



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

December 31, 1980

The Honorable Gary Hart, Chairman  
Subcommittee on Nuclear Regulation  
Committee on Environment and Public Works  
United States Senate  
Washington, D. C. 20510

Dear Mr. Chairman:

The August 18, 1980 GAO report entitled "Analysis of the Price-Anderson Act" (EMD-80-80) recommends that the Nuclear Regulatory Commission undertake technical studies to assist Congress in determining a realistic limitation on liability for nuclear accidents.

There are probabilistic risk analysis models which can be used to calculate the off-site consequences in the event of a nuclear plant accident. The Calculations of Reactor Accident Consequences (CRAC) code, from the 1975 Reactor Safety Study (WASH-1400), is used by the NRC staff to calculate reactor accident consequences, including early fatalities, early illnesses, latent cancers, and property damage. This code has been improved in some respects since 1975 and is continually being revised to incorporate improvements. For example, several computer codes, including CRAC, will be revised to reflect the lessons learned from the Three Mile Island accident and to incorporate recent research results. For a recent study, NUREG-0715, "Task Force Report on Interim Operation of Indian Point" (copy attached), the CRAC code was used to make risk comparisons of various reactor sites, reactor designs, and public protective measures.

In that comparison, off-site risks for six different reactor sites were estimated (see NUREG-0715, p. 17). The sites considered ranged from the Indian Point site, located in the most densely populated area, to the Diablo Canyon site, which is quite remote. The property damage estimates indicate that any accident which is serious enough to require evacuation of members of the general public is likely to cost \$10 to \$100 million. Accidents of this type have a calculated probability of about one in ten thousand per reactor year.

For lower probability accidents, the numbers are larger. As you know, these probabilistic estimates have wide ranges, depending on protective measures, design, sites, and uncertainties in the estimates (see NUREG-0715, p. 39). Thus for a probability of  $10^{-6}$  per reactor year,

the estimates for early fatalities range from none to 5,000. For a probability of  $10^{-9}$ , estimates of early fatalities range from 700 to 50,000. Similarly the estimates for early illness range from 10 to 10,000 for a probability of  $7 \times 10^{-7}$  per reactor year and from 6,000 to 800,000 for a probability of  $10^{-9}$ . Latent cancer estimates range from none to 200 for a  $10^{-6}$  probability and from 200 to 2,000 for a  $10^{-9}$  probability. Property damage estimates range from \$2 million to \$2 billion for a probability of  $10^{-6}$  per reactor year, and from \$8 billion to \$100 billion for a probability of  $10^{-9}$  (in 1974 dollars). We have not estimated the monetary costs associated with early fatalities, early illnesses or latent cancers.

In addition to the substantial uncertainties inherent in this type of calculation, there is a suspected bias in the model for the property damage analyses which the staff believes tends to underestimate the potential costs. The model uses criteria for interdicting the use of contaminated property and assumptions for cleanup of contaminated property which may be optimistic with respect to costs.

The GAO report recommends that the Commission realistically define a limit of liability for the Price-Anderson Act. As the Acting Executive Director for Operations stated in his letter to GAO commenting on the draft report, since a decision to increase the liability limit must be made by Congress and not the Commission, the Commission believes it may be more appropriate for Congress to determine whether to increase the liability limit based on full consideration of the types of consequences which may occur following an accident (i.e., early fatalities, early illnesses, latent cancer, and property damage). However, the Commission believes that the statutorily prescribed limits of liability should be adjusted to account for inflation.

The GAO report also recommends that the Commission reassess the Federal government indemnity. The Commission believes that there is no objective source of information available to reassess this indemnity and that this is an area for the exercise of Congressional judgment.

Finally, in response to the recommendation that the Commission reassess the financial impact of increasing the present \$5 million retrospective premium, I have attached a copy of a financial impact study completed by the staff last year which updates earlier information contained in a 1976 report prepared for the Commission by Dr. Ronald Melicher of the University of Colorado, NR-AIG-003, "Financial Implications of Retrospective Premium Assessments on Electric Utilities" (copy enclosed). This report assessed the financial impact of various retrospective premiums on representative utilities. The staff study provides additional information in this area as well as a sensitivity analysis of the impact of increasing the retrospective premium to \$20 million per reactor. This type of

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review should be required for Congress in assessing the tradeoff between the costs of requiring additional protection through increased premiums and the costs of providing power. We do not present this study as definitive, since we are not experts in the financial management of utilities.

Sincerely,

A handwritten signature in dark ink, appearing to read "John F. Ahearne". The signature is fluid and cursive, with the first name "John" and last name "Ahearne" clearly distinguishable.

John F. Ahearne

Enclosures:

1. NUREG-0715, "Task Force Report  
on Interim Operation of Indian Point"
2. NR-AIG-003, "Financial Implications  
of Retrospective Premium Assessments  
on Electric Utilities"
3. Financial Impact Study

cc: - Sen. Alan Simpson