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November 29, 1989

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

DOCKET 50-155 - LICENSE DPR-6 - BIG ROCK POINT PLANT -
REACTOR CONTAINMENT BUILDING INTEGRATED LEAK RATE TEST - 1989

The attached report, entitled Reactor Containment Building Integrated Leak Rate Test, is submitted in accordance with 10CFR50 Appendix J, Section V.B. Test results meet the required acceptance criteria. The next Integrated Leak Rate Test is tentatively scheduled for the 1992 refueling outage.

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Attachment

OC1189-0018-NL02

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ATTACHMENT

Consumers Power Company
Big Rock Point Plant
Docket 50-155

REACTOR CONTAINMENT BUILDING INTEGRATED LEAK RATE TEST

November 29, 1989

24 Pages

OC1189-0018-NL02

BIG ROCK POINT NUCLEAR PLANT
REACTOR CONTAINMENT BUILDING INTEGRATED LEAK RATE TEST

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1.0 SUMMARY

1.1 INTRODUCTION

Consumers Power Company's Big Rock Point Nuclear Plant completed its eleventh (in a series from 1962) reduced pressure Containment Integrated Leak Rate Test (Type A). A summary of all Type A tests is given in Table A. The results of all Local Leak Rate Tests (Types B and C), conducted since the previous Type A test (October 1985) are listed in Table B.

The containment enclosure has a net free volume of 912,891 cu ft designed for 27 psig with a calculated accident peak pressure of 23 psig. The vessel is made of carbon steel plate ranging from 1/2" to 3/4" thick with 3/8" of mastic exterior coating; an additional 1-1/2" of polyurethane insulation is on the top half of containment. The containment structure is susceptible to changes in atmospheric conditions. The weather conditions during the hold test were hazy, hot and humid on July 26, 1989, cloudy with rain the morning of July 27, 1989, and clearing skies on the afternoon of July 27, 1989. Clear skies prevailed during the verification period with cooler temperatures than the previous two days. Outside temperatures ranged from 61°F to 85°F during the entire test.

1.2 RESULTS

In order to fulfill the requirements of Reference 4.2, a Type A test began with pressurization on July 25, 1989 and concluded with depressurization on July 28, 1989. The pressure at the end of the 28-hour hold test was 13.61 psig.

The containment integrated leak rate at the upper 95% confidence limit was 0.00137 wt %/day. The total as-found containment leak rate was .01768 %/day, following additive corrections for repairs

and adjustments, non-vented systems, pressurized vessels inside containment and water levels changes (per references 4.4 and 4.6).

Following the 28-hour hold test, a measured leakage verification test was performed employing the method suggested by Reference 4.6, Appendix 3, and adopted by Reference 4.2. A controlled leak (L_o) of 0.355 wt %/day was imposed on L_{tm} . Reference 4.4 states the measured composite leak rate (L_c) shall be bound by $L_{tm} + L_o \pm 0.25 L_t$, i.e. $0.257 \leq L_c \leq 0.434$ (wt %/day), where L_t is the maximum allowable leak rate at test pressure. The measured composite leak rate over the verification test period was 0.273 wt %/day which met the requirements of Reference 4.3 and Reference 4.2, Section III.A.3.b, and thus confirmed the Type A test measured leak rate.

For a reduced test pressure of 13.65 psig, the maximum acceptable leak rate for a Type A test is 0.2669 wt %/day ($0.75 L_t$) per Reference 4.2, Section III.A.5.b.1, including additions made from valve repairs prior to the Type A test, non-vented systems and water level/pressurized container corrections. Having met this acceptance criterion, the Big Rock Point Plant was able to resume power operation without further repairing any containment penetrations and re-performing the Type A test.

Only one plant modification affecting containment integrity was completed since the 1985 Type A test. Penetration H-77 was dedicated for ILRT blowdown. The applicable Type C test procedure is TR-39C.

Preceding the Type A test, no post shutdown repairs or changes were made to any of the containment's Type B penetrations, permitting all Type B penetrations to be tested in their true "as-found" condition.

Type C test leak rate improvements for components which were repaired during the refueling outage prior to performing the Type A test, and required to be added to the results thereof, are:

<u>Valve Component Train</u>	<u>Repaired Leakage Improvement¹</u> <u>(wt %/Day)²</u>
Feedwater System (VFW-305)	0.0 ³
Emergency Condenser Sight Glass	0.0 ³
Emergency Condenser Sample Check Valve	8.604 x 10 ⁻⁵
Containment Isolation System (VCI-301, RDS Back-up Nitrogen Supply)	5.66 x 10 ⁻⁶
Total Repair Improvements	9.17 x 10 ⁻⁵

Notes:

1. Leakage improvement taken as the difference in minimum pathway leakage before and after repairs.
2. Containment mass taken as 127049.1 pounds.
3. Measured leakage after repair greater than measured leakage before.

Penalties resulting from non-vented containment pressure boundary lines added to the Type A test results are:

<u>Valve Component Train</u>	<u>Type C Leak Rate</u> <u>(wt %/Day)*</u>
Demin Water Isolation (CV-4105 and VMU-300)	2.03 x 10 ⁻⁵
ILRT Test Penetrations (H-77, H-80, H-88 and H-91)	1.681 x 10 ⁻⁴
Total non-vented Leak Rate	1.884 x 10 ⁻⁴

*Containment mass taken as 127,049.1 pounds.

Successful results of the Big Rock Point Type A test have verified the integrity of the containment building and confirmed the effectiveness of the Type B/C testing program. Therefore, the next Type A test has been tentatively scheduled for the 1992 refueling outage.

A compilation of all Type A test measured data and calculations of required Type C corrections have been filed with the working copy of the CILRT procedure (Reference 4.4).

2.0 DISCUSSION

2.1 ANALYSIS TECHNIQUES

The weighting factors used to calculate the average containment dry bulb temperatures and humidity have been calculated based on the number of sensors within a sub-volume. The containment vapor pressure is computed by converting the relative humidity readings to vapor pressure and applying the appropriate weighting factors. The containment vapor pressure is subtracted from the absolute pressure to give the containment dry air partial pressure. The partial pressure of dry air and the weighted average containment temperature are then used to calculate the leak rate in wt %/day.

The absolute method of determining the leak rate was used for this test and measurements were recorded every 15 minutes. The leak rate was computed using the mass point method of analysis which is endorsed by Reference 4.1.

In the mass point method of analysis, data from an absolute system is reduced to a contained mass of dry air by application of the ideal gas law. The test data consists of a time series of independent values of contained air mass. If the assumption is

made that the leak rate is constant with time, the data lends itself to analysis by the method of linear least squares. The slope of this line represents the rate of change of air mass with respect to time, which is the leak rate. Because of its independent nature, a measurement error will result in only one bad data point and not materially affect the test results. Although no data was rejected in this test, the data rejection criteria found in Appendix D of Reference 4.1 was used by the computer program to check for anomalous data.

