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Mr. Benard C. Rusche	Duke Power Company Charlotte, North Carolina Mr. William O. Parker, Jr.	4/12/77
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Ltr. furnished to supplement info. provided in applicant's 6/30/76 ltr. & 11/18/76 ltr. concerning the liquid effluent radiation monitors....

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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

TELEPHONE: AREA 704
373-4083

April 12, 1977

Mr. Benard C. Rusche, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Re: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Mr. Rusche:

The purpose of this letter is to supplement information provided by my letters dated July 30, 1976 and November 18, 1976 concerning the Oconee Nuclear Station liquid effluent radiation monitors. In the July 30, 1976 letter, it was stated that high background readings experienced by the liquid effluent monitor have precluded the establishment of setpoints which would permit the monitor to function as required by Technical Specification 3.9.7. Efforts were in progress to reduce these high background readings and resolution of this problem was expected by December 1, 1976. A request for temporary revision of the Oconee Nuclear Station Technical Specifications to permit the use of administrative controls in lieu of an operable radiation monitor was approved by the NRC on August 24, 1976.

In the November 18, 1976 letter, you were appraised of our progress in resolution of the monitor background problem. The original on-line Victoreen monitor had been relocated from a low point in the liquid effluent release line to a high point. A second, parallel Victoreen monitor had been installed to permit decontamination of one monitor while the second was in service. Experimentation had been conducted with various piping materials, coatings and surface finishes to minimize buildups of contamination. Provisions were included for the flushing of the monitor after effluent releases. Attempts had been made to chemically clean the monitor in-place. Attempts were also made to use chemical carriers to reduce plate-out of contamination within the monitor. None of these actions dramatically reduced the background seen by the monitor. The background problem has finally been solved, however, through the installation of a General Atomics Corporation off-line monitor. This monitor has a removable chamber which can be properly decontaminated at a decontamination facility. Background levels are now low enough to permit the detection of liquid effluent releases.

The general requirements of Oconee Nuclear Station Technical Specifications, as related to the liquid effluent monitor are:

1. The liquid effluent monitor readings shall be compared with the expected reading of each batch (Technical Specification 3.9.6).

2. The rate of release of radioactive materials in liquid waste from the station shall be controlled such that the instantaneous concentrations of radioactivity in liquid waste, upon release from the restricted area, does not exceed the values listed in 10CFR20, Appendix B, Table II , Column 2. (Technical Specification 3.9.3).

3. The effluent control monitor shall be set to alarm and automatically close the waste discharge valve such that the appropriate requirements of the specification are met. (Technical Specification 3.9.7).

As discussed in the November 18, 1976 letter and in a meeting at Oconee on March 16, 1976 with Mr. P. Stoddard of your staff, difficulty has been experienced with achieving the above requirements. With regard to Item 1, correlation of liquid effluent monitor readings with expected batch readings is not considered possible in an absolute sense due to the changing spectrum of radio nuclides from one discharge batch to another. Correlation has been attempted using the following counting philosophies; correlation using the average gamma energies of each disintegration for the composite mixture; correlation using the average gamma energy of each gamma emission for the composite mixture; and a detector efficiency based upon the composite mixture of radionuclides in the liquid effluent. Additionally, the monitor has been utilized in a single channel mode with a descrimination setting based upon Cobalt 60 (95% of the effluent releases contain Cobalt 60) to determine if the activity of one radionuclide present in the effluent mixture could be related to monitor readings. This has not been successful either; however, even if successful, this would not meet the requirements of Item 2 above in that it could not assure that the limits of 10CFR20 Appendix B, Table II, Column 2 are being met on an instantaneous basis.

Recently, investigations of flow rate and temperature variations at the effluent monitor have revealed fluctuations. Visual inspections of the detector crystals have shown them to be cracked, yellowed or to have bubbled optical couplings between the crystal and photomulliptier tube. This has been determined to be due to temperature flucturations in excess of 1°C per minute. We are pursuing modifications with the vendor which will permit the temperature stabilization of these crystals.

With regard to Item 2, this restricts effluents from the station to the unrestricted area, on an instantaneous basis, from exceeding the valves of 10CFR20, Appendix B, Table II, Column 2. As you are aware, this table lists several hundred isotopes and corresponding maximum permissible concentrations (MPC) in water which may be released to the unrestricted area. In the instances where an effluent contains more than one isotope, a limiting value is established by a partial fraction calculation as detailed in Note 1 of 10CFR20, Appendix B. The bases for these concentrations, as stated in 10CFR20.105, are that they will not be likely to cause an individual to receive a dose in excess of 0.5 rem in one calendar year, two millirem in any one hour, or 100 millirem in any seven day period. Also, as stated in 10CFR20.106, these concentrations may be averaged over a period

not greater than one year. Item 3 requires that the effluent monitor be set to alarm and automatically terminate the release such that the provisions of this specification are met.

While it is possible that the capability may exist sometime in the future to predict a monitor reading based upon a laboratory sample taken prior to release, it is not considered possible for a single monitor to detect each isotope present in the effluent batch and perform the necessary calculation to ensure that the limits established in 10CFR20, Appendix B, Table II, Column 2 are met on an instantaneous basis. Additionally, since the monitor only sees activity per volume, it is not sensitive to flow rate which would also be necessary to include in this calculation in order to assure that the requirements of this specification are met. Reduction of the discharge rate by a factor equivalent to the uncertainty of the ability to correlate the monitor with expected readings or to allow for observance of the instantaneous limits is not considered a viable alternative. This is because the Oconee release point is into the Keowee hydro station leakage flow of 40 cfs rather than the condenser circulating water system as it is in the other stations and hence the necessary effluent discharge flow rate would be unacceptably low.

It is our position that for Oconee the primary method to assure that release limits are met should be the use of administrative controls. Indeed, the proper sampling of effluent batches prior to release, the verification of proper system configuration to ensure the proper tank is released, the calculation of an appropriate release rate, the actual setting of the effluent flow rate, and the setting of a monitor all require personnel action. Even if the monitor could be properly correlated and set to perform the function required by Specification 3.9.3, administrative actions provide the essential controls for each release. The purpose of the monitor should be to provide backup in the event of a significant error and not to assure that the Technical Specifications are met on a instantaneous basis.

In our November 18, 1976 letter, it was pointed out that there is no basis for restricting the effluent releases of a nuclear power plant on an instantaneous basis to the annual average value permitted by 10CFR20. For Oconee in particular, this limitation imposes rather severe limitations due to the small dilution flow. It is our position that releases in accordance with the provisions of 10CFR20.105 and 20.106 should be permitted.

We are continuing our efforts to resolve problems associated with the liquid effluent monitor and are continuing to follow those additional administrative controls outlined in the July 30, 1976 letter. Releases to the unrestricted area are being maintained within the limits of Technical Specification 3.9.3. It is considered that the public health and safety is being safeguarded by these actions. It is requested that you expedite approval of our submittal to resolve this matter. Additionally, in the interim, it is requested that the Oconee Nuclear Station Technical Specifications be revised to continue to permit utilization of administrative controls in lieu of an operable monitor as proposed in the July 30, 1976 letter.

Very truly yours,

William O. Parker, Jr.

MST:ge

cc: Mr. N. C. Moseley