

FROM: Dept. Health, Education, and Welfare  
 Washington, D. C. 20201  
 Roger C. Egeberg, M.D.

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TO: Harold L. Price

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ENCLOSURES: Public Health Review... comments on the "Enviro. Statement" fm Duke Power on Ocenee Station Units 1,2, &3.

Regulatory File (3) (1 ea docket)			
AEC PDR (3) (1 ea docket)			
OGC (Room P-506A) Compliance (2)			
Henderson			
Felton			
Boyd			
DeYoung			

REMARKS: Orig filed with 50-269

E. Price SLR			
N. Dube			
DiNunno			
P. Howe (2)			
Morris/Schroeder			

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 ACKNOWLEDGED  
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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

WASHINGTON, D.C. 20201

**AUG 28 1970**

OFFICE OF THE SECRETARY

Mr. Harold L. Price  
Director of Regulation  
U.S. Atomic Energy Commission  
Washington, D.C. 20545

Dear Mr. Price:

Thank you for your letter of July 22, 1970, to Mr. Roger Strelow transmitting the "Environmental Statement" for the Oconee Nuclear Station. We have considered this statement in our review of the facility which is required by the provisions of the National Environmental Policy Act of 1969. In response to your request for comments, we are pleased to provide the enclosed report by our Bureau of Radiological Health which states our position on the proposed operation of the plant based on an evaluation of the public health and environmental aspects of the facility.

The Bureau's review is based primarily on information contained in the Final Safety Analysis Report. It is recognized that other design information may become available before an operating permit is granted, but we believe our environmental evaluation is substantially completed at this time, unless, of course, major changes occur.

When the other agency comments are compiled, we would be most happy to receive them. If this Department can assist you further in this matter, we would be happy to do so.

Sincerely yours,

Roger O. Egeberg, M.D.  
Assistant Secretary

for Health and Scientific Affairs

Enclosure

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PUBLIC HEALTH REVIEW

OCONEE NUCLEAR STATION UNITS 1, 2, and 3

August 1970

Project Officers:

Ted W. Fowler  
Ted W. Fowler

Approved:

Charles L. Weaver  
Charles L. Weaver  
Director, Division of  
Environmental Radiation

James E. Dieckhoner  
James E. Dieckhoner

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
Public Health Service  
Environmental Health Service  
Bureau of Radiological Health  
Division of Environmental Radiation  
Nuclear Facilities Branch

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## INTRODUCTION AND CONCLUSIONS

The purpose of this report is to summarize the results of an evaluation by the Public Health Service of the environmental effects of the Oconee Nuclear Station (Units 1, 2, and 3) under construction on Lake Keowee near Seneca, South Carolina. The evaluation is based on information provided by the Duke Power Company in its Final Safety Analysis Report (FSAR)<sup>(1)</sup> and the Company's "Environmental Statement"<sup>(2)</sup> relative to the National Environmental Policy Act. The technical review of these documents was conducted by the staff of the Nuclear Facilities Branch of the Service's Bureau of Radiological Health. This review is an updating of an evaluation of the facility that was made by the Branch prior to construction.<sup>(4)</sup> This earlier evaluation was based on information contained in the Preliminary Safety Analysis Report<sup>(5)</sup> and the results of a site survey made in May 1967.

The review and evaluation covered by this report are directly responsive to requirements placed on Federal agencies by the National Environmental Policy Act and as such are intended to state the position of the Department of Health, Education, and Welfare on the environmental effects of this facility. The report is also intended, in the traditional role of the Public Health Service, to provide information to the South Carolina State Board of Health for use in conducting their radiological health program for the facility. A number of technical documents<sup>(3,6)</sup> have been developed by the Branch to expand the details of and support the discussions presented.

4. The gaseous discharge limit for the facility should consider the multiple units and should be applied in such a way to avoid additive effects that would exceed recommended guides at the nearest point of residence, which is within the site boundary. If some valid justification exists for not considering the location of this residence then it should be presented for critical review and analysis.

5. Within the context of the above we are of the opinion that the Oconee Nuclear Station can be operated without significant effect on the environment or the public.

#### RADIOACTIVE WASTE DISCHARGES

Since this nuclear power station will eventually have three units operating at this site, the radioactive waste discharge limits must account for this factor. The liquid waste treatment system design proposed is similar to other pressurized water reactor systems and should be capable of reducing the level of radioactivity in the effluent sufficiently so that exposures to the population through the water pathway will be well within Federal Radiation Council guidance.

