

JAPAN ATOMIC INDUSTRIAL FORUM, INC.
(Nippon Genshiryoku Sangyo Kaigi)

Cable Address:
"JATOMFORUM TOKYO"

No. 1, 1-chome, Shiba Tamura-cho, Minato-ku
Tokyo, Japan

June 1, 1961

Mr. Charles Robbins, Executive Manager
Atomic Industrial Forum, Inc.
3 East 54th Street
New York 22, N. Y.
U.S.A.

Dear Mr. Robbins,

We have been, with a keen interest, following up the actions taken by the nuclear industry of your country with regard to the Proposed Regulation on Reactor Site Criteria published by the United States Atomic Energy Commission on February 11. We are highly encouraged to see an increased effort made by your people in offering comments and proposing alterations on some of the important parts of the proposed guides.

You will notice that the proposed regulation has exercised quite an unnegligible influence over our country. Since it was published in February, our Forum has shared a great concern about it and conducted study works on the regulation as proposed by the USAEC.

Attached are the comments by the nuclear industrial circle of our country on the said proposed regulation. You will find that in many of the points raised your views coincide with ours.

We learn that you have organized an ad hoc committee to work out a counter-proposal to the AEC's regulation. We hope that your examination into our comments may result in incorporating some of them into your work.

In the meantime, we are informing the USAEC, through Atomic Energy Attache of the US Embassy in Tokyo by sending him a copy of this document, of the fact that we have offered our comments to you.

With best regards,

Sincerely yours,

C.C. Mr. W. Herbert Pennington
Atomic Energy Attache
American Embassy
Tokyo

Seinosuke Hashimoto,
Secretary General

Enclosure:

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COMMENTS BY THE JAPANESE NUCLEAR INDUSTRY ON THE PROPOSED
REGULATION ON REACTOR SITE CRITERIA OF THE U.S.A.E.C.

The proposed guides on reactor site criteria published by the United States Atomic Energy Commission on February 11 this year has brought about a great deal of repercussion among the related quarters of the Japanese industry.

We consider that it is now a sort of world wide common sense that in the field of nuclear energy even domestic legislations cannot be made without influencing or being influenced by the situation abroad.

It is recalled that during Diet deliverations on the legislation of Atomic Hazard Indemnity Law in Japan some number of comments were offered by the United States, - an example of such a prevalent common sense. No doubt, such comments were accepted by us as useful instruments in formulating more fitting law in that field.

It is in conformity with this approach that we are this time offering our comments on the proposed regulation.

It is imagined that the approach of the proposed regulation, if enacted as it is, will most probably be applied to Japan mechanically so that only very little room will be left for flexible working mechanism. This is told from the past experiences. Then, it is easily imagined that undue importance will be impressed upon the mind of general public over the population-distance relations, without allowing considerations for reactor design and environmental conditions which per se have a great deal to do with siting evaluation.

Traditionally, there is found in Japan a trend to claiming that such criteria should be severer than the most severe ones, - an inclination justifiably arising from the people's sentiments over safety of nuclear energy forged through experiences of atomic explosions in and out of Japan.

We are, as you know, working on a program to introduce US type nuclear power plants. If such criteria as proposed by the AEC should come to have practical, if not legal, effects on the minds of general public, the program will have to be affected and the cooperative relations between Japan and the US nuclear industries would be greatly jeopardized.

The following comments incorporate (A) those points which have created concern in Japan about the proposed regulation of the United States and the explanations on what is hoped by us with respect to these points, as well as (B) our basic approach to the site criteria.

A. The following are the points which have raised concern in Japan about the proposed regulation of the Commission and explanations on what is hoped by us with respect to them.

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1. The proposed regulation attempts to regulate quantitatively the site evaluation, but it would not be equal to evaluating site in which such fractuating factors as reactor type and environmental conditions of the site are introduced.

