

5/8/61

COMMENTS RECEIVED ON SITE CRITERIA

Outside AEC

- Atomic Energy Research Project, Ann Arbor - Mr. Lee M. Hydeman
- Dept. of Water and Power, L.A. - Ivan L. Bateman
- Department of Commerce - Maritime Adm. - Thomas Stakem
- Cancer Research Institute, New England Deaconess Hospital, Boston - Shields Warren
- Atomic Industrial Forum

A1 256
~~256~~

Public
Submission of Comments Received
on Site Criteria as of 5/8/61

General: ~~Comments~~

Univ. of Mich.
Doc Hydeman, Atomic Energy Research Project -

At the outset, we wish to state that
in our judgment the criteria are a distinct improvement
over the criteria issued on May 23, 1959.

Ivan L. Bateman, Los Angeles Dept. of Water and Power

The proposed guides are considerably more definitive
than the ones published on May 23, 1959, and are quite helpful.

Atomic Industrial Forum Committee on Reactor Safety

Statement of Considerations

Atomic Industrial Forum Committee on Reactor Safety

Considerable criticism was voiced by the seminar participants about the stated "basic objectives", particularly item (b) which now reads: "Even if a more serious accident (not normally considered credible) should occur, the number of people killed should not be catastrophic". It was pointed out that since "not normally considered credible" does not lend itself to definition, prerequisite safety precautions either with respect to site location or engineering design modifications are also undefinable and hence this objective serves no useful purpose. It was further pointed out that this same objective is not only subject to the same lack of

understanding by the public but is also likely to unnecessarily alarm the public through the unfortunate use of the phrase, "not normally considered credible" which implies credibility under abnormal circumstances. Use of the word "catastrophic" was also considered undefinable and unfortunate to the extent that it could provoke public alarm without cause or explanation.

Appreciating that factors other than technical considerations may be determining in this instance, it was the consensus of the group that under no circumstances should objective (b) be retained and that objectives (a) and/or (c) should be modified to fill any gap left by the omission of (b). One suggestion was to add the word "fatal" to objective (a) causing it to read: "Serious or fatal injury to individuals off-site should be avoided if"

With regard to objective (c), it was suggested that the last two sentences beginning: "The Commission intends" should be deleted. The sentences imply that irrespective of safety design improvements or of the interrelationships between population, design and distance, it will never be possible to locate power reactors in large cities. It was surmised that this implication was not intended by the AEC.

Scope

Atomic Industrial Forum Committee on Reactor Safety

..... this section, by an appropriate addition, should reflect the importance attached by the AEC to engineering design as a factor which must be jointly considered with distance and population if a competent and realistic evaluation is to be made of a proposed site. Failure to acknowledge the importance of such safety features as may be incorporated into or excluded from the design of a reactor facility implies by omission that the AEC does not regard design an important factor in selecting a site. Such an implication in the opinion of the seminar group could have a deleterious effect on public confidence in both the AEC and the atomic industry.

It was suggested that the phrase "construction permits and operating" be deleted, making the first sentence read: "This part applies to applications filed under Part 50 of this chapter for licenses for power and testing reactors." Although the group recognized that the construction permit and operating license are intimately associated and also recognized the authority of the AEC to disapprove a site at any stage of reactor construction or operation, it could see nothing to be gained by gratuitously suggesting that the adequacy of the site must be demonstrated again after construction of a facility has been completed in conformance with an AEC-issued construction permit. The suggestion to delete the phrase assumes that the deletion in no way alters the scope of the guides or the intent of the AEC.

It was the consensus of the group that the second paragraph of this section, aside from the first sentence, should be deleted. One interpretation permitted by this section is that by definition it is impossible for a reactor of "novel design" to be as safe or safer than a reactor "of a general type and design on which experience has been developed". In the opinion of the seminar participants, such is not necessarily the case. This section further indicates that "conservatism" and "isolation" are analogous, which again in the opinion of the group is not necessarily the case. Some members of the group also felt that the last sentence of this section was gratuitous and served no real purpose.

Siting Factors

A number of seminar participants expressed the opinion that guides which make distance the dominant factor in site selection would tend to discourage reactor designers from incorporating additional safety features into their designs.

Two other general comments were produced by the seminar discussion. One was concerned with the question of whether the guides give sufficient recognition to additional safety features which may be incorporated into the engineering design of a facility as a possible compensating factor for locating a power or testing reactor in a site which may otherwise meet some but not all of the specifications contained in the criteria.

Several of the seminar participants indicated that they had been assured by staff or consultant specialists that distances of 1/10 to 1/4 mile rather than 1/4 to 1/2 mile from known active earthquake faults offer adequate assurance of stable seismological conditions.

~~Definition~~

Definitions

Sven L. Bateman, L.A. Dept of Water & Power

What are the population center distances to very large cities?

