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

July 28, 1965

Mr. John T. Conway
Executive Director
Joint Committee on Atomic Energy
Congress of the United States

Dear Mr. Conway:

In your letter of July 1, 1965, you asked several questions related to the written testimony that we provided at the Joint Committee's recent hearings on amending and extending the Price-Anderson legislation. The answers to these questions are supplied in the attachment to this letter.

If you have further questions, or wish additional information on the specific matters commented on herein, we should, of course, be pleased to be of assistance.

Sincerely yours,

/s/

W. D. Manly
Chairman

Attachment:
ACRS Response to JCAE Questions.

ACRS RESPONSE TO JCAE QUESTIONS

Question 1

How does the ACRS deal with special problems which arise in areas where your membership may lack specific expertise (e.g., geology, seismology, etc.)?

Answer.

The range of interests and expertness of the ACRS membership is quite broad, and it is constant policy to assure that the fields of science and engineering on which safety of nuclear reactors generally depends are represented on the Committee. Of course, specific reactor proposals at times do present questions in areas where the Committee may need additional experience and background. In these cases, the Committee commonly uses consultants who are recognized as expert in the fields concerned. This has in fact been the practice where questions of seismology and protection against earthquakes have arisen. The Committee also receives the advice given to the Director of Regulation by his consultants. With reference to the specific field of geology cited in the question, it should be noted that the late Dr. Charles Williams, who was a member of this Committee, earned his graduate degree in this area.

Question 2

On page 2 of your testimony, you state that the ACRS reviews proposals for "significant modification of all power, test, and research reactors above 10 megawatts."

A. Who determines and how is it determined whether the modification is "significant"?

B. Do you ever "second guess" the AEC's Regulatory Staff on this?

Answer.

Licensees are required by Federal Regulations (10.CFR.50.59) to obtain AEC authorization for any "proposed change, test, or experiment (that) involves a change in the technical specifications or an unreviewed safety question." Copies of all such proposals are sent to the Committee by the AEC.

Att. to ACRS ltr dtd 7/28/65

The working relationship between the ACRS and the AEC's Regulatory Staff is such that on these matters the ACRS reviews any question which either the Committee or the Director of Regulation considers to be significant enough to warrant ACRS review.

A portion of each ACRS meeting is set aside for discussion with the Regulatory Staff of changes, tests or experiments which will require Commission action. At this time, the Committee sometimes expresses a wish to review proposals that the Director of Regulation had at first believed not to need full Committee attention. When this happens, additional information is developed and if necessary a full Committee review is made. This procedure is also used when warranted for unusual projects of less than 10 megawatts of power.

In the last analysis, the Committee itself makes its own judgment on which modifications it believes to be significant from the aspect of safety.

Question 3

On page 4 you stress that you review "only the technical features of the reactor system and the capability of the operating staff". What do you exclude, if anything, other than the financial qualifications of the applicants?

Answer.

The Committee excludes from consideration all matters that do not bear on the determination of safety. Examples of matters that are not considered are the financial or any similar need for the reactor, esthetic questions, public relations, and zoning and related land use questions.

Question 4

What is your view concerning the possibility of a "maximum conceivable" accident - a catastrophic accident - in a large power reactor? Does our ten years of design and operating experience in any way affect the earlier assessments made at the time Price-Anderson indemnity legislation was enacted?

Answer.

The maximum conceivable accident would be one involving catastrophic damage to the reactor, with releases from the fuel and the primary system envelope of the maximum possible amount of fission products,

and accompanied by the failure of safeguard systems such as containment to limit the consequences. In the case of a large power reactor, these consequences would be serious. The safety reviews conducted by the ACRS seek in part to establish if an accident with such effects is credible. If it were credible in any given case, the Committee would regard the reactor plant in question as unacceptable.

In the past ten years, much has been learned about physical mechanisms that could in principle contribute toward reactor accidents, and the methods of design and construction that help to keep the probability of these accidents very small. Most often, this information has not justified relaxing the conservative attitudes that previously had been assumed where the knowledge was lacking or inadequate.

The probability of a "maximum conceivable accident" depends on two factors. These are, the probability that a failure occurs that could lead to large consequences, and the probability that features of the plant intended to reduce any consequences to the public also fail. In the balance, the probability of initiation of a severe accident is not believed to be much different from the very low value it was thought to be ten years ago. There has, however, been development of methods of reducing the consequences of these improbable severe accidents, to levels that would not be catastrophic. The developments lead the Committee to believe that the possibility of a catastrophic accident of the "maximum conceivable" variety is even less now.

Question 5

Do you foresee a need for a full-time ACRS as the number of applications for nuclear facilities substantially increases?

Answer.

This is a complex question, having various facets.

An increasing number of applications for nuclear facilities is expected in the coming years. However, power reactors are becoming more standardized in design, reducing the need for detailed information of some features.

Certainly, a full-time ACRS should be able to spend more time on each project than is possible under the present system. This procedure would not always be advantageous, however. The information and ideas that Committee members bring to the review of applications

from their regular activities in and outside of the nuclear industry are invaluable to the ACRS function. Members of a part-time Committee are in a good position to remain technically sophisticated and current in their fields of specialization. Many persons highly qualified for membership on the Committee would not be available for a full-time ACRS. The ACRS believes, therefore, that a part-time ACRS can best serve the purposes for which the Committee was established.

Question 6

Are your safety reports to the AEC diluted to the lowest common denominator among the dozen or so ACRS members? Do you encourage minority reports?

Answer.

ACRS reports to the AEC are not diluted to the lowest common denominator among ACRS members. Where members believe strongly that the Committee position is too restrictive or not restrictive enough, they are free to dissent in a minority report. Beyond thorough discussion of the technical basis for the dissent, no attempt is made to discourage minority reports. However, no effort is made to encourage them either.

Question 7

On page 5 of your statement you say that "considerable further improvements in safety are required before large power reactors may be located on sites close to population centers." Can you give us some idea of the kind of safety improvements that are required?

Answer.

The Committee believes that placing large nuclear reactors closer to population centers will require further improvement in methods of design and construction, that would reduce even more the probability of accidents, large and small. In addition, consequences-limiting safeguards must be made even more reliable than at present.

Where people are nearby, small accidents become more important. The design and construction should then be such as to reduce the probability of such conceivable malfunctions and to reduce the credible consequences.

The Committee does not wish to discourage new applications for reactor construction, but only to point out that stricter conditions may be necessary for more urban sites. The Committee believes that these questions would be dealt with best by continuing the practice of reviewing individual reactor proposals.

* * *