NORTHERN STATES POWER COMPANY

MONTICELLO NUCLEAR GENERATING PLANT

MONTICELLO, MINNESOTA

REPORT TO THE

UNITED STATES NUCLEAR REGULATORY COMMISSION

DIVISION OF NUCLEAR REACTOR REGULATION

LICENSE NO. DPR-22

DOCKET NO. 50-263

REACTOR CONTAINMENT BUILDING INTEGRATED LEAK RATE TEST COMPLETED MARCH 1993

Report Date: June 18, 1993

Report Prepared By: P. A. Tobin

TABLE OF CONTENTS PAGE

TABLE OF CONTENTS (Cont'd.) PAGE

1.0 ABSTRACT

This report provides the results and description of the Reactor Containment Building Integrated Leak Rate Test completed in March of 1993 for the Monticello Nuclear Generating Plant. The Monticello Nuclear Generating Plant is located in Monticello, Minnesota, owned and operated by Northern States Power Company, Docket Number 50-263. The containment structure tested is a GE Mark I design consisting of a drywell, suppression chamber and interconnecting vent system. The test was completed with acceptable results for both the as-found and as-left conditions. Additionally, the results from Type B and Type C tests conducted in Cycles 14 and 15 are provided.

2.0 INTRODUCTION

2.1 Type A Test

2.1.1 Test Summary

Type A tests are scheduled in accordance with Paragraph 4.7.A.2.b.1 of the Monticello Technical Specifications. Three Type A overall integrated containment leakage rate tests shall be conducted at 40 ± 10 month intervals during shutdown at $\geq P_a$ during each 10 year service period. The third test of each set shall be conducted during the shutdown for the 10 year plant inservice inspection.

The acceptance criteria for Type A tests is contained in paragraph 3.7.A.2.b of the Monticello Technical Specifications. When Primary Containment Integrity is required, an overall integrated leakage rate shall be limited to less than or equal to L_a, 1.2 percent by weight of the containment air per 24 hours at P_a, 42 PSIG. With the measured overall integrated primary containment leakage rate exceeding 0.75 L_a, restore leakage rate to less than or equal to this value prior to increasing reactor coolant temperature above 212°F.

The acceptance criteria for verification tests is contained in paragraph 4.7.A.2.b.4 of the Monticello Technical Specifications. The accuracy of each Type A test shall be verified by a supplemental test which confirms the accuracy of the test by verifying that the difference between the supplemental data and the Type A test data is within 0.25 L_a, and has duration sufficient to establish accurately the change in leakage rate between the Type A test and the supplemental test, and requires the rate of gas injected into the containment or bled from the containment during the supplemental test to be limited between 75 to 125% of L_a.

In addition to the Monticello Technical Specifications, the Type A test is conducted in accordance with the requirements of 10 CFR Part 50, Appendix J and NRC positions on performing Type A tests. One of these positions is that for test durations less than 24 hours the test is conducted in accordance with the provisions of BN-TOP-1, Revision 1, 1972, in its entirety. Additionally, the results of the Type A tests are corrected to reflect the as-found condition of the containment structure prior to any repairs or adjustments. The overall integrated primary containment leakage rate is limited to less than or equal to 0.75 L_a for the as-found condition.

The primary containment free air volume is 241,200 cubic feet. The primary containment design pressure and temperature are 56 PSIG and 281°F respectively. The calculated peak accident pressure is 42 PSIG.

2.1.2 Conclusion

A short duration Type A test was completed during the 1993 refueling outage which met the acceptance criteria for both the as-found and as-left conditions of the containment structure. Its accuracy was verified by an acceptable supplemental test. The as-found leakage rate, calculated using the Total Time Method and BN-TOP-1 95% Upper Confidence Limit, was 0.8240 percent by weight per day. The as-left leakage rate, calculated using the Total Time Method and BN-TOP-1 95% Upper Confidence Limit, was 0.3943 percent by weight per day. The acceptance criteria for both the as-found and as-left leakage rates is 0.9000 percent by weight per day, 0.75 L_a.

2.2 Type B and C Tests

2.2.1 Test Summary

Type B and C tests are scheduled in accordance with Paragraphs 4.7.A.2.b.5 and 4.7.A.2.c of the Monticello Technical Specifications. Type B and C tests shall be conducted with gas at $\geq P_a$ at each refueling shutdown (maximum interval of 24 months), except for tests involving the main steam isolation valves. Main steam isolation valve tests shall be conducted with gas at $\geq$ 25 PSIG each 18 months. An overall primary containment airlock leakage test shall be conducted at $\geq P_a$ at each refueling shutdown, and at six month intervals thereafter. This test interval may be extended up to the next refueling outage if there have been no airlock openings since the last successful test at P_a. An overall primary containment airlock leakage test shall be conducted at $\geq$ 10 PSIG after each opening, or at least once per 72 hours for multiple openings.

The acceptance criteria for Type B and C tests is contained in paragraphs 3.7.A.2.b and 3.7.A.2.c of the Monticello Technical Specifications. When Primary Containment Integrity is required, a combined leakage rate shall be limited to less than or equal to 0.6 L_a for all penetrations and valves, except for main steam isolation valves, subject to Type B and C tests when pressurized to P_a. For any one main steam isolation valve the leakage rate shall be limited to less than or equal to 11.5 SCF per hour when tested at 25 PSIG. An overall airlock leakage rate shall be limited to less than or equal to 0.05 L_a at P_a or 0.007 L_a at 10 PSIG.

2.2.2 Conclusion

As-found test results for Cycle 14 exceeded technical specification acceptance criteria. The total as-found maximum pathway leakage rate, excluding main steam isolation valves, was measured at 31,760.97 SCFH. This exceeded the acceptance criteria of 275.2 SCFH. Three main steam isolation valves had as-found leakage rates that exceeded the technical specification acceptance criteria of 11.5 SCFH. The leakage rates for the three unacceptable main steam isolation valves when tested at 25 PSIG were 45.1 SCFH, 88.4 SCFH and 684 SCFH. After repairs and adjustments the total as-left maximum pathway leakage rate, excluding the main steam isolation valves, was reduced to 104.26 SCFH and the three main steam isolation valve leakage rates were dropped below 11.5 SCFH.

As-found and as-left total maximum pathway leakage rates, excluding main steam isolation valves, for Cycle 15 were acceptable but seven main steam isolation valves exceeded their technical specification individual acceptance criteria. The as-found total maximum pathway leakage rate, excluding main steam isolation valves, was 232.37 SCFH. The leakage rates for the seven unacceptable main steam isolation valves when tested at 25 PSIG were 12.5 SCFH, 24 SCFH, 32.7 SCFH, 50.1 SCFH, 146 SCFH, 202.3 SCFH and 6388 SCFH. After repairs and adjustments the as-left total maximum pathway leakage rate, excluding main steam isolation valves, was reduced to 121.78 SCFH and the seven main steam isolation valve leakage rates were dropped below 11.5 SCFH.

3.0 TYPE A TEST

3.1 General Test Description

3.1.1 Containment Inspection

A general inspection of accessible interior surfaces of the drywell, suppression chamber and interconnecting vents did not reveal any evidence of structural deterioration that would affect either the containment structural integrity or leak-tightness. Some minor problems with the protective coating on the interior surfaces of the suppression chamber were identified and repaired. No appreciable corrosion was observed in these areas and as such they had no affect on the structural integrity of the steel containment shell.

3.1.2 Equipment and Instrumentation

The containment was pressurized using three 1500 CFM portable diesel powered air compressors. The pressurizing air temperature and humidity were controlled using skid mounted aftercoolers and chiller dryers. The air was supplied to the drywell through a flange connection on the containment nitrogen purge system. The containment was de-pressurized using the suppression chamber vent valves and the Reactor Building Plenum.

The principle measuring instrumentation consisted of twenty platinum RTD's, six chilled mirror dewpoint temperature sensors, two precision pressure gauges and a mercury barometer. Fourteen of the RTD's and four of the dewpoint temperature sensors were located in the drywell. The suppression chamber was provided with five RTD's and two dewpoint temperature sensors. The sensors were connected to their associated signal conditioning units located outside of the containment via shielded cabling and containment electrical penetrations normally used for control rod drive position indication. The precision pressure gauges monitored containment pressure via a connection to plant drywell pressure instrument lines. The atmospheric temperature and pressure in the reactor building were monitored by one RTD and a mercury barometer. The reactor vessel level, containment sump levels and suppression chamber water level were monitored by plant process instrumentation.

The additional measuring instrumentation for the verification test consisted of one mass flowmeter, one rotameter and a manual flow control valve. The manual flow control valve, mass flowmeter and rotameter were connected to the drywell flood switch instrument line in a series configuration, such that superimposed leak flow passed through both flowmeters prior to exiting to the Reactor Building atmosphere.

3.1.3 Data Acquisition System

Data acquisition was accomplished by a data logger and two personal computers. The data logger received input from RTD and dewpoint temperature sensor signal conditioning units and the two precision pressure gauges. The data logger sampled these inputs every fifteen minutes providing output to the personal computers which stored the data on diskettes. The data from the other instrumentation was manually logged and entered into the personal computers if necessary.

3.1.4 Penetrations Not Tested

Several penetrations were not in the ideal configuration during the Type A test and were considered to not have been tested. The specific penetrations not tested and an explanation why they were not tested are listed in ATTACHMENT 3, see Section 5.0 ATTACHMENTS. Appropriate penalties were added to the Type A test results for all penetrations not tested, see Section 3.3.4 As-Left Test Result Corrections.

3.2 Edited Log of Events

On March 12th at 0600 hours, the following preliminary test preparations had been completed:

a. Installation of RTD's and dewpoint temperature sensors in the containment with wiring connections to data acquisition system.
b. In-situ testing of all test instrumentation.
c. Inspection of the drywell and suppression chamber interiors.
d. Blocking of all Suppression Chamber to Drywell Vacuum Breakers in the open position.
e. Draining of the reactor vessel below steam nozzles.
f. Draining of steam lines.
g. Venting of reactor vessel to containment atmosphere.
h. Isolation of the drywell instrument air system and venting the air accumulators for the main steam valves and safety/relief valves.
i. Isolation and draining of containment penetrations.
j. Local leak rate testing of containment hatches except for the personnel airlock.

At 1515 hours on March 12th following completion of airlock local leak rate test and a pre-job briefing, pressurization of the containment commenced. The compressors were shutdown at an indicated containment pressure of 43 PSIG at 1850 hours. At 2115 hours one compressor was restarted to restore pressure above 42 PSIG.

At 2230 hours on March 12th, temperature stabilization commenced. Data was collected at 15 minute intervals and trends of all sensor outputs were monitored. The indication from one RTD in the suppression chamber dropped to approximately 30°F less than the other RTD's. The RTD was declared inoperable and weighting factors for the remaining RTD's in the suppression chamber were adjusted.

The temperature stabilization criteria set forth in ANSI/ANS 56.8 and Bechtel Topical Report BN-TOP-1 were verified to have been satisfied and the official start of the integrated leak rate test was declared at 0245 hours on March 13th. Data was collected and leakage rates calculated at 15 minute intervals. Trends of all sensor outputs were monitored. At 1215 hours on March 13th, all of the BN-TOP-1 acceptance criteria were met and the ILRT was considered complete.

The verification test's superimposed leak was established at 1230 hours on March 13th. After a one hour stabilization period, the verification test was started at 1330 hours with data collection at 15 minute intervals. At 1830 hours sufficient data had been collected and the verification test results were within the acceptance criteria to verify the accuracy of the ILRT.

The containment was depressurized through the 18 inch suppression chamber vent line to the Reactor Building Plenum. The containment depressurization was completed at 0110 hours on March 14th. The containment was inspected and no damage was discovered.