Sheela Warren, Cancer Research Institute

the terminology under (c) "Population center distance" by definition is an unsatisfactory one, since it refers to the distance from the reactor to the nearest boundary of a densely populated center. Furthermore, there is no definition of densely populated. For example, there are many areas in our great cities where there are not 25,000 residents, but there are hundreds of thousands of people in working hours. I believe that this should be defined as follows:

The population boundary distance means the distance from the reactor to the nearest boundary of an area containing more than 25,000 occupants per square mile.

Atomic Industrial Forum Committee on Reactor Safety

... use of the term "guides" may lead to some ambiguity as to their intent and purpose. Some participants, for example, apparently regarded the "guides" as simply a benchmark setting forth certain technical considerations which should prove of assistance in completing an application for a power or testing reactor. Other seminar participants, noting that the proposed "guides" had been identified by the AEC as Part 100 of Chapter 10 of the Code of Federal Regulations, assumed that the "guides" were intended as a rule carrying the full weight and authority of other AEC rules and regulations. At a minimum, it would appear that a substantial burden of proof would be imposed on applicants to justify any deviation from the guides in completing an application.

Projected Population Growth

Ivan L. Bateman, L.A. Dept. of Water & Power

Are "low population zone" and "population center" expressed in terms of present population, or should the projected population ten or twenty years from now be considered?

Atomic Industrial Forum Committee on Reactor Safety

Some concern was also expressed by the fact that the definitions do not address themselves to the problems that may arise from population changes which may take place during the 40-year span of a reactor operating license. By way of example, reference was cited to problems that have confronted some commercial airports from population influxes into adjoining areas.

"Maximum Credible Accident" Concept

*Lee Hydemann, Univ. of Mich. Atomic Energy Research
Project*

Another difficulty with the proposed guides is the retention of, and emphasis placed upon, the concept of a maximum credible accident. It is difficult for us to discern how a maximum believable accident can be identified with the kind of precision which the proposed rule appears to contemplate.

, we would suggest consideration of a requirement that each applicant be required to identify the various types of accidents which are credible for the particular type of reactor being proposed. The applicant also could be required to identify the worst of these possible accidents, but the safety determination should not be predicated solely on the worst accident. The Commission should be able to provide guidance for the kind of accidents to be considered.

Other

John L. Bateman, U.S. Dept. of Water & Power

We suggest, however, especially in the case of proven reactor designs, that you qualify even further the limitations proposed.

Particularly, we would favor the use of qualifying numerical factors rather than words. Where precise factors cannot be determined, perhaps upper limits or maxima could be supplied.

Thos. E. Stakem, Maritime Admin., U.S. Dept. of Commerce

It is assumed that these siting guides were also not intended to apply to nuclear ships. If this assumption is correct, it is requested that an amendment be made to the notice of February 11, 1961, to the effect that the SAVANNAH is not subject to these criteria and that the guides are intended for land-based reactors only.

Atomic Industrial Forum Committee on Reactor Siting

Questions were raised as to how the guides should be interpreted with respect to: (1) the location of multiple reactors within an approved site, and (2) the disposition of a site containing a reactor which may have experienced some type of incident that resulted in measurable radiation levels outside the exclusion area but below the levels indicated in the guides.

Comments on Appendix A

Univ. of Michigan
Lee Hydeman, Atomic Energy Research Proj.

One serious disability of the proposed guides is the incorporation of specific numbers in §100.11 (a)(3) and in Appendix "A" attached to the guides. We acknowledge that specific numbers may be useful to applicants,

in the form of guidance, in assisting them in choosing their sites, but they may also have an adverse effect as published in the proposed guides. While it is true that the calculations and the numbers resulting therefrom are only intended as examples as stated in paragraph §100.11(b), the numbers may well have a limiting effect by assuming the import of standards. Indeed, a reading of the newspaper reports of this proposed rule indicates the likelihood that the numbers used of distance from populous areas for reactors of various power levels will be regarded by the public as firm limitations. Such an eventuality may result in a stifling effect on industrial ingenuity and be an inhibiting factor to new developments.

We would recommend that the guides be published without the specific numbers mentioned above or the formulas contained in the Appendix or in "100.11(a)(3)", and that a supplementary document be published which summarizes the regulatory experience to date with respect to the location of reactors.

we would think that the flat assertion in §100.2 that "This conservatism will result in more isolated sites" may be too categorical. If "more isolated sites" refers to the figures given at the end of Appendix "A" the statement is misleading since the remoteness of the site will depend on the safety factors built into the facility and also may depend on whether the novelty of the facility is such that it is quite likely to be more safe than existing facilities. This minor difficulty could be overcome if the word "may" is substituted for the word "will."

Appendix A

Irvin L. Bateman, U.S. Dept. of Water & Power

Are the assumed meteorological conditions (average worst weather conditions for average meteorological regions over the country) valid for all of the United States including Southern California?

