, 22, 23, 24 and 25 Fan Cooler Unit Containment Isolation Valves sealed by the Service Water System were .3962, .017, .028, .18, and .05 gpm respectively. The drain valve for 21 FCU was found to be leaking excessively and replaced. Additionally ten Service Water Isolation Valves, 41-1-A, 44-1-A, 41-2-A, 44-2-A, 41-3-A, 44-3-A, 41-4-A, 44-4-A, 41-5-A, and 44-5-A were refurbished. The "As Left" leakage for Containment Isolation Valves seal by Service Water was .021, .015, .0085, .028, and .066 gpm respectively for 21, 22, 23, 24 and 25 FCU. This is considered acceptable.

PT-R26A

The combined "As Found" leakage rate for six Containment Isolation Valves sealed by water injected IVSWS was in excess of 60,000 cc/hr. The leaking valves were either replaced or repaired. A retest was then performed. The "As Left" leakage rate for the six valves combined was 128 cc/hr. Valves SA-24 and SA24-1 were replaced, valves 956C and 956D had their strokes adjusted, the seats for valves UH-43 and UH-44 were renewed and packing replaced. The "As Left" leakage for the entire IVSW was 2686 cc/hr. This is considered acceptable.

PT-R26B

The "As Found" leakage rate for Nitrogen Seal Injected IVSWS valves was .0277 SCFM. Valve 958 was found to leak 320 cc/min. Its stroke was adjusted and the "As Left" leakage was 21 cc/min. The "As Left" leakage for the entire IVSWS sealed by Nitrogen was .014 SCFM. This is considered acceptable.

PT-SA10

The "As Found" Leakage for the 80' Elevation Air Lock was 0.6 SCFM; for the 95' Elev. Air Lock the Leakage Rate was 0.0 SCFM. This is considered acceptable.

PT-R11

The combined "As Found" leakage rate for the Containment penetrations and double gasketed seals was 2.0 SCFM. This is considered acceptable.

PT-R12

The leakage rate from RHR system components outside of the containment was considered to be zero since absolutely no physical leakage was observed.

C. CONCLUSION

All Containment Isolation valves which leaked excessively were either replaced or rebuilt. They were retested using the appropriate leakage measurement determination test. The "As Left" leakage rate of Containment Isolation valves met the requirements of Appendix J to 10CFR50 and Technical Specifications.

TABLE 4.4-1 (Page 1 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
549	PRT to Gas Analyzer	Water(4)	52
548	" " "	Water(4)	52
518	PRT N_2 Supply	Gas	47
3418	" " "	Gas	47
3419	" " "	Gas	47
4136	" " "	Gas	47
552	PRT Makeup Water	Water(4)	52
519	" " "	Water(4)	52
741A	RHR return to RCS	Water(5)	52(3)
744	" " " "	Nitrogen(4)	47(3)
888A	RHR to S.I. Pumps	Nitrogen(4)	47
888B	" " " "	Nitrogen(4)	47
958	RHR to Sample System	Nitrogen(4)	47
959	" " " "	Nitrogen(4)	47
990D	" " " "	Nitrogen(4)	47
1870	RHR from RCS	Nitrogen(4)	47
743	" " "	Nitrogen(4)	47
732	" " "	Nitrogen(4)	47(3)
885A	Cont. Sump Recirc. Line	Water(5)	52
885B	" " " "	Water(5)	52
201	Letdown Line (CVCS)	Water(4)	52
202	" " "	Water(4)	52

TABLE 4.4-1 (Page 2 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
205	Charging Line (CVCS)	Water (4)	52
226	" " "	Water (4)	52
227	" " "	Water (4)	52
250A	RCP Seal Water (CVCS)	Water (4)	52
4925	" " " "	Water (4)	52
250B	" " " "	Water (4)	52
4926	" " " "	Water (4)	52
250C	" " " "	Water (4)	52
4927	" " " "	Water (4)	52
250D	" " " "	Water (4)	52
4928	" " " "	Water (4)	52
222	" " " "	Water (4)	52
956E	RCS to Sample System	Water (4)	52
956F	" " " "	Water (4)	52
869A	Cont. Spray System	Water (4)	52
867A	" " "	Gas	47
878A	" " "	Gas	47

TABLE 4.4-1 (Page 3 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
869B	Cont. Spray System	Water (4)	52
867B	" " "	Gas	47
851A	Safety Inj. System	Water(4)	52
850A	" " "	Water(4)	52
851B	" " "	Water(4)	52
850B	" " "	Water(4)	52
859A	S.I. Test Line	Water(4)	52
859C	" " "	Water(4)	52
4312	Acc. & OPS N_2 Supply	Gas	47
863	" " " " "	Gas	47
956G	Acc. to Sample System	Water (4)	52
956H	" " " "	Water (4)	52