3.3 Test Results

3.3.1 BN-TOP-1 Analysis

The Type A test was conducted for a period of 9.5 hours starting at 57.5919 PSIA (43.20 PSIG) and ending at 57.5592 PSIA (43.17 PSIG). Data was collected every 15 minutes, for a total of 39 data sets with no rejected data. The data was evaluated using Bechtel Topical Report BN-TOP-1 total time formulas. The result was a calculated leak rate of 0.253 weight percent per day with a 95% upper confidence limit of 0.354 weight percent per day. The 95% upper confidence limit result was well within the technical specification acceptance criteria of $\leq$ 0.75 L_a, 0.9000 weight percent per day. Test data and results are provided in ATTACHMENTS 1 and 2, see Section 5.0 ATTACHMENTS.

3.3.2 Instrument Selection Guide

Prior to the start of the test, the Instrument Selection Guide was calculated to be 0.012 weight percent per day. This was based on having 19 temperature sensors, 6 dewpoint temperature sensors, 2 pressure sensors and assuming a short duration test of 6 hours with the containment air temperature at 80° F. The Instrument Selection Guide was well below the recommended 0.25 L_a, 0.3000 weight percent per day. One sensor was lost during the test and as such the Instrument Selection Guide was re-calculated for 18 temperature sensors, a test time of 9.5 hours and the actual average containment temperature of 72°F. The re-calculated Instrument Selection Guide was 0.007 weight percent per day.

3.3.3 Verification Test

Following satisfactory completion of the ILRT, a 5 hour verification test was performed. A known leakage rate of 7.33 SCFM, equivalent to 1.132 weight percent per day, was induced. Data was collected every 15 minutes, for a total of 21 data sets. The data was evaluated using Bechtel Topical Report BN-TOP-1 total time formula. The predicted leakage rate for this test was 1.385 weight percent per day. The upper and lower limits (predicted leakage rate $\pm$ 0.25 L_a) for the verification test were 1.685 and 1.085 weight percent per day. The result was a calculated leak rate of 1.250 weight percent per day which was well within the upper and lower limits and meets the technical specification acceptance criteria of being within $\pm$ 0.25 L_a, $\pm$ 0.3000 weight percent per day. Test data and results are provided in ATTACHMENTS 1 and 2, see Section 5.0 ATTACHMENTS.

3.3.4 As-Left Test Result Corrections

The valve configurations for several penetrations deviated from the ideal line-up for the Type A test. The minimum pathway leakage rate determined from Type C tests for these penetrations are added as a penalty to the 95% upper confidence limit. See ATTACHMENT 3, in Section 5.0 ATTACHMENTS, for listing of penetrations deviating from the ideal, penetration minimum pathway leakage results and explanation for deviation. The total line-up penalty was 9.937 SCFH, which is equivalent to 0.0252 weight percent per day.

Water levels inside the containment changed during the course of the Type A test. Containment sump and suppression pool levels increased while the reactor water level dropped. The correction to the 95% upper confidence limit was calculated to be -0.0563 weight percent per day. Since the correction was negative, no correction was made.

The Combustible Gas Control System is required by Technical Specification 4.7.E.3 to be leak tested by venting the recombiner trains to the containment during the Type A test or performing separate leakage rate tests and adding the results to the Type A test leakage. Separate tests were performed and the total leakage rate was determined to be 5.96 SCFH, which is equivalent to 0.0151 weight percent per day.

After taking these penalties and corrections into account, the 95% upper confidence limit for the as-left condition was 0.3943 weight percent per day. This result was well within the technical specification acceptance criteria of $\leq 0.75\ L_a$, 0.9000 weight percent per day.

3.3.5 As-Found Test Result Corrections

The Type A test was performed after repairs and adjustments had been made to the containment boundary. To assess the as-found condition of the containment, minimum pathway leakage rate improvements resulting from the repairs and adjustments were determined from Type B and C test results. The minimum pathway leakage rate improvement for each penetration is identified in ATTACHMENT 5, see Section 5, ATTACHMENTS. The total of the minimum pathway leakage rate improvements was 165.36 SCFH, which is equivalent to 0.4201 weight percent per day. Additionally, a drywell pressure instrument line that was isolated during temperature stabilization had an as-found leakage rate of 3.8 SCFH and an as-left leakage rate of 0 SCFH for an improvement of 3.8 SCFH. The correction for this improvement was 0.0096 weight percent per day.

After taking these corrections and the previously identified as-left corrections into account, the 95% upper confidence limit for the as-found condition was determined to be 0.8240 weight percent per day. This result was within the Appendix J acceptance criteria of $\leq 0.75\ L_a$, 0.9000 weight percent per day.

4.0 TYPE B AND C TESTS

The results of Type B and C tests performed since the last Type A test are provided in ATTACHMENT 4 through 6 in Section 5, ATTACHMENTS. ATTACHMENT 4 provides the results for the Cycle 14 refueling outage tests which were performed in the spring of 1991. ATTACHMENT 5 provides the results for the Cycle 15 refueling outage tests which were performed in the spring of 1993. ATTACHMENT 6 provides the results for mid-cycle tests which were performed between November 1989 and January 1993.

4.1 Cycle 14 Test Results

4.1.1 As-Found Analysis

The total as-found maximum pathway leakage rate, excluding main steam isolation valves, was 31,760.97 SCFH. This exceeded technical specification acceptance criteria of 0.6 La, which is equivalent to 275.2 SCFH. The majority of this leakage was due to three valves that had individual leakage rates that exceeded the 0.6 L_a acceptance criteria. These three valve were AO-2541A with a leakage rate of 841 SCFH, AO-2561A with a leakage rate of 402 SCFH and XP-6 with a leakage rate of 30,203 SCFH. Additionally, three main steam isolation valves had individual leakage rates greater than the technical specification acceptance criteria of

11.5 SCFH. These three valves were AO-2-86A with a leakage rate of 88.4 SCFH, AO-2-86B with a leakage rate of 684 SCFH and AO-2-86D with a leakage rate of 45.1 SCFH. Although the as-found leakage rates for the six valves exceeded technical specification acceptance criteria, in each case the leakage rate of the associated redundant isolation valve was well within the acceptance criteria. The good performance of the redundant valves for all penetrations resulted in a total as-found minimum pathway leakage rate for all Type B and C tested penetrations of 65.06 SCFH which was well below the 0.6 L_a acceptance criteria. For additional information see Licensee Event Report 91-005-01.

4.1.2 Repairs and Adjustments

The six valves identified above were disassembled, inspected and seats cleaned or lapped to return their leakage rates back to acceptable levels. Additional valves with leakage rates that were higher than normal were disassembled and seats lapped to reduce their leakage rates to ensure the technical specification acceptance criteria for total leakage was met. In addition, several modifications were made during the refueling outage which added additional containment isolation valves or allowed existing containment isolation valves to be tested in the correct direction.

4.1.3 As-Left Analysis

The total as-left maximum pathway leakage rate, excluding main steam isolation valves, was 134.58 SCFH. All individual valve leakage rates for main steam isolation valves were below 11.5 SCFH. All of the acceptance criteria for technical specifications were met.

4.2 Cycle 15 Test Results

4.2.1 As-Found Analysis

The total as-found maximum pathway leakage, excluding main steam isolation valves, was 232.37 SCFH. This was within the technical specification acceptance criteria of 0.6 La, which is equivalent to 275.2 SCFH. However, seven main steam isolation valve leakage rates exceeded the technical specification acceptance criteria of 11.5 SCFH. These seven valves were AO-2-80A with a leakage rate of 50.1 SCFH, AO-2-86A with a leakage rate of 6388 SCFH, AO-2-80B with a leakage rate of 32.7 SCFH, AO-2-86B with a leakage rate of 202.3 SCFH, AO-2-86C with a leakage rate of 12.5 SCFH, AO-2-80D with a leakage rate of 24 SCFH and AO-2-86D with a leakage rate of 146 SCFH. The good performance of the redundant valves for all penetrations resulted in a total as-found minimum pathway leakage rate for all Type B and C tested penetrations of 202.48 SCFH which was well below the 0.6 L_a acceptance criteria. For additional information see Licensee Event Report 93-003-01.

4.2.2 Repairs and Adjustments

The seven main steam isolation valves identified above were disassembled, inspected, seats lapped and parts replaced to return their leakage rates back to acceptable levels. Additional valves with leakage rates that were higher than normal were disassembled and seats lapped to reduce their leakage rates to ensure the technical specification acceptance criteria for total leakage was met. In addition, one modification was made during the refueling outage which added a new containment penetration and isolation valves for the Hard Pipe Vent system.

4.2.3 As-Left Analysis

The total as-left maximum pathway leakage rate, excluding main steam isolation valves, was 121.78 SCFH. All individual valve leakage rates for main steam isolation valves were below 11.5 SCFH. All of the acceptance criteria for technical specifications were met.

