

C O P Y

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
U. S. 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 STATE 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 faces 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. There 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 undeniably 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 even 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?

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Appendix A

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e) In this the sort of problem that is not amenable to solution by general research and, therefore, such primary reliance be placed upon judgment and experience?

The problem might be broken down into the following categories:

- 1) Site and environment
- 2) Reactor Core Design
- 3) Reactor Kinetics
- 4) Fuel Elements
- 5) Reliability and Potential 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 experience in the several disciplines involved. The National Laboratories have men of the necessary qualifications, and it is the Commission's belief that it is logical to draw them 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 show within three months of the start and at that time the size of the problem could be better assessed.

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 Director 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 be appointed.

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

Sincerely yours,

s/ C. Rogers McCallough  
C. Rogers McCallough  
Chairman

cc: A.B. Lundberg, OR  
R.L. Price, TRAR