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STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : A. R. Luedecke
General Manager

DATE: JAN 12 1961

FROM : J. E. Travis, Manager
Hanford Operations Office

SUBJECT: PROPOSED REACTOR SITE CRITERIA (YOUR MEMO, 12/23/60)

IS:CNZ

The proposed Reactor Site Criteria contained in Staff Paper AEC-R 2/19 have been reviewed by this office. General comments on the proposed criteria follow:

1. It is believed that the publication of the criteria, though general in nature, is desirable. It tends to standardize the basis for safety judgments, and will permit future reactor designers to optimize their site selections with some degree of confidence that their choices may be acceptable to the Government.

2. The criteria do not appear to give consideration to possible population growth in the vicinity of the reactor during the years of operation. The evacuation area and population center distances obviously will decrease with population growth.

Comments suggesting changes to specific sections of the criteria are given below:

1. Page 38 - Section 51.1, Purpose

   Although this section states "- - for power and testing reactors subject to Part 50 of this chapter", it might be well to use the wording - - for licensed power and testing reactors. This would draw special attention to the fact that the proposed criteria exclude Commission facilities.

2. Page 39 - Appendix "D", Section 51.3c

   "Population center distance" states that this means the distance from the reactor to the nearest boundary of a population center containing more than 25,000 residents. In suburban areas there may be located several relatively small communities or villages separated by a few miles which have individual populations of less than 25,000, but when taken as a whole exceed that figure. If such a cluster of villages is a "population center", then perhaps it should be defined as an area containing more than 25,000 residents within a circle X miles in diameter.

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3. Page 41 - Appendix "D", Section 51.11-1(iii)

It is believed that 133 1/3 should read 133 1/3%.

4. Page 42 - (iii)

Consideration should be given to designing the reactor for an earthquake factor greater than the value expressed by the accepted building codes or standards for the area.

5. Page 44 - Appendix A - Calculation of Bench Mark Areas and Distances

a. The definitions of Section 51.3 (page 38) speak of exclusion areas and evacuation areas, whereas the bench marks are defined in terms of distance. Mathematically an area is the product of two distances. It should be made clear that the distances stated are radii of circles with center at the reactor and that the area of concern is encompassed by a circle having a particular radius given in the table.

6. Pages 44-50, Annexes 1, 2 and 3 to Appendix D and Appendix E

It is not clear whether the bench-mark distances shown in the several tables are those to be used in future safeguards reviews, or whether new bench-mark distances are to be calculated for each proposed new reactor using assumptions (fractional fp releases, release rate, etc.) and constants (diffusion parameters, atmospheric stability, etc.) chosen for the particular reactor and site being proposed. It is hoped that the latter interpretation was the one intended, as otherwise we would consider the distances shown to be too rigid and arbitrary to be realistic in most safeguards reviews. The assumptions of 0.1% release per day, no ground deposition, and the factor-of-ten attenuation of radiation by the building, for example, are certain to be challenged by some reactor designers. In any case, the intent of the regulation should be made clear as to the correct interpretation.

You may be interested in knowing that HOO has proposed a budget submission on Form 189 entitled, "Consequences of Reactor Accidents", a study to provide needed data in the area of site selection. This

program would provide an orderly review of the variables involved including incorporation of the latest findings in the various sciences involved so that the results will reflect the best technology available. By making these techniques generally available, considerable time will be saved on the part of individuals making hazards reviews. Information currently available on the release of fission products, dose rates, diffusion, deposition, and decontamination will be consolidated into the calculations with data on the initiating event, leakage rates from containers, etc., incorporated as needed. The end results of these studies will be review reports indicating the basis for the various assumptions and recommended methods of calculation.

cc: G. F. Quinn, Director
Division of Production, HQ

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HANFORD OPERATIONS OFFICE: TRAVIS

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ENCLOSURES

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