5.0 ATTACHMENTS

ATTACHMENT 1, Summary Data

ATTACHMENT 2, Type A and Verification Test Results

ATTACHMENT 3, Penetrations Not Tested and Leakage Penalties

ATTACHMENT 4, Cycle 14 Refueling Type B and C Test Results

ATTACHMENT 5, Cycle 15 Refueling Type B and C Test Results

ATTACHMENT 6, Mid-Cycle Type B and C Test Results

ATTACHMENT 1, SUMMARY DATA

MONTICELLO NUCLEAR GENERATING PLANT
SUMMARY DATA

ALMAX = 1.200 VOLUME = 241200.
VRATET = 1.385 VRATEM =1.402

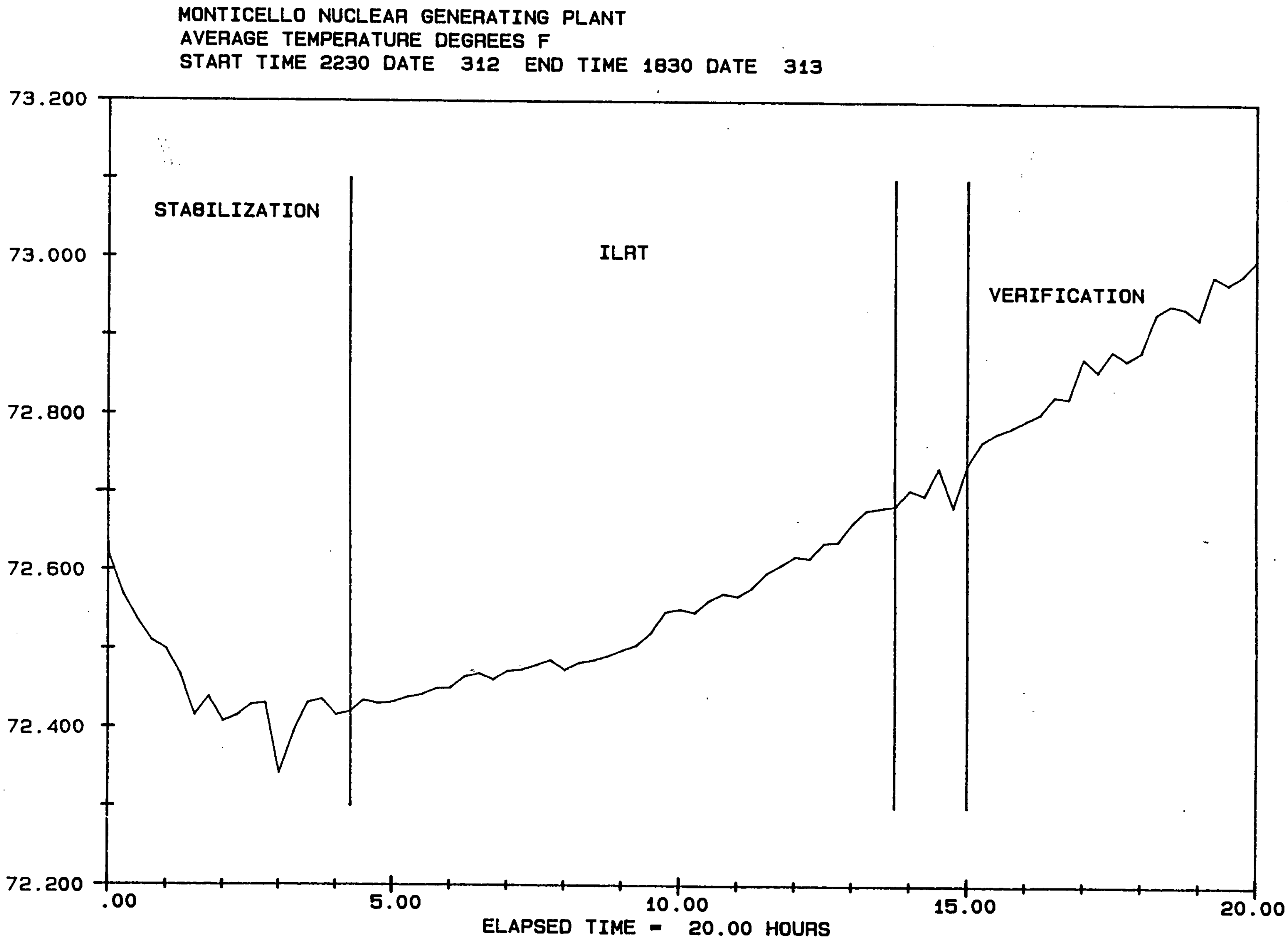
TIME	DATE	TEMP	PRESSURE	VPRS	VOLUME	AIRMASS
2230	312	532.291	57.6397	.3188	241200.0	70498.3
2245	312	532.239	57.6349	.3184	241200.0	70499.3
2300	312	532.206	57.6301	.3187	241200.0	70497.6
2315	312	532.180	57.6259	.3188	241200.0	70496.1
2330	312	532.169	57.6224	.3188	241200.0	70493.2
2345	312	532.136	57.6191	.3190	241200.0	70493.5
0	313	532.084	57.6154	.3191	241200.0	70495.8
15	313	532.108	57.6133	.3192	241200.0	70490.1
30	313	532.077	57.6093	.3196	241200.0	70489.4
45	313	532.084	57.6077	.3198	241200.0	70486.4
100	313	532.098	57.6064	.3200	241200.0	70483.0
115	313	532.101	57.6043	.3203	241200.0	70480.1
130	313	532.010	57.6014	.3208	241200.0	70488.5
145	313	532.063	57.6001	.3210	241200.0	70480.0
200	313	532.101	57.5982	.3214	241200.0	70472.6
215	313	532.106	57.5962	.3216	241200.0	70469.5
230	313	532.085	57.5939	.3227	241200.0	70469.4
245	313	532.090	57.5919	.3226	241200.0	70466.2
300	313	532.104	57.5896	.3231	241200.0	70461.6
315	313	532.100	57.5883	.3235	241200.0	70460.6
330	313	532.102	57.5869	.3241	241200.0	70458.6
345	313	532.109	57.5858	.3243	241200.0	70456.4
400	313	532.112	57.5846	.3243	241200.0	70454.6
415	313	532.120	57.5831	.3245	241200.0	70451.6
430	313	532.121	57.5817	.3245	241200.0	70449.8
445	313	532.135	57.5805	.3247	241200.0	70446.4
500	313	532.139	57.5791	.3247	241200.0	70444.2
515	313	532.132	57.5782	.3247	241200.0	70444.1
530	313	532.142	57.5768	.3247	241200.0	70440.9
545	313	532.144	57.5751	.3251	241200.0	70438.6
600	313	532.150	57.5742	.3248	241200.0	70436.7
615	313	532.156	57.5729	.3247	241200.0	70434.3
630	313	532.144	57.5711	.3247	241200.0	70433.8
645	313	532.153	57.5690	.3249	241200.0	70430.0
700	313	532.156	57.5676	.3248	241200.0	70427.8
715	313	532.162	57.5669	.3249	241200.0	70426.2
730	313	532.169	57.5664	.3250	241200.0	70424.6
745	313	532.175	57.5671	.3239	241200.0	70424.6
800	313	532.191	57.5654	.3252	241200.0	70420.6
815	313	532.218	57.5649	.3252	241200.0	70416.5
830	313	532.221	57.5644	.3253	241200.0	70415.4
845	313	532.217	57.5638	.3254	241200.0	70415.1
900	313	532.232	57.5628	.3261	241200.0	70411.9
915	313	532.241	57.5628	.3257	241200.0	70410.7
930	313	532.238	57.5626	.3253	241200.0	70411.0
945	313	532.248	57.5611	.3259	241200.0	70407.7
1000	313	532.267	57.5605	.3259	241200.0	70404.5
1015	313	532.277	57.5603	.3262	241200.0	70402.9
1030	313	532.288	57.5604	.3264	241200.0	70401.5

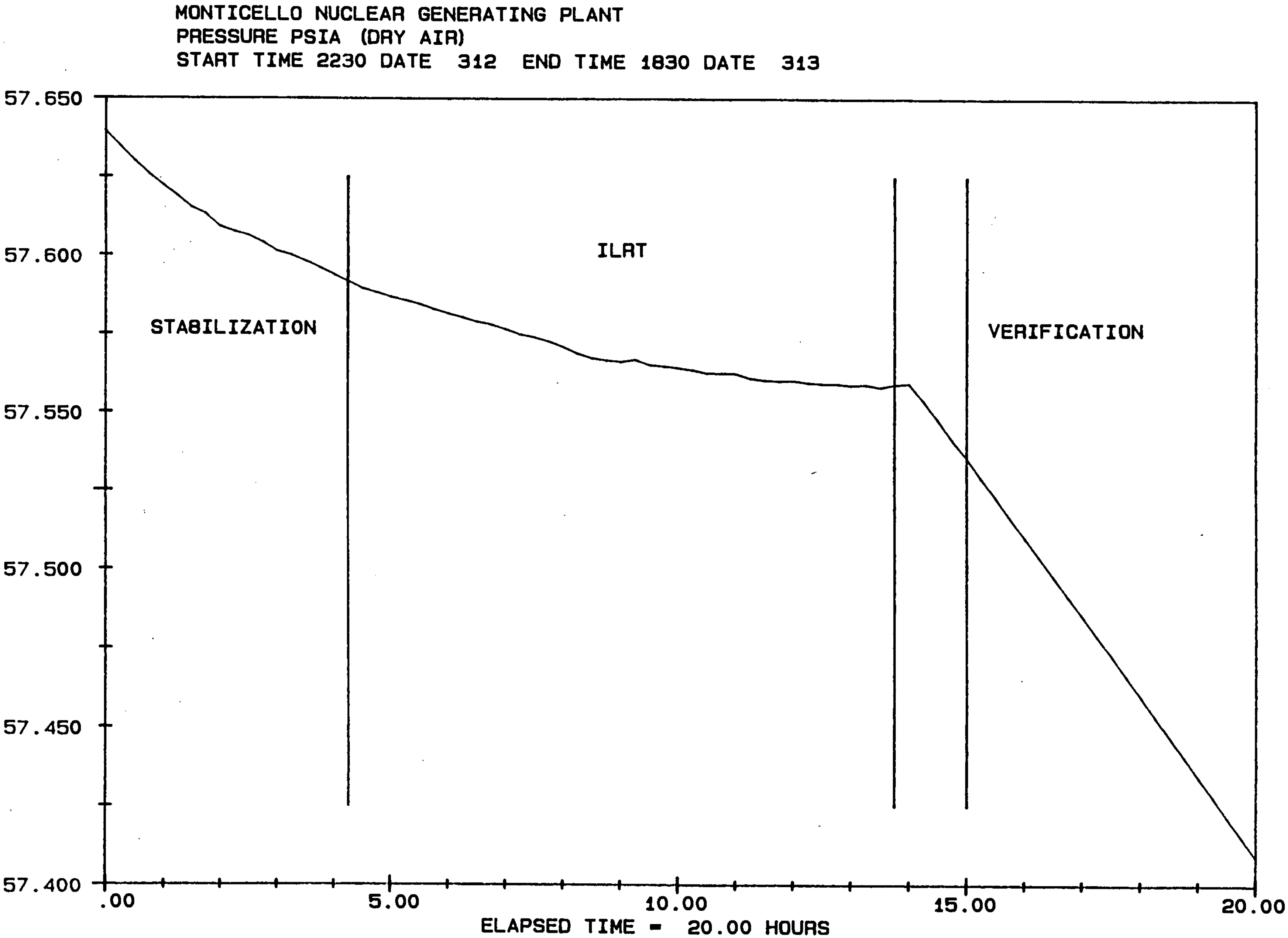
MONTICELLO NUCLEAR GENERATING PLANT
SUMMARY DATA

