

50-269/270/287

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DESCRIPTION

Ref. Their LTR of 2/21/75
Trans the following

ENCLOSURE

Attached revisions to the previously
submitted report on "Oconee Nuclear
Station Requalification Program for
NRC Licensed Personnel" of 2/21/75.
1p+8p

ACKNOWLEDGED

DO NOT REMOVE

PLANT NAME: Oconee Nuclear power Station
Unit No. 1, 2, and 3
RBT 8/5/77

1 CY ENCL Rec'd

P.H.G.

SAFETY

FOR ACTION/INFORMATION

ENVIRONMENTAL

ASSIGNED AD:

BRANCH CHIEF:

PROJECT MANAGER:

LICENSING ASSISTANT:

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X P. COLLINS

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DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

Regulatory

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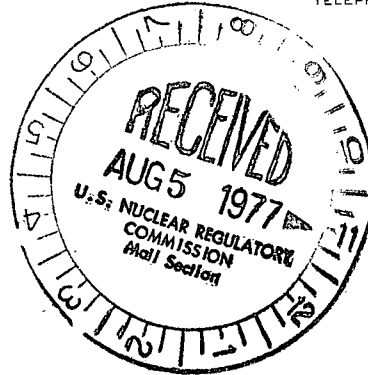
WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

August 1, 1977

TELEPHONE: AREA 704
373-4083

Mr. Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

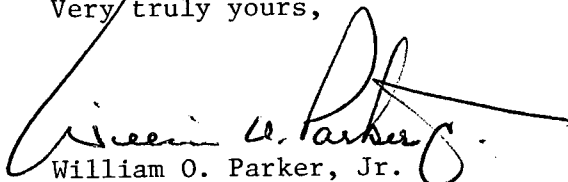
RE: Oconee Nuclear Station
Docket Nos. 80-269, -270, -287



Dear Mr. Case:

Our letter of February 21, 1975 submitted the "Oconee Nuclear Station
Requalification Program for NRC Licensed Personnel". The attached
program indicates revisions which have been made to this program.

Very truly yours,


William O. Parker, Jr.

MST:ge

Attachment

772170334

Regulatory

File Cy

DUKE POWER COMPANY
OCONEE NUCLEAR STATION
REQUALIFICATION PROGRAM
FOR
NRC LICENSED PERSONNEL
DECEMBER 11, 1973

Revised

July 3, 1974
January 7, 1975
February 21, 1975
September 30, 1976
July 18, 1977

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DUKE POWER COMPANY
OCONEE NUCLEAR STATION
REQUALIFICATION PROGRAM
FOR NRC LICENSED PERSONNEL

1.0 Introduction

Appendix A to 10 CFR 55 requires all licensed operators to participate in an approved requalification program. The requalification program for the Oconee Nuclear Station is designed to maintain and demonstrate the continued competence of all licensed operators and senior operators. This program will be conducted on an annual basis and will include a comprehensive exam, formal requalification lectures, on-the-job training and simulator operation. The program will be implemented so as to minimize scheduling difficulties that will be incurred by site management.

2.0 Definitions

2.1 Reactivity Change

A licensed Reactor Operator that performs, or a licensed Senior Reactor Operator that performs, evaluates, or directs, ten (10) reactivity changes from those listed below, in accordance with Section 4.0, On-The-Job Training, Subsection 4.2, meets the requirements of 10 CFR 55, Appendix A, Section 3 (a).

- a) Critical approach from subcritical on source range instrumentation to critical at the point of adding heat on the intermediate range instrumentation.
- b) Any power level change (increase or decrease) of 10% of rated power or greater with control rods in manual.
- c) Reactor shutdown from critical at 15% of rated power to subcritical, shutdown on source range instrumentation.
- d) Boration of deboration during critical operation.
- e) Operation of refueling bridge to change core geometry during refueling.

2.2 Licensed Operator

Individuals who maintain Operator or Senior Operator licenses and who are actively and extensively engaged in the day-to-day operation of the plant.

Any licensed operator who has not been actively performing the functions of an operator or senior operator for a period of four months or longer, shall, prior to resuming licensed activities, participate in an appropriate requalification program pursuant to 10CFR 55.31 (e).

2.3 Backup Licensee

Individuals who maintain Operator or Senior Operator licenses for the purpose of providing backup capability to the Operating Staff.

