



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

September 2, 1983

Honorable Nunzio J. Palladino  
Chairman  
U. S. Nuclear Regulatory Commission  
Washington, DC 20555

Dear Dr. Palladino:

SUBJECT: ACRS REPORT ON THE SEVERE ACCIDENT POLICY

During its 281st meeting, August 31-September 1, 1983, the Advisory Committee on Reactor Safeguards continued its discussion with the NRC Staff of the development of a Severe Accident Policy for dealing with accidents more severe than those now analyzed as design basis accidents. This issue was discussed by the ACRS Subcommittee on Class 9 Accidents with the NRC Staff on August 23, 1983.

The focus for the discussion was a draft report developed by the Severe Accident Research Program (SARP) Senior Review Group and entitled, "Severe Accident Decisions for Existing Nuclear Power Plants," dated August 5, 1983. As indicated by its title, this report and the discussions were mostly concerned with power plants now in operation or under construction.

The report, drafted in response to a Commission request, describes on a preliminary basis "the approach (primarily deterministic, supplemented by probabilistic and systems assurance analysis), the Commission may use to arrive at severe accident decisions for existing nuclear power plants." The NRC Staff asked for comments "so that issues and the decision process can be refined, and so that any needed changes in the Severe Accident Research Program can be identified."

We encourage the NRC Staff to continue its development of this general approach. It appears to be an improvement over what has been proposed up to this time.

The NRC Staff has defined the problem in the form of a question to be answered, namely, "What changes, if any, should be made in nuclear reactor regulation to account for accidents involving core damage greater than the present design basis, including core meltdown accidents?" Although this is probably not the only way to define the issue, it is a reasonable approach.

The success of this approach depends on further, more detailed elaboration of the question, on identification of the information needed for such elaboration and on the ways in which information needed for its answer is to be developed and used in reaching a conclusion. We look forward to this further elaboration and expect to make further comments as more information becomes available.

Two key issues identified in the report are, "How safe are the existing plants with respect to severe accidents?" and, "Is additional protection for severe accidents needed or desirable?" An associated question is how the decisions are to be reached. We urge that priority be given, first to the method to be used for answering these questions, and second to information that may be needed to provide the answers. We do not view this task as primarily a research problem, especially the development of the way in which the decisions are to be made. We believe that some development of decision criteria, and the identification of needed information, at least on a tentative basis, are necessary before one can define any extensive research program.

We also agree with what appears to be a tentative conclusion that the decision process must include both probabilistic and deterministic considerations. Even though the appropriate balance between the two may be difficult to define, we believe that elements of both methods will be needed for a final resolution of the problem. There is a suggestion that Systems Assurance Analysis (SAA) could become a valuable tool in the analysis and prevention of severe accidents. Although this approach may be useful for some purposes, we do not consider it an alternative to the combined deterministic-probabilistic approach. We do not recommend application of SAA to this problem.

Because of the early stage of development of the program described in the draft we discussed, we are not able to comment on its completeness or adequacy. We do have the following comments.

Eventually a policy must be developed for dealing with decisions involving areas of considerable uncertainty. One does not avoid this problem by deciding to use a deterministic approach. We recommend that immediate attention be given to this process. One area of uncertainty, not statistical, is the unexpected problem that may yet be encountered. This is alluded to in the report, but there are no suggestions for dealing with it. The formulation of the policy should take account of experience which has seen a continuing series of new safety issues discovered in the course of new risk analyses and other studies.

We note reference to a source term in this draft. We caution that there are many source terms, and that indeed the source term or terms used will depend markedly on the accident sequence or sequences finally chosen for analysis and decision making. Also, current or possible future changes in regulatory approach could lead to a major perturbation in the basis on which any new source terms may be applied.

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The draft refers to important accident sequences. It is not clear what measure of importance is to be used. We believe that both probability and consequences should be included in judging importance and that sequences not now listed as "dominant" should be carefully screened for their possible significance.

The report implies that the severe accident issue can be dealt with for future plants without consideration of the information and the processes developed to deal with existing plants. Although we expect that there may be differences in the way in which one deals with these two classes of plants, we believe it is desirable that the approach proposed for new plants include what is learned in the development of a policy for existing ones.

Sincerely,

A handwritten signature in black ink, appearing to read "J. J. Ray". The signature is stylized with large, sweeping loops and a long horizontal stroke at the end.

J. J. Ray  
Chairman