GENERAL ELECTRIC

NUCLEAR POWER

SYSTEMS DIVISION

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April 20, 1981
Mk II-2126-E

C. Anderson
United States Regulatory Commission
Washington, D. C. 20555

A. Sonin
Massachusetts Institute of Technology
77 Massachusetts Avenue
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Gentlemen:

SUBJECT: MAIN VENT LATERAL LOADS

Attached is the summary of information discussed in our telecon of 4/9/81 (Anderson, Davis, Roth). You had requested that we provide this. The number of data points has changed as a result of further review of applicability. However, the end point is not greatly affected.

If any questions or additional discussion required, please let us know.

Very truly yours,

W. M. Davis, Manager
Containment Programs

WMD/ar

cc: File C.17

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## MARK II MAIN VENT LATERAL LOADS

In order to evaluate the probability of exceeding the current Mark II design load (30 $Klb_f$), the following approach is proposed:

### Pooled Test Statistics

Test data is available for the following test series which are relevant to Mark II containments: 4T, 4TCO, Reference Test 2 ( from NEDE-24794-P) and GKM II-M. An inferred tip force of 31,000 $lb_f$ from Reference Test 2 is the maximum tip force and the only exceedance of the design load for all the referenced test data. The exceedance probability associated with this value is proposed to be estimated based on the total count of chugs in these tests.

The total number of identified chugs for 4T, 4TCO, and GKMII-M are available. For Reference Test 2, this number is available for nine of 57 tests. The number of chugs for the remaining 48 tests in Reference Test 2 was obtained by applying the average chug occurence rate in these nine tests to the time duration of each of the remaining 48 tests.

Consultants to the NRC have requested that in pooling test data, tests with a final bulk pool temperature greater than $140^0F$ ($60^0C$) be disregarded. While this criterion is not necessarily accepted, the preliminary estimates of total chug numbers have been made both with and without it.

The preliminary results are:

| | All Runs | $T_f = 140^0F$ |
|---|---|---|
| Total # chugs-all 4 tests | 14,000 | 8,500 |

$T_f$ = Final Bulk Pool Temperature

The exceedance probability estimated by the maximum test tip force can be found by

$$CCDF = (i-1/2)/n$$

Where CCDF = complementary cumulative distribution function value, which is the exceedance probability

i = rank order number of the random variable value used, starting with the highest value. For this case, i = 1.

n = the number of values in the sample

The exceedance probability for which the maximum observed value provides the best estimate lies in the middle of the highest 1/n probability interval. This estimate is at the 50% confidence level on a one sided basis.

For the two cases above,

| CCDF | All Runs | $T_f = 140^0F$ |
|---|---|---|
| | $3.6 \times 10^{-5}$ | $5.9 \times 10^{-5}$ |