2.4 Training Instructor/Operations

A supervisor normally assigned no other duties except instructing, coordinating, and record keeping for pre-license operator training programs and licensed operator requalification program.

3.0 Examinations/Lectures

Annually, all SRO and RO licensed personnel will take a written examination. The examination will be given in multiple segments approximately five weeks apart following the lecture series for that segment.

Any operator who scores less than 70 percent overall on the Annual Re-qualification exam shall be removed from licensed duties and placed in an Accelerated Requalification Program. The individual will be reevaluated by a comprehensive written exam paralleling the annual exam in format and by on oral interview with the Training Supervisor to determine his knowledge level. The results of the oral and written exam will be forwarded to the Operating Superintendent for determination of return to licensed duties.

Requalification lectures are intended to be given on an annual basis for all licensed operators in six segments of approximately 3 days duration each (approximately 5 hours lectures and 3 hours group discussion or self study per day). The lecture schedule prior to each annual examination segment will be determined based on weak areas shown from preceding annual exams.

Following the completion of all the annual exam segments, Remedial Requalification lectures will be determined by the results of the annual exam (i.e., categories in which individuals received less than 80 percent). Attendance for all SRO and RO licensed personnel at these lectures will be based on the results of the annual requalification exam (i.e., less than 80 percent on a category requires mandatory attendance at lectures on topics of that category).

Following the completion of each segment of the annual exam, a special Individualized Study Program will be instituted for anyone scoring less than 70 percent on a category to enable the individual to increase his knowledge level for that category in a timely fashion. This program will be in addition to the lectures following completion of all segments of the annual examination but will occur immediately following completion of the segment for which a grade of less than 70 percent was attained. The individualized study program would be no more than five (5) weeks in duration and an examination to evaluate the retraining would occur at the completion of the individualized study program.

Any individual failing a re-examination of a segment of the annual examination following an Individualized Study Program will be evaluated by the Superintendent of Operations to determine the course of action. This action will be documented in the individual's training record. Lecture

attendance will be based on 80% categorical grades from the annual re-qualification exam.

"Quality Assurance for Operation" is now a topic covered as part of the pre-license training and as such would be considered as a topic for re-qualification lectures.

Contingency meetings are an integral part of nuclear plant operation and are normally scheduled as the need arises by plant management.

4.0 On-The-Job Training

4.1 In order to insure the continued proficiency of licensed operators in meeting all operating situations, on-the-job training will play a major role in the Oconee requalification program. Technical Specifications, selected Operating Procedures and Emergency Procedures will be reviewed on shift according to a formal schedule. The effectiveness of this review will be evaluated by testing as a category on the annual exam. All changes to Operating Procedures, facility design changes and revisions to Technical Specifications will be reviewed on shift also. Documentation of the specified reviews is filed in the individual's training records as per Section 6.0, Records.

4.2 All licensed Operators will participate, to the maximum extent possible, in plant evolutions involving reactivity changes. These will include those items defined as reactivity changes in Section 2.0, Definitions. During the two-year license term, a minimum of ten such evolutions shall be conducted or directed by each licensed Senior Operator with no more than three (3) such evolutions being any combination of Items 2.1(d) and 2.1(e) of Section 2.0, Definitions, Subsection 2.1, Reactivity Change.

4.3 All licensed personnel will participate in a one-week (40 hours) simulator training course, consisting of 20 hours classroom and 20 hours simulator, at an approved facility such as the B&W simulator, Lynchburg, Virginia, during the two-year license term.

The B&W simulator is considered the only existing simulator appropriate for use by Oconee personnel in meeting the requirements of Appendix A to 10 CFR Part 55. However, we retain the option to use other simulators that become available in the future and are approved by the NRC for use by Oconee personnel.

This training will include operation during emergency or abnormal conditions including the following:

- a) Reactor Startup
- b) 15-100% PWR Maneuver
- c) 100%-155 PWR Maneuver
- d) Power Operations (Manual and Auto)
- e) Plant Shutdown/Cooldown
- f) Reactor Trip

- g) Turbine Trip
- h) Steam Line Rupture
- i) RC System Leaks

4.4 Control manipulations at the simulator will be credited the same as manipulations on the Oconee Units.

4.5 Backup licensees will maintain proficiency by any of the following:

- a) Assignment as Duty Engineer (SRO's)
- b) Supervising activities covering control room operation, testing, radioactive waste releases (SRO's)
- c) Standing watch as an Assistant Shift Supervisor or Shift Supervisor (SRO's) or as an Assistant Control Operator or Control Operator (RO's).
- d) Conducting drills or instruction in control room system and procedures.
- e) Supervising Refueling Operations (SRO's)
- f) Supervising Fuel Handling Teams (SRO's)
- g) Conducting Oral Audit Examinations of: Licensed Operators or candidates for NRC License Exams. (Training Staff only).

