REACTOR CONTAINMENT BUILDING
INTEGRATED LEAKAGE RATE TEST

TYPES A, B, AND C
PERIODIC TESTS FOR
MAY 1983 TO MAY 1985

NEW YORK POWER AUTHORITY
JAMES A. FITZPATRICK NUCLEAR POWER PLANT
DOCKET NO. 50-333

Prepared by
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Boston, Massachusetts

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REFERENCES

1. 10CFR50, Appendix J, Primary Reactor Containment Leakage Testing For Water-Cooled Power Reactors, October 22, 1980.

2. F-ST-39F, Type "A" Test (60 PSIA) Primary Containment Integrated Leak Rate Test.

3. ANSI N45.4, American National Standard Leakage - Rate Testing of Containment Structures For Nuclear Reactors, March 16, 1972.

4. ANSI/ANS-56.8, Containment System Leakage Testing Requirements, February 19, 1981[1].

[1]This document used only as a guideline and any reference to said document in no way implies compliance.

SECTION 1

PURPOSE

The purpose of this report is to present a description and analysis of the May 1985 Periodic Type A Primary Containment Integrated Leakage Rate Test (PCILRT) and a summary of the last two periodic Type B and C tests conducted since May 1983 at the James A. FitzPatrick Nuclear Power Plant (JAFNPP). JAFNPP is owned and operated by the New York Power Authority (NYPA).

Stone & Webster Engineering Corporation (SWEC) provided engineering consultation services to NYPA during the performance of this test.

This report is submitted as required by 10CFR50, Appendix J, Paragraph V.B.

SECTION 2

SUMMARY

2.1 Type A Test

2.1.1 Test Summary

On May 13, 1985, pressurization was started at 0330 hours. A fairly constant rate of 6.8 psig per hour was established. Equipment problems with 16-FCV-101 (see Attachment 3.2C) interrupted primary containment pressurization at 0615 hours. Flow was reestablished through bypass valve LRA-3 at 0620 hours with a fairly constant rate of 7.0 psig per hour. At 0815 hours, 16-FCV-101 was placed back in service with a fairly constant pressurization rate of 4.2 psig per hour being maintained throughout the remainder of the pressurization period.

Primary containment pressurization was secured at 1230 hours on May 13, 1985, with a peak instantaneous pressure of 60.33 psia. During the pressurization period both drywell vent fans (68-FN-4D and 68-FN-2D) tripped on high current overload. At approximately 1630 hours, the average hourly drywell and torus temperature satisfied the procedural thermal stabilization criterion.

An extensive investigation of all penetration areas was conducted. This search revealed minor packing leaks on several valves, the most significant on 27-AOV-101B.

During the 24 hour test period from 1630 hours on May 13, 1985 to 1630 hours on May 14, 1985, a steady mass increase of about 7.2 lbm per hour was observed (Attachment 2.1A). This mass increase was initially attributed to the difference in torus water and air temperatures, but was later attributed to an increasing torus water level of approximately 5 gpm and an increasing drywell equipment sump water level of approximately 0.5 gpm.

With the calculated mass adjusted for the torus water inleakage, a stable mass loss of about 7.1 lbm per hour was observed. This rate was below the procedural acceptance criteria rate of 0.375%/day (13 lbm per hour).

The Type A PCILRT was successfully completed at 1630 hours on May 14, 1985 with a total Type A leakage of 0.281214%/day. A superimposed leakage verification test was successfully completed from 1730 to 2130 hours on May 14, 1985.

In accordance with the U.S. Nuclear Regulatory Commission's (USNRC) request, an investigation of certain pathways was conducted in order to identify the source of torus water inleakage. For example the condensate transfer supply ("Keep Full") to the Residual Heat Removal (RHR) System was isolated. Also, 10-RV-41B was gagged since it was suspected to be leaking (warm tail pipe) back to the torus. The containment mass and the torus water level rate of change were monitored during this investigation. No significant change in the torus water level inleakage rate was detected during the investigation.

Drywell equipment sump cooling water was also isolated prior to the test since it was suspected that it had been leaking into the Drywell Equipment Sump. This also did not prove to be a water inleakage source, as the level still increased during the Type A test (see Section 3.3.2.d for the correction).

Depressurization of the primary containment began at 0200 hours on May 15, 1985 with a drywell pressure of about 60.2 psia and was completed at 0845 hours.

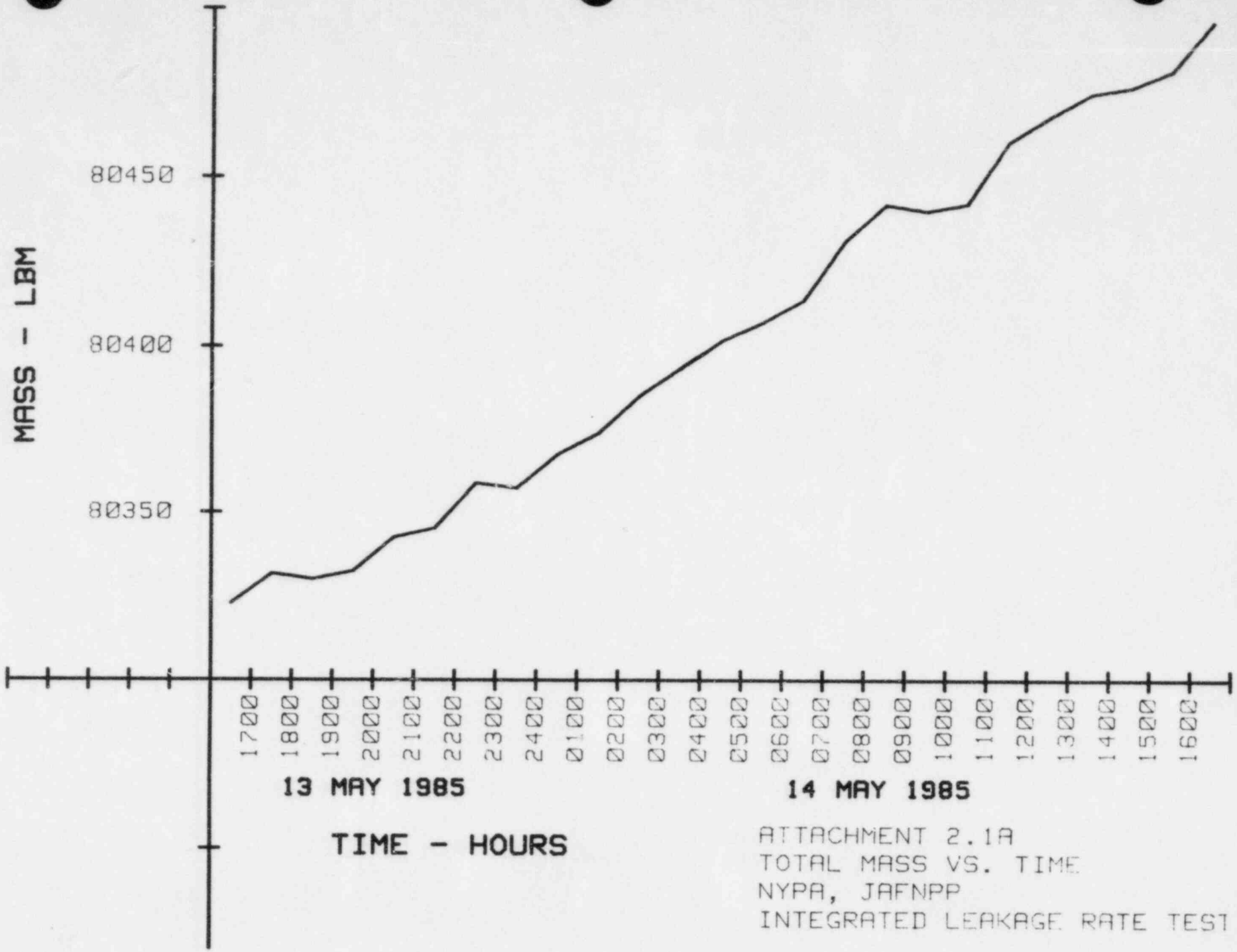
2.1.2 Conclusion

a. The calculated air mass, when adjusted for the torus water inleakage, results in a leakage rate well within the procedural acceptance criteria. Although the source of the torus water inleakage could not be identified, it was the cause of the increasing air mass. As shown in Attachment 2.1A, the water level rate of increase was uniform throughout the Type A test period.

2.2 LOCAL LEAKAGE RATE TESTS (Types B and C)

The Local Leakage Rate Tests (LLRTs) of containment isolation valves and other primary containment penetrations were performed by the methods described in the plant surveillance procedure No. F-ST-39B, "Type 'B' and 'C' LLRT of Containment Penetrations."

Data for the two surveillance periods (1983 and 1985) of LLRTs performed since the last Type A Test in accordance with Appendix J, 10CFR50, Paragraph V.B., is summarized in Section 4 of this report.



ATTACHMENT 2.1A
TOTAL MASS VS. TIME
NYPA, JAFNPP
INTEGRATED LEAKAGE RATE TEST

SECTION 3

TYPE A TEST

3.1 EDITED LOG OF EVENTS

This log was edited from the Official PCILRT Log of Events, Shift Supervisor's Log, Nuclear Control Room Operator's Log, and Auxiliary Operator C's Log.

May 10, 1985

At 0800 hours, the valve lineups were started for the PCILRT.

May 11, 1985

At 2300 hours, used 06-LI-94C instead of 06-LI-94B as control room reactor vessel level indicator backup.

May 12, 1985

At 0001 hours, commenced processing torus water in order to meet 0.0 to -1.5 in.

At 0400 hours, successfully completed the local leakage rate test on the drywell head.

At 0500 hours, the primary containment inspection was completed.

At 1700 hours, observed a drywell equipment sump inleakage of approximately 0.5 gpm. Isolated drywell sump cooler and drywell cooler "A" to determine if the drywell sump cooler was the source of leakage.

At 2315 hours, successfully completed the local leakage rate test on the personnel hatch.

May 13, 1985

At 0215 hours, completed all PCILRT prerequisites.

At 0330 hours, commenced primary containment pressurization in accordance with surveillance procedure No. F-ST-39F entitled "Type A Test (60 psia) Primary Containment Integrated Leak Rate Test."

At 0615 hours, 16-FCV-101 closed.

At 0620 hours, opened bypass valve LRA-3.

At 0815 hours, 16-FCV-101 placed back in service.

At 0845 hours, drywell vent fan 68-FN-4D tripped on high current overload.

At 1015 hours, drywell vent fan 68-FN-2D tripped on high current overload.

At 1050 hours, isolated "Keep Full" to standby loop of RHR (A side). Torus water level pumped down from -0.72 to -1.03.

At 1230 hours, with the drywell pressure at 60.3 psia (instantaneous computer reading), the pressurization equipment was isolated and secured. The minimum 4-hour stabilization period began.

At 1515 hours, extensive search for leakage paths completed. This search revealed minor packing leaks on several valves, the most significant on 27-AOV-101B.

At 1610 hours, pumped down drywell equipment sump.

At 1630 hours, the temperature stabilization criterion was satisfied and the PCILRT was started.

May 14, 1985

At 0215 hours, investigated all possible sources of inleakage to the drywell. None were found.

At 0830 hours, torus water level increased 0.90 in. in 16 hours.

At 1630 hours, the PCILRT test period was completed, and preparation for the superimposed leakage verification test began.

At 1700 hours, the superimposed leakage verification test stabilization period was initiated with an imposed leakage of approximately 5375 SCFD.

At 1730 hours, began the superimposed leakage verification test period.

At 2130 hours, the superimposed leakage verification test was completed.

At 2300 hours, gagged 10-RV-41B to determine if this was the source of torus water inleakage.

May 15, 1985

At 0200 hours, the packing on 27-AOV-101B was adjusted. The PCILRT, the verification test, and the torus water inleakage investigation were documented as complete. The depressurization of the primary containment was started.

At 0845 hours, depressurization of the primary containment was completed.

3.2 GENERAL TEST DESCRIPTION

3.2.1 Prerequisites

In accordance with the James A. FitzPatrick PCILRT Procedure F-ST-39F (Reference 2), the following is a listing of the pertinent prerequisites completed and documented prior to primary containment pressurization:

a. Site meteorological data recorded at least three days prior to and during the performance of the PCILRT (Attachment 3.2A).

b. All required test instrumentation cleaned, calibrated within 6 months of the test, and placed in service.

c. All required Types B and C leakage rate testing completed.

d. Satisfactory inspection of accessible interior and exterior surfaces of the primary containment structures and components completed.

e. Temporary air compressors and test skid ready for use as the pressurization source.

f. Two drywell ventilation fans adjusted for continuous operation at test pressure (45 psig), and their associated dampers blocked in the open position.

g. All computer software used for test calculations tested and operational.

h. Valves lined up and tagged in accordance with the Valve Line-Up List.

i. Water levels recorded for the suppression pool, reactor vessel, drywell equipment sump, and drywell floor drain sump.

j. Controlled Work Area Plan in effect.

k. An Official Log of Events located in the Control Room and maintained by the Test Director.

3.2.2 Equipment and Instrumentation

Pressurization of the primary containment was achieved by the utilization of a temporary system consisting of two parallel compressor trains. Each train consisted of two air compressors which were manifolded through an in-line water cooled heat exchanger and refrigerant air dryer (Attachment 3.2B). The discharge of the temporary system was routed to the primary containment via the drywell spray portion of the RHR System (Attachment 3.2C). The system included adequate instrumentation and valving to maintain proper monitoring and control of the compressed air quality throughout the pressurization sequence. The total capacity of the pressurization system was 3,600 cubic feet per minute.

