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BROOKHAVEN NATIONAL LABORATORY
Associated Universities, Inc.
Upton, L. I., N. Y.

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720519

March 18, 1953

Mr. E. L. Van Horn, Area Manager
Brookhaven Area
U. S. Atomic Energy Commission
Upton, New York

Subject: Policy on release of radioactive gases from BNL.

Dear Mr. Van Horn:

For the past six years, operations at Brookhaven National Laboratory have been in accordance with a letter from W. E. Kelley to P. M. Morse dated March 11, 1947 which set up on a temporary basis maximum permissible radiation doses for persons not employed by the Laboratory but living in the vicinity, and for employees working outside of areas subject to close control. These maximum doses, of 3.5 millirem and 35 millirem in any seven-day period respectively, were established before the AEC had adopted any uniform policy, but were chosen to be 1% and 10% respectively of the then anticipated maximum permissible exposure of 50 millirem per day.

As you are well aware, the chief potential airborne hazard to residents of the vicinity is the $Argon^{41}$ contained in the stack effluent from the reactor, and we have maintained a meteorological program and an elaborate network of monitoring stations to determine that exposures off-site have not exceeded 3.5 mrem in any seven-day period. That we have had very little difficulty in meeting this strict standard is indicated by the fact that in the period since January 1951, during which the reactor has been operating at full power, it has been shut down, for fear the 3.5 mrem limit would be exceeded, on only three occasions of only a few hours each. These shutdowns were recommended on the basis of meteorological predictions, which in our experience have generally indicated somewhat larger doses than the background monitoring stations have reported.

Since 1947 various subcommittees of the National Committee on Radiation Protection and the AEC have given a great deal of study to problems of radioactive waste disposal and maximum permissible dose. A maximum permissible whole body exposure of 300 millirem per week delivered to the critical tissue has been adopted as standard. This figure has been used as the basis for setting the maximum permissible concentrations in air or water for various radioisotopes as listed in the forthcoming National Bureau of Standards Handbook 52, now in press. In that Handbook the maximum permissible concentration for $Argon^{41}$ in air to be breathed continuously is given as 5×10^{-7} microcuries per cc, this being the level calculated to give 300 mrem per week.

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It is our understanding, based on conversations of J. B. H. Kuper with Dr. Forrest Western of the Division of Biology and Medicine, that current AEC philosophy is to apply a safety factor of 10 to the recommendations of the National Committee on Radiation Protection where the general public is concerned. The application of this safety factor is made not because of doubts of the safety of the 300 mrem/week figure, but rather to relieve the requirements of precise measurements in a monitoring system, and to reduce the chance that an individual who receives some other exposure in his employment will accidentally get a total dose over the weekly limit. We understand further that in cases of an isolated incident as distinct from a chronic fairly constant exposure the National Committee on Radiation Protection will permit the use of averaging times longer than one week. Also, the stated weekly limit is believed to be safe for lifetime constant exposure, with a possible exception only in the case of small children.

Our continuing adherence to a safety factor of 86 (= 300/3.5) in contrast to the general AEC policy of a factor of 10 seems inadvisable, not only because of the extra expense involved in the meteorological and monitoring programs but also on account of the implied lack of confidence in the safety of the 300 mrem/week limit. Accordingly, we propose to revise our policy to adopt the latter figure as the exposure limit for all person on-or off-site, except those employees and visitors who are actually engaged in handling radioactive materials, or working with particle accelerators, under properly controlled conditions, for whom the 300 mrem/week limit would apply. In implementing this revised policy we would close down our off-site background monitoring stations, but would keep in operation the on-site stations in order to detect accidental releases of materials (other than the $Argon^{41}$ from the reactor stack) which might occur. Also the program of meteorological prediction of radiation levels will be discontinued as a routine operation although certain special meteorological assistance to the scientific program will continue to be carried out on a small scale.

I trust that you will be agreeable to these suggestions.

Very truly yours,

/s/ Leland J. Haworth

Leland J. Haworth,
Director

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