The backup licensees shall satisfy proficiency requirements by performing the above an average of 4 hours every two (2) months.

5.0 Evaluations

- 5.1 The performance and competency of Operators and Senior Operators will be evaluated by the annual written exam as well as with personal evaluations from supervisors.
- 5.2 Annually each Shift Supervisor will submit a report to the Operating Superintendent, evaluating the performance of each licensed man under his supervision during normal and abnormal operating conditions.
- 5.3 The performance at simulator training of Operators and Senior Operators will be evaluated by the Station Supervisory Staff attending simulator training. Evaluations of personnel will be made by several sources as noted above. The ultimate evaluation will be based on operators performance of his licensed duties at the Oconee Nuclear Station.
- 5.4 The Operating Superintendent will review these reports annually. On the basis of the evaluations, the Operating Superintendent can recommend special training classes and removal from shift duties if necessary. Prior to the license renewal date, the Operating Superintendent will review each Operator's training record. Based on this evaluation he will make recommendations for license renewal or specialized training prior to license renewal.

DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

August 1, 1977

TELEPHONE: AREA 704
373-4083

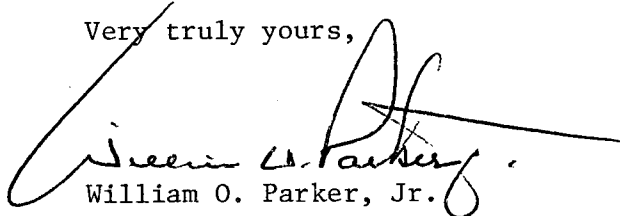
Mr. Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

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

Dear Sir:

My letter dated April 29, 1977 advised you that a probability study of a failure of the Reactor Coolant System in the annular region between the reactor vessel and the cavity shield wall in order to address concerns relative to the Oconee Nuclear Station Reactor Vessel Support System would be submitted in July, 1977. Due to certain refinements and increases in the scope of the study, the report has not been submitted. It is expected that the report will be available for submission in the near future.

Very truly yours,



William O. Parker, Jr.

MST:ge

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6.0 Records

6.1 Training records for each Operator and Senior Operator will be maintained and shall contain the following:

- a) Copies of the graded annual exam.
- b) Re-examinations given after requalification lectures.
- c) Documentation of all training participation.
- d) Records of the number and type of reactivity changes.

6.2 Training Records will be retained for a minimum of six years.

6.3 Evaluations made by Supervisors will be retained in personnel file for a minimum of six years.

7

DUKE POWER COMPANY
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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

November 10, 1977

Central File
50-269
270
287
TELEPHONE: AREA 704
373-4083

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Suite 1217
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

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

Dear Mr. O'Reilly:

Pursuant to the requirements of Oconee Nuclear Station Technical Specification 6.6.2.2.d, this report is submitted describing a condition in which a measured level of radioactivity exceeded the control level by greater than ten times.

On November 7, 1977 analytical results of composited raw water supply grab samples collected in mid-July, August, and September 1977 were reviewed. A summary of the pertinent results of the radioactivity concentrations in these samples is given below:

<u>Sample Location</u>	<u>Tritium Concentration</u>
004.1 Seneca (Control)	< 1.1E-7 μ Ci/ml
006.1 Clemson	(2.9 \pm 0.2)E-6 μ Ci/ml

Tritium concentrations in downstream water samples are dependent upon the tritium concentrations of liquid effluent released from the station. For the period July 1 - September, 1977 a total of 456 curies of tritium were released from the station in liquid effluents. The average release rate for the period was 5.0 Ci/day.

