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Statement of W. Kenneth Davis
Vice President, Bechtel Corporation
Chairman, Committee on Reactor Safety, Atomic Industrial Forum

before the

Joint Committee on Atomic Energy, Congress of the United States

June 13, 1961

Mr. Chairman, Gentlemen:

My name is W. Kenneth Davis. I am a vice president of Bechtel Corporation. I am also chairman of the Committee on Reactor Safety of the Atomic Industrial Forum. I should like to thank the Joint Committee for its invitation to present my views on the important matter of reactor siting, particularly with respect to the AEC's "Notice of Proposed Guides - Reactor Site Criteria," 10 CFR, Part 100, as published in the February 11, 1961, issue of the Federal Register.

In the preparation of this statement, I have made extensive use of the views developed by the Forum Committee on Reactor Safety in its consideration of the reactor siting problem and in its review of the AEC proposed criteria on reactor siting. I should point out that the Committee's views represent those of the individuals on the working group although they do not necessarily represent those of the organizations with which the Committee members are associated nor do they necessarily represent the views of other Forum members.

The views of the Forum Committee have been made known to the AEC in the form of a summary of a meeting held by the Forum on March 17 which was forwarded to Mr. Harold Price, Acting Director of Regulation, on April 6 and in the form of a proposed redraft of the criteria which was also forwarded to Mr. Price on June 6.

Copies of both documents prepared by the Forum Committee are appended to copies of this statement filed with the Joint Committee on June 6, and I respectfully request that they be made a portion of the record of this hearing.

The members of the Forum Committee's working group believe that the AEC proposed guides have already served a useful purpose inasmuch as they have focused timely attention on and have stimulated public thinking on the important

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problem of reactor siting. The group further believes that the adoption by the AEC of site criteria guides can serve a useful and desirable purpose provided:

1. The guides give due recognition to the importance of the engineering design of a proposed reactor as well as to the population density and use characteristics of the site environs and to the physical characteristics of the proposed site; and

2. The guides are sufficiently flexible to accommodate and take advantage of such new information as may be gained from the experience of constructing and operating nuclear power reactors.

The basic features of the AEC proposed criteria are retained in the Forum Committee's proposed redraft. In particular, the Committee concurs with the establishment of:

1. An exclusion area of such size that an individual located at any point on its boundary for two hours immediately following onset of an estimated release of radioactive material would not receive a total radiation dose to the whole body in excess of 25 rem or a total radiation dose in excess of 300 rem to the thyroid from iodine exposure; and

2. A low population zone of such size that an individual located at any point on its outer boundary who is exposed to the estimated release of radioactive material during the entire incident would not receive a total radiation dose to the whole body in excess of 25 rem or a total radiation dose in excess of 300 rem to the thyroid from iodine exposure.

The Committee has accepted without comment the radiation exposure limits specified above. The Committee members do not regard themselves qualified to make a judgment on the radiation limits that should be set for such a low probability, once-in-a-lifetime accidental or emergency exposure. The Committee has, however, noted with assurance that the specified limits have been derived from limits suggested by the National Committee on Radiation Protection and Measurement and that the AEC believes them to be conservative values.

There are three ways in which the Forum Committee's proposed criteria differ significantly from the criteria proposed by the AEC:

1. The criteria proposed by the Forum Committee would apply only to power reactors and would not apply to testing reactors on

the premise that the latter are designed for experimental operations and, therefore, should not be evaluated under the same criteria as power reactors.

2. The criteria proposed by the Forum Committee include, in a separate appendix, example calculations for approximating exclusion area and low population zone radii for several hypothetical reactor and sites. Although the Committee believes that such example calculations should not be published as part of the guides, it does believe that it would be useful to publish such example calculations in the scientific literature, e.g. the AEC Journal of Reactor Safety. In an effort, however, to be consistent with the format adopted by the AEC, four example calculations have been included in an appendix to the criteria proposed by the Committee but not as an integral part of the criteria. The AEC proposed criteria included only one example and its relationship to the criteria is not clear. The use of multiple examples (one of which is identical to that contained in the criteria proposed by the AEC) will, in the opinion of the Committee, emphasize a range of possible design-site relationships. They will also emphasize that a proposed reactor site can be evaluated only after careful consideration of the engineering features of the proposed reactor and cannot be made on the basis of distance alone. It is the opinion of the Forum Committee that the incorporation of only a single example calculation could obscure the intent of the guides and in practice might result in the application of the arbitrary values contained in the single example in the evaluation by the AEC and the applicant of all proposed reactor sites without appropriate regard to reactor design and other pertinent factors.

3. The criteria proposed by the Forum Committee do not include, as do the AEC proposed criteria, "a population center distance of at least 1-1/3 times the distance from the reactor to the outer boundary of the low population zone." In the opinion of the Forum Committee, the arbitrary value of 1-1/3 has no technological basis and this concept should be replaced by a man-rem radiation exposure limit expressed as a function of population distribution and density. This approach would be more meaningful and understandable as well as more in keeping with the exclusion area and low population zone concepts.

Although the Committee recognizes the difficulty that would be involved in developing such radiation exposure limits, it believes it to be the soundest of several suggested alternatives. I should like to suggest that the AEC or the Federal Radiation Council, working in conjunction with interested private groups, be requested to give consideration to this matter. The Forum Committee, I feel sure, would be willing to lend its assistance in any way possible.

It has been the intent of the Forum Committee to revise the proposed site criteria in such a manner as to bring into sharper focus not only the importance but also the interrelationship of such factors as reactor design, site characteristics, distance, and population density. The Forum Committee believes that each of these factors must be integrated into reactor site evaluation if the safety standards set forth by the AEC and subscribed to by the Committee are to be met under the wide variety of circumstances that are expected to characterize reactor license applications of the future.

We should not be unmindful of the impact that the policies and precedents established in this country will have on reactor development in friendly nations outside the U.S. and on our participation in the reactor programs of these nations. In short, we believe it imperative that we develop reactor site criteria which will meet the needs of public safety, establish and maintain public confidence, support our prestige and leadership overseas, and permit the development of atomic power as rapidly as technological development and economic incentives warrant.

I should be pleased to try to answer any questions you may have. Thank you.