TABLE 4.4-1 (Page 4 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
1786	RCDT to Vent Header	Water (4)	52
1787	" " " "	Water (4)	52
3416	RCDT N_2 Supply	Gas	47
3417	" " "	Gas	47
5459	" " "	Gas	47
1616	" " "	Gas	47
1788	RCDT to Gas Analyzer	Water (4)	52
1789	" " "	Water (4)	52
1702	RCDT to WHT (WDS)	Water (4)	52
1705	" " "	Water (4)	52
797	RCP. Comp. Cooling (CCS)	Water (4)	52
784	" " "	Water (4)	52
FCV-625	" " "	Water (4)	52
791	Excess Letdown Cool. (CCS)	Water (4)	52
798	" " "	Water (4)	52
796	" " "	Water (4)	52

TABLE 4.4-1 (Page 5 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
793	Excess Letdown Cool (CCS)	Water (4)	52
1728	Cont. Sump to WHT (WDS)	Water (4)	52
1723	" " " "	Water (4)	52
1234	Cont. Air Sample	Gas (7)	47
1235	" " "	Gas (7)	47
1236	" " "	Gas (7)	47
1237	" " "	Gas (7)	47
PCV-1229	Air Ejector to Cont.	Gas (7)	47
PCV-1230	" " " "	Gas (7)	47
PCV-1214	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1214A	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1215	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1215A	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1216	Steam Gener. Blowdown/ Sample	Water (4)	52

TABLE 4.4-1 (Page 6 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
PCV-1216A	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1217	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1217A	Steam Gener. Blowdown/ Sample	Water (4)	52

TABLE 4.4-1 (Page 7 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-41-5-A	Cont. Fan Cooler-Ser. Wtr.	Water (6)	52
SWN-43-5	" " " "	Water (6)	52
SWN-42-5	" " " "	Water (6)	52
SWN-41-1-A	" " " "	Water (6)	52
SWN-43-1	" " " "	Water (6)	52
SWN-42-1	" " " "	Water (6)	52
SWN-41-2-A	" " " "	Water (6)	52

TABLE 4.4-1 (Page 8 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-43-2	Cont. Fan Cooler-Ser. Wtr	Water (6)	52
SWN-42-2	" " " " "	Water (6)	52
SWN-41-3-A	" " " " "	Water (6)	52
SWN-43-3	" " " " "	Water (6)	52
SWN-42-3	" " " " "	Water (6)	52
SWN-41-4-A	" " " " "	Water (6)	52
SWN-43-4	" " " " "	Water (6)	52
SWN-42-4	" " " " "	Water (6)	52
SWN-44-5-A	" " " " "	Water (6)	52
SWN-44-1-A	" " " " "	Water (6)	52

TABLE 4.4-1 (Page 9 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-44-2-A	Cont. Fan Cooler-Ser.Wtr	Water (6)	52
SWN-44-3-A	" " " " "	Water (6)	52
SWN-44-4-A	" " " " "	Water (6)	52
SWN-71-5-A	" " " " "	Water (6)	52
SWN-71-1-A	" " " " "	Water (6)	52
SWN-71-2-A	" " " " "	Water (6)	52
SWN-71-3-A	" " " " "	Water (6)	52

TABLE 4.4-1 (Page 10 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-71-4-A	Cont. Fan Cooler Ser. Wtr.	Water (6)	52
SA-24	Service Air to Cont.	Water (4)	52
SA-24-1	" " " "	Water (4)	52
580A	Dead Weight Tester	Gas	47
580B	" " "	Gas	47
UH-43	Auxiliary Steam System	Water (4)	52
UH-44	" " "	Water (4)	52
MW-17	City Wtr. to Cont.	Water (4)	52
MW-17	" " " "	Water (4)	52
1170	Cont. Purge System	Gas (7)	47
1171	" " "	Gas (7)	47
1172	" " "	Gas (7)	47
1173	" " "	Gas (7)	47

TABLE 4.4-1 (Page 11 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
1190	Cont. Pressure Relief	Gas (7)	47
1191	" " "	Gas (7)	47
1192	" " "	Gas (7)	47
990A	Recirc. Pump to Samp. Sys.	Nitrogen (4)	47
990B	" " "	Nitrogen (4)	47
956A	Pressurizer to Samp. Sys.	Water (4)	52
956B	" " "	Water (4)	52
956C	" " "	Water (4)	52
956D	" " "	Water (4)	52
1814A	Cont. Pressure Instr.	Gas	47
1814B	" " "	Gas	47
1814C	" " "	Gas	47

