ILLINOIS INSTITUTE OF TECHNOLOGY

Lewis College of Science and Letters
Department of Mathematics

December 26, 1985

Mr. S. Chilk
Secretary of the Commission
US NRC
Washington, DC 20555

Attn: Docketting & Service Branch

Dear Mr. Chilk:

SUBJECT: NUREG-0956

Thank you for soliciting my comments on the study.

My basic coerns are with the NRC Recommendation 1 that the proposed methodology for evaluation of the source term be used to reevaluate the current criteria based on the Reactor Safety Study methods.

The ultimate reactor safety is based on two pillars: 1) an assumption that the containment system will be available at the time of a severe acci accident, and 2) an assumption that the containment leak rate is measured reasonably well and is in agreement with the specified limits based on source terms.

The containment system availability at the present time is about 90% according to Mr. M. Weinstein (American Nuclear Insurers). Such low availability is not acceptable.

The situation with leak rate measurements which must be done periodically is extremely bad (it appears that the real goal of sponsors of the NUREG-0956 was to allow larger leak rates, this is the third attempt to justify such an increase).

The present Regulatory document (of 1972) became obsolete at the time of its endorsement (1972) through Appendix J to 10 CFR, Part 50. Presently, the abnormal situation persists when the majority of the tests are being run on an exemption basis. The testing practices are not significantly better than those of ANS N45.4-72. It has been proven beyond any reasonable doubt (theoretically, on working examples and using the actual data) that a n y v a l u e o f a l e a k r a t e can be "determined" from any set of the raw data using the present practices.

Several fraudulent tests have been officially recognized as deficient (Zion). Deficient and/or fraudulent features of the present practicies include (but are not limited to):

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1) Use of a wrong mass equation instead of the well known ideal gas law;

2) Use of the wrong weighting coefficients;

3) Use of fraudulent computer programs which "erase" or "wipe" the actual data and substitute garbage instead;

4) Use of "stabilization", that is, throwing out of the part of the mass curve;

5) Use of "ventilating-irrigating", that is affecting the instruments in a hope to achieve a better leak rate;

6) Use of the "diurnal effect" notion (that is of a theory that the ambient temperature (through magics?) may affect the air mass inside a containment) for justifying the illegally short tests;

7) Use of a meaningless "verification" test which is based on an obviously erroneous idea that t w o unknowns can be determined from o n e equation;

8) Blocking of leaking paths;

9) Using less, and of lower quality than needed, instruments;

10) Conducting the B and C type tests very inaccurately and mishandling these results.

This list can made much longer. The deficient and/or fraudulent practicies resulted in a situation which is a clear violation of the Atomic Energy Act of 1954. Not a single nuclear power plant in the USA has a proven leak rate and/or a leak rate error within the legally specified limits. Analyses of the actual leak rate tests coupled with theoretical analyses suggest that at least 30% of containment systems have abnormally high leak rate, and several containment systems may have leak rates 10 times higher than allowable.
Improvement of leak rate methodology was not paid nearly as much attention as it was to NUREG-0956, although nobody has yet demonstrated how an increase in the allowable leak rates can increase the public safety. A Draft REG. GUIDE on testing has not been presnted in 1982. The deadline was not met in 1983. The 1984 Draft Guide was so bad that it had to be withdrawn by its own author. No Draft has been presented in 1985 that would be worth such a name.

It is claimed that NUREG-0956 is moderately conservative. To be consisten the leak rate testing methodology (which verifies that the estimates obtained using NUREG-0956, are not exceeded) must be at least moderately conservative as well. The new methodology of testing must come first BEFORE a combination of bad testing with the non-conservative source term method (that justifies high allowable leak rates) puts the safety in an extremely dangerous position. I suggest that the Recommedation 1 should be amended as follows:
RECOMMENDATION 1 The new source term methodology m a y be used to obtain estimates of source terms c o n c u r r e n t l y with the Reactor Safety Study methodology. The more conservative estimate should apply to reevaluation (if any) of Regulations vital to the public safety.

Sincerely, B. Reytblatt

B. Reytblatt, Assoc. Prof., Dept. of Math.