REACTOR CONTAINMENT BUILDING
INTEGRATED LEAK RATE TEST
TYPE A, B, AND C

SURVEILLANCE TEST

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT PLANT
UNIT NO. 4

JANUARY 1981

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FLORIDA GAS AND ELECTRIC COMPANY

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UNIT NO. 4

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REFERENCES

1. 10CFR50 Appendix J, Primary Reactor Containment Leakage Testing for Water cooled Power Reactors, April 19, 1976

2. Florida Power & Light Turkey Point Plant OP13100.2 Integrated Leak Rate Test Unit 4

3. ANS N274, Containment System Leakage Testing Requirements, Draft 3, July 1979

SECTION 1

PURPOSE

The purpose of this report is to present a description of the Type A Containment Integrated Leak Rate Test (CILRT) and an analyses of the Types B, and C testing activities since the last CILRT conducted on the Florida Power and Light Turkey Point Plant Unit No. 4.

This report is submitted as required by 10CFR50 Appendix J, paragraph V.B. (Reference 1)

SECTION 2

SUMMARY

2.1 TYPE A TEST

Pressurization for the CILRT was initiated at approximately 0600 hours on 30 December 1980. At approximately 0924 hours, pressurization was stopped at a pressure of approximately 25 psia, so a preliminary inspection could be made of all penetration areas. There was no significant leakage noted at this time and no corrective action was considered necessary. Pressurization continued at approximately 1146 hours.

Test pressure was reached at approximately 2105 hours and containment pressurization was secured. Containment temperature stabilization criterion was met at approximately 0520 hours on 31 December 1980. The extended time period required for stabilization was apparently due to insufficient air circulation in the containment.

Sensor data were continually recorded at 20 minute intervals. Calculated mass trends from 0520 hours to approximately 1120 hours indicated an acceptable leak rate of approximately 35 percent of La. From 1120 hours to approximately 1600 hours, the mass trends indicated an unacceptable leak rate of approximately La. A detailed inspection was initiated at approximately 1300 hours to identify major leak paths.

At approximately 1600 hours, the reactor coolant drain tank (RCDT) "A" loop pump discharge isolation valve (CV-4668A) was observed to be leaking through the valve body.

It was also observed that the valve was in the open position, although the valve does receive a containment isolation signal to close. A review of the valve line-up revealed that an error had been made in an attachment to the test procedure (Reference 2). The attachment showed the valve in the open position.

The attachment to the procedure was amended to reflect the proper position of the valve. At approximately 1620 hours on 31 December 1980, the valve was placed in its proper position. From 1620 hours 31 December 1980 to approximately 0800 hours on 1 January 1981, the calculated leak rate was acceptable and the requirements of the procedure were satisfied.

At 0900 hours on 1 January 1981, the superimposed leak rate test commenced. At 1400 hours the calculated containment leak rate satisfied the requirements of the procedure.

Depressurization of the containment at approximately 5.5 psi/hr commenced at 1852 hours on 1 January 1981.

During depressurization, the RCDT pump isolation valve was tested in the closed position and a leak rate of 20 cc/min was measured. The bonnet of the valve was removed and it was noted that the diaphragm had failed. The diaphragm was replaced and the valve retested. The measured leak rate was 0 cc/min.

2.2 LOCAL LEAK RATE TESTS (TYPES B AND C)

The local leak rate testing of containment isolation valves and primary containment penetrations was conducted as required by station procedures, since the last Type A Test. The penetrations tested and their associated leak rates are listed in Section 4 of this report.

SECTION 3

TYPE A TEST

3.1 EDITED LOG OF EVENTS

30 December 1980

0600 - initiated containment pressurization

0924 - stopped pressurization for preliminary leakage inspection

1146 - restarted containment pressurization

2105 - secured containment pressurization

31 December 1980

0520 - completed stabilization

1300 - increased containment leakage rate noted

1620 - closed RCDT pump isolation valve

1 January 1981

0800 - leak rate test terminated

0900 - started superimposed leak rate test

1400 - completed superimposed leak rate test

1852 - commenced blowdown of containment

3.2 GENERAL TEST DESCRIPTION

3.2.1 Prerequistes

In accordance with the test procedure (Reference 2), the following is a partial listing of the prerequisites that were completed and documented prior to containment pressurization.

1. General inspection of the accessible interior and exterior surfaces of the containment structure inspected.

2. All equipment and instrumentation that could be damaged or destroyed by test pressure removed or protected.

3. All instrumentation used for test calibrated or functionally verified.

4. Valve line-ups, as required, completed, including closure of the containment isolation valves.

5. Appropriate computer systems programmed and available for data input into the time share computer.

6. The Official Log of Events book established and available prior to commencement of the test.

7. Site meterological data taken for seven days prior to and throughout the performance of the CILRT.

3.2.2 Equipment and Instrumentation

Instrumentation and valving were installed to maintain proper monitoring and control during pressurization. Pressurization of the containment was achieved by utilization of eight air compressors. Air was piped through aftercoolers and refrigerated air dryers. The total capacity of the pressurization system as installed was rated at approximately 7,000 scfm.

During the test, the necessary variables used to determine containment leakage were continually monitored using instrumentation which consisted of resistance temperature detectors (RTDs), relative humidity detectors (RHD) and absolute pressure quartz manometers (see Appendix 3D).

A rotometer was used during the superimposed leak rate test.

3.2.3 Data Acquisition System

The Turkey Point Plant Unit No. 4 CILRT utilized a portable programmable calculator and a time share computer to average and analyze the test data.

CILRT sensor data were recorded at 20 minute intervals during the test. Weighted average temperature, weighted relative humidity, absolute pressure, vapor pressure, and mass values were periodically calculated for each interval using the portable programmable calculator.

3.2.4 Data Resolution System

After the appropriate data had been acquired and averaged, the results were manually input into FP&L's computer system for UCL and leak rate calculations.

3.2.4.1 Absolute Method Mass Point Analysis

The Absolute Method of Mass Point Analysis consists of calculating air masses within the containment structure over a period of time from pressure, temperature, and dew point observations during the CILRT. The air masses are computed using the ideal gas law as follows:

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

where:

M = air mass, lb
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, 1.55×10^6 ft^3

The air mass is correlated and the result is correlated as a function of time by means of a least-squares fit of the form:

$$m = At + B \qquad \text{(Eq 2)}$$

The slope A and the y intercept B are then used in Equation 3 to determine the leak rate.

The leakage rate is then determined by plotting the air mass as a function of time, using a least-squares fit to determine the slope, A = dM/dt. The leak rate is expressed as a percentage of air mass lost in 24 hours or symbolically:

$$\text{Leak rate} = \frac{A/B\ (-2400)}{B} \qquad \text{(Eq 3)}$$

where A is the slope of the least-squares curve and B is the y intercept. The sign convention is such that an outward leak 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 UCL.

The leak rate is less than the UCL with a probability of 95 percent.

3.2.4.2 Absolute Method Total Time Analysis

The absolute method of total time analysis consists of calculating air lost from the containment using pressure, temperature, and dew point observations during the CILRT.

The containment air mass is computed using Equation 1 (Section 3.2.4.1).

The measured leakage rate at any time (t) is then determined by subtracting the mass at that time (Mt) from the initial mass (Mi) and dividing by the initial mass. The measured leak rate is expressed as a percentage of containment mass lost in 24 hours or symbolically:

$$\text{Measured Leak Rate} = \frac{Mi - Mt}{Mi\Delta(t)} \quad (2400)$$

The sign convention is such that an outward leak is positive and the units are in percent/day.

The calculated leakage rate is then determined by plotting the measured leak rate as a function of time and then performing a least-squares fit of the measured leak rate values as follows:

$$\text{Calculated Leak Rate} = At + B$$

Where A is the slope and B is the Y intercept of the least-squares curve.

The 95 percent confidence interval is determined with the 'students' T distribution.

This analysis method was used in conjunction with the procedure.

3.3 TEST ANALYSIS

Test data acquired from the start of stabilization to the termination of the supplemental leak test are shown as a graph in Appendix 3H. The graph is divided into the following zones:

Zone A - depicts temperature stabilization period from 2105 hours 30 December 1980 to 0520 hours 31 December 1980

Zone B - depicts acceptable mass trend from 0520 to 1300 hours 31 December 1980

Zone C - depicts increasing mass trend from 1300 to 1620 hours 31 December 1980

Zone D - depicts acceptable mass trend from 1620 hours 31 December 1980 to 0800 hours 1 January 1981. This zone contains the data used for leakage rate calculations

Zone E - depicts superimposed leak rate test from 0900 hours 1 January 1981 to 1400 hours 1 January 1981

It is apparent that the cause of the increased mass trend as shown in Zone C was a result of the failure of the RCDT pump isolation valve.

The subsequent closing of the valve resulted in the acceptable mass trend as shown in Zone D. The slope of the mass trend shown in Zone D is similar to that slope in Zone B before the RCDT pump isolation valve diaphragm failed.

The leakage rate analysis was performed by using FP&L's CILRT program (Section 3.2.4). The reduced data are shown in Appendix 3E.

