ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
UNIT NO. 1

REACTOR CONTAINMENT BUILDING INTEGRATED LEAK RATE TEST SUMMARY TECHNICAL REPORT

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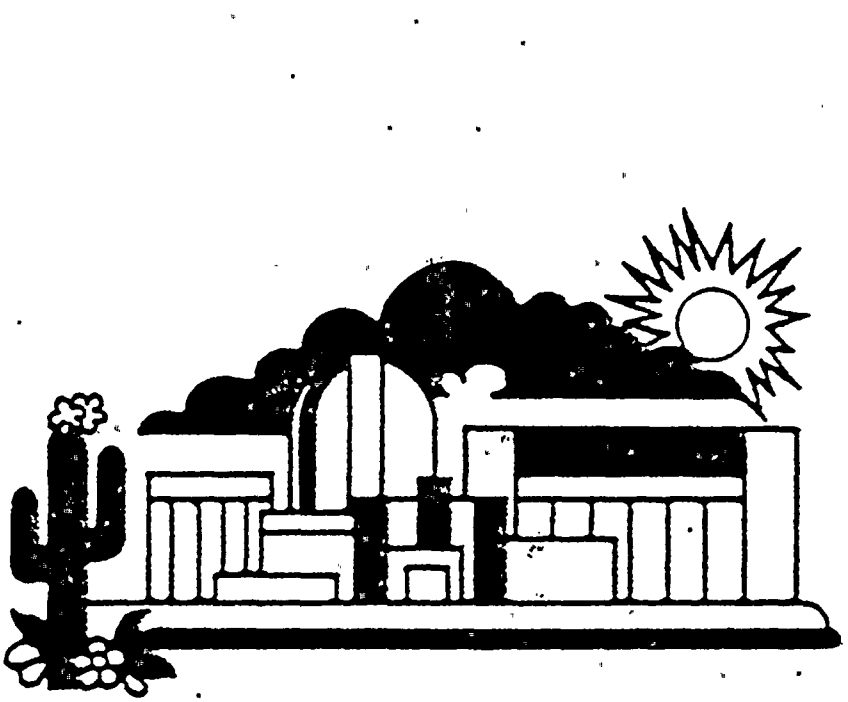

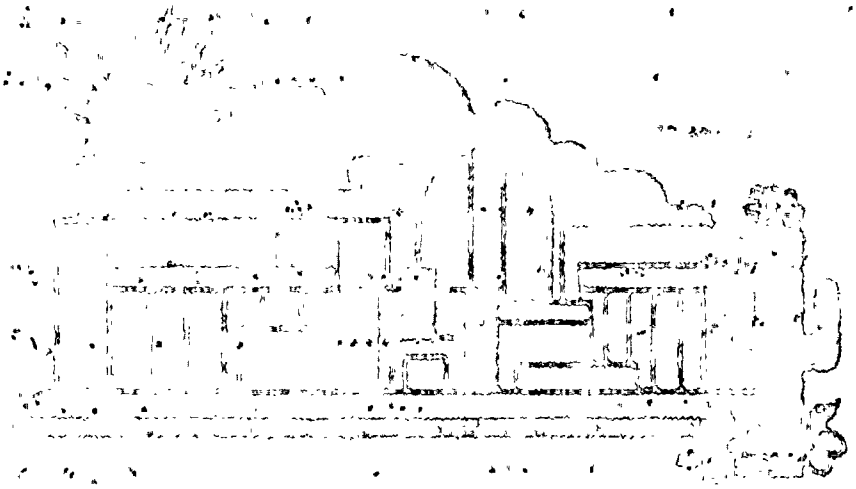

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I. INTRODUCTION

A periodic Type "A" Integrated Leak Rate Test (ILRT) was performed on the containment structure of the Arizona Public Service Company, Palo Verde Nuclear Generating Station (PVNGS) - Unit No. 1 pressurized water reactor in April of 1986. The results of this test were analyzed utilizing the "Total Time" method. This test was performed for a period of thirteen (13) hours at a pressure equal to or greater than the calculated peak containment internal pressure related to the design bases accident and specified in the Technical Specifications. This report describes and presents the results of this periodic Type A test including the supplemental test method utilized for verification (Controlled Leakage Rate Test or CLRT).

The test results are reported in accordance with the requirements of 10 CFR 50, Appendix J, Section V.B.2., ANSI N45.4 (1972) and ANSI/ANS 56.8 (1981).

In addition, Type "B" and "C" test results performed since the last Type "A" Test are included in this report (Appendix B) in accordance with the requirements of 10 CFR 50, Appendix J, Section V.B.3.

II. SUMMARY

Prior to performance of the ILRT, Local Leak Rate Tests (LLRTs) were performed to verify containment integrity. These Type "B" and Type "C" tests were performed on containment electrical penetrations, mechanical penetrations, containment isolation valves, fuel transfer tube, equipment hatch and air locks. The acceptance criteria for the LLRTs is that the total leakage does not exceed 0.60 (L_a) where L_a is the maximum allowable leakage rate at the pressure P_a (peak accident pressure) stated as a percent of containment free volume per day (24 hours). The total leakage from these tests was well within this limit and results are presented in the official copies of the associated type B and C surveillance test procedures (73ST-9CL01, 4, 6 and 7), which are on file at PVNGS.

At the start of the ILRT, all valves were in their normal position for accident conditions. Exceptions to this valve line-up were identified in the official copy of surveillance test procedure 73ST-9CL02 (Integrated Leak Rate Test), which is also on file at PVNGS.

The first order least-squares fit analysis of the data utilizing the Total-Time method yielded a leak rate of 0.0171% per day with a 95% upper confidence limit (one sided) of 0.0664% per day. These values are well within the allowable limit of 0.075% per day.

III. TEST DISCUSSION

A. Description of Containment

The containment design basis is to limit release of radioactive materials, subsequent to postulated accidents, such that resulting calculated offsite doses are less than the guideline values of 10CFR100. In order to meet this requirement, a design (maximum) containment leakage rate has been defined in conjunction with performance requirements placed on the engineered safety features (ESF) systems.

The capability of the containment structure to maintain design leaktight integrity and to provide a predictable environment for operation of ESF systems is ensured by a comprehensive design analysis and testing program that includes consideration of:

- The peak containment pressure and temperature associated with the most severe postulated accident coincident with the operating basis earthquake (OBE) or safe shutdown earthquake (SSE).
- Maximum external pressure loading condition to which the containment may be subjected as a result of inadvertent containment systems operations that potentially reduce containment internal pressure below outside atmospheric pressure.

The bases in determining design are containment peak pressure (and temperature) and external pressure. For the containment structure peak pressure analysis, it is assumed that each postulated accident is concurrent with the most limiting single active failure in systems required to mitigate the consequence of the accident or to shutdown the plant. No two accidents are postulated to occur simultaneously or consecutively.

A. Description of Containment (Cont'd)

The design basis accident (DBA) for each of the categories of: containment peak pressure (and temperature) and containment maximum external pressure is defined as the most severe accident postulated for each case. The difference between the design pressure (60 psig) and the calculated peak pressure of the as-constructed design (49.2 psig) results in a design margin of approximately 20%.

The containment structure is designed to house the reactor coolant system (RCS) and is referred to as the containment. The containment is part of the containment system whose functional requirements are summarized by the following criteria:

- The containment must withstand the peak pressure and time-varying thermal gradient resulting from a hypothetical failure of the RCS or main steam system.
- The containment must provide biological shielding during normal operation and following a postulated loss-of-coolant accident (LOCA) to minimize radiation exposure.
- The containment must be leaktight in order to minimize leakage of airborne radioactive materials.
- The containment must provide approximately 150 penetrations for piping and electrical cabling, as well as, personnel and equipment access, and provides rigid anchor points for piping entering or leaving.

The containment consists of three basic parts:

- Flat base slab with a central cavity and an instrumentation tunnel.
- Right circular cylinder
- Hemispherical dome

A. Description of Containment (Cont'd)

Principal nominal dimensions of the containment are as follows:

- °Interior diameter.....146 ft.
- °Interior height (above filler slab).....206 ft. - 6 in.
- °Cylindrical wall thickness.....4 ft. - 0 in.
- °Dome thickness.....3 ft. - 6 in. at dome apex; 4 ft. - 0 in. at wall springline
- °Base mat thickness.....10 ft. - 6 in.
- °Liner plate thickness.....1/4 in.
- °Internal free volume.....2,600,000 ft^3 net

The containment is constructed of reinforced concrete prestressed by post-tensioned tendons in the cylinder and the dome. The base mat is designed and constructed of conventionally reinforced concrete. Special reinforcing details are provided at discontinuities and at openings in the shell.

A welded steel liner attached to the inside face of the concrete limits the release of radioactivity from the containment. The base liner is installed on the top of the base mat and is covered by a 2 ft. - 9 in. thick concrete slab. The containment building provides biological shielding during normal operation and following a LOCA. It also functions as a leaktight barrier following an accident inside the containment.

The post-tensioning or tendon system consists of high strength wires which are used with button-head anchorage techniques. There are 186 one-quarter inch diameter wires per tendon.

Each tendon assembly consists of wires together with end anchor heads and ring nuts. The tendons transfer load to the structure through shims and a bearing plate.

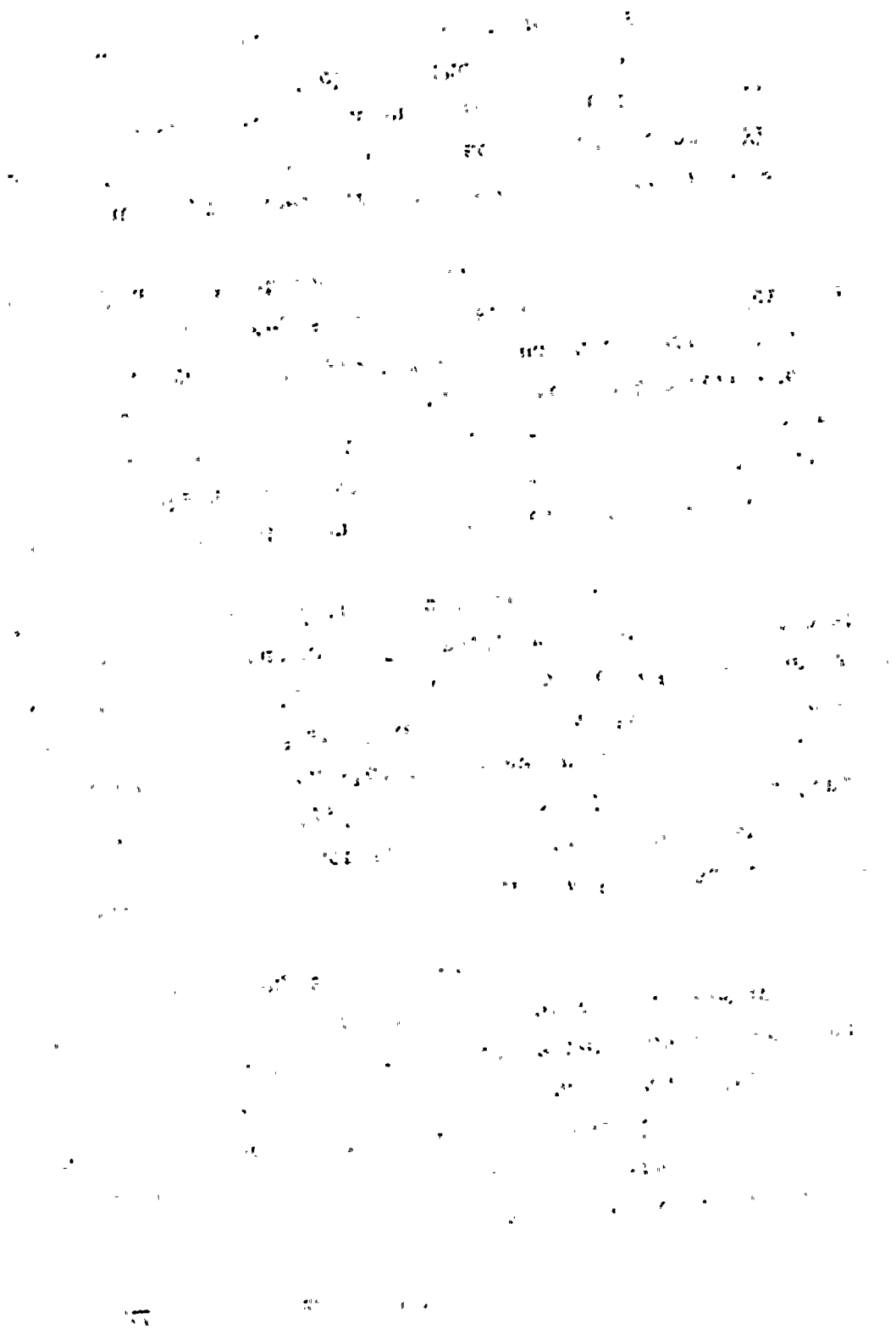
A. Description of Containment (Cont'd)

Tendons are installed in sheaths that form ducts through the concrete between anchorage points. Trumpets, which are enlarged ducts attached to the bearing plate, allow the wires to spread out at the anchorage to suit button-head spacing requirements. Further, trumpets facilitate field button-heading of wires.

Tendon sheathing provides an enclosed space surrounding each tendon. A valved vent at the highest points of curvature permits release of entrapped air during greasing operations. Drains are provided at the lowest points of curvature to remove accumulated water prior to installing tendons. After the greasing operation, the vents and drains are closed and sealed.

The prestressing tendons are protected against atmospheric corrosion during shipment and installation, and during the life of containment. Prior to shipment, the tendons are coated with a thin film of petrolatum containing rust inhibitors. The sheathing filler material used for permanent corrosion protection is a modified, refined petroleum-base product. The material is pumped into the sheathing after stressing.

Prestressing of the cylindrical wall is achieved by a post-tensioning system consisting of both vertical inverted U-shaped and circumferential (hoop) tendons. Vertical tendons are anchored at the base slab and extended up and over the dome to form an inverted U shape. Three buttresses are equally spaced at 120° around the cylinder and extend over the dome joining together at the crown. The hoop tendons are anchored at buttresses located at 240° apart. The successive hoop tendons are anchored at alternate buttresses so that two complete horizontal loops are achieved by three consecutive horizontal tendons.



A. Description of Containment (Cont'd)

Prestressing of the hemispherical dome is achieved by a two-way pattern of tendons, which are an extension of the continuous vertical tendons and are anchored at the base slab. They are arranged to produce two families of tendons mutually intersecting each other at 90° on the horizontal projected plane. Hoop tendons extend into the hemispherical region to provide a two-way pattern up to the 90° solid angle of the dome.

A welded steel liner plate covers the entire inside surface of the containment (excluding penetrations) to satisfy the leaktight criteria. The liner is typically 1/4-inch thick and is thickened locally around penetration sleeves, large brackets, and attachments to the basemat and shell wall. The stability of the liner plate, including the thickened plate, is controlled by anchoring it to the concrete structure. The shell wall and dome liner plate system is also used as a form for construction.

A circular equipment hatch and two personnel airlock assemblies (100' and 140' elevations) penetrate the concrete cylinder walls. Penetration assemblies consist of steel sleeves or nozzles, reinforcing plates and anchors. They are anchored to the concrete walls and are welded to the steel liner. Hatch and air lock doors are provided with double-gasketed flanges with provisions for leak testing the flange-gasket combinations.

The 100' elevation personnel air lock is for emergency access. Each personnel air lock has a door at each end and is an ASME Code stamped pressure vessel. A quick-acting equalizing valve connects the personnel air lock with the interior or exterior of the containment to equalize pressure in the two systems.

A. Description of Containment (Cont'd)

During plant operation, the two doors of each personnel air lock are interlocked to prevent both being opened simultaneously. Remote indicating lights and annunciators in the control room indicate the operational status of the doors. Provision is made to bypass the interlock system during plant cold shutdown.

Single barrier piping penetrations are provided for all piping passing through the containment walls. The closure for process piping to the liner plate is accomplished with a special flued head welded into the piping system and to the penetration sleeve which is, in turn, welded to a reinforced section of the liner plate. In the case of piping carrying hot fluid, the pipe is insulated to prevent excessive concrete temperatures and to prevent excessive heat loss from the fluid. Closures to these penetration assemblies are provided by the piping systems that are served by the penetrations.

Electrical penetration assemblies provide means for carrying one or more electric circuits through a single aperture (nozzle) in the containment pressure barrier while maintaining the integrity of the pressure barrier.

Medium voltage power penetrations are configured in the form of tubular canisters slightly shorter than the containment structure nozzle into which it will be installed. The penetration assemblies are installled in 24-inch diameter nozzles. The canister is used as a pressure chamber to monitor penetration leakage rate by pressurizing the interior space with nitrogen and measuring the leak rate with a pressure gauge. The medium voltage power penetration is flange-mounted to the outside containment wall with nuts, bolts, washers, and lock-washers. The aperture seal is formed between the header plate and the flange with two concentric Viton O-rings.

A. Description of Containment (Cont'd)

The low voltage power, control, and instrumentation penetrations are also flange-mounted to the outside containment wall in the manner described for the medium voltage power penetrations. Each penetration in this category has a stainless steel header plate at the outside containment end. Stainless steel feed-through subassemblies, containing electrical conductors, pass through the header plate and are secured and sealed with special stainless steel compression fittings. The interstices between the seals and feed-through subassemblies provide a pressure chamber which is used to monitor the leakage rate.

A fuel transfer tube penetration is provided for refueling. An inner pipe acts as the refueling tube with an outer pipe as the housing. The tube is fitted with a double-gasketed blind flange in the refueling canal and a standard gate valve in the spent fuel pool. This arrangement prevents leakage through the refueling tube. Outer sleeves permit the transfer tube to penetrate the refueling canal wall, the containment shell, and the exterior wall of the fuel handling building, while maintaining a pressure-tight boundary at each wall. The sleeves are anchored into each wall respectively and welded to each wall's liner plate. The housing is supported by the sleeves in the vertical and horizontal directions. Bellows at both the interior and exterior faces of the containment shell and of the fuel handling building permit thermal expansion of the transfer tube and of the housing. The same expansion bellows permit differential movement between structures.

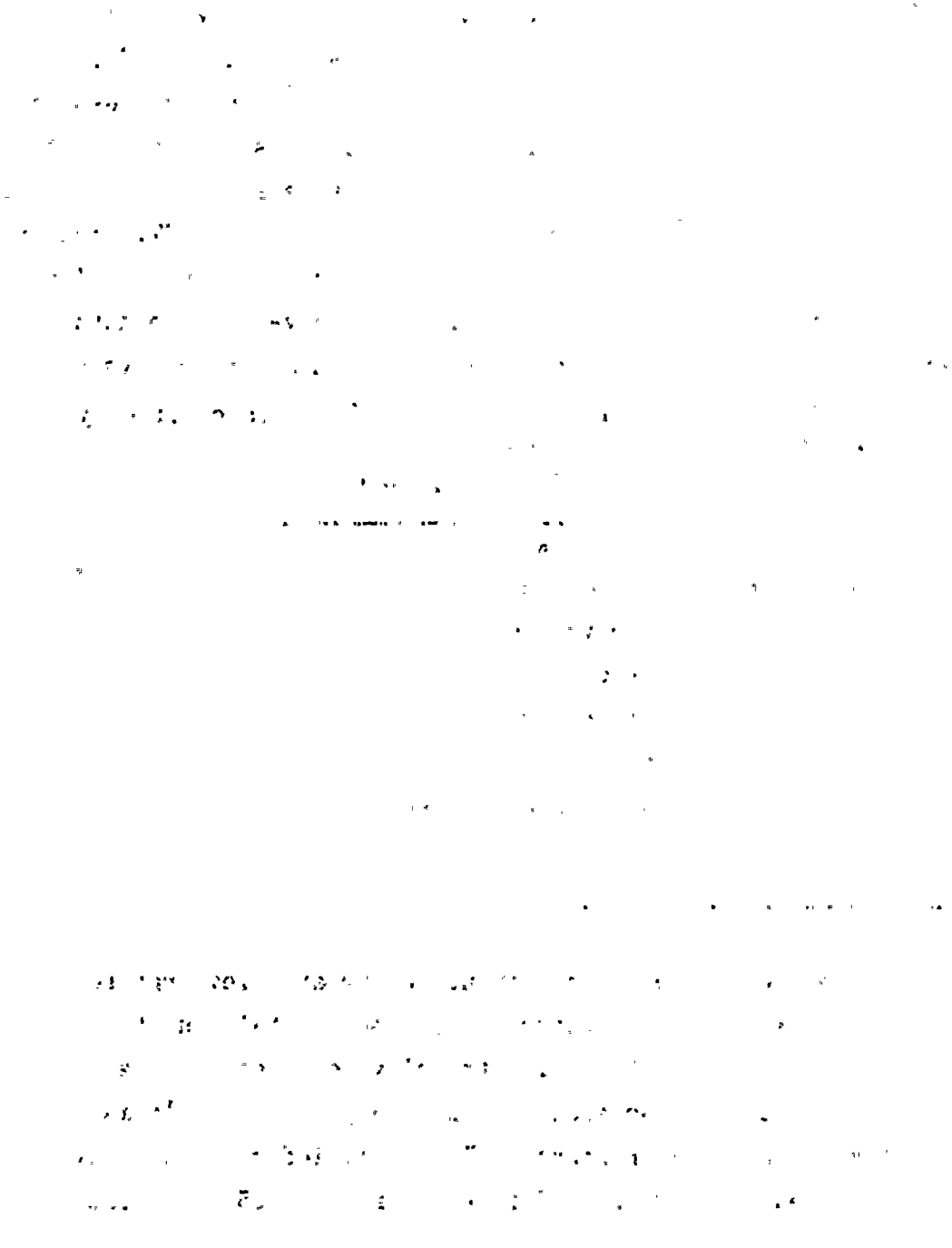
The structural acceptance criteria complies with ASME Section III, Division 2, Article CC-3000. The fundamental acceptance criteria for the complete containment is successful completion of the structural integrity test with measured responses within the limits predicted by analyses.

A. Description of Containment (Cont'd)

Prediction of limits are based on test load combinations and code values for stress, strain, or gross deformation for the range of material properties and construction tolerances specified.

The structural integrity test is planned to yield information on both the overall response of the containment and the response of localized areas, such as major penetrations or buttresses, which are important to its design functions.

The design and analysis methods, as well as the type of construction and construction materials, are chosen to allow assessment of the structure's capability throughout its service life. Additionally, surveillance testing provides further assurances of the structure's continuing ability to meet its design functions.



B. Description of Instrumentation

A "state-of-the-art" ILRT instrumentation package was utilized to allow leak rate determination by the "Absolute Method". The primary measurement variables include containment pressure, dewpoint temperature and drybulb temperature as a function of time. Ancillary measurements include outside ambient temperature and barometric pressure. During the supplemental CLRT, containment verification (fixed-orifice) flow is also measured. Instrument readings were output at 15 minute intervals via a data acquisition system and line printer. The measurement system is shown in Figure 8. The mass of air (Q) is calculated by the Perfect Gas Law as follows:

$$Q = \frac{P_a V}{RT} = \frac{(P_t - P_{wv}) V}{RT}$$

where: P_a = air partial pressure
V = free volume
R = gas constant
T = temperature
P_t = total pressure, psia
P_{wv} = water vapor pressure, psia

1. Temperature Instrumentation

Twenty-four (24) precision platinum Resistance Temperature Detectors (RTD's) were located throughout containment to allow measurement of the volumetrically weighted average drybulb temperature. The specified accuracy of the RTD's is ± 0.1°F (40°F to 120°F range). The specified repeatability for each sensor is 0.025% of temperature or 0.05°C, whichever is greater.

B. Description of Instrumentation (Cont'd)

2. Dewpoint Instrumentation

Six (6) chilled-mirror Dewcells were located throughout the containment to allow measurement of the volumetrically weighted dewpoint temperature. The specified accuracy of each of the sensors is ± 0.3°C (±0.54°F), nominal over a range of -50°C to +100°C (-58°F to 212°F). The specified repeatability for each sensor is ± 0.11°F.

3. Pressure Instrumentation

Two (2) precision fused quartz bourdon tube pressure indicators (0-100 psia) were provided for the determination of containment absolute pressure. One pressure indicator was utilized as a primary while the second indicator was available as a backup. The specified accuracy of the indicators is ± 0.010% of reading ± 0.002% full scale or ± 0.0095 psia. The repeatability of the indicator is ± 0.0005% full scale.

4. Flow Instrumentation

Two (2) thermal mass flowmeters with a range of 0 to 10scfm were utilized during the supplemental CLRT for verification flow. The specified accuracy of the instrument is ± 1.0% full scale. The specified repeatability of the instrument is ± 0.2% full scale.

5. Ancillary Instrumentation

The outside ambient temperature and barometric pressure as well as wind speed and wind direction were measured utilizing the site meteorological tower.

C. Description of the Computer Program

The ILRT computer program is an APS-specified vendor-supplied program which performs the leak rate calculation utilizing the Generator Temperature Monitor (GTM) mini-computer (LSI 11/23). The computer is connected via a data link to the Data Acquisition System (DAS). The drybulb temperature, dewpoint temperature and absolute pressure data that are scanned by the DAS are fed to the computer for storage and printing. The ILRT computer system consists of:

- °Volumetrics A-100 DAS
- °DEC VT55 FE graphics terminal with hard copy unit
- °LSI 11/23 ILRT computer system with dual double-density disk drives.
- °Parallel line printer, Data Royal 5000

After every scan by the DAS, the computer will print a "Raw Data Summary Report" (RDSR). The computer stores the data and, on demand, prints the "ILRT Program Report" (PR). From this report, temperature stabilization can be calculated from average temperature. The ILRT computer uses the Total-Time or Mass-Plot analysis technique to calculate the measured leak rate, calculated leak rate, and 95% upper confidence limit leak rate. The 95% upper confidence limit leak rate is used to determine if the test has met the acceptance criteria. During the verification test or CLRT, the computer will calculate the composite leak rate (L_c). To aid the Test Director in data analysis, plots of the data are made. The RDSR, PR and plots are contained in Appendix A.

The computer contains the following:

- °DEC LSI 11/23 processor with KEV 11 option
- °128K bytes of memory
- °two double-density disk drives (RX02 format)
- °two serial line interfaces
  - °one for console device
  - °one for serial link to DAS

C. Description of the Computer Program (Cont'd)

- °DEC VT55-FE graphics terminal with hard copy unit
- °TCU-50D timing control unit
- °Parallel line printer

The system software consists of an operating system and an applications package. The operating system is supplied by DEC as the RT-11 version 4.0 Foreground/Background monitor with the appropriate RT-11 version 4.0 device handlers.

The applications package consists of the following programs (not including special maintenance and editing programs):

- °LOOK
- °SCAN
- °EXAM
- °CONWEI
- °CALPRE
- °CALC
- °RELHUM
- °INERR
- °PLOT
- °INLEAK

Program LOOK will read data from the A-100 DAS. These data are displayed on the console device. The data output from the DAS are in the same form as is output during the ILRT (i.e., 24 RTD temperatures, 6 dewpoint temperatures, 2 pressure readings, time and date). This program is used during the initial phases of the equipment set-up. The program is a never-ending loop and requires operator intervention to exit.

C. Description of the Computer Program (Cont'd)

Program SCAN is designed to read data from the A-100 DAS and re-format the data into a form more digestable to the other programs in the application package. The program will run continuously until a total of 257 data scans have been received or halted by operator intervention. This program will also run concurrently with the other programs in the application package; it has priority in execution if a conflict arises. The operation of the program is transparent to the user.

Program EXAM is designed to display the contents of the raw data files acquired by the program SCAN. This program will inspect the data files to determine if the raw data file needs editing before being utilized in the calculation sequence.

Program CONWEI is used to create or modify the containment weighting factors of the sensors used in the calculation program. The containment is divided into various sub-volumes. The sub-volume is represented by RTD's and Dewcells. Their readings are proportionally applied to the total volume.

Program CALPRE is designed to compute the calibration constants for pressure gauges. The program requests the true pressure and gauge readings for both pressure gauges, then derives the multiplication factor and correction constant for each gauge.

Program CALC is the main application module in the applications package. This program takes the pre-formatted data from the raw data files and performs various calculations with it to produce the various parameters required in the final report of leak rate. The results of these calculations are stored in two data files for use in the plot routines.

C. Description of Computer Program (Cont'd)

Upon execution, the program CALC reads the scan data files, containment weighting factors and the pressure gauge calibration constants (see Appendix A-General). The RTD and Dewcell temperatures are then multiplied by their corresponding weighting factors and summed. The program checks each sensor reading to insure that it is within the allowable deviation for that set of readings. The elapsed time from "time zero" is calculated and a true pressure is determined from the gauge readings and calibration constants. The pressure is then corrected for the effects of the water vapor pressure. The weighted average containment temperature, average weighted Dewcell temperature and containment pressure are used to compute the measured and calculated leak rate for the Point-to-Point, Total-Time and Mass-Plot methods.

From these values, a regression line is calculated by the least-squares fit method to compute a calculated leak rate for each of the methods. The upper confidence limit is calculated with the "Students T" analysis of n-2 degrees of freedom where n is the number of data samples utilized at each time n.

Program RELHUM is designed to read the average containment dry-bulb and dewpoint temperatures and compute a value of the relative humidity in the containment.

Program INERR is designed to compute the instrument error as a function of average containment temperature, number of RTD sensors, average corrected containment pressure, number of Dewcell sensors, elapsed time and the accuracy of the various sensors used.

Program PLOT is designed to accept computed data from the programs: CALC, RELHUM, INERR, and display the results on the DEC VT55-FE graphics terminal.

C. Description of the Computer Program (Cont'd)

Program INLEAK is designed to calculate the value of the installed leak for the CLRT as measured by the ILRT system. The program requires the operator to enter the various leak rate parameters.

This program interacts with the user to convert the leak rates obtained in weight percent per day to standard cubic feet per minute. The conversion is obtained by calculating the initial containment mass and applying the measured leak rate to this mass. The program also calculates the installed leak.

D. Error Analysis

The instrument system error analysis is based on the Instrument Selection Guide (ISG) formula ANSI/ANS 56.8-1981 "Containment System Leakage Testing Requirements." The formula is:

$$ISG = \pm \frac{2400}{t}\left[2\left(\frac{ep}{P}\right)^2 + 2\left(\frac{epv}{P}\right)^2 + 2\left(\frac{et}{T}\right)^2\right]^{\frac{1}{2}} \text{ \%/day}$$

where,

ep = absolute pressure measurement repeatability error divided by the square root of the number of sensors.
= (.0005%) (100 psia)/$(1)^{\frac{1}{2}}$
= .0005 psia

epv = vapor pressure measurement accuracy error divided by the square root of the number of sensors.
= (.54°F) (0.0124 psia/°F)*/$(6)^{\frac{1}{2}}$
= .00273 psia
* From steam tables at dewpoint temperature range 69-71°F

et = drybulb temperature measurement repeatability error divided by the square root of the number of sensors.
= (0.1°F)/$(24)^{\frac{1}{2}}$ = .0204°F

P = Test pressure
= 63.9 psia

T = Test temperature (nominal)
= 540° R

t = Test duration in hours

t = 8 hours

Therefore, the ISG is:

$$ISG = \frac{2400}{8}\left[2\left(\frac{.0005}{63.9}\right)^2 + 2\left(\frac{.00273}{63.9}\right)^2 + 2\left(\frac{.0204}{540}\right)^2\right]^{\frac{1}{2}} \text{ \%/day}$$

ISG = ± 0.0244% per day for 8 hour ILRT

Additional error calculations are discussed in Section III.C.

E. Description of Tests

The containment was made ready for the ILRT with final inspection, closure and exclusion areas established at 1500 hours on 4-28-86. Prior to this, various tasks were completed such as instrument sensor installation, in-situ testing, temperature survey, Type B and C testing, valve line-ups, etc. Various problems were encountered and resolved during this period. These problems primarily concerned the inability of the A-100 Data Acquisition System (DAS) to transmit in the automatic mode, the 11/23 computer to perform in the SCAN mode and reinstallation delays with the 42" Refueling Purge valves following maintenance. The details concerning these items can be found in surveillance test procedure 73ST-9CL02 (Rev. 2), Integrated Leak Rate Test and/or the corresponding Test Log on file at PVNGS. Dewcell numbers 5 and 6 (located at the 110' elevation) and RTD numbers 20, 21, 22, 23 and 24 (located at the 107' elevation) exhibited erratic behavior during this period and were to be closely observed for possible future deletion if the condition continued.

