August 5, 1958

Honorable John A. McCone
Chairman, U. S. Atomic Energy Commission
Washington 25, D. C.

Subject: LOCKHEED RADIATION EFFECTS REACTOR (RER)

Dear Mr. McCone:

The Advisory Committee on Reactor Safeguards at its Ninth Meeting on August 4, 1958, reviewed for the first time the Lockheed Radiation Effects Reactor (RER) proposed for operation at Air Force Plant No. 67 near Gainesville, Georgia. This is a 10 Megawatt water moderated and cooled enriched uranium reactor which will be used in an unshielded position to irradiate large aircraft components with fast neutrons and gamma rays. The operators will be protected by a shielded control room. For protection of the public, reliance is placed exclusively on distance as maintained by a rigidly controlled exclusion area. The reactor will be lowered into a pool of shielding water when it is not in operation.

Since the proposed reactor is of a type that has been operated successfully elsewhere, the Committee feels that purely from the viewpoint of its operation no especially troublesome problems should be encountered. However, there are two elements of risk to the general public in the proposed operation that do not exist in the case of other reactors operating at similar power levels. The Committee is not prepared to say that the risk is large or unacceptable but it certainly is not negligible. In operating an unshielded reactor at the proposed 10 Megawatt power level a substantial quantity of Carbon 14 and other radioisotopes will be formed in the surrounding atmosphere and soil. Some of this undoubtedly will be scattered around locally, especially if high winds or a tornado should sweep the area. The second element of risk stems from the fact that if a nuclear excursion, followed by a metal-water reaction, should occur when the reactor is suspended in its unshielded location the scatter of the fission products probably would be considerably greater than would be the case for a similar reactor surrounded by

a heavy concrete shield. No containment of any kind is provided in the proposed reactor operation.

If the additional risks entailed in operating a reactor at substantial power in an unshielded position are compensated by the prospect of getting important information that cannot be obtained by safer methods then, in the present instance, these additional risks may be considered acceptable. Within its limited knowledge of radiation damage effects the Committee is doubtful that the benefits of irradiating large scale aircraft components will compensate the additional risks of doing so by the proposed method, but is willing to defer to superior judgment in this regard.

Sincerely yours,

/s/ C. Rogers McCullough

C. Rogers McCullough
Chairman

cc: Paul F. Foster, GM
H. L. Price, DL&R

References:

1) IAC 147 - Radiation Effects Reactor Safeguards (Hazards Summary Report, 15 January 1958.)

2) Lockheed Nuclear Products Emergency Manual, AFP No. 67, May 1958.

3) Memorandum of July 16, 1958, to Lt. Col. Fisher, AEC, from Capt. John E. Lineberger, RDZNMN, Marietta, Georgia.
Subject: Transmittal of Meteorological Data.

4) Wind Rose charts (5) for REF Valley, 2 July 58, C. R. Englund, Area Monitoring Stations.

5) LAC-RER Maximum Credible Accident Calculation Method (2 pages - undated) by Georgia Division, Lockheed Aircraft Corporation.

6) RER Operating Permissives for Over Flying Aircraft (2 pages - undated) by Georgia Division, Lockheed Aircraft Corporation.

7) Argon Dose in a Finite Volume (4 pages - undated) by Georgia Division, Lockheed Aircraft Corporation.

8) The Problem of Argon Diffusion of the Radiation Effects Reactor (8 pages - undated) by Georgia Division, Lockheed Aircraft Corporation.

9) Report to ACRS by Division of Licensing and Regulation on Lockheed Radiation Effects Reactor (RER), July 25, 1958.