ALMAX = 1.200 VOLUME = 241200.
VRATET = 1.385 VRATEM =1.402

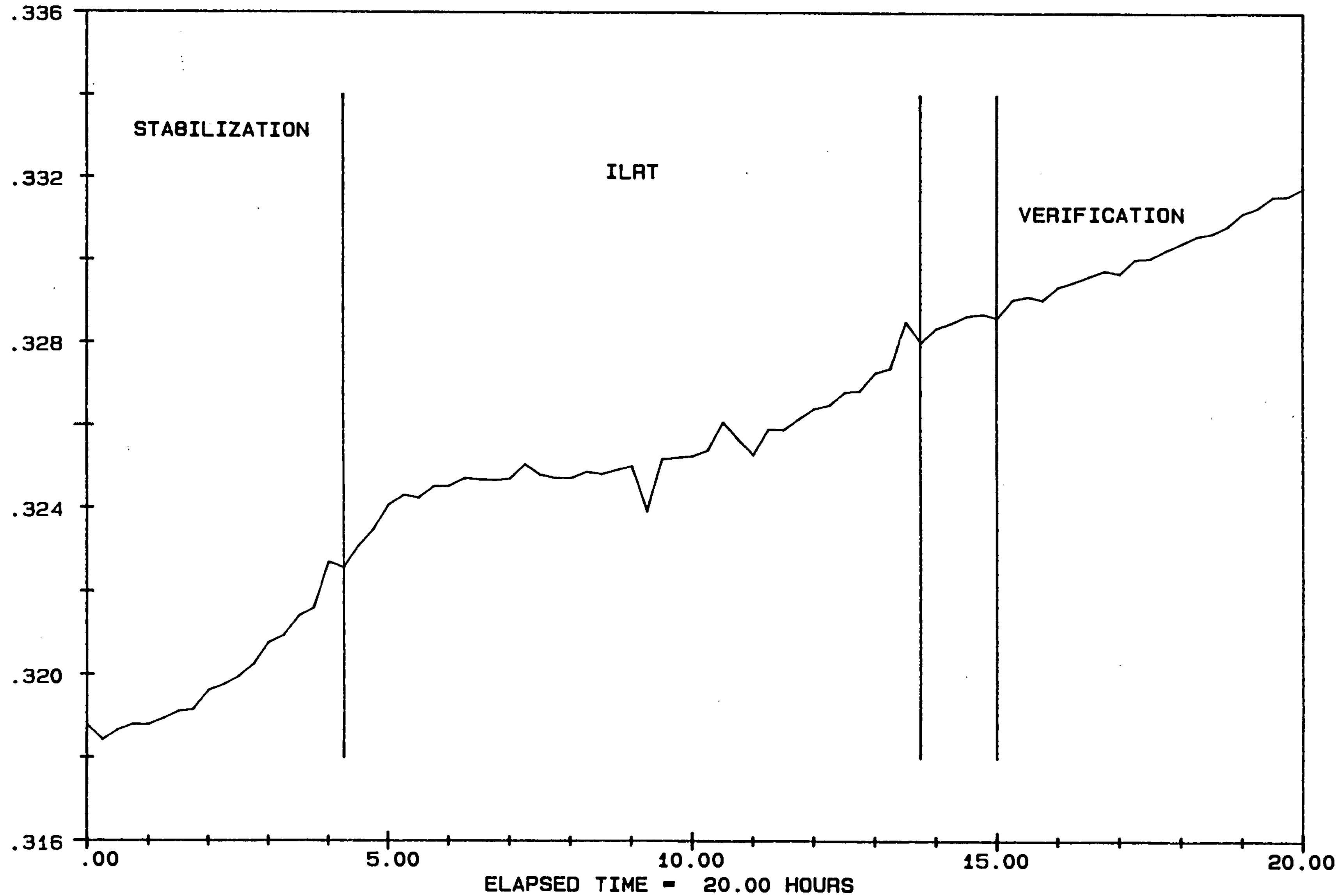
TIME	DATE	TEMP	PRESSURE	VPRS	VOLUME	AIRMASS
1045	313	532.286	57.5598	.3265	241200.0	70401.1
1100	313	532.306	57.5594	.3268	241200.0	70398.1
1115	313	532.307	57.5594	.3269	241200.0	70397.8
1130	313	532.331	57.5589	.3273	241200.0	70394.1
1145	313	532.348	57.5592	.3274	241200.0	70392.2
1200	313	532.351	57.5583	.3285	241200.0	70390.7
1215	313	532.353	57.5592	.3280	241200.0	70391.5
1230	313	532.374	57.5595	.3284	241200.0	70389.1
1245	313	532.367	57.5540	.3285	241200.0	70383.4
1300	313	532.403	57.5480	.3287	241200.0	70371.3
1315	313	532.352	57.5414	.3287	241200.0	70370.0
1330	313	532.407	57.5358	.3286	241200.0	70355.7
1345	313	532.437	57.5291	.3291	241200.0	70343.7
1400	313	532.448	57.5230	.3292	241200.0	70334.8
1415	313	532.455	57.5166	.3291	241200.0	70326.0
1430	313	532.464	57.5105	.3294	241200.0	70317.3
1445	313	532.472	57.5042	.3295	241200.0	70308.6
1500	313	532.495	57.4980	.3296	241200.0	70297.9
1515	313	532.492	57.4919	.3298	241200.0	70290.8
1530	313	532.543	57.4858	.3297	241200.0	70276.6
1545	313	532.527	57.4792	.3301	241200.0	70270.8
1600	313	532.553	57.4731	.3301	241200.0	70259.8
1615	313	532.541	57.4667	.3303	241200.0	70253.5
1630	313	532.552	57.4604	.3304	241200.0	70244.4
1645	313	532.601	57.4538	.3306	241200.0	70230.0
1700	313	532.612	57.4475	.3307	241200.0	70220.8
1715	313	532.608	57.4411	.3309	241200.0	70213.5
1730	313	532.594	57.4346	.3312	241200.0	70207.4
1745	313	532.649	57.4283	.3313	241200.0	70192.4
1800	313	532.639	57.4217	.3316	241200.0	70185.6
1815	313	532.651	57.4154	.3316	241200.0	70176.5
1830	313	532.671	57.4091	.3318	241200.0	70166.1

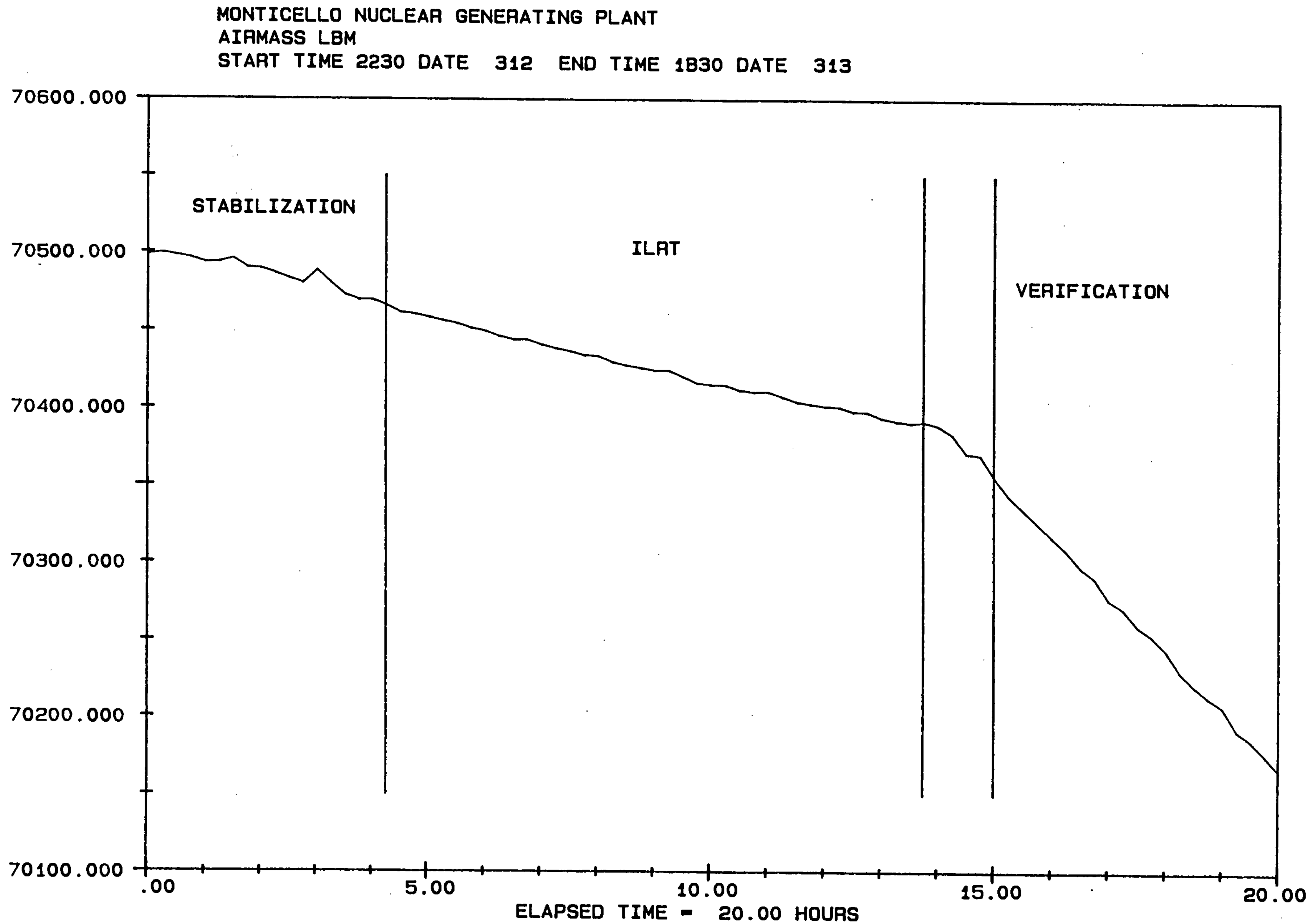
ATTACHMENT 1, SUMMARY DATA




MONTICELLO NUCLEAR GENERATING PLANT
PRESSURE PSIA (DRY AIR)
START TIME 2230 DATE 312 END TIME 1830 DATE 313
57.650
57.600
57.550
57.500
57.450
57.400
STABILIZATION
ILRT
VERIFICATION
.00
5.00
10.00
15.00
20.00
ELAPSED TIME = 20.00 HOURS

MONTICELLO NUCLEAR GENERATING PLANT
VAPOR PRESSURE PSIA
START TIME 2230 DATE 312 END TIME 1830 DATE 313




MONTICELLO NUCLEAR GENERATING PLANT
AIRMASS LBM
START TIME 2230 DATE 312 END TIME 1830 DATE 313
70600.000
70500.000
70400.000
70300.000
70200.000
70100.000
STABILIZATION
ILRT
VERIFICATION
.00
5.00
10.00
15.00
20.00
ELAPSED TIME = 20.00 HOURS

ATTACHMENT 2, TYPE A AND VERIFICATION TEST RESULTS

MONTICELLO NUCLEAR GENERATING PLANT
LEAKAGE RATE (WEIGHT PERCENT/DAY)
TOTAL TIME ANALYSIS

TIME AND DATE AT START OF TEST: 245 313 1993
TEST DURATION: 9.50 HOURS

TIME	TEMP (R)	PRESSURE (PSIA)	MEASURED LEAKAGE RATE
245	532.090	57.5919	
300	532.104	57.5896	.632
315	532.100	57.5883	.385
330	532.102	57.5869	.348
345	532.109	57.5858	.335
400	532.112	57.5846	.318
415	532.120	57.5831	.333
430	532.121	57.5817	.320
445	532.135	57.5805	.339
500	532.139	57.5791	.333
515	532.132	57.5782	.302
530	532.142	57.5768	.314
545	532.144	57.5751	.314
600	532.150	57.5742	.309
615	532.156	57.5729	.311
630	532.144	57.5711	.295
645	532.153	57.5690	.309
700	532.156	57.5676	.308
715	532.162	57.5669	.303
730	532.169	57.5664	.298
745	532.175	57.5671	.283
800	532.191	57.5654	.296
815	532.218	57.5649	.308
830	532.221	57.5644	.301
845	532.217	57.5638	.290
900	532.232	57.5628	.296
915	532.241	57.5628	.291
930	532.238	57.5626	.279
945	532.248	57.5611	.285
1000	532.267	57.5605	.290
1015	532.277	57.5603	.288
1030	532.288	57.5604	.284
1045	532.286	57.5598	.277
1100	532.306	57.5594	.282
1115	532.307	57.5594	.274
1130	532.331	57.5589	.281
1145	532.348	57.5592	.280
1200	532.351	57.5583	.278
1215	532.353	57.5592	.268

MEAN OF THE MEASURED LEAKAGE RATES	=	.312
MAXIMUM ALLOWABLE LEAKAGE RATE	=	1.200
75% OF MAXIMUM ALLOWABLE LEAKAGE RATE	=	.900
THE UPPER 95% CONFIDENCE LIMIT	=	.354
THE CALCULATED LEAKAGE RATE	=	.253

