

File

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File Section Criteria

MEETING OF THE SECTIONAL N-6 COMMITTEE WITH ACRS MEMBERS
IN NEW YORK CITY, JANUARY 12, 1960

In his introductory remarks, Dr. McCullough observed that the Committee has no documented position in regard to the criteria and standards to be used in judging the safety of reactors. The Committee does not feel that it can endorse broad standards at this time. There may be, however, specific standards which could be adopted. He pointed out that safety reviews have been developmental in nature. No reactor is just like another (except small research reactors).

There were only a few reactors in existence at the time the ACRS was created and since that time the Committee has judged reactors on a case by case basis. These reviews included the Hanford and Savannah River production reactors which had as objectives production of material in a reliable manner. The climate is somewhat different now, being influenced by the motivations of those interested in the development of competitive power. He pointed out that the Committee does not tell people how to design reactors but evaluates proposals and alternatives submitted by the designers. More frequently than not, the site and type of reactor is already fixed at the time of the initial ACRS review. In a summary of Committee philosophy, Dr. McCullough stated that, 1) the Committee does not believe in taking unnecessary risks. (Some additional element of risk can be accepted in the case of military and production reactors.) The Committee does not judge this but does attempt to indicate to the Commission the degree of risk involved; 2) the criteria used should wherever possible conform to existing standards; 3) there should never be only one barrier between the fission products and the general public; 4) one should not accept a compromise on quality in order to save money; 5) the Committee feels that its recommendations have not added excessively to the costs of reactor facilities.

Mr. Osborn stated that one should keep in mind that there are different kinds of reactors and the philosophy differs somewhat for each type (production, military, power, test and research). Dr. Gifford stated that he had been studying a method for ranking reactor sites. A figure

F/19

of merit is derived for each reactor so that reactor sites can be compared one to the other, however, the scale of comparison is not yet calibrated. Mr. Osborn said it was fair to ask the ACRS why it had not developed standards. He felt that the answer was that the job cannot be done by part time people. This is an extremely developmental field at this time and the job is a complex one. The Committee is anxious to see standards at the proper time. Dr. Leverett stated that the principal concern in industry's choice of a reactor site is whether or not it will get by the ACRS. Mr. Osborn said that he was sure the Committee was considered conservative but it might be that only time will tell. Frequently there are two and three-year R&D programs associated with the design of a reactor so that one can hardly judge the safety of the reactor until the reactor is almost ready to operate and the R&D program has been completed.

In the case of existing reactors, for example, the PWR, Dr. McCullough pointed out that there is a finite risk of damage to the people living in the vicinity. The increase in risk, however, is so small that it is acceptable in the context of other risks which these people assume in every day life.

There was discussion of the difficulties involved in finding a good analogy in industry to compare with the risks of operating reactors. The principal deficiency, particularly in the analogy of the operation of chemical plants is that the technology of these industries has developed over a long period of years. The nuclear industry, however has been so "safe" that it has no accident experience (statistics) to use as a basis for judgment. Dr. McCullough stated Dr. Conner's criteria which is as follows: In the event of an accident people living in the vicinity of the reactor should have a reasonable chance of escaping serious injury. In the case of plants handling explosives, one criteria is that the administrative offices and houses must be far enough from the magazine so that no substantial structural damage will result from an explosion. This is not to say that people will not be killed by flying glass or missiles. Dr. McCullough discussed briefly the concept of damage to people and defined the levels of damage. These are: 1) acute biological damage (sickness, death, etc.), 2) damage which brings about a shortening of life span (e.g., leukemia, but effect is only seen when hundreds of people are so irradiated), 3) effects on heredity (only seen when hundreds of thousands of people are irradiated at low levels).

Dr. McCullough remarked that Dr. Newson was studying the probability of failures and the possible consequences. Dr. McCullough pointed out that the ACRS had suggested to the AEC that a study be made of the existing data pertinent to reactor safety. The objectives of the study would be to determine 1) if there is enough data so that meaningful criteria can now be written; 2) is additional research needed; 3) is the kind of

problem which is not subject to resolution by either further study or research.

Mr. Johnson, WEC, asked if double standards were used in regard to judging the safety of military and Commission reactors. Dr. Beck said there were no differences in the standards used in judging any new reactors. He said there may be some reactors in existence which are not consistent with present standards. Dr. McCullough noted that an AEC prototype, if constructed for the same purpose, is evaluated in the same manner as a reactor constructed by industry.

Ray Brittan asked if the government would come up with criteria which would define acceptable damage to the public. Dr. Beck said that this would be done within the present calendar year. This may be in terms of a single number or it may vary with population density and/or the probability of an accident. Dr. Beck said that he did not believe that one could come up with numbers which would give an indication of the numerical probability for this kind of an accident. He said that he felt a starting point was needed for an acceptable off-site damage and that some people in the Commission felt strongly that this might be 50 roentgens. Mr. Osborn stated that he could not conceive of any number being selected within a year unless it were extremely conservative. He felt that the selection of any number might be bad for the industry.

Dr. McCullough stated that in his view it is nonsensical to pretend that you can predict the details of an accident.

Dr. Leverett asked what the ACRS would recommend to the N-6 Committee as a course of action. Dr. McCullough said his personal opinion was that all that one can do is to continue to struggle with the problem. He felt that real progress would only be made when competent technical people are assigned a fulltime job of studying the problem. Criteria and standards cannot be developed on a part time basis.

Dr. Leverett observed that his committee had a commitment to supply a paper to the British in May of 1960 concerning reactor siting. Dr. McCullough suggested that wording of this paper be such that an opening is left in case there is a small group (within the United States) which is in violent opposition to the content of the paper. Mr. Harrer called the attention of the group to the tentative standards for the design construction and maintenance of containment vessel for atomic power stations recently published by the ASME Standards Department. Dr. Leverett said that comments by the ACRS relative to these standards would be welcome by his committee.