



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-269/78-17, 50-270/78-17 and 50-287/78-18

Docket Nos.: 50-269, 50-270 and 50-287

License Nos.: DPR-38, DPR-47 and DPR-55

Licensee: Duke Power Company
P. O. Box 33189
422 South Church Street
Charlotte, North Carolina 28242

Inspection at: Oconee Nuclear Station

Inspection conducted: August 7, 1978

Inspector: W. J. Millsap

Reviewed by:

A. F. Gibson
A. F. Gibson, Chief
Radiation Support Section
Fuel Facility and Materials Safety Branch

9/20/78
Date

Inspection Summary

Inspection on August 7, 1978 (Report Nos. 50-269/78-17, 50-270/78-17 and 50-287/78-18)

Area Inspected: Whole body counting practices and procedures, and a test count of the NRC phantom on the whole body counter. The inspection involved 3 inspector-hours on site by one NRC inspector.

Results: In the one area inspected, no items of noncompliance or deviations were identified.

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DETAILS I

Prepared by: William J. Millsap
W. J. Millsap, Radiation Specialist
Radiation Support Section
Fuel Facility and Materials
Safety Branch

20 Sept 78
Date

Date of Inspection: August 7, 1978

Reviewed by: A. F. Gibson
A. F. Gibson, Chief
Radiation Support Section
Fuel Facility and Materials
Safety Branch

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1. Persons Contacted

- *J. E. Smith, Station Manager
- *R. M. Koehler, Technical Services Superintendent
- *C. T. Yongue, Station Health Physicist
- *R. T. Bond, Licensing and Projects
- *D. J. Vito, Licensing and Projects
- *Steve Morgan, Health Physics Laboratory Technician

*Denotes those present at the exit interview

2. Questionnaire Review

The inspector reviewed with a licensee representative his answers to the questions concerning whole body counting sent to him in a letter signed by J. T. Sutherland, dated July 31, 1978. A summary of certain aspects of these results is given below.

a. Whole Body Counting System

This system utilizes a chair whole body counter designed by Masse and Bolton. The two detectors, each NaI (Tl) crystals, are of the following sizes: for the torso, 3" diameter x 3" thick, and for the thyroid, 1½" diameter x ½" thick.

The torso crystal is shielded on the sides and back by two inches of lead incased in steel. The chair, which acts as a shadow shield for the crystals, is constructed with ½" of steel on the back and 3/4" of steel on the bottom.

The system uses a Northern Scientific Model 710 Multichannel Analyzer with 1024 channels which can be used by either of the detectors. Each channel represents approximately 2 keV of energy.

Data reduction is accomplished on-site using a Hewlett Packard Model 9830 computer, which utilizes a program of the "matrix method" type supplied by Applied Physical Technology, Inc.

The torso detector is calibrated for the following radio-nuclides: Cs-134, Cs-137, Co-58 and Co-60. The thyroid detector is calibrated for I-131.

The lower limit of detection for Co-60 and Cs-137 in the torso is approximately 7 nCi. The lower limit of detection for I-131 in the thyroid is approximately 10 nCi. The normal period of count is 600 seconds.

b. Procedures

Health Physics Procedural Guide No. IV-1 (Interim Guidance For Scheduling of Body - Burden Analyses) states that body burden analysis should be performed as soon as practicable on each individual who has been newly assigned a visitor or permanent Health Physics badge number; on each individual who has worked at a non-Duke Nuclear facility since last receiving a body - burden analysis at a Duke facility; on each individual who has accumulated 40 or more MPC - hours of exposure to air particulates, iodines or tritiated water vapor during the immediate past seven - consecutive -day period; on each individual who has been involved in a real or suspected accidental internal exposure incident; and on each individual who has a visitor or permanent Health Physics badge number and who is terminating employment or assignment with Duke Power Company. In addition Oconee Nuclear Station Procedure HP/O/B/1000/63 states that a routine monitoring schedule is in effect to include at least annual monitoring of all persons frequenting the Radiation Control Area, or having significant potential for internal exposure, as determined by the Station Health Physicist. In addition, Procedure HP/O/13/1000/63 states that if a body burden analysis reveals the presence of radioiodine, a thyroid count should be scheduled.

Oconee Nuclear Station Procedure HP/O/B/1001/08 (Operating/ Calibration Procedure For The Body Burden Analyzer) states that calibration of the whole body counter is to be accomplished every six months. Calibration is performed using two five gallon jerry

cans filled with demineralized water and placed in an "L" shaped arrangement to simulate a human being. The upper can is fitted with a glass tube down the center into which point sources are placed during calibration. The calibration is performed using a program developed by Applied Physical Technology, Inc. Procedure HP/0/13/100/63 states that operational checks (energy and efficiency checks) are performed daily on the whole body counter during use.

Oconee Nuclear Station Procedure HP/0/B/1000/63 (Body Burden Analysis Including Radioiodine and Tritium) states that if a body burden analysis reveals internal activities greater than or equal to 5% Maximum Permissible Organ Burden additional analysis are performed and a dose commitment calculation is made. Also, if an acute intake of greater than 10% Maximum Permissible Organ Burden is discovered, an investigation for possible overexposure is initiated and a dose commitment assigned.

3. Test Count of the NRC Phantom

At the request of the inspector, the licensee counted a torso phantom provided by the inspector. The licensee informed the inspector of the amount of each radionuclide detected in the phantom. Since this phantom will be counted by other licensees in Region II, the actual amount of each radionuclide present in the phantom at the time of the count was not communicated to the licensee at the time of this inspection. A summary report will be provided to participating licensees at the conclusion of the test program.

4. Exit Interview

The inspector met with the station manager and other members of the plant staff at the conclusion of the inspection on August 7, 1978 and summarized the scope and findings of the inspection. Items discussed included certain information to be forwarded to the inspector at the Region II office and the issuance of a summary report once the test program is completed.