2.2 DATA ACQUISITION

The test procedure employed was the absolute method as endorsed by Reference 4.1, Section 5. The instrumentation system consisted of twenty (20) Resistance Temperature Detectors (RTDs), ten (10) humidity sensors and two (2) pressure sensors. The weighting factors used to calculate the average containment air temperature were determined on the basis of the number of sensors within a sub-volume. An in-situ calibration check of all sensors was performed.

The sensitivities of the RTDs, humidity sensors and pressure gauges are within the requirements established by Reference 4.1, Section 4.2.1. The calculated Instrument Selection Guide (ISG) for the instrumentation system is .019% per day which meets the requirements of Reference 4.1, Section 4.1.2. Adjustments to this calculation were not required as no sensors were lost during the test.

Sensor data was collected by a data logger (Acurex Autodata Model 10/10), scanned (Acurex Netpack), and transferred to a Commodore PC-compatible computer. The computer program performs the functions listed below:

1. Reduces raw data into weighted containment average temperatures and pressures, and computes vapor pressures necessary for use in the leak rate calculations.
2. Calculates containment mass from the above parameters.
3. Calculates the leak rate in wt %/day using the mass point analysis method.
4. Determines the 95% upper confidence limit of the leak rate using the methods described in Reference 4.1, Appendix B.
5. Calculates the data outlier and the appropriate rejection level according to the criteria of Reference 4.1, Appendix D.
6. Provides plots of outside atmospheric parameters, containment average temperature, pressure, vapor pressure and mass as a function of time.

2.3

SUMMARY OF TEST EVENTS

The average containment temperature fulfilled the stabilization requirements of Reference 4.1, Section 5.3.1.3 and Reference 4.4, Section 5.3.1, approximately six hours after pressurization was completed. The stabilization period was extended an additional nineteen hours in order to begin the hold test at a specified time of day conducive to the BN-TOP-1 test. The hold test portion of the leak rate test was started at 16:00 on July 26, 1989. Approximately 8 hours into the test, ILRT personnel felt a successful short duration test was unlikely and the hold test defaulted to a minimum 24-hour duration.

Containment parameters have been plotted to illustrate the average conditions throughout the 28-hour hold test as shown in Figures 1 through 4. The sine wave shape of the temperature, humidity pressure and containment mass profiles is exemplary of the diurnal

effect experienced. Containment mass throughout the 28-hour hold test is shown graphically in Figure 4.

The verification portion of the test was initiated at 20:15 on July 27, 1989. Diurnal effects resulted in verification test duration of approximately 14 hours in order to reach the acceptance criteria. Figures 5 through 8 include graphs of containment average temperature, average humidity, average pressure as well as calculated containment mass for the full 14.25 hours of verification.

3.0 CONCLUSIONS

- 3.1 The Big Rock Point containment satisfied the acceptance criteria for the Type A test.
- 3.2 The controlled leak rate verified the hold test results.
- 3.3 The calculated ISC fulfilled the acceptance criteria of Reference 4.4, Paragraph 6.3.
- 3.4 The results of all Type B and C tests meet the requirements of Reference 4.3, Section 3.7.

4.0 REFERENCES

- 4.1 ANSI/ANS 56.8-1981, American National Standard Containment System Leak Testing Requirements
- 4.2 10 CFR 50, Appendix J
- 4.3 Big Rock Point Technical Specifications
- 4.4 Big Rock Point CILRT Procedure TV-02, Revision 19

- 4.5 ANSI N45.4-1972, American National Standard Leak Rate Testing of Containment Structures for Nuclear Reactors
- 4.6 Big Rock Point Engineering Analyses EA-89-TV-02-02 and EA-89-TV-02-03
- 4.7 CPGCo response to NRC Inspection Report 89-015