The proposed regulation appears to give quantitative criteria for evaluation of sites. If reasonable, quantitative regulation for site evaluation would lead to simplification of procedures of actual site evaluation and might be, as far as it goes, desirable. With the current stage of nuclear development taken into consideration, such an attempt would inevitably invite many oppositions. It is essentially impossible to try to incorporate into a uniform quantitative criterion all such factors as particular property, safety designs and site environments of each reactor plant. The only way to make it possible would be to cover all conceivable cases by assuming a hypothetical accident which approximates theoretical upper limit. Such appears to be the case of the proposed regulation of the Commission. Assumption of this type, it is true, is conservative and stands on safer side, but this proposed regulation would prove too uniform to be practical for such reactors with improved safety designs helped by rapidly progressing nuclear technology. Until it becomes possible to have a working quantitative regulations, we hope that the regulation allows for case-by-case evaluation for proposed sites.

2. The regulation formulated in the United States which takes leadership in the related matters has a deep effect on Japan.

It has been extremely difficult in Japan to secure a land of wide area for reactor site due to her high population density, and at the same time with frequent danger of earthquakes the site problem has been the target of heated arguments with respect to reactor installation. Research and its findings in the United States which leads the world in the field of reactor development are apt to be promptly employed in such arguments. The site problem is not free from this, either.

It would, therefore, be an unavoidable sequence that the site criteria of our country will be greatly influenced by that of the United States if it has been effectuated as regulation.

In the light of the above, we earnestly wish that the proposed regulation, taking into full consideration the basic approach to site criteria we will explain in B of this comments, would be made more flexible, easier to be utilized by designer, constructor and operator of reactors and would employ more definitive expressions so as not to create any misunderstanding on the part of the general public.

3. Although Notice of Proposed Guides says that the criteria "are utilized as guides in evaluating proposed sites" it leaves room for some doubts that they are as effective as regulation. At any event, their legal nature is not very clear.

It is remarked that the proposed criteria are utilized as guides in evaluating proposed sites. Although this could be interpreted as meaning that they aim at identifying a number of factors considered

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in evaluating such proposed sites, these criteria are regarded by the Commission as federal regulation, which, like other AEC regulations, might exercise as powerful a binding force. The nature of the proposed criteria still remain ambiguous. For instance, Sec. 100.11 which provides that "an applicant should assume a fission product release from the core as illustrated in Appendix "A"," is considered to be mixing regulation with guides and appears contradictory. Although an explanation that the numeric values employed in the regulation are "guides" which are essentially flexible could meet the above argument, a fear could not be denied that those figures come to the fixed in the mind of general public and the authorities. It would also be exceedingly difficult to attempt to revise the figures once set forth. Such an inclination towards fixing originally flexible values has been well experienced in the case of many regulations of almost all the countries. Experiences teach us that regulations should be so made as to allow case-by-case evaluation of proposed site until it becomes possible to make quantitative judgment helped by reasonable knowledge and information.

We hope that the regulation be flexible enough to eliminate fetters of fixed values and at the same time be expressed by clear-cut and definite terms.

4. The proposed regulation places undue emphasis on distance, without giving sufficient considerations to technical features of reactors such as safety devices.

The distance limitation illustrated in appendix "A" may be applied to some cases but not to all.

It appears that full consideration is not given to additional safety devices to be incorporated by safety designs or reactor's technical features which will naturally be resorted to in attempting to install a reactor in a site which would otherwise be unacceptable. Such an undue weight on distance has a danger of giving a misled impression that the U.S.A.E.C. does not consider safety designs of a reactor to be a more important factor.

It is feared lest reactor operator and designer should lose any incentives to examine and work out such a safety device as to meet the given conditions of the proposed site. We, therefore, hope that importance of technology and designing be incorporated into the regulation as the major factor for reactor safety.

5. The proposed regulation says with respect to appendix "A" that the example of the calculation is based upon approximations that presently appear reasonable, but the calculation is made on the basis of too many assumptions to make it practicable. If applied to Japan as they are, this would make it considerably difficult to procure sites.

