

# OAK RIDGE NATIONAL LABORATORY

OPERATED BY  
UNION CARBIDE CORPORATION  
NUCLEAR DIVISION



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June 30, 1983

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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. B0489) for the month of June 1983.

## Technical Highlights

One difference between the ANSI standard and the proposed revision to Appendix J that has not yet been discussed concerns the acceptability criterion for the results of Type B and C tests. To be acceptable the ANSI standard requires the combined leakage rate (including the upper confidence limit) of Type B and C tests to be less than 75 percent of the maximum allowable leakage rate. The proposed revision to Appendix J states that the combined leakage rate of all Type B and C tests must be less than 60 percent of the maximum allowable leakage rate at all times. The differences in these criteria are two-fold. The ANSI standard includes an upper confidence limit on the combined leakages determined by adding the standard deviation of the leakage rate to the leakage rate, while the proposed revision to Appendix J does not. The second difference regards the 75 percent versus 60 percent criterion.

The inclusion of the measurement error through the use of the standard deviation is very worthwhile. Presentation of the leakage rate data in this manner provides a better indication of the accuracy of the Type B and C leak tests. Because the ANSI standard uses 75 percent with a confidence limit and the proposed revision to Appendix J uses 60 percent without a confidence limit, the only way the two could provide the same result is if the standard deviation of the combined leakages is 15 percent of the maximum allowable leak rate. With the sophisticated instrumentation available today such a large standard deviation is very unlikely which means the criteria in the proposed revision to Appendix J are more conservative than the ANSI criteria.

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The remaining question concerns the degree of conservatism to use in evaluating the results (i.e., what percentage of the maximum allowable leak rate). Recognizing the poor performance of Type A tests following the successful completion of local leak testing programs, no reason is evident to justify relaxing the currently enforced 60 percent rule. In fact, except for the knowledge of potential changes elsewhere in the local leak testing programs, the 60 percent criterion should probably be more strict. The 60 percent rule should stand until the effects of potential changes in the local leak testing programs can be evaluated.

A computerized literature search of the DOE energy data base and Nuclear Science Abstracts has been initiated to uncover sources of information concerning the leakage characteristics of containment valves with respect to temperature and seating time. Both domestic and foreign sources are being examined but nothing of value has been obtained yet.

Plant visits to observe leak testing have been tentatively scheduled for the middle of July at Crystal River and the end of July at Surry.

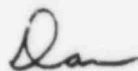
Expenditures

	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>June</u>
Expenditure (\$K)	7.2	8.9	7.8	8.9	9.2	9.4	7.5	8.7	8.7*
Cumulative (\$K)**	14.2	23.1	30.9	39.8	49.0	58.4	65.9	74.6	83.3

\*Estimated

\*\*Program Total

Sincerely,



D. J. Naus

DJN:ege

cc: J. R. Dougan