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The Honorable Lando W. Zech, Jr.
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Chairman Zech:

SUBJECT: ACRS COMMENTS ON THE IMPLICATIONS OF THE ACCIDENT AT THE CHERNOBYL NUCLEAR STATION UNIT 4

During the 321st meeting of the ACRS, January 8-10, 1987, we considered the implications of the accident at the Chernobyl nuclear station as it relates to nuclear power plants in the United States. This subject was also considered during our 320th meeting, December 11-13, 1986 and our 319th meeting, November 6-8, 1986. In our review, we also had the benefit of meetings of our Subcommittee on Safety Philosophy, Technology, and Criteria held on November 5 and December 10, 1986, and discussions with the NRC Staff.

The Chernobyl accident reminds us that, although a large nuclear power plant accident somewhere in the United States is unlikely, it is not impossible. We believe it is essential that a thorough evaluation of the Chernobyl accident be performed and any important lessons from this evaluation are used in evaluating the risk posed by domestic nuclear power plants. We recognize that the NRC Staff has such a program under way.

We believe that the most important lesson to be learned from the Chernobyl accident is that high priority must be given to ensuring that the management and the operating staff of each plant are competent and are motivated to operate the plant safely and in strict compliance with plant administrative controls. Strong emphasis should be given to the adequacy of the training and to the ability of the responsible personnel to prevent, to manage, and to mitigate severe accidents. The operating staff should include on-site personnel with engineering capability who fully understand the design and operating characteristics of the plant and the implications for plant safety. Such a staff should know the basis for the engineering and safety decisions made during plant design. Although these recommendations are not new, the Chernobyl accident has reemphasized their importance.

Chernobyl also reinforces the known importance of determining the extent to which containments are capable of dealing with accidents more severe than the currently specified "design basis accidents." We recommend that the NRC Staff give continued high priority to its current effort to examine the containment performance expected for operating nuclear power plants and to examine improvements needed to ensure that risk is limited to an appropriate level.

Reactivity transients severe enough to damage a light-water-reactor core can be hypothesized. Risk estimates, operating experience, and informed

opinion all indicate that such transients are very unlikely. However, such estimates and opinions depend in part upon assumptions that personnel will comply with the administrative controls for operation, rather than depending entirely upon inherent characteristics of the hardware and processes. Present methods of risk assessment do not satisfactorily account for personnel errors of the sort that could lead to noncompliance with such administrative controls. Operating experience cannot be extensive enough to give high assurance that such errors are incredible. For these reasons, there should be a systematic reexamination of the potential for severe reactivity transients, with emphasis on the impact of human error. Multiple rod ejection, cold water insertions, void collapse, boron depletion, inappropriate bypassing of exposed safety circuits, and the importance of positive temperature coefficients during early core life are examples of the events and conditions that should be restudied. The levels of defense against severe reactivity transients should be identified and, if possible, appropriately codified.

Emergency response following the Chernobyl accident confirmed the need to ensure that the Protective Action Guides developed for application in the United States are comparable with those in neighboring countries and the need to reexamine the national policy on the storage and use of radioprophylactic agents. Since potassium iodide was administered to thousands of people in the Soviet Union as a result of the Chernobyl accident, we hope that useful data regarding its health effects will now become available.

Other emergency response items highlighted by the accident include the importance of effective procedures for relocating large population groups, protecting ground and other drinking water supplies, decontaminating land and facilities, and protective measures for minimizing radionuclide intake through food and other pathways.

The accident at Chernobyl reinforces a previous ACRS concern that the effects of an accident involving a large release of radioactive materials outside containment might negate safe habitation of the control room and other necessary facilities of the affected plant, or other units at a multiple-unit site.

Sincerely,

William Kerr
Chairman

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