

October 13, 1958

Honorable John A. McCone
Chairman, U. S. Atomic Energy Commission
Washington 25, D. C.

Subject: DETERMINATION OF REACTOR EXCLUSION RADII

Dear Mr. McCone:

In answer to Commissioner John Graham's question on October 10, 1958, regarding what is the basis for reducing an exclusion distance around a nuclear reactor, my own views may be helpful.

It should be remembered that an exclusion distance is not an exact quantity nor does it buy complete safety in most cases. It does reduce the hazard to those living at its boundary and it provides a certain amount of time in which to move people or take protective measures.

When a reactor is built close to a populated area these relative safety measures are reduced. There are certain engineering and operating features which can be introduced to reduce the risk even though they are not strictly equivalent to exclusion distance. For example, a containment vessel with a factor of safety of four for pressure can be provided (it is the current practice to put containment vessels around power reactors because adequate exclusion distances are not feasible). This vessel can be protected from missiles by interior concrete lining. By the judicious use of proper metals in the core, pressures due to chemical reaction can be avoided. There are a number of other features of design which can be used to reduce the leakage from the container.

In the matter of highways or railroads persons on them are transient and mobile. There is a low probability that the accident and the presence on the right of way of large numbers of people will coincide. In addition they would be in the hazard zone only for a short time. Subsequent to the accident the railroad or highway can be cleared and blocked. It should be remembered that radiation doses to residents are calculated on the basis of sojourn in the cloud for considerable periods of time, e.g., eight hours.

cc: K.R. Osborn }
W.P. Conner } 11/28/58
G. Silverman }
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Sincerely yours,

C. Rogers McCullough
Chairman

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