ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
UNITED STATES ATOMIC ENERGY COMMISSION
WASHINGTON 25, D.C.

November 5, 1957

Honorable Lewis L. Strauss
Chairman, U. S. Atomic Energy Commission
Washington 25, D. C.

Subject: NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS (NACA) - DOCKET NO. 50-30.

Dear Mr. Strauss:

This letter constitutes the report of the Advisory Committee on Reactor Safeguards on the application for a construction permit by the NACA Docket No. 50-30, in accordance with Section 182 of the Atomic Energy Act of 1954, as amended.

The application is for a test reactor designed to operate at power levels up to 60 megawatts of heat. It is to be located three miles south of Sandusky, Ohio.

One purpose of the reactor is to test nuclear fuel bearing components to destruction or near destruction. This aspect of the experimental program leads the Committee to be especially concerned with the operation of this reactor at a site so close to a densely populated area.

The Committee is of the opinion that with the proposed container and at the selected site it is possible so to restrict the experimental program that the operation of the reactor will not result in appreciable hazard to the public. However, the necessary restrictions may add materially to the cost of the program and may impose serious time delays. Further, some experiments which fall within the general type of experimental program proposed by NACA may not be permissible at this location.

In view of the above, the Committee believes that the facility proposed would be more useful for the program proposed if it were located at a site less close to a center of population.

It is the opinion of the Committee that NACA is providing reasonable precautions to avoid the escape of radioactivity which is likely to be damaging to the health and safety of the public. Among these precautions are three important items:

1) NACA proposes to place the reactor within a pressure vessel which has as its design criterion a maximum leakage rate of 115 cubic feet per day. Furthermore, the applicant has proposed a variety of measures to check the leak tightness of this container during operations. It is difficult to prove and maintain a leakage rate this low but if such a rate actually can be demonstrated and maintained the Committee believes that it should provide adequate protection to the health and safety of the public.

2) NACA is proposing to enclose each test loop within a secondary tank or container which is designed to contain the possible releases of fission products and other radioactive materials in case of breakdown of the fuel elements and other components being tested. The Committee believes that this would be a valuable additional safeguard but is not convinced that this secondary container can be depended upon under all circumstances.

3) The proposed design includes means to prevent the release directly to the atmosphere of effluents from the operation of the reactor or from the experimental loops. Again, the Committee agrees that this is an important safeguard but does not believe that accidental releases to the atmosphere can be entirely precluded.

The applicant proposes to establish a procedure for reviewing planned experiments in order to minimize the possibility of any failure which would release radioactivity even through the secondary enclosure.

The Committee believes that testing of fuel elements under conditions well within limits of possible failure does not offer a significant potential hazard provided that the experiments are properly designed and operated. However, testing of fuel elements in such a way that they are likely to be destroyed may not be permissible. Since NACA has not defined any specific experiments, the Committee is unable to state a more precise opinion than the above.

The Committee also believes that the operation of a test reactor at a site of this nature requires extensive area monitoring both on and off site so that any release of radioactivity to the environment may be detected as soon as possible and necessary protective or warning measures for the public carried out.

The Committee is aware of the risk that pressure may be brought to bear to permit a loosening of restrictions. This could come about as a result of a false sense of security which might develop from a period of

successful operation and as a result of the importance of proposed experimental programs to the national defense. This problem would not be as serious if the proposed reactor were located at a less populated site.

The following are additional remarks by Dr. Abel Wolman:

"While I agree with all that the Committee has stated, I feel that I must add some remarks for purposes of clarifying my own position. In view of the prospect of future continuing debates as to the safety of conducting essential experiments at this site, I would recommend against the site on the information presently available. I believe that the applicant should be required to consider the availability of other sites at which operation of the reactor would be feasible and which would afford a higher degree of protection to the health and safety of the public.

"It is unrealistic to permit operation at this site if experiments of importance to the national defense are likely to have to be curtailed because of the site. The realities of human behavior are such that operation of experiments, the hazards of which may be uncertain, are likely to be permitted if they are important to the national defense.

"I do not believe that we should freeze on a site in a situation like this merely because an applicant has chosen it."

Sincerely yours,

/s/ C. Rogers McCullough

C. Rogers McCullough
Chairman
Advisory Committee on
Reactor Safeguards