As stated in section 11.1.2.3.1 of the FSAR, (1) the gaseous waste disposal system for Unit 3 is normally separated from the system used jointly for Units 1 and 2. The applicant must exercise caution to see that the combined releases from both systems do not exceed the Station's

discharge limit. Administrative controls, alluded to in section 11.1.1.4,<sup>(1)</sup> may need to be augmented by an automatic system. This system would sum the gaseous discharges from all disposal systems and provide suitable alarms or automatically activated devices which would correct the situation.

The gaseous discharge limit for Oconee Nuclear Station is based on the dose delivered to a person situated at the station's boundary. This criterion assumes that there are no permanent residents within this boundary. Throughout the FSAR,<sup>(1)</sup> reference is made to an exclusion area radius of one mile. This figure is used in section 2.3.2<sup>(1)</sup> in calculating the atmospheric dilution factor to which gaseous radioactive effluents will be subjected before members of the general public may be exposed. It is also stated,<sup>(1)</sup> however, that there will be a leased residence within this radius, at a distance of 4,470 feet from the reactor building. The occupants of this residence must be considered as receiving their exposure on a continuous basis. The applicant should consider the distance to this residence when calculating his atmospheric dilution factor. If some valid justification exists for not considering the location of this residence, then this justification must be presented for critical review and analysis.

The applicants environmental statement lacks a definitive statement of company policy with respect to the intent of the recent proposed amendments to Parts 20 and 50 of the Atomic Energy Commission regulations

This review included consideration of radioactive waste handling, environmental surveillance, emergency planning, and potential radiation doses to the public. The major conclusions of this review are as follows:

1. All three units of the facility are typical of pressurized water reactors of current design<sup>(3)</sup> and contain the best waste systems available when the design was finalized. Radioactivity discharges are expected to be low and of minimal health risk as indicated by our recent studies. The environmental statement should, however, contain a commitment by the Company to use all waste systems in such a way that discharges will be kept as low as practicable.
2. We are satisfied that the applicant will work with the South Carolina State Board of Health in its responsibility to conduct surveillance of the operation of the facility and that adequate monitoring will be performed.
3. Although the Company has developed an emergency plan and included the health department in its notification list, we would like to see a clearer recognition by the Company that the State is the only agency that can initiate protective actions in the offsite area and of the Company's commitment to assist the State in this regard by immediate notification of all incidents, by providing source monitoring data, and by monitoring of offsite areas.

regarding the reduction of radioactive discharges to the lowest practicable level. It would be desirable for such a statement to be included that would clearly indicate the applicant's intentions with respect to the management of gaseous and liquid radioactive waste discharges to the environment.

#### ENVIRONMENTAL SURVEILLANCE

The applicant indicates in the environmental statement<sup>(2)</sup> that levels of radioactivity discharged from Oconee Nuclear Station "will be confirmed by a continual environmental radioactivity monitoring program conducted by Duke Power Company with backup environmental monitoring by the South Carolina Board of Health and the U.S. Atomic Energy Commission." It may be of mutual benefit to both Duke Power Company and the South Carolina Board of Health to develop a cooperative environmental surveillance program. This is so even if the only objectives are to eliminate a duplication of effort and to exchange data. In any case; however, it is important that the South Carolina Board of Health's program include the proposed backup monitoring which will provide a cross-check of any surveillance data supplied by the applicant.

In general, the pre-operational surveillance program submitted by the applicant is adequate; however, it is suggested that (1) the program include monitoring of liquid effluents in the tailrace of the Keowee Hydroelectric Plant, where liquid wastes from the Oconee Nuclear Station are discharged, and in Lake Keowee for specific radionuclides



which will be discharged and which could be significant in terms of reconcentration in freshwater fish, (2) the edible portion of food crops and vegetation need be sampled at the time of harvest instead of the proposed quarterly frequency, and (3) radiation dose assessment be done at the residence within the exclusion area with a TLD monitoring system.