The various containment parameters required to calculate containment leakage during the test were monitored by the leakage monitoring system instrumentation. The instrumentation consisted of multiple resistance temperature detectors (RTDs), moisture detectors (dewcells), and absolute pressure quartz manometers for both the drywell and torus. Pertinent data for the test instrumentation is listed in Attachment 3.2D. The general locations of the temperature and moisture sensors, including applicable test zones, are shown in Attachments 3.2E and 3.2F.

A mass flow meter was used to perform the superimposed leakage verification test (Attachment 3.2G). All test instrumentation with the exception of that used for the superimposed leakage verification test was monitored by the plant process computer for data acquisition.

3.2.3 Data Acquisition System

The James A. FitzPatrick plant process computer system (PPCS) performs reactor core calculations and provides the plant operator with current core operating data. The PPCS also scans, calculates, stores, logs, and alarms information which has been collected for the plant operation.

The PPCS analog scan package reads all the analog inputs in a pre-established manner, converts these readings into engineering units, and then stores these values into predefined locations for use by the plant operators and by the plant application programs.

For the PCILRT, the function of the PPCS is to provide and transmit at five minute intervals sufficient sensor and zone pair information for input to a remote AT&T 3B2/300 computer (PCILRT computer) PCILRT calculation program. The PPCS PCILRT sensor program converts binary-coded decimal digital information from each manometer to an analog value.

For the PCILRT, the plant computer monitored the following instrumentation:

Type	Scan Rate (sec)
18 RTDs	60
6 Dewcells	60
4 Absolute Manometers	60

3.2.4 Data Resolution System

Periodically, during the PCILRT test period, leakage rate trends were monitored from data obtained from the plant process computer. The PCILRT computer program converts the dewcell equilibrium temperature to dewpoint temperature, and calculates a zone pair average (see Attachment 3.2E and 3.2F). This data along with the instantaneous sensor values and the difference between the two averaged sensor values for each zone are logged on the utility typer every 10 minutes.

After the appropriate data had been acquired and averaged utilizing the PCILRT computer system, the results were inputted for leakage rate calculations, utilizing the Absolute Method of Mass Point Analysis.

Absolute Method of Mass Point Analysis

The Absolute Method of Mass Point Analysis consists of calculating air masses within the containment structure over the test period from pressure, temperature, and dewpoint observations made during the PCILRT. The air masses are computed using the ideal gas law as follows:

$$\text{Mass} = \frac{144V(P-Pv)}{RT} \qquad \text{(Eq. 1)}$$

where:

M = air mass, lbm
P = total pressure, psia
Pv = average vapor pressure, psia
R = 53.35 ft-lbf/lbm°R (for air)
T = average containment temperature, °R
V = containment free volume, ft^3

There are two containments: torus (suppression chamber) and drywell. The masses for each containment are computed separately and added together. The leakage rate is then determined by plotting the total air mass as a function of time, using a least-squares fit to determine the slope, A = dM/dT. The leakage rate is expressed as a percentage of the air mass lost in 24 hours or symbolically:

$$\text{Leakage Rate} = A/B(-2400) \qquad \text{(Eq.2)}$$

where A is the slope of the least-squares curve and B is the y-intercept. The sign convention is such that the leakage out of containment is positive and the units are in percent/day.

A 95 percent confidence interval is calculated using a Students T distribution. The sum of the leakage rate and the 95 percent confidence interval is the upper confidence limit (UCL). The measured leakage rate may be described as 95 percent accurate to within the value of the UCL.

ATTACHMENT 3.2A

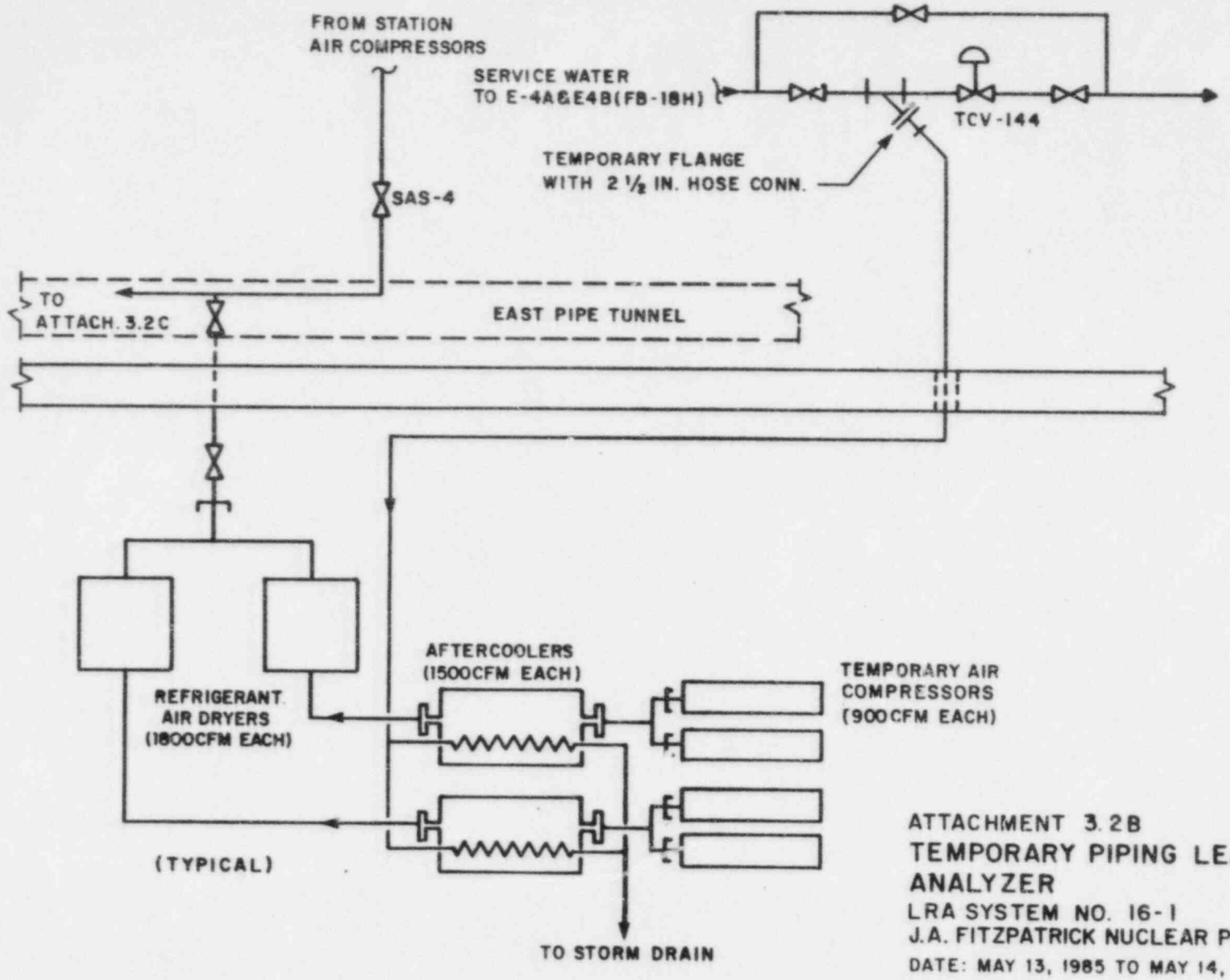
SITE METEOROLOGY

Date	Time	Temperature Ambient, °F	Barometric Pressure, in. Hg	Wind Velocity, mph	Wind Direction	Dew Point Temperature °F	Reactor Bldg. Temperature °F
5/9/85	1500	64.3	29.87	7.0	232.9° (SW)	21.2	68
	2300	65.3	29.79	8.1	183.3	35.0	75
5/10/85	0700	65.2	29.75	11.2	197.6	38.6	73
	1500	62.8	29.71	12.4	244.8	21.4	69
	2300	71.0	29.72	10.3	224.9	19.4	78
5/11/85	0700	65.0	29.77	6.1	206.8	23.7	70
	1500	69.7	29.78	3.4	34.2	21.4	72
	2300	68.5	29.73	4.1	95.7	15.4	74
5/12/85	0700	66.8	29.71	7.9	134.5	16.6	71
	1500	65.4	29.66	3.4	285.4	57.7	72
	2300	N/A	N/A	N/A	N/A	N/A	72
5/13/85	0330 - Start Pressurization						
	0400	N/A	N/A	N/A	N/A	N/A	N/A
	0500	N/A	N/A	N/A	N/A	N/A	N/A
	0600	N/A	N/A	N/A	N/A	N/A	N/A
	0700	N/A	N/A	N/A	N/A	N/A	70
	0800	70.5	29.64	9.3	228.4	22.6	N/A
	0900	69.2	29.65	12.8	240.0	15.3	N/A
	1000	62.7	29.66	14.0	247.1	14.5	N/A
	1100	54.6	29.67	12.1	251.7	22.0	N/A
	1200	53.0	29.66	13.2	247.8	26.1	N/A

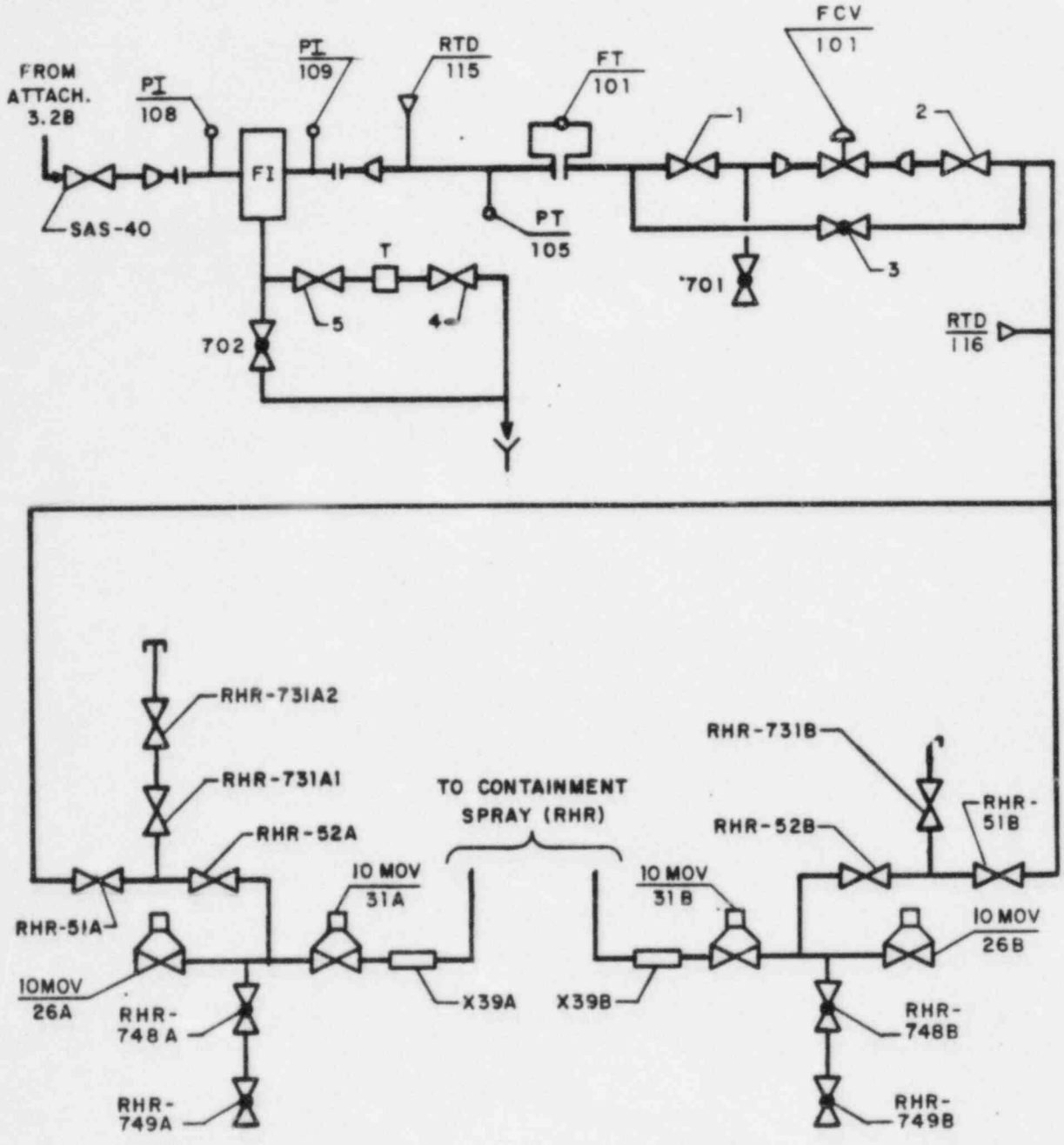
Date	Time	Temperature Ambient, °F	Barometric Pressure, in. Hg	Wind Velocity, mph	Wind Direction	Dew Point Temperature °F	Reactor Bldg. Temperature °F
5/13/85	1300	52.2	29.67	12.6	250.4	24.0	N/A
	1400	56.0	29.67	13.6	257.9	22.0	N/A
	1500	56.9	29.67	12.3	247.2	27.5	69
	1600	57.9	29.67	13.3	247.7	25.1	68
	1630 - Start PCILRT						
	1700	56.0	29.66	12.6	249.4	22.0	70
	1800	54.5	29.67	12.4	249.7	18.8	69
	1900	53.6	29.67	13.1	248.3	17.1	70
	2000	52.6	29.68	12.6	247.5	16.0	70
	2100	52.1	29.70	12.9	247.5	16.7	70
	2200	51.3	29.70	11.2	260.1	21.4	70
	2300	52.7	29.71	10.2	241.7	26.9	70
	2400	52.1	29.73	12.0	242.5	22.8	70
5/14/85	0100	50.5	29.75	11.2	242.8	21.1	70
	0200	48.7	29.75	10.0	252.6	19.5	70
	0300	49.7	29.75	6.8	239.2	18.1	70
	0400	50.4	29.74	5.3	228.5	16.3	69
	0500	49.9	29.76	7.5	238.3	16.3	69
	0600	48.6	29.77	9.0	241.9	16.2	69
	0700	48.8	29.80	9.0	243.2	15.2	69
	0800	49.0	29.82	11.0	246.0	13.3	69
	0900	47.7	29.83	10.8	288.5	13.1	69
	1000	47.5	29.85	9.9	333.5	N/A	70
	1100	46.8	29.86	9.9	348.5	N/A	70
	1200	47.1	29.87	5.2	357.1	N/A	69
	1300	N/A	N/A	N/A	N/A	N/A	69
	1400	N/A	N/A	N/A	N/A	N/A	69
	1500	52.6	29.89	5.0	303.3	45.5	69
	1600	53.7	29.89	5.4	6.4	45.6	69
	1630 - Complete PCILRT						

NOTE:

N/A - Site Meteorology Data Computer Inoperable.



