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

July 21, 1972

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

Subject: HIGH TEMPERATURE, GAS-COOLED REACTOR SAFETY RESEARCH

Dear Dr. Schlesinger:

In its report of February 10, 1972, on water reactor safety research, the ACRS stated its belief that for water reactors there should be an industrial program adequate to provide proper assurance of public safety and that the AEC should support a vigorous continuing water reactor safety program designed to provide independent confirmation and to study improved engineered safety features. The ACRS also emphasized the importance of an independent accident analysis capability for the Regulatory Staff. In this report, the Committee wishes to comment further on the national reactor safety research program as it relates to the high temperature, gas-cooled reactor (HTGR).

Plans for construction of several large HTGR's have been announced, and construction permit applications are expected in the near future. It, therefore, becomes increasingly important that appropriate HTGR safety research programs be defined and implemented in timely fashion by both industry and the AEC. It also becomes important that the Regulatory Staff develop an independent capability for accident analysis, and that the Staff and the ACRS have available independent expert consultants in various major aspects of HTGR design.

The Committee believes that the necessary source of independent expert consultants to the regulatory groups can best be obtained by an adequate, continuing, federally-supported program of safety research and development which is organized and directed in a manner to meet the regulatory needs. The ACRS recommends that the AEC substantially augment its current modest program on HTGR safety so as to accomplish this function, as well as to provide independent resolution of safety questions and to probe for unidentified safety matters.

The ACRS also recommends that the necessary industrially supported, safety-related HTGR research and development be implemented on a time scale commensurate with the anticipated commercial application of this reactor type.

Examples of HTGR safety research areas which warrant augmentation or new studies include the following: failure modes of multi-cavity, prestressed concrete reactor vessels; irradiation and structural behavior of reactor graphite; fission product release characteristics as a function of fuel design; safety-related instrumentation; temperature effects on concrete and other important structural materials; dynamic response of the prestressed concrete reactor vessel, the core, and other internals to both seismic and accident excitation.

Sincerely yours,

C. P. Siess
Chairman