Dilution and dispersion of tritium in liquid effluents between Oconee Nuclear Station and the Clemson water intake has been calculated using the equation for instantaneous release taken from the U. S. Geological Survey Paper No. 443-B, "Dispersion of Dissolved or Suspended Materials in Flowing Streams" by Robert E. Glover (1964), p.5. This equation accounts for longitudinal dispersion only. Conservatism was used in selecting parameters for substitution in the instantaneous release equation to determine the concentration of effluents at Clemson water intake. These assumptions were (1) the elevation of Lake Hartwell is 654.00 feet, (2) the flow of the Keowee River is 1100 cfs, the yearly average, and

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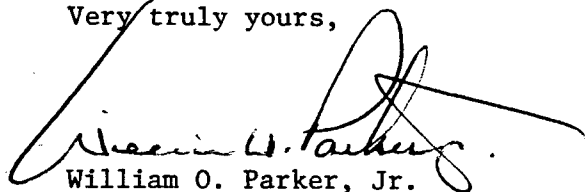
November 10, 1977

(3) an instantaneous release of 5.0 Ci of tritium is made each day several days prior to sampling. The peak concentration which would result at the 006.1 sample point is approximately $2.4\text{E-}6$ $\mu\text{Ci/ml}$.

The calculated tritium concentration is comparable to the observed value of $2.9\text{E-}6$ $\mu\text{Ci/ml}$. Therefore, the observed concentration is within the limits of conservative calculated values.

The Final Environmental Statement for Oconee states that "the largest estimates of dose to the individuals from liquid effluents are at Clemson and Pendleton where drinking water is withdrawn from the Keowee River. The radionuclide making the most important contribution to dose at these locations is tritium (more than 50%)". The dose estimate for any individual consuming Clemson water containing 2.9×10^{-6} $\mu\text{Ci/ml}$ of tritium is 0.29 mrem/year if these tritium concentrations were maintained over the year. This estimate of dose is less than 0.3% of the dose from natural background and less than 0.06% of the limits of 10CFR20. Therefore, it is concluded that the observed anomalous tritium concentration does not adversely affect public health and safety.

Very truly yours,



William O. Parker, Jr.

RLG:ge

DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

November 1, 1977

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TELEPHONE: AREA 704
373-4083

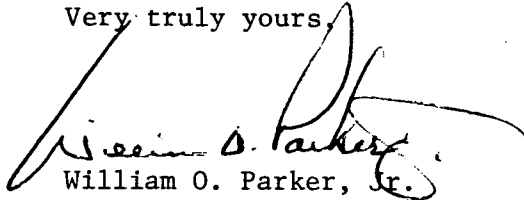
Mr. J. P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Suite 1217
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

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

Dear Mr. O'Reilly:

My letter dated August 26, 1977 informed you of our intentions to submit a summary environmental report for Oconee Nuclear Station pursuant to Oconee Technical Specification Appendix B 1.B. This report is nearing completion but due to delays encountered, the report will be submitted December 1, 1977.

Very truly yours,


William O. Parker, Jr.

LJB:ge

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DUKE POWER COMPANY
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422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

Central File

*50-269
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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

October 31, 1977

TELEPHONE: AREA 704
373-4083

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Suite 1217
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

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

Dear Mr. O'Reilly:

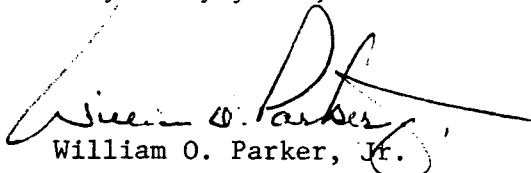
Pursuant to the requirements of Oconee Nuclear Station Technical Specification 6.6.2.2.a, this report is submitted describing a condition in which measured iodine 131 levels exceeded 10pCi/l in individual milk samples.

On October 26, 1977, analytical results of a milk sample collected on October 5, 1977 were reviewed. A summary of the pertinent results of these analyses is given below:

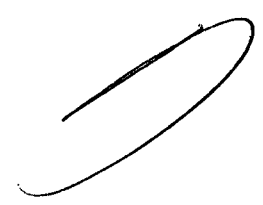
<u>Sample Location</u>	<u>I-131 Activity (pCi/liter)</u>
002.1 Five miles West of site on Highway 183	19 \pm 1

This observed value is comparable with concentration of iodine 131 seen in other parts of South Carolina by state officials and other power companies. The results were apparently due to the September 17, 1977 Chinese nuclear test. The observed values were not a result of a plant related release.

Very truly yours,


William O. Parker, Jr.