ATTACHMENT 3.2B
TEMPORARY PIPING LEAK RATE ANALYZER
LRA SYSTEM NO. 16-1
J.A. FITZPATRICK NUCLEAR POWER PLANT
DATE: MAY 13, 1985 TO MAY 14, 1985



NOTE:

ALL MANUAL VALVES ARE PREFIXED WITH LRA, WHICH IS LEAK RATE ANALYZER SYSTEM NO. 16-1, EXCEPT AS NOTED.

ATTACHMENT 3.2C

PERMANENT PIPING LEAK RATE ANALYZER

LRA SYSTEM NO. 16-1

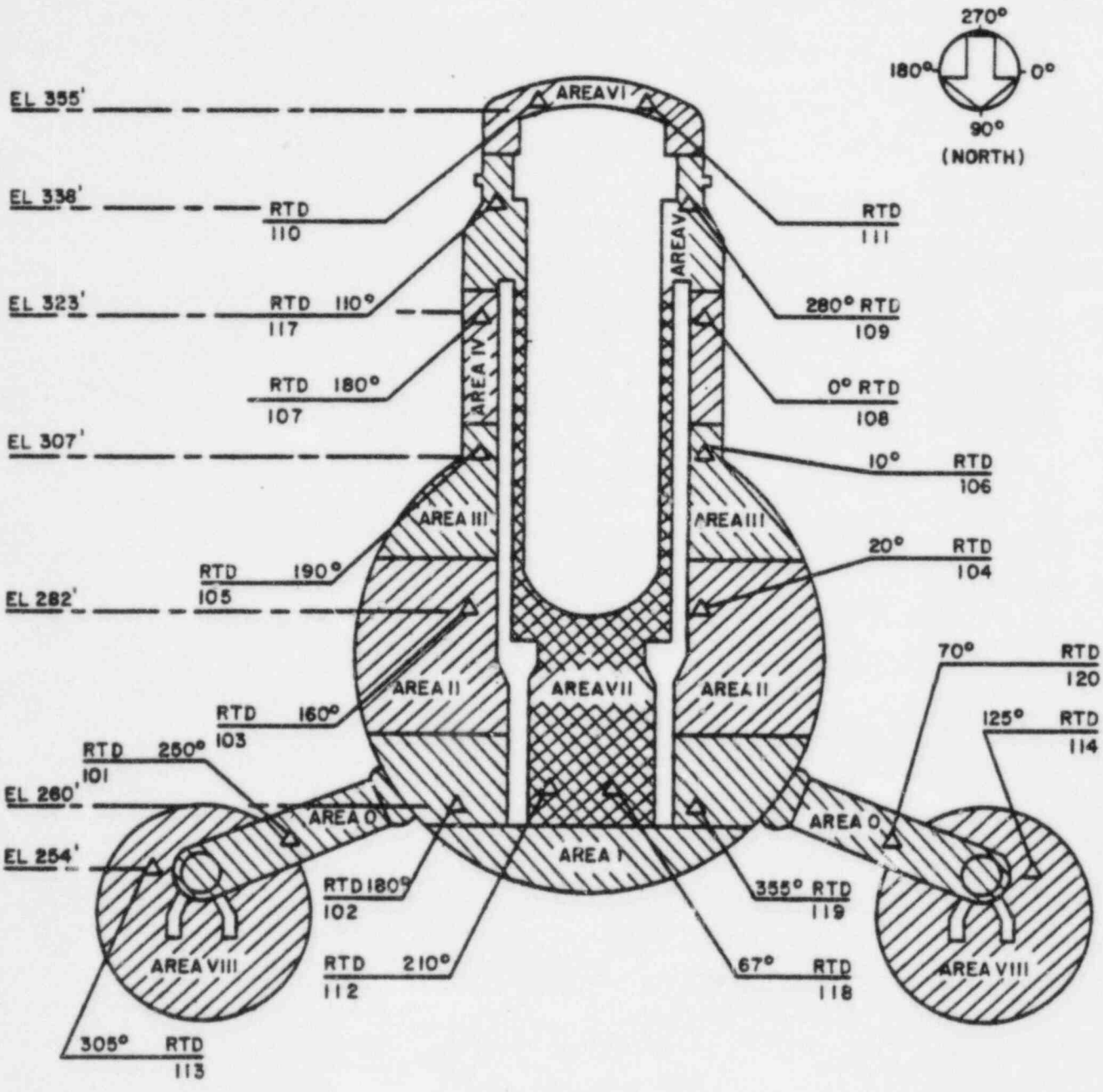
J.A. FITZPATRICK NUCLEAR POWER PLANT

DATE: MAY 13, 1985 TO MAY 14, 1985

ATTACHMENT 3.2D

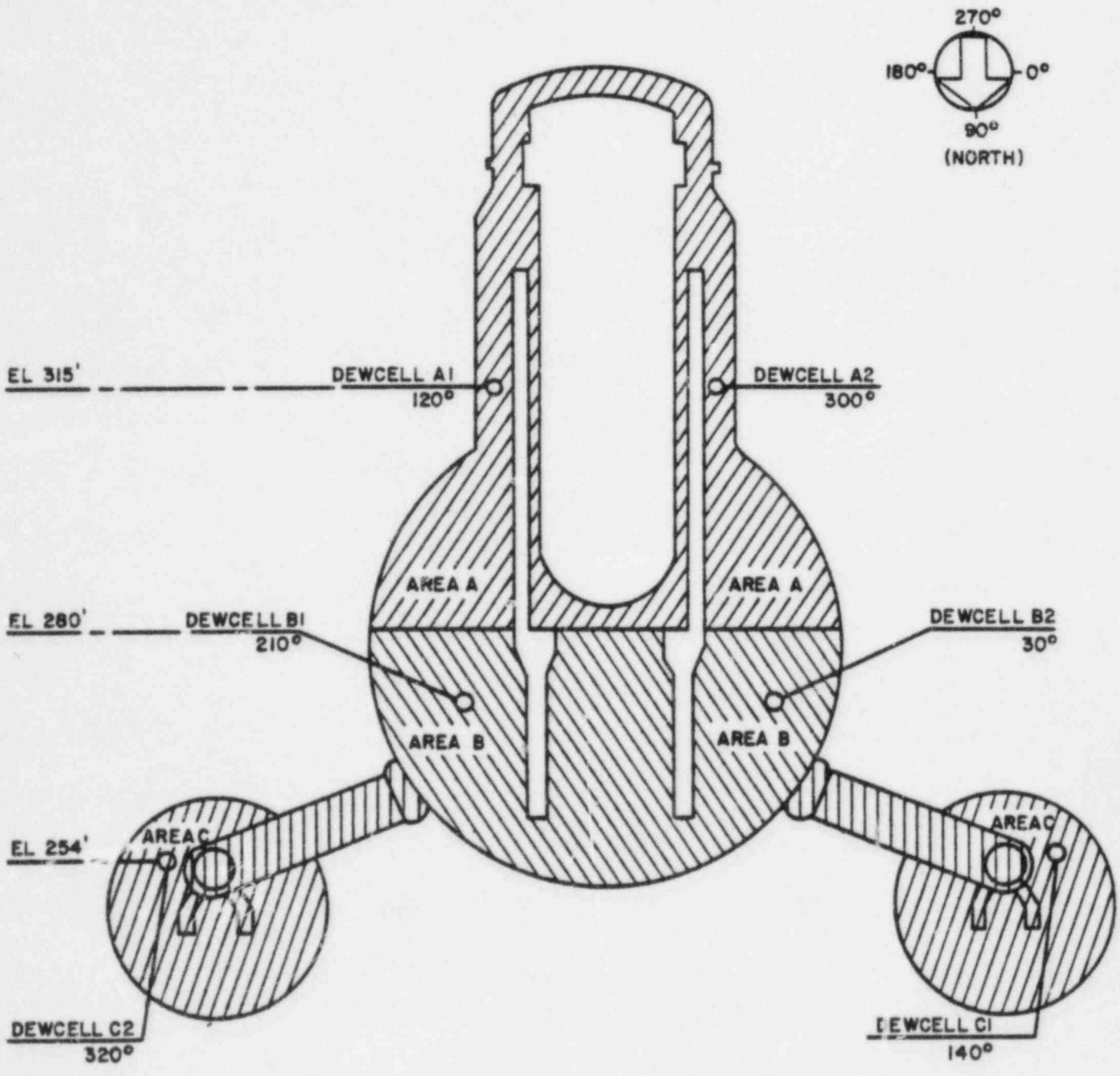
INSTRUMENTATION

Instrument	Weight Factor	Computer Point	Range	Zone	Accuracy
A. Temperature					
16-1-RTD-101	0.056755	M103	0°-300°F	0	±1.0°F
16-1-RTD-120	0.056755	M116	0°-300°F	0	±1.0°F
16-1-RTD-102	0.082510	M084	0°-300°F	1	±1.0°F
16-1-RTD-119	0.082510	M115	0°-300°F	1	±1.0°F
16-1-RTD-103	0.178020	M085	0°-300°F	2	±1.0°F
16-1-RTD-104	0.178020	M086	0°-300°F	2	±1.0°F
16-1-RTD-105	0.065685	M087	0°-300°F	3	±1.0°F
16-1-RTD-106	0.065685	M088	0°-300°F	3	±1.0°F
16-1-RTD-107	0.023505	M089	0°-300°F	4	±1.0°F
16-1-RTD-108	0.023505	M090	0°-300°F	4	±1.0°F
16-1-RTD-109	0.026685	M091	0°-300°F	5	±1.0°F
16-1-RTD-117	0.026685	M113	0°-300°F	5	±1.0°F
16-1-RTD-110	0.035765	M092	0°-300°F	6	±1.0°F
16-1-RTD-111	0.035765	M093	0°-300°F	6	±1.0°F
16-1-RTD-112	0.031075	M094	0°-300°F	7	±1.0°F
16-1-RTD-118	0.031075	M114	0°-300°F	7	±1.0°F
16-1-RTD-113	0.500000	M095	0°-300°F	8	±1.0°F
16-1-RTD-114	0.500000	M102	0°-300°F	8	±1.0°F
B. Pressure					
16-1-PIT-101	0.50	M096	0-100 psia	Drywell	±0.02%
16-1-PIT-102	0.50	M097	0-100 psia	Drywell	±0.02%
16-1-PIT-103	0.50	M098	0-100 psia	Torus	±0.02%
16-1-PIT-104	0.50	M099	0-100 psia	Torus	±0.02%
C. Dewpoint					
16-1-DC-A1	0.50	T062	38.5°-118.5°F	A	±1°-2°F
16-1-DC-A2	0.50	T063	38.5°-118.5°F	A	±1°-2°F
16-1-DC-B1	0.50	T064	38.5°-118.5°F	B	±1°-2°F
16-1-DC-B2	0.50	T065	38.5°-118.5°F	B	±1°-2°F
16-1-DC-C1	0.50	T066	38.5°-118.5°F	C	±1°-2°F
16-1-DC-C2	0.50	T067	38.5°-118.5°F	C	±1°-2°F
D. Superimposed Leakage Verification Test Flow Instrument					
Mass Flow Meter	N/A	N/A	0-150 SLPM	N/A	±2% F.S.