TABLE 4.4-1 (Page 12 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
5018	Post Acc. Cont. Sampling	Gas	47
5019	" " "	Gas	47
5020	" " "	Gas	47
5021	" " "	Gas	47
5022	" " "	Gas	47
5023	" " "	Gas	47
5024	" " "	Gas	47
5025	" " "	Gas	47
IV-1A	O_2 Supply to Cont.	Gas	47
IV-1B	" " "	Gas	47
IV-2A	" " "	Gas	47
IV-2B	" " "	Gas	47
3420	H_2 Supp. To H_2 Recomb.	Gas	47
IV-3A	" " "	Gas	47

TABLE 4.4-1 (Page 13 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
3421	H_2 Supp. To H_2 Recomb.	Gas	47
IV-5A	" " "	Gas	47
3422	" " "	Gas	47
IV-3B	" " "	Gas	47
3423	" " "	Gas	47
IV-5B	" " "	Gas	47
IA-39	Inst. Air to Cont.	Gas	47
PCV-1228	" " "	Gas	47
E-2	Post Acc. Vent Exh.	Gas (7)	47
E-1	" " "	Gas (7)	47
E-3	" " "	Gas (7)	47
E-5	" " "	Gas (7)	47
85A	Personnel Airlock	Gas	47
85B	" " "	Gas	47
85C	" " "	Gas (7)	47
85D	" " "	Gas (7)	47

TABLE 4.4-1 (Page 14 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
95A	Equipment Airlock	Gas	47
95B	" " "	Gas	47
95C	" " "	Gas (7)	47
95D	" " "	Gas (7)	47
4399	Sample Return to Cont. Sump.	Water (4)	52
5132	" " "	Water (4)	52

Notes:

1. System description in which valve is located.
2. Gas Test Fluid indicates either nitrogen or air as test medium.
3. Testable only when at cold shutdown.
4. Isolation Valve Seal Water System.
5. Sealed by Residual Heat Removal System fluid.
6. Sealed by Service Water System.
7. Sealed by Weld Channel and Penetration Pressurization System.

INDIAN POINT UNIT NO. 2

1982 REFUELING OUTAGE

TYPE "B" AND "C" TEST RESULTS

A. SUMMARY

Type "B" and "C" testing was performed on the Containment Isolation Valves listed in Table 4.4-1 (attached) between September and December 1982. The following Acceptance Criteria was used:

1. The Combined Leakage Rate for valves listed in Table 4.4-1 subject to gas or nitrogen pressurization testing, air lock testing and portions of the Sensitive Leakage Rate Test which pertain to Containment penetrations and Double Gasketed Seals shall be less than 0.6 LA as per Appendix J to 10CFR50. 0.6 LA is equivalent to 4.56 SCFM.

2. The Leakage Rate into Containment for the Isolation Valves sealed with the Service Water System shall not exceed 0.36 GPM per fan cooler.

3. The Leakage Rate for the Isolation Valve Seal Water System shall not exceed 14,700 cc/Hr.

4. The Allowable Leakage from the Residual Heat Removal System components located outside of Containment shall not exceed two gallons per hour.

The "As Left" conditions per the above criteria are:

1. The Combined Leakage Rate per criterion A.1 was 2.93 SCFM.

2. The Leakage Rate into Containment for those valves sealed by Service Water was $<$0.01 gpm, $<$0.01 gpm, $<$0.01 gpm, $<$0.01 gpm and $<$0.01 gpm for Fan Cooler Units 21, 22, 23, 24 and 25, respectively.

3. The Leakage Rate for the Isolation Valve Seal Water System was 12,760 cc/hr.

4. The leakage rate from RHR system components outside of Containment was considered to be zero since absolutely no physical leakage was observed.

B. DESCRIPTION

Five tests were used to fulfill the requirements of Appendix J to 10CFR50 and Technical Specifications.

1. PT-R27 Containment Isolation Valves Leakage Rate Determination

2. PT-R26 Isolation Valve Seal Water System Test (includes Nitrogen Seal Injected valves)

3. PT-SA10 Containment Air Locks Test

4. PT-R11 Sensitive Leakage Rate Test

5. PT-R12 Residual heat Removal System Test

PT-R27

The combined "As Found" leakage rate for four Containment Isolation valves subject to gas or nitrogen pressurization testing was in excess of 25,000 cc/min. The valves were repaired or replaced. A retest was performed. The combined "As Left" leakage rate was 39 cc/min for valves 518, IV-5A, IV-5B and 3423. The combined "As left" leak rate for Containment Isolation Valves subject to gas or nitrogen pressurization testing was .0875 SCFM. This is considered acceptable.

The "As Found" leakage rate from 21, 22, 23, 24 and 25 Fan Cooler Unit Containment Isolation Valves sealed by the Service Water System was $<$ 0.01 GPM per Fan Cooler Unit. This is considered acceptable.