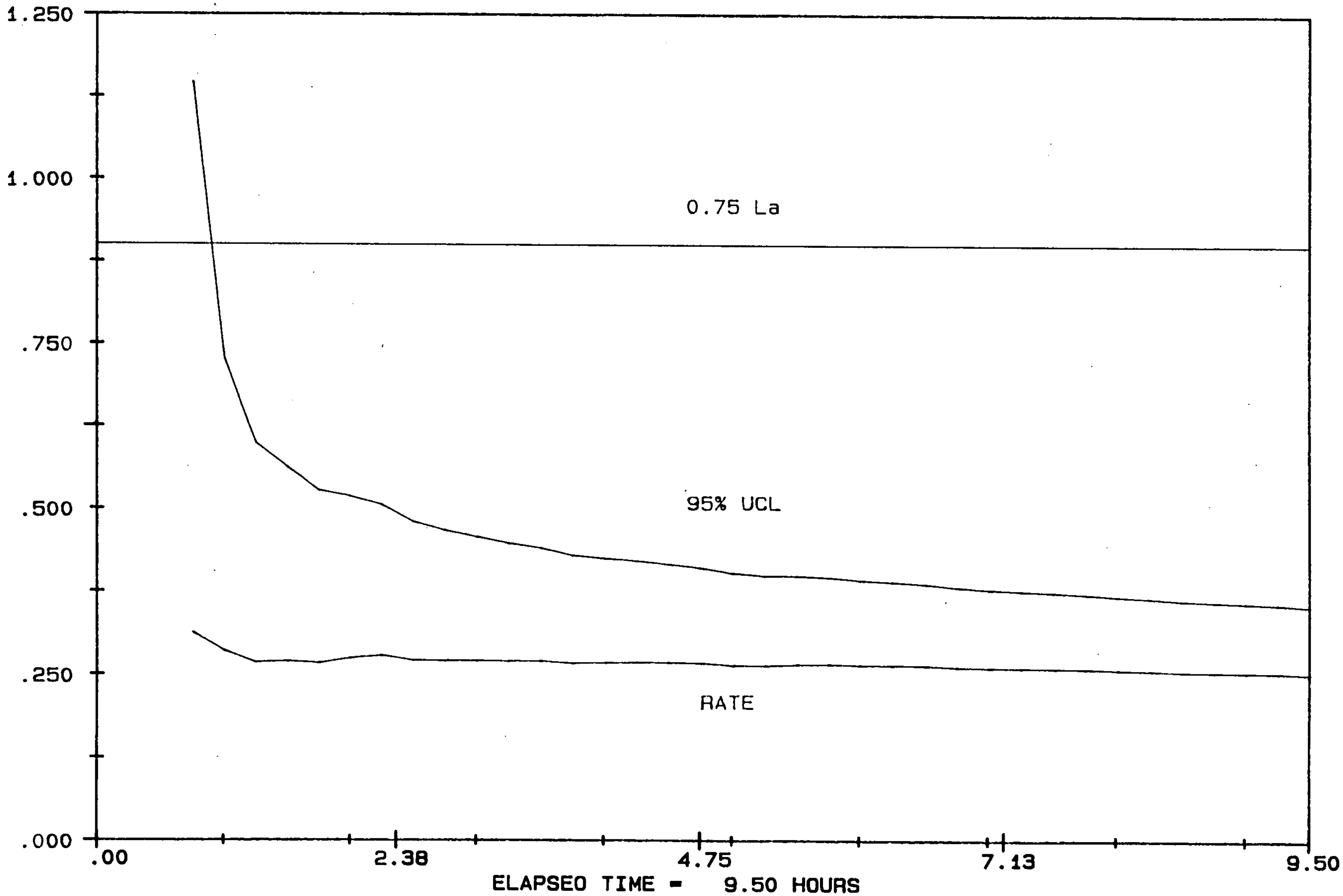
ATTACHMENT 2, TYPE A AND VERIFICATION TEST RESULTS

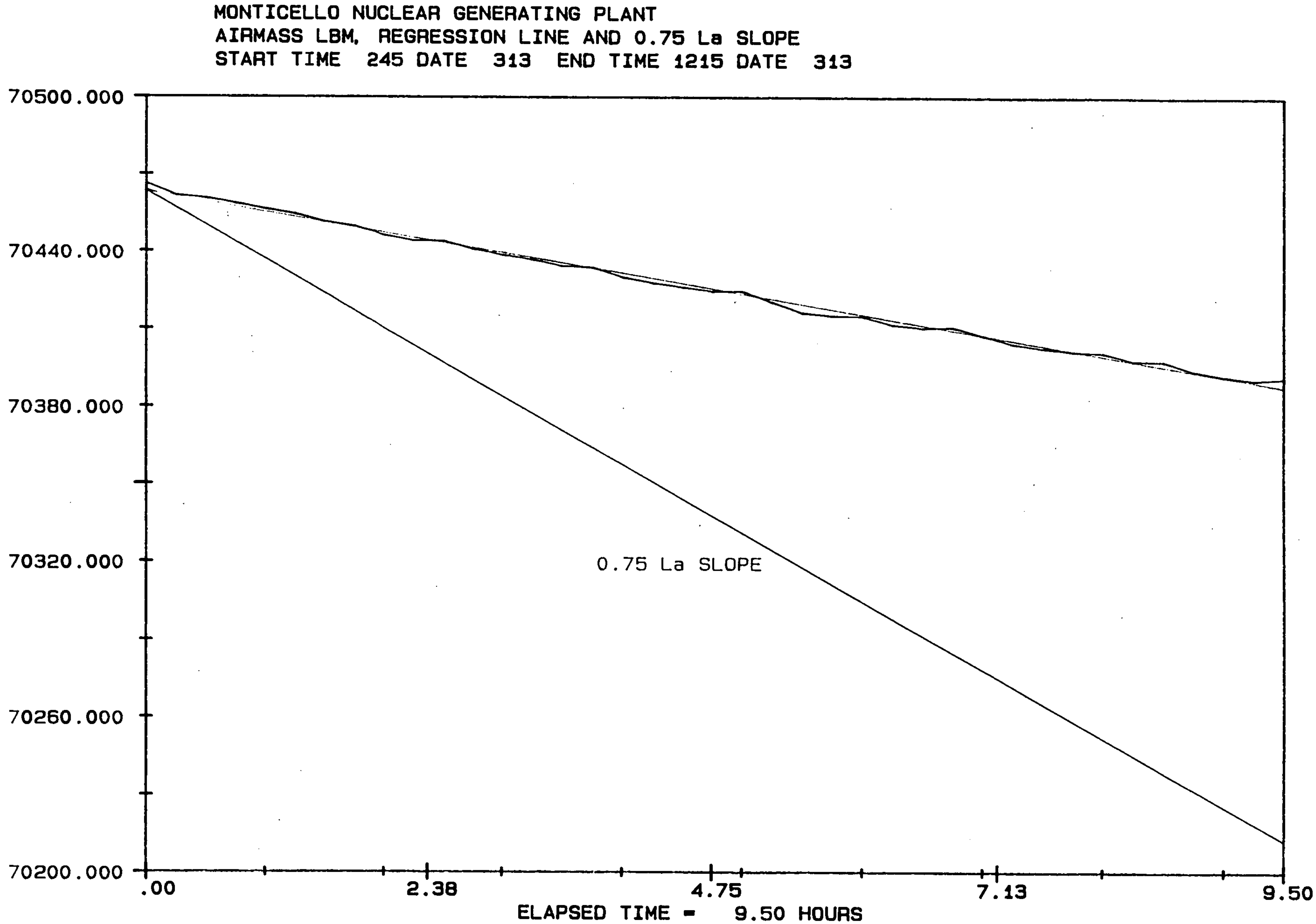
MONTICELLO NUCLEAR GENERATING PLANT
TREND REPORT

TIME AND DATE AT START OF TEST: 245 313 1993

NO. PTS	END TIME	TOTAL TIME ANALYSIS MEAS.	TOTAL TIME ANALYSIS CALCULATED	TOTAL TIME ANALYSIS UCL	MASS POINT ANALYSIS CALCULATED	MASS POINT ANALYSIS UCL
2	300	.632	.632	99.000	.632	99.000
3	315	.385	.385	99.000	.385	1.607
4	330	.348	.313	1.145	.327	.539
5	345	.335	.285	.727	.309	.410
6	400	.318	.268	.598	.296	.358
7	415	.333	.270	.563	.303	.345
8	430	.320	.267	.527	.301	.332
9	445	.339	.275	.519	.311	.337
10	500	.333	.279	.506	.315	.336
11	515	.302	.272	.480	.304	.324
12	530	.314	.271	.467	.303	.319
13	545	.314	.271	.457	.302	.316
14	600	.309	.271	.448	.300	.313
15	615	.311	.271	.441	.300	.311
16	630	.295	.268	.430	.295	.305
17	645	.309	.268	.426	.296	.305
18	700	.308	.269	.422	.296	.304
19	715	.303	.269	.417	.295	.303
20	730	.298	.268	.412	.293	.300
21	745	.283	.265	.403	.288	.296
22	800	.296	.264	.400	.288	.295
23	815	.308	.266	.399	.290	.297
24	830	.301	.266	.397	.290	.297
25	845	.290	.265	.393	.288	.295
26	900	.296	.265	.390	.288	.294
27	915	.291	.265	.387	.287	.292
28	930	.279	.262	.382	.283	.290
29	945	.285	.261	.379	.282	.288
30	1000	.290	.261	.377	.282	.287
31	1015	.288	.261	.374	.281	.286
32	1030	.284	.260	.372	.280	.285
33	1045	.277	.259	.369	.278	.283
34	1100	.282	.258	.366	.277	.282
35	1115	.274	.256	.363	.275	.280
36	1130	.281	.256	.361	.274	.279
37	1145	.280	.255	.359	.273	.278
38	1200	.278	.255	.357	.273	.277
39	1215	.268	.253	.354	.270	.275

MONTICELLO NUCLEAR GENERATING PLANT
TOTAL TIME LEAKAGE RATE, UCL AND 0.75 La - %/DAY
START TIME 245 DATE 313 END TIME 1215 DATE 313




MONTICELLO NUCLEAR GENERATING PLANT
AIRMASS LBM, REGRESSION LINE AND 0.75 La SLOPE
START TIME 245 DATE 313 END TIME 1215 DATE 313
70500.000
70440.000
70380.000
70320.000
70260.000
70200.000
0.75 La SLOPE
.00
2.38
4.75
7.13
9.50
ELAPSED TIME = 9.50 HOURS

ATTACHMENT 2, TYPE A AND VERIFICATION TEST RESULTS

MONTICELLO NUCLEAR GENERATING PLANT
LEAKAGE RATE (WEIGHT PERCENT/DAY)
TOTAL TIME ANALYSIS

TIME AND DATE AT START OF TEST: 1330 313 1993
TEST DURATION: 5.00 HOURS

TIME	TEMP (R)	PRESSURE (PSIA)	MEASURED LEAKAGE RATE
1330	532.407	57.5358	
1345	532.437	57.5291	1.640
1400	532.448	57.5230	1.424
1415	532.455	57.5166	1.351
1430	532.464	57.5105	1.310
1445	532.472	57.5042	1.287
1500	532.495	57.4980	1.314
1515	532.492	57.4919	1.265
1530	532.543	57.4858	1.349
1545	532.527	57.4792	1.287
1600	532.553	57.4731	1.308
1615	532.541	57.4667	1.267
1630	532.552	57.4604	1.266
1645	532.601	57.4538	1.319
1700	532.612	57.4475	1.315
1715	532.608	57.4411	1.294
1730	532.594	57.4346	1.265
1745	532.649	57.4283	1.311
1800	532.639	57.4217	1.289
1815	532.651	57.4154	1.287
1830	532.671	57.4091	1.294

MEAN OF THE MEASURED LEAKAGE RATES	=	1.322
VERIFICATION TEST LEAKAGE RATE UPPER LIMIT	=	1.685
VERIFICATION TEST LEAKAGE RATE LOWER LIMIT	=	1.085
THE CALCULATED LEAKAGE RATE	=	1.250