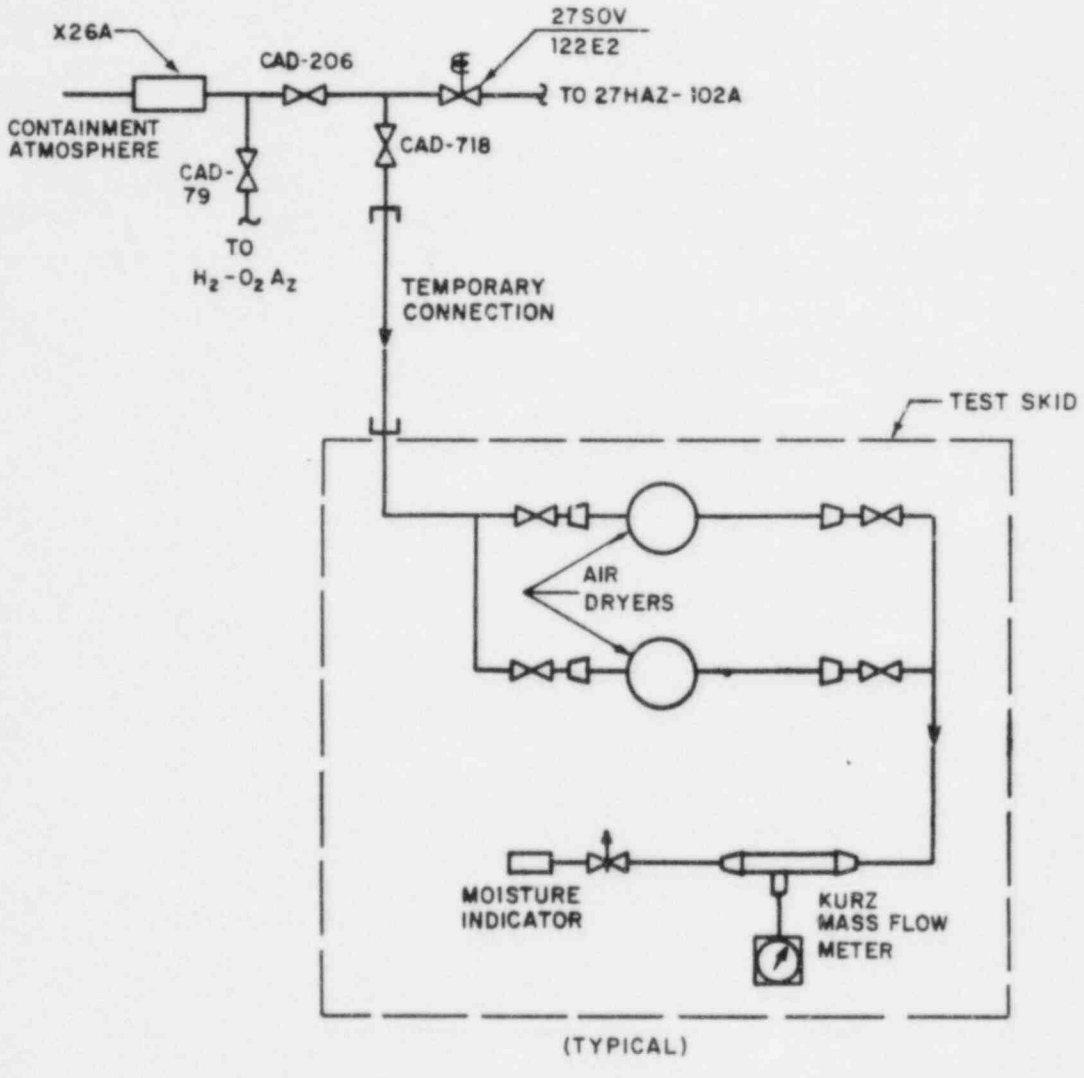
NOTE
RTD ELEVATIONS AND AZIMUTH POSITIONS ARE APPROXIMATE

ATTACHMENT 3.2E
PCILRT TEMPERATURE DETECTOR LOCATIONS
LRA SYSTEM NO. 16-1
J.A. FITZPATRICK NUCLEAR POWER PLANT
DATE: MAY 13, 1985 TO MAY 14, 1985



NOTE
MOISTURE DETECTOR ELEVATIONS AND AZIMUTH POSITIONS ARE APPROXIMATE.

ATTACHMENT 3.2F
PCILRT MOISTURE DETECTOR LOCATIONS
LRA SYSTEM NO. 16-1
J.A. FITZPATRICK NUCLEAR POWER PLANT
DATE: MAY 13, 1985 TO MAY 14, 1985



ATTACHMENT 3.2G
TEMPORARY PIPING SUPERIMPOSED
LEAKAGE VERIFICATION TEST
CAD SYSTEM NO. 27
J.A. FITZPATRICK NUCLEAR POWER PLANT
DATE: MAY 13, 1985 TO MAY 14, 1985

3.3 TEST RESULTS

3.3.1 Presentation of Test Results

The test data for the period of 1630 hours on May 13, 1985 through 1630 on May 14, 1985 were analyzed for the final test results using NYPA's AT&T 3B2/300 PCILRT computer program. The reduced input data and test results obtained by the PCILRT computer program are contained in Attachments 3.3A through 3.3C. Primary containment air mass was adjusted for the continuous torus water inleakage.

Two representative graphs (Attachments 3.3E and 3.3F) are provided showing the following quantities vs time:

1. Primary Containment Leakage Rate and UCL
2. Primary Containment Air Mass

The Absolute Test Method - Mass Point Analysis calculated test results are well below the procedural acceptance criteria of 0.375 percent/day. These test results include corrections for water levels and Type C leakage penalties (Section 3.3.2).

The Type A test instrumentation was verified during the supplemental test which used the superimposed leakage verification test method. The calculated test results using the PCILRT computer program were acceptable, as shown in Section 3.3.3. The reduced input data and test results obtained by the PCILRT computer program are contained in Attachments 3.3G and 3.3H.

3.3.2 60-psia PCILRT Results

The 60-psia PCILRT was conducted in accordance with Section VII.3 of surveillance procedure No. F-ST-39F. The results for the PCILRT is shown below.

a.	Lam, leakage rate calculated (percent/day)		0.203447
b.	95 percent confidence level (percent/day)		0.007808
c.	UCL, leakage rate with 95 percent confidence level (percent/day)		0.211255
d.	Corrections due to water level (percent/day)		
	Torus (adjusted)	0.000000	
	Reactor Vessel	0.000692	
	Drywell Equipment Sump	0.027695	
	Drywell Floor Sump	0.00000	
	Total		0.028387
e.	Correction for Type C leakage (percent/day) (See Attachment 3.3D)		0.041572
f.	Total reported Type A leakage rate (percent/day)		0.281214

Results were within the acceptable limits of 0.75 La or 0.375 percent/day.

3.3.3 Supplemental Test Results

The Supplemental Verification Test was performed using the Superimposed Leakage Verification Test Method in accordance with Section VII.4 of surveillance procedure No. F-ST-39F. The results for the superimposed leakage verification test is shown below.

a. Average Flow

i. Average flow in 4 hours = 223.9583 scfh

or Lo = 0.489579%/day

b. Composite Leakage, Lc

i. Lc = 0.761626%/day

c. Leakage rate from 24 hour PCILRT, Lam

i. Lam = 0.203447%/day

d. $Lam + Lo - 0.25\ La \leq Lc \leq Lam + Lo + 0.25\ La$

i. $0.203447 + 0.489579 - 0.125 = 0.568026$
ii. $0.203447 + 0.489579 + 0.125 = 0.818026$

$$0.568026 \leq 0.761626 \leq 0.818026$$

The composite leakage rate is within the limits for the period of 1730 to 2130 hours on May 14, 1985.

ATTACHMENT 3.3A

PRIMARY CONTAINMENT INTEGRATED LEAKAGE RATE TEST
NYPA JAMES A. FITZPATRICK NUCLEAR POWER PLANT
FROM 1630 ON MAY 13, 1985 TO 1630 ON May 14, 1985

INPUT VARIABLES

	Drywell				Torus			
Time Hr	Temp Degr	Abs Press Psia	Dew Pt Degr	Vap Press Psia	Temp Degr	Abs Press Psia	Dew Pt Degr	Vap Press Psia
1630	89.274	60.146	75.575	0.438	75.133	60.244	73.424	0.408
1730	89.342	60.142	76.005	0.444	74.790	60.241	73.234	0.405
1830	89.353	60.136	76.316	0.449	74.653	60.235	72.995	0.402
1930	89.398	60.136	76.699	0.455	74.516	60.235	72.804	0.399
2030	89.482	60.136	76.913	0.458	74.242	60.235	72.613	0.397
2130	89.572	60.138	77.201	0.462	74.104	60.238	72.470	0.395
2230	89.556	60.142	77.439	0.466	73.966	60.241	72.326	0.393
2330	89.593	60.144	77.655	0.469	73.966	60.244	72.231	0.391
0030	89.595	60.147	77.822	0.472	73.830	60.245	72.183	0.391
0130	89.619	60.150	77.966	0.474	73.762	60.249	72.040	0.389
0230	89.621	60.155	78.037	0.475	73.693	60.255	71.992	0.388
0330	89.623	60.158	78.110	0.476	73.624	60.258	71.896	0.387
0430	89.626	60.161	78.109	0.476	73.555	60.261	71.896	0.387
0530	89.666	60.168	78.205	0.478	73.555	60.268	71.849	0.386
0630	89.674	60.165	78.133	0.477	73.418	60.267	71.801	0.386
0730	89.655	60.175	78.229	0.478	73.350	60.275	71.801	0.386
0830	89.662	60.183	78.229	0.478	73.350	60.283	71.706	0.385
0930	89.682	60.186	78.181	0.477	73.418	60.286	71.753	0.385
1030	89.654	60.186	78.229	0.478	73.418	60.286	71.706	0.385
1130	89.663	60.200	78.253	0.479	73.418	60.300	71.658	0.384
1230	89.672	60.199	78.205	0.478	73.282	60.299	71.658	0.384
1330	89.612	60.201	78.277	0.479	73.282	60.301	71.658	0.384
1430	89.589	60.204	78.253	0.479	73.350	60.305	71.706	0.385
1530	89.592	60.207	78.229	0.478	73.350	60.308	71.610	0.383
1630	89.586	60.215	78.277	0.479	73.282	60.315	71.658	0.384

ATTACHMENT 3.3A (Cont)

Initialization	Drywell	Torus
Abs Press	60.146	60.244
Vap Press	0.438	0.408
Temp	89.274	75.133
Volume	154476	115800

ATTACHMENT 3.3B

PRIMARY CONTAINMENT INTEGRATED LEAKAGE RATE TEST
NYPA JAMES A. FITZPATRICK NUCLEAR POWER PLANT
FROM 1630 ON MAY 13, 1985 TO 1630 ON MAY 14, 1985

ABSOLUTE TEST METHOD, MASS POINT ANALYSIS TEST RESULTS

Time Hrs	Air Mass Pounds	(Adjusted) Air Mass Pounds	Leakage Rate Pct/Day	95 Pct Conf Pct/Day	UCL
0.000	80322.69	80322.69	0.000000	0.000000	0.000000
1.000	80331.16	80316.88	0.000000	0.000000	0.000000
2.000	80329.91	80301.35	.318808	.717293	1.036101
3.000	80332.36	80289.52	.343724	.118156	.461880
4.000	80342.45	80285.33	.305006	.075838	.380844
5.000	80345.13	80273.73	.299885	.045391	.345276
6.000	80358.22	80272.54	.269740	.046376	.316116
7.000	80356.73	80256.77	.273965	.033670	.307635
8.000	80367.02	80252.78	.265623	.027017	.292641
9.000	80374.05	80245.53	.258705	.022421	.281126
10.000	80384.84	80242.04	.247914	.021359	.269273
11.000	80392.48	80235.40	.239785	.019523	.259309
12.000	80401.03	80229.67	.232613	.017963	.250575
13.000	80406.44	80220.80	.229031	.015705	.244735
14.000	80413.25	80213.33	.226557	.013749	.240306
15.000	80430.96	80216.76	.217646	.015006	.232652
16.000	80441.23	80212.75	.209614	.015481	.225095
17.000	80439.32	80196.56	.208786	.013724	.222510
18.000	80441.17	80184.13	.210759	.012391	.223150
19.000	80460.30	80188.98	.207119	.011696	.218815
20.000	80467.05	80181.45	.204656	.010832	.215489
21.000	80474.53	80174.65	.202790	.009995	.212785
22.000	80476.25	80162.09	.203244	.009114	.212358
23.000	80480.70	80152.26	.204498	.008428	.212926
24.000	80495.49	80152.77	.203447	.007808	.211255

ATTACHMENT 3.3C

PRIMARY CONTAINMENT INTEGRATED LEAKAGE RATE TEST
NYPA JAMES A. FITZPATRICK NUCLEAR POWER PLANT
FROM 1630 ON MAY 13, 1985 TO 1630 ON MAY 14, 1985

INITIALIZATION AND CONTROL VARIABLES

Weighting Factors for Temperature and Dew Point Averaging

Zone 0	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8	Zone A	Zone B	Zone C
0.11351	0.16502	0.35604	0.13137	0.04701	0.05337	0.07153	0.06215	1.00000	0.50000	0.50000	1.00000

