

January 14, 1959

MEMORANDUM

**To:** Those Listed Below

**From:** C. Rogers McCullough, Chairman

**Subject:** REACTOR SITE EVALUATION

The enclosed is a copy of a paper prepared by Downes and Singer which was originally planned for presentation at the Geneva Conference in 1958. The paper was rejected for Geneva but Downes and Singer are of the strong opinion that they have developed a method of computing the potential damage to population by reactor accidents which is much simpler and quicker than the method which has been developed by Gomberg and specifically applied to the PRDC site. It is proper to say that the word "compute" may easily lead to a distorted conception since Downes and Singer themselves readily admit that whatever numbers are derived by their method are highly approximate and may easily be in error by a factor of ten (10).

The methods developed in this paper were applied by Downes and Singer in the two days they were here in Washington working with me in arriving at the total damage figures which I presented at the last meeting in our discussion of site evaluation. In arriving at these numbers we uncovered several potential sources of serious error in applying their method. In particular their method does not take into consideration skewed population densities and it was necessary to make special corrections for the Elk River and Piqua sites to take account of this fact. Likewise if the skewed population density were coupled with an asymmetrical wind rose pattern another correction must be applied. The method also needs modification when there are a few dense centers of population within the range of significant damage. It was also brought out that distorted results can come about from using compilations of population densities which do not reflect accurately the population density in detail.

Finally, the method as presented in this paper only covered from 100 to 1000 roentgens and I have the strong believe that the dosages should be extended down to one (1) roentgen. The numbers which I presented to the

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Subject: Reactor Site Evaluation

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Committee would reflect a modification of the method to include from 1 to 1000 roentgens on the basis that the damage can be measured in terms of roentgen-persons. Biology and Medicine has not yet decided whether this sort of relation should be used or how it should be modified.

As far as you are able I wish you would put this information into your thinking on the general problem of site criteria. Downes and Singer are thinking about the problem further and I will pass on any information they develop as soon as it is available.

K. R. Osborn  
F. A. Gifford  
L. Silverman  
A. Wolman  
W. P. Conner

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