Six (6) portable circulating fans were installed in containment to prevent stratification. These fans each utilized 1.5 HP motors to minimize heat input to containment atmosphere but were not energized throughout the test since the electrical breaker line-up for the fans caused tripping of other non-essential loads when altered. As a result, "static" conditions existed in containment with the potential for a longer stabilization period and a higher base-to-dome temperature differential. A pneumatic test (nitrogen) was satisfactorily performed prior to ILRT start on the steam generators (secondary-side) up to the MSIVs at approximately 70 psig to identify and correct any resultant leakage detected. This pressure was then reduced to essentially atmospheric to assure no potential adverse effects on the ILRT test results with temporary pressure gauges (located on the main steam lines external to containment) left in-place to monitor secondary-side pressure.

E. Description of Tests (Cont'd)

Since wide range steam generator level indication was required, LT 1123A/B and LT 1124A/B were valved in-service subsequent to the completion of the pneumatic test. The RCS was vented to containment atmosphere with shutdown cooling and charging systems in-service. Both as-found and as-left Type "C" test minimum path leakages for these three (3) penetrations were zero. Just prior to containment pressurization, an additional test was performed on the containment personnel lock (140' elevation) and the emergency lock (100' elevation) to reverify their integrity. Both locks tested satisfactorily with no measurable leakage. All non-essential loads in containment were de-energized at this time.

At 1552 hours, pressurization of the containment commenced with all eleven (11) mobile air compressors in-service having a total capacity of 10,800 cfm. The compressors were oil-free, diesel-driven, rotary screw-type units. These units were connected to the containment as shown in Figures 9, 10 and 11. An average rate of approximately 3.4 psi/hr was achieved with an average air inlet temperature to containment of approximately 70°F to 80°F maintained by adjusting cooling water flow to the after-cooler and chiller-dryer units. With both a containment ambient and outside ambient temperature of approximately 90°F just prior to the start of pressurization, this inlet air temperature reduced the stabilization time by limiting the containment temperature gradient. This became a concern since the Purge System was not available prior to pressurization and the aforementioned portable circulating fans in containment were not being utilized. During this period, a small but constant decrease in pressurizer level was observed since it was being constantly monitored throughout this evolution. At 1850 hours pressurization was secured at a containment pressure of 10.0 psig (surveillance test procedure limit for containment entry) to evaluate this concern in the unlikely event that a containment entry was required. The leak survey

E. Description of Tests (Cont'd)

team was also deployed at this time. The results of the evaluation were that pressurizer level was varying as a function of containment pressure. Pressurizer level could be adjusted during this period with no adverse effects on the ILRT but no adjustments would be made subsequent to cessation of pressurization. Pressurization recommenced at 2000 hours to accident pressure (P_a) and was secured at 0852 hours on 4-29-86 at a pressure of approximately 49.7 psig. A 0.5 psig "buffer" was intentionally installed to assure pressure did not fall below P_a (49.2 psig) due to temperature stabilization and/or potential leakage. At this time, the pressurization line to containment was vented to atmosphere. Pressurizer level was observed to decrease as a function of increasing containment air pressure throughout the pressurization period. The decrease in level was a result of the increasing containment air pressure on the vented RCS displacing the voids created at atmospheric pressure primarily in the reactor vessel head and steam generator U-tube region. Charging was initiated to return pressurizer level to its predetermined indication.

During the above period, the leak survey team discovered pressure had developed between both Containment Refueling Purge supply and exhaust 42" butterfly valves and Containment Power Access Purge supply 8" butterfly valves. Preparations commenced to check if any leakage existed past the outboard valves by removing their associated manways or spool pieces and leak checking. There was no evidence of leakage past any of the outboard valves addressed. Between the hours of 0852 and 1755, containment pressure had decreased to approximately 48.9 psig or a loss of 0.8 psig. Throughout the eleven (11) hour delay, extensive leak surveys were repeatedly performed and the team size was increased in an attempt to identify the indicated leakage. Minor leakage was found and corrected at the Swagelok fittings on the instrument tubing from containment to the ILRT Measuring System pressure indicators.

E. Description of Tests (Cont'd)

It was also observed that the temporary pressure gauges located on the main steam lines to monitor steam generator secondary-side pressure were indicating approximately 2 to 3 psig or evidence of a potential leakage path from the containment to the main steam lines via the steam generator secondary-side. The decision was made to repressurize back to P_a (plus buffer), reinitiate stabilization and determine whether or not the leakage rate was acceptable in lieu of depressurizing the containment for entry and repair.

At 1755 hours, repressurization commenced and was secured at 1810 hours at 49.7 psig. The pressurization line to containment was again vented to atmosphere and stabilization commenced at 1815 hours. The leak survey team remained active and a complete analysis of all instrument sensors commenced. The analysis immediately revealed that Dewcell number 5 was exhibiting erratic behavior and exceeded its error limits. After several more hours of analyzing and trending, it was concluded that Dewcell number 6 and RTD numbers 20, 21, 22, 23, and 24 were also exhibiting erratic behavior and exceeded their error limits. Consequently, these sensors were deleted from the calculations and the volume fractions for the remaining four (4) Dewcells and nineteen (19) RTDs were adjusted, accordingly. At 2300, a gas sample was taken from steam generator number 2 in an attempt to analyze the O_2 content of the N_2 blanket but the results proved inconclusive. However, over a period of approximately 50 minutes, the Heise gauge indicated an increase of approximately 0.1 psig which appeared to confirm communication between the containment atmosphere and the secondary-side. This leakage was attributed to LT 1123A/B and LT 1124A/B being valved-in. All stabilization criteria were satisfied at 2315 hours which became the first data set for the start of the ILRT. Steam generator secondary pressure was constantly monitored during the ensuing period with no visible increase in Heise indication observed. At 1215 hours on 4-30-86, the ILRT

E. Description of Tests (Cont'd)

was successfully completed for a total duration of thirteen (13) hours. The reduced duration test was performed subsequent to discussions with on-site NRC representatives and upon satisfying all the requirements for both ANSI/ANS-56.8 (1981) and BN-TOP-1 (Revision 1-1972). The results yielded a calculated Total-Time leak rate of 0.0171% per day and 0.0664% per day at the 95% upper confidence limit (one sided).

The CLRT stabilization commenced at 1245 hours following the successful completion of the ILRT. A fixed-orifice "leak" for verification of the ILRT data of 7.54 scfm was superimposed. The CLRT discharge line to the Auxiliary Building was checked by installation of a constant air monitor. This flow was approximately equivalent to 0.1% per day (L_a) at actual test pressure conditions. The actual CLRT commenced at 1345 hours and was successfully completed at 2015 hours for a total CLRT duration of 6.50 hours (not including 1.0 hour for stabilization). The results yielded a calculated Total-Time leak rate of 0.1180% per day. It should be noted that no data sets or individual data points were rejected for either the ILRT or CLRT.

Depressurization to atmosphere commenced at 2142 hours with a constant air monitor connected to the exhaust line to atmosphere and a release permit in effect. Depressurization was maintained at a maximum rate of 10 psi/hr. At 1300 hours on 5-1-86, 0 psig containment pressure was achieved followed by containment air sampling and personnel entry for inspection. All sumps were verified to be dry or as they were prior to pressurization with no abnormalities observed. The exclusion areas were removed and system/component restoration commenced with the ILRT Test Log closed at 2200 hours on 5-15-86.

IV. RESULT AND VERIFICATION

The ILRT was conducted for a period of thirteen (13) hours starting at 64.168 psia (49.492 psig) with a total of fifty-three (53) samples or data sets taken and ending at 64.026 psia (49.350 psig). The results of a calculated least-squares statistical fit of all data revealed a Total-Time leak rate of 0.0171% per day with a 95% upper confidence limit (one sided) of 0.0664% per day.

Following satisfactory completion of the ILRT at P_a, a six and one half (6.5) hour CLRT was performed with a total of twenty-seven (27) samples or data sets taken. This test was conducted by superimposing a known fixed-orifice leak approximately equivalent to L_a (0.1% per day) of 7.54 scfm. The calculated Total-Time leak rate for CLRT was 0.1180% per day.

No data samples were rejected in computing the results for either the ILRT or the CLRT and all data were recorded at equal fifteen (15) minute intervals.

V. CONCLUSIONS

The Integrated Leak Rate Test at peak accident pressure provided acceptable results as evidenced by the computer printouts in Appendix A of this report. The computed leak rate is well within the specified limit. The acceptance criteria for the ILRT is as follows:

1 - The maximum allowable operational leak rate shall not exceed 75% of L_a (0.1% per day) at a pressure of not less than P_a (49.2 psig):

° 0.075% per day

2 - The accuracy of the ILRT is verified by a supplemental test (CLRT) where a calibrated leak is imposed on the existing leaks (L_{am}) in the containment system. The superimposed leak rate (L_o) shall be between 75% and 125% of L_a. Acceptability is demonstrated if:

° $(L_o + L_{am} - 0.25\ L_a) \leq L_c \leq (L_o + L_{am} + 0.25\ L_a)$

$(0.1+0.0171-0.025) \leq L_c \leq (0.1+0.0171+0.025)$

$(0.0921) \leq L_c \leq (0.1421)$

ILRT	Leak Rate (L_{am}) % per 24 hrs by weight Fitted	95% UCL
°Total-Time Analysis	0.0171	0.0664

CLRT	
°Induced Flow	7.54 scfm (L_a or 0.1%)

CLRT	Leak Rate (L_c) % per 24 hrs by weight
°Total-Time Analysis	0.118

V. CONCLUSIONS (Cont'd)

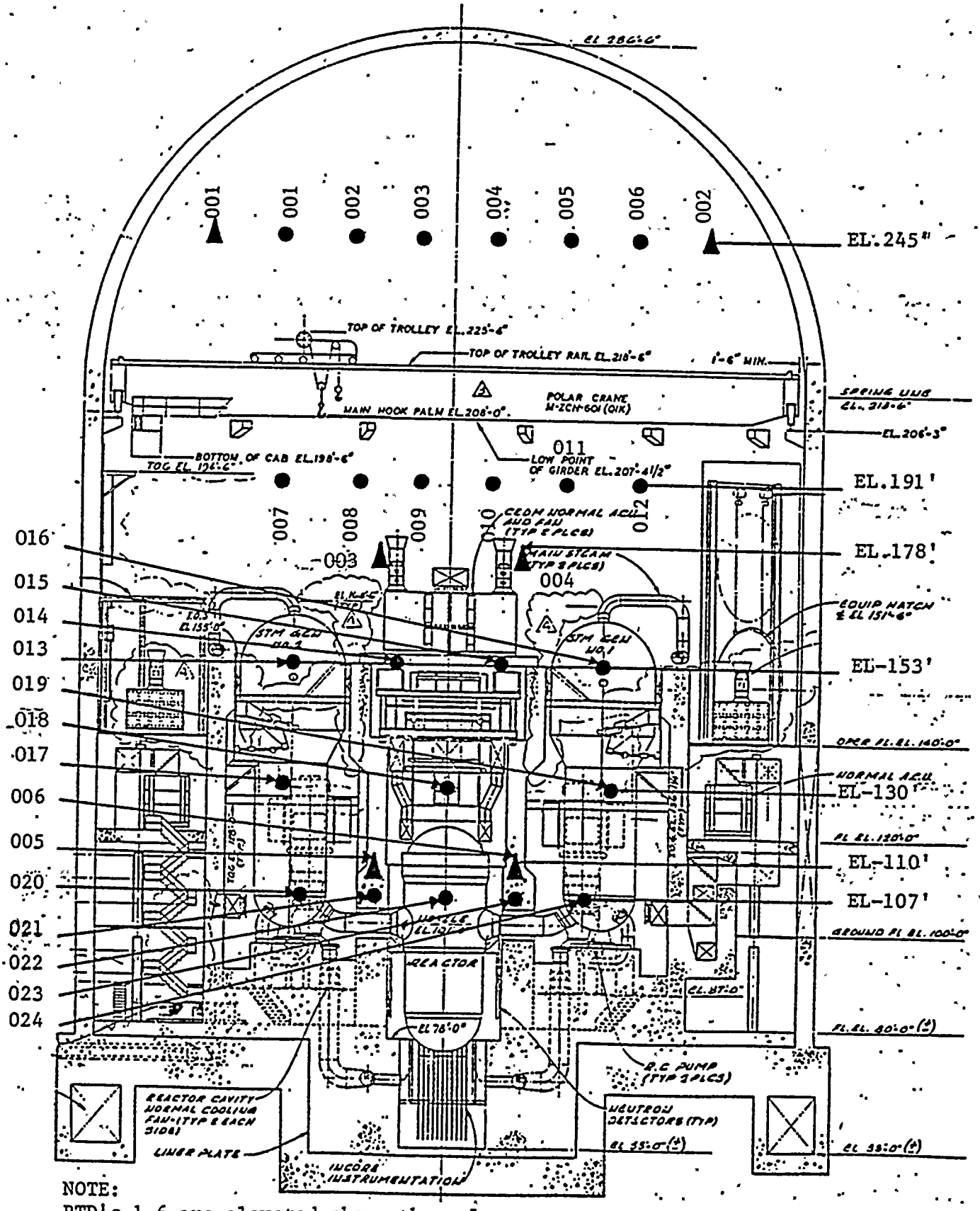
CLRT LIMITS	CLRT Limits % per 24 hrs by weight
Total-Time Analysis	
°Upper Limit	0.1421
°Lower Limit	0.0921

The computer generated reports based upon verified data substantiate for both the ILRT and CLRT that an acceptable test has been performed in accordance with 10 CFR 50, Appendix J, ANSI N45.4 (1972) and ANSI/ANS 56.8 (1981).

VI. FIGURES

Figure 1

RTD & ME LOCATION



NOTE:
RTD's 1-6 are elevated above the polar crane at approximately elevation 245' (suspended from containment spray headers)

● TEMPERATURE ELEMENT (RTD)

▲ DEWCELL ELEMENT (ME)

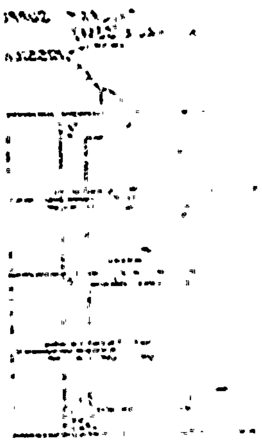
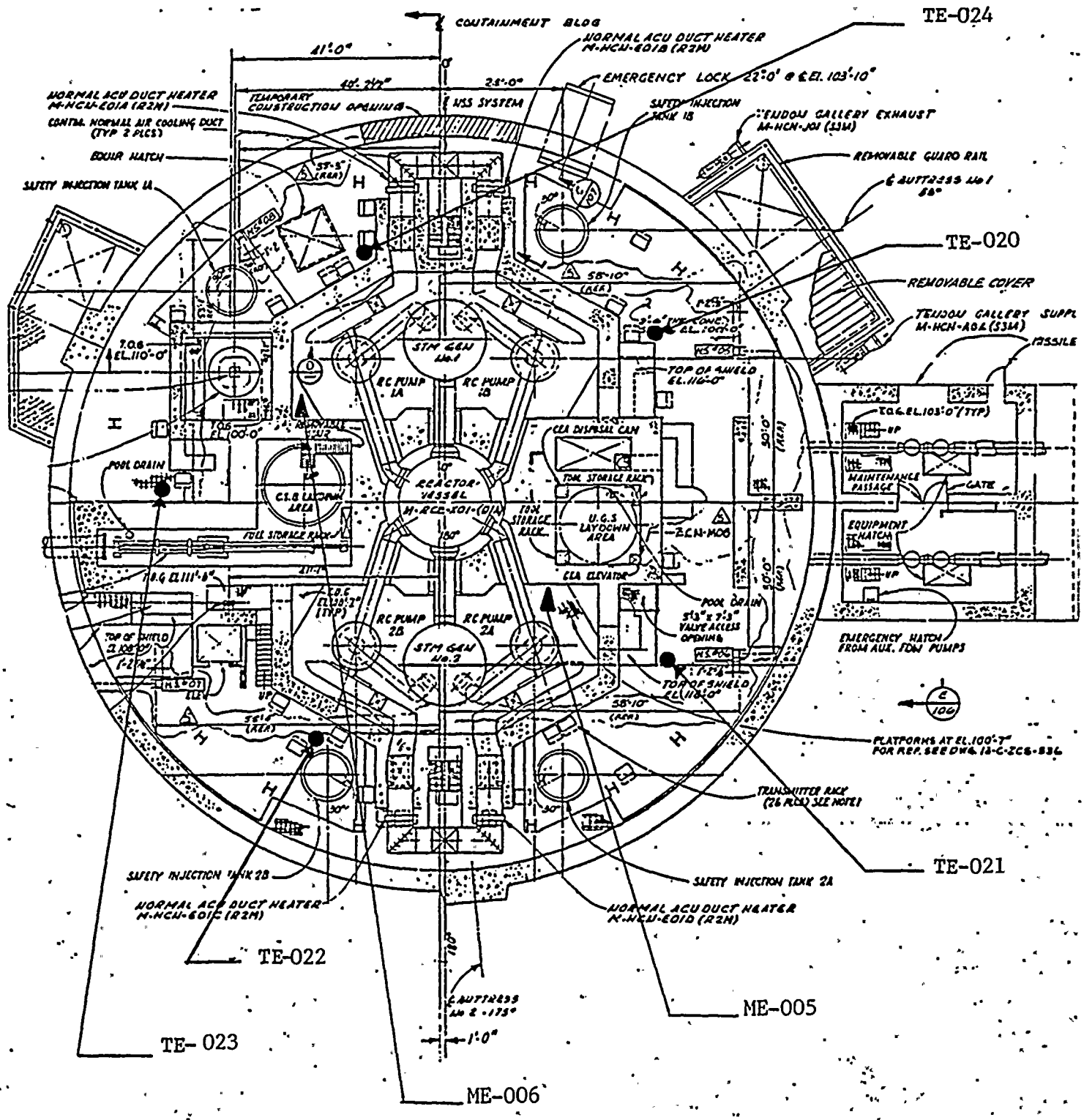


Figure 2

RTD & ME LOCATION

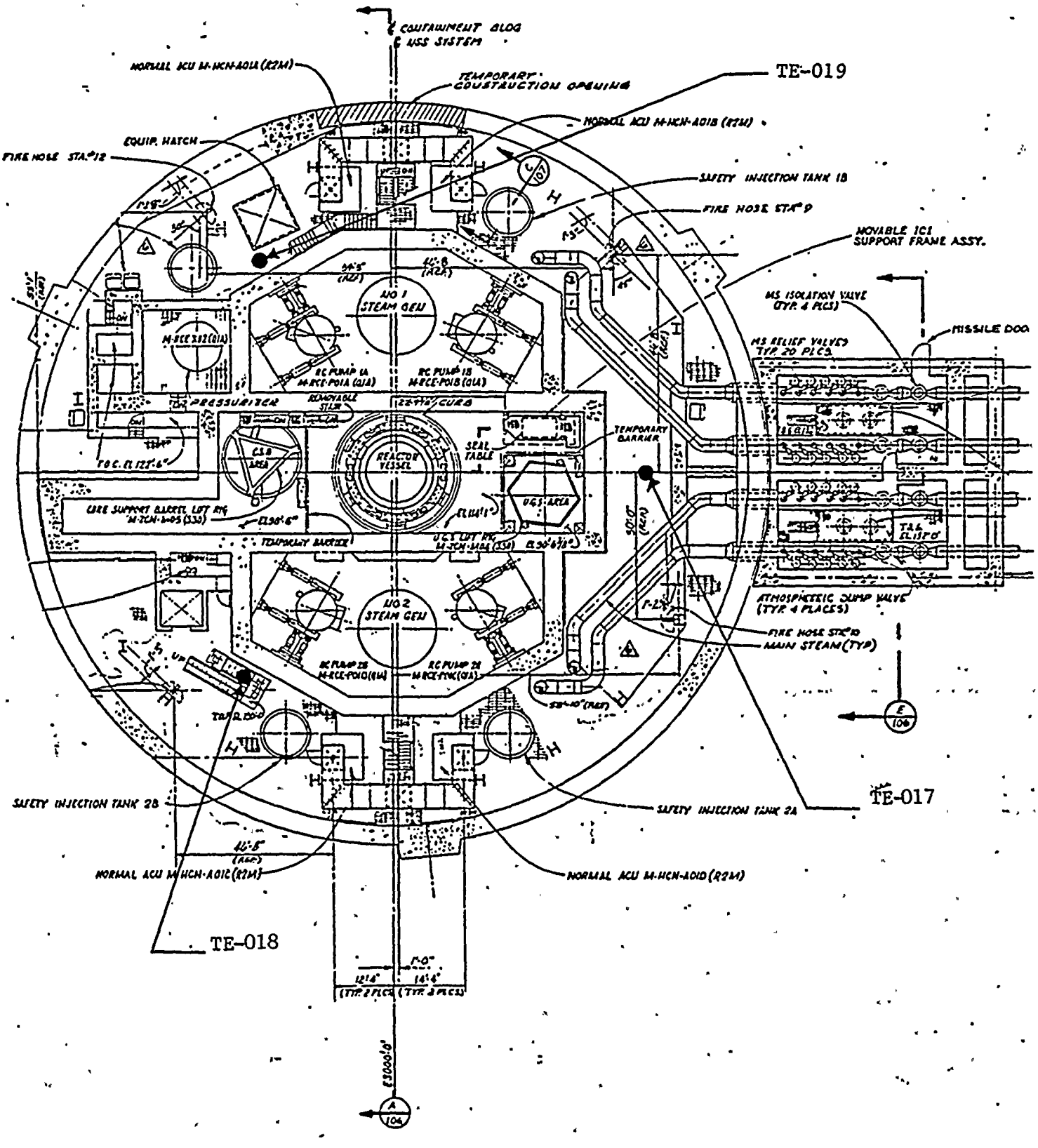


PLAN AT EL 100'-0"

TE's 020 through 024 are located at EL.107'
ME 005 and 006 are located at EL. 110'

Figure 3

RTD & ME LOCATION

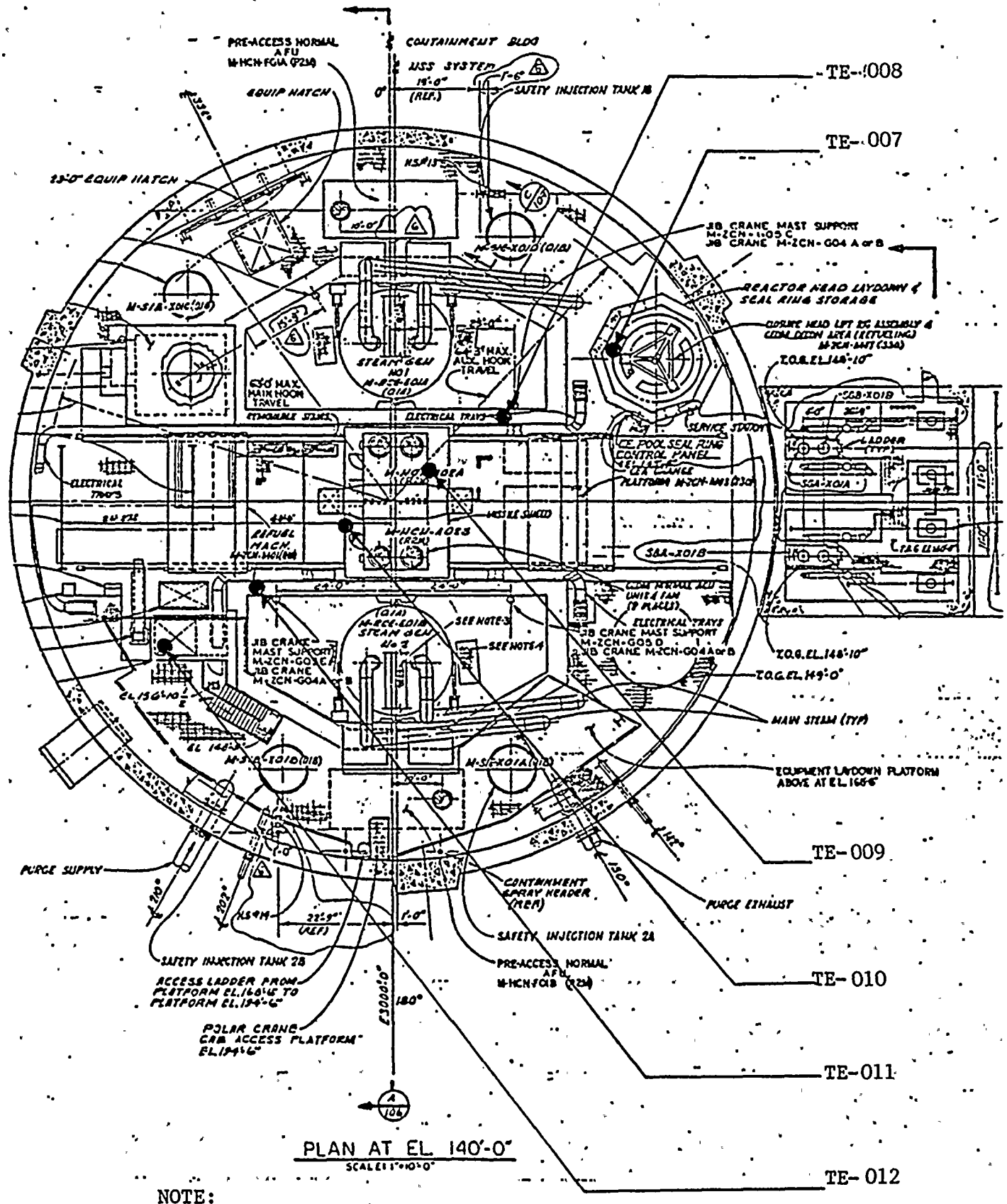


PLAN AT EL 120'-0"

TE's 017 through 019 are located at EL.130'

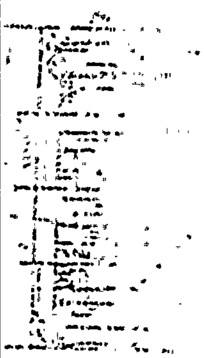
Figure 4

RTD & ME LOCATION



NOTE:
RTD's 7-12 are lowered from the crane to an elevation approximately 30' below the top of the crane rail.

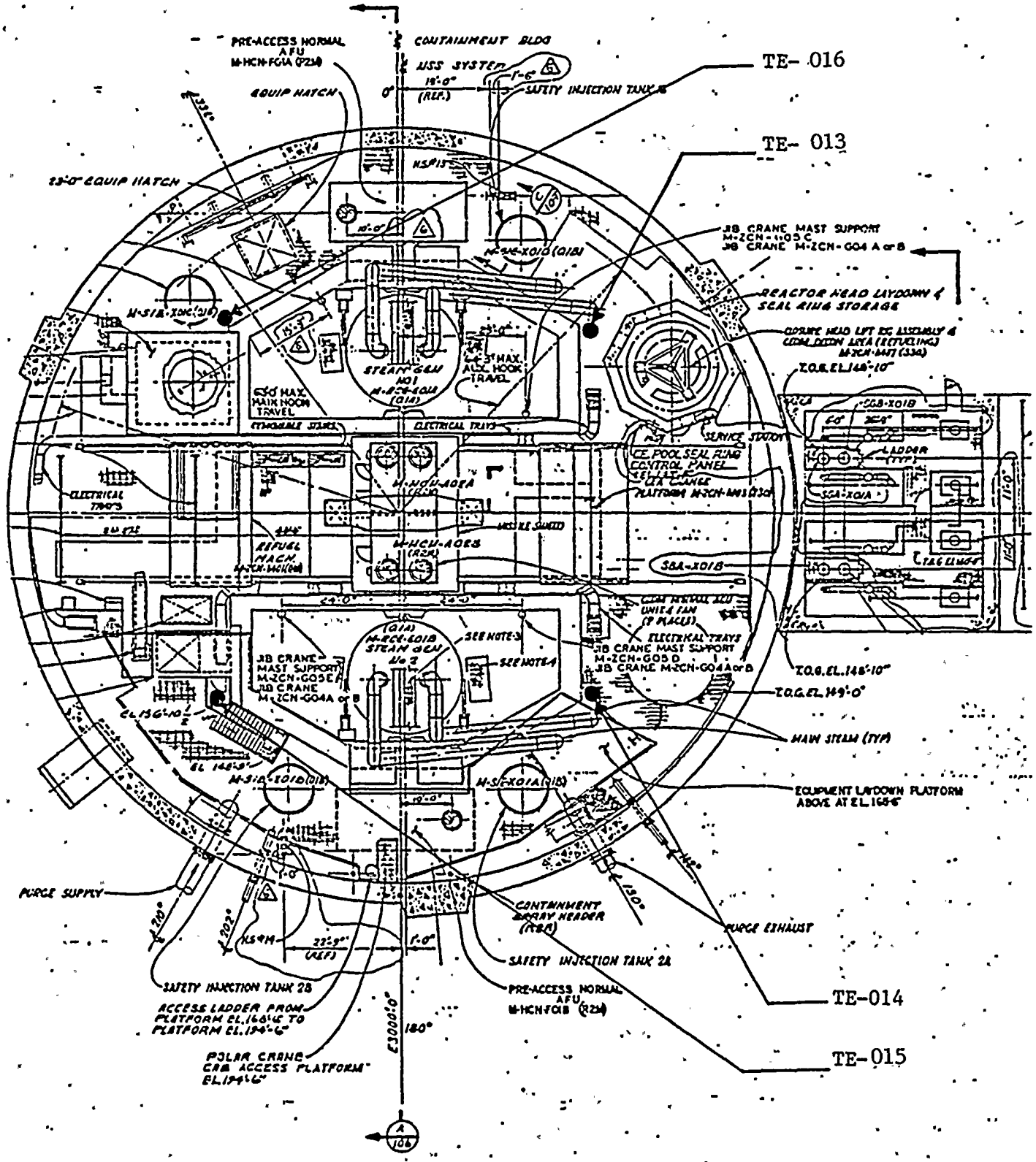
TE's 007 through 012 are located at EL.191'



[illegible]

Figure 5

RTD & ME LOCATION



TE's 013, 014, 015 and 016 are located at EL.153"

