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AUTH. NAME AUTHOR AFFILIATION
COLLINS, D. M. Region 2, Ofc of the Director
RECIP. NAME RECIPIENT AFFILIATION
TUCKER, H. B. Duke Power Co.

SUBJECT: Informs that util has satisfied concerns NRC had re elevated levels of radiocesiums in fish & sediment in vicinity of facility, per util 871130 submittal of supplemental info in response to NRC 870923 ltr. Review encl.

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Official

JAN 28 1988

Duke Power Company
ATTN: Mr. H. B. Tucker, Vice President
Nuclear Production Department
422 South Church Street
Charlotte, NC 28242

Gentlemen:

SUBJECT: ELEVATED LEVELS OF RADIOCESIUMS IN THE ENVIRONMENT - OCONEE NUCLEAR STATION, DOCKET NOS. 50-269, 50-270 AND 50-287

In a letter to the NRC dated November 30, 1987, Duke Power Company (DPC) submitted supplemental information in regard to elevated levels of radiocesiums in fish and sediment in the vicinity of the Oconee Nuclear Station (ONS). We requested this supplemental information in a letter dated September 23, 1987 (NRR) in order to complete our review of the issues identified in a letter to the NRC from Duke Power Company dated April 17, 1987.

We have completed our review of the supplemental information submitted by your staff and prepared a brief report. In the report, we have concluded that Duke Power Company has adequately addressed our concerns.

Should you have any further questions regarding these matters, please contact J. B. Kahle (404-331-6968) or W. B. Gloersen (404-331-6279).

Sincerely,

Douglas M. Collins, Chief
Emergency Preparedness and
Radiological Protection Branch
Division of Radiation Safety
and Safeguards

Enclosure:
Review of DPC's Response

cc w/encl:
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IE06

ENCLOSURE

REVIEW OF DUKE POWER COMPANY'S RESPONSE TO NRC STAFF REPORT ON ELEVATED LEVELS OF RADIOCESIUMS IN THE ENVIRONMENT AROUND THE OCONEE NUCLEAR POWER PLANT

1.0 INTRODUCTION

By a Task Interface Agreement, dated June 19, 1987, Region II requested NRR's assistance in evaluating information contained in a letter from Mr. Hal B. Tucker, Duke Power Company (DPC), to the Nuclear Regulatory Commission, dated April 17, 1987 (Ref. 1). This information was submitted in response to an NRC staff report on elevated levels of radiocesiums in the environment around the Oconee Nuclear Power Plant (Ref. 2). Supplemental information was submitted by DPC in a letter dated November 30, 1987 (Ref. 3).

Three principal concerns were identified in Ref. 2:

1. There is a potential for radioactive materials to seep from the chemical treatment ponds (i.e., CTP-1, CTP-2 and CTP-3) on the Oconee site through the ground water to nearby waterbodies, and thus expose members of the public by an unmonitored pathway.

2. There may be a significant unaccounted for dose to individuals from the consumption of fish that feed off the bottom of Lake Hartwell (hereinafter referred to as "bottom feeding fish") near the plant discharge area. The Offsite Dose Calculation Manual (ODCM) does not specifically address the buildup of radionuclides in the sediment over the life of the plant, and their incorporation into bottom feeding fish.

3. The Oconee Technical Specifications (i.e., TS 3.9.4) may need to be changed to place a limit on the quantities of radionuclides in CTP-3 that is similar to the limit placed on CTP-1 and CTP-2. In addition, the current TS 3.9.4 should be clarified to indicate whether the radioactive inventory limit on CTP-1 and CTP-2 is applicable to each pond, or the sum of the activities of both ponds.

2.0 EVALUATION

In regard to the migration of radioactive materials from the chemical treatment ponds, DPC states that although the TSs do not require ground water sampling, DPC has collected and analyzed ground water samples from three indicator locations (i.e., downstream of the liquid effluent path and within the site boundary) and two control locations. The data (see Attachments 1 and 2 of Ref. 1) indicate that only two radionuclides (i.e., Nb-95 and Co-60) were detected in groundwater samples taken at the 3 indicator locations over the time period of June 1985 through December 1986. The staff notes that the reported concentrations are less than the lower limit of detection for these radionuclides in surface and drinking water samples (15 picocuries per liter, TS Table 4.11-2). The staff concludes that it is unlikely that radioactive materials are seeping through the groundwater to nearby waterbodies such that they would lead to a significant dose (i.e., a large fraction of the annual dose design objectives in 10 CFR 50 Appendix I) to members of the general public.