HOLD TEST GRAPHS

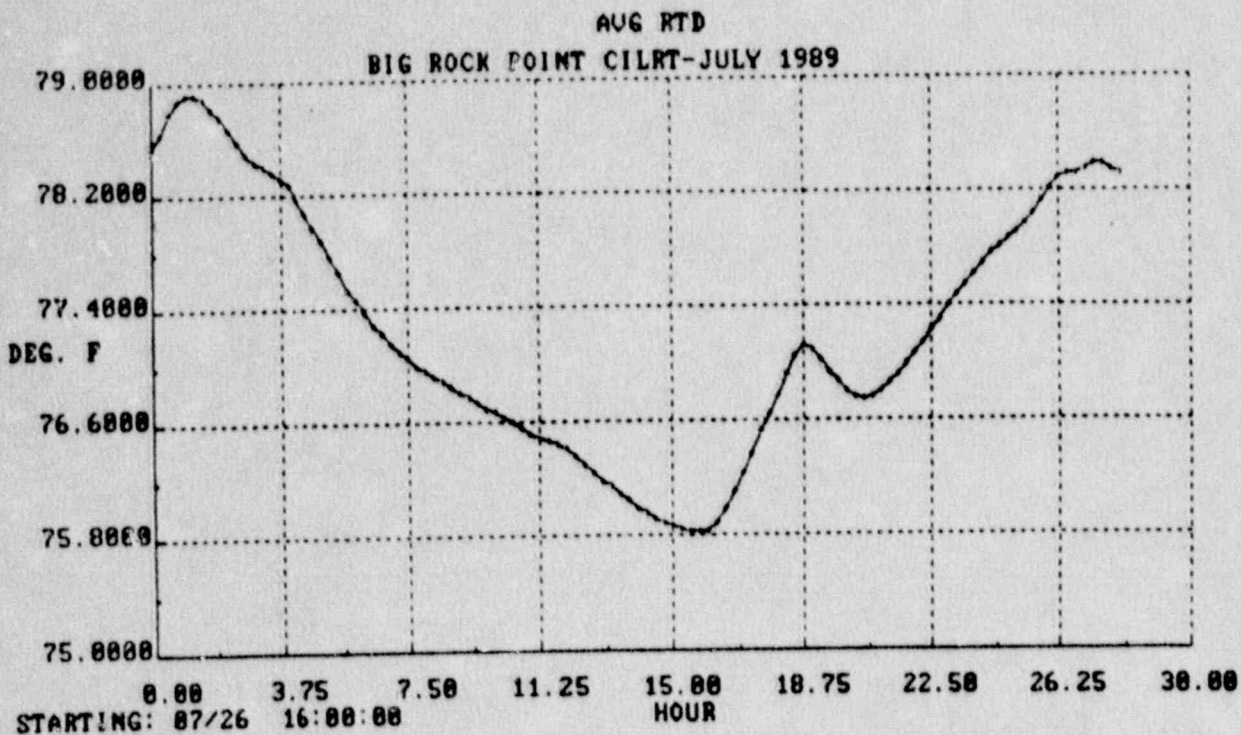


Figure 1

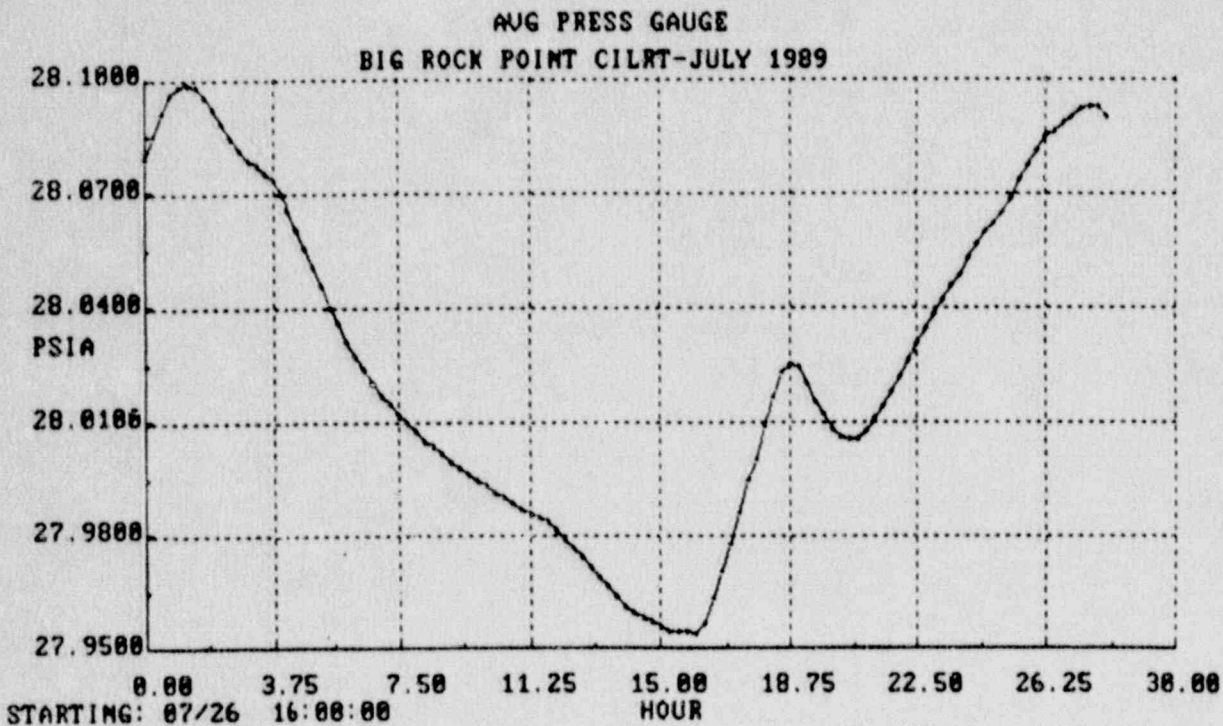


Figure 2

HOLD TEST GRAPHS

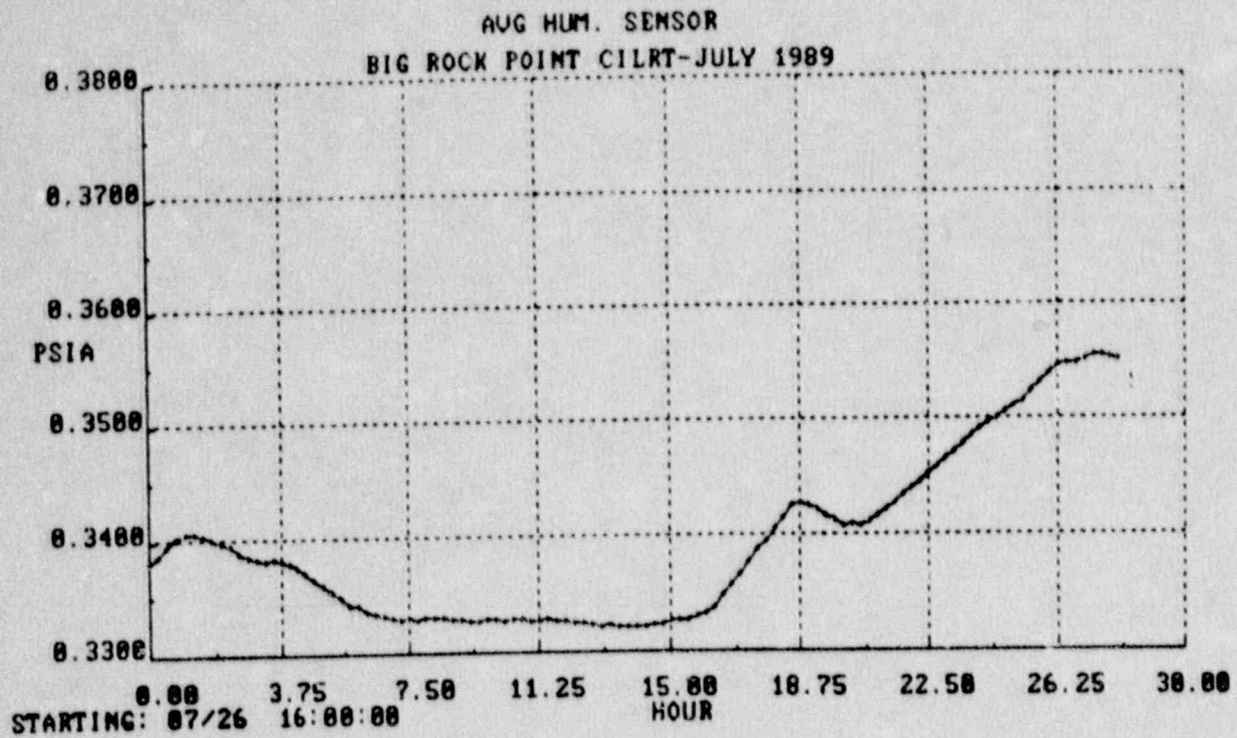


Figure 3

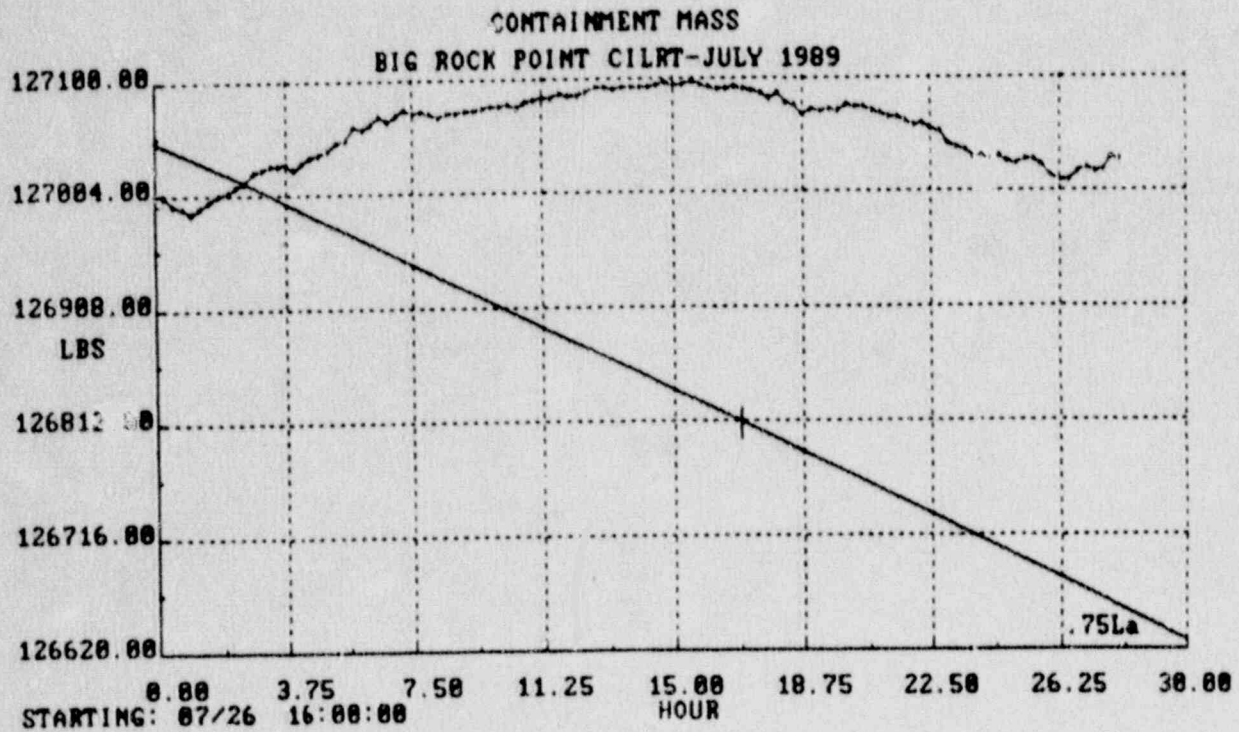


Figure 4

VERIFICATION TEST GRAPHS

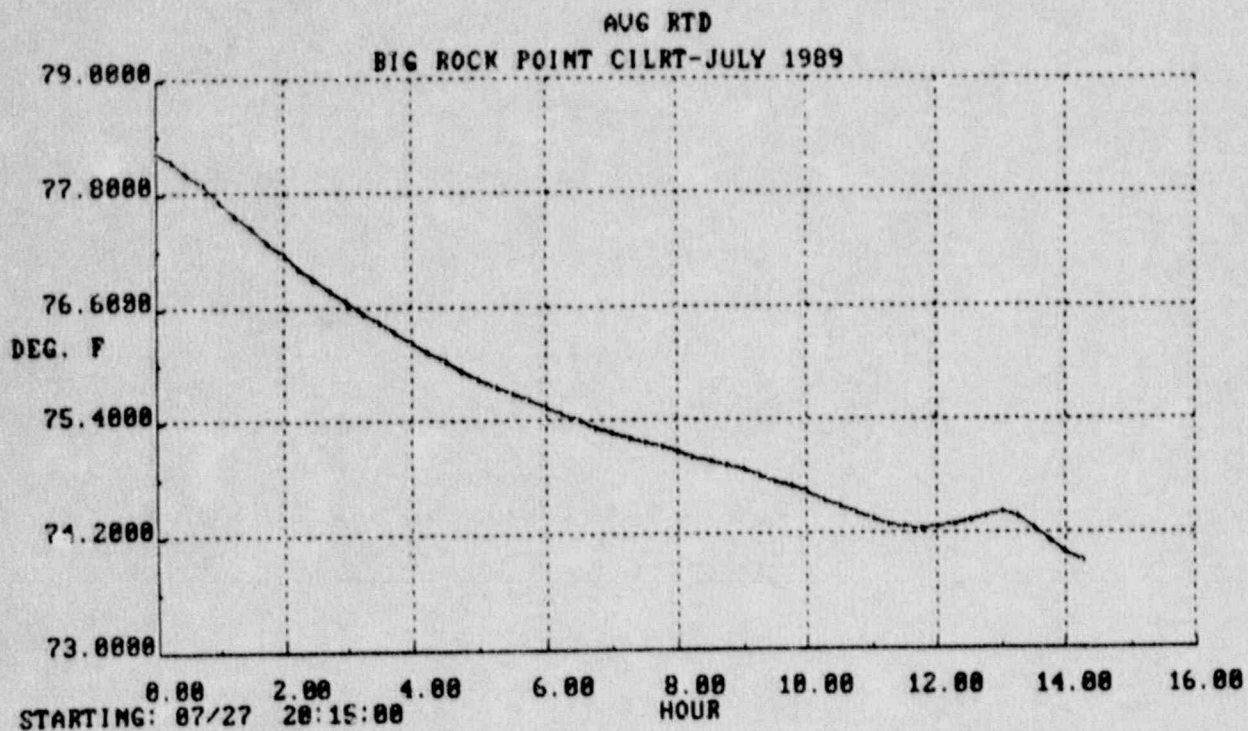


Figure 5

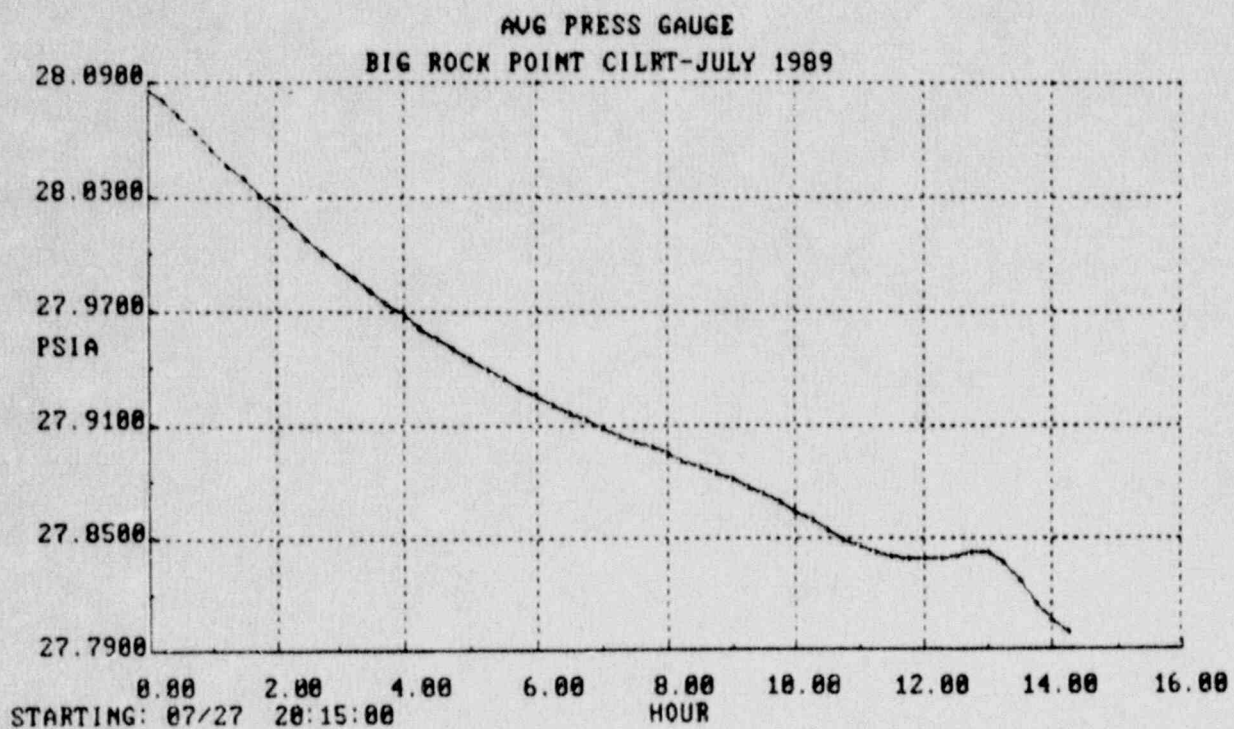


Figure 6

VERIFICATION TEST GRAPHS

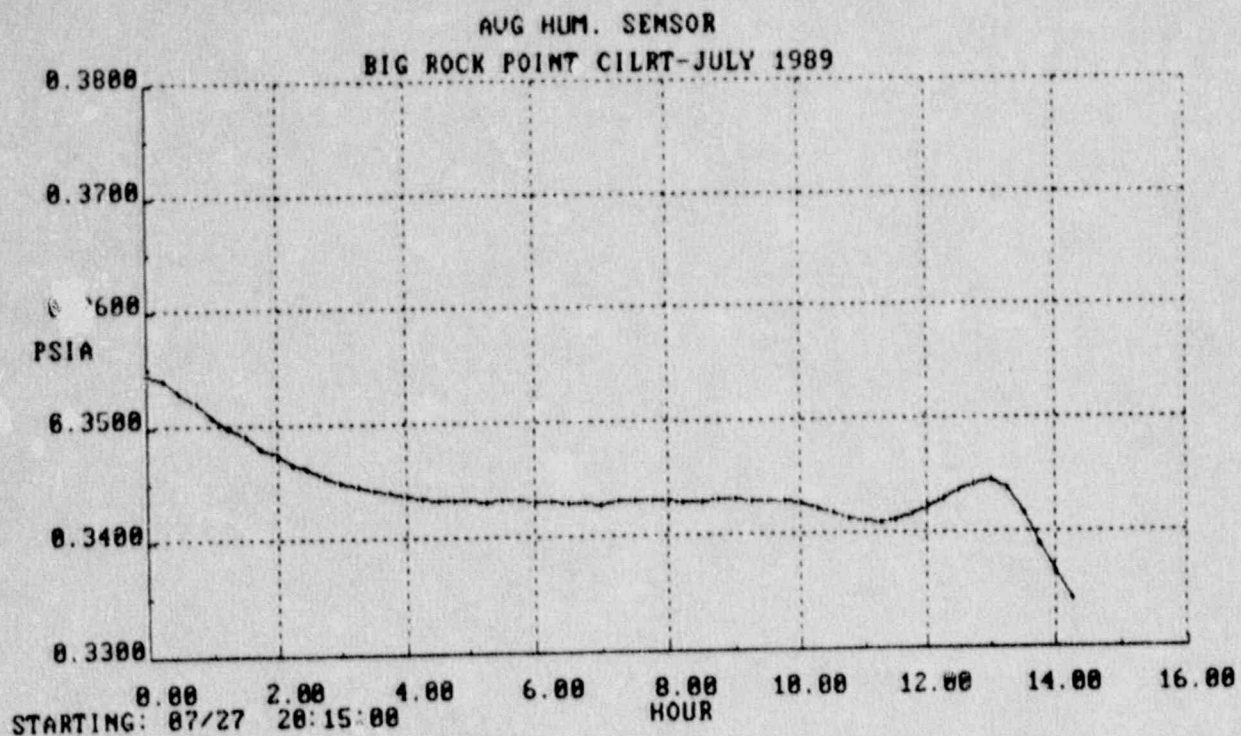


Figure 7

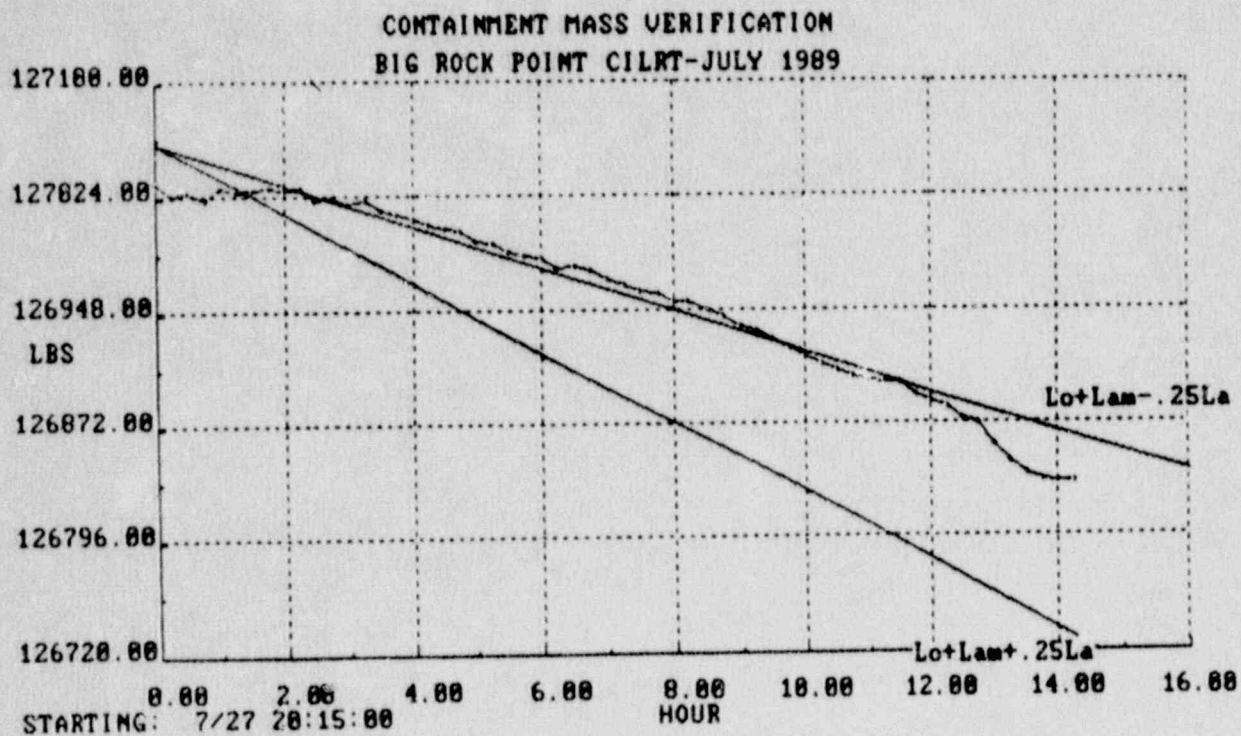


Figure 8

SUMMARY OF BIG ROCK POINT PLANT CONTAINMENT INTEGRATED LEAK RATE TESTS

<u>Date</u>	<u>Test Pressure (psig)</u>	<u>Measured Leak Rate-Ltm (wt %/Day)</u>	<u>Allowable Leak Rate-Lt (wt %/Day)</u>	<u>Comments</u>
01/61	27	0.036	0.5	Included pneumatic over-load test at 33.75 psig.
06/62	10	0.36	0.121	Allowed leak rate is 75% of Technical Specification reduced pressure allowed leak rate from 6/62 to the last test of 4/74.
04/64	10	0.037 ± 0.034	0.121	
04/66	10	0.077 ± 0.025	0.121	
07/68	10	0.061 ± 0.017	0.121	