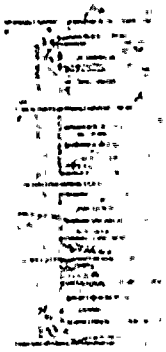
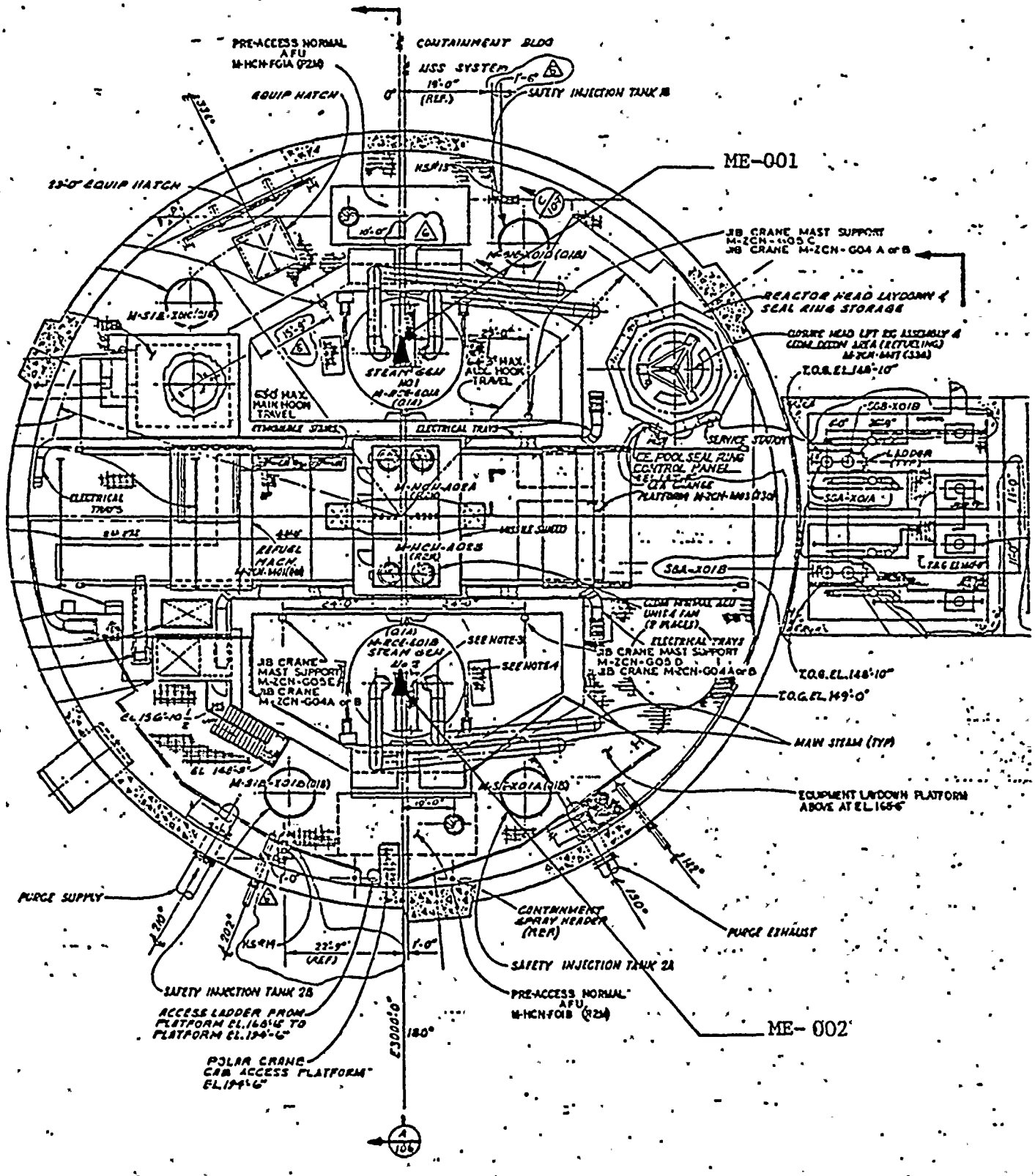


Figure 6

RTD & ME LOCATION



NOTE:

ME's 1 and 2 are elevated above the polar crane at approximately elevation 245' (suspended from containment spray headers)

ME's 001 and 002 are located at EL.245'

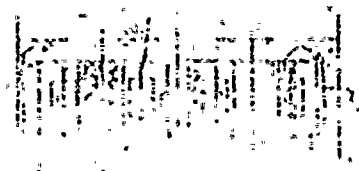
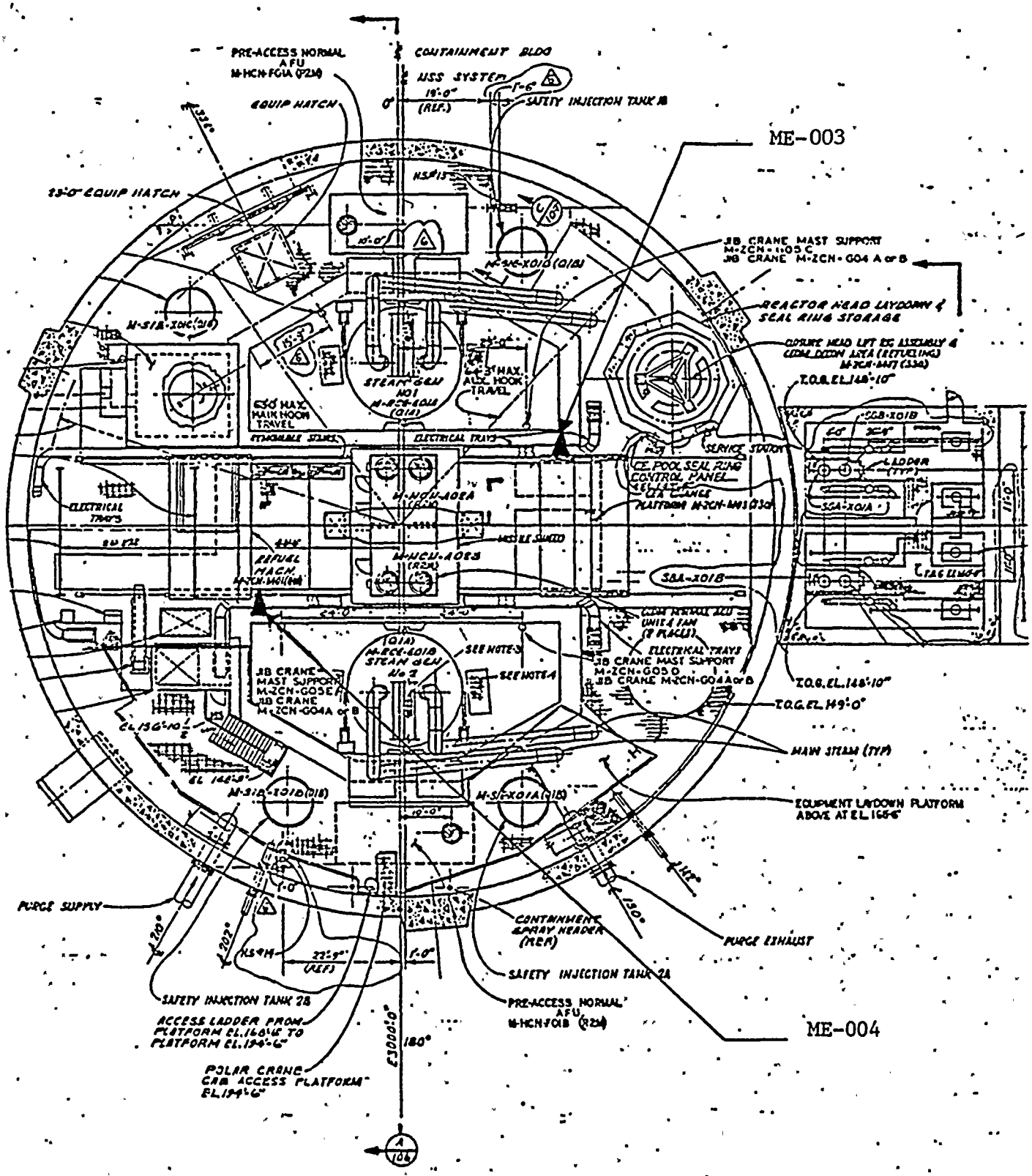


Figure 7

RTD & ME LOCATION



PLAN AT EL 140'-0"

SCALE 1"=10'-0"

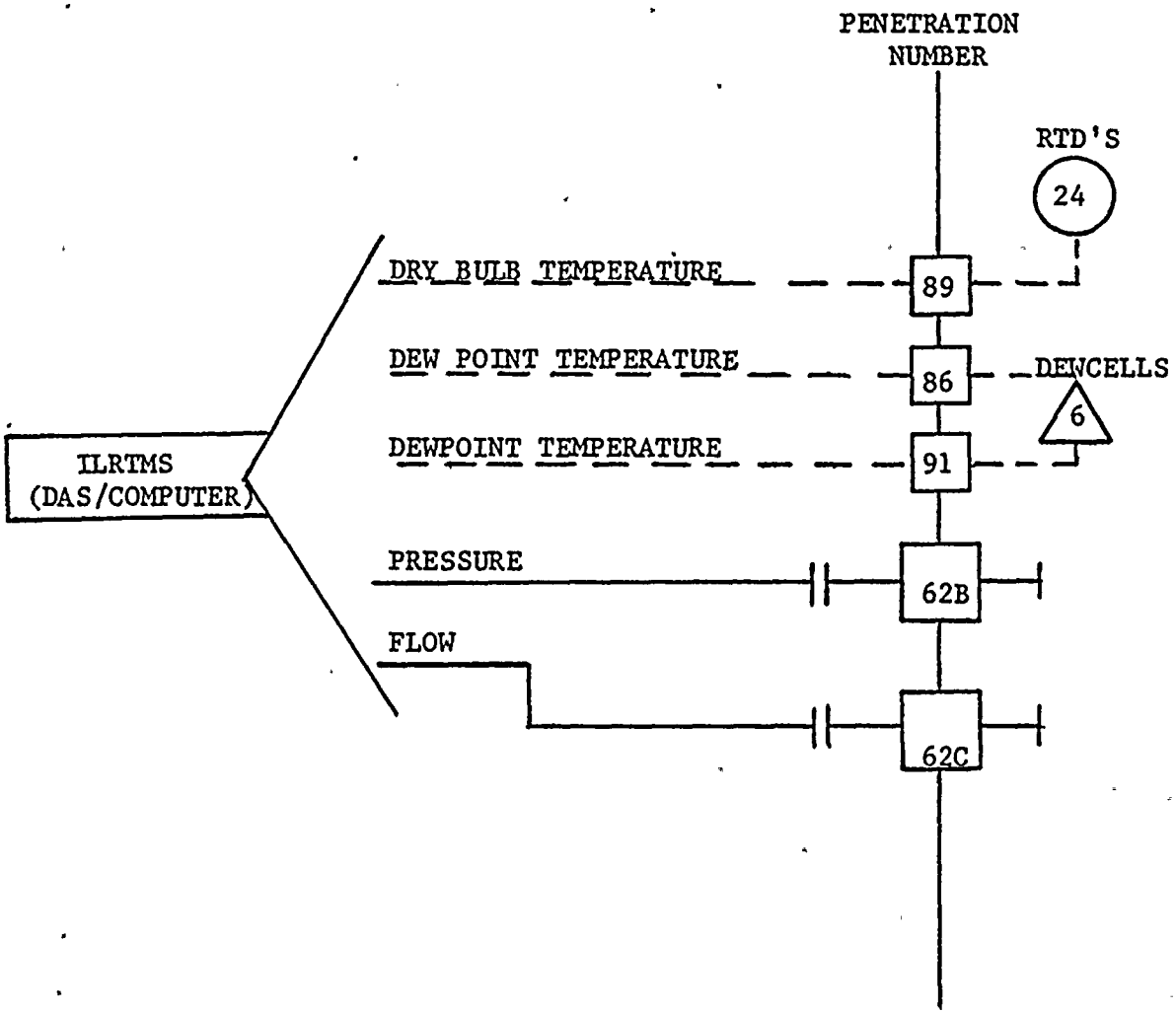
NOTE:

ME's 3 and 4 are lowered from the crane to an elevation approximately 30' below the top of the crane rail.

ME's 003 and 004 are located at EL.178'

Figure 8

ILRT MEASUREMENT SYSTEM
SCHEMATIC



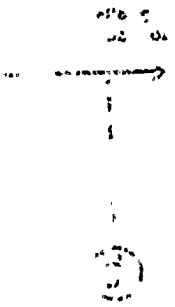
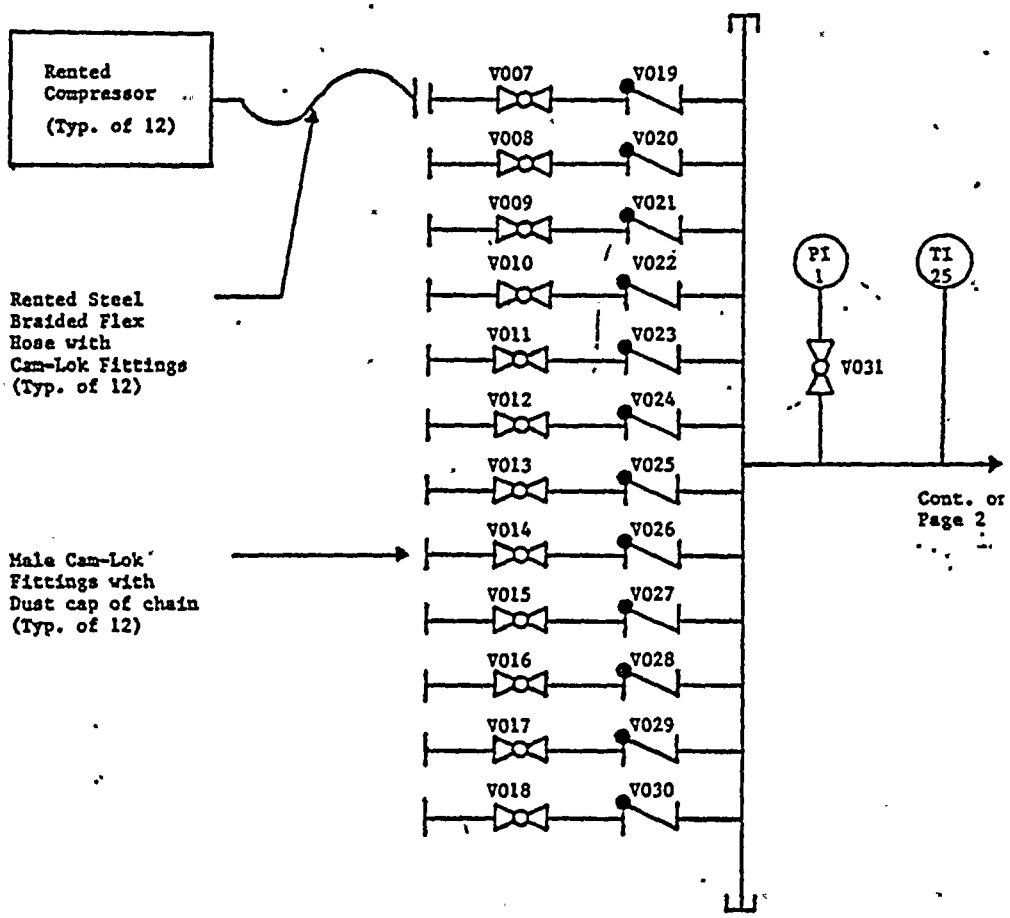


Figure 9

PRESSURIZATION SYSTEM



[illegible]
[illegible]
[illegible]

Figure 10

PRESSURIZATION SYSTEM

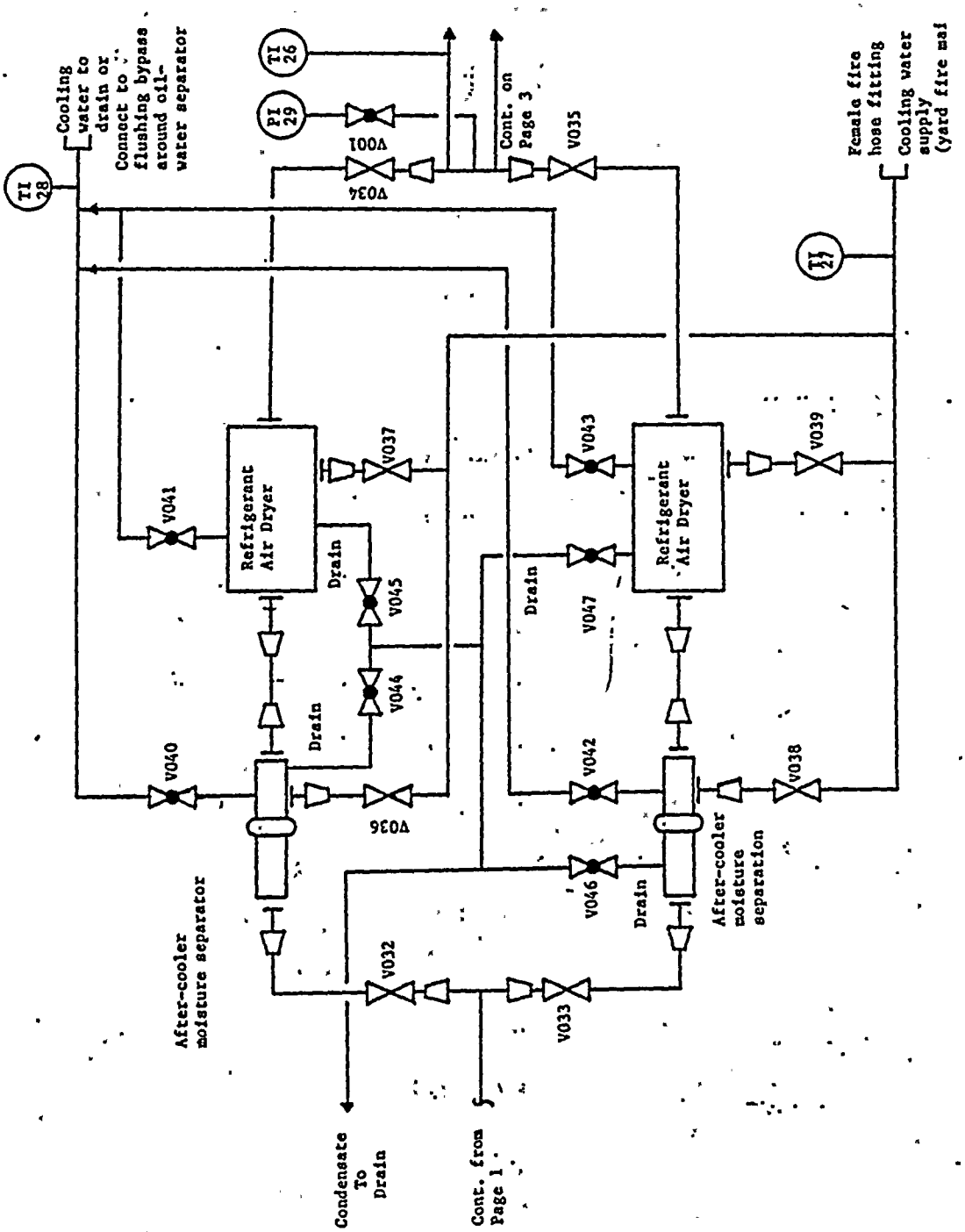
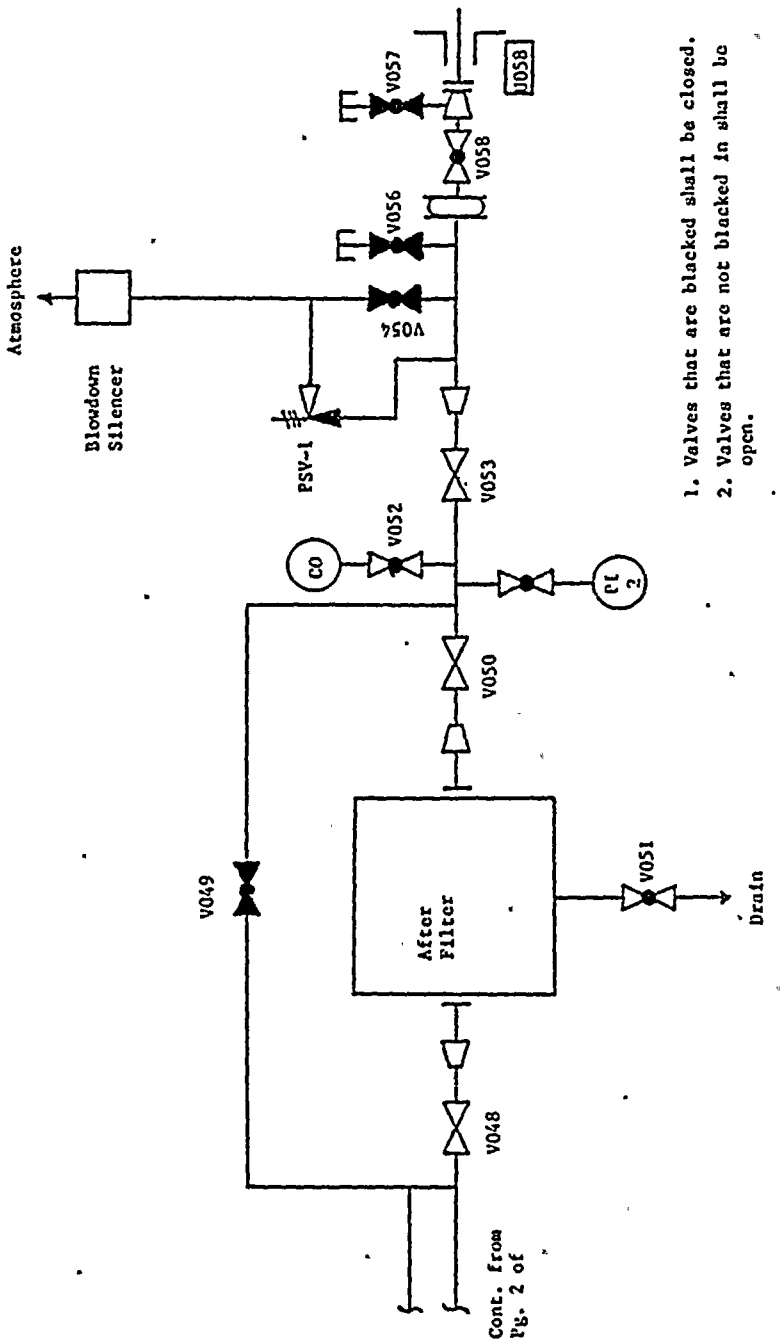


Figure 11

PRESSURIZATION SYSTEM



VII. APPENDICES

APPENDIX A

COMPUTER - GENERATED REPORT

1.

STABILIZATION

[illegible]

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	DATE	TIME	PRESS 1	PRESS 2	RTD #1	RTD #2	RTD #3	RTD #4	RTD #5	RTD #6	RTD #7	RTD #8	RTD #9
SD.137	119	18:15	63.535	63.597	96.333	94.856	95.829	95.341	94.590	95.750	94.140	93.936	94.053
SD.138	119	18:30	63.491	63.553	95.977	94.583	95.565	95.176	94.346	95.512	93.878	93.714	93.928
SD.139	119	18:45	63.469	63.530	95.730	94.316	95.274	94.807	94.050	95.202	93.617	93.455	93.660
SD.140	119	19: 0	63.452	63.514	95.533	94.029	95.028	94.590	93.840	94.972	93.402	93.251	93.473
SD.141	119	19:15	63.440	63.501	95.385	93.792	94.876	94.416	93.588	94.766	93.229	93.077	93.338
SD.142	119	19:30	63.426	63.491	95.211	93.660	94.708	94.218	93.420	94.651	93.093	92.974	93.219
SD.143	119	19:45	63.420	63.482	95.074	93.562	94.644	94.088	93.328	94.548	92.994	92.863	93.040
SD.144	119	20: 0	63.412	63.474	94.967	93.432	94.497	93.986	93.219	94.439	92.912	92.753	92.952
SD.145	119	20:15	63.405	63.466	94.894	93.350	94.400	93.893	93.132	94.364	92.840	92.678	92.903
SD.146	119	20:30	63.398	63.460	94.827	93.298	94.387	93.891	93.071	94.278	92.778	92.633	92.843
SD.147	119	20:45	63.392	63.454	94.722	93.205	94.285	93.837	93.005	94.177	92.680	92.514	92.768
SD.148	119	21: 0	63.384	63.448	94.648	93.187	94.218	93.733	92.919	94.101	92.648	92.486	92.700
SD.149	119	21:15	63.380	63.443	94.580	93.075	94.123	93.681	92.869	94.035	92.573	92.434	92.648
SD.150	119	21:30	63.375	63.437	94.541	93.026	94.068	93.637	92.811	93.949	92.541	92.410	92.593
SD.151	119	21:45	63.370	63.432	94.497	92.994	94.041	93.600	92.758	93.927	92.475	92.347	92.573
SD.152	119	22: 0	63.363	63.427	94.438	92.971	93.963	93.542	92.710	93.878	92.417	92.309	92.509
SD.153	119	22:15	63.359	63.423	94.390	92.941	93.957	93.501	92.657	93.800	92.388	92.260	92.491
SD.154	119	22:30	63.355	63.418	94.320	92.843	93.904	93.429	92.575	93.779	92.361	92.196	92.401
SD.155	119	22:45	63.353	63.414	94.294	92.793	93.837	93.394	92.552	93.714	92.295	92.129	92.366
SD.156	119	23: 0	63.350	63.411	94.223	92.686	93.769	93.328	92.488	93.687	92.256	92.053	92.327
SD.157	119	23:15	63.347	63.407	94.183	92.645	93.757	93.269	92.416	93.673	92.218	92.024	92.295

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #10	RTD #11	RTD #12	RTD #13	RTD #14	RTD #15	RTD #16	RTD #17	RTD #18	RTD #19	RTD #20
SD.137	94.308	94.209	94.104	93.261	93.277	94.012	93.887	91.127	90.347	89.955	87.948
SD.138	94.085	93.949	93.853	92.996	93.081	93.812	93.670	90.905	90.144	89.668	88.122
SD.139	93.814	93.672	93.565	92.826	92.886	93.621	93.498	90.757	90.062	89.578	88.208
SD.140	93.634	93.486	93.350	92.736	92.750	93.583	93.408	90.658	90.014	89.546	88.229
SD.141	93.484	93.327	93.176	92.640	92.646	93.516	93.344	90.622	89.985	89.535	88.244
SD.142	93.347	93.203	93.049	92.578	92.572	93.481	93.284	90.605	89.962	89.506	88.252
SD.143	93.232	93.101	92.948	92.489	92.494	93.432	93.226	90.600	89.942	89.471	88.258
SD.144	93.188	93.005	92.861	92.457	92.442	93.374	93.154	90.605	89.932	89.456	88.253
SD.145	93.136	92.947	92.799	92.359	92.384	93.307	93.072	90.600	89.920	89.436	88.249
SD.146	93.072	92.861	92.730	92.327	92.356	93.258	93.026	90.614	89.920	89.437	88.261
SD.147	92.999	92.787	92.649	92.277	92.288	93.208	92.944	90.591	89.889	89.422	88.250
SD.148	92.889	92.720	92.582	92.187	92.224	93.148	92.884	90.589	89.871	89.413	88.246
SD.149	92.865	92.672	92.520	92.158	92.167	93.109	92.810	90.583	89.868	89.422	88.252
SD.150	92.791	92.623	92.471	92.109	92.121	93.034	92.762	90.565	89.854	89.410	88.249
SD.151	92.770	92.567	92.417	92.060	92.071	92.991	92.730	90.559	89.852	89.402	88.252
SD.152	92.747	92.524	92.375	92.018	92.019	92.964	92.649	90.560	89.845	89.399	88.255
SD.153	92.675	92.492	92.306	91.961	91.981	92.930	92.596	90.556	89.843	89.386	88.253
SD.154	92.601	92.433	92.250	91.928	91.935	92.875	92.598	90.547	89.825	89.387	88.252
SD.155	92.541	92.398	92.245	91.929	91.891	92.823	92.564	90.533	89.808	89.393	88.235
SD.156	92.483	92.355	92.216	91.925	91.832	92.771	92.497	90.519	89.793	89.402	88.221
SD.157	92.446	92.323	92.176	91.914	91.803	92.755	92.483	90.519	89.775	89.402	88.220

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #21	RTD #22	RTD #23	RTD #24	DEW CELL #1	DEW CELL #2	DEW CELL #3	DEW CELL #4	DEW CELL #5	DEW CELL #6
SD.137	87.431	87.425	86.640	86.908	74.807	74.821	74.093	73.892	72.091	71.142
SD.138	87.512	87.355	86.987	87.223	74.903	74.687	74.084	73.939	72.445	71.113
SD.139	87.518	87.327	87.097	87.300	74.917	74.685	74.043	73.938	72.277	71.188
SD.140	87.525	87.333	87.120	87.330	74.935	74.765	73.988	73.919	72.168	71.270
SD.141	87.535	87.329	87.130	87.345	74.906	74.642	74.026	73.878	72.096	71.356
SD.142	87.539	87.336	87.146	87.352	74.877	74.575	73.898	73.831	72.155	71.308
SD.143	87.544	87.344	87.162	87.359	74.853	74.379	73.974	73.751	72.056	71.200
SD.144	87.539	87.339	87.155	87.367	74.694	74.505	73.761	73.696	94.000	71.191
SD.145	87.541	87.341	87.164	87.370	74.765	74.420	73.754	73.693	95.268	71.182
SD.146	87.547	87.347	87.179	87.379	74.783	74.389	73.710	73.747	109.360	71.211
SD.147	87.533	87.341	87.165	87.370	74.707	74.481	73.692	73.661	71.937	71.214
SD.148	87.533	87.339	87.165	87.365	74.549	74.382	73.638	73.666	71.646	71.276
SD.149	87.535	87.348	87.164	87.368	74.679	74.331	73.582	73.608	71.839	71.400
SD.150	87.535	87.359	87.171	87.367	74.594	74.249	73.666	73.631	71.818	71.392
SD.151	87.532	87.359	87.175	87.365	74.610	74.261	73.643	73.515	71.832	71.353
SD.152	87.530	87.364	87.175	87.365	74.510	74.237	73.619	73.532	71.902	71.310
SD.153	87.522	87.361	87.162	87.367	74.447	74.240	73.477	73.486	71.925	71.395
SD.154	87.513	87.370	87.158	87.364	74.530	74.261	73.613	73.497	71.958	71.385
SD.155	87.507	87.347	87.150	87.359	74.458	74.183	73.466	73.440	71.952	71.385
SD.156	87.503	87.327	87.149	87.356	74.452	74.107	73.393	73.359	71.994	71.449
SD.157	87.504	87.332	87.142	87.353	74.441	74.168	73.371	73.374	72.151	71.443

[illegible]	0.3354 01
[illegible]	0.35[illegible] 01
[illegible]	0.355[illegible] 01

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
ILRT PROGRAM REPORT

STARTING DAY - 119 STARTING TIME - 18:15: 0 STARTING SCAN - SD.137 ENDING SCAN - SD.157

SCAN NO.	ELAPSED TIME (HR)	AVERAGE TEMP. (F)	AVERAGE PRESSURE (PSIA)	POINT TO POINT MEASURED LEAK RATE	POINT TO POINT CALCULATED LEAK RATE	TOTAL TIME MEASURED LEAK RATE	TOTAL TIME CALCULATED LEAK RATE (WEIGHT PERCENT PER DAY)	TOTAL TIME UPPER CONFIDENCE	MASS PLOT MEASURED LEAK RATE	MASS PLOT CALCULATED LEAK RATE	MASS PLOT UPPER CONFIDENCE
SD.137	0.00	93.34	64.357								
SD.138	0.25	93.10	64.313	0.255E+01	0.255E+01	0.255E+01	0.255E+01	0.000E+00	0.255E+01	0.255E+01	0.000E+00
SD.139	0.50	92.88	64.291	-0.434E+00	-0.434E+00	0.106E+01	0.106E+01	0.000E+00	0.106E+01	0.106E+01	0.000E+00
SD.140	0.75	92.73	64.274	-0.229E-01	-0.589E+00	0.700E+00	0.511E+00	0.234E+01	0.700E+00	-0.229E+00	0.787E+00
SD.141	1.00	92.62	64.261	-0.308E+00	-0.779E+00	0.448E+00	0.189E+00	0.133E+01	0.448E+00	-0.231E+00	-0.741E-01
SD.142	1.25	92.52	64.247	0.340E+00	-0.434E+00	0.426E+00	0.639E-01	0.115E+01	0.426E+00	-0.118E+00	0.519E-01
SD.143	1.50	92.45	64.241	-0.534E+00	-0.692E+00	0.266E+00	-0.621E-01	0.923E+00	0.266E+00	-0.146E+00	-0.399E 01
SD.144	1.75	92.38	64.233	-0.111E+00	-0.627E+00	0.212E+00	-0.143E+00	0.800E+00	0.212E+00	-0.153E+00	-0.813E-01
SD.145	2.00	92.32	64.226	0.830E-01	-0.495E+00	0.196E+00	-0.187E+00	0.740E+00	0.196E+00	-0.135E+00	-0.805E-01
SD.146	2.25	92.29	64.219	0.460E+00	-0.257E+00	0.226E+00	-0.195E+00	0.735E+00	0.226E+00	-0.863E-01	-0.198E-01
SD.147	2.50	92.23	64.213	-0.256E+00	-0.336E+00	0.177E+00	-0.209E+00	0.706E+00	0.177E+00	-0.721E-01	-0.177E-01
SD.148	2.75	92.18	64.205	0.198E+00	-0.243E+00	0.179E+00	-0.212E+00	0.692E+00	0.179E+00	-0.520E-01	-0.316E-02
SD.149	3.00	92.13	64.201	-0.163E+00	-0.279E+00	0.151E+00	-0.217E+00	0.670E+00	0.151E+00	-0.437E-01	-0.280E-02
SD.150	3.25	92.09	64.196	0.343E-01	-0.250E+00	0.142E+00	-0.220E+00	0.653E+00	0.142E+00	-0.368E-01	-0.180E-02
SD.151	3.50	92.06	64.191	0.158E+00	-0.193E+00	0.143E+00	-0.218E+00	0.642E+00	0.143E+00	-0.266E-01	0.484E-02
SD.152	3.75	92.03	64.184	0.386E+00	-0.926E-01	0.159E+00	-0.210E+00	0.641E+00	0.159E+00	-0.974E-02	0.223E-01
SD.153	4.00	91.99	64.180	-0.101E+00	-0.122E+00	0.143E+00	-0.204E+00	0.635E+00	0.143E+00	-0.557E-03	0.289E-01
SD.154	4.25	91.95	64.176	-0.343E-02	-0.124E+00	0.134E+00	-0.200E+00	0.627E+00	0.134E+00	0.590E-02	0.325E-01
SD.155	4.50	91.92	64.174	-0.439E+00	-0.215E+00	0.102E+00	-0.200E+00	0.612E+00	0.102E+00	0.278E-02	0.266E-01
SD.156	4.75	91.88	64.171	-0.379E+00	-0.277E+00	0.771E-01	-0.204E+00	0.592E+00	0.771E-01	-0.559E-02	0.172E-01
SD.157	5.00	91.85	64.168	0.395E-01	-0.250E+00	0.753E-01	-0.207E+00	0.576E+00	0.752E-01	-0.114E-01	0.982E-02

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
ILRT PROGRAM REPORT

STARTING DAY - 119 STARTING TIME - 16:15: 0 STARTING SCAN - SD.137 ENDING SCAN - SD.157

ILRT RESULTS AFTER 5.00 HRS.