The absolute method mass point analysis (Section 3.4.1) represents the results of the containment leakage rate. The results, shown in Appendix 3F, show the UCL to be 0.0367 percent/day which is within the acceptable limit of 0.1875 percent/day (0.75 La).

The Absolute Method Total Time Analysis (Section 3.4.2) is used in conjunction with the Instrument Selection Guide (Reference 3) to determine the duration of the CILRT if less than 24 hours. The data used in Zone D satisfy the requirements of the test procedure. The results of the total time analysis are tabulated in Appendix 3G.

The results show the UCL to be 0.1299 percent/day which is within the acceptable limit of 0.25 percent/day (La).

The following appendixes summarize the plots provided by this report:

Appendix	Description
3H	Containment air mass vs time (2120 hours on 12/30/80 to 1400 hours on 1/1/81)
3J	Containment leak rate and UCL vs time, mass point analysis (1620 hours on 12/31/81 to 0800 hours on 1/1/81
3K	Calculated containment leak rate vs time, total time analysis (1620 hours on 12/31/81 to 0800 hours on 1/1/81)

The leakage rate test calculations were verified by the superimposed leak method. The test ran from 0900 to 1400 hours on January 1, 1981. The containment leakage rate calculated during the verification test satisfied the procedure.

3.4 TEST RESULTS

3.4.1 CILRT Results - Mass Point Method

1.	Leakage rate calculated, Lam	0.032450 percent/day
2.	95 percent upper confidence	0.004231 percent/day
3.	UCL, Lam leakage rate with 95 percent confidence interval (1+2)	0.036681 percent/day

3.4.2 CILRT Results - Total Time Method

1.	Leakage rate calculated, Lam	0.047204 percent/day
2.	95 percent upper confidence	0.082689 percent/day
3.	UCL, Lam leakage rate with 95 percent confidence interval (1+2)	0.129893 percent/day

3.4.3 Imposed Leakage Rate Test Results

1. The Imposed Leak Rate Test is acceptable if Lc falls within the following range:

   $(Lo+Lam - 0.25\ La) \leq Lc \leq (Lo+Lam + 0.25\ La)$

   where: Lc = containment leakage rate calculated during the verification test (0.1108%/day).

   Lo = leakage rate imposed on containment using flow measuring device (0.1103%/day)

   La = Maximum allowable leakage rate for ILRT (0.25%/day)

   Lam = total measured containment leakage rate (0.0472%/day)

   $(0.1108 + 0.0472 - 0.0625) \leq 0.110\% \leq (0.1108 + 0.0472 + 0.0625)$

   $0.0950 \leq 0.1108 \leq 0.2200$

2. The Imposed Leakage Rate Test met the requirements set forth in Reference 3.

APPENDIX 3A

SITE METEOROLOGY PRIOR TO CILRT

Date	Time	Barometric Pressure (In. Hg)	Dry Bulb Temperature (°F)	Wind Direction	Wind Velocity (Mph)
12/23/80	0400	30.21	69.0	120	18
	0800	30.27	71.0	120	16
	1200	30.25	76.0	130	19
	1600	30.20	70.0	60	8
	2000	30.23	68.0	360	18
	2400	30.21	65.0	350	14
12/24/80	0400	30.18	65.0	350	15
	0800	30.21	61.0	315	14
	1200	30.20	67.0	10	14
	1600	30.15	71.0	350	8
	2000	30.16	68.0	350	8
	2400	30.15	64.0	355	16
12/25/80	0400	30.13	62.0	320	8
	0800	30.16	61.0	270	12
	1200	30.18	65.0	310	20
	1600	30.15	64.0	340	24
	2000	30.21	55.0	330	18
	2400	30.18	49.0	320	16
12/26/80	0400	30.21	45.0	320	14
	0800	30.22	47.0	330	6
	1200	30.18	70.0	340	12
	1600	30.10	68.0	45	10
	2000	30.10	61.0	350	15
	2400	30.10	60.0	10	10
12/27/80	0400	30.07	54.0	300	20
	0800	30.12	53.0	310	15
	1200	30.12	67.0	300	15
	1600	30.05	63.0	320	20
	2000	30.05	55.0	300	20
	2400	30.08	50.0	340	20
12/28/80	0400	30.04	45.0	320	20
	0800	30.05	43.0	320	18
	1200	30.10	54.0	300	12
	1600	30.05	58.0	290	15
	2000	30.09	50.0	360	10
	2400	30.05	48.0	60	2
12/29/80	0400	30.03	50.0	240	6
	0800	30.08	49.0	320	13

Appendix 3A (Cont)

Date	Time	Barometric Pressure (In. Hg)	Dry Bulb Temperature (°F)	Wind Direction	Wind Velocity (Mph)
	1200	30.10	65.0	190	12
	1600	30.04	64.0	310	12
	2000	30.12	56.0	270	12
	2400	30.08	52.0	300	14
12/30/80	0400	30.08	50.0	340	15

APPENDIX 3B

SITE METEOROLOGY DURING THE CILRT

Date	Time	Barometric Pressure (In. Hg)	Dry Bulb Temperature (°F)	Wind Direction	Wind Velocity (Mph)
12/30/80	0600	30.09	50.0	320	12
	0700	30.10	55.0		
	0800	30.12	56.0	N/A	0
	0900	30.14	58.0		
	1000	30.13	67.0	120	4
	1100	30.14	64.5		
	1200	30.13	67.0	120	4
	1300	30.09	68.0	150	12
	1400	30.07	65.0	170	14
	1500	30.06	64.0	290	8
	1600	30.06	67.0	220	12
	1700	30.07	65.0	280	10
	1800	30.07	63.0	260	18
	1900	30.07	62.0	260	20
	2000	30.09	58.0	260	12
	2100	30.08	58.0	230	12
	2200	30.08	60.0	230	14
	2300	30.06	59.0	240	14
12/31/80	0000	30.06	59.0	240	14
	0100	30.06	58.0	260	19
	0200	30.05	56.0	300	20
	0300	30.07	56.0	340	20
	0400	30.07	55.0	340	23
	0500	30.05	52.0	320	16
	0600	30.09	50.0	320	16
	0700	30.12	49.0	330	16
	0800	30.13	50.0	320	16
	0900	30.16	56.0	310	19
	1000	30.16	57.5	310	20
	1100	30.16	59.0	300	16
	1200	30.16	63.0	300	12
	1300	30.16	63.0	310	11
	1400	30.16	64.0	310	12
	1500	30.16	65.0	312	8
	1600	30.11	63.0	320	8
	1700	30.11	62.0	300	5
	1800	30.12	59.0	300	7
	1900	30.13	58.0	330	8
	2000	30.16	56.0	270	4
	2100	30.18	54.0	270	7
	2200	30.16	52.0	280	16
	2300	30.19	52.0	310	17
1/1/81	0000	30.20	49.0	310	18

Appendix 3B (Cont)

Date	Time	Barometric Pressure (In. Hg)	Dry Bulb Temperature (°F)	Wind Direction	Wind Velocity (Mph)
	0100	30.20	48.0	320	19
	0200	30.19	48.0	310	18
	0300	30.18	47.0	305	17
	0400	30.19	46.0	320	18
	0500	30.18	46.0	325	16
	0600	30.21	45.0	330	10
	0700	30.22	46.0	310	12
	0800	30.24	51.0	340	15
	0900	30.26	58.0	340	12
	1000	30.27	58.0	330	6
	1100	30.27	62.0	360	8
	1200	30.21	60.0	30	6
	1300	30.20	62.0	30	8
	1400	30.18	72.0	270	10
	1500	30.18	71.0	270	10
	1600	30.16	70.0	280	4
	1700	30.19	63.0	170	14
	1800	30.20	60.0	170	12

