ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

January 7, 1972

Honorable James R. Schlesinger
Chairman
U. S. Atomic Energy Commission
Washington, D.C. 20545

Subject: REPORT ON INTERIM ACCEPTANCE CRITERIA FOR EMERGENCY CORE COOLING SYSTEMS FOR LIGHT-WATER POWER REACTORS

Dear Dr. Schlesinger:

At its 140th meeting, December 9-11, 1971, the Advisory Committee on Reactor Safeguards completed a review of proposed amendments to the Interim Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Power Reactors, published as an AEC Interim Policy Statement on June 29, 1971. The proposal was considered at a Subcommittee meeting held on December 4, 1971, in Washington, D. C. Further consideration was given to the interim criteria at the Committee's 141st meeting, January 6-8, 1972. The proposed amendments add new evaluation models by Combustion Engineering, Inc. and the Babcock and Wilcox Company to the existing list of acceptable evaluation models.

The Committee concluded that the proposed amendments were acceptable, on the same basis as the original Policy Statement evaluation models. Both the original and the amended criteria involve a number of provisions which are clearly conservative as well as some which may not be conservative, but on balance reflect adequate conservatism for interim use the plants similar in design to those which have been reviewed for construction permits. The Committee believes that each plant should be reviewed on a case by case basis to determine the extent to which these criteria are satisfied or modifications to the design or operation of the plant are required.

At the time adoption of the Interim Acceptance Criteria was under consideration, the Committee had opportunity to discuss the draft Criteria with the AEC Regulatory Staff and the Commission, and to offer comments. The Committee comments, made orally to the Commission on June 17, 1971 included the following:

> "The ACRS believes that the draft, 'Interim Acceptance Criteria for ECCS for Light-Water Power Reactors', dated June 17, 1971 is satisfactory for release subject to some clarification of the language.
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> "The Committee concurs with the suggested approach of publishing the criteria in the Federal Register as an interim policy statement by the Commission. It agrees that Alternate A setting January 1, 1968 as a cut-off date is reasonable. It agrees with the relaxation in the criteria in Section IV B as promoting greater flexibility without freezing design and codes.
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> "The Committee believes that the document represents an interim solution only, and that more work is required in code development, safety research oriented to LOCA-ECCS, and work on improved ECCS. The Committee is prepared to work closely with Staff and vendors through appropriate Subcommittees. We believe this approach may lead to an orderly solution of the outstanding problems.
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> "With regard to the course of events of the last few months, the Committee now feels that there has been an over-all gain in that the level of work on ECCS evaluation has increased and more specific goals and objectives have been established. However, the Committee believes that more experimental work is needed to supplement the further analytical development of the evaluation models.
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> "The Committee reemphasizes that the Commission should indicate publicly the need for continuing work on new ECC systems or significant modifications to current designs. It should be indicated that increases in power or power density will require larger margins."

Some of the restrictive assumptions imposed by the Interim Criteria have been introduced because of uncertainties in the behavior of the ECCS. The Committee believes such restrictions should be removed, as possible, either by design changes, or by demonstration that they are unnecessary. The Committee believes that it is timely for further implementation of the statement in the Commission's Policy Statement of June 29, 1971, that "in connection with the water power reactors yet to be designed and constructed the possibility of accomplishing by changes in design further improvements in the capability of emergency core cooling systems should be considered." Although the Interim Acceptance Criteria should be useful and helpful in the licensing process, the evaluation models prescribed in these criteria are recognized to have only limited usefulness as design tools for improving emergency core cooling systems. The nuclear industry should respond in a more direct fashion with realistic design methods, based upon additional scaled experiments and analytical studies. Design changes which would clearly eliminate any potential steam binding problems during a loss-of-coolant accident represent an example of the type of improvement considered to be of particular importance. The Committee recommends that design changes to improve ECCS capability should be sought and, to the extent practical, employed in plants for which construction permit applications are received in the future, irrespective of whether the plant design without such changes appears to meet the provisions of the Interim Acceptance Criteria.

The Committee believes that there is reasonable assurance that, with appropriate use of the Interim Acceptance Criteria and other applicable design and evaluation criteria, water reactors of current design can be operated without undue risk to the health and safety of the public.

Sincerely yours,

/s/ C.P. Siess

C.P. Siess
Chairman