Polynomial Coefficients for Vapor Pressure Conversion

0.919818D-14 0.172223D-10 0.105015D-08 0.349876D-06 0.179585D-04 0.112199D-02 0.211397D-01

STUDENT'S T CONSTANTS

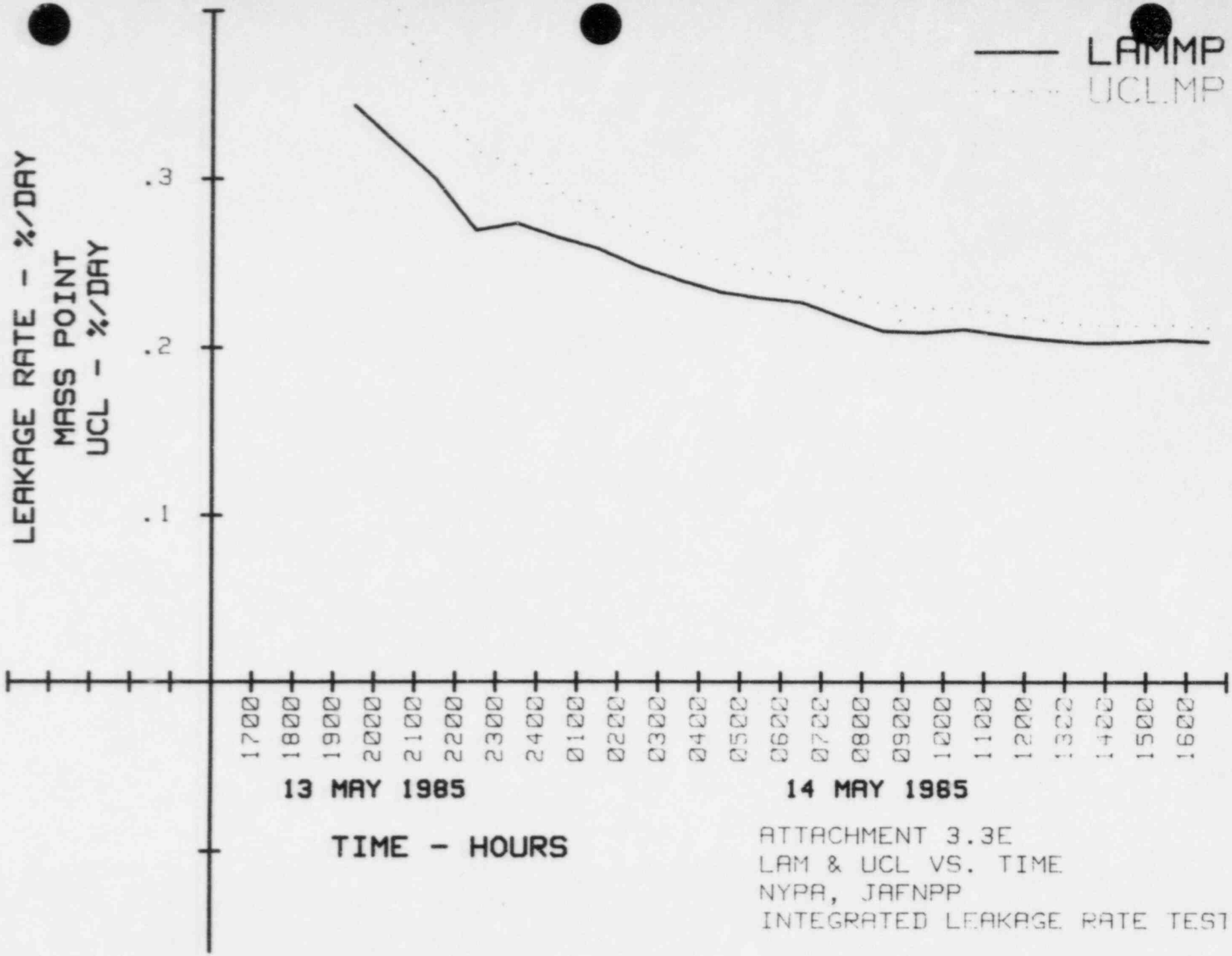
1.95996 2.37226 2.82250

ATTACHMENT 3.3D

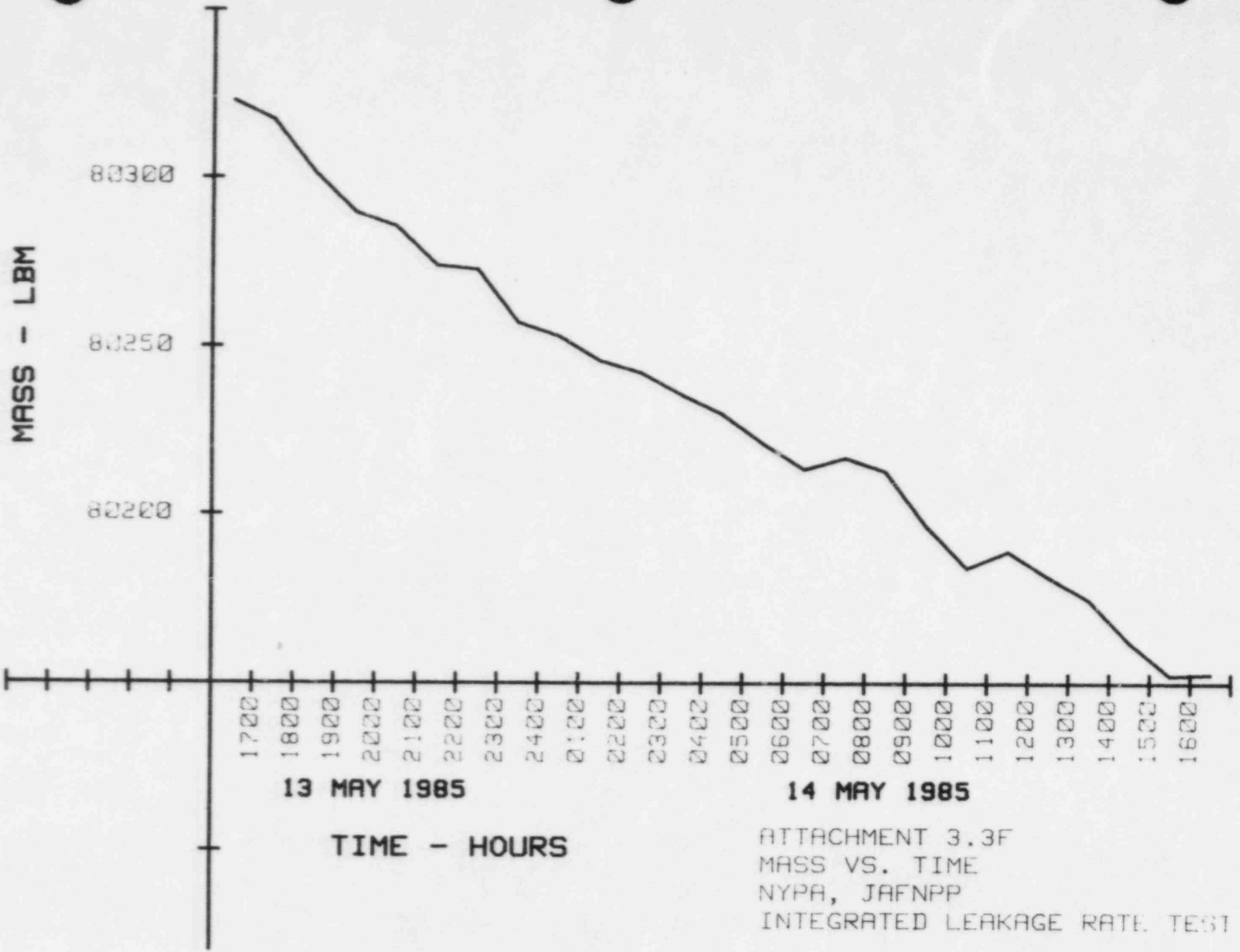
TYPE C PENETRATION LEAKAGE TO BE ADDED
TO CALCULATED PCILRT LEAKAGE RATE

1. Penetrations to be penalized from initial valve line-up (see Types B and C data):

Penetration	Description	Leakage (SCFD)
X-9A	"A" Feedwater Line	184.20
X-9B	"B" Feedwater Line	221.40
X-14	RWCU Supply	13.54
X-23	Drywell Cooling Equipment	30.44
X-24	Drywell Cooling Equipment	6.71
	Total (percent/day)	0.041572



ATTACHMENT 3.3E
LAM & UCL VS. TIME
NYPA, JAFNPP
INTEGRATED LEAKAGE RATE TEST



ATTACHMENT 3.3F
MASS VS. TIME
NYPA, JAFNPP
INTEGRATED LEAKAGE RATE TEST

ATTACHMENT 3.3G

PRIMARY CONTAINMENT INTEGRATED LEAKAGE RATE TEST
SUPERIMPOSED LEAKAGE VERIFICATION TEST
NYPA JAMES A. FITZPATRICK NUCLEAR POWER PLANT
FROM 1730 ON MAY 14, 1985 TO 2130 ON MAY 14, 1985

Input Variables

	Drywell				Torus			
Time Hr	Temp Degr	Abs Press Psia	Dew Pt Degr	Vap Press Psia	Temp Degr	Abs Press Psia	Dew Pt Degr	Vap Press Psia
1730	89.601	60.191	78.253	0.479	73.282	60.292	71.658	0.384
1750	89.554	60.186	78.276	0.479	73.350	60.286	71.610	0.383
1810	89.582	60.186	78.277	0.479	73.282	60.286	71.610	0.383
1830	89.627	60.182	78.253	0.479	73.213	60.283	71.610	0.383
1850	89.607	60.179	78.301	0.479	73.350	60.281	71.658	0.384
1910	89.592	60.177	78.276	0.479	73.282	60.278	71.610	0.383
1930	89.592	60.174	78.277	0.479	73.350	60.274	71.610	0.383
1950	89.600	60.171	78.325	0.480	73.282	60.272	71.610	0.383
2010	89.570	60.168	78.420	0.481	73.282	60.269	71.610	0.383
2030	89.613	60.165	78.276	0.479	73.213	60.265	71.610	0.383
2050	89.634	60.166	78.253	0.479	73.282	60.268	71.658	0.384
2110	89.626	60.163	78.348	0.480	73.350	60.264	71.658	0.384
2130	89.655	60.160	78.325	0.480	73.282	60.260	71.610	0.383

Initialization	Drywell	Torus
Abs Press	60.191	60.292
Vap Press	0.479	0.384
Temp	89.601	73.282
Volume	154476	115800

ATTACHMENT 3.3H
PRIMARY CONTAINMENT INTEGRATED LEAKAGE RATE TEST
SUPERIMPOSED LEAKAGE VERIFICATION TEST
NYPA JAMES A. FITZPATRICK NUCLEAR POWER PLANT
FROM 1730 ON MAY 14, 1985 TO 2130 ON May 14, 1985

ABSOLUTE TEST METHOD, MASS POINT ANALYSIS TEST RESULTS

Time Hrs	Air Mass Pounds	(Adjusted) Air Mass Pounds	Leakage Rate Pct/Day	95 Pct Conf Pct/Day	UCL
0.000	80462.26	80462.26	0.000000	0.000000	0.000000
0.333	80455.06	80450.30	0.000000	0.000000	0.000000
0.667	80456.20	80446.68	.697084	1.843232	2.540316
1.000	80452.97	80438.69	.665140	.288623	.953763
1.333	80441.54	80422.50	.815458	.244019	1.059477
1.667	80444.95	80421.15	.759181	.160372	.919553
2.000	80435.02	80406.46	.798572	.116573	.915145
2.333	80434.56	80401.24	.787368	.084730	.872098
2.667	80431.91	80393.83	.773855	.065677	.839532
3.000	80431.30	80388.46	.750980	.056990	.807971
3.333	80426.50	80378.90	.743252	.046595	.789847
3.667	80417.58	80365.22	.757283	.041050	.798333
4.000	80415.28	80358.16	.761626	.034670	.796296

SECTION 4

LOCAL LEAKAGE RATE TESTS (TYPES B AND C)

Attachments 4A and 4B, which follow, summarize the LLRT data which has been obtained from periodic testing performed since the February 1982 Type A Test. Pre-repaired data is provided for surveillance testing performed in 1985 and 1983. Values listed in both summaries are individual valve measurements, unless otherwise noted. Each penetration's leakage rate can be obtained form site reference material. These LLRTs were performed using "volumetric" leakage measuring equipment with a maximum range of 1,018 SCFD. No attempt to establish the actual leakage rate was made when the calibrated range of the test instrumentation was exceeded.

The acceptance criteria for Types B and C testing are in accordance with 10CFR50, Appendix J. The combined "as-left" leakage rate for all penetrations and valves subject to Types B and C tests shall be less than 0.6 La. The LLRTs performed in 1983 and 1985 were well below the acceptance criteria.

The data contained in this section are summarized below:

Attachment No.	Title
4A	1985 LLRT Data (10-Year Plant Inservice Inspection)
4B	1983 LLRT Data (Refueling Outage)
4C	Primary Containment Boundary Modifications

ATTACHMENT 4A
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
Drywell Stabilizer					
0° (GE-90°)	B	"O" rings	0.188	0.188	
45° (GE-135°)	B	"O" rings	0.181	0.181	
90° (GE-180°)	B	"O" rings	0.133	0.133	
135° (GE-225°)	B	"O" rings	0.154	0.154	
180° (GE-270°)	B	"O" rings	0.252	0.252	
225° (GE-315°)	B	"O" rings	0.417	0.417	
270° (GE-0°)	B	"O" rings	28.0	<0.102	270°
315° (GE-45°)	B	"O" rings	0.155	0.155	
Dry Well Head	B	"O" rings	0.2886	0.2886	
X-1A Equipment and Emergency Escape Hatch	B	"O" rings	7.89	7.89	
X-1B Equipment Hatch	B	"O" rings	0.1404	0.1404	
X-2A Personnel Access Hatch	B	"O" rings	91.387	91.387	
X-4 Drywell Head Manhole	B	"O" rings	0.2886	0.2886	
X-6 CRD Removal Hatch	B	"O" rings	<0.102	<0.102	
X-7A "A" Main Steam Line	C	29-AOV-80A(IPC) 29-AOV-86A(OPC)	0.298 (Combined)	0.298 (Combined)	
X-7B "B" Main Steam Line	C	29-AOV-80B(IPC) 29-AOV-86B(OPC)	>1018 (Combined)	16.13 (Combined)	AOV-86B
X-7C "C" Main Steam Line	C	29-AOV-80C(IPC) 29-AOV-86C(OPC)	0.102 (Combined)	0.102 (Combined)	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-7D "D" Main Steam Line	C	29-AOV-80D(IPC) 29-AOV-86D(OPC)	0.141 (Combined)	0.141 (Combined)	
X-8 Condensate Drain	C	29-MOV-74(IPC) 29-MOV-77(OPC)	826.6 16.69	<0.102 16.69	MOV-74 ground bonnet mating surfaces and replaced gasket.
X-9A Feedwater	C	34-FWS-28A(IPC) 13-MOV-21(OPC) 34-NRV-111A(OPC) RWC-62(OPC)	0.520 (FWS-28A) 184.2 (MOV-21) (NRV-111A) 17.9 (RWC-62)	0.520 (FWS-28A) 184.2 (MOV-21) (NRV-111A) 17.9 (RWC-62)	
X-9B Feedwater	C	34-FWS-28B(IPC) 23-MOV-19(OPC) 34-NRV-111B(OPC)	0.674 (FWS-28B) 343.5 (MOV-19) (NRV-111B)	0.674 (FWS-28B) 221.4 (MOV-19) (NRV-111B)	NRV-1118 machined disc and seat. Replaced internals and adjusted valve.
X-10 Steam to RCIC Turbine	C	13-MOV-16(IPC) 13-MOV-15(OPC)	>0.102 30.4	<0.102 4.39	MOV-15 lapped disc and seat and body/ bonnet tightened.
X-11 Steam to HPCI Turbine	C	23-MOV-15(IPC) 23-MOV-16(OPC) 23-MOV-60(OPC)	14.04 (Combined)	14.04 (Combined)	
X-12 Shutdown Supply to RHR	C	10-MOV-17(IPC) 10-MOV-18(OPC)	>1018 >1018	26.72 23.82	MOV-17 lapped disc and seat replaced MOV-18 new installation

