

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

November 16, 1959

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

Subject: PROPOSED STUDY OF THE REACTOR HAZARD AND CRITERIA PROBLEM

Dear Mr. McCone:

The Advisory Committee on Reactor Safeguards has become keenly aware of the increasing difficulties which it foresees in the adequate evaluation of the hazards of reactor facilities. It seems to the Committee that this is due to:

- 1) The absence of a correlation and critical evaluation of existing data relating to reactor safety.
- 2) The absence of written and agreed upon criteria for judging the adequacy of the proposed design, construction and operation of the various parts of a reactor.

The Committee knows of the research on safety features, the attempted writing of meaningful criteria, and the recently inaugurated quarterly technical progress review in Nuclear Safety. These are all excellent steps to a better understanding of the problem. The amount of pertinent information has now reached a volume at which intensive study undertaken now has an excellent chance of reaching helpful answers to most of the critical problems. The increasing number of reactors, and the growing difficulty of handling cases in a reasonable length of time, make it important that the additional effort be started now.

It is the Committee's belief that the problem requires a study of the available information on reactor safety, arranging it so it is readily available and deriving from it logical conclusions pertinent to answering the questions:

- A) Is the available knowledge sufficient to set criteria?
- B) Is more research needed and of what kind?

Honorable John A. McCone - 2 -
Subject: Proposed Study of the
Reactor Hazard and Criteria Problem

Nov. 16, 1959

- C) Is this the sort of problem that is not susceptible to solution by planned research and, therefore, must primary reliance be placed upon judgment and experience?

The problem might be broken down into the following categories:

- 1) Site and environment
- 2) Nuclear Core Design
- 3) Reactor Kinetics
- 4) Fuel Elements
- 5) Metallurgy and Material Radiation Effects
- 6) Instrumentation and Control
- 7) Chemical Reactions
- 8) System Interactions
- 9) Reactor Operating Organization and Procedures

Additional categories on a somewhat different outline may be required.

The proposed study must be conducted on a full time basis by persons fully conversant with the reactor field and having scientific and technical competence in the several disciplines involved. The National Laboratories have men of the necessary qualifications, and it is the Committee's belief that it is logical to draw the men from these sources. It is difficult to estimate the extent of effort required but it is certainly not a small one. At a rough guess it might require as much as twenty-five man-years of effort. This work would require at least one year and might require two or more. It is anticipated that worthwhile results would start to flow within three months of the start and at that time the size of the problem could be better assayed.

The nature of the work is such that this effort should be organized as a working group but close contact should be maintained with the Divisions

Honorable John A. McCone - 3 -
Subject: Proposed Study of the
Reactor Hazard and Criteria Problem

Nov. 16, 1959

of Inspection, Licensing and Regulation, Biology and Medicine, Office of Health and Safety, the Advisory Committee on Reactor Safeguards, and the National Laboratories, as well as with other useful groups. A steering committee representative of these various interests might well be appointed.

It is our hope that the Commission will proceed with this effort at once.

Sincerely yours,

/s/ C. Rogers McCullough

C. Rogers McCullough
Chairman

cc: A.R.Luedcke, GM
H.L.Price, DL&R