RLG:ge



DUKE POWER COMPANY
POWER BUILDING
422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

Central File
50-269
270
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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

August 25, 1977

TELEPHONE: AREA 704
373-4083

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Suite 1217
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

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

Dear Mr. O'Reilly:

Pursuant to the requirements of Oconee Nuclear Station Technical Specification 6.6.2.2.d, this report is submitted describing a condition in which a measured level of radioactivity exceeded the control level by greater than ten times.

On August 19, 1977, analytical results of fish samples collected in July, 1977, were reviewed. Given below is a summary of the pertinent results of the radioactivity concentration of these samples.

<u>Sample Location</u>	<u>Type</u>	<u>Radionuclide Concentration</u> pCi/g(wet)
000.5 1-mile radius of site and Lake Keowee (Control)	Carp	Cs-137 $< 5.3E-2$
013 Hartwell Reservoir 5.8 miles south of Keowee Dam	Carp	Cs-137 $1.2E0 \pm 6E-2$

Fish samples are collected for Oconee Nuclear Station by the State of South Carolina Wildlife Resources Division on a rotating basis. As a result, no carp sample was available at the control location during July, 1977. The control value listed above is for a sample collected in October, 1976 and is conservative.

Since carp is considered a bottom feeder, it is reasonable to assume that the Cs-137 concentration in carp would be the same order of magnitude as the concentration in sediment over which the fish feeds.

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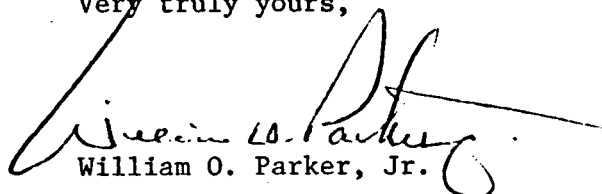
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Mr. James P. O'Reilly, Director
August 25, 1977
Page Two

The Cs-137 activity in bottom sediment at location 005.2 (near location 013) collected three days prior to the carp sample showed a Cs-137 activity of (2.1 ± 0.2) EO pCi/g(dry). This value compares favorably with the measured value in the carp sample.

The dose model of Regulatory Guide 1.109 was used to calculate the dose which would result from consuming fish for a year with a Cs-137 activity of 1.2 EO pCi/g(wet). The maximum annual dose to the whole body, assuming 21 kg/yr consumption, would be 1.8 mR/yr. The average annual dose to the whole body, assuming 6.9 kg/yr consumption, would be 0.6 mR/yr. Therefore, it is concluded that the health and safety of the public is not affected by this measured Cs-137 concentration in carp.

Very truly yours,



William O. Parker, Jr.

LJB:ge

DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

August 18, 1977

TELEPHONE: AREA 704
373-4083

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Suite 818
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

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

Dear Mr. O'Reilly:

Pursuant to the requirements of Oconee Nuclear Station Technical Specification 6.6.2.2.d, this report is submitted describing conditions in which measured levels of radioactivity exceeded the control levels by greater than ten times and conditions in which measured levels of radioactivity exceeded the control level by greater than fifty times.

On August 12, 1977, analytical results of composite surface water samples collected early in April, May, and June, 1977 were reviewed. Given below is a summary of the pertinent results of the radioactivity concentrations of these samples:

<u>Sample Location</u>	<u>Type of Sample</u>	<u>Tritium Concentration</u>
00.3, Hwy. 183 Bridge N. of site (Control)	Surface	$(1.1 \pm 0.9)E-7$ μ Ci/ml
000.7, Hwy. 183 Bridge S. of Site	Surface (>50x)	$(1.6 \pm 0.1)E-5$ μ Ci/ml
013 Hartwell Reservoir 5.8 mi. S. of Keowee Dam	Surface (>10x)	$(1.6 \pm 0.2)E-6$ μ Ci/ml

Tritium concentrations in water samples collected are dependent upon the tritium concentrations of liquid effluent released from the station immediately prior to and during sampling. For the period March 15, 1977 through June 7, 1977, a total of 540 curies of tritium were released from the station in liquid effluents. The average release rate for the period was 6.35 Ci/day.

B ma'

Based on the curies released and the continuous sampler design at location 000.7, it is calculated that the activity in the sample should have been approximately $5E-5$ $\mu\text{Ci/ml}$. This concentration compares favorably with the observed value at location 000.7 near the effluent discharge point.