03/70	10	0.048 ± 0.030	0.121	
04/72	12	0.028 ± 0.072	0.149	
04/74	13	0.075 ± 0.047	0.131	Measured containment leakage after acceptance of ventilation valve.
09/77	13	0.072 ± 0.043 ¹	0.174/0.347 ²	¹ 95% confidence level of containment leak rate corrected for measured local leakage rate of feedwater check valve. ² Technical Specification limit/10CFR50 Appendix J, Section III A.4 limit.
04/82	12.6	0.0201/0.0232 ¹	0.3416	¹ Nominal measured rate/95% approx. upper confidence limit. The difference in leakage rates from before maintenance and after maintenance. Results are not added to these leakage rates.
10/85	13.75	0.0915/0.0959 ¹ 0.1268 ²	0.3568	¹ Measured leak rate 95% upper confidence limit. ² Total containment leak rate inclusive of all corrections.

SUMMARY OF BIG ROCK POINT PLANT CONTAINMENT INTEGRATED LEAK RATE TESTS

<u>Date</u>	<u>Test Pressure (psig)</u>	<u>Measured Leak Rate-Ltm (wt %/Day)</u>	<u>Allowable Leak Rate-Lt (wt %/Day)</u>	<u>Comments</u>
07/89	13.6	.00137 ¹	0.2663	¹ Measured leak rate 95% upper confidence limit.