PT-R26

The combined "As Found" leakage rate for three Containment Isolation valves sealed by the water injected IVSWS was in excess of 16,500 cc/hour. The leaking valves were either replaced or rebuilt. A retest was then performed. The "As Left" leakage rate for the three valves combined was 50 cc/hr. Valves PCV-1216 and PCV-1216A were replaced. The seals of valve 850B were cleaned and old gasket replaced. The "As Left" leakage rate for the entire IVSWS WAS 12,760 cc/hr. This is considered acceptable.

The "As Found" leakage rate for nitrogen seal injected IVSWS valves was 0.03 SCFM. This is considered acceptable.

PT-SA10

The "As Found" leakage rate for the 80' el. Air Lock was 0.28 SCFM; for the 95' El Air Lock the leakage rate was 0.23 SCFM. This is considered an acceptable leakage rate.

PT-R11

The combined "As Found" leakage rate for the Containment penetrations and double gasketed seals was 2.32 SCFM. This is considered acceptable.

PT-R12

The leakage rate from RHR system components outside of the containment was considered to be zero since absolutely no physical leakage was observed.

C. CONCLUSION

All Containment Isolation Valves which leaked excessively were either replaced or rebuilt. They were retested using the appropriate leakage measurement determination test. The "As Left" leakage rate of Containment Isolation valves met the requirements of Appendix J to 10CFR50 and Technical Specifications.

TABLE 4.4-1 (Page 1 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
549	PRT to Gas Analyzer	Water (4)	52
548	" " "	Water (4)	52
518	PRT N_2 Supply	Gas	47
3418	" " "	Gas	47
3419	" " "	Gas	47
4136	" " "	Gas	47
552	PRT Makeup Water	Water (4)	52
519	" " "	Water (4)	52
741A	RHR return to RCS	Water (5)	52 (3)
744	" " " "	Nitrogen (4)	47 (3)
888A	RHR to S.I. Pumps	Nitrogen (4)	47
888B	" " " "	Nitrogen (4)	47
958	RHR to Sample System	Nitrogen (4)	47
959	" " " "	Nitrogen (4)	47
990D	" " " "	Nitrogen (4)	47
1870	RHR from RCS	Nitrogen (4)	47
743	" " "	Nitrogen (4)	47
732	" " "	Nitrogen (4)	47 (3)
885A	Cont. Sump Recirc. Line	Water (5)	52
885B	" " " "	Water (5)	52
201	Letdown Line (CVCS)	Water (4)	52
202	" " "	Water (4)	52

TABLE 4.4-1 (Page 2 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
205	Charging Line (CVCS)	Water(4)	52
226	" " "	Water(4)	52
227	" " "	Water(4)	52
250A	RCP Seal Water (CVCS)	Water(4)	52
4925	" " " "	Water(4)	52
250B	" " " "	Water(4)	52
4926	" " " "	Water(4)	52
250C	" " " "	Water(4)	52
4927	" " " "	Water(4)	52
250D	" " " "	Water(4)	52
4928	" " " "	Water(4)	52
222	" " " "	Water(4)	52
956E	RCS to Sample System	Water(4)	52
956F	" " " "	Water(4)	52
869A	Cont. Spray System	Water(4)	52
867A	" " "	Gas	47
878A	" " "	Gas	47

TABLE 4.4-1 (Page 3 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
869B	Cont. Spray System	Water (4)	52
867B	" " "	Gas	47
851A	Safety Inj. System	Water(4)	52
850A	" " "	Water(4)	52
851B	" " "	Water(4)	52
850B	" " "	Water(4)	52
859A	S.I. Test Line	Water(4)	52
859C	" " "	Water(4)	52
4312	Acc. & OPS N_2 Supply	Gas	47
863	" " " " "	Gas	47
956G	Acc. to Sample System	Water (4)	52
956H	" " " "	Water (4)	52

TABLE 4.4-1 (Page 4 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
1786	RCDT to Vent Header	Water (4)	52
1787	" " " "	Water (4)	52
3416	RCDT N_2 Supply	Gas	47
3417	" " "	Gas	47
5459	" " "	Gas	47
1616	" " "	Gas	47
1788	RCDT to Gas Analyzer	Water (4)	52
1789	" " "	Water (4)	52
1702	RCDT to WHT (WDS)	Water (4)	52
1705	" " "	Water (4)	52
797	RCP. Comp. Cooling (CCS)	Water (4)	52
784	" " "	Water (4)	52
FCV-625	" " "	Water (4)	52
791	Excess Letdown Cool. (CCS)	Water (4)	52
798	" " "	Water (4)	52
796	" " "	Water (4)	52

