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Anderson

OAK RIDGE NATIONAL LABORATORY

OPERATED BY
UNION CARBIDE CORPORATION
NUCLEAR DIVISION



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August 8, 1983

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 July 1983.

Technical Highlights

The major emphasis of the work during this period has been on the preparation of a talk entitled "The Issue of CILRT Duration" to be presented at the Eleventh Biennial Topical Conference on Reactor Operating Experience in Scottsdale, Arizona on August 2. Four points are used to describe the basis of a successful test. First, some type of minimum time period must be met. This time period may be specified by a minimum number of hours, a minimum number of data points, a minimum time between data sets, or most likely by some combination of these ways. Second, leak rates determined by mass plot technique are preferred over total time leak rates. Leak rates calculated by mass plot seem to exhibit more stability at an earlier time than those calculated by total time, as illustrated in Fig. 1. Third, leak rate stability must be demonstrated over a period of time. Estimates of the time period range from one hour to four hours. The determination of stability is very subjective unless a specific criterion is employed. This criteria may be in the form of a quantitative limit on the amount of change of the leak rate or the rate of change (the slope of the leak rate curve). Fourth, the acceptability of the leak rate should be determined by comparing the 95% upper confidence limit on the leak rate to 75% of the maximum allowable leakage. This requirement helps to ensure acceptable containment leak tightness during the time between tests by allowing a degradation of 25% of the maximum allowable leakage before becoming unacceptable. Additional criteria as well as revisions to the four just discussed are expected as a result of the conference.

Scheduling conflicts have prevented plant visits to observe leak rate testing, but new plans are being made as other plants schedule tests.

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Expenditures

*Estimated
**Program Total

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personnel cost/month	6037
computer	647
mat'ls (s./deo)	77
NRC program office	
0.9% overhead	455

ORNL overhead 2,012
11% General Admin
15% Gen Plant Service
25%
1%
7%
\$ 7,228

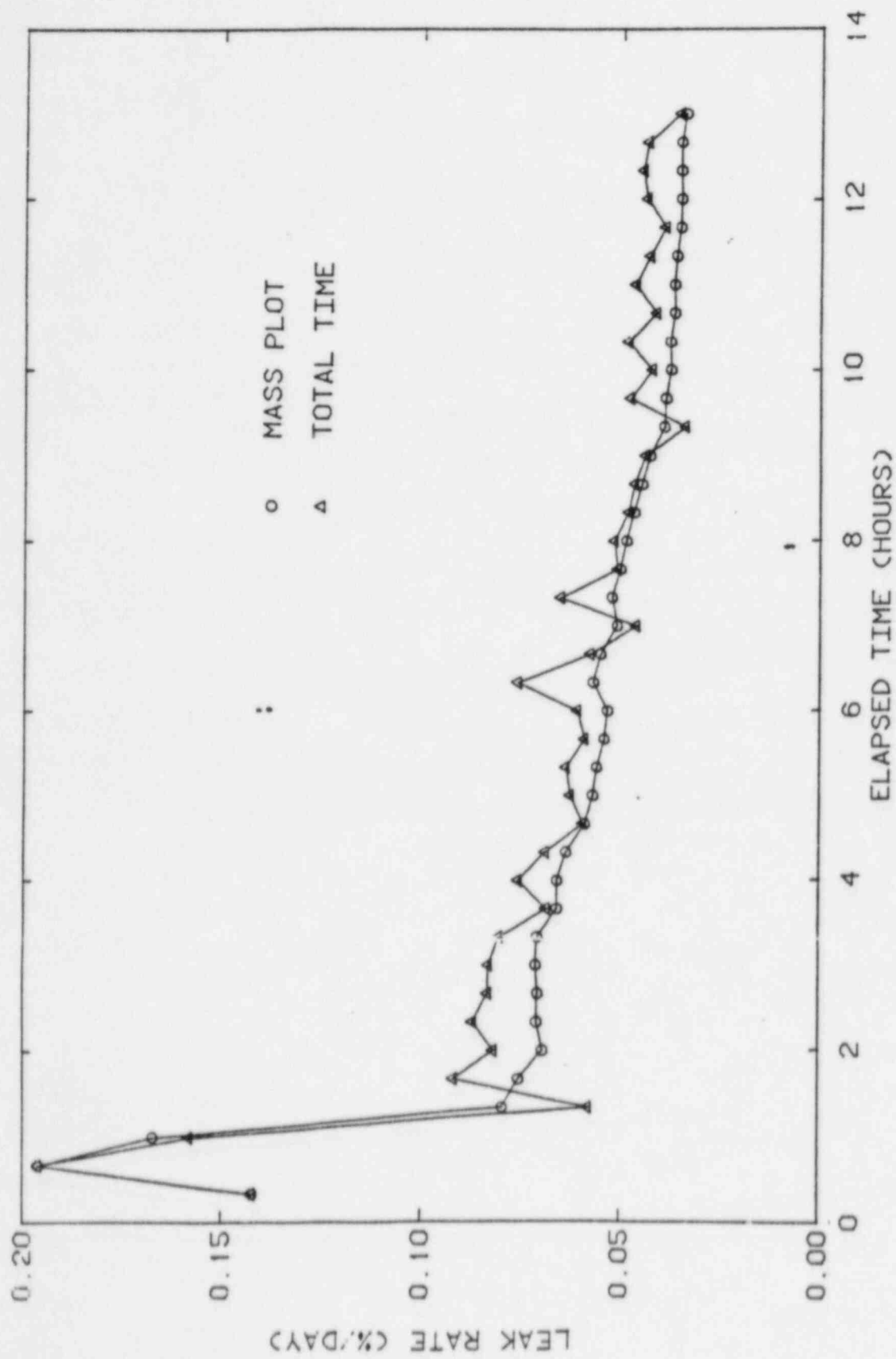


Fig. 1. Relationship between mass plot and total time leak rates.