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PETITION FOR EMERGENCY RELIEF

RE: Primary Containment Leakage and Integrated Leak Rate Testing at all  
U.S. nuclear power reactors

Honorable Harold Denton  
Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington DC 20555

Dear Mr. Denton:

I am writing to notify you of an extremely serious and unsafe condition which now prevails with regard to Integrated Leak Rate Testing (ILRT) of U.S. nuclear power reactor containments, and to request emergency action on your part to correct this situation. Besides being a clear and present danger, this situation represents a gross violation of the requirements of the Atomic Energy Act and 10 CFR Part 50.

Description of the situation:

1. There are severe errors, defects, and loopholes in "American National Standard N45.4-1972, Leakage Rate Testing of Containment Structures for Nuclear Reactors", which Appendix J of 10 CFR Part 50 requires that containment leak rate tests be conducted in accordance with.
2. These errors, defects, and loopholes stand uncorrected in the document "ANSI/ANS-56.8-1981: American National Standard Containment System Testing Requirements", which the American Nuclear Society is proposing as a standard to replace the N45.4 standard.
3. The defects in these documents include:
  - a. The equation used to calculate the containment air mass at any given time is wrong. This error is the result of an obvious and glaring mistake made during the derivation of this equation. This error was reported as early as 1969 (see References 1 and 2). Errors resulting from the use of the wrong equation may become significant when temperature gradients throughout a containment are not small.
  - b. A wide variety of ways in which the final calculated leak rate may be fudged. These include, but are not limited to:
    - i. unjustified discarding of the first part of the mass curve;
    - ii. unjustified discarding of data;
    - iii. insufficient and unjustified placement of temperature and pressure sensors;
    - iv. use of unjustified weighting coefficients;

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- v. Invalid and unjustified blockage of leakage pathways;
  - vi. Invalid and unjustified use of "B" and "C" type tests as verification of overall containment leak rate; and
  - vii. Errors in verification tests.
- c. Loose requirements for permanent archiving of the actual raw, individual temperature and pressure sensor readings, as well as other essential data. If this data is not preserved, meaningful review of an ILR test is impossible - especially in light of the many opportunities described above for fudging the calculated result.
4. It can be mathematically demonstrated that the errors and loopholes in the standards allow the reporting of a leak rate which may be one, or in extreme cases as much as two, orders of magnitude lower than the real leak rate.
5. Integrated leak rate tests at U.S. power reactors have been conducted in this faulty manner since at least the 1960's.
6. This situation has persisted, and persists today, despite the fact that the Nuclear Regulatory Commission staff, the American Nuclear Society, Oak Ridge National Laboratory, and Sargent and Lundy were notified of it years ago.

To sum up, the ILRT methodology now in use offers no guarantee that actual leak rates are acceptably low. We simply do not know what the actual leak rates are. There is evidence, however, that at least one or several U.S. containments may have drastically higher leak rates than has been reported, and than the technical specifications for these plants allow.

If a Three Mile Island-type accident were to occur at a reactor with an unacceptably high containment leak rate (one that had not been detected by a faulty ILR test), radioactive contamination of the surrounding area could be severe. The immense fission product inventory of the core would not be contained to the degree mandated by law.

This unacceptable situation represents a fundamental violation of the requirements of 10 CFR Part 50, which requires that reactor containment leak rates be demonstrated to be within certain values for a reactor to obtain and keep an operating license.

This situation also violates the Atomic Energy Act - indirectly since it violates 10 CFR Part 50, and directly since the Atomic Energy Act mandates that atomic reactors may only be licensed if such licensing is consistent with protecting the public health and safety.

Specific problems with LaSalle Unit 1 ILRT:

In July of this year, I filed with the NRC a Freedom of Information Act Request (FOIA-83-384), asking for copies of any and all documents in the NRC's possession regarding Integrated Leak Rate Testing at the LaSalle 1 and 2 and D.C. Cook 1 and 2 reactors, including any and all flaws or errors in these tests. The NRC responded, after a very significant delay, by placing various documents regarding LaSalle in the LaSalle Public Document Room, at which I was able to peruse and photocopy them. I have submitted these materials for review to Dr. Zinovy Reytblatt, a specialist on containment leak rate testing.

Dr. Reytblatt informs me that these materials, which pertain to the spring 1982 ILRT conducted at LaSalle 1, are:

- a. insufficient to justify the reported leak rate;
- b. insufficient to prove that the kind of unjustifiable fudging of the data described above was not done; and
- c. insufficient to permit a meaningful review of this test.

Necessary data not provided include:

- a. Precise location of temperature and pressure instruments;
- b. Compartment subvolume recalculations. It appears that the testing organization simply used temperature averaging over individual compartments;
- c. Individual sensor weighting factors;
- d. Individual temperature sensor readings;
- e. Back-up pressure gauge readings; and
- f. Containment ventilation and cooling conditions in effect during the test.

No complete review can be done without such information.

There is strong evidence, however, that the real leak rate may be in excess of the reported value simply because the local temperature range within the containment during the test was at times greater than 40 degrees F. Another adverse factor is a possibility of actual weighting factors being in excess of 0.1, which violates even the faulty standard.

In addition, the materials received were fragmentary, disordered, and in many cases illegible.

There appears, therefore, to be no justification whatever for any conclusion that LaSalle Unit 1's containment leak rate is within acceptable limits. It appears that the NRC has never received from Commonwealth Edison any materials which can justify any such conclusion.

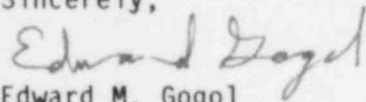
Relief requested:

I therefore request that you immediately order:

1. that LaSalle Unit 1 be placed in cold shutdown until Commonwealth Edison (CECO) has provided to the NRC valid proof that its containment leak rate is within the limit mandated by law;
2. that all further construction and licensing activities on LaSalle Unit 2 and Byron Unit 1 be halted until CECO has provided to the NRC complete and valid proof that their containment leak rates are within the limit mandated by law;
3. that the NRC staff immediately order CECO to submit complete ILRT reports and all supporting documentation, of the most recent ILRT's done at LaSalle Units 1 and 2, and Byron Unit 1;
4. that the NRC immediately release all such materials to me, including that described in "Necessary data not provided", points a-f above;
5. that a moratorium be placed on further Integrated Leak Rate Testing until all errors and defects in the test methodology have been corrected;
6. that the NRC notify all U.S. reactor owners of this unsafe situation;
7. that the NRC order all U.S. reactor owners to assemble all ILR test reports and supporting documents or computer media containing such supporting materials, including such documents or media which contain the actual raw test data; and to supply this material or copies thereof to the NRC;
8. That the NRC commence an urgent program to promulgate a correct, valid methodology for Integrated Leak Rate Testing; and initiate a rule-making procedure to obtain the adoption of this new methodology; and
9. that the most recent ILR tests done at all U.S. reactors be reviewed immediately, and reactors ordered closed where there is not sufficient evidence of containment leak rates within the legal limits.

The public safety, as well as the law you are sworn to uphold, demands that this extremely serious situation be corrected. I shall expect to hear from you immediately.

Sincerely,



Edward M. Gogol

References:

1. See pages 33-34 of: BNWL-1028, UC-80, Reactor Technology: Air Leakage Rate Studies on the C.S.E. Containment Vessel. by M.E. Witherspoon and G.J. Rogers Battelle Memorial Institute
2. Report 0183: Critique of Containment System Test Requirements By Z. Reytblatt, Extran Inc., POB 2849, Chicago IL 60690