TABLE 4.4-1 (Page 5 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
793	Excess Letdown Cool (CCS)	Water (4)	52
1728	Cont. Sump to WHT (WDS)	Water (4)	52
1723	" " " "	Water (4)	52
1234	Cont. Air Sample	Gas (7)	47
1235	" " "	Gas (7)	47
1236	" " "	Gas (7)	47
1237	" " "	Gas (7)	47
PCV-1229	Air Ejector to Cont.	Gas (7)	47
PCV-1230	" " " "	Gas (7)	47
PCV-1214	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1214A	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1215	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1215A	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1216	Steam Gener. Blowdown/ Sample	Water (4)	52

TABLE 4.4-1 (Page 6 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
PCV-1216A	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1217	Steam Gener. Blowdown/ Sample	Water (4)	52
PCV-1217A	Steam Gener. Blowdown/ Sample	Water (4)	52

TABLE 4.4-1 (Page 7 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-41-5-A	Cont. Fan Cooler-Ser. Wtr.	Water (6)	52
SWN-43-5	" " " "	Water (6)	52
SWN-42-5	" " " "	Water (6)	52
SWN-41-1-A	" " " "	Water (6)	52
SWN-43-1	" " " "	Water (6)	52
SWN-42-1	" " " "	Water (6)	52
SWN-41-2-A	" " " "	Water (6)	52

TABLE 4.4-1 (Page 8 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-43-2	Cont. Fan Cooler-Ser. Wtr	Water (6)	52
SWN-42-2	" " " " "	Water (6)	52
SWN-41-3-A	" " " " "	Water (6)	52
SWN-43-3	" " " " "	Water (6)	52
SWN-42-3	" " " " "	Water (6)	52
SWN-41-4-A	" " " " "	Water (6)	52
SWN-43-4	" " " " "	Water (6)	52
SWN-42-4	" " " " "	Water (6)	52
SWN-44-5-A	" " " " "	Water (6)	52
SWN-44-1-A	" " " " "	Water (6)	52

TABLE 4.4-1 (Page 9 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-44-2-A	Cont. Fan Cooler-Ser.Wtr	Water (6)	52
SWN-44-3-A	" " " " "	Water (6)	52
SWN-44-4-A	" " " " "	Water (6)	52
SWN-71-5-A	" " " " "	Water (6)	52
SWN-71-1-A	" " " " "	Water (6)	52
SWN-71-2-A	" " " " "	Water (6)	52
SWN-71-3-A	" " " " "	Water (6)	52

TABLE 4.4-1 (Page 10 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-71-4-A	Cont. Fan Cooler Ser. Wtr.	Water (6)	52
SA-24	Service Air to Cont.	Water (4)	52
SA-24-1	" " " "	Water (4)	52
580A	Dead Weight Tester	Gas	47
580B	" " "	Gas	47
UH-43	Auxiliary Steam System	Water (4)	52
UH-44	" " "	Water (4)	52
MW-17	City Wtr. to Cont.	Water (4)	52
MW-17	" " " "	Water (4)	52
1170	Cont. Purge System	Gas (7)	47
1171	" " "	Gas (7)	47
1172	" " "	Gas (7)	47
1173	" " "	Gas (7)	47

TABLE 4.4-1 (Page 11 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
1190	Cont. Pressure Relief	Gas (7)	47
1191	" " "	Gas (7)	47
1192	" " "	Gas (7)	47
990A	Recirc. Pump to Samp. Sys.	Nitrogen (4)	47
990B	" " "	Nitrogen (4)	47
956A	Pressurizer to Samp. Sys.	Water (4)	52
956B	" " "	Water (4)	52
956C	" " "	Water (4)	52
956D	" " "	Water (4)	52
1814A	Cont. Pressure Instr.	Gas	47
1814B	" " "	Gas	47
1814C	" " "	Gas	47

TABLE 4.4-1 (Page 12 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
5018	Post Acc. Cont. Sampling	Gas	47
5019	" " "	Gas	47
5020	" " "	Gas	47
5021	" " "	Gas	47
5022	" " "	Gas	47
5023	" " "	Gas	47
5024	" " "	Gas	47
5025	" " "	Gas	47
IV-1A	O_2 Supply to Cont.	Gas	47
IV-1B	" " "	Gas	47
IV-2A	" " "	Gas	47
IV-2B	" " "	Gas	47
3420	H_2 Supp. To H_2 Recomb.	Gas	47
IV-3A	" " "	Gas	47

TABLE 4.4-1 (Page 13 of 14)
CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
3421	H_2 Supp. To H_2 Recomb.	Gas	47
IV-5A	" " "	Gas	47
3422	" " "	Gas	47
IV-3B	" " "	Gas	47
3423	" " "	Gas	47
IV-5B	" " "	Gas	47
IA-39	Inst. Air to Cont.	Gas	47
PCV-1228	" " "	Gas	47
E-2	Post Acc. Vent Exh.	Gas (7)	47
E-1	" " "	Gas (7)	47
E-3	" " "	Gas (7)	47
E-5	" " "	Gas (7)	47
85A	Personnel Airlock	Gas	47
85B	" " "	Gas	47
85C	" " "	Gas (7)	47
85D	" " "	Gas (7)	47