APPENDIX 3C

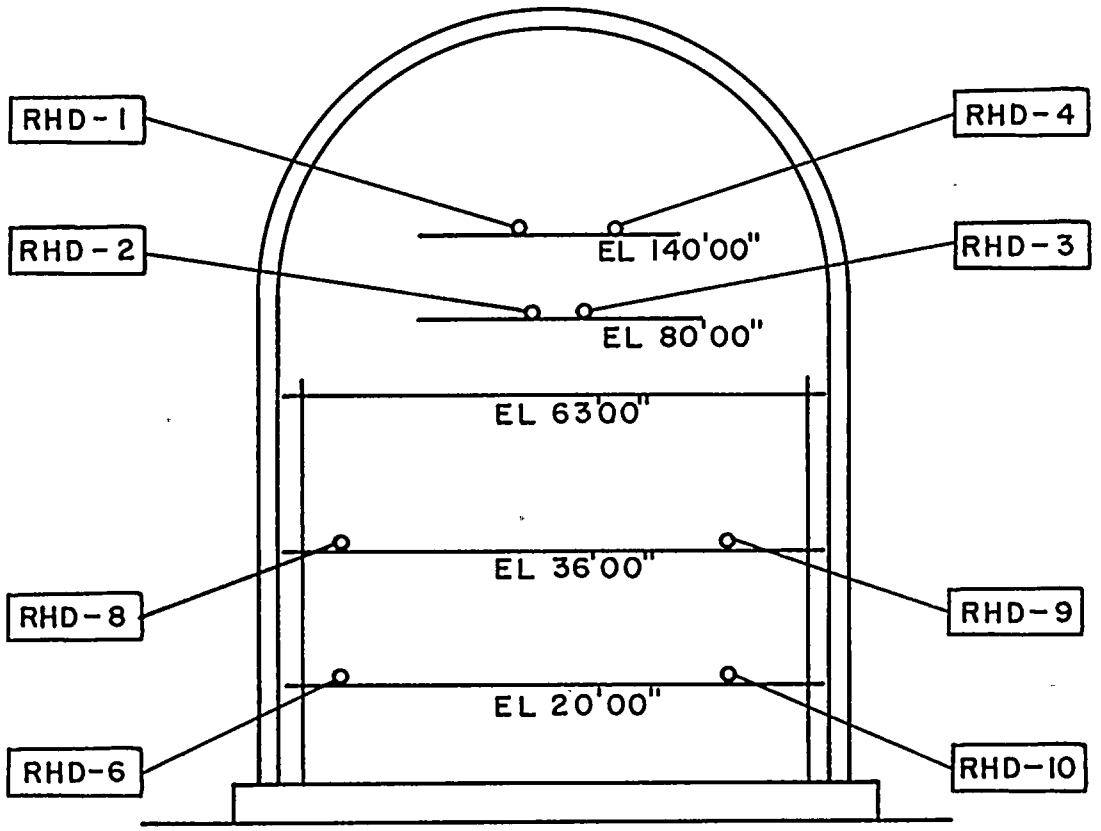
INSTRUMENTATION TABLE

The following instruments were calibrated or functionally verified no greater than 6 months prior to the performance of this test and in accordance with 10CFR50, Appendix J, and Field Calibration Procedures using instrumentation traceable to the National Bureau of Standards.

Instrument	Weight_Factor	Accuracy
RTD-1	0.181	±0.5°F
RTD-2	0.32	±0.5°F
RTD-3	0.024	±0.5°F
RTD-4	Not Used	
RTD-5	0.024	±0.5°F
RTD-6	Not Used	
RTD-7	0.024	±0.5°F
RTD-8	0.024	±0.5°F
RTD-9	0.0198	±0.5°F
RTD-10	0.0198	±0.5°F
RTD-11	0.0198	±0.5°F
RTD-12	0.0198	±0.5°F
RTD-13	0.0198	±0.5°F
RTD-14	0.0198	±0.5°F
RTD-15	0.0198	±0.5°F
RTD-16	Not Used	
RTD-17	0.0198	±0.5°F
RTD-18	0.0198	
RTD-19	Not Used	±0.5°F
RTD-20	0.0198	±0.5°F
RTD-21	0.024	±0.5°F

Instrument	Weight_Factor	Accuracy
RTD-22	0.181	±0.5°F
RHD-1	0.160	±0.3°C
RHD-2	not used	
RHD-3	0.482	±0.3°C
RHD-4	0.160	±0.3°C
RHD-6	0.0495	±0.3°C
RDH-8	0.0495	±0.3°C
RDH-9	0.0495	±0.3°C
RHD-10	0.0495	±0.3°C
TI-145 Quartz Manometer 1	N/A	0-100 psia
TI-145 Quartz Manometer 2	N/A	0-100 psia

Flowmeter - 0-28 scfm at 50 psig

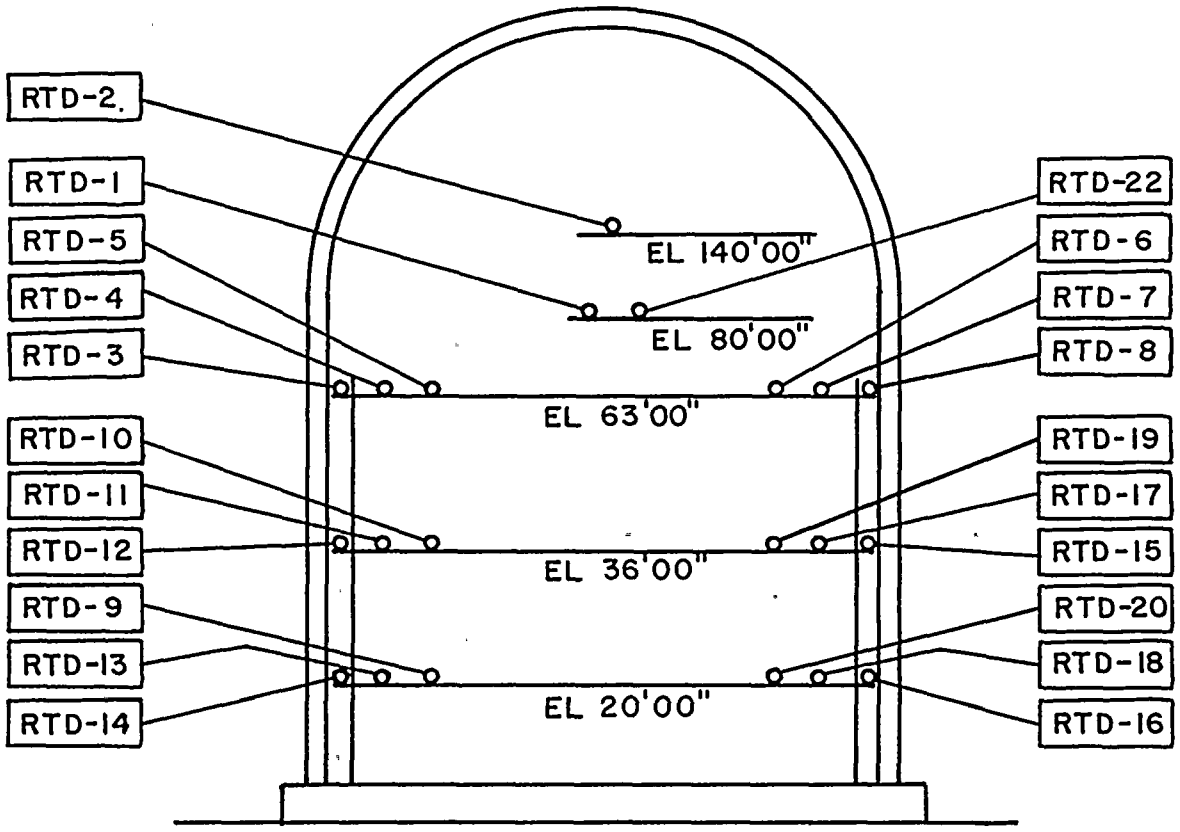


PROFILE VIEW

NOTE:

1. RHD-2 NOT USED

APPENDIX 3D
INSTRUMENTATION LOCATION
RELATIVE HUMIDITY DETECTORS (RHD)
TURKEY POINT PLANT - UNIT 4
INTEGRATED LEAK RATE TEST

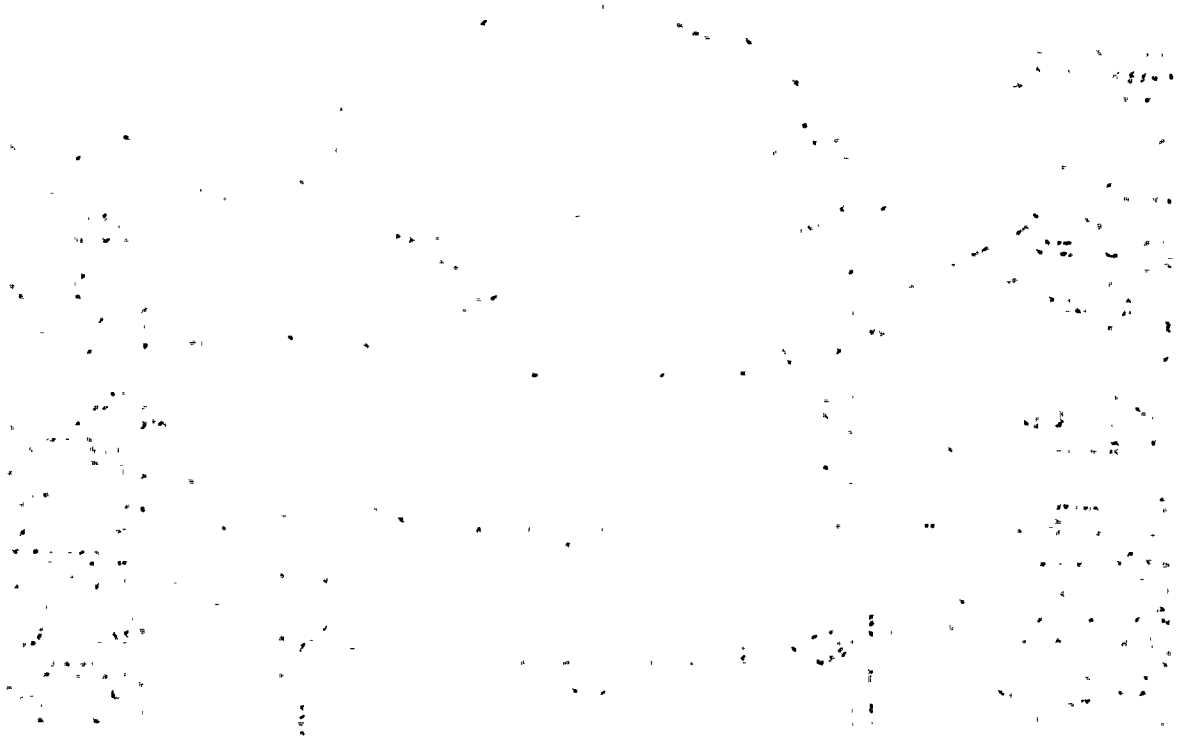


PROFILE VIEW

NOTE:

