OAK RIDGE NATIONAL LABORATORY
OPERATED BY
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NUCLEAR DIVISION

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November 1, 1982

Mr. Gunter Arndt
Mechanical/Structural Engineering Branch
Division of Engineering Technology
NL 238
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Gunter:

This letter summarizes our progress on the Containment Leak Rate Testing Investigations (Fin. No. BO 489) Program for the month of October 1982.

Technical Highlights

The data from the test reports on plants which utilized reduced pressure tests have been reviewed. Additional information was discovered during the review which was used to update the statistics reported last month regarding reduced pressure tests. In the currently available data base, full pressure tests are represented 43 times and reduced pressure tests are represented 23 times. Of the 23 reduced pressure tests, 17 were part of the preoperational tests conducted with the full pressure tests to develop the correlation between the two tests. Therefore, reduced pressure tests were used only six times to determine the leak rate.

Table 1 contains the reported preoperational test data for the 17 plants which chose to conduct reduced pressure tests. Columns 2-4 contain the full pressure, reduced pressure, and the ratio of the two, respectively. Column 5 contains the maximum allowable leakage rate at the full pressure, and columns 6-8 contain the measured leak rates at full pressure, measured leak rates at reduced pressure, and the ratio of the two, respectively. Column 9 contains the maximum allowable leakage rate at the reduced pressure as calculated in accordance with the Appendix J equations shown at the bottom of the table.

Five of the plants, numbers 1, 3, 4, 9, and 17, measured higher leakages at the reduced pressure than at full pressure. Plants 9 and 17 measured significantly higher leakages at the reduced pressure. with plant 9 recording a negative leakage at the full pressure. The verification tests for plants 3, 4, and 9 confirmed the measured leakage rates, while the

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verification tests for plant 1 were considered inconclusive. Verification test information was not radily available for plant 17. Both plants 1 and 4 rejected the reduced pressure test method and subsequently conducted full pressure tests. Plants 3, 9, and 17 all continued to conduct reduced pressure tests to determine the containment leak rate.

The remaining plants all measured higher leakages at full pressure than the reduced pressure. Of these 12 plants, only plants 5 and 14 continued to conduct reduced pressure tests. Plant number 2 failed verification of the reduced pressure test leakage measurement check, but no reasons are apparent as to why the other 9 plants decided against the reduced pressure test. The verification tests were successful in all cases. Plant 10 may be continuing to use reduced pressure tests but no information other than the preoperational test was available. Attempts will be made to determine why these plants dropped the reduced pressure tests in favor of the full pressure tests.

The tentative dates for plant visits to witness leak rate tests have been revised. The dates are now December 6-10 for Sequoyah, December 15-22 for St. Lucie, and January 11-15 for Browns Ferry.

Expenditures

Expenditures under this program are shown below.

	May	June	July	Aug.	Sept.	Oct.
Expenditure ($K)	0.1	2.8	0	0.1	4.0	7.7*
Cumulative ($K)	0.1	2.9	2.9	3.0	7.0	14.7

*Estimated

Sincerely,

D. J. Naus

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TABLE 1. PREOPERATIONAL TEST DATA FOR REDUCED PRESSURE TESTS

Plant	P_a (psig)	P_t (psig)	P_t/P_a	L_a (%/day)	L_{am} (%/day)	L_{tm} (%/day)	L_{tm}/L_{am}	L_t* (%/day)
1	48.0	25.0	0.521	1.600	0.16340	0.20000	1.22399	1.15470
2	48.0	25.0	0.521	1.600	0.23200	0.01750	0.07543	0.12069
3	49.0	25.0	0.510	2.000	0.56600	0.71000	1.25442	1.42857
4	39.2	25.0	0.638	0.100	0.02160	0.02540	1.17593	0.07986
5	46.0	23.0	0.500	0.500	0.01410	0.00870	0.61702	0.30851
6	41.0	21.0	0.512	0.100	0.02700	0.00500	0.18519	0.01852
7	58.0	29.9	0.516	0.635	0.17600	0.16900	0.96023	0.45593
8	46.0	23.0	0.500	0.500	0.04840	0.00680	0.14050	0.07025
9	46.0	23.0	0.500	0.250	−0.00020	0.01520	−76.00000	0.17678
10	59.0	30.0	0.508	0.200	0.08150	0.02920	0.35828	0.07166
11	50.0	25.0	0.500	0.200	0.04660	0.01340	0.28755	0.05751
12	49.0	25.0	0.510	0.500	0.14990	0.04870	0.32488	0.16244
13	49.0	25.0	0.510	0.500	0.18701	0.15339	0.82022	0.35714
14	39.6	19.8	0.500	0.500	0.02500	0.01600	0.64000	0.32000
15	54.0	27.0	0.500	0.500	0.27600	0.00670	0.02428	0.01214
16	54.0	27.0	0.500	0.100	0.01900	0.00100	0.05263	0.00526
17	55.0	28.0	0.509	0.072	0.00484	0.02230	4.62656	0.05137

*For $L_{tm}/L_{am} \leq 0.7$, $L_t = L_a \left(\frac{L_{tm}}{L_{am}}\right)$

For $L_{tm}/L_{am} > 0.7$, $L_t = L_a \left(\frac{P_t}{P_a}\right)^{1/2}$