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

Dear Chairman Zech:

SUBJECT: REPORT ON THE INTEGRATION PLAN FOR CLOSURE OF SEVERE ACCIDENT ISSUES (SECY-88-147)

During the 339th meeting of the Advisory Committee on Reactor Safeguards, July 14-16, 1988, we discussed with members of the NRC staff a plan for the integration of the various severe-accident-related programs as described in SECY-88-147, "Integration Plan for Closure of Severe Accident Issues." This plan was also considered by our Severe Accidents Subcommittee during a meeting held on July 13, 1988. We also had the benefit of the documents listed as references to this letter.

We commend the NRC staff for its efforts to develop an integrated approach for dealing with the various severe accident issues and to centralize responsibility for resolving them. SECY-88-147 describes the first step toward developing such a plan, namely, identifying the relevant issues. However, it gives little information on how the various issues are to be integrated. Rather, it discusses the severe-accident-related issues and programs that should be integrated, but does not describe the process to be used.

The need for additional integration is illustrated in the discussion of external initiators. In several recent PRAs, externally initiated sequences are major contributors to risk. This fact appears not to have been considered in SECY-88-147. Considering only internal initiators may well provide a distorted picture of the "major vulnerabilities" for a particular plant. This may result in an inappropriate allocation of resources for plant-specific fixes, unless all system changes are delayed until external events are treated. This does not seem to be the procedure to be used. Further, the statement is made, in support of delaying a consideration of external initiators, that no new sequences are likely to be initiated by seismic events. This seems to contradict the conclusions of a Brookhaven study of the GESSAR PRA which concluded that relay chatter, produced by a seismic event, could be a major risk contributor. Furthermore, it ignores the fact that a large seismic event has the capability (much less likely for other initiators) of simultaneously initiating a large number of risk-significant sequences.

The comments on severe accident management provide no indication of how the licensee is to proceed. Although for this issue, immediate action is not required in connection with the Individual Plant Examinations (IPEs), the implication is that enough information now exists to permit a licensee to formulate an appropriate program. We note that on March 13, 1985, the ACRS sent a memorandum to the then-EDO,

Mr. William J. Dircks, in which we asked if enough information existed to provide guidance to plant operators in a situation in which core melting had proceeded without a source of cooling. Our question was whether a situation could develop in which, if coolant became available after core melt had begun, adding coolant to the in-vessel melt would exacerbate the accident. We have yet to receive a response to our memorandum. This, we think, is a rather fundamental question. If the staff does not have the information to answer this question, how is a licensee to reach a decision? Does existing instrumentation provide the information needed? Does the instrumentation suggested in Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," suffice for the task? For accident management, answers to such questions are required.

We observe that, in the evaluation of containment performance, the licensee is to "consider" direct containment heating (DCH), a postulated event about which there are major uncertainties. However, the proposed generic letter on IPEs (Reference 3) states that no major changes in the containment are to be made until the NRC research program has produced information required to decide what, if any, system changes should be made. Is anything to be done in the meantime? What is the "consideration" by licensees to produce? We note that a Panel report on source term uncertainties (Reference 4) concluded that information needed to determine the effects of DCH is unlikely to be available for a long time. The Panel recommended that, rather than wait for the results of the needed research, the probability of DCH should be made negligibly low by hardware changes or procedural measures.

Furthermore, in describing the resolution of some of these important issues, the process to be used is left so vague as to be uninterpretable. For example, from the discussion of the way in which it is proposed to deal with severe accidents for advanced light water reactors (LWRs), one gets the impression that if some as yet undefined process, possibly rulemaking, is put into place, the problem will somehow become resolved.

In the area of containment performance criteria for advanced LWRs, it is especially important that some early decisions be made. The review process currently being considered appears to endorse the use of design criteria based on "design-basis accidents" formulated before the Reactor Safety Study (WASH-1400), which indicated a need to consider severe core damage accidents. This seems, at best, imprudent in light of all that has been learned since these criteria were first formulated. Designs using these "obsolete" criteria are now being considered in the licensing process.

In our discussions with the staff, we explored how the Reactor Risk Reference Document (NUREG-1150) will be used in the resolution of the severe accident issues. Although we were told that the information in this document will play a key role, we were unable to get a clear picture of just how. If NUREG-1150 is to play a key role, it is important that its accuracy and credibility be established. We believe that subjecting the final version of NUREG-1150 to a thorough peer review is required as part of the process of establishing credibility.

We believe a glossary of terms used in SECY-88-147 would be helpful. We suggest that SEVERE ACCIDENT, DAMAGED CORE, CORE DAMAGE, CORE MELT, VULNERABILITIES, RADIOACTIVE RELEASE, LARGE RADIOACTIVE RELEASE, CONTAINMENT PERFORMANCE, CONTAINMENT FAILURE, and CONTAINMENT BYPASS be defined. In addition, definitions for FRONT END, BACK END, LEVEL I PRA, PREVENTION, and MITIGATION as used in this paper might be helpful.

Finally, we encourage the staff to continue its efforts toward integration of the various programs being developed for resolution of the severe accident issues. We believe that the most recent draft generic letter describing the IPE program (Reference 3) represents a move in the direction we have recommended in our letter to you of May 10, 1988. We are convinced that further integration can conserve resources of both the staff and the licensees and can contribute to a more effective process for risk reduction in operating plants.

Sincerely,

W. Kerr
Chairman

References:

1. SECY-88-147, Memorandum dated May 25, 1988, for the Commissioners from V. Stello, Executive Director for Operations, Subject: Integration Plan for Closure of Severe Accident Issues
2. Brookhaven National Laboratory Draft Report, "A Review of the GESSAR II BWR/6 Standard Plant Seismic Probabilistic Risk Assessment," September 1984 (Unpublished-Predecisional)
3. Memorandum dated April 1, 1988, from T. Speis (NRC) to W. Kerr (ACRS), "Documentation Necessary for the Initiation of the Severe Accident Policy Implementation" (Draft Predecisional Attachments - Portions Updated as of June 28, 1988)
4. Brookhaven National Laboratory Report, NUREG/CR-4883, "Review of Research on Uncertainties in Estimates of Source Terms from Severe Accidents in Nuclear Power Plants," H. Kouts, April 1987
5. U.S. Nuclear Regulatory Commission, WASH-1400 (NUREG-75/014) "Reactor Safety Study," October 1975
6. U.S. Nuclear Regulatory Commission, NUREG-1150, "Reactor Risk Reference Document," Draft for Comment, February 1987

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