		.01768 ²		² Total containment leak rate inclusive of all corrections.

TABLE B
LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
12/17/85	T180-01D	Escape Lock	5.901981	
12/18/85	T180-01B	Personnel Lock	12.13024	
02/09/86	T180-01B	Equip Lock	.1733	
03/14/86	T180-01C	Equip Lock Person Lock	Eq-0 Per-.914451	
04/21/86	T180-01A	Supply Valves	88.185	
04/21/86	T180-01A	Exhaust Valves	46.37	
06/16/86	T180-01B	Personnel Lock	1.595	
06/16/86	T180-01D	Escape Lock	163.92	
06/16/86	T180-01B	Personnel Lock	.648	
06/18/86	T180-01D	Escape Lock	185.7	
06/19/86	T180-01D	Escape Lock	2.6	
06/20/86	T180-01D	Escape Lock	20.19	
08/08/86	T180-01B	Equipment Lock	8.77997	
08/09/86	T180-01B	Equipment Lock	2.7536	
09/10/86	T180-01C	Personnel Lock Powell Valve	.819	
09/11/86	T180-01C	Equip Lock Powell Valve	.00775	
10/21/86	T180-01A	Supply Valve	34.84	
10/21/86	T180-01A	Exhaust Valve	33.14	
12/12/86	T180-01B	Personnel Lock	1.885825	
12/13/86	T180-01D	Escape Lock	1.159282	
12/29/86	T180-01B	Equipment Lock	1.263884	
01/09/87	TR-39E	CV-4031	1.472495	