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-13A RHR Return	C	10-MOV-27A(OPC)	>1018	81.74	MOV-27A repacked
		10-MOV-25A(OPC)	5.53	40.92	MOV-25A repacked
X-13B RHR Return	C	10-MOV-27B(OPC)	73.9	73.9	
		10-MOV-25B(OPC)	119.6	119.6	
X-14 RWCU Supply to Recirculation Pumps	C	12-MOV-15(IPC)	71.26 (MOV-15)	9.75 (MOV-15)	MOV-15 machined stem and wedge. Lapped wedge and seat. Replaced gasket and packing.
		12-MOV-18(OPC)	13.54 (MOV-18)	13.54 (MOV-18)	
		12-MOV-80(OPC)	(MOV-80)	(MOV-80)	
X-16A Core Spray Pump Discharge	C	14-MOV-11A(OPC)	0.102	0.102	
		14-MOV-12A(OPC)	0.231	0.231	
X-16B Core Spray Pump Discharge	C	14-MOV-11B(OPC)	0.178	0.178	
		14-MOV-12B(OPC)	0.102	0.102	
X-17 RPV Head Spray	C	10-MOV-32(IPC)	0.855	0.855	
		10-MOV-33(OPC)	15.06	15.06	
X-18 Floor Sump Pump Discharge	C	20-MOV-82(IPC)	1.74	1.74	
		20-AOV-83(OPC)	19.95	19.95	
X-19 Equipment Sump Pump Discharge	C	20-MOV-94(IPC)	>1018	18.9	MOV-94 cleaned seat and disc. RDW-98A repacked lapped seat.
		20-MOV-95(OPC)	269.0	1.53	
X-21 Service Air	C	39-SAS-10(IPC)	>1018	15.6	SAS-10 lapped disc and seat, cleaned, new gasket.
		39-SAS-9(OPC)	4.63	4.63	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-22 Instrument Air	C	IAS-22(IPC)	0.242	0.242	
		IAS-21(OPC)	0.102	0.102	
		IAS-23(OPC)	0.102	0.102	
X-23 Cooling Water Supply	C	46-ESW-16B(OPC)	<0.102	3.48	ESW-16B disassembled for drywell cooling.
		15-RBC-24A(OPC)	<0.102	<0.102	
		15-AOV-130A(OPC)	30.44	30.44	
X-24 Cooling Water Supply	C	46-ESW-16A(OPC)	65.05	6.71	ESW-16A lapped disc and seat and cleaned valve internals.
		15-RBC-24B(OPC)	<0.102	<0.102	
		15-AOV-130B(OPC)	13.89	13.89	
X-25 Drywell Inerting and CAD and Purge X-71	C	27-AOV-111(OPC)	<0.102 (AOV-111)	<0.102 (AOV-111)	
		27-AOV-112(OPC)	(AOV-112)	(AOV-112)	CV-68 lapped seat and replaced disc, spring, and gasket. AOV-131A replaced plug, stem, seat, and repacked.
		27-AOV-131A(OPC)	>1018 (AOV-131A)	9.37 (AOV-131A)	
		CV-68(OPC)	(CV-68)	(CV-68)	
		27-AOV-131B(OPC)	6.36 (AOV-131B)	6.36 (AOV-131B)	
		CV-69(OPC)	(CV-69)	(CV-69)	
X-26A Containment Atmospheric Sampling	C	27-SOV-119F1(OPC)	0.25	0.25	SOV-120A cleaned replaced disc spring, body o-ring, piston ring.
		27-SOV-119F2(OPC)	0.102	0.102	
		27-SOV-120A(OPC)	21.3	<0.102	
		27-SOV-120B(OPC)	41.1	<0.102	
		27-SOV-120E1(OPC)	0.102	0.102	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
		27-SOV-120E2(OPC)	0.102	0.102	SOV-120B cleaned replaced disc spring, body o-ring, piston ring.
		27-SOV-122A(OPC)	>1018	0.102	SOV-122A cleaned replaced disc spring, body o-ring, piston ring.
		27-SOV-122B(OPC)	98.2	<0.102	SOV-122B
		27-SOV-122E1(OPC)	1.67	1.67	
		27-SOV-122E2(OPC)	0.386	0.386	
		27-SOV-121A(OPC)	4.38	4.38	
		27-SOV-121B(OPC)	33.8	0.119	SOV-121B cleaned replaced disc spring, body o-ring, piston ring.
X-26A, X-26B Containment Vent and Purge	C	27-AOV-113(OPC)	7.35 (AOV-113)	7.35 (AOV-113)	
		27-AOV-114(OPC)	(AOV-114)	(AOV-114)	
		27-MOV-113(OPC)	0.179 (MOV-113)	0.179 (MOV-113)	
		27-MOV-122(OPC)	(MOV-122)	(MOV-122)	
X-31Ac "A" Recirculation Pump Mini-Purge	C	02-RWR-13A(IPC)	>1018 (RWR-13A)	2.8 (RWR-13A)	RWR-13A lapped disc and seat.
		02-RWR-14A(IPC)	(RWR-14A)	(RWR-14A)	
		02-RWR-40A(OPC)	11.2 (RWR-40A)	11.2 (RWR-40A)	Cleaned valve internals and replaced spring and gasket.
			(RWR-14A)	(RWR-14A)	
X-31Ad Drywell Inert and Purge	C	27-SOV-135A(OPC)	2.85	11.04	SOV-135A
		27-SOV-135B(OPC)	328.3	11.4	SOV-135B new plunger assembly viton disc, piston ring, body o-ring.

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-31Bc "B" Recirculation Pump Mini-Purge	C	02-RWR-13B(IPC) 02-RWR-14B(IPC) 02-RWR-40B(OPC)	79.9 (RWR-13B) (RWR-14B) 7.48 (RWR-40B) (RWR-14B)	4.55 (RWR-13B) (RWR-13B) 7.48 (RWR-40B) (RWR-14B)	RWR-14B replaced internals RWR-13B lapped disc and seat. Cleaned valve internals and replaced disc, spring, and gasket.
X-35A TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	0.347 0.102	0.488 0.282	X-35A disassembled for maintenance.
X-35B TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	0.79 0.102	2.5 0.116	X-35B disassembled for maintenance.
X-35C TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	3.17 0.102	<0.102 0.228	X-35C disassembled for maintenance. Ball valve replaced.
X-35D TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	0.401 0.102	0.79 2.74	X-35D disassembled for maintenance.
X-35E TIP Purge	C/B	TP-1 (OPC) "O" ring (OPC)	0.435 0.102	0.435 0.102	
X-39A Containment Spray	C	10-MOV-26A(OPC) 10-MOV-31A(OPC)	>101.8 (Combined)	42.1 (Combined)	MOV-26A lapped wedge and seat.

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
		RHR-52A(OPC)			Replaced gasket and packing MOV-31A lapped wedge and seat, polished stem, repacked.
X-39B Containment Spray	C	10-MOV-26B(OPC) 10-MOV-31B(OPC) RHR-52B(OPC)	136.9 (Combined)	41.3 (Combined)	MOV-26B lapped disc and seat and replaced gasket.
X-41 Recirculation Loop Sample	C	02-AOV-39(IPC) RWR-255(IPC) 02-AOV-40(OPC)	0.266 (AOV-39) (RWR-255) 0.109 (AOV-40) (RWR-255)	0.266 (AOV-39) (RWR-255) 0.109 (AOV-40) (RWR-255)	
X-42 Standby Liquid Control	C	11-SLC-17(IPC) 11-SLC-16(OPC)	0.447 0.987	0.447 0.987	
X-45 Leak Rate Analyzer	C	16-1-AOV-101A(OPC) 16-1-AOV-101B(OPC) LRA-20(OPC) LRA-21(OPC)	0.3415 (AOV-101A) (AOV-101B) <0.102 (LRA-20) (LRA-21)	0.3415 (AOV-101A) (AOV-101B) <0.102 (LRA-20) (LRA-21)	
X-55B Drywell CAD Inert and Purge	C	27-SOV-125A(OPC) 27-SOV-125B(OPC)	1.068 >1018	1.068 0.364	27-SOV-125B installed new valve.
X-58B CAD System	C	27-SOV-122F1(OPC) 27-SOV-122F2(OPC)	0.251 0.1694	0.251 0.1694	
X-58C CAD System	C	27-SOV-120F1(OPC) 27-SOV-120F2(OPC)	0.786 0.1501	0.786 0.1501	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-58D CAD System	C	27-SOV-123F1(OPC)	<0.102	<0.102	
		27-SOV-123F2(OPC)	<0.102	<0.102	
X-59 Drywell CAD Inert and Purge	C	27-SOV-123A(OPC)	101.8		X-59; SOV-123A, 123B line cut and capped.
		27-SOV-123B(OPC)	357.0		
		27-SOV-123E1(OPC)	0.102	0.102	
		27-SOV-123E2(OPC)	0.923	0.923	
X-61 Breathing Air	C	BAS-5(IPC)	16.38	16.38	BAS-4 lapped disc and seat.
		BAS-4(OPC)	125.21	0.72	
X-62 Drywell Cooling Return	C	RBC-26B(OPC)	2.55	2.55	
		15-AOV-131B(OPC)	1.41	1.41	
X-63 "B" Recirculation Pump MTR Cooling Supply	C	15-RBC-21A(OPC)	0.127	0.127	
		46-ESW-15B(OPC)	33.64	33.64	
		15-AOV-132A(OPC)	2.9	2.9	
X-64 "A" Recirculation Pump MTR Cooling Return	C	15-RBC-22A(OPC)	6.7	6.7	
		15-AOV-133A(OPC)	0.81	0.81	
X-65 Equipment Drain Pump Cooler Return	C	15-RBC-33(OPC)	4.95	4.95	
		15-AOV-134A(OPC)	6.3	6.3	
X-66 "A" Drywell Cooler Assembly Return	C	15-RBC-26A(OPC)	207.0	9.0	RBC-26A, lapped seat, disc, repacked.
		15-AOV-131A(OPC)	9.92	9.92	
X-67 "A" Recirculation Pump MTR Cooling Supply	C	15-RBC-21B(OPC)	0.102	0.102	
		46-ESW-15B(OPC)	0.102	0.102	
		15-AOV-132B(OPC)	0.324	0.324	
X-68 "B" Recirculation Pump MTR Cooling Return	C	15-RBC-22B(OPC)	3.72	3.72	
		15-AOV-133B(OPC)	0.835	0.835	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-100A Elect	B	"O" rings	0.525	0.525	
X-100B Elect	B	"O" rings	0.554	0.127	X-100B Elect.
X-100C Elect	B	"O" rings	0.242	0.242	
X-100D Elect	B	"O" rings	0.639	0.639	
X-100F Elect	B	"O" rings	0.2692	0.2692	
X-100G Elect	B	"O" rings	0.102	0.102	
X-100K Elect	B	"O" rings	<0.102	<0.102	
X-101A Elect	B	"O" rings	0.303	0.303	
X-101B Elect	B	"O" rings	0.453	0.453	
X-101C Elect	B	"O" rings	0.239	0.239	
X-101D Elect	B	"O" rings	0.171	0.171	
X-101E Elect	B	"O" rings	0.401	0.401	
X-101F Elect	B	"O" rings	0.1119	0.1119	
X-103A Elect	B	"O" rings	0.102	0.102	
X-103B Elect	B	"O" rings	0.102	0.102	
X-104C Elect	B	"O" rings	1.018	0.102	X-104C Elect.
X-104D Elect	B	"O" rings	0.102	0.102	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-104E Elect	B	"O" rings	0.776	0.776	
X-106A Elect	B	"O" rings	0.948	0.102	X-106A Elect.
X-106B Elect	B	"O" rings	0.5614	0.5614	
X-107 Elect	B	"O" rings	0.102	0.102	
X-108 Elect	B	"O" rings	0.207	0.207	
X-109 Elect	B	"O" rings	0.489	0.489	
X-110C Elect	B	"O" rings	0.1628	0.1628	
X-110D Elect	B	"O" rings	0.1409	0.1409	
X-111B Elect	B	"O" rings	0.4591	0.1786	X-111B Elect.
X-200A Torus Access	B	"O" rings	0.1521	0.102	X-200A
X-200B Torus Access	B	"O" rings	0.3949	0.3949	
X-200C Torus Access	B	"O" rings	0.332	0.332	
X-202BG Vacuum Breaker	C	27-AOV-101B(OPC) VB-7(OPC) 27-AOV-101A(OPC) VB-6(OPC)	<0.102 (AOV-101B) (VB-7) 4.79 (AOV-101A) (VB-6)	<0.102 (AOV-101B) (VB-7) 4.79 (AOV-101A) (VB-6)	
X-202F Vacuum Breaker	B	"O" ring(VB-1)	0.285	0.285	
X-202G Vacuum Breaker	B	"O" ring(VB-2)	0.210	0.102	VB-2
X-202H Vacuum Breaker	B	"O" ring(VB-3)	0.1369	0.1369	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-202I Vacuum Breaker	B	"O" ring(VB-4)	0.1328	0.1328	
X-202J Vacuum Breaker	B	"O" ring(VB-5)	0.2397	0.2397	
X-203A O_2 Analyzer Sample	C	27-SOV-119A(OPC)	16.03	0.284	SOV-119A cleaned new disc spring, body o-ring and piston ring.
		27-SOV-119B(OPC)	0.1817	0.1817	
		27-SOV-119E1(OPC)	2.81	2.81	
		27-SOV-119E2(OPC)	0.1129	0.1129	
X-203B O_2 Analyzer Sample	C	27-SOV-124A(OPC)	7.5	7.5	
		27-SOV-124B(OPC)	0.228	0.228	
		27-SOV-124E1(OPC)	0.171	0.171	
		27-SOV-124E2(OPC)	0.35	0.35	
		27-SOV-124F1(OPC)	0.115	0.115	
		27-SOV-124F2(OPC)	0.378	0.378	
X-205 Drywell Inert CAD and Purge	C	27-AOV-117(OPC)	>1018 (AOV-117)	0.338 (AOV-117)	AOV-117, 118 cleaned valve and installed new "T" ring and "O" ring
		27-AOV-118(OPC)	(AOV-118)	(AOV-118)	
		27-MOV-117(OPC)	0.33 (MOV-117)	0.33 (MOV-117)	
		27-MOV-123(OPC)	(MOV-123)	(MOV-123)	
X-211A Containment Spray	C	10-MOV-34A(OPC)	>101.8	4.16	MOV-
		10-MOV-38A(OPC)	(Combined)	(Combined)	
		10-MOV-39A(OPC)			
X-211B Containment Spray	C	10-MOV-34B(OPC)	153.7	96.15	MOV-39B ground seat and disc. Cleaned valve internals and replaced gasket.
		10-MOV-38B(OPC)	(Combined)	(Combined)	
		10-MOV-39B(OPC)			