Dilution and dispersion of tritium in liquid effluents between Oconee Nuclear Station and the Clemson water intake has been calculated using the equation for instantaneous release taken from the U. S. Geological Survey Paper No. 443-B, "Dispersion of Dissolved or Suspended Materials in Flowing Streams" by Robert E. Glover (1964), p.5. This equation accounts for longitudinal dispersion only. Conservatism was used in selecting parameters for substitution in the instantaneous release equation to determine the concentration of effluents at the Clemson water intake. These assumptions were (1) the elevation of Lake Hartwell is 654.00 feet, (2) the flow of the Keowee River is 1100 cfs, the yearly average and, (3) an instantaneous release of 6.35 Ci per day. Using this method, the average concentration of tritium at the Clemson water intake should be approximately $1.1E-6$ $\mu\text{Ci/ml}$. The calculated tritium concentration is approximately the same as that observed in Hartwell Reservoir just upstream of the Clemson water intake.

The Final Environmental Statement for Oconee states that "the largest estimates of dose to the individuals from liquid effluents are at Clemson and Pendleton where drinking water is withdrawn from the Keowee River. The radionuclide making the most important contribution to dose at these locations is tritium (more than 50%)." The maximum dose estimate (using the Regulatory Guide 1.109 model) for any individual consuming Clemson water containing $1.1E-6$ $\mu\text{Ci/ml}$ of tritium is 0.11 mrem/year if these tritium concentrations were maintained over the year. This estimate of dose is less than 0.1% of the dose from natural background and less than 0.05% of the limits of 10CFR20. Therefore, it is concluded that the observed anomalous tritium concentrations do not affect public health and safety in any way.

Very truly yours,

W. O. Parker, Jr.

William O. Parker, Jr. *By ASB*

LJB:ge

DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

Central File

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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

August 18, 1977

TELEPHONE: AREA 704
373-4083

Mr. James P. O'Reilly, Director
U. S. Nuclear Regulatory Commission
Suite 818
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

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

Dear Mr. O'Reilly:

Pursuant to the requirements of Oconee Nuclear Station Technical Specification 6.6.2.2.d, this report is submitted describing conditions in which measured levels of radioactivity exceeded the control levels by greater than ten times and conditions in which measured levels of radioactivity exceeded the control level by greater than fifty times.

On August 12, 1977, analytical results of composite surface water samples collected early in April, May, and June, 1977 were reviewed. Given below is a summary of the pertinent results of the radioactivity concentrations of these samples:

<u>Sample Location</u>	<u>Type of Sample</u>	<u>Tritium Concentration</u>
00.3, Hwy. 183 Bridge N. of site (Control)	Surface	$(1.1 \pm 0.9)E-7$ μ Ci/ml
000.7, Hwy. 183 Bridge S. of Site	Surface (>50x)	$(1.6 \pm 0.1)E-5$ μ Ci/ml
013 Hartwell Reservoir 5.8 mi. S. of Keowee Dam	Surface (>10x)	$(1.6 \pm 0.2)E-6$ μ Ci/ml

Tritium concentrations in water samples collected are dependent upon the tritium concentrations of liquid effluent released from the station immediately prior to and during sampling. For the period March 15, 1977 through June 7, 1977, a total of 540 curies of tritium were released from the station in liquid effluents. The average release rate for the period was 6.35 Ci/day.

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Based on the curies released and the continuous sampler design at location 000.7, it is calculated that the activity in the sample should have been approximately $5E-5$ $\mu\text{Ci/ml}$. This concentration compares favorably with the observed value at location 000.7 near the effluent discharge point.

Dilution and dispersion of tritium in liquid effluents between Oconee Nuclear Station and the Clemson water intake has been calculated using the equation for instantaneous release taken from the U. S. Geological Survey Paper No. 443-B, "Dispersion of Dissolved or Suspended Materials in Flowing Streams" by Robert E. Glover (1964), p.5. This equation accounts for longitudinal dispersion only. Conservatism was used in selecting parameters for substitution in the instantaneous release equation to determine the concentration of effluents at the Clemson water intake. These assumptions were (1) the elevation of Lake Hartwell is 654.00 feet, (2) the flow of the Keowee River is 1100 cfs, the yearly average and, (3) an instantaneous release of 6.35 Ci per day. Using this method, the average concentration of tritium at the Clemson water intake should be approximately $1.1E-6$ $\mu\text{Ci/ml}$. The calculated tritium concentration is approximately the same as that observed in Hartwell Reservoir just upstream of the Clemson water intake.