In regard to the buildup of radionuclides in fish, DPC states that: (1) the fish samples that exceeded the reporting levels were anomalies; (2) based on previous releases from Oconee and a sensitivity analysis of the models presently in Oconee's ODCM, it is not surprising that the concentrations of Cs-134 and/or Cs-137 in some fish samples would be higher than the reporting levels in TS Table 4.11-3, and presumably these reporting levels will be exceeded in the future; (3) mean sample data for the years 1977, 1979 through 1985 would lead to 50 year integrated dose estimates of about 8.4 mrem and 12 mrem to the whole body and liver, respectively, of a maximally exposed individual; and (4) "bottom feeders" are only a small fraction of the fish caught in the lakes around the Oconee Nuclear Station.

The NRC staff have reviewed the detailed information regarding concentrations of radiocesiums in the environment and conclude the following:

1. The measured concentrations of radiocesiums in at least two types of indicator samples (i.e., fish and sediment) have been consistently greater than the corresponding concentrations in the control samples. This conclusion is based on a review of the data for fish samples for the years 1984 through 1986 (Attachments 4 through 6 of Ref. 1) and the data for sediment samples taken from the tailrace area (Attachment 7 of Ref. 1). For example, the average concentration of Cs-137 in fish at location #063 was 27 times higher (even after excluding the 3 highest values) than the average for the controls for the year 1984, while the average for location #067 was 9 times higher than the control. These elevated levels are most likely due to radioactive liquid effluents released from the Oconee Station.

2. With only a few exceptions the measured concentrations of radiocesiums in environmental samples are less than the reporting levels that are contained in Oconee's TS Table 4.11-3. In general, annual releases of radiocesiums from Oconee over recent years (e.g., 1983 through 1986) have been lower than in earlier years (Attachment 3 of Ref. 1). In the first half of 1987, Oconee released 14 millicuries of Cs-134 and 32 millicuries of Cs-137 (Ref. 4).

3. Over the years 1976 through 1983, Duke Power did not collect, nor did their TSs require them to collect, fish samples in the vicinity of the plant discharge point. For the years prior to 1984, fish samples were collected at location #067 (previously numbered #013) which is about 4.2 miles south-southeast of the plant. Although DPC presently monitors fish near the plant discharge (location #063), Oconee's present TS Table 4.11-1 does not require them to monitor fish near the plant discharge. However, according to DPC's analysis, the total flow past location #067 is only 5% higher than the total flow in the plant discharge area (Ref. 3).

4. There are not sufficient data at this time to require any changes in DPC's dose model for eating fish, or to require any additional limits on the release of radioactive liquid effluents.

In regard to CTP-3, DPC states that: (1) limits were placed on the total activity stored in CTP-1 and CTP-2 since these ponds are radioactive storage areas; (2) the water that is discharged to CTP-3 is only slightly contaminated as compared to the water that is discharged to CTP-1 and CTP-2. The inventory limit on radionuclides in CTP-1 and CTP-2 is applicable to the sum of the

activities of both ponds (Ref. 3). DPC has confirmed that the limit is applicable to radionuclides in the water and radionuclides deposited in the pond. According to DPC's analysis, the radionuclides inventory at CTP-3 is less than 1% of the limit for CTP-1 and CTP-2 (Ref. 3). The staff concludes that there is no need at this time to place a TS limit on the quantities of radionuclides in CTP-3.

3.0 CONCLUSIONS

The staff has reviewed the information submitted by DPC in regard to elevated levels of radiocesiums in fish and sediment in the vicinity of the Oconee Nuclear Power Plant (Ref. 1 and 3). DPC has adequately addressed each of the three concerns identified by the staff in Reference 2.

4.0 REFERENCES

1. Letter with 14 Attachments from Hal B. Tucker, Duke Power Company, to NRC, dated April 17, 1987.

2. Memorandum from Dennis M. Crutchfield, NRC, to Helen Pastis, NRC, dated July 10, 1986.

3. Letter from Hal B. Tucker, Duke Power Company, to NRC, dated November 30, 1987.

4. Letter from Hal B. Tucker, Duke Power Company, to NRC, dated August 28, 1987.