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NEPA PROJECT
OAK RIDGE TENNESSEE

March 5, 1948

VIA AIR MAIL

Dr. Joseph G. Hamilton
Radiation Laboratory
University of California
Berkeley, California

Dear Dr. Hamilton:

The NEPA Project is engaged in the exploration of nuclear energy for the propulsion of aircraft under the joint sponsorship of the U.S. Air Force and the Navy Bureau of Aeronautics, and with the cooperation of the Atomic Energy Commission, and in association with the National Advisory Committee for Aeronautics. Associated with the project in the capacity of member companies are the following organizations:

Fredric Flader, Inc.
Wright Aeronautical Corporation
Northrop Aircraft, Inc.
Westinghouse Electric Corporation
United Aircraft Corporation
Allison Division, General Motors Corp.
Continental Aviation and Engine Corp.
General Electric Company
Lycoming Division, Avco Manufacturing Co.
Fairchild Engine and Airplane Corp.

In addition to many nuclear engineering problems, the project is also confronted by a very basic problem which involves the radiation protection of an air crew inhabiting a nuclear powered aircraft. This problem may be divided into two basic phases:

1. The allowable radiation intensities in the crew compartment

2. The shield design necessary to achieve this level

Having in mind the operating conditions of a military airplane, it is not desirable to accept the present radiation standards established for existing ground installations, such as stationary piles and research laboratories.

The factors that differ from normal, hot laboratory operations are:

1. The air crew may only be exposed for a limited number of hours in their entire lifetime

2. The urgency and importance of the mission may warrant risks beyond those expected of civilian noncombatants

FAIRCHILD ENGINE AND AIRPLANE CORPORATION
P. O. BOX 415, OAK RIDGE, TENNESSEE

1172097

Dr. Ernest Lawrence

[redacted]

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3. The hazards from enemy action may be inversely dependent upon the degree of radiation protection afforded the air crew

In order to evaluate various reactor and shielding designs and be assured of reasonable balancing of the important factors, it is necessary to have as accurate knowledge as may be possible of the effects of fission-produced radiation on the human organism. Subjects of outstanding interest include the following examples:

1. Actuarial statistics relating to human survival at various levels of radiation

2. Range of variation in human resistance to fission-produced radiation, including study of examination techniques for establishing a resistance index

3. Investigation of the dependence on time for pathological damage due to a constant total energy absorption

4. Investigation of the dependence on time for genetic damage due to a constant total energy absorption

5. Establishment of a system of consistent units to measure the biological damage from high energy radiation, including further study and refinement of the r.e.m. and r.e.p. concepts, including, if possible, a better correlation between various types of radiations and the associated conversion factors.

The foregoing examples indicate the scope of the program contemplated. The magnitude of this program, the many difficult research problems involved, the probable time required to obtain useful data, and its importance to the national welfare lead to the conclusion that intensive, coordinated action should be started as soon as possible. Representatives of the NEPA Project have contacted the Air Surgeon's office, representatives of the AEC, and other competent specialists in this field. As a result of these conferences, it was decided that:

1. A committee of outstanding authorities, including the fields of radiology, pathology, biophysics, and health physics, be convened for the following purposes:

   (A) To formulate and recommend a research program designed to develop useful data at the earliest possible date

University of California - Berkeley
The Bancroft Library
Dr. Ernest Lawrence

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(B) To recommend research personnel and facilities best qualified to carry out the work of the program

(C) To recommend the staff for a permanent board having the functions of:

(a) Screening the work of the program and furnishing broad direction of the research effort

(b) Serving individually as technical consultants to the research program on problems in their respective fields

2. The cooperation of the Air Surgeon's office, the National Research Council, and the Atomic Energy Commission will be invited

3. Air Force and Navy funds will be made available as needed through the medium of the NEPA Project

The NEPA Project is interested in the possibility of obtaining your services on the committee. We will appreciate having you write us, giving any comments or suggestions relative to the approach that has been outlined, and an expression of your position in respect to serving. We would also like to have a representative of the NEPA Project contact you at your convenience for further discussion of this program.

Very truly yours,

FAIRCHILD ENGINE AND AIRPLANE CORPORATION

G. Simmons

G. Simmons, Jr.
Technical Director
NEPA Division

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Dr. Ernest Lawrence

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