Reading the appendix, it is clear, although not so described, that the accident assumed in the appendix involves melting of total fuel elements. Such an accident is an approximation to theoretical upper limit, and as far as it goes it is conservative and stands on safer side, it is true, but such a hypothesis could never be considered to be practical

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With regard to full-scale reactors. In that the assumption upon which the calculation is based does not incorporate such many factors as reactor property, safety design, and many other efforts to prevent melting of fuel elements, the calculation is merely formal and unrealistic.

If all the numeric values developed with regard to exclusion distance, low population zone distance and population center distance were to be applied to Japan mechanically, it would practically be prohibitive to procure site where to install US type power reactor.

If the calculation made in the appendix is nothing more than an example, all the references to the appendix which appear in the regulation's provisions should be eliminated and clearer description should be made in the appendix to the effect that the calculation is just an example. Furthermore, if a series of several examples of calculation be added which allow for consideration on technological features of reactor and reactor plant, the regulation, without leading to any misunderstanding, would become flexible and easy to utilize. We do hope that the regulation come out likewise.

B. Our basic approach to the proposed regulation on site criteria will be summed up as follows:

The three principles which the proposed regulation refers to as the basic objectives to be achieved under the criteria are generally acceptable. Considerations given by the Commission to the effect that the extent of hazards caused not only by credible accident but also by serious accident which is not normally considered credible should be minimized are also found reasonable.

The core of the problem, however, lies in to which extent we should assume the size of accidents in actually evaluating sites for reactors. Although the provisions of the proposed regulation do not refer to this, an example of calculation given in Appendix "A" as "a means of obtaining preliminary guidance" seems to reveal the Commission's approach to this point.

Such an approach of the Commission as we see it is as follows: The appendix contains an example of calculation for a "serious accident of a hypothetical reactor" and no such expression as "maximum credible accident" is employed here. In this connection, it is reminded that Dr. Clifford K. Beck presented to the Winter Meeting of the American Nuclear Society held in San Francisco last December a paper which contains a proposal for site criteria almost similar to the AEC proposed regulation. In his paper, Dr. Beck defines an accident based upon similar assumptions to that of appendix "A" to be "maximum credible accident." However, since maximum credible accident has its proper assumption for each specific plant according to reactor types and safety designs, the accident illustrated in appendix "A" should be interpreted not as maximum credible accident but as "hypothetical" one. This inevitably leads us to regard the accident as illustrated in the appendix "A" as literally hypothetical and not as a maximum credible accident.

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It is our opinion that the basic approach to setting forth site criteria should be based upon maximum credible accident of each specific reactor taking into consideration its safety features. This will be by far more practical and flexible a method than all-put-in-together system in that the former allows much consideration of property, safety devices and operation techniques of each specific reactor. Undoubtedly it is admitted that one difficulty with this approach is how to link maximum credible accident with a hypothetical accident or hypothetical release which has to be taken in consideration with respect to "serious accident not normally considered credible" when we attempt to evaluate the extent of hazard to general public. However, this is a matter of judgment which has to be left for insight and discretion of the agency. With sufficient specialized knowledge, wisdom and fairmindedness on the part of hazard analysts and those who check on such analyses, this method will lead to the best, if not absolute, conclusion for each specific case of accident based upon knowledge and information presently available. If we define such serious accident as exceeds the scale of maximum credible accident and release of radioactivity caused thereby or assumed separately under the amount of radioactivity release of maximum credible accident respectively as "hypothetical accident and hypothetical release for evaluation of public hazards," they will offer basis for fixing values of low population zone distance or population center distance.

Although it remains undeniable that a certain degree of ambiguity of such a method will possibly raise a number of arguments in evaluating acceptability of each proposed site, this method, by leaving much room for efforts to be made by reactor constructors to work out such safety design as will meet requirements of the proposed site, will help progress nuclear technology and develop atomic industry.