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

Report No.: 50-369/78-19

Docket No.: 50-369

License No.: CPPR-83

Licensee: Duke Power Company
422 South Church Street
Charlotte, North Carolina 28242

Facility Name: McGuire Unit 1

Inspection at: McGuire site, Lake Norman, North Carolina

Inspection conducted: July 10-14, 1978

Inspectors: G. L. Troup
L. L. Jackson

Reviewed by: _____ 9/8/78
A. F. Gibson, Chief Date
Radiation Support Section
Fuel Facility and Materials Safety Branch

Inspection Summary

Inspection on July 10-14, 1978 (Report No. 50-369/78-19)
Areas Inspected: Routine, unannounced inspection of the radiation protection and radioactive waste management programs including respiratory protection program; radiation protection training; radioactive material storage; health physics and chemistry staffing; waste handling procedures; installation and preoperational testing of liquid and solid radioactive waste systems; radiation protection procedures; health physics instrumentation and equipment; power ascension test program, and IE circulars and bulletins. The inspection involved sixty-six inspector-hours on site.
Results: No items of noncompliance or deviations were identified in the areas inspected.

DETAILS I

Prepared by: _____ 9/7/78
G. L. Troup, Radiation Specialist Date
Radiation Support Section
Fuel Facility and Materials Safety Branch

_____ 9/7/78
L. L. Jackson, Radiation Specialist Date
Radiation Support Section
Fuel Facility and Materials Safety Branch

Dates of Inspection: July 10-14, 1978

Reviewed by: _____ 9/8/78
A. F. Gibson, Chief Date
Radiation Support Section
Fuel Facility and Materials Safety Branch

1. Individuals Contacted

Duke Power Company

M. D. McIntosh, Station Manager
*T. L. McConnell, Superintendent, Technical Services
*G. W. Cage, Superintendent of Operations
T. B. Owen, Station Chemist
*T. J. Keene, Station Health Physicist
*L. E. Weaver, Performance Engineer
*W. M. Samples, Technical Services Engineer
R. Leonard, Health Physics Supervisor
J. R. Leonard, Health Physics Supervisor
J. Ferguson, Health Physics Supervisor
R. Propst, Chemistry Supervisor
J. Rowe, Engineer
*Denotes those present at the exit interview.

2. Licensee Actions on Previous Inspection Findings

There were no previous findings in the areas inspected.

3. Unresolved Items

No unresolved items were identified during this inspection.

4. New Fuel Receipt

a. On July 12 the licensee received the first shipment of new fuel for the unit. The inspectors observed the receipt of the shipment and the surveys made by the licensee. Licensee actions met

the requirements of 10 CFR 20.205 for the receipt of radioactive materials. An inspector reviewed the licensee's radiation and contamination surveys and determined that the results were within the limits of 10 CFR 20.205(b)(2) and 20.205(e)(2).

b. The inspectors observed the storage area for the fuel and the work practices in effect during the receipt and storage of the fuel. Areas inspected included use of approved procedures, use of suitable, calibrated instruments, personnel dosimetry, protective clothing, contamination control and access control. The inspectors also observed that access doors to the storage areas were posted as required by 10 CFR 20.203(e). The inspectors had no questions concerning the licensee's work practices.

5. Health Physics Instruments and Equipment

a. FSAR Section 12.3.2.4 describes the portable and laboratory equipment which will be provided in the counting room and available for surveys. An inspector reviewed the list of counting room equipment, such as counter-scalers and scintillation counters and determined that the instruments as described in the FSAR were available on site although the multi-channel gamma analyzer was not operable. This was due to incomplete work in installing a liquid nitrogen supply to the Ge(Li) detectors.

b. An inspector reviewed the types of portable survey instruments as described in the FSAR and verified that various types of instruments were available. A licensee representative informed the inspector that final inventory quantities had not been established. The inspector reviewed several instruments and verified that they were of types generally used in the industry.

c. At the time of the inspection the instrument calibration room was not functional due to construction work. A licensee representative informed the inspector that instruments were being sent to the Oconee Nuclear Station (ONS) for calibration so that calibrated instruments were available during receipt of new fuel and the handling of radioactive sources. The inspector reviewed the calibration record forms provided by ONS with two different instruments and verified that the instruments were within calibration tolerances. In reviewing the calibration records and the plant calibration procedures, the inspector noted that the calibration did not include a calibration for beta radiation or the establishment of a beta calibration factor. A licensee representative stated that the beta calibration factor would be investigated and discussed with the corporate health physics staff; if considered necessary, the beta radiation calibration would be added to the calibration procedure (78-19-01).