1. RTD-4, 16 AND 19 NOT USED

APPENDIX 3D
INSTRUMENTATION LOCATION
RESISTANCE TEMPERATURE DETECTORS(RTD)
TURKEY POINT PLANT - UNIT 4
INTEGRATED LEAK RATE TEST



APPENDIX 3E

FP&L TURKEY POINT PLANT UNIT 4
INTEGRATED LEAK RATE TEST FROM 1620
HOURS ON 12/31/80 TO 0800 HOURS ON 1/1/81

Time (Hours)	Abs Pressure (Psia)	Rel Humicity (Pt)	Vap Press (Psia)	Dry Bulb Temperature (°R)	Mass (lbm)
0.000	67.942	76.744	0.3856	539.40	523978.3862
0.333	67.938	76.768	0.3853	539.36	523987.9376
0.667	67.935	76.805	0.3850	539.33	523998.9060
1.000	67.932	76.832	0.3851	539.32	523981.8564
1.333	67.929	76.861	0.3849	539.29	523986.1885
1.667	67.925	76.903	0.3849	539.26	523971.1748
2.000	67.923	76.906	0.3849	539.27	523961.2429
2.333	67.919	76.944	0.3847	539.25	523954.3788
2.667	67.915	76.968	0.3848	539.24	523930.0180
3.000	67.913	77.010	0.3849	539.23	523920.7972
3.333	67.910	77.042	0.3849	539.22	523912.8436
3.667	67.907	77.084	0.3847	539.19	523919.8039
4.000	67.904	77.120	0.3843	539.14	523941.3212
4.333	67.901	77.160	0.3844	539.17	523924.6400
4.667	67.898	77.152	0.3839	539.10	523939.6182
5.000	67.895	77.221	0.3839	539.07	523946.5153
5.333	67.891	77.281	0.3839	539.05	523934.9075
5.667	67.889	77.275	0.3835	539.02	523951.4822
6.000	67.886	77.275	0.3834	539.01	523940.3169
6.333	67.883	77.278	0.3832	539.00	523930.4792
6.667	67.879	77.289	0.3831	538.98	523917.1398

[illegible]

[illegible]

[illegible]

Time (Hours)	Abs Pressure (Psia)	Rel Humidity (Pt)	Vap Press (Psia)	Dry Bulb Temperature (°R)	Mass (lbm)
7.000	67.875	77.338	0.3829	538.94	523921.8974
7.333	67.872	77.351	0.3827	538.92	523921.4147
7.667	67.869	77.335	0.3825	538.92	523905.1664
8.000	67.866	77.355	0.3822	538.89	523913.8941
8.333	67.863	77.364	0.3819	538.86	523919.9586
8.667	67.859	77.199	0.3809	538.84	523911.3762
9.000	67.855	77.370	0.3811	538.79	523928.6897
9.333	67.852	77.387	0.3813	538.80	523897.9574
9.667	67.849	77.362	0.3810	538.78	523891.9441
10.000	67.846	77.357	0.3805	538.75	523904.6628
10.333	67.842	77.343	0.3801	538.73	523901.3968
10.667	67.838	77.309	0.3798	538.72	523880.7412
11.000	67.835	77.328	0.3794	538.68	523889.2432
11.333	67.826	77.307	0.3784	538.66	523889.9409
11.667	67.829	77.252	0.3789	538.66	523874.1923
12.000	67.826	77.224	0.3784	538.63	523883.2692
12.333	67.824	77.212	0.3780	538.61	523894.3491
12.667	67.821	77.165	0.3774	538.57	523907.6057
13.000	67.818	77.171	0.3771	538.55	523907.4625
13.333	67.815	77.143	0.3770	538.55	523884.3588
13.667	67.813	77.113	0.3765	538.53	523889.8624
14.000	67.810	77.144	0.3767	538.52	523867.8800
14.333	67.808	77.161	0.3766	538.52	523861.3200

Time (Hours)	Abs Pressure (Psia)	Rel Humidity (Pt)	Vap Press (Psia)	Dry Bulb Temperature (°R)	Mass (lbm)
14.667	67.805	77.133	0.3761	538.48	523871.5800
15.000	67.802	77.089	0.3757	538.47	523864.5923
15.333	67.799	77.086	0.3754	538.45	523868.0273
15.667	67.797	77.039	0.3752	538.44	523855.8481

APPENDIX 3F

FP&L TURKEY POINT PLANT UNIT 4
INTEGRATED LEAK RATE TEST FROM 1620 HOURS ON 12/31/80
TO 0800 HOURS ON 1/1/81
ABSOLUTE TEST METHOD, MASS POINT ANALYSIS

Time (Hours)	Mass (Lbm)	Leakage (Pct/Day)	Conf (Pct/Day)	UCL (Pct/Day)
0	523978.39	0.00	0.000000	0.00
0.333	523987.94	0.00	0.000000	0.00
0.667	523998.91	-0.140916	0.039323	-0.101593
1.00	523981.86	-0.029395	-0.189510	0.218905
1.333	523986.19	-0.013104	0.091465	0.104569
1.667	523971.17	0.022907	0.089013	0.111920
2.000	523961.24	0.047927	0.069319	0.117246
2.333	523954.38	0.062221	0.053301	0.115522
2.667	523930.02	0.087057	0.052334	0.139391
3.000	523920.80	0.101862	0.045255	0.147117
3.333	523912.84	0.110279	0.037900	0.148179
3.667	523919.80	0.107208	0.031322	0.138530
4.000	523941.32	0.092076	0.032455	0.124531
4.333	523924.64	0.086485	0.028403	0.114888
4.667	523939.62	0.075537	0.027951	0.103488
5.000	523946.52	0.064459	0.27875	0.092334
5.333	523934.91	0.058721	0.025432	0.084153
5.667	523951.48	0.049665	0.025059	0.074724
6.000	523940.32	0.044823	0.023074	0.067897
6.333	523930.48	0.42586	0.020852	0.063438
6.667	523917.14	0.042757	0.018827	0.061584

APPENDIX 3F (CONT)

Time (Hours)	Mass (Lbm)	Leakage (Pct/Day)	Conf (Pct/Day)	UCL (Pct/Day)
7.000	523921.90	0.041604	0.017078	0.058682
7.333	523921.41	0.040346	0.015617	0.055963
7.667	523905.17	0.041206	0.014311	0.055517
8.000	523913.89	0.040389	0.013167	0.053556
8.333	523919.96	0.038689	0.012294	0.050983
8.667	523911.38	0.037969	0.011389	0.049358
9.000	523928.69	0.035354	0.011001	0.046355
9.333	523897.96	0.035912	0.010245	0.046157
9.667	523891.94	0.03667	0.009584	0.046254
10.000	523904.66	0.036007	0.008987	0.044994
10.333	523901.40	0.035513	0.008433	0.043946
10.667	523880.74	0.036431	0.007985	0.044416
11.000	523899.24	0.035732	0.007550	0.043282
11.333	523889.94	0.035584	0.007112	0.042696
11.667	523874.19	0.036273	0.006758	0.043031
12.000	523883.27	0.036170	0.006387	0.042557
12.333	523894.35	0.035320	0.006126	0.041446
12.667	523907.61	0.033757	0.006087	0.039844
13.000	523907.46	0.032301	0.006023	0.038324
13.333	523884.36	0.032042	0.005732	0.037774
13.667	523889.86	0.031460	0.005496	0.036956
14.000	523867.88	0.031814	0.005273	0.037067
14.333	523861.32	0.032298	0.005042	0.037340
14.667	523871.58	0.032218	0.004816	0.037034

Time (Hours)	Mass (Lbm)	Leakage (Pct/Day)	Conf (Pct/Day)	UCL (Pct/Day)
15.000	523864.59	0.032326	0.004604	0.036930
15.333	523868.03	0.032208	0.004408	0.036616
15.667	523855.84	0.032450	0.004231	0.036681