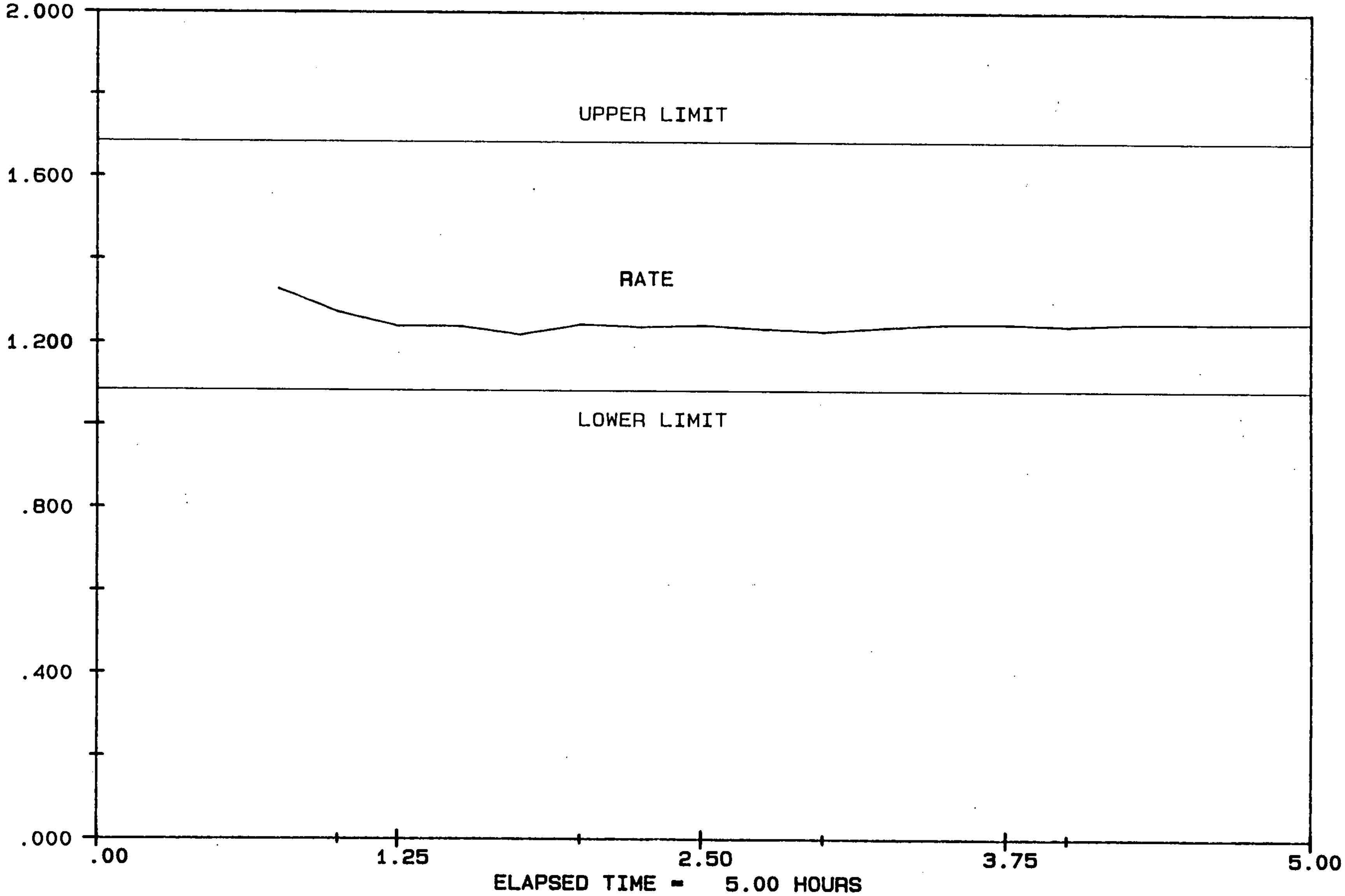
ATTACHMENT 2, TYPE A AND VERIFICATION TEST RESULTS

MONTICELLO NUCLEAR GENERATING PLANT
TREND REPORT

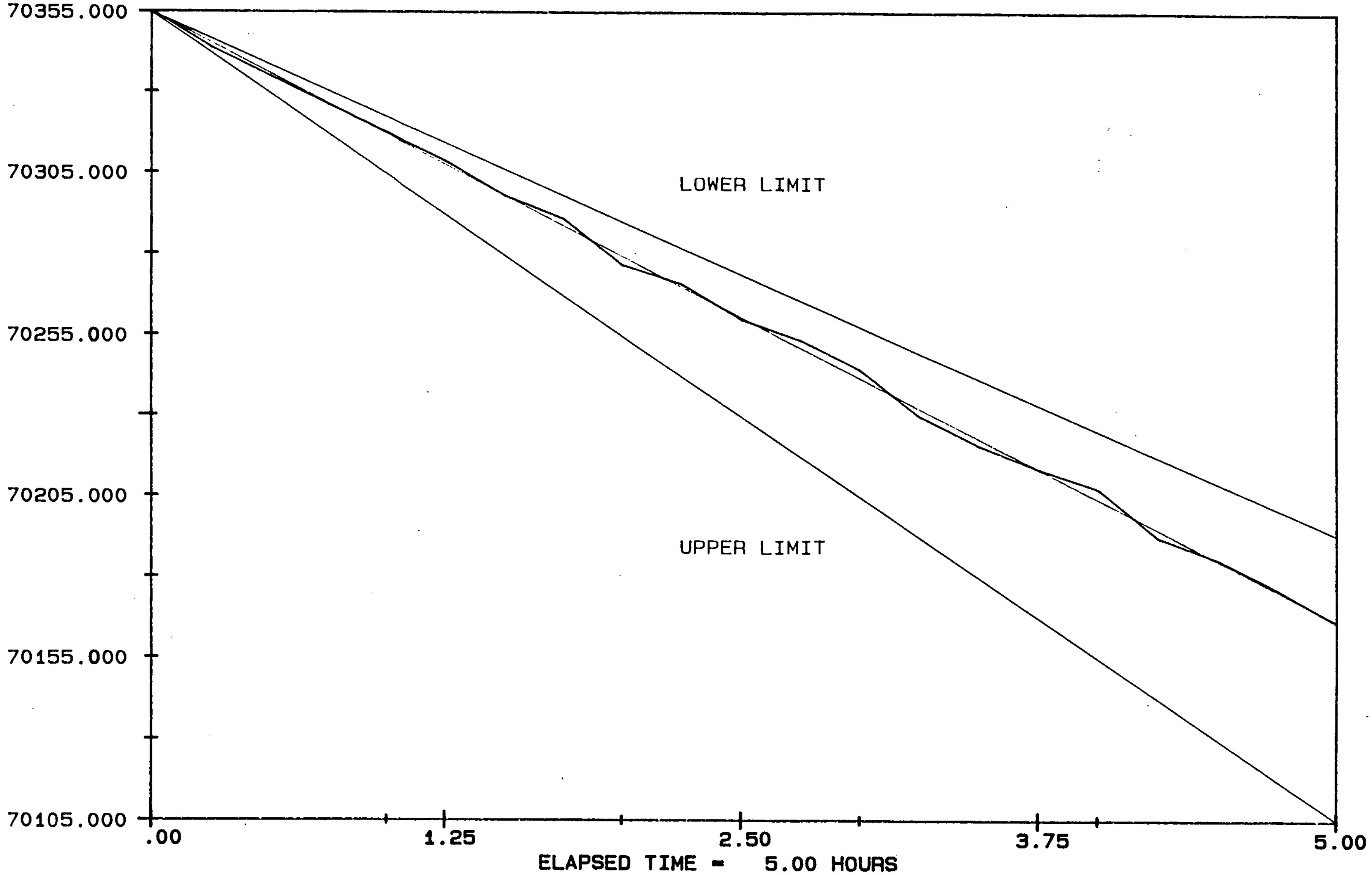
TIME AND DATE AT START OF TEST: 1330 313 1993

NO. PTS	END TIME	TOTAL TIME ANALYSIS MEAS.	CALCULATED	UCL	MASS POINT ANALYSIS CALCULATED	UCL
2	1345	1.640	1.640	99.000	1.640	99.000
3	1400	1.424	1.424	99.000	1.424	2.493
4	1415	1.351	1.327	1.895	1.337	1.558
5	1430	1.310	1.272	1.596	1.289	1.410
6	1445	1.287	1.238	1.505	1.262	1.341
7	1500	1.314	1.239	1.511	1.273	1.327
8	1515	1.265	1.219	1.458	1.252	1.297
9	1530	1.349	1.244	1.505	1.287	1.340
10	1545	1.287	1.238	1.478	1.279	1.321
11	1600	1.308	1.242	1.472	1.284	1.318
12	1615	1.267	1.234	1.447	1.271	1.302
13	1630	1.266	1.227	1.428	1.262	1.290
14	1645	1.319	1.238	1.439	1.276	1.304
15	1700	1.315	1.245	1.443	1.285	1.311
16	1715	1.294	1.246	1.437	1.285	1.307
17	1730	1.265	1.241	1.423	1.276	1.298
18	1745	1.311	1.247	1.427	1.283	1.304
19	1800	1.289	1.248	1.422	1.282	1.301
20	1815	1.287	1.248	1.417	1.281	1.298
21	1830	1.294	1.250	1.415	1.283	1.297

MONTICELLO NUCLEAR GENERATING PLANT
TOTAL TIME LEAKAGE RATE AND VERIFICATION TEST LIMITS - %/DAY
START TIME 1330 DATE 313 END TIME 1830 DATE 313



MONTICELLO NUCLEAR GENERATING PLANT
AIRMASS LBM, REGRESSION LINE AND VERIFICATION TEST LIMITS
START TIME 1330 DATE 313 END TIME 1830 DATE 313



ATTACHMENT 3, PENETRATIONS NOT TESTED AND LEAKAGE PENALTIES

Penetration	Description	MNPLR Leakage Rate	Explanation
X-9B	FW-94-1 FW-97-1	0.715 SCFH	Decay heat removal flow path required to be in operation
X-12	MO-2029 MO-2030	0.537 SCFH	Backup decay heat removal flow path required to be in operation
X-13A	MO-2013 MO-2015	0.873 SCFH	Backup decay heat removal flow path required to be in operation
X-13B	MO-2012 MO-2014	0.888 SCFH	Backup decay heat removal flow path required to be in operation
X-14	MO-2397 MO-2398	0.086 SCFH	Decay heat removal flow path required to be in operation
X-16A	MO-1752 MO-1754	0.210 SCFH	Conflict between venting requirements and post-accident system configuration
X-16B	MO-1751 MO-1753	0.131 SCFH	Conflict between venting requirements and post-accident system configuration
X-17	MO-2026 MO-2027	0.404 SCFH	Venting not possible due to system configuration for backup decay heat removal
X-18	AO-2541A AO-2541B	0.032 SCFH	Containment sump system required to be in operation
X-19	AO-2561A AO-2561B	0.309 SCFH	Containment sump system required to be in operation
X-23	RBCC-15 MO-4229	0.096 SCFH	Closed cooling water water system for drywell required to be in operation
X-24	MO-1426 MO-4230	2.488 SCFH	Closed cooling water water system for drywell required to be in operation
X-41	CV-2790 CV-2791	0.017 SCFH	Draining system not practical due to extemely high dose rates at drain valve
X-218	AO-2379 DWV-8-2	3.151 SCFH	Suspected excessive leakage path isolated by pressurizing between containment barriers