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-212 RCIC Turbine Exhaust	C	RCIC-04(OPC)	>1018	38.17	RCIC-04 lapped seat.
		RCIC-05(OPC)	>1018	52.93	
		13-MOV-130(OPC)	0.2	0.2	RCIC-03 lapped wedge and seat.
X-214 HPCI Turbine Exhaust	C	23-HPI-12(OPC)	96.6	96.35	HPI-65 cleaned, new gasket.
		23-HPI-65(OPC)	>1018	88.51	HPI-11 Cleaned ground seat, new gasket
X-217 HPCI Turbine Exhaust Vent	C	23-MOV-59(OPC)	9.45	9.55	MOV-59 repacked.
		23-HPI-403(OPC)	(Combined)	(Combined)	
		23-HPI-402(OPC)			
X-218 Leak Rate Analyzer	C	LRA-13(OPC)	0.203 (LRA-13)	0.203 (LRA-13)	
		LRA-14(OPC)	(LRA-14)	(LRA-14)	
		AOV-102A(OPC)	5.3 (AOV-102A)	5.3 (AOV-102A)	
		AOV-102B(OPC)	(AOV-102B)	(AOV-102B)	
X-220 Drywell CAD Inert and Purge	C	27-AOV-132A(OPC)	4.3 (AOV-132A)	4.3 (AOV-132A)	
		CV-67(OPC)	(CV-67)	(CV-67)	
		27-AOV-132B(OPC)	0.116 (AOV-132B)	0.116 (AOV-132B)	
		CV-70(OPC)	(CV-70)	(CV-70)	
		27-AOV-115(OPC)	>1018 (AOV-115)	1.84 (AOV-115)	AOV-116 replaced operator pin.
		27-AOV-116(OPC)	(AOV-116)	(AOV-116)	
X-221 Condensate from RCIC Turbine	C	13-RCIC-07(OPC)	>101.8	23.41	RCIC-07 lapped piston and seat, installed new spring and gasket, and repacked valve.
		13-RCIC-08(OPC)	>101.8	5.27	

ATTACHMENT 4A (Cont.)
1985 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
					RCIC-08 lapped seat and replaced gasket.
X-231A Elect	B	"O" rings	0.597	0.597	

ATTACHMENT 4B
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
Drywell Stabilizer					
0° (GE-90°)	B	"O" rings	0.5003	0.5003	
45° (GE-135°)	B	"O" rings	0.6153	0.6153	
90° (GE-180°)	B	"O" rings	0.401	0.401	
135° (GE-225°)	B	"O" rings	0.3206	0.3206	
180° (GE-270°)	B	"O" rings	0.5156	0.5156	
225° (GE-315°)	B	"O" rings	0.539	0.539	
270° (GE-0°)	B	"O" rings	0.6036	0.6036	
315° (GE-45°)	B	"O" rings	0.6153	0.6153	
Dry Well Head	B	"O" rings	0.102	0.102	
X-1A Equipment and Emergency Escape Hatch	B	"O" rings	1.593	1.593	
X-1B Equipment Hatch	B	"O" rings	0.2229	0.2229	
X-2A Personnel Access Hatch	B	"O" rings	42.25	42.25	
X-4 Drywell Head Manhole	B	"O" rings	0.2682	0.2682	
X-6 CRD Removal Hatch	B	"O" rings	0.2957	0.2957	
X-7A "A" Main Steam Line	C	29-AOV-80A(IPC) 29-AOV-86A(OPC)	14.761 (Combined)	14.761 (Combined)	
X-7B "B" Main Steam Line	C	29-AOV-80B(IPC) 29-AOV-86B(OPC)	20.36 914.164	<0.102 <0.102	
X-7C "C" Main Steam Line	C	29-AOV-80C(IPC) 29-AOV-86C(OPC)	18.4258 (Combined)	18.4258 (Combined)	

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-7D "D" Main Steam Line	C	29-AOV-80D(IPC)	>1018	112.489	
		29-AOV-86D(OPC)	<0.102	<0.102	
X-8 Condensate Drain	C	29-MOV-74(IPC)	2.825	2.825	
		29-MOV-77(OPC)	5.0034	5.0034	
X-9A Feedwater	C	34-FWS-28A(IPC)	>1018(FWS-28A)	12.826(FWS-28A)	FWS-28A cleaned valve, ground seat, and replaced disc.
		13-MOV-21(OPC)	>1018(MOV-21)	147.61(MOV-21)	NRV-111A cleaned valve, ground seat and disc,
		34-NRV-111A(OPC)	(NRV-111A)	(NRV-111A)	cleaned operator shaft and cylinder, and replaced
		RWC-62(OPC)	(RWC-62)	(RWC-62)	O-ring and gasket.
X-9B Feedwater	C	34-FWS-28B(IPC)	>1018(FWS-28B)	6.275(FWS-28B)	FWS-28B cleaned valve, ground seat, and replaced disc.
		23-MOV-19(OPC)	>1018(MOV-19)	32.5251(MOV-19)	
		34-NRV-111B(OPC)	(NRV-111B)	(NRV-111B)	
X-10 Steam to RCIC Turbine	C	13-MOV-16(IPC)	<0.102	<0.102	
		13-MOV-15(OPC)	5.1205	5.1205	
X-11 Steam to HPCI Turbine	C	23-MOV-15(IPC)	>1018	3.0947	MOV-16 repacked valve
		23-MOV-16(OPC)	(Combined)	(Combined)	
		23-MOV-60(OPC)			
X-12 Shutdown Supply to RHR	C	10-MOV-17(IPC)	191.893	191.893	MOV-18 replaced wedge, ground seats.
		10-MOV-18(OPC)	>1018	1.99	
X-13A RHR Return	C	10-MOV-27A(OPC)	81.44	81.44	
		10-MOV-25A(OPC)	124.196	124.196	
X-13B RHR Return	C	10-MOV-27B(OPC)	81.185	81.185	
		10-MOV-25B(OPC)	115.54	115.54	

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-14 RWCU Supply to Recirculation Pumps	C	12-MOV-15(IPC) 12-MOV-18(OPC) 12-MOV-80(OPC)	28.504(MOV-15) 6.342(MOV-18) (MOV-80)	28.504(MOV-15) 6.342(MOV-18) (MOV-80)	
X-16A Core Spray Pump Discharge	C	14-MOV-11A(OPC) 14-MOV-12A(OPC)	<1.02 29.165	<1.02 29.165	
X-16B Core Spray Pump Discharge	C	14-MOV-11B(OPC) 14-MOV-12B(OPC)	0.1822 3.3085	0.1822 3.3085	
X-17 RPV Head Spray	C	10-MOV-32(IPC) 10-MOV-33(OPC)	30.2855 17.5605	30.2855 17.5605	
X-18 Floor Sump Pump Discharge	C	20-MOV-82(IPC) 20-AOV-83(OPC)	0.803 3.28	0.803 3.28	
X-19 Equipment Sump Pump Discharge	C	20-MOV-94(IPC) 20-AOV-95(OPC)	>1018 >1018	1.04117 0.579	MOV-94 ground seat, replaced wedge, and repacked with new rings.
X-21 Service Air	C	39-SAS-10(IPC) 39-SAS-9(OPC)	>1018 <0.102	1.379 <0.102	SAS-10 cleaned and lapped seat and disc, replaced gasket. SAS-11 inspected valve and lapped seat.
X-22 Instrument Air	C	IAS-22(IPC) IAS-21(OPC) IAS-23(OPC)	>1018 12.98 <0.102	21.429 12.98 <0.102	IAS-22 ground and lapped seat, replaced gasket.
X-23 Cooling Water Supply	C	46-ESW-16B(OPC) 15-RBC-24A(OPC) 15-AOV-130A(OPC)	<0.102 <0.102 39.3966	<0.102 <0.102 39.3966	AOV-130A new installation.
X-24 Cooling Water Supply	C	46-ESW-16A(OPC) 15-RBC-24B(OPC) 15-AOV-130B(OPC)	>1018 <0.102 <0.102	2.1475 <0.102 <0.102	AOV-130B new installation. ESW-16A ground disc and seat, new gasket.

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-25 Drywell Inerting and CAD and Purge X-71	C	27-AOV-111(OPC)	>1018(AOV-111)	0.3547(AOV-111)	AOV-111, 112 cleaned valves, replaced T rings and O-rings.
		27-AOV-112(OPC)	(AOV-112)	(AOV-112)	
		27-AOV-131A(OPC)	>1018(AOV-131A)	4.983(AOV-131A)	CV-68 machined plug seat, replaced spring, replaced gasket, ground seat.
		CV-68(OPC)	(CV-68)	(CV-68)	
		27-AOV-131B(OPC)	2.5094(AOV-131B)	2.5094(AOV-131B)	
		CV-69(OPC)	(CV-69)	(CV-69)	
X-26A Containment Atmospheric Sampling	C	27-SOV-119F1(OPC)	<0.102	<0.102	SOV-119F1,F2 new installation.
		27-SOV-119F2(OPC)	<0.102	<0.102	
		27-SOV-120A(OPC)	127.25	<0.102	
		27-SOV-120B(OPC)	6.8613	6.8613	
		27-SOV-120E1(OPC)	<0.102	<0.102	SOV-120E1,E2 new installation.
		27-SOV-120E2(OPC)	<0.102	<0.102	
		27-SOV-122A(OPC)	>1018	<0.102	
		27-SOV-122B(OPC)	2.2294	2.2294	
		27-SOV-122E1(OPC)	<0.102	<0.102	SOV-122E1,E2 new installation.
		27-SOV-122E2(OPC)	<0.102	<0.102	
		27-SOV-121A(OPC)	4.072	4.02	
		27-SOV-121B(OPC)	9.6557	9.6557	
X-26A, X-26B Containment Vent and Purge	C	27-AOV-113(OPC)	0.2428(AOV-113)	0.2428(AOV-113)	
		27-AOV-114(OPC)	(AOV-114)	(AOV-114)	
		27-MOV-113(OPC)	0.2718(MOV-113)	0.2718(MOV-113)	
		27-MOV-122(OPC)	(MOV-122)	(MOV-122)	
X-31Ac "A" Recirculation Pump Mini-Purge	C	02-RWR-13A(IPC)	>1018(RWR-13A)	7.13(RWR-13A)	RWR-13A machined plug, lapped plug and seat, replaced gasket and spring.
		02-RWR-14A(IPC)	(RWR-14A)	(RWR-14A)	
		02-RWR-40A(OPC)	>1018(RWR-40A)	13.28(RWR-40A)	
			(RWR-14A)	(RWR-14A)	
X-31Ad Drywell Inert and Purge	C	27-SOV-135A(OPC)	8.037	8.037	SOV-135B cleaned valve, replaced viton plug, seat, piston rings, o-rings, piston, piston rod, connection link, plunger assembly, and disc.
		27-SOV-135B(OPC)	>1018	26.57	

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-31Bc "B" Recirculation Pump Mini-Purge	C	02-RWR-13B(IPC) 02-RWR-14B(IPC) 02-RWR-40B(OPC)	30.133(RWR-13B) (RWR-14B) 34.256(RWR-40B) (RWR14B)	30.133(RWR-13B) (RWR-14B) 34.256(RWR-40B) (RWR-14B)	
X-35A TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	26.824 0.207	26.824 0.207	
X-35B TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	0.964 0.205	0.964 0.205	
X-35C TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	3.346 0.135	3.346 0.135	
X-35D TIP Probe	C/B	Ball Valve (OPC) "O" ring (OPC)	6.795 0.0208	6.795 0.0208	
X-35E TIP Purge	C/B	TP-1 (OPC) "O" ring (OPC)	1.006 0.132	1.006 0.132	
X-36 CRD Return	C	CRD-113(IPC) CRD-110(OPC)	70.14 >1018	1.5422 (Combined)	
X-39A Containment Spray	C	10-MOV-26A(OPC) 10-MOV-31A(OPC) RHR-52A(OPC)	>1018 (Combined)	1.5779 (Combined)	RHR-52A cut-out valve and replaced with new one.
X-39B Containment Spray	C	10-MOV-26B(OPC) 10-MOV-31B(OPC) RHR-52B(OPC)	533.941 (Combined)	74.212 (Combined)	MOV-26B inspected valve operator, increased torque switch setting, machined rings, replaced wedge and rings.