Initial estimated mass = 523973.17

Final estimated mass = 523862.18

APPENDIX 3G
FP&L TURKEY POINT PLANT UNIT 4
INTEGRATED LEAK RATE TEST FROM 1620 HOURS ON 12/31/80
TO 0800 HOURS ON 1/1/81

ABSOLUTE TEST METHOD, TOTAL TIME ANALYSIS

Time (Hours)	Mass (Lbm)	Meas Leakage (Pct/Day)	Mean of Meas Leakage	Calc Leakage (Pct/Day)	Conf (Pct/Day)	UCL (Pct/Day)
0.000	523978.39	0.000000	0.000000	0.000000	0.000000	0.000000
0.333	523987.94	-0.131377	0.000000	0.000000	0.000000	0.000000
0.667	523998.91	-0.140911	0.000000	0.000000	0.000000	0.000000
1.000	523981.86	-0.015895	-0.096061	-0.03838	0.532747	0.494364
1.333	523986.19	-0.026810	-0.078748	-0.01297	0.214869	0.201891
1.667	523971.17	0.019814	-0.059036	0.02427	0.136351	0.160628
2.000	523961.24	0.039261	-0.042653	0.05193	0.107194	0.159129
2.333	523954.38	0.047133	-0.029826	0.06996	0.097679	0.167640
2.667	523930.02	0.083068	-0.015714	0.09486	0.085773	0.180640
3.000	523980.80	0.087926	-0.004199	0.11188	0.082199	0.194079
3.333	523912.84	0.090071	0.005228	0.12332	0.083704	0.207030
3.667	523919.80	0.073173	0.011405	0.12529	0.094114	0.219410
4.000	523941.32	0.042443	0.013991	0.11690	0.112455	0.229363
4.333	523924.64	0.056814	0.017286	0.11396	0.116501	0.230462
4.667	523939.62	0.038048	0.018769	0.10643	0.123111	0.229542
5.000	523946.52	0.029196	0.019464	0.09798	0.127933	0.225916
5.333	523934.91	0.037342	0.020581	0.09281	0.128153	0.220967
5.667	523951.48	0.021745	0.020650	0.08505	0.129888	0.214940
6.000	523940.32	0.029062	0.021117	0.07998	0.128872	0.208861
6.333	523930.48	0.034649	0.021829	0.07673	0.126664	0.203396
6.667	523917.14	0.042077	0.022842	0.07527	0.123720	0.198993

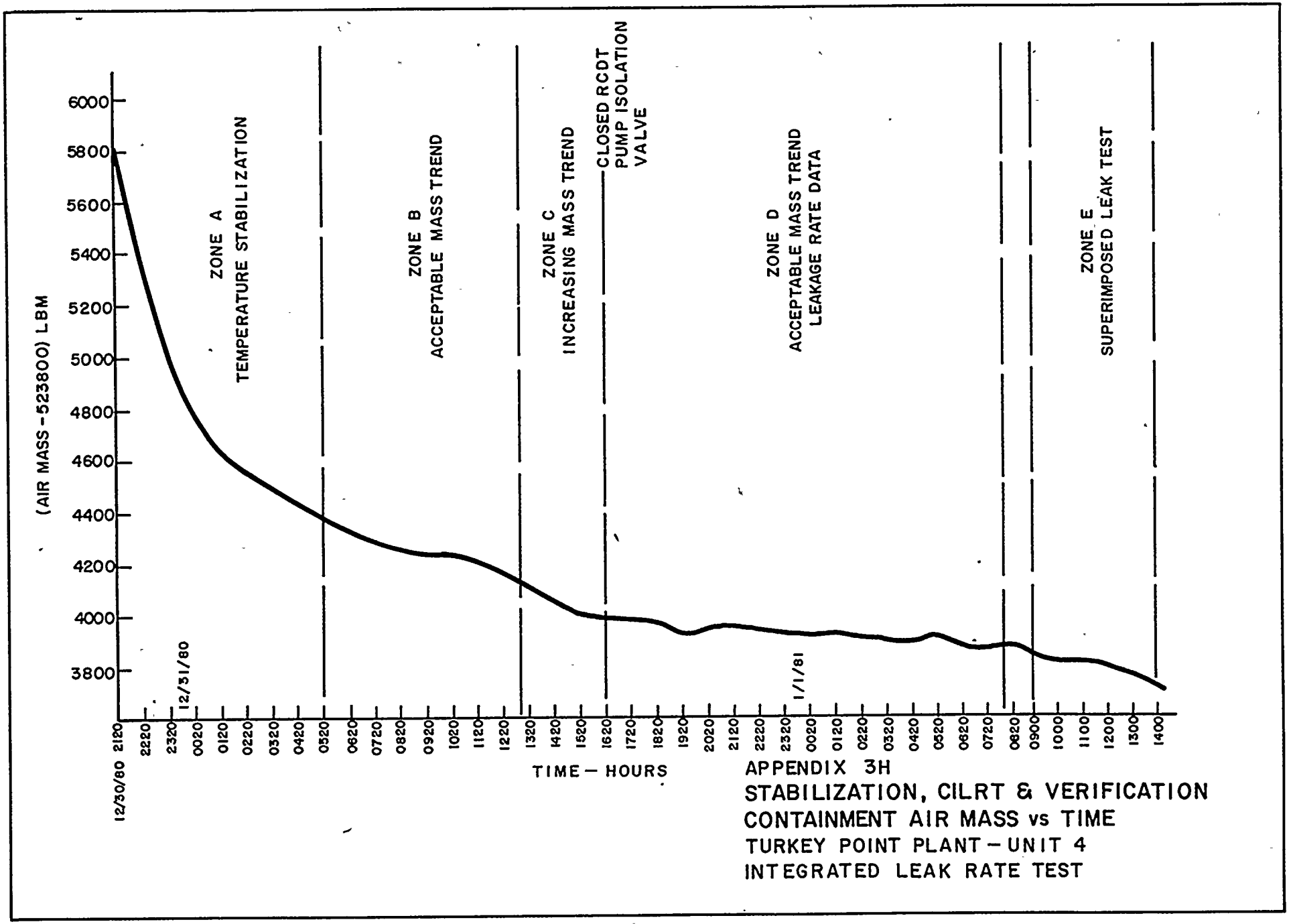
APPENDIX 3G (CONT)

Time (Hours)	Mass (Lbm)	Meas Leakage (Pct/Day)	Mean of Meas Leakage	Calc Leakage (Pct/Day)	Conf (Pct/Day)	UCL (Pct/Day)
7.000	523921.90	0.036963	0.023514	0.07300	0.121333	0.194341
7.333	523921.41	0.035586	0.024063	0.07075	0.119089	0.189842
7.667	523905.17	0.043742	0.024918	0.07007	0.116382	0.186460
8.000	523913.89	0.036924	0.025419	0.06834	0.114246	0.182588
8.333	523919.96	0.032115	0.025686	0.06604	0.112468	0.178516
8.667	523911.38	0.035413	0.026061	0.06447	0.110501	0.174978
9.000	523928.69	0.025292	0.026032	0.06162	0.109168	0.170790
9.333	523897.96	0.039472	0.026512	0.06098	0.107080	0.168066
9.667	523891.94	0.040957	0.027010	0.06058	0.105059	0.165644
10.000	523904.66	0.033768	0.027235	0.05927	0.103415	0.162689
10.333	523901.40	0.034127	0.027458	0.05811	0.101806	0.159924
10.667	523880.74	0.041928	0.027910	0.05799	0.10017	0.158006
11.000	523899.24	0.032955	0.028063	0.05860	0.098595	0.155398
11.333	523889.94	0.035746	0.028289	0.05602	0.097123	0.153147
11.667	523874.19	0.040905	0.028649	0.05586	0.095578	0.151447
12.000	523883.27	0.036306	0.028862	0.05521	0.094219	0.149431
12.333	523894.35	0.031210	0.028925	0.05406	0.093058	0.147125
12.667	523907.61	0.025594	0.028838	0.05244	0.092106	0.144550
13.000	523907.46	0.024989	0.028739	0.05088	0.091164	0.142046
13.333	523884.36	0.032302	0.028828	0.05014	0.090011	0.140155
13.667	523889.86	0.029668	0.028849	0.04921	0.088956	0.138166
14.000	523867.88	0.036155	0.029023	0.04893	0.087794	0.136727
14.333	523861.32	0.037408	0.029218	0.04878	0.086658	0.135442
14.667	523871.58	0.033354	0.029312	0.04827	0.085632	0.133908