Is the power level to be used for determining distances from population the total power level of all nuclear units on site or only the power level of the largest unit?

Atomic Industrial Forum Committee on Reactor Safety

There was an obvious difference of opinion among the seminar participants as to the intended purpose of "Appendix A". For example, Section 100.11 (b) states that "Appendix 'A' of these guides contains an example of a calculation for hypothetical reactors which can be used as an initial estimate of the exclusion area, the low population zone, and the population center distance", suggesting to some industry representatives that Appendix A is intended as no more or less than an example.

On the other hand, Section 100.11 (a) states that "As an aid in evaluating a proposed site, an applicant should assume a fission product release from the core as illustrated in Appendix 'A' ...", suggesting to other industry representatives that Appendix A is intended as an integral part of the "proposed guides" and specifies the assumptions to be made by all applicants for power and testing reactors irrespective of reactor design or site location.

There was also a difference of opinion among the seminar participants as to the intended interpretation of the word "reasonable" in the statement in Section 100.11 (b) that reads: "The numerical values stated for the variables listed in Appendix 'A' represent approximations that presently appear reasonable, but these numbers may need to be revised as further experience and technical information develops." The question raised by the group was how much deviation, if any, from the numerical assumptions characterized in the guides as "reasonable" would be permitted by the AEC.

Hence, unless there is an unequivocal intent on the part of the AEC not to permit variance from the assumptions used in Appendix A, it should not be included as an integral part of the guides. It was noted by the group that the assumptions used are more conservative than experience in some cases would dictate.

it was generally agreed that the AEC could render a service to the industry by publishing a series of examples similar to that now contained in Appendix A as a separate booklet or in the Journal of Reactor Safety.

With regard to attaching -- not incorporating -- Appendix A to the guides, the group expressed the following consensus. It would be most helpful to remove all numerical assumptions from the example, substituting instead terms such as "x", "y", and "z". The example treated in this manner would also be more useful if more fully developed. A less desirable alternative would be to supplement the present example with two or more examples. This would serve to show that they were intended as no more and no less than examples and would also demonstrate a range of distances possible with different engineering assumptions. All members of the groups were agreed that the present example, without further modification or amplification, would raise more questions than it would answer.

By way of summing up these general comments, considerable support was expressed for a guide which would be much simpler and more useful to reactor designers, builders and operators.

Specific Comments

Itemized below with reference to specific sections of the proposed guides are some specific comments produced by the seminar discussion.

ATOMIC INDUSTRIAL FORUM INC.

3 EAST 54TH STREET • NEW YORK 22, N. Y. • PLAZA 4 1075

April 6, 1961

Mr. Harold Price
Acting Director of Regulation
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

The Atomic Industrial Forum's Committee on Reactor Safety met at the Forum's headquarters in New York on March 17 to review and discuss the Commission's "Notice of Proposed Guides on Reactor Site Criteria", 10 CFR Part 100, as published in the Federal Register of February 11. Enclosed is a summary of comments and opinions produced by that meeting which we hope will be of assistance to the AEC in its further review of this important matter. Forum members attending the March 17 meeting were requested to forward directly to the AEC their own individual comments which we trust will also prove helpful to the AEC.

As may be noted from the enclosed summary, the March 17 meeting produced agreement on a number of points, the two most important of which might be described as: (1) the AEC and the industry share the opinion that some type of site criteria could be mutually beneficial to the continued development and construction of nuclear reactors for civilian power production and to the continued maintenance of the excellent safety record achieved in the civilian reactor program through government-industry cooperation; and (2) the industry is concerned with what it regards as ambiguities and unfortunate placements of emphasis in the proposed criteria as now drafted.

If we can assist the AEC in any other way in securing comments from the industry and the public on these important guides, please let us know.

Sincerely yours,

WKD:RW
Enclosure: Summary

W. Kenneth Davis,
Chairman-Forum Committee
on Reactor Safety

ATOMIC INDUSTRIAL FORUM

Summary

Forum Seminar on AEC-Prepared Notice of Proposed Guides

"Reactor Site Criteria" - 10 CFR 100
New York, New York - March 17, 1961

Scope of Meeting

At the suggestion of its Chairman, the Forum's Committee on Reactor Safety met at the Forum's headquarters to discuss the AEC-prepared "Notice of Proposed Guides - Reactor Site Criteria", 10 CFR Part 100, as published in the February 11, 1961 issue of the Federal Register. The purpose of the seminar was twofold: (1) to provide those contemplating the submission to the AEC of written comments on the proposed guides an opportunity to discuss the proposed guides with other interested persons; and (2) to provide those having questions on the proposed guides an opportunity to pose such questions to the AEC representative participating in the seminar.