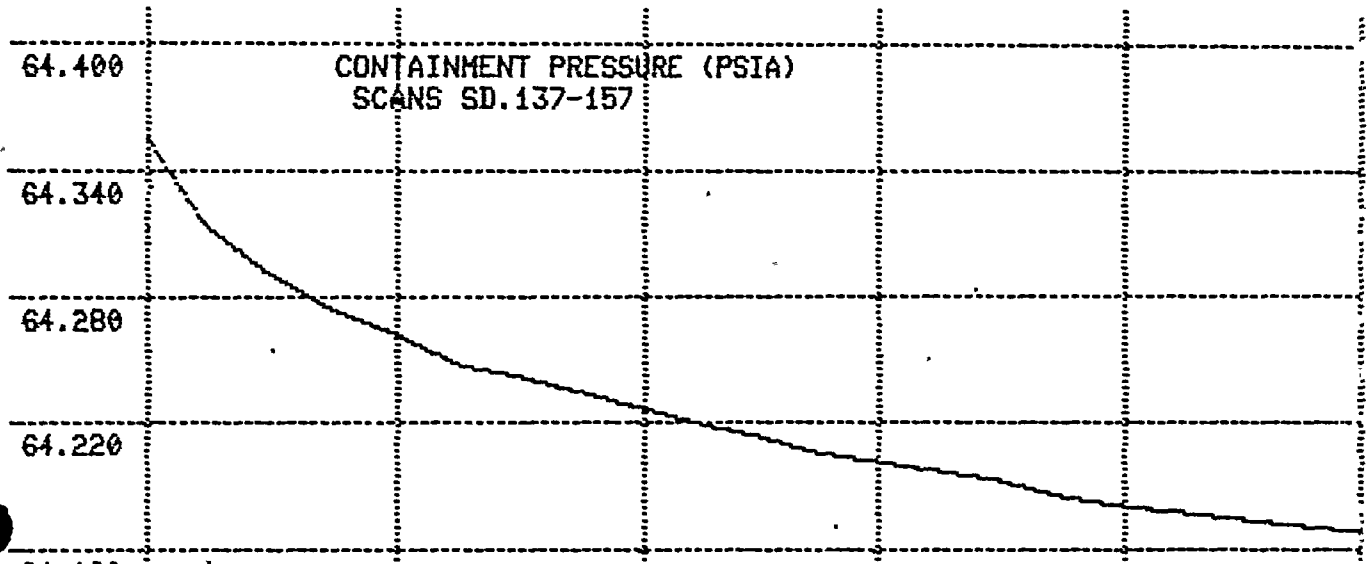
POINT TO POINT	TOTAL TIME		MASS PLOT	
AVERAGE MEASURED LEAK RATES (WEIGHT PERCENT PER DAY)				
LEAK RATE	LEAK RATE	STD.DEV.	LEAK RATE	STD.DEV.
0.751E-01	0.379E+00	0.558E+00	0.379E+00	0.557E+00

CALCULATED LEAK RATES (WEIGHT PERCENT PER DAY)						
LEAK RATE	LEAK RATE	STD.DEV.	UPPER CON. LIMIT	LEAK RATE	STD.DEV.	UPPER CON.LIMIT
-0.250E+00	-0.207E+00	0.372E+00	0.575E+00	-0.114E-01	0.122E-01	0.143E-01

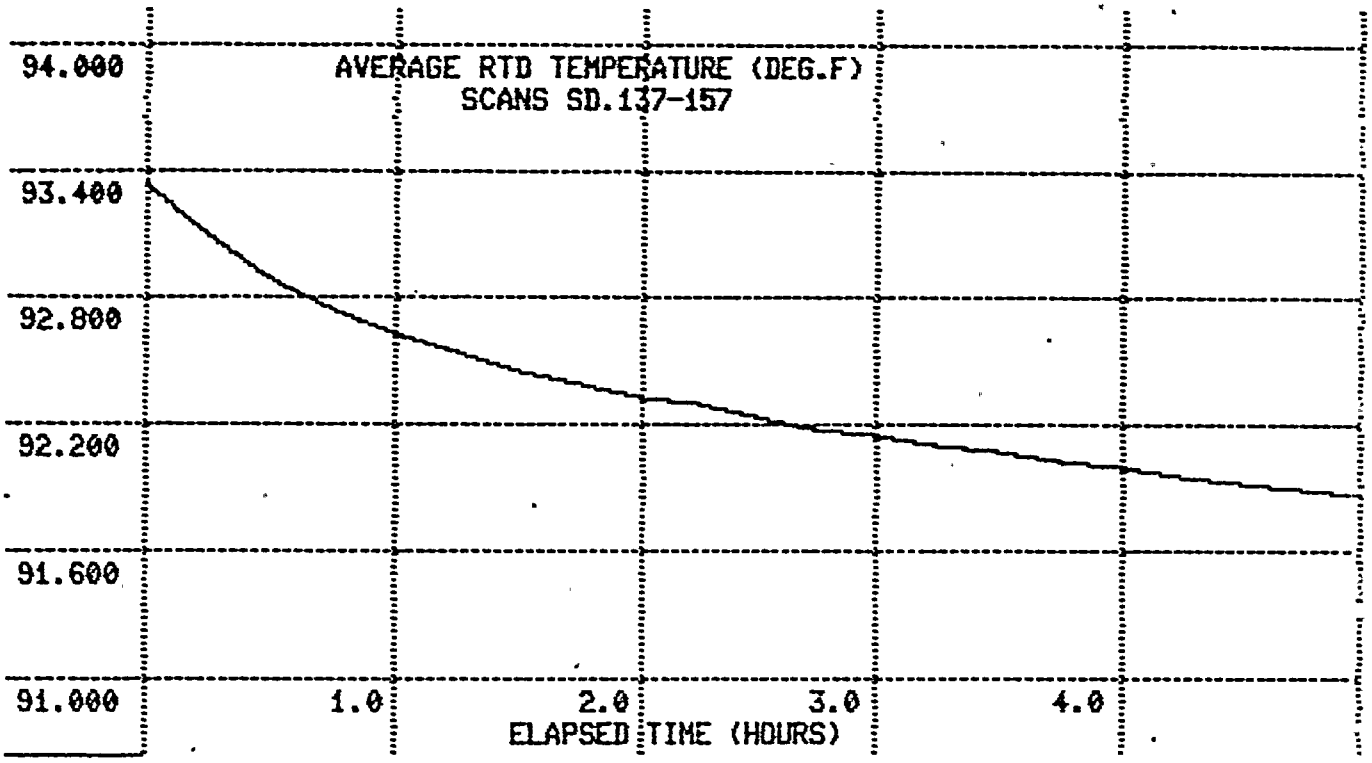
ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RELATIVE HUMIDITY PROGRAM

SCAN NO.	AVERAGE DEW POINT TEMPERATURE (F)	AVERAGE CONTAINMENT TEMPERATURE (F)	AVERAGE VAPOR PRESSURE (PSIA)	AVERAGE RELATIVE HUMIDITY (%)
SD.137	74.354	93.337	0.419	54.265
SD.138	74.356	93.100	0.419	54.669
SD.139	74.347	92.884	0.419	55.019
SD.140	74.348	92.735	0.419	55.276
SD.141	74.313	92.617	0.419	55.416
SD.142	74.243	92.523	0.418	55.447
SD.143	74.194	92.445	0.417	55.488
SD.144	74.111	92.379	0.416	55.448
SD.145	74.106	92.324	0.416	55.533
SD.146	74.105	92.289	0.416	55.593
SD.147	74.080	92.225	0.415	55.656
SD.148	74.010	92.175	0.414	55.611
SD.149	73.995	92.133	0.414	55.657
SD.150	73.988	92.092	0.414	55.715
SD.151	73.956	92.062	0.414	55.707
SD.152	73.926	92.026	0.413	55.714
SD.153	73.860	91.993	0.412	55.647
SD.154	73.925	91.951	0.413	55.841
SD.155	73.834	91.919	0.412	55.728
SD.156	73.773	91.878	0.411	55.684
SD.157	73.782	91.853	0.411	55.744

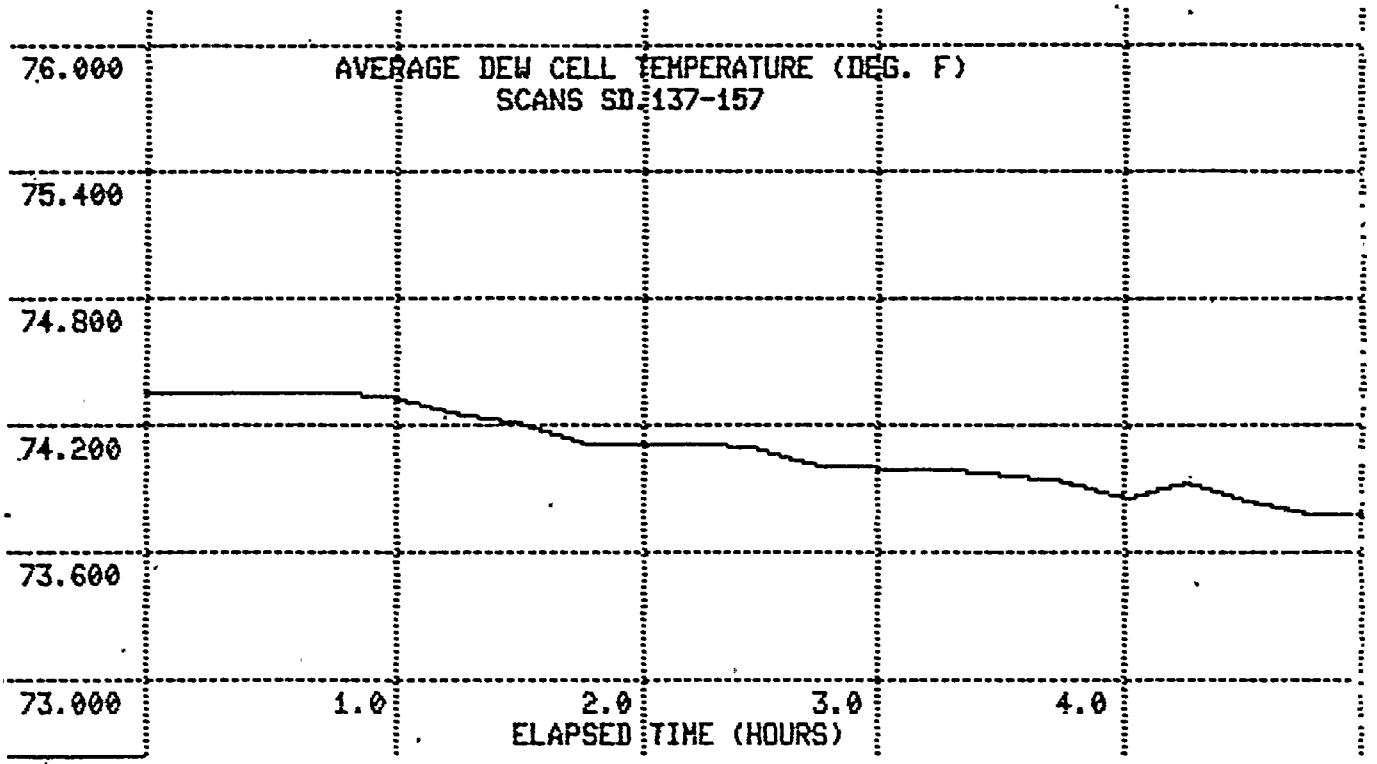
STABILIZATION



STABILIZATION



STABILIZATION



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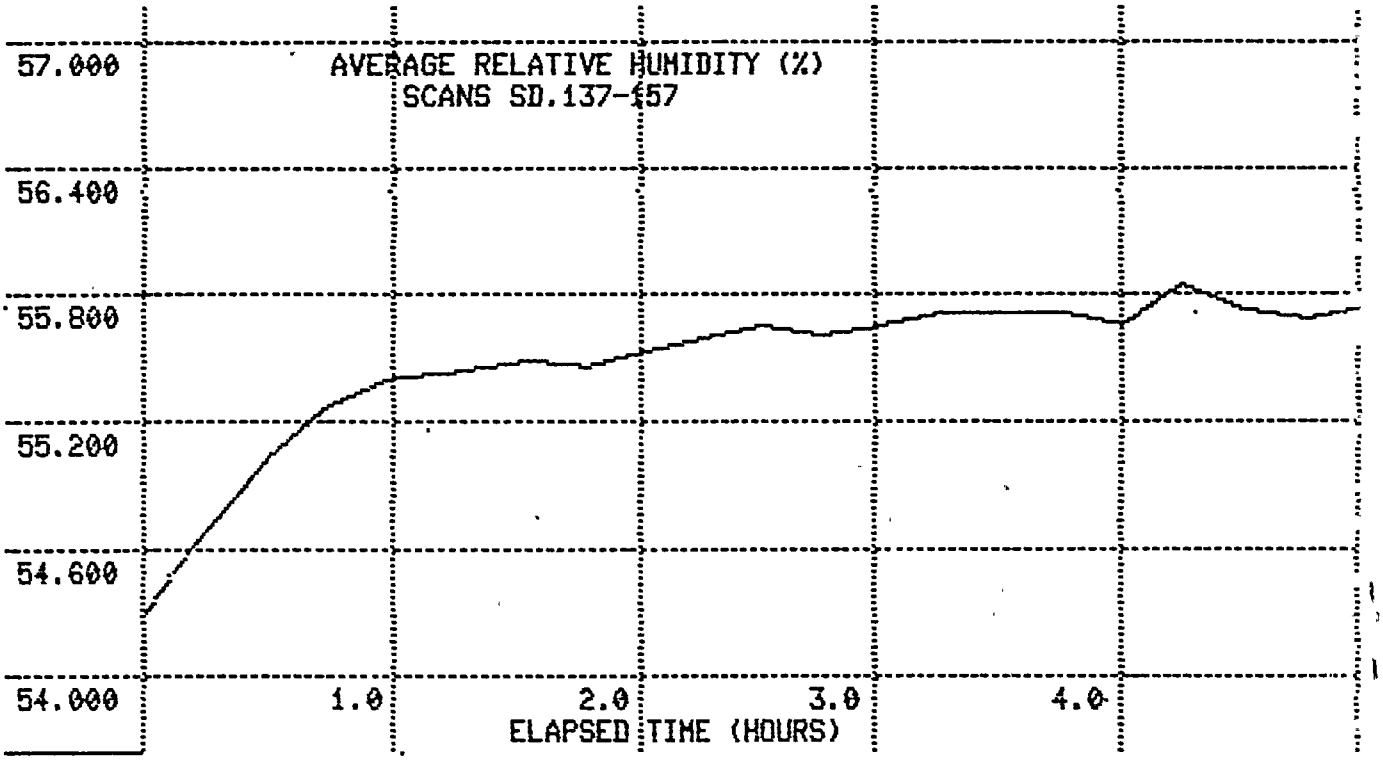

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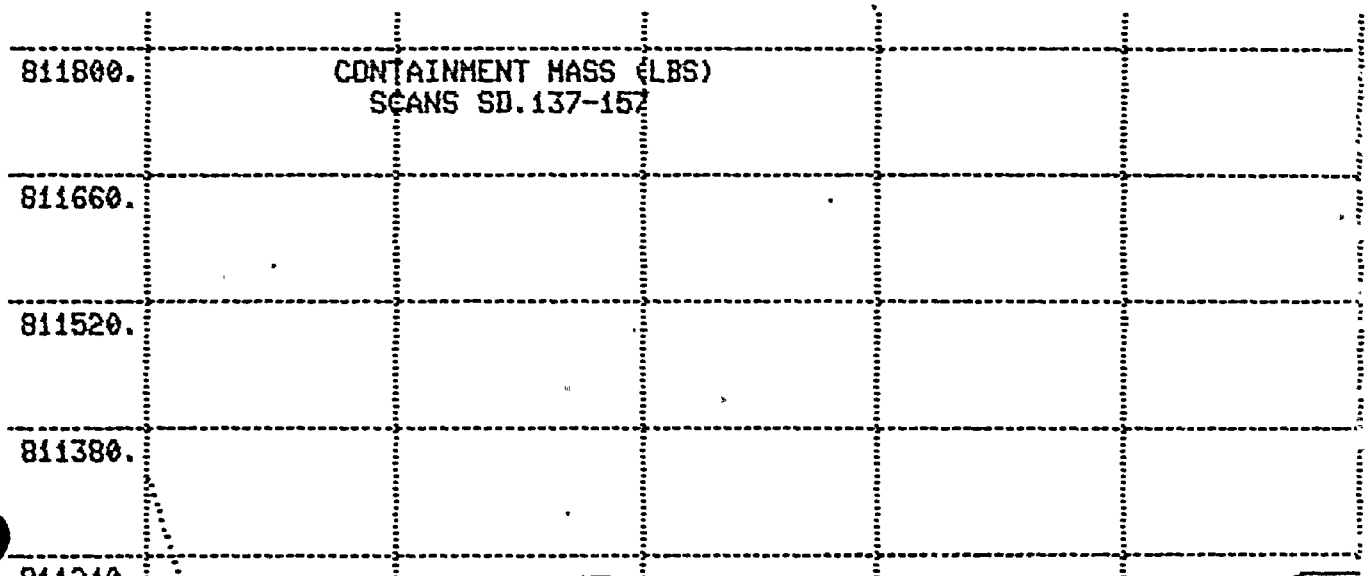

2.

INTEGRATED LEAK RATE TEST

(ILRT)

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	DATE	TIME	PRESS 1	PRESS 2	RTD #1	RTD #2	RTD #3	RTD #4	RTD #5	RTD #6	RTD #7	RTD #8	RTD #9
SD.157	119	23:15	63.347	63.407	94.183	92.645	93.757	93.269	92.416	93.673	92.218	92.024	92.295
SD.158	119	23:30	63.342	63.403	94.136	92.630	93.690	93.219	92.381	93.605	92.179	91.987	92.263
SD.159	119	23:45	63.338	63.399	94.111	92.540	93.663	93.203	92.366	93.583	92.134	91.941	92.193
SD.160	120	0: 0	63.333	63.395	94.091	92.485	93.597	93.168	92.311	93.550	92.092	91.893	92.158
SD.161	120	0:15	63.331	63.391	94.027	92.460	93.583	93.106	92.276	93.518	92.067	91.839	92.088
SD.162	120	0:30	63.325	63.388	93.989	92.437	93.534	93.057	92.271	93.441	92.010	91.832	92.063
SD.163	120	0:45	63.324	63.384	93.930	92.376	93.513	93.034	92.181	93.388	91.973	91.770	92.036
SD.164	120	1: 0	63.319	63.380	93.907	92.334	93.443	93.006	92.152	93.359	91.941	91.723	92.002
SD.165	120	1:15	63.310	63.376	93.905	92.305	93.428	92.987	92.126	93.344	91.888	91.729	91.969
SD.166	120	1:30	63.305	63.372	93.853	92.301	93.396	92.947	92.088	93.298	91.899	91.673	91.922
SD.167	120	1:45	63.308	63.368	93.801	92.263	93.348	92.926	92.054	93.281	91.842	91.641	91.926
SD.168	120	2: 0	63.305	63.365	93.801	92.207	93.321	92.875	92.016	93.196	91.812	91.616	91.893
SD.169	120	2:15	63.301	63.361	93.747	92.164	93.281	92.819	92.001	93.199	91.801	91.589	91.806
SD.170	120	2:30	63.299	63.359	93.695	92.131	93.255	92.807	91.957	93.170	91.770	91.532	91.777
SD.171	120	2:45	63.295	63.356	93.673	92.082	93.206	92.750	91.896	93.138	91.697	91.485	91.796
SD.172	120	3: 0	63.294	63.353	93.658	92.062	93.168	92.710	91.882	93.110	91.702	91.444	91.752
SD.173	120	3:15	63.291	63.350	93.592	92.016	93.135	92.691	91.824	93.049	91.624	91.398	91.746
SD.174	120	3:30	63.289	63.347	93.589	91.976	93.115	92.651	91.819	93.020	91.607	91.369	91.684
SD.175	120	3:45	63.285	63.344	93.550	91.967	93.075	92.620	91.781	93.038	91.612	91.365	91.665
SD.176	120	4: 0	63.280	63.340	93.530	91.954	93.043	92.598	91.754	92.973	91.563	91.336	91.642
SD.177	120	4:15	63.278	63.337	93.461	91.914	93.013	92.604	91.726	92.985	91.537	91.314	91.622
SD.178	120	4:30	63.275	63.334	93.478	91.902	92.981	92.520	91.711	92.916	91.502	91.293	91.577
SD.179	120	4:45	63.272	63.332	93.429	91.876	92.955	92.540	91.659	92.881	91.500	91.230	91.557
SD.180	120	5: 0	63.270	63.329	93.396	91.853	92.939	92.509	91.668	92.834	91.450	91.243	91.551
SD.181	120	5:15	63.267	63.326	93.379	91.798	92.915	92.475	91.610	92.834	91.401	91.198	91.520
SD.182	120	5:30	63.265	63.324	93.357	91.777	92.889	92.454	91.575	92.790	91.398	91.160	91.465
SD.183	120	5:45	63.263	63.321	93.338	91.784	92.849	92.428	91.549	92.839	91.410	91.151	91.471
SD.184	120	6: 0	63.260	63.319	93.269	91.766	92.829	92.427	91.542	92.765	91.354	91.125	91.438
SD.185	120	6:15	63.258	63.316	93.281	91.716	92.781	92.396	91.497	92.718	91.349	91.120	91.404
SD.186	120	6:30	63.253	63.313	93.257	91.729	92.758	92.405	91.476	92.706	91.308	91.088	91.362
SD.187	120	6:45	63.253	63.311	93.251	91.737	92.753	92.364	91.462	92.709	91.282	91.087	91.307
SD.188	120	7: 0	63.251	63.308	93.215	91.680	92.712	92.356	91.421	92.683	91.282	91.061	91.339
SD.189	120	7:15	63.249	63.306	93.209	91.648	92.678	92.318	91.400	92.654	91.235	91.049	91.253
SD.190	120	7:30	63.246	63.304	93.183	91.680	92.666	92.273	91.407	92.620	91.221	91.014	91.278
SD.191	120	7:45	63.244	63.301	93.158	91.615	92.663	92.265	91.365	92.613	91.181	90.998	91.278
SD.192	120	8: 0	63.241	63.299	93.130	91.572	92.620	92.239	91.352	92.599	91.137	90.982	91.250
SD.193	120	8:15	63.239	63.296	93.115	91.574	92.607	92.205	91.319	92.591	91.156	90.972	91.218
SD.194	120	8:30	63.236	63.294	93.103	91.572	92.581	92.179	91.293	92.524	91.131	90.943	91.166
SD.195	120	8:45	63.236	63.292	93.064	91.513	92.547	92.153	91.268	92.530	91.099	90.908	91.169
SD.196	120	9: 0	63.228	63.290	93.034	91.514	92.550	92.120	91.247	92.549	91.095	90.908	91.156
SD.197	120	9:15	63.231	63.288	93.000	91.507	92.520	92.120	91.249	92.492	91.044	90.876	91.134
SD.198	120	9:30	63.230	63.286	92.976	91.444	92.526	92.106	91.214	92.469	91.029	90.838	91.114
SD.199	120	9:45	63.226	63.284	92.953	91.453	92.494	92.050	91.154	92.468	90.992	90.838	91.087
SD.200	120	10: 0	63.226	63.281	92.919	91.464	92.445	92.060	91.169	92.434	90.976	90.797	91.082

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	DATE	TIME	PRESS 1	PRESS 2	RTD #1	RTD #2	RTD #3	RTD #4	RTD #5	RTD #6	RTD #7	RTD #8	RTD #9
SD.201	120	10:15	63.223	63.279	92.939	91.438	92.428	92.013	91.151	92.401	90.988	90.795	91.050
SD.202	120	10:30	63.221	63.277	92.900	91.427	92.419	92.002	91.130	92.392	90.947	90.792	91.023
SD.203	120	10:45	63.219	63.275	92.878	91.381	92.401	92.004	91.128	92.334	90.960	90.768	91.021
SD.204	120	11: 0	63.217	63.273	92.858	91.394	92.387	91.975	91.066	92.340	90.928	90.713	90.989
SD.205	120	11:15	63.216	63.271	92.819	91.377	92.346	91.946	91.044	92.350	90.896	90.722	90.971
SD.206	120	11:30	63.210	63.269	92.826	91.355	92.350	91.932	91.061	92.303	90.882	90.719	90.940
SD.207	120	11:45	63.211	63.267	92.790	91.372	92.317	91.903	91.020	92.308	90.881	90.675	90.928
SD.208	120	12: 0	63.210	63.265	92.787	91.319	92.297	91.905	91.012	92.305	90.832	90.695	90.916
SD.209	120	12:15	63.206	63.263	92.755	91.328	92.280	91.880	90.979	92.271	90.834	90.649	90.893

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ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #10	RTD #11	RTD #12	RTD #13	RTD #14	RTD #15	RTD #16	RTD #17	RTD #18	RTD #19	RTD #20
SD.157	92.446	92.323	92.176	91.914	91.803	92.755	92.483	90.519	89.775	89.402	88.220
SD.158	92.392	92.282	92.157	91.857	91.754	92.710	92.430	90.509	89.769	89.408	88.212
SD.159	92.358	92.263	92.096	91.816	91.731	92.665	92.402	90.513	89.765	89.398	88.212
SD.160	92.353	92.201	92.082	91.751	91.677	92.627	92.337	90.496	89.752	89.396	88.211
SD.161	92.251	92.179	92.041	91.746	91.639	92.588	92.292	90.490	89.736	89.387	88.194
SD.162	92.210	92.121	92.016	91.702	91.604	92.567	92.273	90.481	89.740	89.384	88.198
SD.163	92.190	92.092	91.990	91.664	91.583	92.536	92.250	90.472	89.726	89.378	88.185
SD.164	92.132	92.031	91.944	91.641	91.539	92.514	92.224	90.463	89.712	89.376	88.179
SD.165	92.146	92.025	91.918	91.603	91.508	92.482	92.160	90.458	89.717	89.360	88.183
SD.166	92.083	92.013	91.873	91.564	91.482	92.465	92.129	90.460	89.717	89.360	88.185
SD.167	92.009	91.946	91.828	91.548	91.433	92.430	92.128	90.454	89.707	89.346	88.182
SD.168	92.018	91.911	91.847	91.507	91.409	92.399	92.111	90.451	89.694	89.355	88.176
SD.169	91.980	91.903	91.767	91.493	91.384	92.367	92.056	90.444	89.688	89.350	88.177
SD.170	91.914	91.844	91.749	91.474	91.342	92.346	92.022	90.440	89.686	89.350	88.171
SD.171	91.909	91.790	91.741	91.474	91.326	92.297	91.961	90.437	89.668	89.355	88.168
SD.172	91.861	91.781	91.716	91.441	91.304	92.274	91.972	90.429	89.663	89.349	88.171
SD.173	91.816	91.754	91.685	91.398	91.262	92.254	91.940	90.428	89.657	89.344	88.177
SD.174	91.803	91.713	91.632	91.371	91.249	92.224	91.934	90.437	89.646	89.355	88.174
SD.175	91.772	91.705	91.603	91.342	91.215	92.201	91.868	90.428	89.651	89.346	88.188
SD.176	91.761	91.676	91.555	91.319	91.192	92.186	91.850	90.420	89.639	89.337	88.189
SD.177	91.749	91.619	91.523	91.290	91.163	92.163	91.833	90.412	89.631	89.337	88.192
SD.178	91.716	91.604	91.487	91.255	91.156	92.143	91.806	90.409	89.624	89.328	88.198
SD.179	91.677	91.575	91.436	91.232	91.128	92.109	91.760	90.420	89.622	89.329	88.197
SD.180	91.680	91.558	91.421	91.210	91.104	92.096	91.786	90.420	89.621	89.325	88.203
SD.181	91.690	91.548	91.392	91.186	91.072	92.067	91.722	90.420	89.607	89.332	88.200
SD.182	91.664	91.516	91.368	91.218	91.052	92.056	91.723	90.422	89.607	89.320	88.209
SD.183	91.616	91.491	91.345	91.198	91.033	92.033	91.674	90.417	89.602	89.321	88.212
SD.184	91.587	91.426	91.311	91.157	91.020	92.013	91.677	90.412	89.601	89.320	88.217
SD.185	91.549	91.462	91.284	91.130	90.991	91.993	91.661	90.406	89.601	89.314	88.220
SD.186	91.529	91.404	91.232	91.090	90.968	91.978	91.632	90.408	89.601	89.306	88.227
SD.187	91.503	91.394	91.233	91.073	90.940	91.966	91.635	90.399	89.587	89.309	88.230
SD.188	91.493	91.391	91.201	91.078	90.913	91.934	91.598	90.388	89.575	89.312	88.224
SD.189	91.449	91.319	91.168	91.043	90.899	91.911	91.601	90.383	89.573	89.306	88.227
SD.190	91.433	91.336	91.157	91.008	90.878	91.885	91.561	90.380	89.569	89.305	88.227
SD.191	91.395	91.273	91.127	91.009	90.850	91.867	91.523	90.379	89.578	89.302	88.238
SD.192	91.386	91.275	91.108	90.994	90.835	91.864	91.519	90.376	89.569	89.294	88.235
SD.193	91.374	91.232	91.090	90.962	90.820	91.842	91.522	90.376	89.559	89.289	88.230
SD.194	91.415	91.253	91.076	90.948	90.795	91.816	91.494	90.373	89.561	89.292	88.240
SD.195	91.352	91.192	91.050	90.954	90.782	91.810	91.479	90.374	89.558	89.289	88.234
SD.196	91.342	91.212	91.029	90.907	90.754	91.789	91.436	90.371	89.564	89.283	88.240
SD.197	91.279	91.130	91.011	90.879	90.744	91.783	91.421	90.368	89.558	89.282	88.235
SD.198	91.273	91.143	90.971	90.878	90.725	91.763	91.423	90.359	89.544	89.288	88.232
SD.199	91.262	91.111	90.963	90.820	90.705	91.745	91.391	90.354	89.549	89.274	88.232
SD.200	91.250	91.099	90.947	90.808	90.686	91.737	91.406	90.351	89.549	89.273	88.240