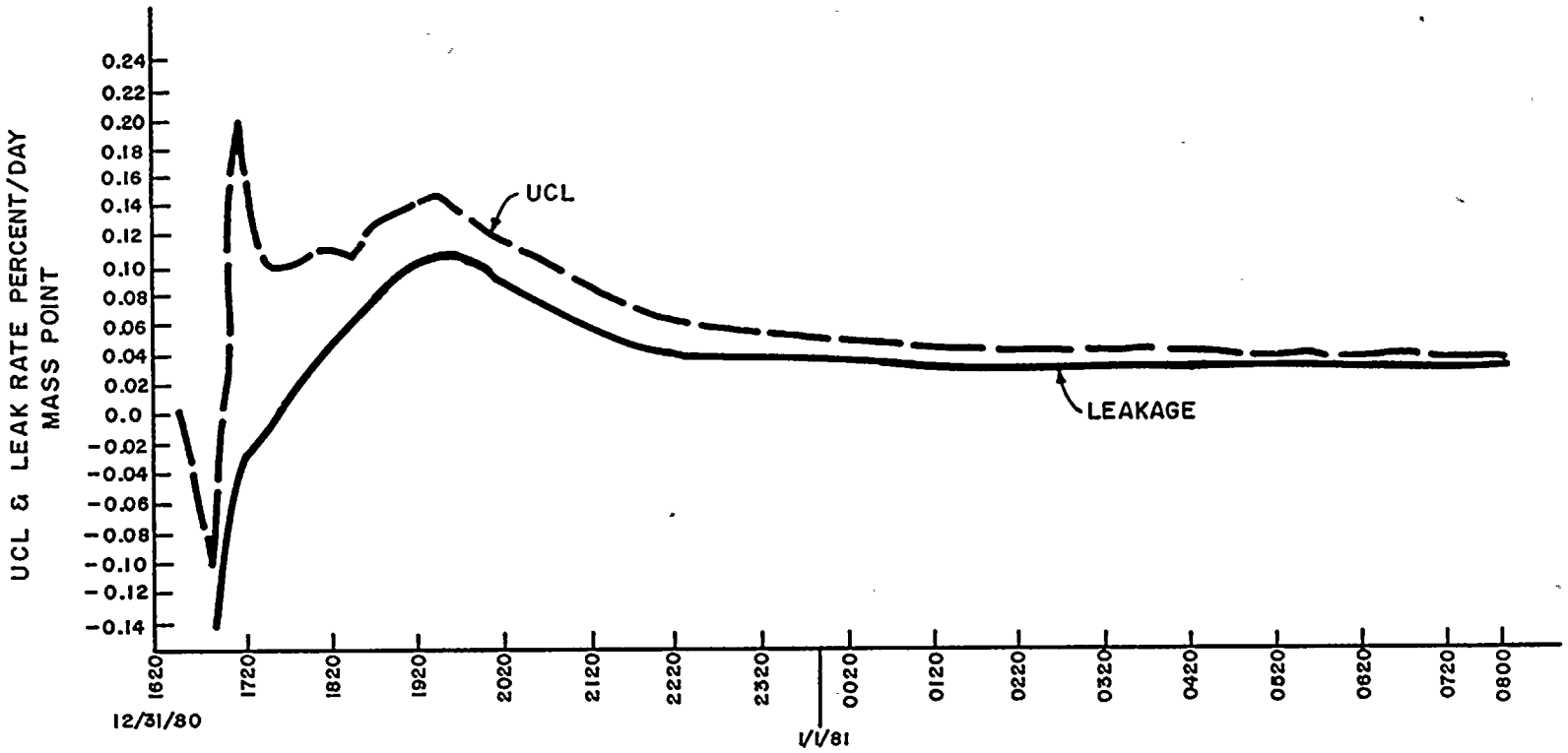
Time (Hours)	Mass (Lbm)	Meas Leakage (Pct/Day)	Mean of Meas Leakage	Calc Leakage (Pct/Day)	Conf (Pct/Day)	UCL (Pct/Day)
15.000	523864.59	0.034748	0.029432	0.04791	0.084613	0.132532
15.333	523868.03	0.032965	0.029509	0.04743	0.083659	0.131090
15.667	523855.84	0.035827	0.029644	0.04720	0.082689	0.129893

Initial calculated leakage = 0.011320

Final calculated leakage = 0.047204



APPENDIX 3H
STABILIZATION, CILRT & VERIFICATION
CONTAINMENT AIR MASS vs TIME
TURKEY POINT PLANT – UNIT 4
INTEGRATED LEAK RATE TEST

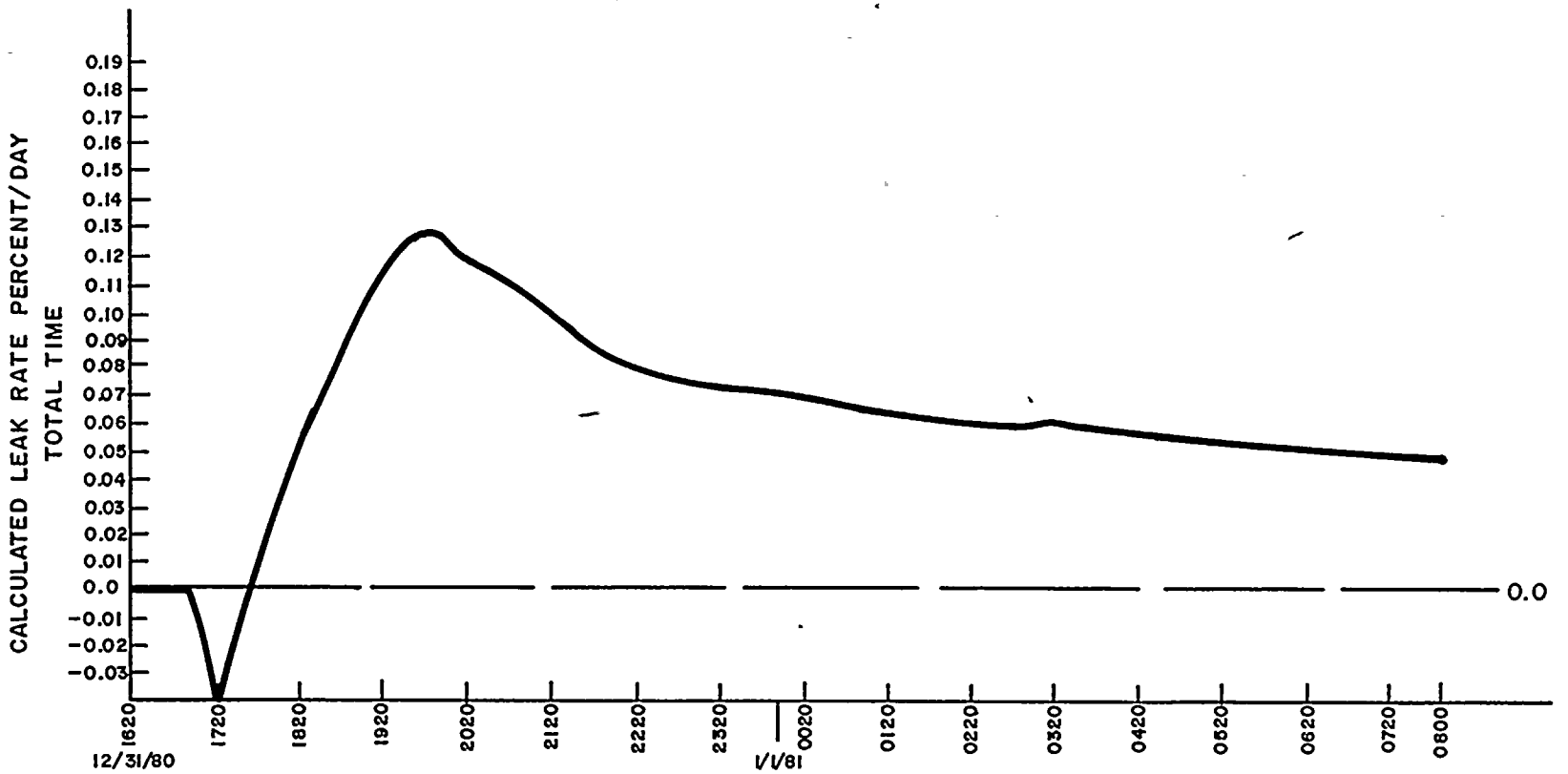


APPENDIX 3J

CONTAINMENT LEAK RATE & UCL vs TIME

TURKEY POINT PLANT - UNIT 4

INTEGRATED LEAK RATE TEST



APPENDIX 3K
CALCULATED CONTAINMENT LEAK RATE vs TIME
TURKEY POINT PLANT – UNIT 4
INTEGRATED LEAK RATE TEST

SECTION 4

LOCAL LEAK RATE TESTS (TYPES B AND C)

Local leak rate tests were performed by pressurizing with air the penetrations listed and either measuring leakage across containment isolation valves (Type C) or across resilient seals (Type B).

The total Types B and C leakage documented was verified to be in accordance with station procedures. The following pages list the penetrations tested and their documented leakage.

APPENDIX 4A

TYPE B DATA SUMMARY

Penetration No.	Equipment Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
1980 TYPE B DATA SUMMARY				
Equipment Hatch	O-Ring and Body	0	0	
Personnel Hatch	O-Ring and Body	25	0	Cleaned seats and seating surface
Inner Annulus of Personnel Hatch	O-Ring and Body	0	0	
Emergency Escape Hatch	O-Ring and Body	0	0	
Fuel Transfer Tube	Flange	400	180	Flange tightened
Inner Annulus of Emergency Escape Hatch	O-Ring and Body	0	0	
1979 TYPE B DATA SUMMARY				
Emergency Escape Hatch	O-Ring and Body	0	0	
Inner Annulus of Emergency Escape Hatch	O-Ring and Body	0	0	
Personnel Hatch	O-Ring and Body	0	0	
Inner Annulus of Personnel Hatch	O-Ring and Body	0	0	
Equipment Hatch	O-Ring and Body	0	0	
Fuel Transfer Tube	Flange	95	95	
1978 TYPE B DATA SUMMARY				
Inner Annulus of Emergency Escape Hatch	O-Ring and Body	0	0	
Equipment Hatch	O-Ring and Body	0		
Personnel Hatch	O-Ring and Body	30	30	

Penetration No.	Equipment Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
Emergency Escape Hatch	O-Ring and Body	0	0	
Fuel Transfer Tube	Flange	65	65	
Inner Annulus of Personnel Hatch	O-Ring and Body	0	0	
1977 TYPE B DATA SUMMARY				
Equipment Hatch	O-Ring and Body	440	0	Cleaned seats
Personnel Hatch	O-Ring and Body	0	0	
Inner Annulus of Personnel Hatch	O-Ring and Body	0	0	
Emergency Escape Hatch	O-Ring and Body	0	0	
Inner Annulus of Emergency Escape Hatch	O-Ring and Body	0	0	
Fuel Transfer Tube	Flange	200	200	

All electrical cannisters were tested from 1977 to 1980 with no leakages noted or repairs required with one exception. In 1977, electrical cannister T4P33 had a leakage rate of 820 cc/min. The cannister was repaired and the leakage rate was 0 cc/min.