In addition to a specific analysis of fish and water for  $^{90}\text{Sr}$  and  $^{137}\text{Cs}$  as proposed by the applicant, the surveillance program should include monitoring of liquid effluents in the tailrace of the Keowee Hydroelectric Plant and in Lake Keowee for  $^{134}\text{Cs}$ ,  $^{58}\text{Co}$ ,  $^{60}\text{Co}$ ,  $^{89}\text{Sr}$ , and  $^{131}\text{I}$  which are the expected critical radionuclides based on measurements made at Yankee Nuclear Power Station<sup>(6)</sup> during a Division of Environmental Radiation (DER) field study. The majority of the  $^{134}\text{Cs}$  is reconcentrated in edible fish tissue and some of the  $^{58}\text{Co}$ ,  $^{60}\text{Co}$ , and  $^{131}\text{I}$  may also be deposited in the edible portion of fish. In general,  $^{89}\text{Sr}$ ,  $^{58}\text{Co}$ , and  $^{60}\text{Co}$  are not significant from a population exposure standpoint because they concentrate in non-edible portions of fish, i.e., strontium in the bone and cobalt in the liver and kidney. Iodine-131 is a significant critical radionuclide mainly because of its relatively high radiotoxicity. Although the  $^{131}\text{I}$  is mainly concentrated in the fish thyroid, some of the  $^{131}\text{I}$  may be deposited in the edible portion of the fish. Should detectable concentrations of these specific radionuclides be found during the operation of the plant, the  $^{89}\text{Sr}$  to  $^{90}\text{Sr}$ , and  $^{134}\text{Cs}$  to  $^{137}\text{Cs}$  ratios will provide an indication as to the relative contributions of fallout and Oconee discharges.

The applicant stated in the PSAR<sup>(5)</sup> that the operational surveillance program "will be modified as indicated by experience, particularly by the kinds and quantities of radioactive liquid and gaseous wastes released, as well as by environmental monitoring results." Thus, it appears that the applicant plans to periodically evaluate plant discharges and to modify the surveillance program as indicated by changes in the radionuclide composition of the wastes. The applicant also plans to make the results of the Oconee Environmental Radioactivity Monitoring Program available to the State of South Carolina and interested Federal agencies. If the applicant reports its surveillance results in terms of specific radionuclides and if the surveillance program is continually modified as indicated by experience, both the State of South Carolina and the appropriate Federal agencies can use the surveillance data provided by the applicant to determine population doses in the environs of Oconee Nuclear Station from all sources including the facility.

The results of an environmental surveillance program that includes the suggested specific radionuclide analysis will provide useful data for subsequent evaluation of the critical population exposure pathways from operation of the proposed Oconee plant.

#### RADIOLOGICAL ASSISTANCE PLANNING

The importance of emergency planning was emphasized in the public health evaluation of Oconee Nuclear Station dated December 1966<sup>(4)</sup> and since the writing of this report, an emergency plan has been established

at Oconee. The applicant stated in the FSAR<sup>(1)</sup> that they gave copies of their emergency plan to the South Carolina State Board of Health, the AEC Emergency Radiological Monitoring Team, and other participating outside emergency units who discussed the plan with the utility. In our judgment, the applicant should make maximum use of emergency planning capability in order to provide full protection to the public in all accident and emergency situations. In this regard, he should formally recognize that only the State has the authority to initiate action measures to protect the public health and that he will immediately notify the State of all incidents, that he will provide source monitoring data, and will otherwise assist the State in designing and carrying out procedures to assess the ensuing environmental levels and their public health effects.

## REFERENCES

1. "Oconee Nuclear Station, Units 1, 2, and 3, Final Safety Analysis Report," The Duke Power Company, June 1969.
2. "Environmental Quality Features of Duke Power Company's Keowee-Toxaway Project," The Duke Power Company, July 1970.
3. "A Pressurized Water Reactor Nuclear Power Station," U.S. Department of Health, Education, and Welfare, Public Health Service, Bureau of Radiological Health, Division of Environmental Radiation, Nuclear Facilities Branch, September 1, 1967.
4. Martin, J.E., NF-67-7, "Public Health Evaluation, Oconee Nuclear Station," U.S. Department of Health, Education, and Welfare, Public Health Service, Bureau of Radiological Health, Division of Environmental Radiation, Nuclear Facilities Branch, August 1967.
5. "Oconee Nuclear Station, Units 1, 2, and 3, Preliminary Safety Analysis Report," The Duke Power Company, December 1966.
6. BRH/DER 70, "Radiological Surveillance Studies at a Pressurized Water Nuclear Power Reactor," Kahn, B., R. Blanchard, et al., in course of review and publication.