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
95A	Equipment Airlock	Gas	47
95B	" " "	Gas	47
95C	" " "	Gas (7)	47
95D	" " "	Gas (7)	47
4399	Sample Return to Cont. Sump.	Water (4)	52
5132	" " "	Water (4)	52

Notes:

1. System description in which valve is located.
2. Gas Test Fluid indicates either nitrogen or air as test medium.
3. Testable only when at cold shutdown.
4. Isolation Valve Seal Water System.
5. Sealed by Residual Heat Removal System fluid.
6. Sealed by Service Water System.
7. Sealed by Weld Channel and Penetration Pressurization System.

INDIAN POINT UNIT NO. 2

1980-81 REFUELING OUTAGE

TYPE "B" AND "C" TEST RESULTS

A. SUMMARY

Type "B" and "C" testing was performed on the Containment Isolation Valves listed in Table 4.4-1 (attached) between October 1980 and May 1981. The following Acceptance Criteria was used:

1. The Combined Leakage Rate for valves listed in Table 4.4-1 subject to gas or nitrogen pressurization testing, air lock testing and portions of the Sensitive Leakage Rate Test which pertain to Containment penetrations and Double Gasketed Seals shall be less than 0.6 LA as per Appendix J to 10CFR50. 0.6 LA is equivalent to 4.56 SCFM.

2. The Leakage Rate into Containment for the Isolation Valves sealed with the Service Water System shall not exceed 0.36 GPM per fan cooler.

3. The Leakage Rate for the Isolation Valve Seal Water System shall not exceed 14,700 cc/Hr.

4. The Allowable Leakage from the Residual Heat Removal System components located outside of Containment shall not exceed two gallons per hour.

The "As Left" conditions per the above criteria are:

1. The Combined Leakage Rate per criterion A.1 was 3.92 SCFM.

2. The Leakage Rate into Containment for those valves sealed by Service Water was $<$ 0.015 gpm, $<$0.01 gpm, $<$0.015 gpm, $<$0.01 gpm and $<$0.01 gpm for Fan Cooler Units 21, 22, 23, 24, 25, respectively.

3. The Leakage Rate for the Isolation Valve Seal Water System was 5,500 cc/hr.

4. The leakage rate from RHR system components outside of Containment was considered to be zero since absolutely no physical leakage was observed.

B. DESCRIPTION

Five tests were used to fulfill the requirements of Appendix J to 10CFR50 and Technical Specifications.

1. PT-R27 Containment Isolation Valves Leakage Rate Determination

PT-R26 Isolation Valve Seal Water System Test (includes Nitrogen Seal Injected Valves)

3. PT-SA10 Containment Air Locks Test

4. PT-R11 Sensitive Leak Rate Test

5. PT-R12 Residual Heat Removal System Test

PT-R27

The "As Found" leak rate for Containment Isolation Valve 1875K subject to gas or Nitrogen Pressurization testing was in excess of 180 cc/min. The valve was repaired by resurfacing its seat. A retest was performed, the "As Left" Leak Rate was 0.0 cc/min. The combined "As Left" Leak Rate for Containment Isolation Valves subject to gas or nitrogen pressurization testing was .1876 SCFM. This is considered acceptable.

The "As Found" leakage rate from Fan Cooler Unit Containment Isolation valves sealed by Service Water could not be determined due to degraded cooler coils. During the outage the cooling coils as well as the Isolation Valve were replaced. The "As Left" leakage rate upon completion of a 165 pound hydrostatic test were < .015, < .01, < .015, < .01, < .01 gallons per minute, respectively for the five fan cooler units.

PT-R26

combined "As Found" leakage rate for all Containment Isolation Valves sealed by water ected IVSWS was 5,500 cc/hr. This was also the "As Left" leak rate. This is considered acceptable.

The "As Found" leakage rate for nitrogen seal injected IVSWS valves was .005 SCFM. This is considered acceptable.

PT-SA10

The "As Found" leakage rate for the 80' El. Air Lock was 0.0 SCFM; for the 95' El. Air Lock the leakage rate was 0.0 SCFM. This is considered an acceptable leakage rate.

PT-R11

The combined "As Found" leakage rate for the containment penetrations and double gasketed seals was 3.73 SCFM. This is considered acceptable.

PT-R12

The leakage rate from RHR system components outside of the containment was considered to be zero since absolutely no pnysical leakage was observed.

C. CONCLUSION

Containment Isolation Valves which leaked excessively were either replaced or rebuilt. y were retested using the appropriate leakage measurement determination test. The "As Left" leakage rate of Containment Isolation Valves met the requirements of Appendix J to 10CFR50 and Technical Specifications.