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #10	RTD #11	RTD #12	RTD #13	RTD #14	RTD #15	RTD #16	RTD #17	RTD #18	RTD #19	RTD #20
SD.201	91.235	91.082	90.916	90.785	90.667	91.706	91.359	90.329	89.546	89.262	88.210
SD.202	91.206	91.075	90.895	90.766	90.649	91.705	91.351	90.316	89.543	89.257	88.241
SD.203	91.169	91.032	90.892	90.763	90.640	91.690	91.320	90.310	89.534	89.260	88.238
SD.204	91.157	91.026	90.860	90.745	90.612	91.676	91.326	90.307	89.544	89.259	88.241
SD.205	91.128	91.001	90.855	90.731	90.588	91.655	91.278	90.306	89.543	89.248	88.237
SD.206	91.096	90.986	90.847	90.708	90.594	91.644	91.265	90.295	89.535	89.250	88.246
SD.207	91.098	90.962	90.840	90.698	90.583	91.633	91.239	90.293	89.537	89.248	88.247
SD.208	91.104	90.953	90.821	90.690	90.554	91.629	91.233	90.298	89.541	89.245	88.255
SD.209	91.082	90.960	90.806	90.689	90.547	91.624	91.230	90.292	89.543	89.242	88.262

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #21	RTD #22	RTD #23	RTD #24	DEW CELL #1	DEW CELL #2	DEW CELL #3	DEW CELL #4	DEW CELL #5	DEW CELL #6
SD.157	87.504	87.332	87.142	87.353	74.441	74.168	73.371	73.374	72.151	71.443
SD.158	87.489	87.324	87.133	87.355	74.461	74.026	73.312	73.341	72.024	71.438
SD.159	87.484	87.326	87.138	87.344	74.380	74.060	73.443	73.359	72.084	71.411
SD.160	87.481	87.326	87.133	87.333	74.455	73.913	73.269	73.312	72.261	71.458
SD.161	87.475	87.309	87.126	87.329	74.421	74.035	73.262	73.336	72.016	71.415
SD.162	87.480	87.315	87.115	87.326	74.324	74.055	73.361	73.295	72.094	71.376
SD.163	87.475	87.303	87.118	87.330	74.330	74.008	73.225	73.292	71.379	71.478
SD.164	87.471	87.315	87.124	87.323	74.247	73.907	73.262	73.210	72.137	71.517
SD.165	87.466	87.313	87.117	87.319	74.313	73.857	73.126	73.208	72.090	71.475
SD.166	87.466	87.319	87.121	87.323	74.342	73.924	73.068	73.248	72.036	71.345
SD.167	87.463	87.318	87.118	87.326	74.249	73.826	73.254	73.172	72.050	71.528
SD.168	87.463	87.301	87.121	87.327	74.232	73.844	73.132	73.210	72.068	71.487
SD.169	87.457	87.303	87.112	87.324	74.220	73.820	73.066	73.097	72.126	71.548
SD.170	87.454	87.306	87.104	87.321	74.200	73.773	73.040	73.095	72.009	71.550
SD.171	87.454	87.286	87.100	87.313	74.249	73.777	73.017	73.088	72.180	71.490
SD.172	87.451	87.281	87.103	87.316	74.145	73.712	73.083	73.031	72.085	71.582
SD.173	87.449	87.286	87.101	87.310	74.119	73.774	72.967	73.005	72.071	71.563
SD.174	87.452	87.281	87.095	87.326	74.125	73.736	72.935	72.950	72.097	71.539
SD.175	87.457	87.312	87.117	87.326	74.125	73.678	72.950	73.046	72.183	71.601
SD.176	87.455	87.306	87.117	87.330	74.082	73.683	72.963	72.995	72.171	71.519
SD.177	87.455	87.303	87.127	87.336	74.130	73.725	72.961	72.961	73.774	71.513
SD.178	87.452	87.306	87.121	87.347	74.093	73.623	72.924	72.879	71.971	71.537
SD.179	87.454	87.303	87.117	87.350	74.021	73.681	72.917	72.856	72.073	71.505
SD.180	87.455	87.301	87.126	87.353	73.992	73.635	72.900	72.853	71.421	71.525
SD.181	87.455	87.300	87.133	87.355	74.067	73.710	72.782	72.848	71.791	71.521
SD.182	87.455	87.307	87.133	87.356	74.037	73.580	72.839	72.790	71.978	71.548
SD.183	87.455	87.312	87.144	87.359	73.994	73.606	72.868	72.801	71.841	71.516
SD.184	87.454	87.309	87.153	87.359	73.919	73.565	72.758	72.801	71.914	71.495
SD.185	87.457	87.319	87.144	87.358	73.924	73.561	72.842	72.752	71.908	71.542
SD.186	87.454	87.341	87.153	87.359	73.851	73.535	72.808	72.779	71.888	71.543
SD.187	87.454	87.326	87.152	87.356	73.924	73.463	72.735	72.735	71.922	71.569
SD.188	87.451	87.319	87.150	87.356	73.913	73.501	72.796	72.724	71.861	71.514
SD.189	87.455	87.313	87.149	87.358	73.866	73.591	72.717	72.705	71.888	71.409
SD.190	87.455	87.323	87.150	87.361	73.844	73.548	72.732	72.642	71.868	71.472
SD.191	87.457	87.323	87.150	87.362	73.834	73.388	72.749	72.692	71.788	71.382
SD.192	87.455	87.313	87.150	87.362	73.852	73.455	72.677	72.647	71.658	71.386
SD.193	87.458	87.319	87.149	87.362	73.814	73.388	72.650	72.656	71.872	71.546
SD.194	87.454	87.316	87.158	87.364	73.858	73.388	72.616	72.589	72.302	71.537
SD.195	87.457	87.341	87.158	87.368	73.761	73.442	72.624	72.682	72.213	71.395
SD.196	87.455	87.356	87.164	87.368	73.783	73.318	72.583	72.576	71.762	71.388
SD.197	87.454	87.341	87.161	87.371	73.762	73.298	72.560	72.554	71.792	71.383
SD.198	87.452	87.336	87.165	87.370	73.751	73.323	72.531	72.570	71.746	71.472
SD.199	87.452	87.350	87.164	87.371	73.748	73.336	72.506	72.554	71.777	71.440
SD.200	87.449	87.359	87.171	87.373	73.678	73.321	72.511	72.517	71.762	71.446

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #21	RTD #22	RTD #23	RTD #24	DEW CELL #1	DEW CELL #2	DEW CELL #3	DEW CELL #4	DEW CELL #5	DEW CELL #6
SD.201	87.449	87.352	87.173	87.374	73.652	73.283	72.515	72.532	71.777	71.377
SD.202	87.451	87.377	87.179	87.376	73.657	73.269	72.522	72.485	71.679	71.513
SD.203	87.454	87.353	87.181	87.376	73.675	73.272	72.512	72.502	71.762	71.414
SD.204	87.454	87.359	87.179	87.376	73.689	73.374	72.482	72.470	71.745	71.350
SD.205	87.451	87.341	87.175	87.376	73.648	73.220	72.422	72.465	71.748	71.391
SD.206	87.454	87.344	87.179	87.379	73.594	73.257	72.372	72.401	71.659	71.402
SD.207	87.457	87.382	87.188	87.379	73.602	73.194	72.522	72.422	71.751	71.337
SD.208	87.457	87.368	87.187	87.381	73.622	73.228	72.377	72.473	71.644	71.360
SD.209	87.457	87.373	87.199	87.381	73.603	73.204	72.363	72.392	71.681	71.331

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ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
ILRT PROGRAM REPORT

STARTING DAY - 119 STARTING TIME - 23:15: 0 STARTING SCAN - SD.157 ENDING SCAN - SD.209

				POINT TO POINT		TOTAL TIME			MASS PLOT		
SCAN NO.	ELAPSED TIME (HR)	AVERAGE TEMP. (F)	AVERAGE PRESSURE (PSIA)	MEASURED LEAK RATE	CALCULATED LEAK RATE	MEASURED LEAK RATE	CALCULATED LEAK RATE (WEIGHT PERCENT PER DAY)	UPPER CONFIDENCE	MEASURED LEAK RATE	CALCULATED LEAK RATE	UPPER CONFIDENCE
SD.157	0.00	91.85	64.168								
SD.158	0.25	91.82	64.163	0.938E-01	0.938E-01	0.938E-01	0.938E-01	0.000E+00	0.947E-01	0.947E-01	0.000E+00
SD.159	0.50	91.79	64.159	0.194E+00	0.194E+00	0.144E+00	0.144E+00	0.000E+00	0.144E+00	0.144E+00	0.000E+00
SD.160	0.75	91.76	64.154	0.183E-01	0.643E-01	0.102E+00	0.117E+00	0.266E+00	0.102E+00	0.107E+00	0.538E+00
SD.161	1.00	91.73	64.152	-0.215E+00	-0.143E+00	0.229E-01	0.525E-01	0.171E+00	0.229E-01	0.118E-02	0.191E+00
SD.162	1.25	91.70	64.146	0.453E+00	0.171E+00	0.109E+00	0.763E-01	0.181E+00	0.109E+00	0.710E-01	0.200E+00
SD.163	1.50	91.67	64.145	-0.482E+00	-0.156E+00	0.105E-01	0.375E-01	0.129E+00	0.105E-01	0.117E-01	0.117E+00
SD.164	1.75	91.64	64.139	0.134E+00	-0.570E-01	0.282E-01	0.240E-01	0.987E-01	0.282E-01	0.386E-02	0.751E-01
SD.165	2.00	91.62	64.130	0.994E+00	0.365E+00	0.149E+00	0.666E-01	0.183E+00	0.149E+00	0.828E-01	0.185E+00
SD.166	2.25	91.60	64.125	0.383E+00	0.410E+00	0.175E+00	0.105E+00	0.231E+00	0.175E+00	0.140E+00	0.239E+00
SD.167	2.50	91.57	64.128	-0.977E+00	-0.308E-01	0.599E-01	0.912E-01	0.209E+00	0.599E-01	0.103E+00	0.193E+00
SD.168	2.75	91.55	64.125	0.320E-01	-0.245E-01	0.574E-01	0.807E-01	0.191E+00	0.574E-01	0.870E-01	0.159E+00
SD.169	3.00	91.52	64.121	0.120E-01	-0.253E-01	0.536E-01	0.719E-01	0.175E+00	0.536E-01	0.724E-01	0.134E+00
SD.170	3.25	91.50	64.119	-0.190E+00	-0.809E-01	0.348E-01	0.601E-01	0.158E+00	0.349E-01	0.544E-01	0.109E+00
SD.171	3.50	91.47	64.115	0.150E+00	-0.357E-01	0.432E-01	0.533E-01	0.146E+00	0.431E-01	0.461E-01	0.932E-01
SD.172	3.75	91.45	64.114	-0.248E+00	-0.963E-01	0.235E-01	0.433E-01	0.132E+00	0.236E-01	0.335E-01	0.761E-01
SD.173	4.00	91.42	64.111	-0.136E+00	-0.119E+00	0.137E-01	0.332E-01	0.118E+00	0.137E-01	0.214E-01	0.605E-01
SD.174	4.25	91.40	64.109	-0.732E-01	-0.123E+00	0.855E-02	0.240E-01	0.106E+00	0.857E-02	0.111E-01	0.470E-01
SD.175	4.50	91.39	64.105	0.341E+00	-0.408E-01	0.270E-01	0.204E-01	0.991E-01	0.270E-01	0.938E-02	0.411E-01
SD.176	4.75	91.36	64.100	0.325E+00	0.240E-01	0.428E-01	0.206E-01	0.973E-01	0.428E-01	0.134E-01	0.420E-01
SD.177	5.00	91.34	64.098	-0.217E-01	0.139E-01	0.395E-01	0.203E-01	0.950E-01	0.396E-01	0.159E-01	0.417E-01
SD.178	5.25	91.32	64.095	-0.710E-01	-0.341E-02	0.343E-01	0.192E-01	0.917E-01	0.343E-01	0.165E-01	0.397E-01
SD.179	5.50	91.30	64.092	0.692E-01	0.582E-02	0.359E-01	0.186E-01	0.894E-01	0.359E-01	0.177E-01	0.388E-01
SD.180	5.75	91.29	64.090	0.544E-01	0.113E-01	0.367E-01	0.182E-01	0.875E-01	0.367E-01	0.190E-01	0.383E-01
SD.181	6.00	91.27	64.087	0.692E-01	0.185E-01	0.380E-01	0.183E-01	0.862E-01	0.380E-01	0.204E-01	0.381E-01
SD.182	6.25	91.25	64.085	-0.618E-01	0.494E-02	0.340E-01	0.177E-01	0.843E-01	0.340E-01	0.209E-01	0.371E-01
SD.183	6.50	91.24	64.083	0.117E+00	0.192E-01	0.373E-01	0.178E-01	0.833E-01	0.373E-01	0.221E-01	0.371E-01
SD.184	6.75	91.22	64.080	-0.607E-01	0.677E-02	0.336E-01	0.174E-01	0.817E-01	0.336E-01	0.222E-01	0.361E-01
SD.185	7.00	91.20	64.078	0.126E-01	0.578E-02	0.329E-01	0.170E-01	0.801E-01	0.329E-01	0.225E-01	0.354E-01
SD.186	7.25	91.18	64.073	0.397E+00	0.552E-01	0.454E-01	0.183E-01	0.811E-01	0.454E-01	0.249E-01	0.371E-01
SD.187	7.50	91.17	64.073	-0.271E+00	0.144E-01	0.348E-01	0.182E-01	0.800E-01	0.349E-01	0.253E-01	0.367E-01
SD.188	7.75	91.15	64.071	0.446E-01	0.169E-01	0.352E-01	0.181E-01	0.790E-01	0.352E-01	0.257E-01	0.364E-01
SD.189	8.00	91.13	64.069	-0.157E+00	-0.487E-02	0.292E-01	0.174E-01	0.773E-01	0.291E-01	0.248E-01	0.349E-01
SD.190	8.25	91.12	64.066	0.214E+00	0.186E-01	0.347E-01	0.174E-01	0.766E-01	0.348E-01	0.252E-01	0.346E-01
SD.191	8.50	91.10	64.064	-0.481E-01	0.102E-01	0.323E-01	0.172E-01	0.755E-01	0.323E-01	0.252E-01	0.340E-01
SD.192	8.75	91.08	64.061	0.142E+00	0.235E-01	0.355E-01	0.174E-01	0.751E-01	0.355E-01	0.258E-01	0.341E-01
SD.193	9.00	91.07	64.059	0.195E-01	0.224E-01	0.350E-01	0.175E-01	0.746E-01	0.351E-01	0.260E-01	0.339E-01
SD.194	9.25	91.06	64.056	0.183E+00	0.384E-01	0.390E-01	0.181E-01	0.747E-01	0.390E-01	0.270E-01	0.345E-01
SD.195	9.50	91.04	64.056	-0.299E+00	0.430E-02	0.301E-01	0.177E-01	0.736E-01	0.301E-01	0.265E-01	0.336E-01
SD.196	9.75	91.03	64.048	0.916E+00	0.930E-01	0.528E-01	0.197E-01	0.759E-01	0.528E-01	0.296E-01	0.369E-01
SD.197	10.00	91.01	64.051	-0.863E+00	0.281E-02	0.299E-01	0.192E-01	0.747E-01	0.300E-01	0.290E-01	0.360E-01
SD.198	10.25	90.99	64.050	-0.114E+00	-0.947E-02	0.264E-01	0.185E-01	0.732E-01	0.264E-01	0.278E-01	0.346E-01
SD.199	10.50	90.97	64.046	0.258E+00	0.135E-01	0.319E-01	0.184E-01	0.725E-01	0.319E-01	0.276E-01	0.340E-01
SD.200	10.75	90.96	64.046	-0.224E+00	-0.869E-02	0.260E-01	0.178E-01	0.712E-01	0.260E-01	0.266E-01	0.328E-01

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
ILRT PROGRAM REPORT

STARTING DAY - 119 STARTING TIME - 23:15: 0 STARTING SCAN - SD.157 ENDING SCAN - SD.209

				POINT TO POINT		TOTAL TIME			MASS PLOT		
SCAN NO.	ELAPSED TIME (HR)	AVERAGE TEMP. (F)	AVERAGE PRESSURE (PSIA)	MEASURED LEAK RATE	CALCULATED LEAK RATE	MEASURED LEAK RATE	CALCULATED LEAK RATE (WEIGHT PERCENT PER DAY)	UPPER CONFIDENCE	MEASURED LEAK RATE	CALCULATED LEAK RATE	UPPER CONFIDENCE
SD.201	11.00	90.94	64.043	0.132E+00	0.213E-02	0.284E-01	0.174E-01	0.702E-01	0.284E-01	0.259E-01	0.319E-01
SD.202	11.25	90.93	64.041	0.286E-01	0.329E-02	0.284E-01	0.171E-01	0.693E-01	0.284E-01	0.255E-01	0.312E-01
SD.203	11.50	90.91	64.039	0.652E-01	0.747E-02	0.291E-01	0.169E-01	0.686E-01	0.292E-01	0.252E-01	0.307E-01
SD.204	11.75	90.90	64.037	0.801E-01	0.126E-01	0.303E-01	0.168E-01	0.680E-01	0.302E-01	0.253E-01	0.305E-01
SD.205	12.00	90.88	64.036	-0.256E+00	-0.986E-02	0.242E-01	0.162E-01	0.669E-01	0.243E-01	0.243E-01	0.294E-01
SD.206	12.25	90.87	64.030	0.659E+00	0.418E-01	0.372E-01	0.168E-01	0.672E-01	0.372E-01	0.251E-01	0.300E-01
SD.207	12.50	90.86	64.031	-0.285E+00	0.166E-01	0.308E-01	0.168E-01	0.668E-01	0.308E-01	0.252E-01	0.299E-01
SD.208	12.75	90.85	64.030	-0.172E-01	0.135E-01	0.298E-01	0.167E-01	0.663E-01	0.298E-01	0.252E-01	0.297E-01
SD.209	13.00	90.84	64.026	0.327E+00	0.363E-01	0.356E-01	0.171E-01	0.664E-01	0.356E-01	0.258E-01	0.302E-01

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
ILRT PROGRAM REPORT

STARTING DAY - 119 STARTING TIME - 23:15: 0 STARTING SCAN - SD.157 ENDING SCAN - SD.209

ILRT RESULTS AFTER 13.00 HRS.

POINT TO POINT	TOTAL TIME		MASS PLOT	
	AVERAGE MEASURED LEAK RATES (WEIGHT PERCENT PER DAY)			
LEAK RATE	LEAK RATE	STD.DEV.	LEAK RATE	STD.DEV.
0.356E-01	0.445E-01	0.340E-01	0.445E-01	0.340E-01

	CALCULATED LEAK RATES (WEIGHT PERCENT PER DAY)					
LEAK RATE	LEAK RATE	STD.DEV.	UPPER CON. LIMIT	LEAK RATE	STD.DEV.	UPPER CON.LIMIT
0.363E-01	0.171E-01	0.246E-01	0.664E-01	0.258E-01	0.262E-02	0.310E-01

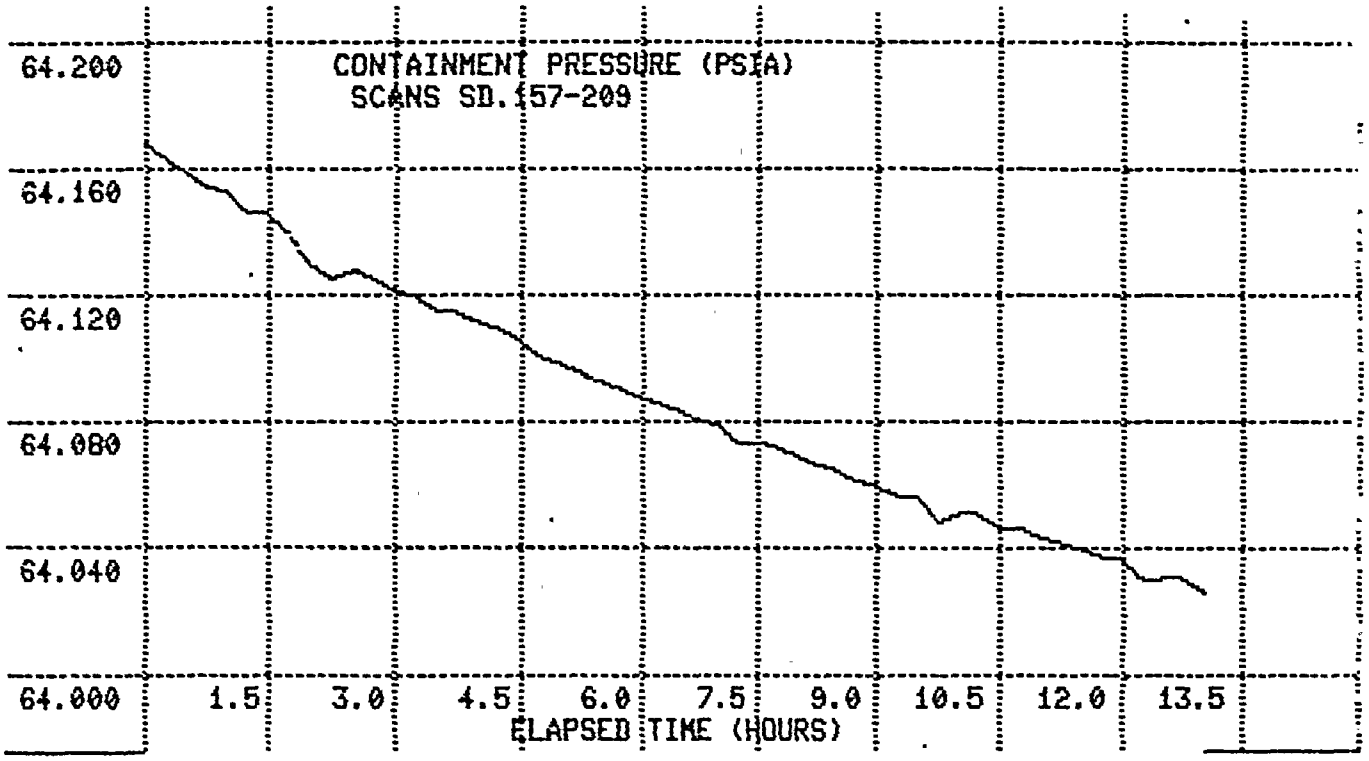
ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RELATIVE HUMIDITY PROGRAM

SCAN NO.	AVERAGE DEW POINT TEMPERATURE (F)	AVERAGE CONTAINMENT TEMPERATURE (F)	AVERAGE VAPOR PRESSURE (PSIA)	AVERAGE RELATIVE HUMIDITY (%)
SD.157	73.782	91.853	0.411	55.744
SD.158	73.730	91.821	0.411	55.701
SD.159	73.761	91.794	0.411	55.807
SD.160	73.683	91.761	0.410	55.719
SD.161	73.707	91.728	0.410	55.821
SD.162	73.707	91.702	0.410	55.866
SD.163	73.659	91.671	0.410	55.829
SD.164	73.606	91.642	0.409	55.781
SD.165	73.571	91.625	0.408	55.745
SD.166	73.587	91.601	0.409	55.816
SD.167	73.575	91.572	0.408	55.845
SD.168	73.552	91.551	0.408	55.838
SD.169	73.494	91.524	0.407	55.777
SD.170	73.472	91.498	0.407	55.779
SD.171	73.475	91.471	0.407	55.832
SD.172	73.440	91.452	0.407	55.800
SD.173	73.408	91.422	0.406	55.792
SD.174	73.377	91.404	0.406	55.764
SD.175	73.395	91.387	0.406	55.829
SD.176	73.376	91.364	0.406	55.833
SD.177	73.386	91.344	0.406	55.886
SD.178	73.322	91.322	0.405	55.805
SD.179	73.311	91.301	0.405	55.820
SD.180	73.288	91.289	0.405	55.799
SD.181	73.287	91.267	0.405	55.834
SD.182	73.252	91.250	0.404	55.797
SD.183	73.259	91.239	0.404	55.831
SD.184	73.203	91.216	0.403	55.765
SD.185	73.213	91.198	0.404	55.816
SD.186	73.189	91.180	0.403	55.802
SD.187	73.156	91.168	0.403	55.762
SD.188	73.176	91.151	0.403	55.829
SD.189	73.158	91.127	0.403	55.838
SD.190	73.131	91.116	0.402	55.804
SD.191	73.112	91.098	0.402	55.800
SD.192	73.098	91.082	0.402	55.803
SD.193	73.070	91.069	0.402	55.772
SD.194	73.051	91.055	0.401	55.761
SD.195	73.070	91.036	0.402	55.830
SD.196	73.006	91.026	0.401	55.727
SD.197	72.985	91.005	0.400	55.723
SD.198	72.984	90.990	0.400	55.748
SD.199	72.975	90.971	0.400	55.764
SD.200	72.947	90.961	0.400	55.729
SD.201	72.939	90.944	0.400	55.743
SD.202	72.925	90.929	0.400	55.743

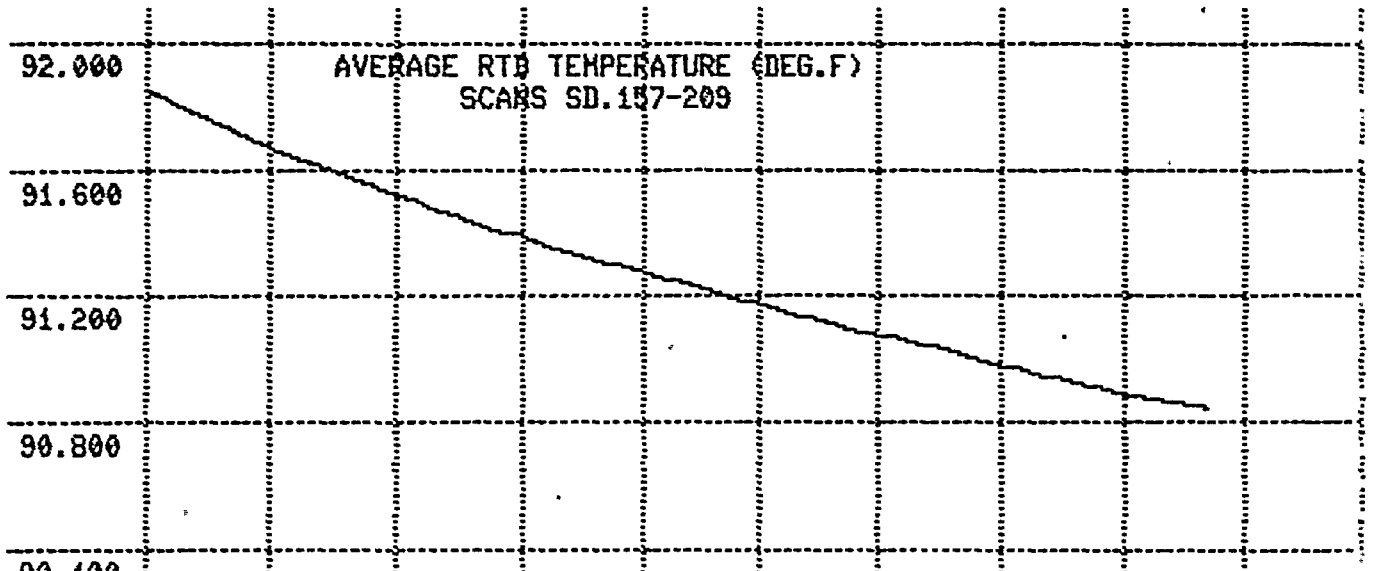
ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RELATIVE HUMIDITY PROGRAM

SCAN NO.	AVERAGE DEW POINT TEMPERATURE (F)	AVERAGE CONTAINMENT TEMPERATURE (F)	AVERAGE VAPOR PRESSURE (PSIA)	AVERAGE RELATIVE HUMIDITY (%)
SD.203	72.932	90.915	0.400	55.781
SD.204	72.940	90.901	0.400	55.820
SD.205	72.879	90.885	0.399	55.734
SD.206	72.843	90.874	0.399	55.685
SD.207	72.879	90.863	0.399	55.773
SD.208	72.865	90.855	0.399	55.760
SD.209	72.829	90.843	0.398	55.713

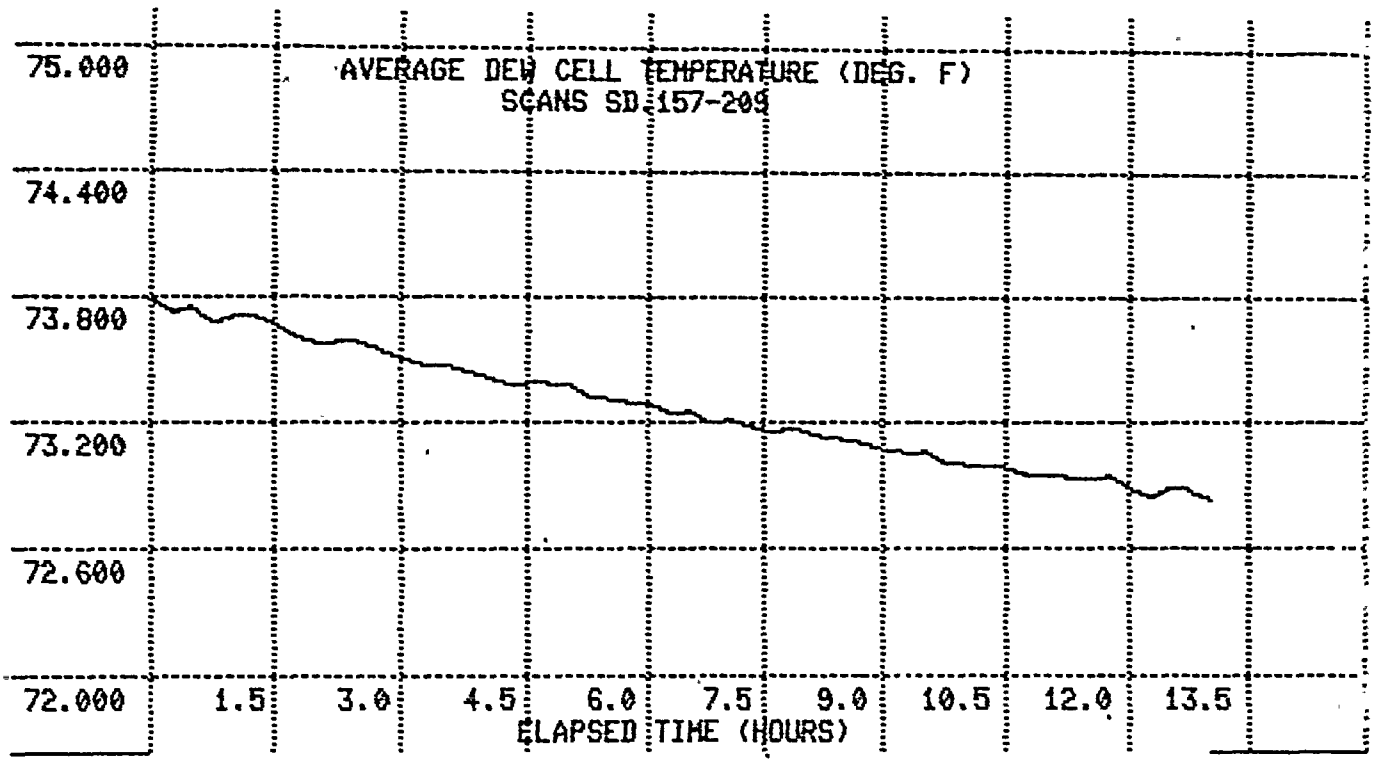
ILRT


CONTAINMENT PRESSURE (PSIA)
SCANS SD.157-209
64.200
64.160
64.120
64.080
64.040
64.000
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
ELAPSED TIME (HOURS)