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-41 Recirculation Loop Sample	C	02-AOV-39(IPC) RWR-255(IPC) 02-AOV-40(OPC)	>1018(AOV-39) (RWR-255) 2.036(AOV-40) (RWR-255)	1.481(AOV-39) (RWR-255) 2.036(AOV-40) (RWR-255)	AOV-39 repacked valve, ground and lapped seat and plug.
X-42 Standby Liquid Control	C	11-SLC-17(IPC) 11-SLC-16(OPC)	2.652 44.792	2.652 39.85	SLC-16 replaced gasket, plug, piston, disc, and spring.
X-45 Leak Rate Analyzer	C	16-1-AOV-101A(OPC) 16-1-AOV-101B(OPC) LRA-20(OPC) LRA-21(OPC)	0.789(AOV-101A) (AOV-101B) 0.1415(LRA-20) (LRA-21)	0.789(AOV-101A) (AOV-101B) 0.1415(LRA-20) (LRA-21)	
X-55B Drywell CAD Inert and Purge	C	27-SOV-125A(OPC) 27-SOV-125B(OPC)	0.9625 1.3183	0.9625 1.3183	
X-58B CAD System	C	27-SOV-122F1(OPC) 27-SOV-122F2(OPC)	4.698 0.1669	4.698 0.1669	SOV-122F1,F2 new installation.
X-58C CAD System	C	27-SOV-120F1(OPC) 27-SOV-120F2(OPC)	0.3995 0.6542	0.3995 0.6542	SOV-120F1,F2 new installation.
X-58D CAD System	C	27-SOV-123F1(OPC) 27-SOV-123F2(OPC)	0.4123 0.2647	0.4123 0.2647	SOV-123F1,F2 new installation.
X-59 Drywell CAD Inert and Purge	C	27-SOV-123A(OPC) 27-SOV-123B(OPC) 27-SOV-123E1(OPC) 27-SOV-123E2(OPC)	>1018 >1018 2.6977 <0.102	5.6499 <0.102 2.6977 <0.102	SOV-123A,B cleaned valves, replaced seats, viton discs, springs, piston rings, and O-rings. SOV-123E1,E2 new installation.

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-61 Breathing Air	C	BAS-5(IPC)	413.817	13.743	BAS-5 cleaned valve and polished disc.
		BAS-4(OPC)	119.615	6.785	BAS-4 ground disc and seat.
X-62 Drywell Cooling Return	C	RBC-26B(OPC)	36.85	36.85	AOV-131B new installation.
		15-AOV-131B(OPC)	13.794	13.794	
X-63 "B" Recirculation Pump MTR Cooling Supply	C	15-RBC-21A(OPC)	<0.102	<0.102	AOV-132A new installation.
		46-ESW-15B(OPC)	12.5214	12.5214	
		15-AOV-132A(OPC)	27.995	27.995	
X-64 "A" Recirculation Pump MTR Cooling Return	C	15-RBC-22A(OPC)	38.84	38.84	AOV-133A new installation.
		15-AOV-133A(OPC)	4.5351	4.5351	
X-65 Equipment Drain Pump Cooler Return	C	15-RBC-33(OPC)	2.0156	2.0156	AOV-134A new installation.
		15-AOV-134A(OPC)	2.1174	2.1174	
X-66 "A" Drywell Cooler Assembly Return	C	15-RBC-26A(OPC)	<0.102	<0.102	AOV-131A new installation.
		15-AOV-131A(OPC)	5.446	5.446	
X-67 "A" Recirculation Pump MTR Cooling Supply	C	15-RBC-21B(OPC)	<0.102	<0.102	AOV-132B new installation.
		46-ESW-15A(OPC)	<0.102	<0.102	
		15-AOV-132B(OPC)	<0.102	<0.102	
X-68 "B" Recirculation Pump MTR Cooling Return	C	15-RBC-22B(OPC)	560.41	34.3575	RBC-22B cleaned valve, lapped disc and seat.
		15-AOV-133B(OPC)	19.8001	19.8001	AOV-133B new installation.
X-100A Elect	B	"O" rings	<0.102	<0.102	
X-100B Elect	B	"O" rings	<0.102	<0.102	
X-100C Elect	B	"O" rings	<0.102	<0.102	
X-100D Elect	B	"O" rings	0.2769	0.2769	

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-100F Elect	B	"O" rings	0.1312	0.1312	
X-100G Elect	B	"O" rings	<0.102	<0.102	
X-100K Elect	B	"O" rings	<0.102	<0.102	
X-101A Elect	B	"O" rings	<0.102	<0.102	
X-101B Elect	B	"O" rings	<0.102	<0.102	
X-101C Elect	B	"O" rings	<0.102	<0.102	
X-101D Elect	B	"O" rings	<0.102	<0.102	
X-101E Elect	B	"O" rings	<0.102	<0.102	
X-101F Elect	B	"O" rings	0.1273	0.1273	
X-103A Elect	B	"O" rings	<0.102	<0.102	
X-103B Elect	B	"O" rings	<0.102	<0.102	
X-104C Elect	B	"O" rings	<0.102	<0.102	
X-104D Elect	B	"O" rings	<0.102	<0.102	
X-104E Elect	B	"O" rings	<0.102	<0.102	
X-106A Elect	B	"O" rings	0.5039	0.5039	
X-106B Elect	B	"O" rings	<0.102	<0.102	
X-107 Elect	B	"O" rings	<0.102	<0.102	

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-108 Elect	B	"O" rings	<0.102	<0.102	
X-109 Elect	B	"O" rings	<0.102	<0.102	
X-110C Elect	B	"O" rings	<0.102	<0.102	
X-110D Elect	B	"O" rings	<0.102	<0.102	
X-111B Elect	B	"O" rings	<0.102	<0.102	
X-200A Torus Access	B	"O" rings	0.3741	0.3741	
X-200B Torus Access	B	"O" rings	0.5415	0.5415	
X-200C Torus Access	B	"O" rings	0.3837	0.3837	
X-202BG Vacuum Breaker	C	27-AOV-101B(OPC) VB-7(OPC) 27-AOV-101A(OPC) VB-6(OPC)	1.49(AOV-101B) (VB-7) 2.35(AOV-101A) (VB-6)	1.49(AOV-101B) (VB-7) 2.35(AOV-101A) (VB-6)	
X-202F Vacuum Breaker	B	"O" ring(VB-1)	0.214	0.214	
X-202G Vacuum Breaker	B	"O" ring(VB-2)	0.214	0.214	
X-202H Vacuum Breaker	B	"O" ring(VB-3)	0.216	0.216	
X-202I Vacuum Breaker	B	"O" ring(VB-4)	2.988	2.988	
X-202J Vacuum Breaker	B	"O" ring(VB-5)	0.247	0.247	

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-203A O_2 Analyzer Sample	C	27-SOV-119A(OPC)	3.242	3.242	SOV-119E1,E2 new installation.
		27-SOV-119B(OPC)	3.7528	3.7528	
		27-SOV-119E1(OPC)	0.779	0.779	
		27-SOV-119E2(OPC)	2.08	2.08	
X-203B O_2 Analyzer Sample	C	27-SOV-124A(OPC)	13.28	13.28	
		27-SOV-124B(OPC)	0.2214	0.2214	
		27-SOV-124E1(OPC)	0.6103	0.6103	SOV-124E1,E2 new installation.
		27-SOV-124E2(OPC)	0.2713	0.2713	
		27-SOV-124F1(OPC)	0.2779	0.2779	SOV-124F1,F2 new installation.
		27-SOV-124F2(OPC)	0.6886	0.6886	
X-205 Drywell Inert CAD and Purge	C	27-AOV-117(OPC)	330.85(AOV-117)	52.1725(AOV-117)	AOV-117 replaced T-ring and O-ring.
		27-AOV-118(OPC)	(AOV-118)	(AOV-118)	
		27-MOV-117(OPC)	0.2886(MOV-117)	0.2886(MOV-117)	
		27-MOV-123(OPC)	(MOV-123)	(MOV-123)	
X-211A Containment Spray	C	10-MOV-34A(OPC)	107.399	107.399	
		10-MOV-38A(OPC)	(Combined)	(Combined)	
		10-MOV-39A(OPC)			
X-211B Containment Spray	C	10-MOV-34B(OPC)	53.5468	53.5468	
		10-MOV-38B(OPC)	(Combined)	(Combined)	
		10-MOV-39B(OPC)			
X-212 RCIC Turbine Exhaust	C	RCIC-04(OPC)	>1018	44.7106	RCIC-04 machined back seat surface, seat ring, and disc.
		RCIC-05(OPC)	>1018	44.1812	
		13-MOV-130(OPC)	6.885	6.885	
X-214 HPCI Turbine Exhaust	C	23-HPI-12(OPC)	>1018	101.545	HPI-65 cleaned valve, machined and ground back seat surface, seat, disc, disc swing arm, and replaced gaskets.
		23-HPI-65(OPC)	>1018	44.842	HPI-12 cleaned valve, machined disc, ground seat, replaced gasket.

ATTACHMENT 4B (Cont.)
1983 LOCAL LEAKAGE RATE TEST PENETRATION DATA

Penetration No.	Type Test	Equipment/Valves Tested	Pre-Repair Leakage (scf/day)	Post-Repair Leakage (scf/day)	Repair/Notes
X-217 HPCI Turbine Exhaust Vent	C	23-MOV-59(OPC) 23-HPI-403(OPC) 23-HPI-402(OPC)	19.2402 (Combined)	19.2402 (Combined)	
X-218 Leak Rate Analyzer	C	LRA-13(OPC) LRA-14(OPC) AOV-102A(OPC) AOV-102B(OPC)	0.3277(LRA-13) (LRA-14) 0.3064(AOV-102A) (AOV-102B)	0.3277(LRA-13) (LRA-14) 0.3064(AOV-102A) (AOV-102B)	
X-220 Drywell CAD Inert and Purge	C	27-AOV-132A(OPC) CV-67(OPC) 27-AOV-132B(OPC) CV-70(OPC) 27-AOV-115(OPC) 27-AOV-116(OPC)	2.789(AOV-132A) (CV-67) 55.1756(AOV-132B) (CV-70) >1018(AOV-115) (AOV-116)	2.789(AOV-132A) (CV-67) 55.1756(AOV-132B) (CV-70) 4.0618(AOV-115) (AOV-116)	AOV-115,116 cleaned valves, replaced T-rings and O-rings.
X-221 Condensate from RCIC Turbine	C	13-RCIC-07(OPC) 13-RCIC-08(OPC)	>1018 >1018	2.8605 2.7587	RCIC-07,08 cleaned valves, ground and lapped plugs, seats, pistons, replaced flex gaskets and springs.
X-231A Elect	B	"O" rings	0.3823	0.3823	

ATTACHMENT 4C

PRIMARY CONTAINMENT BOUNDARY MODIFICATIONS

The following JAFNPP primary containment boundaries were modified during the 1983 and 1985 outages.

1. Penetrations modified to provide taps for the H_2 Monitoring System:

   a. X-26A — SOV-120E1, SOV-120E2, SOV-119F1, SOV-119F2, SOV-122E1, and SOV-122E2 were tied in. Manual valves (CAD-204, CAD-205, and CAD-206) are open and associated caps removed.

   b. X-58B — SOV-122F1 and SOV-122F2 were tied in. Manual valve (CAD-214) is open and associated cap removed.

   c. X-58C — SOV-120F1 and SOV-120F2 were tied in. Manual valve (CAD-215) is open and associated cap removed.

   d. X-58D — SOV-123F1 and SOV-123F2 were tied in. Manual valve (CAD-216) is open and associated cap removed.

   e. X-59 — SOV-123E1 and SOV-123E2 were tied in. Manual valve (CAD-207) is open and associated cap removed.

   f. X-203A — SOV-119E1 and SOV-119E2 were tied in. Manual valve (CAD-201) is open and associated cap removed.

   g. X-203B — SOV-124E1, SOV-124E2, SOV-124F1, and SOV-124F2 were tied in. Manual valves (CAD-202 and CAD-203) are open and associated caps removed.

2. Reactor Building Cooling Water containment isolation valves added:

   a. X-23 — AOV-130A was added.

   b. X-24 — AOV-130B was added.

   c. X-62 — AOV-131B was added.

   d. X-63 — AOV-132A was added.

   e. X-64 — AOV-133A was added.

   f. X-65 — AOV-134A was added.

   g. X-66 — AOV-131A was added.

   h. X-67 — AOV-132B was added.

   j. X-68 — AOV-133B was added.

PRIMARY CONTAINMENT BOUNDARY MODIFICATIONS

3. MOV-18 was replaced and relocated on Penetration X-12.

4. Penetration X-36 CRD return line was cut and capped.

5. Penetration X-59 line containing valves SOV-123A,B was cut and capped.