6. Ventilation Systems

a. Fume hoods are installed in various locations in the plant for sample collection, chemical analysis and similar operations. A licensee representative discussed the exhaust system from the hoods with an inspector and described how various hood exhaust fans are interlocked to assure that the exhaust goes into the ventilation system rather than out of a neighboring hood. An inspector asked a licensee representative what measures had or would be taken to assure that the hoods had adequate face velocities when in use. The inspector stated that National Bureau of Standards Handbook No. 92 states that the minimum face velocity for fume hoods handling radioactive materials should be 100 linear feet per minute and that other industrial ventilation books recommend this velocity as a minimum. A licensee representative stated that a modification would be made to install flow meters on the hoods and when this was done, the face velocities would be checked so that the relationship between hood door position, face velocity and flow meter readings could be established. A second licensee representative stated that the ventilation system blancing would be reviewed to verify that the hoods had adequate flow (78-19-02).

b. The technical specifications for the plant, which are presently in draft form, require that certain ventilation filters and charcoal absorbers be periodically tested in accordance with ANSI N510-1975, "Testing of Nuclear Air-Cleaning System". An inspector discussed this testing with licensee representatives and pointed out that ANSI N510 specifies certain tests which are prerequisites for the periodic tests and are to be performed upon acceptance of the systems. The licensee representatives stated that this matter would be reviewed and the ventilation system and filter tests would be reviewed to verify that the prerequisite tests were included (78-19-03).

7. Radiation Protection Procedures

An inspector reviewed the status of station health physics procedures. Approximately 78 percent of the procedures identified in the Health Physics Procedures Index have been completed and approved. Discussions with plant management personnel indicated that health physics procedures are primarily for the use of the health physics staff and that other members of the plant staff will obtain health physics guidance from the Station Health Physics Manual. This manual will also contain policy statements relative to the ALARA program and the Respiratory Protection Program. Because the Station Health Physics Manual will provide the bulk of the health physics guidance for the general plant

employees, it was recommended to plant management that the completion of this manual be expedited to allow ample time for employees to acquaint themselves with the contents of the manual. A management representative stated that completion of the manual would be expedited.

8. Health Physics Staffing

An inspector reviewed the current level of health physics staffing and discussed projected levels, and plans to achieve projected levels, with plant management. There were no questions in this area.

9. Radiation Protection Training

10 CFR 19.12 identifies a number of specific subject areas which are to be included in instructions to individuals working in or frequenting any portion of a restricted area. The licensee has a videotape program which is required viewing for all new personnel and, in the case of non-plant personnel (contractors, etc.), is the only training required prior to unescorted access to the restricted area. Unescorted access is usually contingent upon satisfactorily completing a test which covers the videotape material. The inspectors reviewed the videotape program and determined that the required instructions were presented.

10. Respiratory Protection Program

In accordance with 10 CFR 20.103, allowances for the use of respiratory protective equipment in estimating exposures of individuals to airborne radioactive material may be made if such equipment is used as stipulated in Regulatory Guide 8.15 "Acceptable Programs for Respiratory Protection". Regulatory Guide 8.15 specifies several requirements for an acceptable respiratory protection program. The following areas were reviewed or discussed with various licensee representatives.

a. A written policy statement has not been issued. An inspector discussed this point with the Station Health Physicist who stated that the policy statement would be included in the Station Health Physics Manual, which is not yet complete.

b. Equipment was discussed with a licensee representative and an inspector looked at several items of equipment. The licensee representative stated that there would be approximately 40 self contained breathing units and 150-200 full face respirators for use with supplied air or with filters. A licensee representative stated that only approved equipment is being ordered, that only full face respirators will be used in the radiological respirator protection program and that the demand mode of operation will not be used for any respirators. There were no questions in this area.

c. An inspector reviewed several procedures related to the respiratory protection program. There are approved procedures covering the fitting, cleaning, maintenance, inspection, etc. of respiratory protection equipment. One area which was not addressed was the selection and use of respirators. The Station Health Physicist stated that this subject wiould be included in the Station Health Physics Manual. (The status of the Station Health Physics Manual is addressed under Radiation Protection Procedures.)

d. The respiratory protection training program has not been implemented; however, plans are to use a videotape program presented by the training staff, followed by a fitting exercise conducted by the Health Physics staff. A licensee representative stated that the videotape program is complete.

e. An inspector observed that a body burden analyzer was available to assist in determining the effectiveness of the respiratory protection program. A licensee representative stated that all personnel would receive an initial background count and periodic recounts. Persons wearing respirators a significant amount of time will be recounted more frequently than those who seldom wear respirators.

11. Personnel Dosimetry

a. Plans for on-site readout of thermoluminescent dosimeters (TLDs), as stated in FSAR Section 12.3.3, were discussed with a management representative. The representative stated that the FSAR was incorrect in that no on-site TLD readout capability would exist. Instead of an on-site TLD readout capbaility, the Company will provide a TLD readout capability at its corporate headquarters in Charlotte, North Carolina. A licensee representative stated that the FSAR will be amended to show this change.

b. Neutron dosimetry was discussed with a licensee representative who stated that they were aware of the limitations on neutron film badges and that various options for determining neutron exposures are still under study. The licensee representative stated that FSAR Section 12.3.3 which states that neutron sensitive film will be used, will be changed, as appropriate.

c. Because of activities taking place under Nuclear Regulagory Commission Material Licenses, pocket dosimeters are being issued to certain individuals. Records of calibration checks and leak tests of pocket dosimeters were checked against Procedure HP/0/B/1003/01, "Dosimeter Leak and Calibration Check". There were no questions in this area.