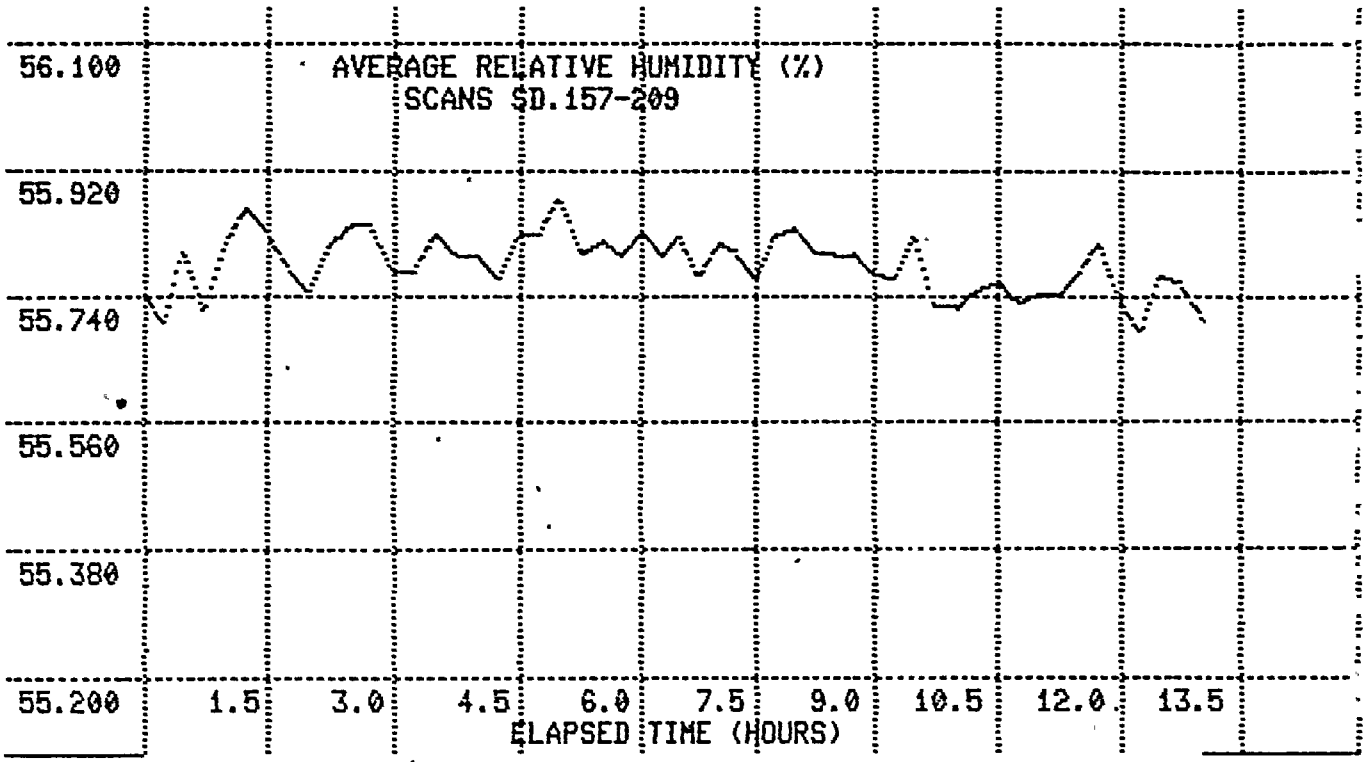
ILRT

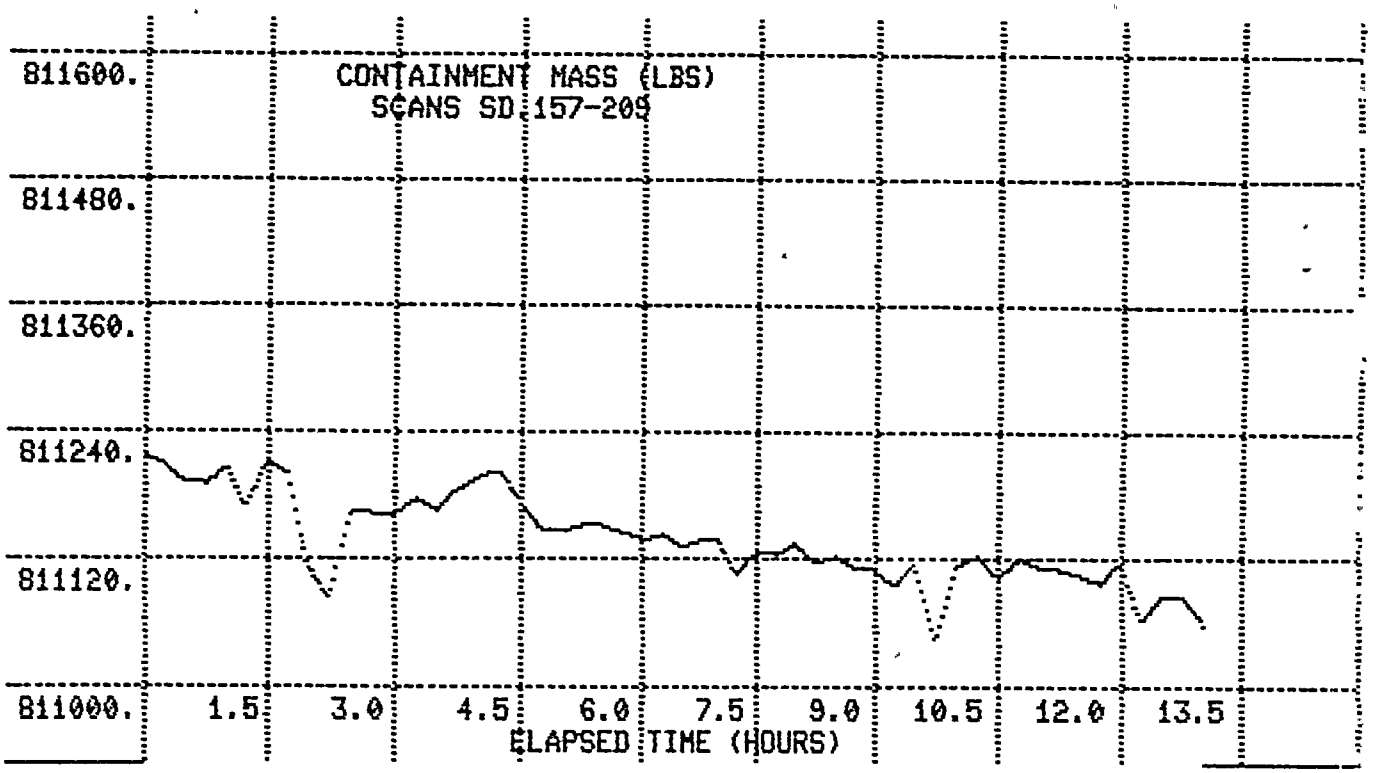

AVERAGE RTD TEMPERATURE (DEG.F)
SCARS SD.157-209
92.000
91.600
91.200
90.800
90.400
90.000
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
ELAPSED TIME (HOURS)

ILRT

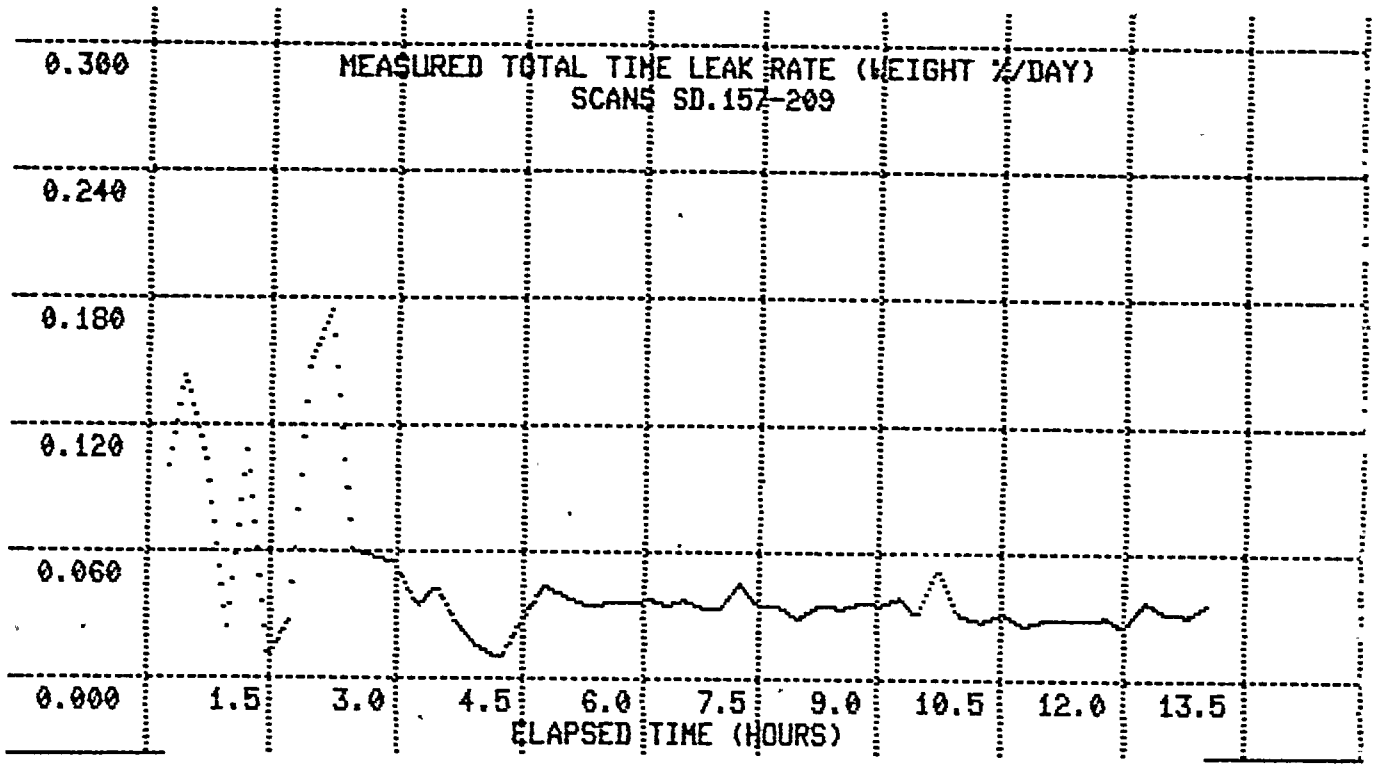

AVERAGE DEW CELL TEMPERATURE (DEG. F)
SCANS SD-157-209
75.000
74.400
73.800
73.200
72.600
72.000
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
ELAPSED TIME (HOURS)

ILRT

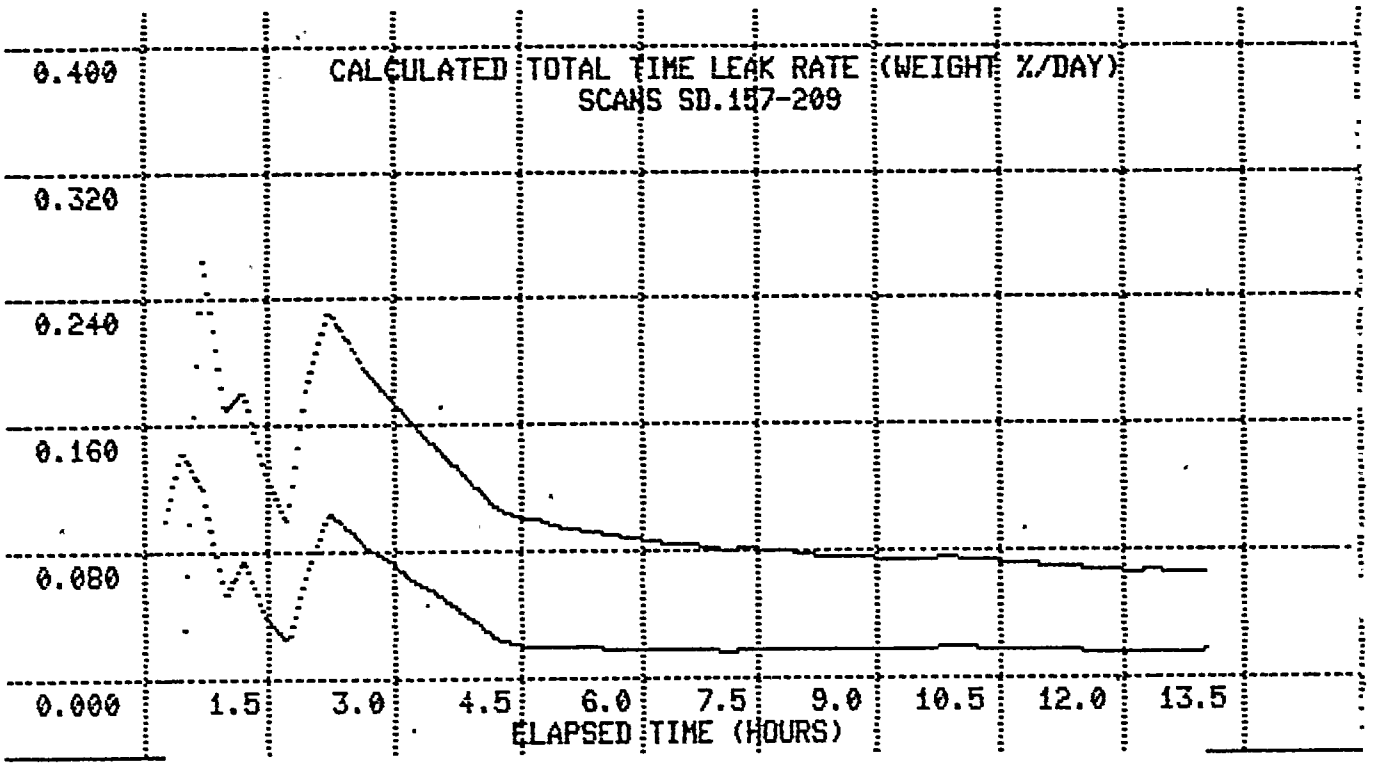

AVERAGE RELATIVE HUMIDITY (%)
SCANS SD.157-209
56.100
55.920
55.740
55.560
55.380
55.200
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
ELAPSED TIME (HOURS)


CONTAINMENT MASS (LBS)
SCANS SD:157-209
811600.
811480.
811360.
811240.
811120.
811000.
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
ELAPSED TIME (HOURS)

ILRT


MEASURED TOTAL TIME LEAK RATE (WEIGHT %/DAY)
SCANS SD.157-209
0.300
0.240
0.180
0.120
0.060
0.000
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
ELAPSED TIME (HOURS)

ILRT


CALCULATED TOTAL TIME LEAK RATE (WEIGHT %/DAY)
SCANS SD.157-209
0.400
0.320
0.240
0.160
0.080
0.000
1.5
3.0
4.5
6.0
7.5
9.0
10.5
12.0
13.5
ELAPSED TIME (HOURS)

3.

CONTROLLED LEAK RATE TEST

(CLRT)

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	DATE	TIME	PRESS 1	PRESS 2	RTD #1	RTD #2	RTD #3	RTD #4	RTD #5	RTD #6	RTD #7	RTD #8	RTD #9
SD.215	120	13:45	63.194	63.250	92.643	91.224	92.182	91.777	90.847	92.149	90.753	90.545	90.765
SD.216	120	14: 0	63.192	63.247	92.654	91.246	92.157	91.754	90.867	92.102	90.719	90.530	90.773
SD.217	120	14:15	63.184	63.245	92.619	91.195	92.140	91.752	90.835	92.109	90.718	90.527	90.747
SD.218	120	14:30	63.186	63.243	92.610	91.215	92.144	91.720	90.802	92.073	90.679	90.521	90.725
SD.219	120	14:45	63.185	63.240	92.584	91.178	92.124	91.711	90.774	92.083	90.670	90.510	90.695
SD.220	120	15: 0	63.180	63.238	92.590	91.177	92.102	91.699	90.774	92.092	90.661	90.525	90.721
SD.221	120	15:15	63.175	63.236	92.549	91.145	92.063	91.682	90.747	92.062	90.638	90.463	90.684
SD.222	120	15:30	63.172	63.234	92.549	91.111	92.083	91.682	90.748	92.047	90.631	90.457	90.666
SD.223	120	15:45	63.170	63.231	92.518	91.108	92.057	91.645	90.722	92.036	90.609	90.470	90.660
SD.224	120	16: 0	63.173	63.229	92.512	91.134	92.062	91.662	90.733	92.034	90.597	90.484	90.652
SD.225	120	16:15	63.166	63.227	92.509	91.116	92.024	91.633	90.715	92.010	90.568	90.420	90.623
SD.226	120	16:30	63.171	63.225	92.512	91.105	92.038	91.609	90.722	91.984	90.579	90.402	90.614
SD.227	120	16:45	63.166	63.215	92.480	91.066	91.999	91.597	90.681	92.010	90.556	90.393	90.625
SD.228	120	17: 0	63.160	63.222	92.466	91.038	91.975	91.569	90.679	91.963	90.551	90.379	90.609
SD.229	120	17:15	63.163	63.220	92.451	91.050	91.980	91.558	90.657	91.972	90.559	90.387	90.606
SD.230	120	17:30	63.164	63.218	92.443	91.032	91.989	91.566	90.670	91.920	90.535	90.364	90.597
SD.231	120	17:45	63.161	63.216	92.451	91.011	91.976	91.532	90.634	91.909	90.574	90.358	90.629
SD.232	120	18: 0	63.159	63.214	92.430	91.018	91.992	91.555	90.626	91.893	90.545	90.391	90.570
SD.233	120	18:15	63.156	63.212	92.448	91.037	91.969	91.557	90.649	91.868	90.528	90.344	90.568
SD.234	120	18:30	63.153	63.210	92.427	91.023	91.943	91.563	90.611	91.899	90.513	90.348	90.594
SD.235	120	18:45	63.152	63.207	92.417	91.012	91.941	91.528	90.591	91.871	90.509	90.327	90.551
SD.236	120	19: 0	63.148	63.205	92.367	90.995	91.911	91.505	90.600	91.877	90.506	90.322	90.554
SD.237	120	19:15	63.146	63.203	92.372	90.950	91.897	91.490	90.542	91.870	90.475	90.283	90.492
SD.238	120	19:30	63.144	63.200	92.363	90.957	91.885	91.464	90.528	91.873	90.458	90.292	90.492
SD.239	120	19:45	63.141	63.198	92.347	90.953	91.844	91.444	90.509	91.871	90.448	90.277	90.519
SD.240	120	20: 0	63.140	63.196	92.329	90.927	91.856	91.482	90.506	91.793	90.405	90.277	90.463
SD.241	120	20:15	63.138	63.194	92.337	90.893	91.844	91.406	90.501	91.796	90.411	90.208	90.437

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #10	RTD #11	RTD #12	RTD #13	RTD #14	RTD #15	RTD #16	RTD #17	RTD #18	RTD #19	RTD #20
SD.215	90.945	90.827	90.698	90.615	90.443	91.557	91.154	90.283	89.532	89.213	88.262
SD.216	90.947	90.831	90.681	90.594	90.428	91.560	91.102	90.278	89.527	89.215	88.264
SD.217	90.943	90.821	90.675	90.580	90.416	91.540	91.122	90.277	89.527	89.215	88.259
SD.218	90.913	90.823	90.649	90.585	90.391	91.526	91.148	90.260	89.527	89.215	88.262
SD.219	90.911	90.814	90.638	90.564	90.391	91.526	91.095	90.258	89.523	89.209	88.272
SD.220	90.908	90.745	90.622	90.550	90.371	91.523	91.066	90.248	89.526	89.209	88.264
SD.221	90.875	90.786	90.628	90.547	90.353	91.505	91.058	90.246	89.523	89.209	88.261
SD.222	90.846	90.739	90.609	90.518	90.353	91.508	91.082	90.251	89.535	89.205	88.256
SD.223	90.855	90.716	90.603	90.562	90.333	91.479	91.154	90.239	89.527	89.195	88.267
SD.224	90.855	90.734	90.593	90.556	90.329	91.484	91.130	90.234	89.524	89.199	88.264
SD.225	90.812	90.704	90.609	90.515	90.324	91.467	91.087	90.228	89.530	89.196	88.267
SD.226	90.766	90.704	90.571	90.538	90.310	91.479	91.075	90.229	89.530	89.195	88.270
SD.227	90.789	90.692	90.560	90.556	90.307	91.464	91.061	90.222	89.527	89.196	88.266
SD.228	90.783	90.672	90.519	90.559	90.290	91.433	91.098	90.217	89.527	89.193	88.261
SD.229	90.762	90.666	90.518	90.556	90.287	91.424	91.116	90.214	89.524	89.193	88.255
SD.230	90.751	90.692	90.551	90.545	90.280	91.406	91.117	90.206	89.521	89.199	88.258
SD.231	90.770	90.687	90.522	90.545	90.272	91.412	91.146	90.200	89.517	89.183	88.255
SD.232	90.771	90.650	90.518	90.531	90.261	91.410	91.145	90.205	89.521	89.176	88.262
SD.233	90.771	90.644	90.538	90.489	90.251	91.383	91.114	90.193	89.523	89.164	88.269
SD.234	90.779	90.670	90.513	90.466	90.242	91.412	91.145	90.202	89.527	89.160	88.267
SD.235	90.773	90.643	90.477	90.489	90.235	91.394	91.127	90.191	89.521	89.157	88.258
SD.236	90.724	90.626	90.448	90.464	90.223	91.375	91.072	90.193	89.514	89.160	88.246
SD.237	90.692	90.615	90.448	90.443	90.206	91.380	91.003	90.185	89.503	89.155	88.241
SD.238	90.710	90.554	90.452	90.437	90.194	91.386	91.035	90.188	89.508	89.157	88.247
SD.239	90.669	90.612	90.449	90.412	90.181	91.348	91.003	90.184	89.502	89.154	88.237
SD.240	90.661	90.564	90.416	90.365	90.168	91.333	90.957	90.181	89.491	89.154	88.234
SD.241	90.646	90.545	90.435	90.368	90.148	91.336	90.937	90.190	89.488	89.164	88.230

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RAW DATA SUMMARY REPORT

SCAN NO.	RTD #21	RTD #22	RTD #23	RTD #24	DEW CELL #1	DEW CELL #2	DEW CELL #3	DEW CELL #4	DEW CELL #5	DEW CELL #6
SD.215	87.455	87.367	87.200	87.387	73.519	73.094	72.288	72.320	71.792	71.421
SD.216	87.454	87.385	87.200	87.390	73.472	73.109	72.338	72.299	71.640	71.302
SD.217	87.449	87.400	87.190	87.387	73.461	73.124	72.285	72.296	71.565	71.344
SD.218	87.454	87.399	87.202	87.388	73.506	73.024	72.296	72.303	71.615	71.403
SD.219	87.451	87.394	87.200	87.387	73.472	73.106	72.229	72.264	71.652	71.392
SD.220	87.454	87.364	87.197	87.388	73.400	72.973	72.166	72.227	71.669	71.344
SD.221	87.449	87.373	87.202	87.387	73.402	72.999	72.229	72.222	70.541	71.383
SD.222	87.448	87.399	87.205	87.384	73.411	73.005	72.210	72.230	72.271	71.318
SD.223	87.448	87.391	87.207	87.387	73.384	72.969	72.216	72.250	108.740	71.246
SD.224	87.449	87.420	87.210	87.391	73.397	72.941	72.158	72.201	108.730	71.308
SD.225	87.448	87.420	87.216	87.394	73.391	72.934	72.111	72.160	108.550	71.258
SD.226	87.446	87.397	87.211	87.388	73.371	72.964	72.198	72.215	108.470	71.241
SD.227	87.442	87.377	87.207	87.393	73.347	72.843	72.172	72.184	108.530	71.260
SD.228	87.435	87.382	87.207	87.387	73.347	72.969	72.081	72.151	108.520	71.226
SD.229	87.440	87.400	87.194	87.393	73.324	72.978	72.123	72.164	70.263	71.157
SD.230	87.434	87.373	87.190	87.384	73.298	72.921	72.088	72.146	70.831	71.398
SD.231	87.434	87.400	87.194	87.376	73.310	72.871	72.111	72.163	70.620	71.336
SD.232	87.432	87.403	87.190	87.371	73.318	72.874	72.065	72.117	69.728	71.322
SD.233	87.428	87.406	87.202	87.376	73.268	72.845	72.074	72.106	70.881	71.266
SD.234	87.425	87.381	87.205	87.371	73.312	72.853	72.021	72.122	105.100	71.328
SD.235	87.425	87.406	87.193	87.368	73.262	72.871	72.140	72.128	70.724	71.328
SD.236	87.426	87.403	87.190	87.368	73.211	72.863	72.099	72.056	70.953	71.163
SD.237	87.419	87.396	87.187	87.368	73.277	72.854	72.001	72.049	70.930	71.232
SD.238	87.420	87.381	87.190	87.365	73.205	72.848	72.006	72.047	71.037	71.182
SD.239	87.414	87.379	87.178	87.361	73.260	72.816	71.911	72.068	107.740	71.113
SD.240	87.413	87.371	87.179	87.356	73.194	72.793	71.929	71.969	107.980	71.118
SD.241	87.408	87.377	87.170	87.359	73.168	72.738	71.997	71.960	107.880	71.101

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
ILRT PROGRAM REPORT

STARTING DAY - 120 STARTING TIME - 13:45: 0 STARTING SCAN - SD.215 ENDING SCAN - SD.241

SCAN NO.	ELAPSED TIME (HR)	AVERAGE TEMP. (F)	AVERAGE PRESSURE (PSIA)	POINT TO POINT MEASURED LEAK RATE	POINT TO POINT CALCULATED LEAK RATE	TOTAL TIME MEASURED LEAK RATE	TOTAL TIME CALCULATED LEAK RATE (WEIGHT PERCENT PER DAY)	TOTAL TIME UPPER CONFIDENCE	MASS PLOT MEASURED LEAK RATE	MASS PLOT CALCULATED LEAK RATE	MASS PLOT UPPER CONFIDENCE
SD.215	0.00	90.76	64.014								
SD.216	0.25	90.76	64.011	0.162E+00	0.162E+00	0.162E+00	0.162E+00	0.000E+00	0.162E+00	0.162E+00	0.000E+00
SD.217	0.50	90.75	64.003	0.102E+01	0.102E+01	0.592E+00	0.592E+00	0.000E+00	0.592E+00	0.592E+00	0.000E+00
SD.218	0.75	90.73	64.005	-0.518E+00	-0.118E+00	0.222E+00	0.355E+00	0.165E+01	0.222E+00	0.253E+00	0.496E+01
SD.219	1.00	90.72	64.004	-0.104E+00	-0.210E+00	0.141E+00	0.214E+00	0.755E+00	0.140E+00	0.675E-01	0.731E+00
SD.220	1.25	90.72	63.999	0.499E+00	0.122E+00	0.212E+00	0.196E+00	0.539E+00	0.212E+00	0.117E+00	0.431E+00
SD.221	1.50	90.70	63.994	0.527E+00	0.312E+00	0.265E+00	0.215E+00	0.486E+00	0.265E+00	0.190E+00	0.397E+00
SD.222	1.75	90.69	63.991	0.359E+00	0.344E+00	0.278E+00	0.234E+00	0.464E+00	0.278E+00	0.230E+00	0.382E+00
SD.223	2.00	90.69	63.989	0.145E+00	0.274E+00	0.262E+00	0.239E+00	0.438E+00	0.262E+00	0.245E+00	0.351E+00
SD.224	2.25	90.69	63.992	-0.506E+00	-0.184E-01	0.176E+00	0.210E+00	0.390E+00	0.176E+00	0.200E+00	0.294E+00
SD.225	2.50	90.67	63.985	0.690E+00	0.194E+00	0.228E+00	0.209E+00	0.372E+00	0.228E+00	0.203E+00	0.277E+00
SD.226	2.75	90.66	63.990	-0.777E+00	-0.120E+00	0.136E+00	0.179E+00	0.333E+00	0.136E+00	0.161E+00	0.236E+00
SD.227	3.00	90.65	63.985	0.508E+00	0.294E-01	0.167E+00	0.166E+00	0.309E+00	0.167E+00	0.150E+00	0.212E+00
SD.228	3.25	90.64	63.979	0.681E+00	0.190E+00	0.207E+00	0.168E+00	0.305E+00	0.207E+00	0.160E+00	0.214E+00
SD.229	3.50	90.64	63.982	-0.469E+00	0.187E-01	0.159E+00	0.157E+00	0.286E+00	0.159E+00	0.149E+00	0.196E+00
SD.230	3.75	90.63	63.983	-0.296E+00	-0.737E-01	0.128E+00	0.142E+00	0.264E+00	0.128E+00	0.131E+00	0.175E+00
SD.231	4.00	90.63	63.980	0.366E+00	0.414E-02	0.143E+00	0.133E+00	0.250E+00	0.143E+00	0.124E+00	0.163E+00
SD.232	4.25	90.62	63.978	0.189E+00	0.295E-01	0.146E+00	0.127E+00	0.239E+00	0.146E+00	0.120E+00	0.155E+00
SD.233	4.50	90.62	63.975	0.283E+00	0.697E-01	0.153E+00	0.124E+00	0.232E+00	0.153E+00	0.120E+00	0.151E+00
SD.234	4.75	90.62	63.972	0.459E+00	0.138E+00	0.169E+00	0.125E+00	0.232E+00	0.169E+00	0.125E+00	0.153E+00
SD.235	5.00	90.60	63.971	-0.320E-01	0.103E+00	0.159E+00	0.124E+00	0.229E+00	0.159E+00	0.127E+00	0.152E+00
SD.236	5.25	90.59	63.967	0.279E+00	0.129E+00	0.165E+00	0.124E+00	0.228E+00	0.165E+00	0.131E+00	0.154E+00
SD.237	5.50	90.57	63.965	-0.824E-01	0.905E-01	0.154E+00	0.122E+00	0.224E+00	0.154E+00	0.130E+00	0.151E+00
SD.238	5.75	90.57	63.963	0.223E+00	0.107E+00	0.157E+00	0.122E+00	0.222E+00	0.157E+00	0.131E+00	0.150E+00
SD.239	6.00	90.56	63.960	0.259E+00	0.127E+00	0.161E+00	0.122E+00	0.221E+00	0.161E+00	0.133E+00	0.151E+00
SD.240	6.25	90.54	63.959	-0.243E+00	0.688E-01	0.145E+00	0.120E+00	0.217E+00	0.145E+00	0.131E+00	0.148E+00
SD.241	6.50	90.53	63.957	0.131E+00	0.724E-01	0.144E+00	0.118E+00	0.213E+00	0.144E+00	0.130E+00	0.145E+00

ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
ILRT PROGRAM REPORT

STARTING DAY - 120 STARTING TIME - 13:45: 0 STARTING SCAN - SD.215 ENDING SCAN - SD.241

ILRT RESULTS AFTER 6.50 HRS.