01/09/87	TR-39E	CV-4102	1.914512	
01/10/87	TR-39E	CV-4025	1.467435	
01/10/87	TR-39E	CV-4103	26.0776	

TABLE B
LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
01/11/87	TR-39D	Gauge Glass	1.129605	
01/12/87	TR-39D	Check Valve	.11141184	
01/12/87	TR-39D	Sight Glass	.017555	
01/12/87	TR-39I	Feedwater Check	4.509814	
01/13/87	TR-39Q	MSIV	30.02109	
01/14/87	TR-39A	SV-9155	0.0	
01/14/87	TR-39A	SV-9156	0.0	
01/14/87	TR-39C	H-80	.178316	
01/15/87	TR-39F	Check Valve	.0081439	
01/15/87	TR-39F	CV-4049	0.0	
01/17/87	TR-39R	CV-9472	.014598	
01/17/87	TR-39R	VCI-20	.002631	
01/17/87	TR-39R	VCI-301	.005197	
01/17/87	TR-39M	VCRD-310 VCRD-311	.004 in ³ /min .014 in ³ /min	
01/20/87	TR-39B	CV-4117 CV-4027	.1519 .2434	
01/21/87	TR-39D	Gauge Class	.579	
01/24/87	TR-39H	CV-4091 CV-4092 CV-4093	0.0	
01/24/87	TR-39P	Resin Sluice	.4278	
01/25/87	TR-39E	CV-4102	0.0	
01/25/87	TR-39E	CV-4103	23.8462	
01/25/87	TR-39A	SV-9155	.0778	
01/25/87	TR-39A	SV-9156	.1556	
01/27/87	TR-39B	CV-4027	.01413	
01/27/87	TR-39B	CV-4117	.1499	