ATTACHMENT 4, CYCLE 14 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR
__	S.R. Port A	0.0135	0.0135	0.0135	0.0135
__	S.R. Port B	0.0135	0.0135	0.0135	0.0135
__	S.R. Port C	0.0135	0.0135	0.0135	0.0135
__	S.R. Port D	0.0135	0.0135	0.0135	0.0135
__	S.R. Port E	0.0135	0.0135	0.0135	0.0135
__	S.R. Port F	0.0135	0.0135	0.0135	0.0135
__	S.R. Port G	0.0135	0.0135	0.0135	0.0135
__	S.R. Port H	0.0135	0.0135	0.0135	0.0135
--	DW Head	0.4000	0.4000	0.0135	0.0135
X-1	DW Equip H	0.0800	0.0800	0.0128	0.0128
X-2	Airlock	10.1800	5.0900	8.6800	4.3400
X-4	DW Head MW	0.0135	0.0135	0.0135	0.0135
X-6	CRD MW	0.0128	0.0128	0.0135	0.0135
X-7A	Bellows	0.0864	0.0432	0.0864	0.0432
	AO-2-80A AO-2-86A	(88.4 @ 25#) 132.1000	(3.1 @ 25#) 4.6300	(7.35 @ 25#) 10.9800	(1.67 @ 25#) 1.7400
X-7B	Bellows	0.5475	0.2738	0.5475	0.2738
	AO-2-80B AO-2-86B	(684 @ 25#) 1038.6000	(1.9 @ 25#) 2.8400	(1.9 @ 25#) 2.8400	(0.42 @ 25#) 0.4350
X-7C	Bellows	0.0288	0.0144	0.0288	0.0144
	AO-2-80C AO-2-86C	(3.76 @ 25#) 5.6200	(0.50 @ 25#) 0.7590	(3.76 @ 25#) 5.6200	(0.50 @ 25#) 0.7590
X-7D	Bellows	0.0576	0.0288	0.0576	0.0288
	AO-2-80D AO-2-86D	(45.1 @ 25#) 68.4800	(6.6 @ 25#) 10.0200	(7.51 @ 25#) 10.8800	(6.6 @ 25#) 10.0200

(Leakage Rates Reported in SCFH)

ATTACHMENT 4, CYCLE 14 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR
X-8	Bellows	0.2882	0.1441	0.2882	0.1441
	MO-2373 MO-2374	2.2600	1.7200	0.2500	0.0801
X-9A	Bellows	0.0432	0.0216	0.0432	0.0216
	FW-97-2 FW-94-2	0.5100	0.0390	0.5100	0.0390
X-9B	Bellows	0.0288	0.0144	0.0288	0.0144
	FW-97-1 FW-94-1	0.8120	0.1470	4.2210	0.8120
X-10	Bellows	0.0288	0.0144	0.0288	0.0144
	MO-2075 MO-2076	1.0100	0.0670	0.2500	0.0165
X-11	Bellows	0.0720	0.0360	0.0720	0.0360
	MO-2034 MO-2035	0.2550	0.2150	0.3235	0.2500
X-12	Bellows	0.0288	0.0144	0.0288	0.0144
	MO-2029 MO-2030	5.4600	0.4030	6.3610	2.1300
X-13A	Bellows	0.1009	0.0505	0.1009	0.0505
	MO-2015 MO-2013	0.9300	0.8700	0.9325	0.8715
X-13B	Bellows	0.0576	0.0288	0.0576	0.0288
	MO-2014 MO-2012	0.9565	0.8900	0.9565	0.8892
X-14	Bellows	0.0598	0.0299	0.0598	0.0299
	MO-2397 MO-2398	3.5400	0.1090	6.3600	0.0124

(Leakage Rates Reported in SCFH)

ATTACHMENT 4, CYCLE 14 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR
X-16A	Bellows	0.0297	0.0148	0.0297	0.0148
	MO-1754 MO-1752	1.1200	0.2100	1.1200	0.2100
X-16B	Bellows	0.3458	0.1729	0.3458	0.1729
	MO-1753 MO-1751	0.0870	0.0865	0.0883	0.0865
X-17	Bellows	0.0288	0.0144	0.0288	0.0144
	MO-2027 MO-2026	0.0383	0.0253	0.2400	0.0145
X-18	AO-2541A AO-2541B	840.9100	0.2380	0.7410	0.4740
X-19	AO-2561A AO-2561B	402.5800	0.0530	0.0161	0.0160
X-20	DM-152 DM-151	0.0600	0.0600	0.0600	0.0600
X-21	AS-79 AS-78	0.4580	0.2520	0.4580	0.2520
X-22	AI-571 CV-1478	0.6920	0.3450	0.6920	0.3450
X-23	RBCC-15 MO-4229	1.3200	0.2300	1.3200	0.2300
X-24	MO-1426 MO-4230	4.6600	3.3500	4.6600	3.3500
X-25	AO-2386 CV-2385 AO-2387	4.3900	4.2600	16.6300	2.1950
X-26	AO-2381 AO-2377	2.7900	2.0300	4.7800	0.5100
X-26/218	CV-3267 CV-3268 CV-3269	0.3460	0.1320	0.3460	0.1320

(Leakage Rates Reported in SCFH)

ATTACHMENT 4, CYCLE 14 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR
X-27D	SV-4001B SV-4020B	0.5046	0.4973	0.5046	0.4973
X-27E	SV-3307 SV-4082 SV-3308 SV-4081	0.5032	0.4953	0.5032	0.4953
X-27F	SV-4001A SV-4020A	0.5098	0.5096	0.5098	0.5096
X-34A	AI-598 SV-4235	0.6240	0.1150	0.1150	0.0143
X-35A	TIP Flange	0.0146	0.0146	0.0146	0.0146
	TIP-1-1	0.7100	0.7100	0.7100	0.7100
X-35B	TIP Flange	0.0146	0.0146	0.0146	0.0146
	TIP-2-1	0.0140	0.0140	0.0140	0.0140
X-35C	TIP Flange	0.0146	0.0146	0.0128	0.0128
	TIP-3-1	0.9700	0.9700	0.1000	0.1000
X-35D	TIP Flange	0.0146	0.0146	0.0146	0.0146
X-35E	TIP Flange	0.0146	0.0146	0.0146	0.0146
	AI-226-1 AI-625	6.3000	6.3000	5.9800	0.0129
X-37B	XR-27-1 XR-25-1	4.0900	0.3100	4.0900	0.3100
X-38B	XR-27-2 XR-25-2	1.6500	0.0300	1.6500	0.0300
X-39A	MO-2023 MO-2021	0.9200	0.1400	0.9200	0.1400
X-39B	MO-2022 MO-2020	1.8600	1.2500	1.8600	1.1500

(Leakage Rates Reported in SCFH)

ATTACHMENT 4, CYCLE 14 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR
X-41	CV-2790 CV-2791	0.8900	0.7200	1.6810	0.0159
X-42	XP-7 XP-6	30203.0000	0.0970	0.1285	0.0970
X-47	AO-7422A AO-7422B AO-7423A AO-7423B	1.5400	0.0590	1.5400	0.0590
X-100A	Electric P	0.0236	0.0236	0.0236	0.0236
X-100B	Electric P	0.0001	0.0001	0.0001	0.0001
X-100C	Electric P	0.0001	0.0001	0.0001	0.0001
X-100D	Electric P	0.0001	0.0001	0.0001	0.0001
X-101B	Electric P	0.0001	0.0001	0.0001	0.0001
X-101D	Electric P	0.0001	0.0001	0.0001	0.0001
X-103	Electric P	0.0001	0.0001	0.0001	0.0001
X-104A	Electric P	0.0400	0.0400	0.0400	0.0400
X-104B	Electric P	0.0001	0.0001	0.0001	0.0001
X-104C	Electric P	0.0201	0.0201	0.0201	0.0201
X-104D	Electric P	0.0001	0.0001	0.0001	0.0001
X-105A	Electric P	0.0001	0.0001	0.0001	0.0001
X-105B(G)	AI-599 SV-4234	0.0575	0.0145	0.0575	0.0145
X-105C	Electric P	0.0001	0.0001	0.0001	0.0001
X-105D	Electric P	0.0001	0.0001	0.0001	0.0001
X-106	Electric P	0.0001	0.0001	0.0001	0.0001
	EP Flange	0.0290	0.0290	0.0290	0.0290

(Leakage Rates Reported in SCFH)

ATTACHMENT 4, CYCLE 14 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR
X-107	Electric P	0.0001	0.0001	0.0001	0.0001
	EP Flange	0.0146	0.0146	0.0146	0.0146
X-200A	SW Torus MW	0.0127	0.0127	0.0127	0.0127
X-200B	NE Torus MW	0.0127	0.0127	0.0127	0.0127
X-205	AO-2383 AO-7424B CV-2384 AO-7425B AO-2896	3.4700	1.8200	2.7200	1.3900
X-211A	MO-2011 MO-2007 MO-2009	229.4800	2.0800	2.0800	0.0001
X-211B	MO-2010 MO-2006 MO-2008	0.5260	0.3436	0.5260	0.0001
X-212	RCIC-9 RCIC-10	1.5200	1.5200	1.8100	0.0170
X-214	SV-4005A SV-4004A	6.4600	0.4996	6.4600	0.4996
	SV-4005B SV-4004B	0.5002	0.4974	0.5002	0.4974
	CV-3313 CV-3314	0.4928	0.4922	0.4928	0.4922
X-215	SV-4003A SV-4002A	0.5010	0.5010	0.5010	0.5010
X-218	AO-2378 AO-2379 AO-2380 AO-7424A AO-7425A DWV-8-1 DWV-8-2	3.1500	1.5500	3.9400	1.5500

(Leakage Rates Reported in SCFH)

ATTACHMENT 4, CYCLE 14 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR
X-220	CV-3311 CV-3312	0.5075	0.5073	0.5075	0.5073
	SV-4003B SV-4002B	0.4952	0.4950	0.4952	0.4950
X-221	HPCI-9 HPCI-10	1.3700	1.3700	0.8640	0.4500
X-229B	AI-629 CV-7956	0.3200	0.3200	0.7860	0.5260
X-230	Electric P	0.0001	0.0001	0.0001	0.0001

Total As-Found MXPLR (Including MSIV's)	33005.77	SCFH
Total As-Found MXPLR (Excluding MSIV's)	31760.97	SCFH
Total As-Found MNPLR (Including MSIV's)	65.06	SCFH
Total As-Left MXPLR (Including MSIV's)	134.58	SCFH
Total As-Left MXPLR (Excluding MSIV's)	104.26	SCFH

ATTACHMENT 5, CYCLE 15 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR	MNPLR Improvement
--	S.R. Port A	0.0150	0.0150	0.0150	0.0150	0.0000
--	S.R. Port B	0.0160	0.0160	0.0160	0.0160	0.0000
--	S.R. Port C	0.0160	0.0160	0.0160	0.0160	0.0000
--	S.R. Port D	0.0160	0.0160	0.0160	0.0160	0.0000
--	S.R. Port E	0.0160	0.0160	0.0160	0.0160	0.0000
--	S.R. Port F	0.0150	0.0150	0.0150	0.0150	0.0000
--	S.R. Port G	0.0590	0.0590	0.0590	0.0590	0.0000
--	S.R. Port H	0.0150	0.0150	0.0150	0.0150	0.0000
--	DW Head	0.1780	0.1780	0.3250	0.3250	0.0000
X-1	DW Equip H	0.0560	0.0560	0.0150	0.0150	0.0410
X-2	Airlock	10.1800	5.0900	7.4040	3.7020	1.3880
X-4	DW Head MW	0.0150	0.0150	0.0150	0.0150	0.0000
X-6	CRD MW	0.0560	0.0560	0.0560	0.0560	0.0000
X-7A	Bellows	0.1190	0.0595	0.1190	0.0595	0.0000
	AO-2-80A AO-2-86A	(6388 @ 25#) 9860.6000	(50.1 @ 25#) 76.0800	(8.0 @ 25#) 12.1500	(2.92 @ 25#) 4.2300	71.8500
X-7B	Bellows	0.4300	0.2150	0.4300	0.2150	0.0000
	AO-2-80B AO-2-86B	(202.3 @ 25#) 312.2300	(32.7 @ 25#) 49.8100	(6.26 @ 25#) 9.6250	(0.25 @ 25#) 0.3800	49.4300
X-7C	Bellows	0.0300	0.0150	0.0300	0.0150	0.0000
	AO-2-80C AO-2-86C	(12.5 @ 25#) 19.3300	(3.3 @ 25#) 5.0300	(3.29 @ 25#) 5.0300	(0.42 @ 25#) 0.6060	4.4240
X-7D	Bellows	0.0446	0.0223	0.0446	0.0223	0.0000
	AO-2-80D AO-2-86D	(146 @ 25#) 225.4300	(24 @ 25#) 37.3000	(1.2 @ 25#) 1.8230	(0.83 @ 25#) 1.1900	36.1100