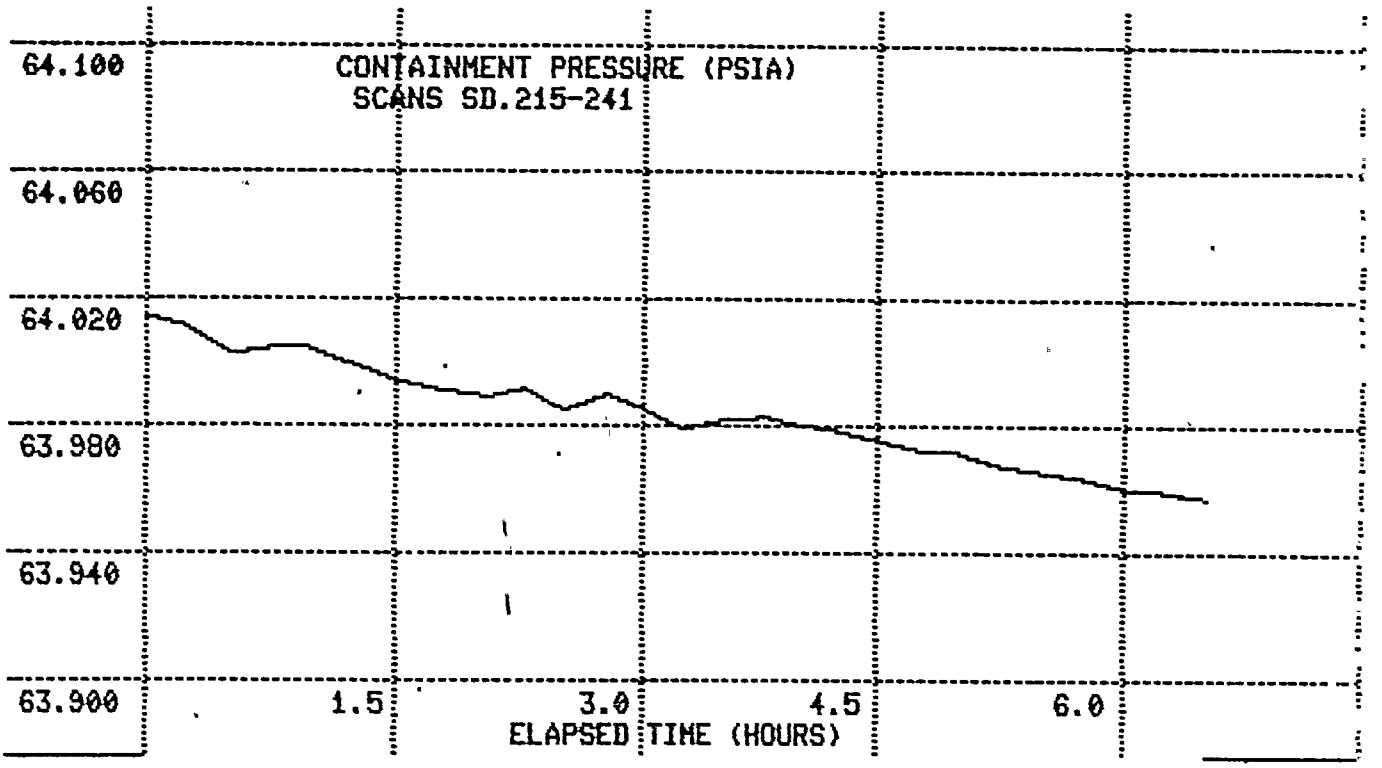
POINT TO POINT	TOTAL TIME		MASS PLOT	
	AVERAGE MEASURED LEAK RATES (WEIGHT PERCENT PER DAY)			
LEAK RATE	LEAK RATE	STD.DEV.	LEAK RATE	STD.DEV.
0.144E+00	0.193E+00	0.975E-01	0.193E+00	0.975E-01

	CALCULATED LEAK RATES (WEIGHT PERCENT PER DAY)					
LEAK RATE	LEAK RATE	STD.DEV.	UPPER CON. LIMIT	LEAK RATE	STD.DEV.	UPPER CON.LIMIT
0.724E-01	0.118E+00	0.462E-01	0.213E+00	0.130E+00	0.874E-02	0.148E+00

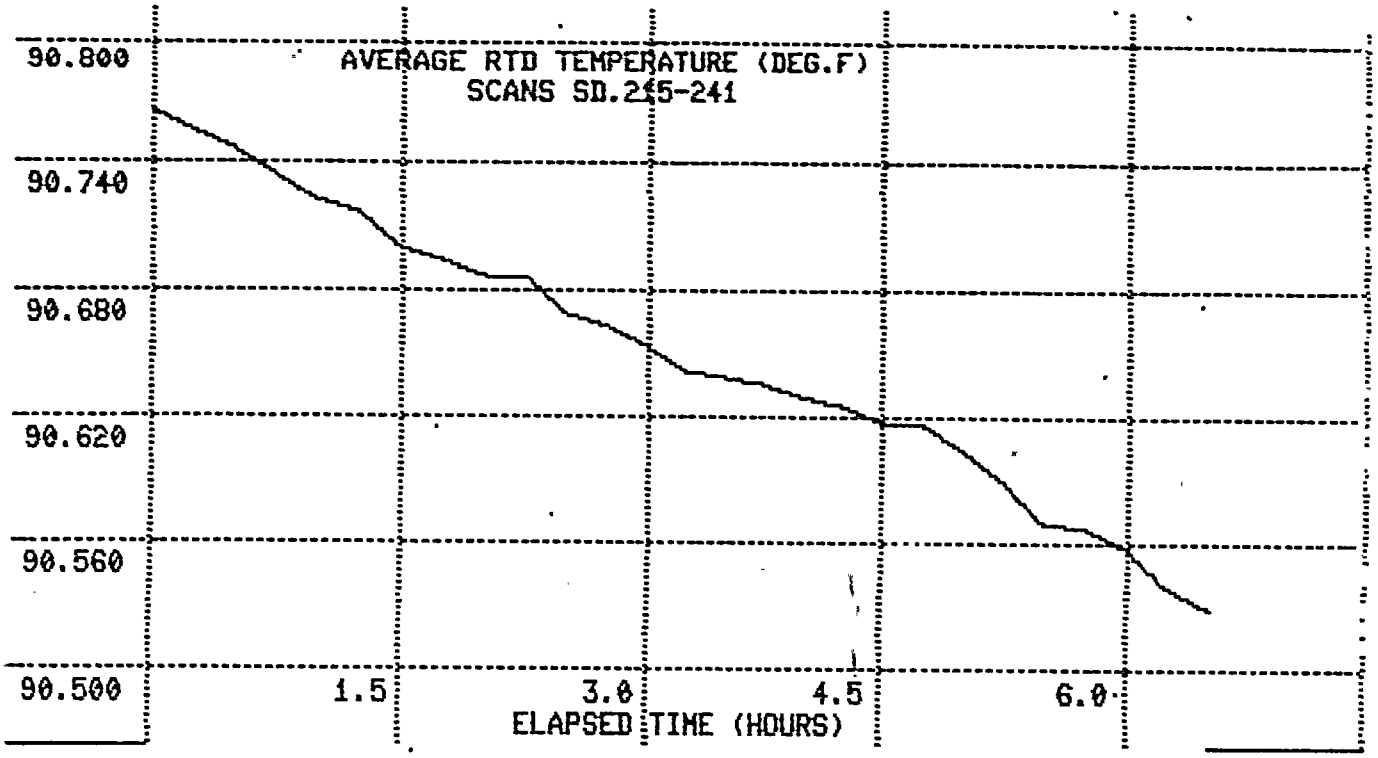
ARIZONA PUBLIC SERVICE COMPANY
PALO VERDE NUCLEAR GENERATING STATION
RELATIVE HUMIDITY PROGRAM

SCAN NO.	AVERAGE DEW POINT TEMPERATURE (F)	AVERAGE CONTAINMENT TEMPERATURE (F)	AVERAGE VAPOR PRESSURE (PSIA)	AVERAGE RELATIVE HUMIDITY (%)
SD.215	72.745	90.763	0.397	55.693
SD.216	72.746	90.755	0.397	55.710
SD.217	72.731	90.746	0.397	55.699
SD.218	72.724	90.734	0.397	55.705
SD.219	72.705	90.722	0.397	55.691
SD.220	72.632	90.715	0.396	55.565
SD.221	72.654	90.699	0.396	55.635
SD.222	72.654	90.694	0.396	55.645
SD.223	72.648	90.685	0.396	55.647
SD.224	72.615	90.686	0.395	55.583
SD.225	72.587	90.668	0.395	55.563
SD.226	72.629	90.662	0.396	55.652
SD.227	72.581	90.653	0.395	55.578
SD.228	72.574	90.641	0.395	55.586
SD.229	72.586	90.639	0.395	55.613
SD.230	72.553	90.634	0.395	55.559
SD.231	72.556	90.629	0.395	55.574
SD.232	72.533	90.625	0.394	55.537
SD.233	72.515	90.617	0.394	55.517
SD.234	72.516	90.617	0.394	55.519
SD.235	72.544	90.603	0.395	55.595
SD.236	72.499	90.589	0.394	55.536
SD.237	72.482	90.569	0.394	55.539
SD.238	72.466	90.566	0.394	55.513
SD.239	72.450	90.557	0.393	55.501
SD.240	72.408	90.539	0.393	55.452
SD.241	72.407	90.529	0.393	55.467

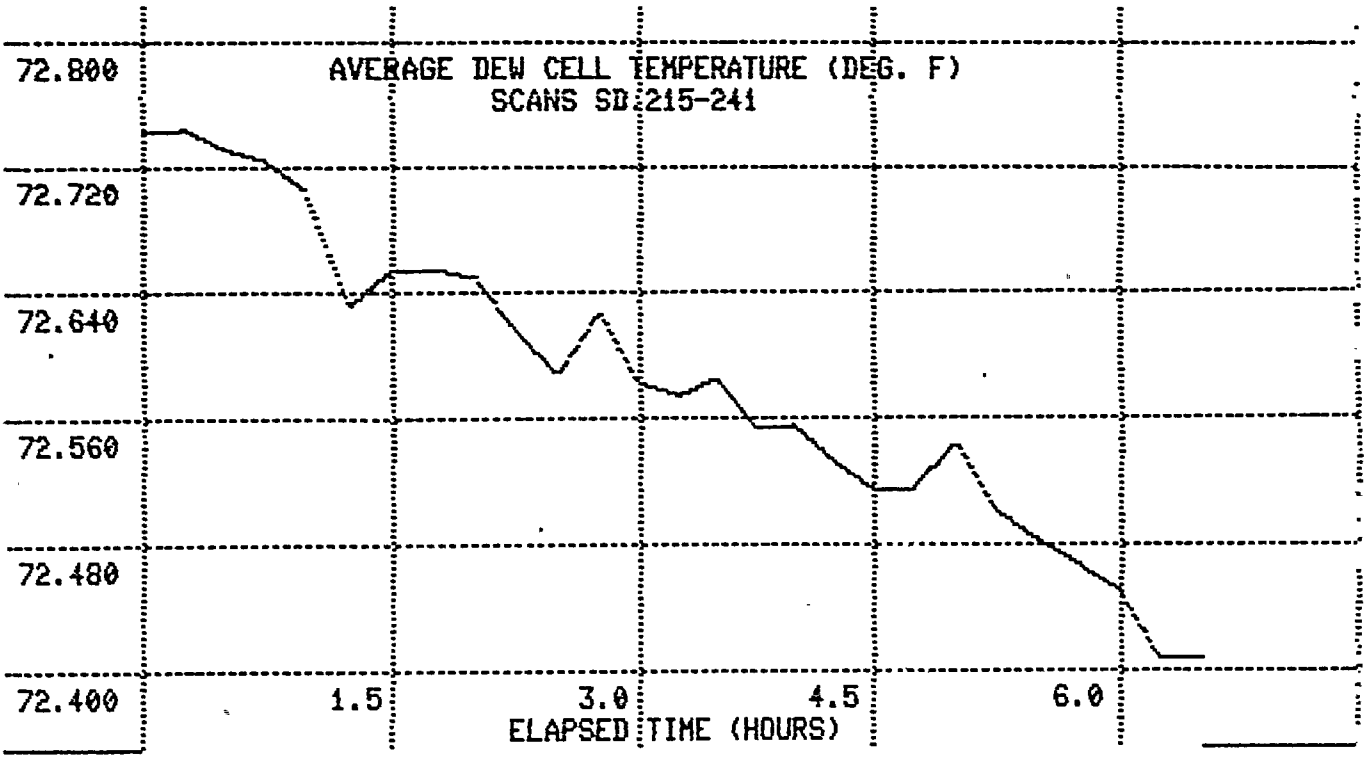
CLRT


CONTAINMENT PRESSURE (PSIA)
SCANS SD.215-241
64.100
64.060
64.020
63.980
63.940
63.900
1.5
3.0
4.5
6.0
ELAPSED TIME (HOURS)

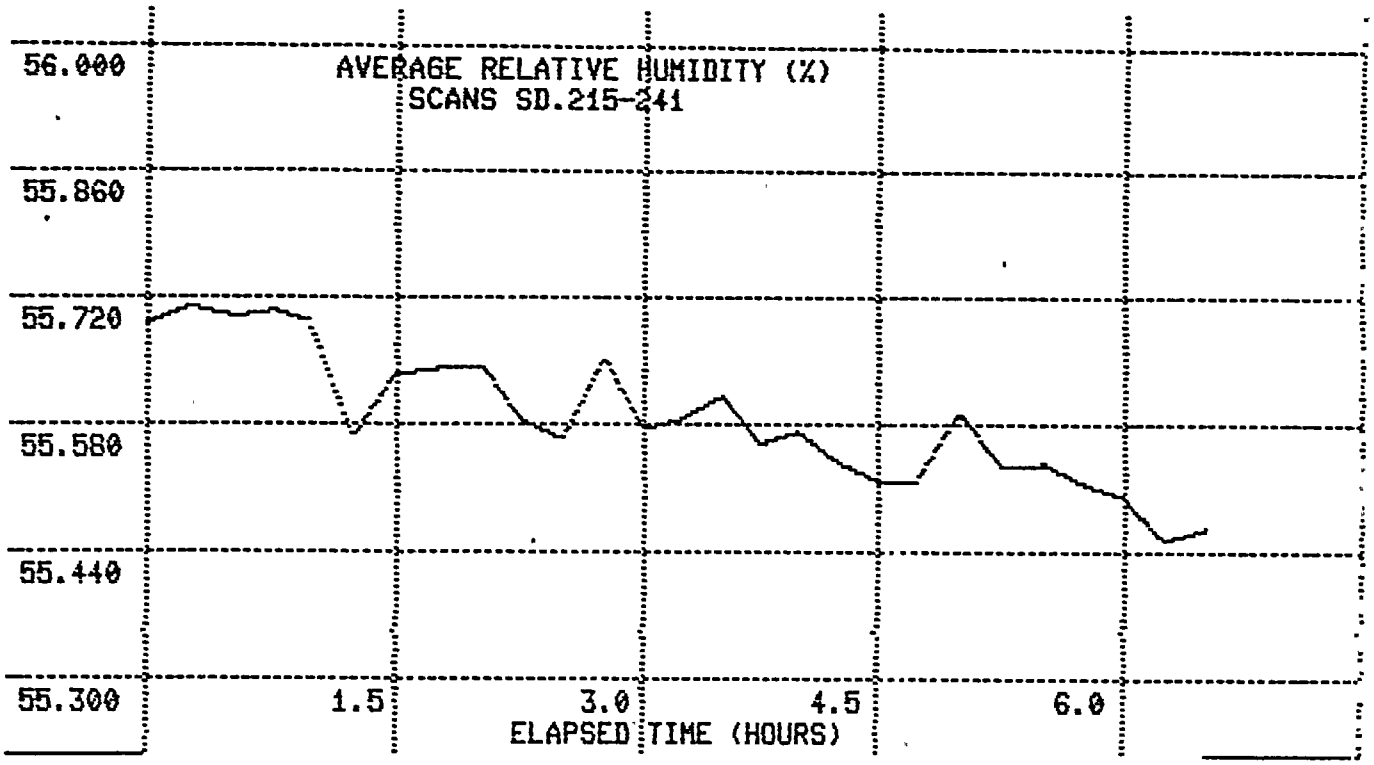
CLRT


AVERAGE RTD TEMPERATURE (DEG.F)
SCANS SD.215-241
90.800
90.740
90.680
90.620
90.560
90.500
1.5
3.0
4.5
6.0
ELAPSED TIME (HOURS)

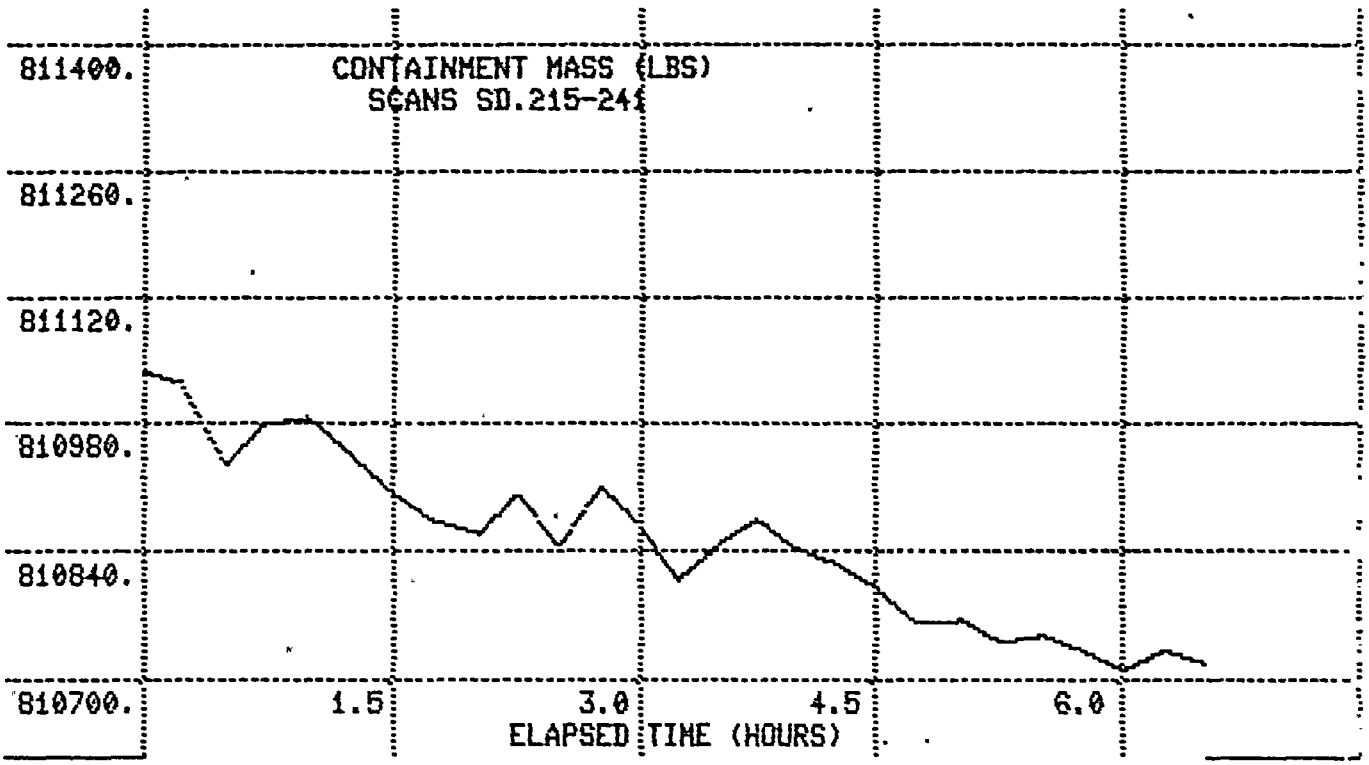
CLRT


AVERAGE DEW CELL TEMPERATURE (DEG. F)
SCANS SD:215-241
72.800
72.720
72.640
72.560
72.480
72.400
1.5
3.0
4.5
6.0
ELAPSED TIME (HOURS)

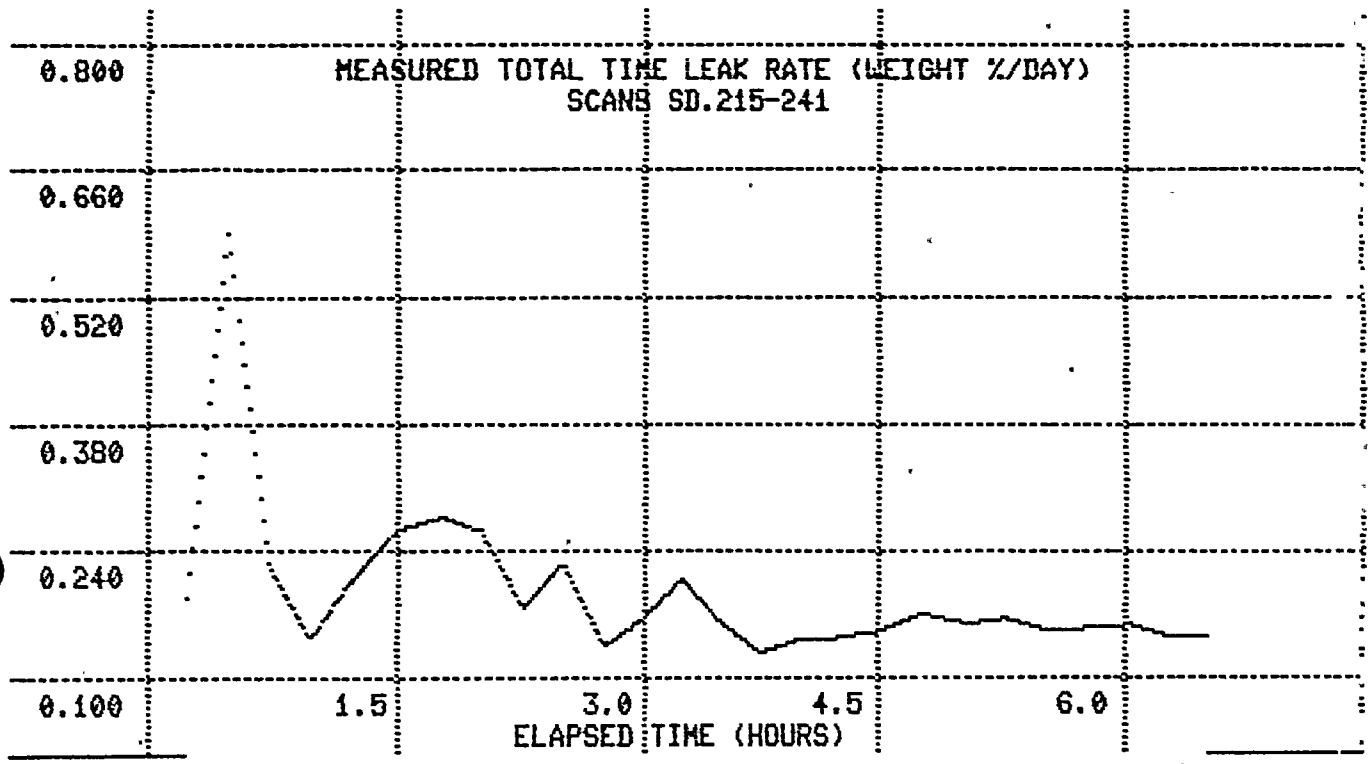
CLRT


56.000
55.860
55.720
55.580
55.440
55.300
AVERAGE RELATIVE HUMIDITY (%)
SCANS SD.215-241
1.5
3.0
4.5
6.0
ELAPSED TIME (HOURS)

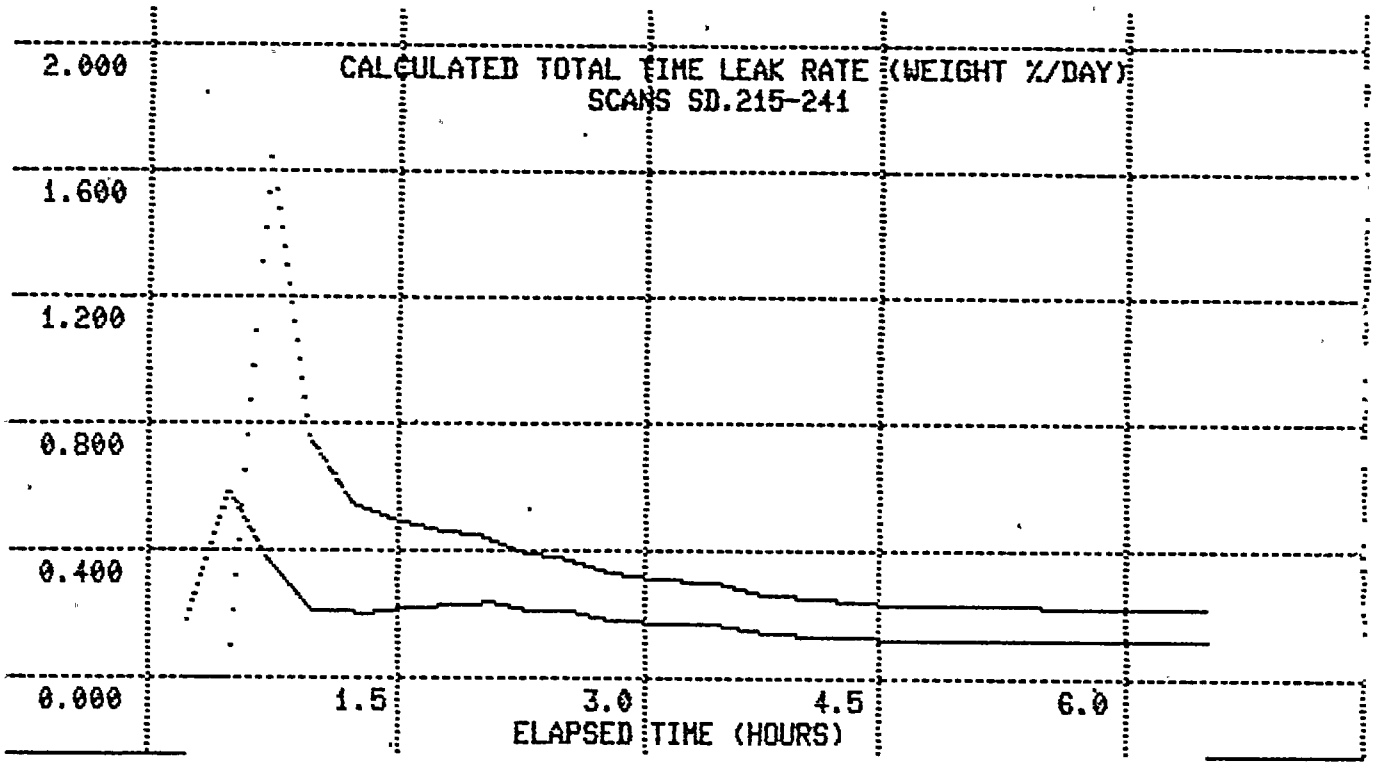
CLRT


811400.
CONTAINMENT MASS (LBS)
SCANS SD.215-241
811260.
811120.
810980.
810840.
810700.
1.5
3.0
4.5
6.0
ELAPSED TIME (HOURS)

CLRT


MEASURED TOTAL TIME LEAK RATE (WEIGHT %/DAY)
SCANS SD.215-241
0.800
0.660
0.520
0.380
0.240
0.100
1.5
3.0
4.5
6.0
ELAPSED TIME (HOURS)

CLRT


CALCULATED TOTAL TIME LEAK RATE (WEIGHT %/DAY)
SCANS SD.215-241
2.000
1.600
1.200
0.800
0.400
0.000
1.5
3.0
4.5
6.0
ELAPSED TIME (HOURS)

4.

GENERAL

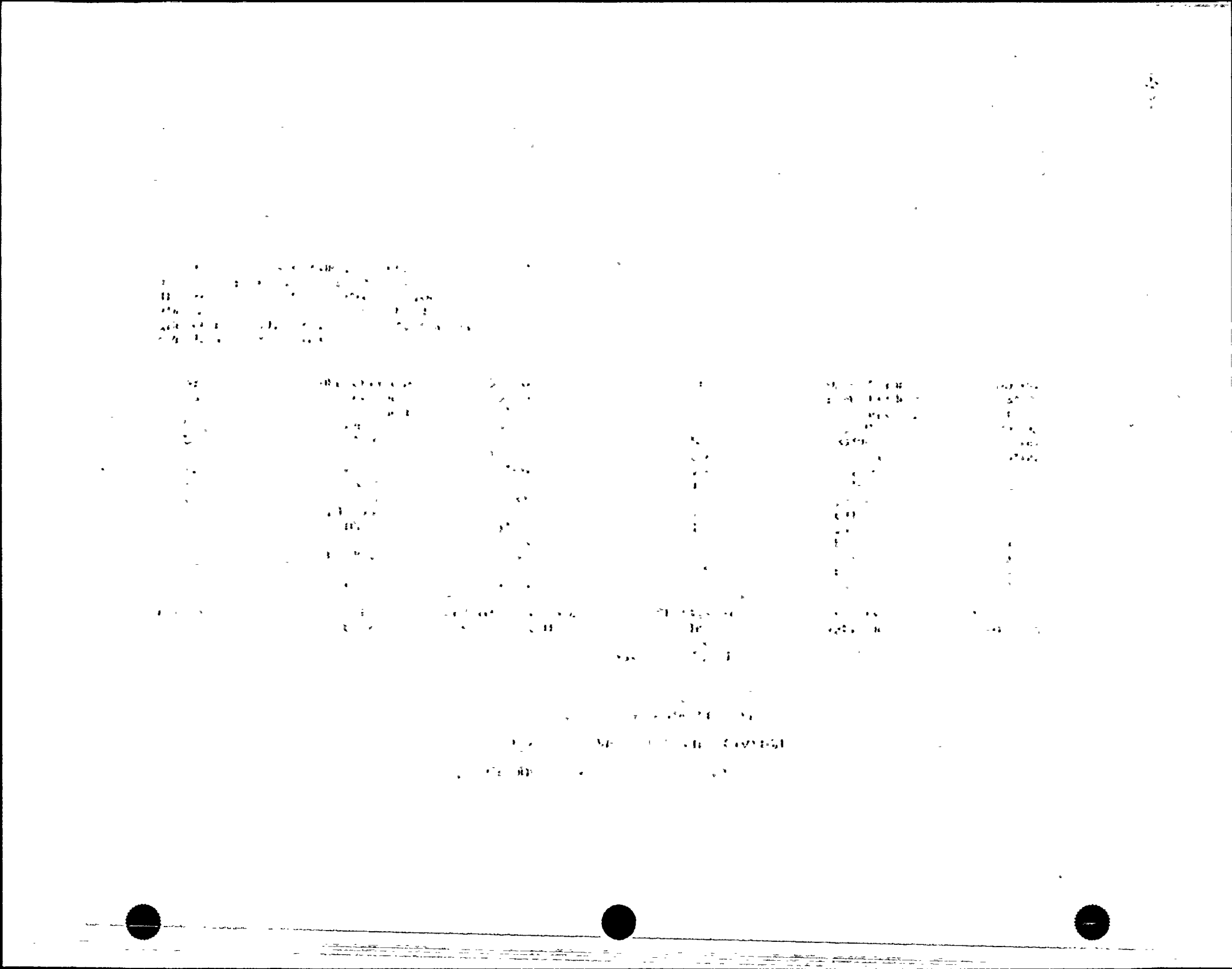
ARIZONA PUBLIC SERVICE COMPANY

PALO VERDE NUCLEAR GENERATING STATION

PRESSURE GAUGE CALIBRATION PROGRAM

CALIBRATION POINT	TRUE PRESSURE	PRESSURE GAUGE 1 GAUGE READING	PRESSURE GAUGE 1 MULTIPLICATION FACTOR	PRESSURE GAUGE 1 CORRECTION CONSTANT	PRESSURE GAUGE 2 GAUGE READING	PRESSURE GAUGE 2 MULTIPLICATION FACTOR	PRESSURE GAUGE 2 CORRECTION CONSTANT
1	0.000	* 0.000			* 0.000		
		*----------<	1.01649	0.000	*----------<	1.00706	0.000
2	4.993	* 4.912			* 4.958		
		*----------<	1.01751	-0.005	*----------<	1.00848	-0.007
3	9.990	* 9.823			* 9.913		
		*----------<	1.01726	-0.003	*----------<	1.01233	-0.045
4	14.999	* 14.747			* 14.861		
		*----------<	1.01958	-0.037	*----------<	1.01606	-0.101
5	19.997	* 19.649			* 19.780		
		*----------<	1.00974	0.157	*----------<	1.00709	0.077
6	24.971	* 24.575			* 24.719		
		*----------<	1.01525	0.021	*----------<	1.01237	-0.054
7	29.965	* 29.494			* 29.652		
		*----------<	1.01134	0.137	*----------<	1.01175	-0.035
8	34.959	* 34.432			* 34.588		
		*----------<	1.01114	0.144	*----------<	1.01134	-0.021
9	39.953	* 39.371			* 39.526		
		*----------<	1.01216	0.103	*----------<	1.01422	-0.135
10	44.947	* 44.305			* 44.450		
		*----------<	1.01042	0.180	*----------<	1.01428	-0.138
11	49.991	* 49.297			* 49.423		
		*----------<	1.01113	0.145	*----------<	1.01360	-0.104
12	54.986	* 54.237			* 54.351		
		*----------<	1.00787	0.322	*----------<	1.01319	-0.082
13	59.980	* 59.192			* 59.280		
		*----------<	1.00787	0.322	*----------<	1.01422	-0.143
14	64.973	* 64.146			* 64.203		
		*----------<	1.00604	0.439	*----------<	1.00848	0.226
15	69.970	* 69.113			* 69.158		
		*----------<	1.00382	0.593	*----------<	1.00624	0.380
16	74.964	* 74.088			* 74.121		
		*----------<	1.00523	0.488	*----------<	1.00665	0.350
17	79.960	* 79.058			* 79.084		
		*----------<	1.00201	0.743	*----------<	1.00060	0.828
18	84.952	* 84.040			* 84.073		
		*----------<	1.00180	0.760	*----------<	0.99840	1.014
19	89.946	* 89.025			* 89.075		
		*----------<	1.00040	0.886	*----------<	0.99802	1.047
20	94.991	* 94.068			* 94.130		
		*----------<	0.99920	0.998	*----------<	0.99740	1.105
21	99.985	* 99.066			* 99.137		