TABLE 4.4-1(Page 1 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
549	PRT to Gas Analyzer	Water (4)	52
548	" " "	Water (4)	52
518	PRT N_2 Supply	Gas	47
550	" " "	Gas	47
552	PRT Makeup Water	Water (4)	52
519	" " "	Water (4)	52
741	RHR return to RCS	Water (5)	52 (3)
744	" " "	Nitrogen (4)	47 (3)
888A	RHR to S.I. Pumps	Nitrogen (4)	47
888B	" " "	Nitrogen (4)	47
9[illegible]	RHR to Sample System	Nitrogen (4)	47
95[illegible]	" " "	Nitrogen (4)	47
990C	" " "	Nitrogen (4)	47
1870	RHR from RCS	Nitrogen (4)	47
743	" " "	Nitrogen (4)	47
732	" " "	Nitrogen (4)	47 (3)
885A	Cont. Sump Recirc.Line	Water (5)	52
885B	" " " "	Water (5)	52
201	Letdown Line (CVCS)	Water (4)	52
202	" " " "	Water (4)	52
205	Charging Line (CVCS)	Water (4)	52
226	" " " "	Water (4)	52
[illegible]	" " " "	Water (4)	52
2[illegible]	RCP Seal Water (CVCS)	Water (4)	52
241A	" " " "	Water (4)	52

TABLE 4.4-1 (Page 2 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System[1]	Test Fluid[2]	Minimum Test Pressure (PSIG)
250B	RCP Seal Water (CVCS)	Water[4]	52
241B	" " " "	Water[4]	52
250C	" " " "	Water[4]	52
241C	" " " "	Water[4]	52
250D	" " " "	Water[4]	52
241D	" " " "	Water[4]	52
222	" " " "	Water[4]	52
956E	RCS to Sample System	Water[4]	52
956F	" " " "	Water[4]	52
8[illegible]A	Cont. Spray System	Water[4]	52
86[illegible]	" " " "	Gas	47
878A	" " " "	Gas	47
869B	" " " "	Water[4]	52
867B	" " " "	Gas	47
878B	" " " "	Gas	47
851A	Safety Inj. System	Water[4]	52
850A	" " " "	Water[4]	52
851B	" " " "	Water[4]	52
850B	" " " "	Water[4]	52
859A	S.I. Test Line	Water[4]	52
859C	" " "	Water[4]	52
4312	Acc. & OPS N_2 Supply	Gas	47
8[illegible]	" " " " "	Gas	47

TABLE 4.4-1 (Page 3 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure(PSIG)
956G	Acc. to Sample System	Water (4)	52
956H	" " " "	Water (4)	52
1786	RCDT to Vent Header	Water (4)	52
1787	" " "	Water (4)	52
1610	RCDT N_2 Supply	Gas	47
1616	" " "	Gas	47
1[illegible]	RCDT to Gas Analyzer	Water (4)	52
17[illegible]	" " "	Water (4)	52
1702	RCDT to WHT (WDS)	Water (4)	52
1705	" " " "	Water (4)	52
797	RCP Comp. Cooling (CCS)	Water (4)	52
784	" " " "	Water (4)	52
FCV-625	" " " "	Water (4)	52
791	Excess Letdown Cool.(CCS)	Water (4)	52
798	" " " "	Water (4)	52
796	" " " "	Water (4)	52
793	" " " "	Water (4)	52
1728	Cont. Sump to WHT (WDS)	Water (4)	52
1723	" " " "	Water (4)	52
12[illegible]	Cont. Air Sample	Gas (7)	47
1235	" " "	Gas (7)	47

TABLE 4.4-1 (Page 4 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
1236	Cont. Air Sample	Gas (7)	47
1237	" "	Gas (7)	47
PCV-1229	Air Ejector to Cont.	Gas (7)	47
PCV-1230	" " "	Gas (7)	47
PCV-1214	Steam Gener. Blowdown	Water (4)	52
PCV-1214A	" " "	Water (4)	52
PCV-1215	" " "	Water (4)	52
PCV-1215A	" " "	Water (4)	52
PCV-1216	" " "	Water (4)	52
PCV-1216A	" " "	Water (4)	52
P[illegible]217	" " "	Water (4)	52
PCV-1217A	" " "	Water (4)	52
PCV-1223	S.G. to Sample System	Water (4)	52
PCV-1223A	" " "	Water (4)	52
PCV-1224	" " "	Water (4)	52
PCV-1224A	" " "	Water (4)	52
PCV-1225	" " "	Water (4)	52
PCV-1225A	" " "	Water (4)	52
PCV-1226	" " "	Water (4)	52
PCV-1226A	" " "	Water (4)	52
SWN-41	Cont. Fan Cooler-Ser.Wtr.	Water (6)	52
SWN-43	" " " "	Water (6)	52