TABLE B

LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
01/27/87	O-CIS-6	VA-300	.0519	
01/28/87	TR-39G	VMU-300 Test 1	.0293737	
01/28/87	TR-39G	CV-4105 Test 2	.8841	
01/28/87	TR-39G	VMU-300 Test 3	.5875	
01/28/87	T180-01A	Supply Valves	4.7074	
01/28/87	T180-01A	Exhaust Valves	14.90847	
01/30/87	T180-01A	Supply Valves	7.3237	
01/31/87	TR-39G	VMU-300 Test 1	.4488	
01/31/87	TR-39G	CV-4105 Test 2	1.4152	
01/31/87	TR-39G	VMU-300 Test 3	.3740	
02/01/87	O-CIS-5	VA-304	.00831	
02/03/87	TR-39I	VFW-305	1.12319	
02/04/87	TR-39Q	MSIV	33.95376	
02/08/87	TR-39P	Manual Resin Slice VCU-10, VCU-11 VCU-13	0.0	
02/08/87	TR-39H	CV-4090, CV-4091 CV-4093	.05138	
02/28/87	TR-39Q	MSIV	43.3674	
03/11/87	T180-01C	Per. lock Ck Vlv	.229051	
03/11/87	T180-01C	Equip Lock Ck Vlv	.0058683	
04/16/87	T180-01A	Supply Valves CV-4096, CV-4097	30.43944	
04/16/87	T180-01A	Exhaust Valves CV-4094, CV-4095	28.15326	
05/31/87	TR-39D	Check Valve	2.538761	

TABLE B

LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
06/01/87	TR-39D	Gage Glass	.5282199	
06/01/87	TR-39D	Vent Valve	.0097503	
06/05/87	TR-39D	Check Valve	0.0	
06/11/87	T180-01B	Personnel Lock	.5729672	
06/12/87	T180-01D	Escape Lock	43.01577	
06/16/87	TR-39E	CV-4025	2.151846	
06/16/87	TR-39E	CV-4103	15.27761	
06/16/87	TR-39D	Check Valve	.00429766	
06/16/87	TR-39D	Sight Glass	0.0	
06/16/87	TR-39D	Sight Glass Vent Valve	0.0	
06/17/87	TR-39D	Sight Glass	1.53329	
06/17/87	TR-39D	Sight Glass Vent Valve	.0497868	
06/27/87	T180-01B	Equip Lock	0.0	
07/03/87	T180-01B	Personnel Lock	3.671677	
07/03/87	T180-01D	Escape Lock	-.069339	
07/25/87	TR-39E	CV-4103	9.111424	
07/26/87	TR-39D	Gage Glass	.1361049	
09/09/87	T180-01C	Equip Lock Powell Ck Vlvs	.001934413	
09/09/87	T180-01C	Personnel Lock Powell Ck Vlvs	.828912	
09/09/87	T180-01C	Personnel Lock Powell Ck Valves	.2370536	
10/13/87	T180-01A	Supply Valves	31.80912	
10/13/87	T180-01A	Exhaust Valves	24.12105	
12/08/87	T180-01(B)	Personnel Lock	2.196	
12/10/87	T180-01(D)	Escape Lock	78.3161	

TABLE B

LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
12/10/87	T180-01(D)	Escape Lock	0.0	
02/16/87	TV-27	Conax Penet. H-40	.00377654	
12/23/87	T180-01	Equipment Lock	6.10377	
03/04/88	T180-01C	Personnel Lock Powell Valve	1.26429	
03/04/88	T180-01C	Equipment Lock Powell Valve	.00402507	
04/09/88	T180-01A	Supply Valves	54.08249	
04/09/88	T180-01A	Vent Valves	53.10163	
04/19/88	TR-39C	H-91	.3001463	
04/19/88	TR-39C	H-80	.9998931	
04/19/88	TR-39C	H-88	.2171867	
04/19/88	TR-39D	Gage Glass	.8731954	
04/19/88	TR-39D	Vent Isol. Valve	.01068364	
04/19/88	TR-39D	Check Valve	.01405994	
04/19/88	TR-39A	SV-9155	.1437569	
04/19/88	TR-39A	SV-9156	0.00	
04/20/88	TR-39F	VRW-313	.03264303	
04/20/88	TR-39F	CV-4049	.01873435	
04/22/88	TR-39B	CV-4117	.6017935	
04/22/88	TR-39B	CV-4027	.7096579	
04/23/88	TR-39G	VMU-300 Test 1	.0150208	
04/23/88	TR-39G	CV-4105 Test 2	.9042551	
04/23/88	TR-39G	VMU-300 Test 3	.7795792	
04/23/88	TR-39R	CV-9472	.0007216345	

TABLE B

LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
04/23/88	TR-39R	VCI-20	.001938523	
04/23/88	TR-39R	VCI-301	.678963	
04/23/88	TR-39M	VCRD-310	.047 in ³ /hr	
04/23/88	TR-39M	VCRD-311	0.0 in ³ /hr	
04/24/88	TR-39S	VA-300	.01519	
04/24/88	TR-39T	VA-304	.1987546	
04/24/88	TR-39E	CV-4031	.2640647	
04/24/88	TR-39E	CV-4102	0.0	
04/24/88	TR-39E	CV-4025	9.167802	
04/24/88	TR-39E	CV-4103	38.7799	Failed
04/26/88	TR-39E	CV-4103	9.526324	Repaired
05/02/88	TR-39H	Resin Sluice CV-4091, CV-4091 CV-4093	0.0	
05/12/88	TR-39D	Sight Glass	.7551613	
05/13/88	TR-39I	VFW-305	0.0	
05/14/88	T180-01A	Exh. Valves	56.85981	Failed
05/18/88	T180-01A	Exh. Valves	∞	Test stopped. Could not not pressurize.
05/18/88	T180-01A	Exh. Valves	∞	Failed
05/20/88	T180-01A	Exh. Valves	40.77496	Repaired
05/23/88	T180-01A	Supply Valves	25.25681	
05/24/88	TR-39H	Resin Sluice CV-4091, CV-4091 CV-4093	9.473956	Failed
05/25/88	TR-39H	Resin Sluice CV-4091, CV-4091 CV-4093	3.871289	Repaired
06/04/88	TR-39Q	MSIV	7.269	