The Final Environmental Statement for Oconee states that "the largest estimates of dose to the individuals from liquid effluents are at Clemson and Pendleton where drinking water is withdrawn from the Keowee River. The radionuclide making the most important contribution to dose at these locations is tritium (more than 50%)." The maximum dose estimate (using the Regulatory Guide 1.109 model) for any individual consuming Clemson water containing $1.1E-6$ $\mu\text{Ci/ml}$ of tritium is 0.11 mrem/year if these tritium concentrations were maintained over the year. This estimate of dose is less than 0.1% of the dose from natural background and less than 0.05% of the limits of 10CFR20. Therefore, it is concluded that the observed anomalous tritium concentrations do not affect public health and safety in any way.

Very truly yours,

W. O. Parker, Jr.

William O. Parker, Jr. *By AM*

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DUKE POWER COMPANY

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Central File

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WILLIAM O. PARKER, JR.
VICE PRESIDENT
STEAM PRODUCTION

August 1, 1977

TELEPHONE: AREA 704
373-4063

Mr. Dudley Thompson, Acting Director
U. S. Nuclear Regulatory Commission
Suite 818
230 Peachtree Street, Northwest
Atlanta, Georgia 30303

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

Dear Mr. Moseley:

Pursuant to the requirements of Oconee Nuclear Station Technical Specification 6.6.2.2.d, this report is submitted describing a condition in which measured levels of radioactivity exceeded the control levels by greater than ten times.

On July 25, 1977 analytical results of aquatic vegetation collected on July 5, 1977 were reviewed. A summary of the pertinent results of the radioactivity concentrations of these samples is given below:

<u>Sample Location</u>	<u>Activity (pCi/gm wet)</u>		
	(Co-58)	(Cs-134)	(Cs-137)
000.5 Lake Keowee (Control	$<9 \times 10^{-2}$	$<6 \times 10^{-2}$	$<9 \times 10^{-2}$
005.2 Hwy. 27 Bridge	3	4	7

Radioactivity concentrations in downstream aquatic vegetation samples are dependent upon the corrosion and fission product concentrations in liquid effluents released from the station and upon long term bioaccumulation factors. Assuming that the aquatic vegetation activity is effectively determined by the releases which have occurred in the past year and a half (1/1/76 through 6/30/76) and using the bioaccumulation factors given on page 131 of the Final Environmental Statement for Oconee Nuclear Station, expected activities are calculated below for aquatic vegetation in the Keowee Dam tailrace and compared with the average observed tailrace vegetation activities for 1976. These values are then compared with the observed values reported here for the 005.2 site several miles downstream from the tailrace.

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Mr. Norman C. Moseley, Director

Page Two

August 1, 1977

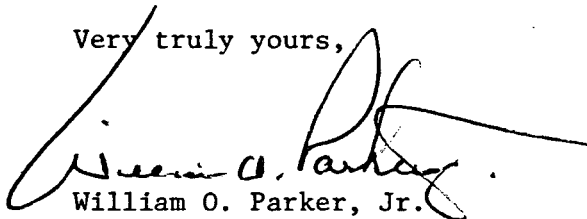
	<u>Total Curies Released</u> <u>(1/1/76 - 6/30/77)</u>	<u>Bioaccumulation</u> <u>Factor</u>	<u>Tailrace Aq. Veg. (pCi/gm)</u> <u>Expected</u>	<u>Observed</u>
Co-58	2.48	2.5×10^3	4	108
Cs-134	2.48	2.5×10^4	36	41
Cs-137	1.58	2.5×10^4	23	25

NOTE: Tailrace flow for 1/1/76 - 6/30/77 was 1.75×10^{12} liters.

A comparison of the expected and average 1976 observed tailrace aquatic vegetation activities shows remarkable correlation for Cs-134 and Cs-137. The observed activity for Co-58 implies that certain transfer coefficients may have been larger in this case than generally assumed in the Final Environmental Report.

In any event, the aquatic vegetation activity observed at the Highway 27 Bridge should be comparable to, but several times lower than, the activity observed at the tailrace, and indeed, such is the case.

Very truly yours,



William O. Parker, Jr.

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