APPENDIX 4B

TYPE C DATA SUMMARY

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
1980 TYPE C DATA SUMMARY				
1 To RHR from Loop A Hot leg	MOV-751 (ISC)	30	30	
5 PRT to Gas Analyzer	CV-516 (OSC)	0	0	
6 Nitrogen to PRT	CK-518 (ISC)	4000	800	Lapped seat
7 PW to PRT and RCP Standpipes	CV-519A (OSC), CV-519B (ISC), CV-522A (ISC), CV-522B (ISC) and CV-522C (ISC)	0	0	
8 PRZ Steam Samples	CV-951 (ISC)	20	20	
	CV-956A (OSC)	0	0	
9 PRZ Liquid Samples	CV-953 (ISC)	0	0	
	CV-956B (OSC)	200	200	
10 RCDT and PRT Vent and Nitrogen to RCDT	CV-4658B (OSC)	0	0	
	PCV-4-1014 (OSC)	60	60	
11 Alternate Low Head SI to Loops	MOV-872 (OSC)	0	0	
14 Letdown to Nonregenerative Heat Exhanger	SV-200A (ISC), SV-200 B (ISC) SV-200 C (ISC)	750	750	
	CV-204 (OSC)	15	15	
15 Charging to Regenerative Heat Exchanger	312 C (ISC)	0	0	
	HCV-121 (OSC) and HCV-333 (OSC)	35	35	

APPENDIX 4B (CONT)

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
16 PACVS, Hydrogen Removal	HV-4-2 (OSC)	0	0	
17 SI Test Line	GI-895 V (OSC)	0	0	
19A Containment Spray A	CK-890 A (OSC)	52,000	0	Valve stroke readjusted
	CK-880 A (OSC)	0	0	
19B Containment Spray B	CK-890 B (OSC)	60	60	
	CK-880 B (OSC)	10	10	
20 A & B Hot Leg Sample	SV-955A (ISC)	0	0	
	SV-955B (ISC)	190	190	
	SV-956C (OSC)	110	110	
23 Containment Sump to WHT	CV-2822 (OSC)	7000	0	Valve stroke readjusted
	CV-2821 (OSC)	0	0	
24A Seal Water Injection to A RCP	CK-298A (ISC)	0	0	
	297A (OSC)	0	0	
24B Seal Water Injection to B RCP	CK-298B (ISC)	0	0	
	297B (OSC)	0	0	
24C Seal Water Injection to C RCP	CK-298C (ISC)	0	0	
	297C (OSC)	0	0	
25 RCP Seal Water Return	MOV-381 (OSC)	0	0	
29 Instrument Air Supply	CK-336 (ISC)	350	350	
	SV-2803 (OSC)	0	0	

APPENDIX 4B (CONT)

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
31 RCDT to Gas Analyzer	CV-4659B (OSC)	0	0	
32 Containment Air Sample Return	CK-11-003 (ISC)	0	0	
	SV-2912 (OSC)	120	120	
33 Containment Air Sample	SV-2913 (OSC)	>52,000	265	Solenoid coil replaced and adjusted
	SV-2911 (OSC)	>52,000	37	Solenoid coil replaced and adjusted
34 Service Air	205 (ISC)	>52,000	1,200	Valve seat replaced and lapped
	204 (OSC)	0	0	
35 Containment Purge Inlet	PV-2600 (OSC) and PV-2601 (ISC) PV-2601 (ISC)	>52,000	80	Rubber seat replaced
36 Containment Purge Outlet	PV-2602 (OSC) and PV-2603 (ISC)	>52,000	40	Rubber seat replaced and tightened
42 Nitrogen to Accumulators	855 (OSC)	35	35	
47 Primary Water Supply to Wash Header	10-567 (OSC)	0	0	
52 RCDT Pump Discharge	CV-4668B (OSC)	0	0	
53 PACVS	HV-4-4 (OSC)	20	20	
54A Containment Recirc Sump to RHR Pump A	MOV-861A (OSC)	1500	1500	
54B Containment Recirc Sump to RHR Pump B	MOV-861B (OSC)	300	300	

APPENDIX 4B (CONT)

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
55 Accumulator Sampling	CV-955C (ISC)	0	0	
	CV-955D (ISC)	32,000	260	Readjusted valve stroke
	CV-955E (ISC)	0	0	
	CV-956D (OSC)	0	0	
61B Deadweight Tester to PT	VIV-C (OSC)	0	0	
63 Instrument Air Bleed	CV-2819 (ISC)	65	65	
	CV-2826 (OSC)	165	165	
65A Containment Air Test Air In-out	VIV-E (OSC)	0	0	
65B Containment Air Test Pressure	VIV-F (OSC)	0	0	
65C Containment Air Test Leakage Flow	VIV-G (OSC)	0	0	

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
1979 TYPE C SUMMARY				
1 To RHR from Loop A Hot Leg	MOV-751 (ISC)	0	0	
5 PRT to Gas Analyzer	CV-516 (OSC)	0	0	
6 Nitrogen to PRT	CK-518 (ISC)	1700	1700	
7 PW to PRT and RCP Standpipes	CV-519A (OSC), CV-519B (ISC), CV-522A (ISC), CV-522B (ISC) and CV-522C (ISC)	0	0	
8 PRZ Steam Samples	CV-951 (ISC)	3600	0	Valve packing tightened; plug properly seated
	CV-956A (OSC)	3600	0	
9 PRZ Liquid Samples	CV-953 (ISC)	0	0	
	CV-956B (OSC)	0	0	
10 RCDT and PRT Vent and Nitrogen to RCDT	CV-4658B (OSC)	0	0	
	PCV-4-1014 (OSC)	0	0	

APPENDIX 4B (CONT)

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
11 Alternate Low Head SI to Loops	MOV-872 (OSC)	30	30	
14 Letdown to Nonregenerative Heat Exchanger	SV-200A (ISC), SV-200B (ISC) and SV-200C (ISC)	1000	1000	
	CV-204 (OSC)	0	0	
15 Charging to Regenerative Heat Exchanger	312C (ISC)	>50000	2000	Seat cleaned and gasket replaced
	HCV-121 (OSC) and HCV-333 (OSC)	260	260	
16 PACVS, Hydrogen Removal	HV-4-2 (OSC)	0	0	
17 SI Test Line	GI-895 V (OSC)	0	0	
19A Containment Spray A	CK-890 A (OSC)	0	0	
	CK-880A (OSC)	0	0	
19B Containment Spray B	CK-890B (OSC)	45	45	
	CK-880B (OSC)	0	0	
20A & B Hot Leg Sample	SV-955A (ISC), SV-955B (ISC) and SV-956C (OSC)	300	300	
23 Containment Sump to WHT	CV-2822 (OSC)	0	0	
	CV-2821 (OSC)	0	0	
24A Seal Water Injection to A RCP	CK-298A (ISC)	0	0	
	297A (OSC)	0	0	
24B Seal Water Injection to B RCP	CK-298B (ISC)	0	0	

APPENDIX 4B (CONT)

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
	297B (OSC)	0	0	
24C Seal Water Injection to C RCP	CK-298C (ISC)	2500	2500	
	297C (OSC)	30	30	
25 RCP Seal Water Return	MOV-331 (OSC)	0	0	
29 Instrument Air Supply	CK-336 (ISC)	400	400	
	SV-2803 (OSC	0	0	
31 RCDT to Gas Analyzer	4659B (OSC)	0	0	
32 Containment Air Sample Return	11-003 (ISC) SV-2912 (OSC)	2700 16500	40 190	Valve lapped and cleaned. Replaced coil.
33 Containment Air Sample Suction	SV-2913 (OSC)	290	290	
	SV-2911 (OSC)	250	250	
34 Service Air	205 (ISC)	480	480	
	204 (OSC)	300	300	
35 Containment Purge Inlet	PV-2600 (OSC) and PV-2601 (ISC)	30	30	
36 Containment Purge Outlet	PV-2602 (OSC) and			Adjusted seat and seal.
	PV-2603 (ISC)	>51000	90	Adjusted seat and seal
42 Nitrogen to Accumulators	855 (OSC)	1500	10	Replaced actuator, repacked bonnet
47 Primary Water Supply to Wash Header	10-567 (OSC)	>51000	540	Lapped seat

