



Electric Power
Research Institute

August 1, 1985

U.S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Dr. Gutam Bagchi

Subject: EPRI Comments on Draft NUREG-1037

Dear Dr. Bagchi:

We have reviewed draft NUREG-1037 "Containment Performance Working Group Report" and have the following comments for your consideration.

In general, we found the report quite readable, free of technical errors insofar as we can tell, and free also of overly broad conclusions based on work of relatively narrow scope. The authors are to be commended. We do have several suggestions regarding points which, in our view, should have somewhat more emphasis or minor changes.

- The estimates of leakage rates are based on the use of the quite conservative preliminary pressure history and seal failure estimates of the Containment Loads Working Group. As a consequence, the results represent upper bound estimates of leakage rates rather than best estimates for the example sequence chosen. While this does not affect the relationship between the estimated leak rate and the ultimate pressure capability of the containment, i.e., the question of leak-before-break, it does leave a somewhat too pessimistic impression of the probability of leakage. Also, will the final CLWG estimates appreciably change the results given in NUREG-1037?
- In some places in the report, the phraseology is such as to imply that the results obtained apply generically to all BWRs or all PWRs. While this impression is partly neutralized by remarks elsewhere in the report, it would be desirable to emphasize that the details of containment design differ from plant to plant and that it is often the details which determine the response of structures. Indeed, we suggest that the

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report should state, on p. xx that ". . .final conclusions will (not may) need to be plant specific."

- The report considers the effects of pressure and temperature separately. Actually there are some sequences in which high pressure and high temperature are present at the same time; for completeness, these cases too should be considered.
- The accident sequences from which the pressure histories are taken are not clearly defined in the report.
- The report stops short of attempting to interpret its findings, i.e., it does not say whether leak-before-break is desirable or undesirable. This is an appropriate omission, since the answer to the question is quite dependent on circumstances. If, in one case, leakage prevents gross containment failure, that may be good. If, in another case, the pressure would not have reached the gross failure value anyhow, then leakage may lead to release of fission products which would otherwise have been retained in the containment. Perhaps this point could be made in the report.
- Although the upper bound nature of the study provides one limit to the uncertainties in it, it would still be desirable to include some uncertainty analyses in the report, e.g., the effect of uncertainties in material properties, or in pressure histories or assumptions.
- The report refers to "engineering judgments" but does not identify such judgments or their probable effects. Actually, most of the quantitative results appear to depend only on simple, straightforward analyses. A brief tabulation of the "engineering judgments" would be helpful.
- The relatively simple analytical methods used are probably quite adequate for the purpose, but a comment on the possible errors introduced by their use would be welcome.
- The report should note that Mark I and Mark II BWR containments have, or will have, provisions for venting. Thus, the question of leak-before-break becomes somewhat academic for these plants.

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- It would add to the credibility of the calculated results if they were compared with the results of experimental observations of leak rates at elevated pressure. Experiments of this type were done in Germany, at the HDR in the early 1980s, and later at Sandia. The HDR pressures probably did not approach the vessel failure value, but those at Sandia did and some leakage measurements were made. If comparison with experiments is not made, an explanation for its omission should be included.

We appreciate having had the opportunity to review this report and hope that our comments will be helpful.

Yours truly,



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