TABLE B

LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
06/07/88	T180-01B	Personnel Lock	2.833848	
06/16/88	T180-01D	Escape Lock	5.496619	
06/22/88	T180-01B	Equipment Lock	2.684468	
08/20/88	T180-01B	Personnel Lock	3.983259	
08/22/88	T180-01B	Personnel Lock	2.345711	
08/26/88	T180-01D	Escape Lock	5.056986	
08/30/88	T180-01D	Escape Lock	7.573366	
08/31/88	T180-01C	Personnel Lock Powell Valve	1.578948	
08/31/88	T180-01C	Personnel Lock Powell Valve	.08487131	
10/07/88	T180-01A	Supply Valve	22.13205	
10/07/88	T180-01A	Exhaust Valves	22.18969	
12/02/88	T180-01B	Personnel Lock	1.665923	
12/15/88	T180-01D	Escape Lock	1.122477	
12/20/88	T180-01B	Equipment Lock	4.810107	
12/23/88	T180-01B	Equipment Lock	4.856717	
02/09/89	TV-27	H-40	.0007	
02/22/89	T180-01A	Supply Valves	2.635643	
02/22/89	T180-01A	Exhaust Valves	15.41146	
02/27/89	T180-01C	Personnel Lock Powell Ck. Vlvs	1.146369	
02/27/89	T180-01C	Equipment Lock Powell Ck. Vlvs	2.004823	
04/07/89	T180-01A	Supply Valves	45.30920	Failed
04/07/89	T180-01A	Exhaust Valves	25.19713	
04/07/89	T180-01A	Supply Valves	3.39985	Repaired
04/25/89	T180-01B	Personnel Lock	3.844458	

TABLE B
LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
04/26/89	T180-01B	Personnel Lock	4.789959	
06/07/89	T180-01D	Escape Lock	0.0	
06/18/89	T180-01B	Equipment Lock	3.535603	
06/18/89	TR-39M	VRD-310	0 in ³ /min	
06/18/89	TR-39M	VRD-311	0 in ³ /min	
06/18/89	TR-39R	CV-9472	.00718571	
06/18/89	TR-39R	VCI-20	.006017152	
06/18/89	TR-39R	VCI-301	3.416220	Failed
06/20/89	TR-39R	VCI-301	∞ Could not press	13.5 lb test
06/19/89	TR-39H	CV-4091, CV-4092 CV-4093	0.0	
06/22/89	TR-39R	VCI-301	.01615864	1/2 press - Repaired
06/22/89	TR-39R	VCI-301	.02554003	Full press - Repaired
06/25/89	TR-39P	VCU-10, VCU-11, VCU-13	1.32	Full press
06/25/89	TR-39P	VCU-10, VCU-11, VCU-13	1.078	1/2 press
06/27/89	TR-39D	Check Valve	.1574	Full press
06/27/89	TR-39D	Gage Glass	.7044975	Full press
06/27/89	TR-39D	Vent Isolation Valve	.003454907	Full press
06/27/89	TR-39D	Check Valve	.1213753	1/2 press
06/27/89	TR-39D	Gage Glass	.4561562	1/2 press
06/29/89	TR-39C	H-80	.3420695	Full press
06/29/89	TR-39C	H-80	0.0	1/2 press
06/29/89	TR-39C	H-88	.003296836	Full press
06/29/89	TR-39C	H-88	0.0	1/2 press
06/29/89	TR-39C	H-91	.002197891	Full press

TABLE B
LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
06/29/89	TR-39C	4-91	0.0	1/2 press
06/30/89	T180-01A	Supply Valves	14.36995	Full press
06/30/89	T180-01A	Supply Valves	11.78527	1/2 press
07/01/89	TR-39E	CV-4031	4.660796	
07/01/89	TR-39E	CV-4103	9.915374	
07/01/89	TR-39E	CV-4102	4.867973	
07/01/89	TR-39E	CV-4025	2.30887	
07/01/89	TR-39G	CV-4105	2.607899	Full press
07/01/89	TR-39G	CV-4105	.3347835	1/2 press
07/01/89	TR-39G	VMU-300	1.242561	Test 1 - Full press
07/01/89	TR-39G	VMU-300	.0257641	Test 1 - 1/2 press
07/01/89	TR-39G	VMU-300	.5916958	Test 3 - Full press
07/01/89	TR-39G	VMU-300	0.0	Test 3 - 1/2 press
07/01/89	TR-39F	CV-4049	.01830776	
07/01/89	TR-39F	VRW-313	.007972736	
07/02/89	TR-39I	VFW-305	1.127455	Full press - Pre-repair
07/02/89	TR-39I	VFW-305	0.0	1/2 press - Pre-repair
07/03/89	TR-39A	SV-9155	0.0	
07/03/89	TR-39A	SV-9156	0.0	
07/05/89	TR-39P	VCU-10 VCU-11 VCU-13	0.0	Full press
07/05/89	TR-39P	VCU-10 VCU-11 VCU-13	0.0	1/2 press
07/05/89	TR-39B	CV-4027	.3209026	
07/05/89	TR-39B	CV-4117	.1513048	
07/10/89	TR-39C	H-77 w/o Valve	.2135613	1/2 press

TABLE B

LOCAL LEAK RATE DATA (TYPE B & C) FROM 1985 ILRT TO 1989 ILRT

Date	Test	Valves, Penet Etc	M24c (lbs/24 hr)	NOTES
07/10/89	TR-39C	H-77 w/o Valve	.644186	Full press
07/10/89	TR-39D	Gage Glass	2.239535	Full press - failed
07/10/89	TR-39D	Gage Glass	2.299591	1/2 press - failed
07/10/89	TR-39D	Check Valve	.01533992	Full press
07/10/89	TR-39D	Check Valve	.01206842	1/2 press
07/10/89	T180-01B	Personnel Lock	3.579282	
07/10/89	TR-39D	E.C. Gage Glass	.8469831	Full press - Post repair
07/10/89	TR-39D	E.C. Gage Glass	1.209973	1/2 Press - Post repair
07/12/89	TR-39I	VFW-305	9.200737	Full Press - Post repair
07/12/89	TR-39I	VFW-305	≤ 0.0	1/2 Press - In leakage, test again.
07/13/89	TR-39I	VFW-305	10.11324	1/2 press - ok
07/19/89	TR-39C	H-77	.1234032	Full press w/valve
07/19/89	TR-39C	H-77	0.0	1/2 press w/valve
07/19/89	TR-39C	H-77	.644186	Full press w/o valve
07/19/89	TR-39C	H-77	.1234032	Full press w/valve
07/20/89	TR-39S	VA-300	.799	
07/24/89	TR-39T	VA-304	.02215773	