TABLE 4.4-1 (Page 5 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
SWN-42	Cont. Fan Cooler-Ser. Wtr.	Water (6)	52
SWN-41	" " "	Water (6)	52
SWN-43	" " "	Water (6)	52
SWN-42	" " "	Water (6)	52
SWN-41	" " "	Water (6)	52
SWN-43	" " "	Water (6)	52
SWN-42	" " "	Water (6)	52
SWN-41	" " "	Water (6)	52
[illegible]3	" " "	Water (6)	52
SWN-42	" " "	Water (6)	52
SWN-41	" " "	Water (6)	52
SWN-43	" " "	Water (6)	52
SWN-42	" " "	Water (6)	52
SWN-44	" " "	Water (6)	52
SWN-51	" " "	Water (6)	52
SWN-44	" " "	Water (6)	52
SWN-51	" " "	Water (6)	52
SWN-44	" " "	Water (6)	52
SWN-51	" " "	Water (6)	52
SWN-44	" " "	Water (6)	52
S[illegible]1	" " "	Water (6)	52

TABLE 4.4-1 (Page 6 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure(PSIG)
SWN-44	Cont.Fan Cooler-Ser. Wtr.	Water (6)	52
SWN-51	" " " " "	Water (6)	52
SWN-71	" " " " "	Water (6)	52
SWN-71	" " " " "	Water (6)	52
SWN-71	" " " " "	Water (6)	52
SWN-71	" " " " "	Water (6)	52
SWN-71	" " " " "	Water (6)	52
SA-24	Service Air to Cont.	Water (4)	52
SA-24	" " " "	Water (4)	52
580A	Dead Weight Tester	Gas	47
[illegible]0B	" " "	Gas	47
UH-43	Auxiliary Steam System	Water (4)	52
UH-44	" " "	Water (4)	52
MW-17	City Wtr. to Cont.	Water (4)	52
MW-17	" " " "	Water (4)	52
1170	Cont. Purge System	Gas (7)	47
1171	" " "	Gas (7)	47
1172	" " "	Gas (7)	47
1173	" " "	Gas (7)	47
1190	Cont. Pressure Relief	Gas (7)	47
1191	" " "	Gas (7)	47
1192	" " "	Gas (7)	47
[illegible]0A	Recirc. Pump to Samp.Sys.	Nitrogen (4)	47
990B	" " " " "	Nitrogen (4)	47

TABLE 4.4-1 (Page 7 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure(PSIG
956A	Pressurizer to Samp. Sys.	Water (4)	52
956B	" " " "	Water (4)	52
956C	" " " "	Water (4)	52
956D	" " " "	Water (4)	52
1814A	Cont. Pressure Instr. Line	Gas	47
1814B	" " " "	Gas	47
1814C	" " " "	Gas	47
1875D	Post Acc. Cont. Sampling	Gas	47
1875E	" " "	Gas	47
1875A	" " "	Gas	47
[illegible]	" " "	Gas	47
1875F	" " "	Gas	47
1875B	" " "	Gas	47
1875G	" " "	Gas	47
1875H	" " "	Gas	47
1875J	" " "	Gas	47
1882A	O_2 Supply to Cont.	Gas	47
1882-D	" " "	Gas	47
IV-2A	" " "	Gas	47
IV-2B	" " "	Gas	47
4429	H_2 supp. to H_2 Recomb.	Gas	47
1875-K	" " "	Gas	47
[illegible]	" " "	Gas	47

TABLE 4.4-1 (Page 8 of 9)

CONTAINMENT ISOLATION VALVES

Valve No.	System (1)	Test Fluid (2)	Minimum Test Pressure (PSIG)
4430	H_2 Supply to H_2 Recomb.	Gas	47
1876-C	" " "	Gas	47
IV-5A	" " "	Gas	47
4431	" " "	Gas	47
1875-L	" " "	Gas	47
IV-3B	" " "	Gas	47
4432	" " "	Gas	47
1876-D	" " "	Gas	47
IV-5B	" " "	Gas	47
IA-39	Inst. Air to Cont.	Gas	47
[illegible]1228	" " "	Gas	47
E-2	Post Acc.Vent Exhaust Line	Gas (7)	47
E-1	" " " "	Gas (7)	47
E-3	" " " "	Gas (7)	47
E-5	" " " "	Gas (7)	47
85A	Personnel Airlock	Gas	47
85B	" " "	Gas	47
85C	" " "	Gas (7)	47
85D	" " "	Gas (7)	47
95A	Equipment Airlock	Gas	47
95B	" "	Gas	47
95C	" "	Gas (7)	47
[illegible]	" "	Gas (7)	47