12. IE Bulletins and Circulars

a. IE Bulletin 78-07, "Protection Afforded by Air-Line Respirators and Supplied-Air Hoods" related to conditions under which the protection factor afforded by respiratory protection equipment is less than the value published in Regulatory Guide 8.15. As part of the review of the respiratory protection program (paragraph 10), an inspector determined that the licensee does not intend to utilize respiratory protection equipment in the manner discussed in the bulletin. The inspector had no further questions.

b. IE Circular 77-14, "Separation of Contaminated Water Systems From Non-Contaminated Plant Systems," described a situation where the plant domestic water system at a nuclear plant had been contaminated with radioactive water due to a valving error. An inspector discussed this with licensee representatives. A licensee representative stated that a review of piping systems had been made to determine if cross connections existed, especially from potentially contaminated systems to the domestic (potable) water system. The licensee representative stated that a drawing was being made of the domestic water showing possible cross connections and that back flow preventer devices would be installed at the cross connections. The inspector stated that this would be reviewed once the back flow preventers had been installed.

c. IE Circular 78-03, "Packaging Greater Than Type A Quantities of Low Specific Activity Radioactive Material for Transport" describes a condition where the shipment of radioactive material may comply with Department of Transportation regulations, but violate NRC regulations. A licensee representative informed an inspector that this circular was being reviewed and that appropriate health physics procedures would be revised, if necessary.

13. Storage of Radioactive Material

10 CFR 20.203(e)(1) requires that each area or room in which licensed material is used or stored shall be conspicuously posted "Caution-Radioactive Materials." The licensee presently has various radioactive sources on site as authorized by a by-product materials license. An inspector toured the calibration facility where the sources are stored and observed that the door was properly posted and that the door was locked to control access. The inspector also noted that the containers and cabinets in which sources were stored were labeled in accordance with 10 CFR 20.203(f)(1). The inspector had no further questions.

14. Power Ascension Test Procedures

Regulatory Guide 1.68, "Preoperational and Initial Startup Test Programs For Water-Cooled Power Reactors" lists in Appendix A, Sections C and D, those tests which should be performed during low power and power ascension testing. Included in these tests are chemical and radiochemical tests. FSAR Table 14.1.4-1, "Initial Startup Testing," does not address the chemical and radiochemical tests. A licensee management representative stated that Table 14.1.4-1 did not contain all of the tests which will be conducted during power ascension and that the chemical and radiochemical tests would be conducted. A licensee representative discussed these tests with an inspector and stated that the appropriate procedures would be prepared and the necessary control sign-offs would be included in the power ascension control procedure. The inspector stated that the procedures would be reviewed during a later inspection.

15. Radioactive Waste Processing Systems

a. FSAR Section 11.5 describes the radioactive solid waste disposal system. The majority of this system consists of the components for the solidification of evaporator concentrates and resins. The inspectors discussed the operation of the system with licensee representatives, and placed emphasis on the licensee's test program for ascertaining the operating parameters to assure that the solidified waste contained no free liquid. A licensee representative informed the inspectors that the system was being tested to verify that the flow paths were per design, that pumps, instruments, etc., functioned as intended and that the system was operable but would not include actual solidification. A licensee management representative informed an inspector that the current plans are to establish the operability of the mechanical equipment and verify flow paths but, due to problems encountered with similar systems at other plants, the system would not be used to perform any solidification until a review by the corporate staff is completed. In the interim, any waste solidification will be performed by a contractor.

b. The liquid radioactive waste system as described in FSAR Section 11.2 contains several tanks from which releases will be made to the environment. An inspector asked a licensee represntative how the actual volumes would be verified, e.g., measurements of the tanks as installed, calibrated fill, etc. The inspector pointed out that use of shop drawings or design documents would probably not give the actual, as-built tank volumes. The inspector emphasized that the volumes need to be accurately established for discharge record purposes. A licensee management representative stated that this would be investigated so that the actual volumes were known (78-19-04).

c. Regulatory Guide 1.68, Appendix A, Section A.13 states that tests of the radioaactive waste systems shall include tests to demonstrate that samples of liquids and gases are representative of releases. A licensee representative also stated that the test procedures would be reviewed, and if sample points are identified which are not covered by the test, additional testing will be performed to assure that representative sampling is demonstrated (78-19-05).

16. Posting of Notices

10 CFR 19.11 requires posting of current copies of certain documents or a reference to where these documents can be found. Documents posted pursuant to 10 CFR 19.11 shall appear in a sufficient number of places to permit individuals engaged in licensed activities to observe them on the way to or from any particular licensed activity location to which the document applies. An inspector observed such postings on several bulletin boards including one at the access control point. Postings appeared to be adequate at this time.

17. Exit Interview

At the conclusion of the inspection on July 14, 1978, the inspectors met with licensee representatives (denoted in paragraph 1). The inspectors summarized the purpose and scope of the inspection and the findings and observations.