The seminar discussion opened with only industry representatives in attendance. By prior arrangement, Dr. Clifford Beck, Assistant Director for Nuclear Facilities Safety of AEC's Division of Licensing and Regulation and principal author of the proposed guides, subsequently joined the group to participate in a review of the comments produced by the morning discussion.

It was agreed at the outset of the seminar that no attempt would be made in the preparation of this summary to attribute specific comments and opinions to specific individuals. It was also agreed that neither the discussion nor this summary was intended to serve as a substitute for written comments to be submitted directly to the AEC by persons attending and participating in the seminar. Indeed, participants were urged to forward their individual comments to the AEC.

Attendees

A list of committee members and guests attending and participating in the seminar, in addition to Dr. Beck, is attached to this summary. Mr. W. Kenneth Davis, Chairman of the Forum's Committee on Reactor Safety and Vice President of Bechtel Corp., served as chairman of the seminar.

All seminar participants agreed that the first sentence of this section should be modified to read: "In evaluating a proposed site, an applicant should estimate the radioactivity release from the reactor facility." The group did not agree with the premise that fission product release from the core should be assumed nor did it agree with the assumption that this would prove "an aid" to the evaluating procedure.

It was also agreed that subsection (b) should be rewritten in such a way as to clarify the status of Appendix A as has been suggested earlier.

Note should be made of the frequently repeated observation that in the formulation of such criteria, the industry shares with the Commission a common goal -- the expeditious development and achievement of competitive nuclear power commensurate with assurance of public health and safety. It was the consensus of the group that no inference to the contrary should be conveyed by the guides.

The other was concerned with the question of whether the guides may, through inadvertent phraseology, have a possible adverse impact on public opinion even though their intent might be clearly understood by reactor licensees and others in the atomic industry.

In both subsections (a) (1) and (a) (2) reference is made to a radiation exposure limit of 300 rem to the thyroid. It was pointed out that such a limit is not significant in the case of a sodium-cooled reactor since most of the iodine would be expected to be absorbed by the coolant.

Some question, without comment or criticism, was raised about the basis for the "two hours" referred to in subsection (a) (1) and the "1-1/3 times" in subsection (a) (3). It was also suggested that subsection (a) (3) should give recognition to the importance of engineering design.

Appendix A

As pointed out above, the intended status of the example contained in Appendix A was not clear to the seminar group. As also pointed out above, the group expressed the strong opinion that Appendix A should not be made an integral part of the guides.

Most of the discussion on this section related to the group consensus that all reference to Appendix A should be deleted. Although it was acknowledged that an example containing a sample calculation as set forth in Appendix A might prove helpful to certain applicants, it should under no circumstance, in the opinion of the group, be made a part of or specifically related to the guides.

-5-

It was suggested in the interest of giving increased recognition to the importance of engineering design, that the order of the subsections within this section be reversed, that is, subsection (c) should be entered first and subsection (a) last.

Part of the argument for this position was tied to the group's inability to agree on the intended status of Appendix A as indicated under the general comments of this summary. Another part of the argument was based on the premise that the AEC intended to permit some variance from the assumptions made in the example contained in Appendix A. In this connection, it was agreed that experience with the AEC's Division of Licensing and Regulation has clearly demonstrated a tendency on the part of the AEC to take the most conservative of alternative interpretations permitted by any rule.

REACTOR SAFETY COMMITTEE

Meeting of March 17, 1961

List of Attendees

ATTENDEE

AFFILIATION

W. Kenneth Davis, CHAIRMAN

Bechtel Corporation

J. L. Allen

Philadelphia Electric Co.

Myron Beekman

Detroit Edison Co.

Gerald Charnoff

Atomic Industrial Forum

Roger Coe

Yankee Atomic Electric Co.

Giovanni D' Arminio

Selni - Edisonvolta

Harold Etherington

Allis-Chalmers Manufacturing Co.

J. F. Fairman

Consolidated Edison Co. of N. Y.

Carl Gamertsfelder

General Electric Co.

B. John Garrick

Holmes & Narver, Inc.

John E. Gray

Nuclear Utility Services

W. E. Johnson

Westinghouse Electric Corp.

Kenneth Kasschau

Alco Products, Inc.

R. W. Kupp

S. M. Stoller Associates, Inc.

Robert L. Menegus

E. I. du Pont de Nemours & Co., Inc.

G. R. Milne

Consolidated Edison Co. of N. Y.

Don Rees

Saxton Nuclear Experimental Corp.

Charles Robbins

Atomic Industrial Forum

D. Roy Shoults

General Electric Co.

Chauncey Starr

Atomics International

Harold Vann

Jackson & Moreland, Inc.

Edwin A. Wiggin

Atomic Industrial Forum

Hood Worthington

E. I. du Pont de Nemours & Co.

Paul C. Zmola

Combustion Engineering