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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
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IN REPLY REFER TO: RPP

Harold L. Price, Director
Division of Licensing and
Regulation
United States
Atomic Energy Commission
Washington 25, D. C.

Dear Mr. Price:

This is in reply to your letter of May 26, 1959 to Dr. Hugh L. Dryden.

Presumably the proposed site environmental factors are intended to amplify section 50.34 of Part 50 of AEC regulations entitled "Licensing of Production and Utilization Facilities", dated January 19, 1956. If such is the case, the proposed revisions are somewhat more explicit and definitive and hence desirable. The following specific comments relate only to item b, regarding exclusion distances, and item f, regarding hydrology.

Item b. These requirements seem to put undue emphasis on present experience as to power levels and may not adequately provide for future trends for the following reasons:

1. The normal economic pressures will lead to greater power levels in single units, higher temperatures and pressures, and greater emphasis on minimal exclusion areas.

2. Big installations tend to promote local population density increases as evidenced by most airport experience. This tendency should result in more emphasis on adequate exclusion areas in site selection. The present emphasis on local population densities is not believed to offer a realistic approach for long lived installations.

3. Power levels are likely to be of the order of thousands of heat power megawatts in single units. If the integrated dosages shown in the NACA Reactor Facility (Plum Brook) Hazards Summary are realistic, one can expect dose rates of the order of 10 r/hr at one quarter mile for 1000 mw heat power, even though all fission products are contained after a creditable incident.

4. The tendency in both power and test reactor development will be toward higher temperatures and pressures. This may well lead to smaller safety factors in materials of construction, and may make containment more difficult in case of a serious incident. Accordingly, we may have to expect more serious incidents in the future than past experience would indicate. Future designs might prove to be less conservative, particularly for test reactors.

Item f. This question of water movement, both above and below the surface, may well become the dominant factor in future site selection, and yet it is one of the most difficult to analyze properly, either before or during operation. The means of adequately detecting and measuring contaminants in water tend to be slow and involved and expensive. Accidental discharges are unlikely to be as quickly dispersed (except perhaps in large rivers), or as quickly detected as are atmospheric releases. There is more likelihood of reconcentration of activity than in atmospheric releases. Moreover, the objectionable contaminants are more likely to appear in efflux and leakage water.

In the past, most emphasis has been placed on external exposures probably because of their greater ease of measurement. In the future, greater emphasis on internal exposures of the population can be expected. As a result, greater emphasis on proper evaluation of water problems and the control of water contaminants may well be desirable. The responsibility for leadership and guidance in this area necessarily rests with the AEC. It is unlikely that all reactor designers and operators will be able to develop the necessary criteria on their own volition.

Very truly yours,

Ira H. Abbott
Director of Aeronautical
and Space Research