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CONTROL OF INFORMATION ON COLUMBIA RIVER

W. E. Johnson

December 27, 1962

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HANFORD ATOMIC PRODUCTS OPERATION

[redacted]

December 27, 1962

U. S. Atomic Energy Commission
Hanford Operations Office
Richland, Washington

ATTENTION: Mr. J. E. Travis, Manager

Gentlemen:

CONTROL OF INFORMATION ON COLUMBIA RIVER

Reference: (1) Letter October 29, 1962, JE Travis to WE Johnson, above subject. (RS:RDW)
(2) Letter November 14, 1962, WE Johnson to JE Travis, above subject.

In reference (1) you requested us to undertake objective studies of the relationship between the river water temperatures and reactor production rates in order to provide better guidance for policy decisions on classification.

The first phase of the requested work has been completed and consisted of sets of temperature measurements made above and below the reactors on November 9, November 28-29, November 15, and December 4, 1962. Complete descriptions of these studies, together with tabulations of the data, are being prepared in document form which should be ready for transmittal to you next month. Our evaluation of this preliminary data is, however, included below.

For the late October through December period of the year, a direct comparison of river temperatures at Priest Rapids with those in the general vicinity of Ringold yields estimates of reactor power level which are within twenty per cent of the true value. A closer estimate would not likely result if attempts were made to introduce corrections to compensate for heat lost to the atmosphere, at least at the present stage of the art. An anomaly seemed to exist in the Hanford area, (an unexplained temperature increment) which would make this site less favorable than Ringold for estimation of power level.

Within McNary Pool, in the vicinity of the 300 Area, similar direct comparisons with temperatures at Priest Rapids yielded estimated power levels

[redacted]

which were in error by as much as several hundred per cent on the low side. The introduction of appropriate correction factors to compensate for heat lost to the atmosphere, if made by a very astute engineer, could, however, reduce the error to fifty per cent or less, still on the low side. We note that temperature studies made in August, 1962 by a consulting biologist employed by the Northwest Pulp and Paper Association, which used measurements at Priest Rapids and Richland, resulted in an estimate of the heat contributed from the reactors which would overestimate power levels by about ten per cent.

We would like to stress that our estimates apply only to the time of year when these initial surveys were made. Power levels estimated from river temperature measurements which are uncorrected for weather conditions will generally be substantially on the high side in the summer and on the low side in the winter. In the spring and fall, therefore, there will be times when the effects of weather will be essentially nil. At these times, integrated temperature measurements made at a number of different cross sections of the river should give valid estimates of the power level. However, one must expect water temperatures within the McNary Pool to be influenced more by weather conditions and the mixing of different water masses than temperatures at Ringold or above. For this reason, the chances of arriving at an accurate estimate of the power level from temperature measurements at Richland are considerably less favorable than from measurements made further upstream.

It is our intent to continue temperature measurements at several locations above and below the reactors throughout the coming year in connection with the program titled "Effects of Reactor Effluents on Columbia River Water Quality". By the end of 1963 we should be able to provide superior evaluations of the impact of the effluent on river temperatures, as well as the capability of estimating reactor power levels from off-project measurements.

Very truly yours,

W. E. Johnson

General Manager

WE Johnson:RFF:fo

[redacted]

END

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