(Leakage Rates Reported in SCFH)

ATTACHMENT 5, CYCLE 15 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR	MNPLR Improvement
X-8	Bellows	0.2220	0.1110	0.2220	0.1110	0.0000
	MO-2373 MO-2374	5.4000	0.4770	4.0100	0.2570	0.2200
X-9A	Bellows	0.0298	0.0149	0.0298	0.0149	0.0000
	FW-97-2 FW-94-2	0.7150	0.0630	0.7150	0.0630	0.0000
X-9B	Bellows	0.0444	0.0222	0.0444	0.0222	0.0000
	FW-97-1 FW-94-1	4.0940	0.7150	4.0940	0.7150	0.0000
X-10	Bellows	0.0300	0.0150	0.0300	0.0150	0.0000
	MO-2075 MO-2076	0.2500	0.0170	0.2530	0.0170	0.0000
X-11	Bellows	0.0300	0.0150	0.0300	0.0150	0.0000
	MO-2034 MO-2035	0.3230	0.2500	0.4310	0.2520	0.0000
X-12	Bellows	0.0300	0.0150	0.0300	0.0150	0.0000
	MO-2029 MO-2030	2.7300	0.2700	3.2200	0.5370	0.0000
X-13A	Bellows	0.1162	0.0581	0.1162	0.0581	0.0000
	MO-2015 MO-2013	1.7430	0.9320	0.9330	0.8730	0.0590
X-13B	Bellows	0.0590	0.0295	0.0590	0.0295	0.0000
	MO-2014 MO-2012	1.7800	0.9550	2.8650	0.8880	0.0670
X-14	Bellows	0.0300	0.0150	0.0300	0.0150	0.0000
	MO-2397 MO-2398	4.3920	0.0120	0.4740	0.0860	0.0000

(Leakage Rates Reported in SCFH)

ATTACHMENT 5, CYCLE 15 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR	MNPLR Improvement
X-16A	Bellows	0.0300	0.0150	0.0300	0.0150	0.0000
	MO-1754 MO-1752	0.3010	0.1040	2.0200	0.2100	0.0000
X-16B	Bellows	0.4130	0.2065	0.4130	0.2065	0.0000
	MO-1753 MO-1751	0.2620	0.1770	0.1770	0.1310	0.0460
X-17	Bellows	0.1997	0.0999	0.1997	0.0999	0.0000
	MO-2027 MO-2026	0.0390	0.0260	0.4590	0.4040	0.0000
X-18	AO-2541A AO-2541B	0.0320	0.0320	0.0320	0.0320	0.0000
X-19	AO-2561A AO-2561B	0.0640	0.0160	0.6020	0.3090	0.0000
X-20	DM-152 DM-151	0.0150	0.0150	0.0150	0.0150	0.0000
X-21	AS-79 AS-78	2.1900	0.4740	2.1900	0.4740	0.0000
X-22	AI-571 CV-1478	1.6490	1.6450	1.6490	1.6450	0.0000
X-23	RBCC-15 MO-4229	2.2400	0.0960	0.9320	0.0960	0.0000
X-24	MO-1426 MO-4230	9.3300	2.2300	9.3300	2.4880	0.0000
X-25	AO-2386 CV-2385 AO-2387	12.8660	3.0720	12.8660	3.0720	0.0000
X-26	AO-2381 AO-2377	7.4350	1.0170	7.4350	1.0170	0.0000
X-26/218	CV-3267 CV-3268 CV-3269	0.4320	0.1120	0.4320	0.1120	0.0000

(Leakage Rates Reported in SCFH)

ATTACHMENT 5, CYCLE 15 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR	MNPLR Improvement
X-27D	SV-4001B SV-4020B	0.5200	0.5200	0.5200	0.5200	0.0000
X-27E	SV-3307 SV-4082 SV-3308 SV-4081	0.5000	0.5000	0.5000	0.5000	0.0000
X-27F	SV-4001A SV-4020A	0.5200	0.5200	0.5200	0.5200	0.0000
X-34A	AI-598 SV-4235	0.0140	0.0140	0.0140	0.0140	0.0000
X-35A	TIP Flange	0.0140	0.0140	0.0140	0.0140	0.0000
	TIP-1-1	0.0450	0.0450	0.0450	0.0450	0.0000
X-35B	TIP Flange	0.0140	0.0140	0.0140	0.0140	0.0000
	TIP-2-1	1.1910	1.1910	1.1910	1.1910	0.0000
X-35C	TIP Flange	0.0140	0.0140	0.0140	0.0140	0.0000
	TIP-3-1	0.0750	0.0750	0.0750	0.0750	0.0000
X-35D	TIP Flange	0.0140	0.0140	0.0140	0.0140	0.0000
X-35E	TIP Flange	0.0140	0.0140	0.0140	0.0140	0.0000
	AI-226-1 AI-625	5.6930	0.7500	5.6930	0.7500	0.0000
X-37B	XR-27-1 XR-25-1	4.5600	0.4500	4.5600	0.4500	0.0000
X-38B	XR-27-2 XR-25-2	3.0100	0.2070	3.0100	0.2070	0.0000
X-39A	MO-2023 MO-2021	1.0850	0.3900	0.9200	0.3120	0.0780
X-39B	MO-2022 MO-2020	0.1800	0.0760	0.0765	0.0183	0.0577

(Leakage Rates Reported in SCFH)

ATTACHMENT 5, CYCLE 15 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR	MNPLR Improvement
X-41	CV-2790 CV-2791	1.7460	0.0171	1.7460	0.0171	0.0000
X-42	XP-7 XP-6	0.6930	0.2950	0.6930	0.2950	0.0000
X-47	AO-7422A AO-7422B AO-7423A AO-7423B	1.0920	0.1170	3.7700	2.4600	0.0000
X-100A	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-100B	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-100C	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-100D	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-101B	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-101D	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-103	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-104A	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-104B	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-104C	Electric P	0.0200	0.0200	0.0200	0.0200	0.0000
X-104D	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-105A	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-105B(G)	AI-599 SV-4234	0.0430	0.0150	0.0430	0.0150	0.0000
X-105C	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-105D	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-106	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
	EP Flange	0.0140	0.0140	0.0140	0.0140	0.0000

(Leakage Rates Reported in SCFH)

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR	MNPLR Improvement
X-107	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
	EP Flange	0.0140	0.0140	0.0140	0.0140	0.0000
X-200A	SW Torus MW	0.0140	0.0140	0.0140	0.0140	0.0000
X-200B	NE Torus MW	0.0140	0.0140	0.0140	0.0140	0.0000
X-205	AO-2383 AO-7424B CV-2384 AO-7425B AO-2896	4.5100	3.3300	2.4200	1.7400	1.5900
X-211A	MO-2011 MO-2007 MO-2009	113.6600	0.0001	1.7200	0.0001	0.0000
X-211B	MO-2010 MO-2006 MO-2008	0.0180	0.0001	0.0280	0.0001	0.0000
X-212	RCIC-9 RCIC-10	0.0260	0.0170	0.0260	0.0170	0.0000
X-214	SV-4005A SV-4004A	4.9300	0.5000	4.9300	0.5000	0.0000
	SV-4005B SV-4004B	0.5000	0.5000	0.5000	0.5000	0.0000
	CV-3313 CV-3314	0.5000	0.5000	0.5000	0.5000	0.0000
X-215	SV-4003A SV-4002A	0.5170	0.5160	0.5170	0.5160	0.0000
X-218	AO-2378 AO-2379 AO-2380 AO-7424A AO-7425A DWV-8-1 DWV-8-2	5.1800	3.1510	10.7300	3.1510	0.0000

(Leakage Rates Reported in SCFH)

ATTACHMENT 5, CYCLE 15 REFUELING TYPE B AND C TEST RESULTS

Penetration	Description	As-Found MXPLR	As-Found MNPLR	As-Left MXPLR	As-Left MNPLR	MNPLR Improvement
X-220	CV-3311 CV-3312	0.5000	0.5000	0.5000	0.5000	0.0000
	SV-4003B SV-4002B	0.5000	0.5000	0.5000	0.5000	0.0000
X-221	HPCI-9 HPCI-10	9.3200	0.1120	9.3200	0.1120	0.0000
X-229B	AI-629 CV-7956	0.3010	0.1010	0.3010	0.1010	0.0000
X-230	Electric P	0.0001	0.0001	0.0001	0.0001	0.0000
X-240	AO-4539 AO-4540	N/A	N/A	1.2860	0.0760	0.0000

Total As-Found MXPLR (Including MSIV's)	10649.96 SCFH
Total As-Found MXPLR (Excluding MSIV's)	232.37 SCFH
Total As-Found MNPLR (Including MSIV's)	202.48 SCFH
Total As-Left MXPLR (Including MSIV's)	150.40 SCFH
Total As-Left MXPLR (Excluding MSIV's)	121.78 SCFH
Total MNPLR Improvement	165.36 SCFH

ATTACHMENT 6, MID-CYCLE TYPE B AND C TEST RESULTS

Date	Penetration	Description	Leakagc Rate	Explanation
07-Nov-89	X-2	Airlock	0.463 SCFH	Drywell entry, test performed at 10 PSIG
09-Nov-89	X-2	Airlock	8.330 SCFH	As-left test after Drywell entry
04-Jul-90	X-2	Airlock	1.388 SCFH	Drywell entry, test performed at 10 PSIG
07-Jul-90	X-2	Airlock	0.926 SCFH	Drywell entry, test performed at 10 PSIG
07-Jul-90	X-1	DW Equip H	0.014 SCFH	Drywell equipment hatch opened
10-Jul-90	X-2	Airlock	9.256 SCFH	As-left test after Drywell entry
11-Sep-90	X-2	Airlock	9.256 SCFH	As-found test prior to Drywell entry
14-Sep-90	X-2	Airlock	1.851 SCFH	Drywell entry, test performed at 10 PSIG
16-Sep-90	X-2	Airlock	9.256 SCFH	As-left test after Drywell entry
29-Oct-90	X-2	Airlock	11.662 SCFH	As-found test prior to Drywell entry
02-Nov-90	X-2	Airlock	12.032 SCFH	As-left test after Drywell entry
07-Feb-91	X-2	Airlock	11.107 SCFH	As-found test prior to Drywell entry
09-Feb-91	X-10	MO-2076	0.031 SCFH	Replaced valve stem packing
10-Feb-91	X-2	Airlock	0.463 SCFH	Drywell entry, test performed at 10 PSIG
12-Feb-91	X-2	Airlock	0.463 SCFH	Drywell entry, test performed at 10 PSIG
15-Feb-91	X-2	Airlock	9.256 SCFH	As-left test after Drywell entry
03-Jan-92	X-2	Airlock	1.505 SCFH	Drywell entry, test performed at 10 PSIG
06-Jan-92	X-2	Airlock	11.569 SCFH	As-left test after Drywell entry
25-Apr-92	X-2	Airlock	2.314 SCFH	Drywell entry, test performed at 10 PSIG
27-Apr-92	X-2	Airlock	11.569 SCFH	As-left test after Drywell entry