



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

The Honorable Alan Cranston
United States Senate
Washington, DC 20510

Dear Senator Cranston:

Thank you for your letter of March 11, 1985 concerning the use of severe accident research results in reactor regulation.

I want to assure you that the Commission and the staff are firmly committed to protection of the public health and safety. No changes to regulations would be contemplated without the belief that they were based on scientifically accepted principles and methodology.

The issue of source terms and especially its impact on emergency plans is of great interest at the present time because the results of the Commission's own reviews and those of other groups have recently become available. At the request of the Commission, the American Physical Society (APS) has provided a broad-based review of the adequacy of the underlying science and the methodology for estimating source terms. They found "that considerable progress has been made since publication of the Reactor Safety Study ..." and they concluded that "[i]n a number of cases, new calculations indicate that the quantity of radionuclides that would reach the environment is significantly lower than that calculated in the Reactor Safety Study." After discussing the major factors leading to this reduction and one mechanism that could increase the calculated release, they further concluded that "[i]t is impossible to make the sweeping generalization that the calculated source term for any accident sequence involving any reactor plant would always be a small fraction of the fission product inventory at reactor shutdown." They did note, however, that "further studies may improve this situation."

With increased emphasis on codes which model the physical phenomena in detail, it is likely that differences among plants will have to be taken into account, where such differences did not previously exist in the simplified evaluations of the past.

The Commission has recognized that the uncertainties associated with the source term methodology are large and that consideration of those uncertainties is mandatory for any application. The uncertainties that you mention, relating to containment performance and initiating event probabilities, are only a part of the complete uncertainty picture. The APS has discussed the uncertainties in the supporting science and modeling for such areas of the methodology as the core-concrete interactions and the performance of mitigative features, for instance, the ice condensers or pressure suppression pools. The NRC has been conducting an extensive research program aimed at addressing all of these uncertainties. We are assessing the program to determine where some changes in emphasis may be needed.

6/16

I believe that the state of our knowledge today about the fundamental aspects of nuclear safety is greatly improved relative to our understanding a few years ago. We have had a most thorough review of this work and have had general confirmation that our research is well founded and is in the right direction. We have had conclusions confirmed that for most radionuclides and most sequences, the source terms are much lower than had been previously predicted. While the APS explicitly took no position on such major uses of source term research as emergency planning or backfits, the report did conclude that we should use the new information as we determine what is necessary in the regulatory arena.

Again, thank you for your letter. Be assured that only technology with broad-based scientific acceptance will be used in any proposed regulatory changes. I or members of my staff would be available to discuss the source term issue with you or your staff at any time.

Sincerely,

(Signed) William J. Dircks

William J. Dircks
Executive Director for Operations

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