****



ARIZONA PUBLIC SERVIC COMPANY

PALO VERDE NUCLEAR GENERATING STATION

ILRT SUB-VOLUME WEIGHTING PROGRAM

DATE: 6-19-86 TIME: 08:37:01

DAS CHANNEL NO.	TYPE OF SENSOR	CONTAINMENT WEIGHTING FACTOR(%)	DAS CHANNEL NO.	TYPE OF SENSOR	CONTAINMENT WEIGHTING FACTOR(%)
1	RTD# 1	4.83	2	RTD# 2	4.83
3	RTD# 3	4.83	4	RTD# 4	4.83
5	RTD# 5	4.83	6	RTD# 6	4.83
7	RTD# 7	4.33	8	RTD# 8	4.33
9	RTD# 9	4.33	10	RTD#10	4.33
11	RTD#11	4.33	12	RTD#12	4.33
13	RTD#13	3.77	14	RTD#14	3.77
15	RTD#15	3.77	16	RTD#16	3.77
17	RTD#17	10.00	18	RTD#18	10.00
19	RTD#19	10.00	20	RTD#20	00.00
21	RTD#21	00.00	22	RTD#22	00.00
23	RTD#23	00.00	24	RTD#24	00.00
25	DEW CELL# 1	21.98	26	DEW CELL# 2	21.98
27	DEW CELL# 3	28.02	28	DEW CELL# 4	28.02
29	DEW CELL# 5	00.00	30	DEW CELL# 6	00.00

FAULTY PRESSURE GUAGE-- 2.
THE CONTAINMENT VOLUME IS 0.2600E+07 CUBIC FEET
THE NUMBER OF RTDS IN USE ARE 19.
THE TOTAL PERCENT FOR RTDS IS 100.000 %
THE NUMBER OF DEW CELLS IN USE IS 4.
THE TOTAL PERCENT FOR DEW CELLS IS 100.000 %

APPENDIX B

Type "B" and "C" Test Results

FIRST SURVEILLANCE TEST

MECHANICAL PENETRATIONS

PENETRATION NUMBER	SUBSYSTEM DESIGNATOR	CIV	VALVE SIZE (inches)	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT
6	DW	PDWE V061	2	8/15/83	0	0
		PDWE V062	2	8/15/83	0	0
7	FP	PFPE V089	6	10/18/83	1000	0
		PFPE V090	6	10/18/83	0	0
9	RD	JRDA UV-23	3	11/4/83	0	0
		JRDB UV-24	3	11/4/83	200	0
		JRDB UV-407	½	11/4/83	0	0
21	SI	PSIA V164	10	3/16/84	0	0
		JSIA UV-672	8	3/16/84	130	0
22	SI	PSIE V165	10	3/15/84	0	0
		JSIB UV671	8	3/15/84	0	0
25A	SQ	JHCB UV-44	1	7/28/83	0	0
		JHCA-UV-45	1	7/28/83	0	0
25B	SQ	JHCA UV-46	1	7/28/83	0	0
		JHCB UV-47	1	7/28/83	0	0
26	SI	JSID UV-654	16	12/5/84	>2000	0
		JSIB UV-656	16	12/5/84	>2000	0
		JSIB HV-690	10	12/5/84	0	0
		JSIB PSV-189	6	12/5/84	0	0
27	SI	JSIC UV-653	16	6/15/84	0	0
		JSIA UV-655	16	6/15/84	0	0
		JSIA HV-691	10	6/15/84	0	0
		JSIA PSV-179	6	6/15/84	650	0
28	SI	JSIA UV-682	2	2/24/84	0	0
		PSIE V463	2	2/24/84	0	0
		JSIE PSV-474	1	2/24/84	0	0
29	GA	PGAE V015	1	7/27/83	2	0
		JGAA UV-2	1	7/27/83	0	0
30	GA	PGAE V011	1	7/26/83	>2000	18
		JGAA UV-1	1	7/26/83	0	0
31	IA	PIAE V021	2	7/27/83	5	3.5
		JIAA UV-2	2	7/27/83	0	0
33	NC	PNCE V118	10	11/8/83	0	0
		JNCB UV-401	10	11/8/83	>2000	0
34	NC	JNCA UV-402	10	11/8/83	0	0
		JNCB UV-403	10	11/8/83	0	0
35	HP	JHPA UV-1	2	8/3/83	14	0
		JHPA UV-3	2	8/3/83	400	0
		JHPA HV-7A	1	8/3/83	0	0
36	HP	JHPB UV-2	2	8/16/83	0	0
		JHBP UV-4	2	8/16/83	11	0
		JHPB HV-8A	1	8/16/83	0	0
38	HP	PHPA V002	2	8/9/83	45	70
		JHPA UV-5	2	8/9/83	45	70
		JHPA HV-7B	1	8/9/83	0	0
		JHPA UV-23	1	8/9/83	0	0

[illegible]

FIRST SURVEILLANCE TEST

MECHANICAL PENETRATIONS

PENETRATION NUMBER	SUBSYSTEM DESIGNATOR	CIV	VALVE SIZE (inches)	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT
39	HP	PHPB V004	2	8/19/83	12	55
		JHPB UV-6	2	8/19/83	0	0
		JHPB HV-8B	1	8/19/83	0	0
40	CH	JCHA UV-516	3	11/19/84	0	0
		JCHB UV-523	3	11/19/84	0	0
		JCHB HV-924	½	11/19/84	0	0
41	CH	PCHE VM-70	3	2/27/84	0	0
		JCHA HV-524	2	2/27/84	0	0
		PCHE V854	1	2/27/84	0	0
42A	SS	JSSB UV-201	3/8	11/7/84	0	0
		JSSA UV-204	3/8	11/7/84	0	0
42B	SS	JSSB UV-202	3/8	11/8/84	0	0
		JSSA UV-205	3/8	11/8/84	0	0
42C	SS	JSSB UV-200	3/8	11/8/84	0	0
		JSSA UV-203	3/8	11/8/84	0	0
43	CH	JCHB UV-505	1	6/13/84	0	0
		JCHA UV-506	1	6/13/84	35	35
44	CH	JCHA UV-560	3	10/11/84	>2000	0
		JCHB UV-561	3	10/11/84	>2000	0
45	CH	PCHN V494	1½	10/10/84	200	12
		JCHA UV-580	1½	10/10/84	0	0
		JCHA UV-715	½	10/10/84	200	200
50	PC	PPCE V070	4	8/9/83	0	0
		PPCE V071	4	8/9/83	0	0
51	PC	PPCE V075	4	8/9/83	0	0
		PPCE V076	4	8/9/83	0	0
52	GR	JGRA UV-1	1	8/15/83	0	0
		JGRB UV-2	1	8/15/83	0	0
53	FH	N/A	66	5/11/84	0	0
56	CP	JCPA UV-002A	42	every 6mo	0	0
		JCPB UV-003A	42	every 6mo	0	0
57	CP	JCPA UV-002B	42	every 6mo	0	0
		JCPB UV-003B	42	every 6mo	0	0
58	CL	N/A	8	12/1/84	0	0
59	IA	PIAE V072	3	9/22/83	0	0
		PIAE V073	3	9/22/83	500	20
60	WC	PWCE V039	10	10/28/83	8	0
		JWCB UV-63	10	10/28/83	0	0
61	WC	JWCB UV-61	10	10/27/83	0	0
		JWCA UV-62	10	10/27/83	0	0
62B	CL	N/A	3/4	10/13/83	0	0
62C	CL	N/A	3/4	10/13/83	0	0
67	RC SI	PSIB V533	3	3/12/84	0	0
		JSID HV-331	3	3/12/84	0	0
72	CH	PCHN V835	1½	9/27/83	200	200
		JCHB HV-255	1½	9/27/83	0	0
77	RC SI	PSIA V523	3	3/9/84	0	0
		JSIC HV-321	3	3/9/84	0	0
78	CP	JCPA UV-004A	8	every 92d	0	0
		JCPB UV-005A	8	every 92d	0	0
79	CP	JCPA UV-004B	8	every 92d	0	0
		JCPB UV-005B	8	every 92d	0	0
L-1	ZC	N/A (5)	N/A	every 6 mo	0	0
L-2	ZC	N/A (6)	N/A	4/3/85	0	0
L-3	ZC	N/A (7)	N/A	every 6 mo	0	0

[illegible]

FIRST SURVEILLANCE TEST

ELECTRICAL PENETRATIONS

PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM)		PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM)	
		AS FOUND	AS LEFT			AS FOUND	AS LEFT
Z-01	8/31/83	0	0	Z-31	2.20/85	0	0
Z-02	8/30/83	0	0	Z-32	3/1/84	0	0
Z-03	8/31/83	0	0	Z-33	8/39/83	0	0
Z-04	8/30/83	0	0	Z-34	8/29/83	0	0
Z-05	8/31/83	0	0	Z-35	8/29/83	0	0
Z-06	8/30/83	0	0	Z-36	8/25/83 4/15/85	0	0
Z-07	8/31/83	0	0	Z-37	8/29/83	0	0
Z-08	8/30/83	0	0	Z-38	8/25/83	0	0
Z-09	8/31/83	0	0	Z-39	8/29/83	0	0
Z-10	8/30/83	0	0	Z-40	8/25/83	0	0
Z-11	8/31/83	0	0	Z-41	8/29/83	0	0
Z-12	8/30/83	0	0	Z-42	8/25/83	0	0
Z-13	8/31/83	0	0	Z-43	8/29/83	0	0
Z-14	8/30/83	0	0	Z-44	2/20/85	0	0
Z-15	8/31/83	0	0	Z-45	2/20/85	0	0
Z-16	8/30/83	0	0	Z-46	9/7/83	0	0
Z-17	9/2/83	0	0	Z-47	9/6/83	0	0
Z-18	9/1/83	0	0	Z-48	9/7/83	0	0
Z-19	9/2/83	0	0	Z-49	9/6/83	0	0
Z-20	9/1/83	0	0	Z-50	9/6/83	0	0
Z-21	9/2/83	0	0	Z-51	9/6/83 4/15/85	0	0
Z-22	9/1/83	0	0	Z-52	9/6/83	0	0
Z-23	9/2/83	0	0	Z-53	9/6/83	0	0
Z-24	9/1/83	0	0	Z-54	9/7/83	0	0
Z-25	9/2/83	0	0	Z-55	9/6/83	0	0
Z-26	9/1/83	0	0	Z-56	9/7/83	0	0
Z-27	9/2/83	0	0	Z-57	9/6/83	0	0
Z-28	9/1/83	0	0	Z-58	9/8/83	0	0
Z-29	9/2/83	0	0	Z-59	9/9/83	0	0
Z-30	9/1/83	0	0	Z-60	9/8/83	0	0

[illegible]

FIRST SURVEILLANCE TEST

ELECTRICAL PENETRATIONS

PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT	PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT
Z-61	9/7/83	0	0	Z-77	9/8/83	0	0
Z-62	9/8/83	0	0	Z-78	9/9/83	0	0
Z-63	9/7/83	0	0	Z-79	9/8/83	0	0
Z-64	9/8/83	0	0	Z-80	9/9/83	0	0
Z-65	9/7/83	0	0	Z-81	9/8/83	0	0
Z-66	9/8/83	0	0	Z-82	9/9/83	0	0
Z-67	9/7/83	0	0	Z-83	9/8/83	0	0
Z-68	9/8/83	0	0	Z-84	9/9/83	0	0
Z-69	9/7/83	0	0	Z-85	11/13/84	0	0
Z-70	2/21/85	0	0	Z-86	9/9/83	0	0
Z-71	9/9/83	0	0	Z-87	9/8/83	0	0
Z-72	9/9/83	0	0	Z-88	9/9/83	0	0
Z-73	9/8/83	0	0	Z-89	9/8/83	0	0
Z-74	9/9/83	0	0	Z-90	9/9/83	0	0
Z-75	9/8/83	0	0	Z-91	9/8/83	0	0
Z-76	9/9/83	0	0				

NOTES:

(1) Fuel Transfer Tube flange.
(2) ILRT Test Connection (pressurization/depressurization) flange.
(3) ILRT Pressure Sensing Line flange.
(4) ILRT Flow Test Verification (CLRT) flange.
(5) Personnel Lock (140' elevation).
(6) Equipment Hatch.
(7) Emergency Lock (100' elevation).

FIRST SURVEILLANCE TEST

TYPE "B" AND "C" TEST RESULTS

SUMMARY:

All tests were performed utilizing air or nitrogen as the test media at a minimum pressure of 49.2 psig (P_a) for a minimum duration of 15 minutes after stabilization.

DATA SUMMARY:

°total allowable (0.60 La) ..... 133,373 SCCM

°total "as-found" ..... >51,408 SCCM

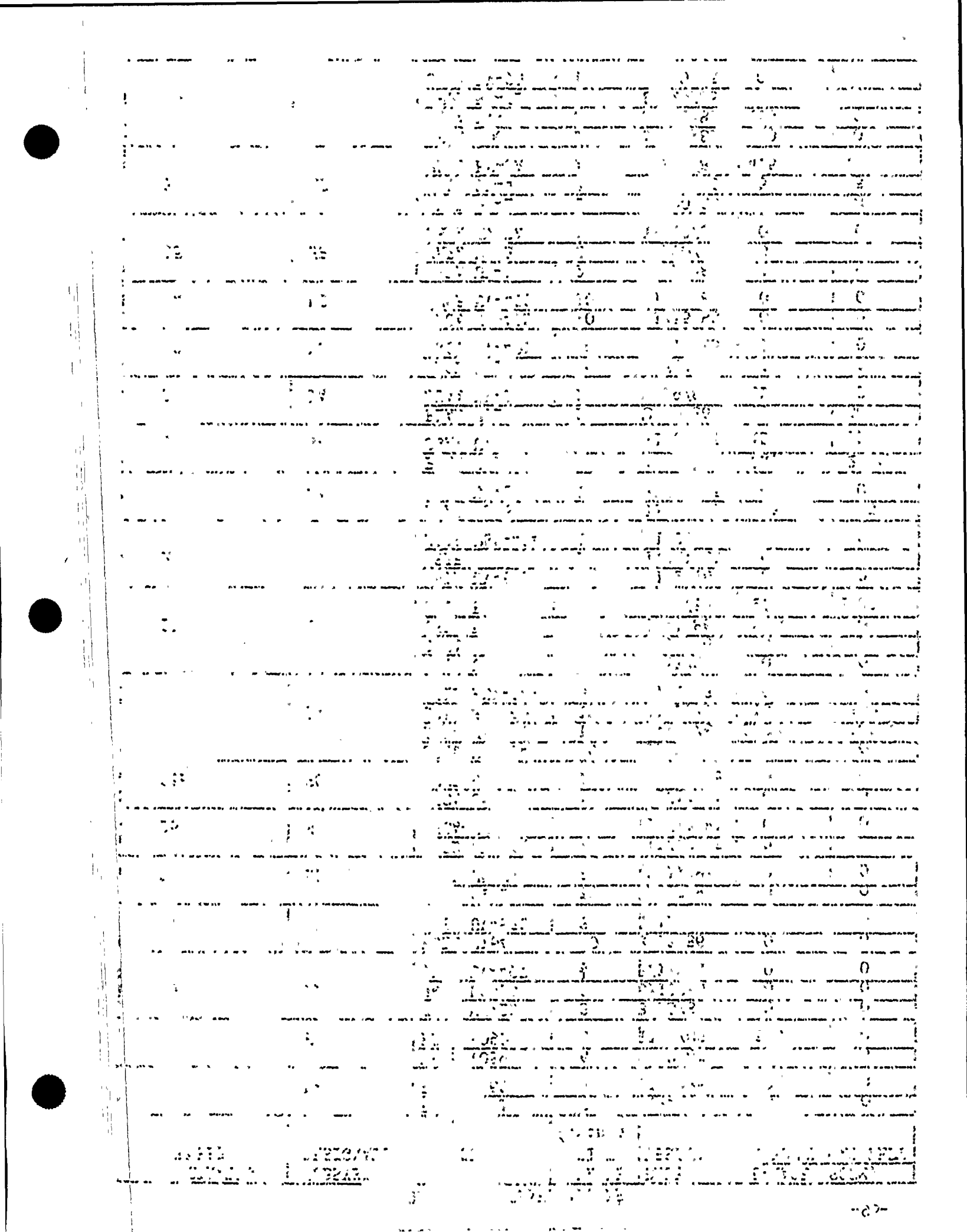
°total "as-left" ..... 916.5 SCCM

ACCEPTANCE CRITERIA:

The combined leakage rate of all Type B and C tests shall be less than 0.60 La or <133,373 SCCM.

CONCLUSIONS:

The combined leakage rate of all Type B and C tests was 916.5 SCCM which is well within the acceptance limit. The data substantiates that an acceptable test was performed in accordance with the requirements of 10CFR50, Appendix J.



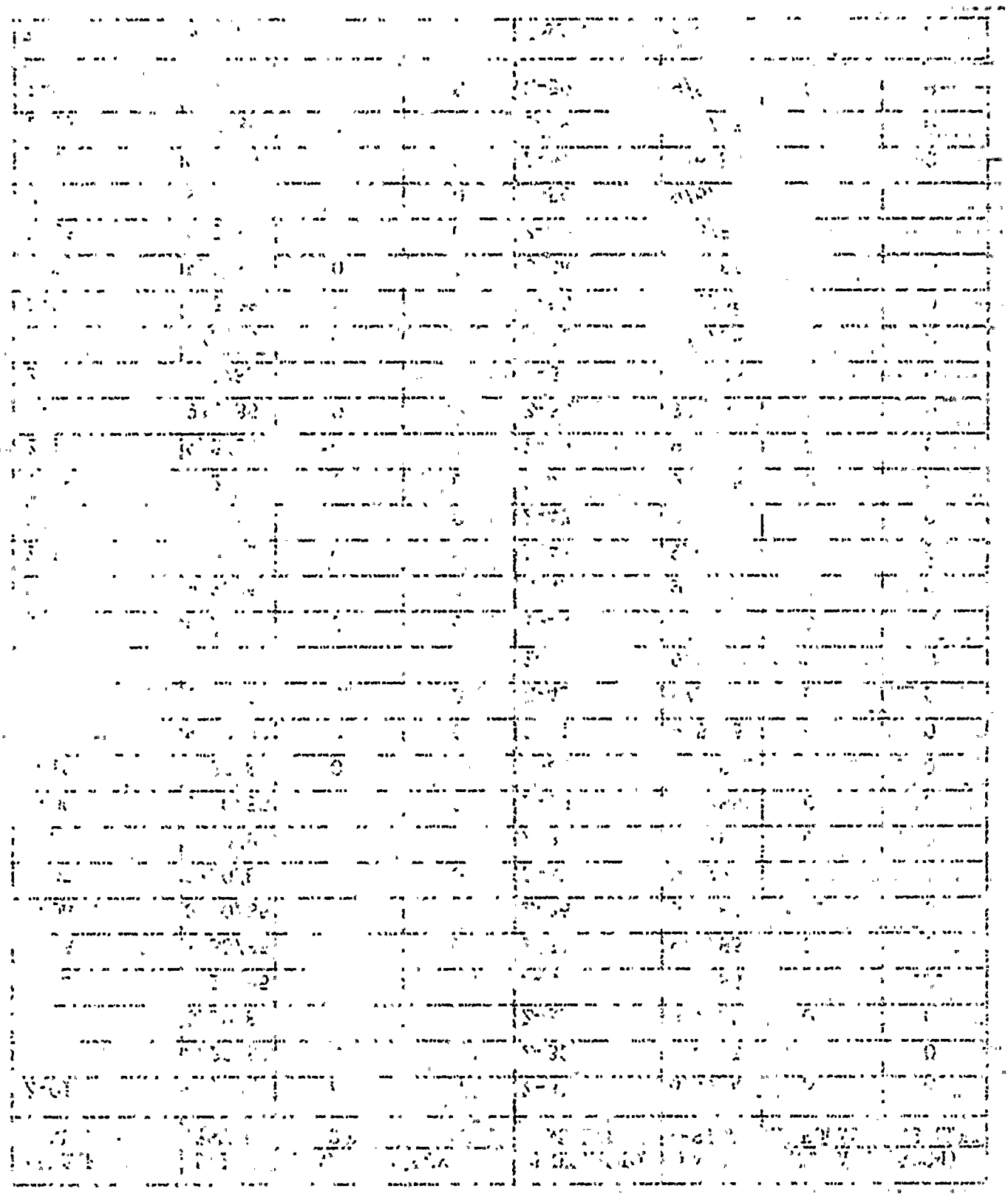
MECHANICAL PENETRATIONS

PENETRATION NUMBER	SUBSYSTEM DESIGNATOR	CIV	VALVE SIZE (inches)	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT
6	DW	PDWE V061	2	11/4/85	0	0
		PDWE V062	2	11/4/85	0	0
7	FP	PFPE V089	6	11/7/85	0	0
		PFPE V090	6	11/7/85	1500	0
9	RD	JRDA UV-23	3	3/13/86	0	0
		JRDB UV-24	3	3/13/86	0	0
		JRDB UV-407	½	3/1/386	0	0
21	SI	PSIA V164	10	3/15/86	0	0
		JSIA UV-672	8	3/15/86	0	0
22	SI	PSIE V165	10	3/17/86	0	0
		JSIB UV671	8	3/17/86	0	0
25A	SQ	JHCB UV-44	1	11/17/85	0	0
		JHCA-UV-45	1	11/17/85	0	0
25B	SQ	JHCA UV-46	1	11/17/85	0	0
		JHCB UV-47	1	11/17/85	0	0
26	SI	JSID UV-654	16	11/23/85	0	0
		JSIB UV-656	16	11/23/85	2200	2200
		JSIB HV-690	10	11/23/85	100	100
		JSIB PSV-189	6	11/23/85	0	0
27	SI	JSIC UV-653	16	3/11/86	0	0
		JSIA UV-655	16	3/11/86	0	0
		JSIA HV-691	10	3/11/86	>2000	0
		JSIA PSV-179	6	3/11/86	2700	2700
28	SI	JSIA UV-682	2	11/2/185	0	0
		PSIE V463	2	11/21/85	0	0
		JSIE PSV-474	1	11/21/85	0	0
29	GA	PGAE V015	1	11/16/85	15	15
		JGAA UV-2	1	11/16/85	0	0
30	GA	PGAE V011	1	11/16/85	24.5	24.5
		JGAA UV-1	1	11/16/85	15	15
31	IA	PIAE V021	2	3/19/86	30	30
		JIAA UV-2	2	3/19/86	12	12
33	NC	PNCE V118	10	11/15/85	0	0
		JNCB UV-401	10	11/15/85	0	0
34	NC	JNCA UV-402	10	11/15/85	0	0
		JNCB UV-403	10	11/15/85	0	0
35	HP	JHPA UV-1	2	11/20/85	0	0
		JHPA UV-3	2	11/20/85	0	0
		JHPA HV-7A	1	11/20/85	0	0
36	HP	JHPB UV-2	2	11/20/85	0	0
		JHBP UV-4	2	11/20/85	55	55
		JHPB HV-8A	1	11/20/85	4.5	4.5
38	HP	PHPA V002	2	11/20/85	140	0
		JHPA UV-5	2	11/20/85	160	0
		JHPA HV-7B	1	11/20/85	0	0
		JHPA UV-23	1	11/20/85	0	0

SECOND SURVEILLANCE TEST

MECHANICAL PENETRATIONS

PENETRATION NUMBER	SUBSYSTEM DESIGNATOR	CIV	VALVE SIZE (inches)	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT
39	HP	PHPB V004	2	11/20/85	45	0
		JHPB UV-6	2	11/20/85	24.5	0
		JHPB HV-8B	1	11/20/85	0	0
40	CH	JCHA UV-516	3	11/23/85	0	0
		JCHB UV-523	3	11/23/85	0	0
		JCHB HV-924	½	11/23/85	0	0
41	CH	PCHE VM-70	3	11/22/85	1500	0
		JCHA HV-524	2	11/22/85	0	0
		PCHE V854	1	11/22/85	0	0
42A	SS	JSSB UV-201	3/8	3/18/86	200	0
		JSSA UV-204	3/8	3/18/86	0	0
42B	SS	JSSB UV-202	3/8	3/18/86	0	0
		JSSA UV-205	3/8	3/18/86	0	0
42C	SS	JSSB UV-200	3/8	3/18/86	0	0
		JSSA UV-203	3/8	3/18/86	0	0
43	CH	JCHB UV-505	1	11/4/85	0	0
		JCHA UV-506	1	11/4/85	11.5	11.5
44	CH	JCHA UV-560	3	3/21/86	0	0
		JCHB UV-561	3	3/21/86	0	0
45	CH	PCHN V494	1½	3/11/86	>2000	0
		JCHA UV-580	1½	3/11/86	0	0
		JCHA UV-715	½	3/11/86	200	200
50	PC	PPCE V070	4	3/14/86	0	0
		PPCE V071	4	3/14/86	0	0
51	PC	PPCE V075	4	3/14/86	0	0
		PPCE V076	4	3/14/86	0	0
52	GR	JGRA UV-1	1	3/22/86	0	0
		JGRB UV-2	1	3/22/86	90	90
53	FH	N/A (1)	66	3/10/86	0	0
56	CP	JCPA UV-002A	42	every 6mo	0	0
		JCPB UV-003A	42	every 6mo	0 (a)	0
57	CP	JCPA UV-002B	42	every 6mo	0	0
		JCPB UV-003B	42	every 6mo	0	0
58	CL	N/A (2)	8	3/10/86	0	0
59	IA	PIAE V072	3	3/10/86	300	0
		PIAE V073	3	3/10/86	50	50
60	WC	PWCE V039	10	11/16/85	0	0
		JWCB UV-63	10	11/16/85	0	0
61	WC	JWCB UV-61	10	11/16/85	0	0
		JWCA UV-62	10	11/16/85	0	0
62B	CL	N/A (3)	3/4	3/10/86	0	0
62C	CL	N/A (4)	3/4	3/10/86	0	0
67	RC SI	PSIB V533	3	3/15/86	0	0
		JSID HV-331	3	3/15/86	3100	0
72	CH	PCHN V835	1½	3/13/86	14	14
		JCHB HV-255	1½	3/13/86	0	0
77	RC SI	PSIA V523	3	3/13/86	0	0
		JSIC HV-321	3	3/13/86	0	0
78	CP	JCPA UV-004A	8	every 92d	0	0
		JCPB UV-005A	8	every 92d	0	0
79	CP	JCPA UV-004B	8	every 92d	0	0
		JCPB UV-005B	8	every 92d	0	0
L-1	ZC	N/A (5)	N/A	every 6mo	20 (b)	20 (b)
L-2	ZC	N/A (6)	N/A	3/10/86	0	0
L-3	ZC	N/A (7)	N/A	every 6mo	2000 (c)	2000 (c)



PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM)		PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM)	
		AS FOUND	AS LEFT			AS FOUND	AS LEFT
Z-01	8/29/85	0	0	Z-31	9/3/85	0	0
Z-02	8/29/85	0	0	Z-32	9/4/85	0	0
Z-03	8/29/85	0	0	Z-33	9/4/85	0	0
Z-04	8/29/85	0	0	Z-34	9/4/85	0	0
Z-05	8/30/85	0	0	Z-35	9/4/85	0	0
Z-06	8/30/85	0	0	Z-36	9/4/85	0	0
Z-07	8/30/85	0	0	Z-37	9/5/85	0	0
Z-08	8/30/85	0	0	Z-38	9/5/85	0	0
Z-09	8/30/85	0	0	Z-39	9/5/85	0	0
Z-10	8/30/85	0	0	Z-40	9/5/85	0	0
Z-11	8/30/85	0	0	Z-41	9/5/85	0	0
Z-12	8/30/85	0	0	Z-42	9/5/85	0	0
Z-13	9/2/85	0	0	Z-43	9/5/85	0	0
Z-14	9/2/85	0	0	Z-44	9/5/85	0	0
Z-15	9/2/85	0	0	Z-45	9/5/85	0	0
Z-16	9/2/85	0	0	Z-46	9/6/85	0	0
Z-17	9/2/85	0	0	Z-47	9/6/85	0	0
Z-18	9/2/85	0	0	Z-48	9/6/85	0	0
Z-19	9/2/85	0	0	Z-49	9/6/85	0	0
Z-20	9/2/85	0	0	Z-50	9/6/85	0	0
Z-21	9/2/85	0	0	Z-51	9/6/85	0	0
Z-22	9/2/85	0	0	Z-52	9/6/85	0	0
Z-23	9/2/85	0	0	Z-53	9/6/85	0	0
Z-24	9/2/85	0	0	Z-54	9/6/85	0	0
Z-25	9/3/85	0	0	Z-55	9/6/85	0	0
Z-26	9/3/85	0	0	Z-56	9/6/85	0	0
Z-27	9/3/85	0	0	Z-57	9/6/85	0	0
Z-28	9/3/85	0	0	Z-58	9/9/85	0	0
Z-29	9/3/85	0	0	Z-59	9/9/85	0	0
Z-30	9/3/85	0	0	Z-60	9/9/85	0	0

[illegible]

SECOND SURVEILLANCE TEST

ELECTRICAL PENETRATIONS

PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT	PENETRATION NUMBER	DATE TESTED	LEAKAGE (SCCM) AS FOUND	LEAKAGE (SCCM) AS LEFT
Z-61	9/9/85	0	0	Z-77	9/11/85	0	0
Z-62	9/9/85	0	0	Z-78	9/11/85	0	0
Z-63	9/9/85	0	0	Z-79	9/11/85	0	0
Z-64	9/10/85	0	0	Z-80	9/11/85	0	0
Z-65	9/10/85	0	0	Z-81	9/11/85	0	0
Z-66	9/10/85	0	0	Z-82	9/12/85	0	0
Z-67	9/10/85	0	0	Z-83	9/12/85	0	0
Z-68	9/10/85	0	0	Z-84	9/12/85	0	0
Z-69	9/10/85	0	0	Z-85	9/12/85	0	0
Z-70	9/11/85	0	0	Z-86	9/12/85	0	0
Z-71	9/11/85	0	0	Z-87	9/12/85	0	0
Z-72	9/11/85	0	0	Z-88	9/12/85	0	0
Z-73	9/11/85	0	0	Z-89	9/12/85	0	0
Z-74	9/11/85	0	0	Z-90	9/12/85	0	0
Z-75	9/11/85	0	0	Z-91	9/12/85	0	0
Z-76	9/11/85	0	0				

NOTES:

(1) Fuel Transfer Tube flange.
(2) ILRT Test Connection (pressurization/depressurization) flange.
(3) ILRT Pressure Sensing Line flange.
(4) ILRT Flow Test Verification (CLRT) flange.
(5) Personnel Lock (140' elevation).
(6) Equipment Hatch.
(7) Emergency Lock (100' elevation).

(a) during 10/3/85 surveillance, valve UV-003A handwheel was found cracked open, preventing pressurization. Handwheel was closed, test was reperformed and leakage was Ø SCCM. All other "as-found"/"as-left" leakage rates were Ø SCCM.

(b) 5/14/86 test results only. All other surveillance test results for "as-found"/"as-left" were Ø SCCM.

(c) 5/7/86 test results only. All other surveillance test results for "as-found"/"as-left" were Ø SCCM.

SECOND SURVEILLANCE TEST

TYPE "B" AND "C" TEST RESULTS

SUMMARY:

All tests were performed utilizing air or nitrogen as the test media at a minimum pressure of 49.2 psig (P_a) for a minimum duration of 15 minutes after stabilization.

DATA SUMMARY:

°total allowable (0.60 La) ..... 133,373 SCCM

°total "as-found" ..... >18,496 SCCM

°total "as-left" ..... 7,541.5 SCCM

ACCEPTANCE CRITERIA:

The combined leakage rate of all Type B and C tests shall be less than 0.60 La or < 133,373 SCCM.

CONCLUSIONS:

The combined leakage rate of all Type B or C tests was 7,541.5 SCCM which is well within the acceptance limit. The data substantiates that an acceptable test was performed in accordance with the requirement of 10CFR50, Appendix J.