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
1979 TYPE C SUMMARY				
52 RCDT Pump Discharge	CV-4668B (OSC)	0	0	
53 PACVS	HV-4-4 (OSC)	0	0	
54A Containment Recirc Sump to RHR Pump A	MOV-861A (OSC)	1000	1000	
54B Containment Recirc Sump	MOV-861B (OSC)	0	0	
55 Accumulator Sampling	CV-955C (ISC), CV-955D (ISC) and CV-955E (ISC)	2000	2000	
	CV-956D (OSC)	210	210	
61B Deadweight Tester to PT	VIV-C (OSC)	0	0	
63 Instrument Air Bleed	2819 (ISC)	70	70	
	2826 (OSC)	140	140	
65A Containment Air Test Air In-out	(OSC) Flange	0	0	
65B Containment Air Test Pressure	VIV-F (OSC)	0	0	
65C Containment Air Test Leakage Flow	VIV-G (OSC)	0	0	

Penetration No.		Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
1978 TYPE C DATA SUMMARY					
1	To RHR from Loop	MOV-751 (ISC)	120	120	
5	PRT to Gas Analyzer	CV-516 (OSC)	0	0	
6	Nitrogen to PRT	CK-518 (ISC)	2000	2000	
7	PW to PRT and RCP Standpipes	CV-519A (OSC), SC-519B (ISC) CV-522A (ISC), CV-522B (ISC), and CV-522C (ISC)	55	55	
8	PRZ Steam Samples	CV-951 (ISC) and	2300	55	Stroke adjusted
		CV-956A			
9	PRZ Liquid Samples	CV-953 (ISC)	2000	0	Stroke adjusted
		CV-956B (OSC)	2000	0	Stroke adjusted
10	RCDT and PRT Vent and Nitrogen to RCDT	CV-4658B (OSC)	0	0	
		PCV-4-1014 (OSC)	80	80	
11	Alternate Low Head SI to Loops	MOV-872 (OSC)	0	0	
14	Letdown to Nonregenerative Heat Exchanger	SV-200A (ISC), SV-200B (ISC) and SV-200C (ISC)	120	120	
		CV-204 (OSC)	0	0	
15	Charging to Regenerative Heat Exchanger	312 C (ISC)	155	155	
		HCV-121 (OSC) and HCV-333 (OSC)	60	60	
16	PACVS, Hydrogen Removal	HV-4-2 (OSC)	0	0	
17	SI Test Line	GI-895 V (OSC)	0	0	

APPENDIX 4B (CONT)

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
19A Containment Spray A	CK-890 A (OSC)	5	5	
	CK-880A (OSC)	5	5	
19B Containment Spray B	CK-890B (OSC)	15	15	
	CK-880B (OSC)	0	0	
20 A&B Hot Leg Sample	SV-955A (ISC), SV-955B (ISC) and SV-956C (OSC)	55	55	
23 Containment Sump to WHT	CV-2822 (OSC)	0	0	
	CV-2821 (OSC)	0	0	
24A Seal Water Injection to A RCP	CK-298A (ISC)	0	0	
	297A (OSC)	0	0	
24B Seal Water Injection to B RCP	CK-298B (ISC)	0	0	
	297B (OSC)	0	0	
24C Seal Water Injection to C RCP	CK-298C (ISC)	0	0	
	297C (OSC)	0	0	
25 RCP Seal Water Return	MOV-381 (OSC)	55	55	
29 Instrument Air Supply	CK-336 (ISC)	1200	1200	
	SV-2803 (OSC)	0	0	
31 RCDT to Gas Analyzer	CV-4659B (OSC)	0	0	
32 Containment Air Sample Return	CK-11-003 (ISC)	>52000	160	Solenoid replaced,
	SV-2912 (OSC)	21000	95	stroke adjusted
33 Containment Air Sample Suction	SV-2913 (OSC)	>52000	180	Solenoid replaced,
	SV-2911 (OSC)	21000	105	stroke adjusted

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
34 Service Air	205 (ISC)	>52000	700	Valve lapped
	204 (OSC)	320	320	
35 Containment Purge Inlet	PV-2600 (OSC) and			
	PV-2601 (ISC)	40	40	
36 Containment Purge	PV-2602 (OSC) and PV-2603 (ISC)	5	5	
42 Nitrogen to Accumulators	855 (OSC)	690	3500	Repairs unsuccessful
47 Primary Water Supply	10-567 (OSC)	0	0	
52 RCDT Pump Discharge	CV-4668B (OSC)	0	0	
53 PACVS	HV-4-4 (OSC)	0	0	
54A Containment Recirc Sump to RHR Pump A	MOV-861A (OSC)	40	40	
54B Containment Recirc Sump to RHR Pump B	MOV-861B (OSC)	5	5	
55 Accumulator Sampling	CV-955C (ISC), CV-955D (ISC), CV-955E (ISC) and CV-956D (OSC)	250	250	
61B Deadweight Tester to PT	VIV C (OSC)	0	0	
63 Instrument Air Bleed	CV-2819 (ISC)	85	85	
	CV-2826 (OSC)	200	200	
65A Containment Air Test Air In-Out	Flange E (OSC)	0	0	
65B Containment Air Test Pressure	VIV-F (OSC)	0	0	
65C Containment Air Test	VIV-G (OSC)	0	0	

Penetration No.		Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
	Leakage Flow				
1977 TYPE C DATA SUMMARY					
1	To RHR from Loop	MOV-751 (ISC)	400	400	
5	PRT to Gas Analyzer	CV-516 (OSC)	40	40	
6	Nitrogen to PRT	CK-518 (ISC)	1160	1160	
7	PW to PRT and RCP Standpipes	CV-519A (OSC),	0	0	
		CV-519B (ISC),	0	0	
		CV-522A (ISC),	0	0	
		CV-522B (ISC) and	0	0	
		CV-522C (ISC)	0	0	
8	PRZ Steam Samples	CV-951 (ISC)	0	0	
		CV-956A	0	0	
9	PRZ Liquid Samples	CV-953 (ISC)	0	0	
		CV-956B (OSC)	0	0	
10	RCDT and PRT Vent and Nitrogen to RCDT	CV-4658B (OSC)	0	0	
11	Alternate Low Head SI to Loops	MOV-872 (OSC)	25	25	
14	Letdown to Nonregenerative Heat Exchanger	SV-200A (ISC), SV-200B (ISC) and SV-200C (ISC)	0	0	
		CV-204 (OSC)	0	0	
15	Charging to Regenerative Heat Exchanger	312 C (ISC)	30	30	
		HCV-121 (OSC) and HCV-333 (OSC)	100	100	

APPENDIX 4B (CONT)

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
16 PACVS, Hydrogen Removal	HV-4-2 (OSC)	0	0	
17 SI Test Line	GI-895 V (OSC)	0	0	
19A Containment Spray A	CK-890 A (OSC)	0	0	
	CK-880A (OSC)	0	0	
19B Containment Spray B	CK-890B (OSC)	20	20	
	CK-880B (OSC)	0	0	
20 A&B Hot Leg Sample	SV-955A (ISC), SV-955B (ISC) and SV-956C (OSC)	55 55	55 55	
23 Containment Sump to WHT	CV-2822 (OSC) and			
	CV-2821 (OSC)	15	15	
24A Seal Water Injection to A RCP	CK-298A (ISC) 297A (OSC)	0 0	0 0	
24B Seal Water Injection to B RCP	CK-298B (ISC) 297B (OSC)	1200 0	1200 0	
24C Seal Water Injection to C RCP	CK-298C (ISC) 297C (OSC)	25 30	25 30	
25 RCP Seal Water Return	MOV-381 (OSC)	20	20	
29 Instrument Air Supply	CK-336 (ISC)	800	800	
	CV-2803 (OSC)	30	30	
31 RCDT to Gas Analyzer	CV-4659B (OSC)	0	0	
32 Containment Air Sample Return	CK-11-003 (ISC)	250	250	
	SV-2912 (OSC)	1800	80	Replaced solenoid adjusted stroke

Penetration No.	Valves Tested	Prerepair Leakage (cc/min)	Post Repair Leakage (cc/min)	Remarks
33 Containment Air Sample Suction	SV-2913 (OSC)	230	230	
	SV-2911 (OSC)	200	200	
34 Service Air	205 (ISC) and 204 (OSC)	2000	2000	
35 Containment Purge Inlet	PV-2600 (OSC) and PV-2601 (ISC)	15	15	
36 Containment Purge	PV-2602 (OSC) and PV-2603 (ISC)	10	10	
42 Nitrogen to Accumulators	855 (OSC)	0	0	
47 Primary Water Supply	10-567 (OSC)	700	700	
53 PACVS	HV-4-4 (OSC)	0	0	
54A Containment Recirc Sump to RHR Pump A	MOV-861A (OSC)	10	10	
54B Containment Recirc Sump to RHR Pump B	MOV-861B (OSC)	0	0	
55 Accumulator Sampling	CV-955C (ISC), CV-955D (ISC), CV-955E (ISC) and CV-956D (OSC)	>52000	150	Repaired valves Used for test boundaries
61B Deadweight Tester to PT	VIV C (OSC)	0	0	
63 Instrument Air Bleed	CV-2819 (ISC) and CV-2826 (OSC)	600	600	
65A Containment Air Test Air In-out	Flange E (OSC)	200	200	
65B Containment Air Test Pressure	VIV-F (OSC)	10	10	
65C Containment Air Test Leakage Flow	VIV-G (OSC)	0	0	