



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

October 9, 1979

The Honorable Victor Gilinsky
Commissioner
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Dr. Gilinsky:

In response to your letter of September 12, 1979, we offer the following comments relative to the emission of xenon from the TMI-2 nuclear plant and the possibility of reducing such releases in similar accidents which may occur in the future.

So far as we know, the comments on the various approaches for estimating the total quantity of xenon released following the accident appear reasonable. In terms of controlling xenon releases in accidents which may occur in the future, we believe that chilled or cryogenic charcoal adsorption beds of adequate capacity would be helpful. Adsorption systems using this principle are commercially available and are in successful operation for handling routine releases at several nuclear power plants. The major problems would be possible decreases in the effectiveness of such beds under conditions which involve the larger volume and moisture content of releases accompanying an accident, and the difficulties in assuring that all the xenon emissions are collected so they can be effectively directed to and treated by the adsorption system. Other methods, such as low temperature liquefaction and fractional distillation may also be usable for removal of radioactive noble gases.

As noted above, the technology exists and has been applied in BWRs and PWRs to remove and retain for decay purposes certain radioactive noble gases before discharge as gaseous effluent. The systems have not, however, been applied under accident conditions where multimetric releases may occur essentially in bursts or over relatively short time intervals, such as was experienced during the TMI-2 accident. The Committee believes that a study should be undertaken to determine the applicability and desirability of available technology to minimize the release of radioactive noble gases during various postulated accident scenarios. The study should include assessment of the various potential pathways for radioactive gaseous releases as well as considerations of accelerated rates of treatment of large gas volumes such as those existing in large containments.

October 9, 1979

Anticipating the need for answers to the types of questions raised in your letter, the Committee requested about a year ago that an ACRS Fellow develop a report summarizing experimental data on the performance of charcoal beds under a variety of parameters. It is anticipated that this report will be completed within the next two to three months, and we will plan to provide a copy to you at that time.

Sincerely,

A handwritten signature in black ink, appearing to read "Max W. Carbon". The signature is fluid and cursive, with the first name "Max" being the most prominent.

Max W. Carbon
Chairman

cc: Joseph M. Hendrie, OCM
Richard T. Kennedy, OCM
Peter A. Bradford, OCM
John F. Ahearne, OCM
Samuel Chilk, SECY
Lee V. Gossick, EDO