



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

Report No.: 50-369/78-41

Docket No.: 50-369

License No.: CPPR-83

Licensee: Duke Power Company
P. O. Box 2178
422 South Church Street
Charlotte, North Carolina 28242

Facility Name: McGuire Nuclear Station, Unit 1

Inspection at: McGuire Nuclear Station, Cornelius, North Carolina

Inspection conducted: December 11-15, 1978

Inspectors: W. J. Millsap
R. W. Zavadoski

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

1/9/79
Date

Inspection Summary

Inspection on December 11-15, 1978 (Report No. 50-369/78-41)

Areas Inspected: Routine, unannounced inspection of the radiation protection and the radioactive waste management program including followup on previously identified items, potentially contaminated air streams, volume determination of waste gas tanks, design bases of the stack sampling probe, ventilation systems, demineralizers and spent resin sluice line. The inspection involved 66 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance or deviations were identified in the areas inspected.

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DETAILS I

Prepared by:

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 W. J. Millsap, Radiation Specialist
 Radiation Support Section
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 Safety Branch

1/9/78
 Date

R. W. Zawadoski
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Dates of Inspection: December 11-15, 1978

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 Radiation Support Section
 Fuel Facility and Materials
 Safety Branch

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1. Individuals Contacted

- *T. L. McConnell, Superintendent of Technical Services
- *W. M. Sample, Technical Services Engineer
- *J. C. Cox, Senior QA Engineer
- *T. J. Keane, Station Health Physicist
- *T. B. Owen, Station Chemist
- *E. E. Estep, Associate Engineer
- G. Singletary, Associate Engineer
- P. Shuttleworth, Associate Engineer
- H. Pham, Assistant Engineer
- S. Hurrell, Assistant Engineer
- E. Faggart, Junior Engineer
- J. Furgeson, Health Physics Supervisor
- D. M. McGinnis, Health Physics Supervisor
- R. Propst, Chemistry Supervisor
- J. H. Bowden, I&E Supervisor
- T. McGee, Health Physics Technician

*Denotes those present at the exit interview.

2. Licensee Action on Previous Inspection Findings

(Open) Open Item (78-BU-08) Radiation Level From Fuel Element Transfer Tube. An incident at another facility whereby two individuals were

overexposed during the transfer of spent fuel through the fuel element transfer tube resulted in the issuance of IE Bulletin 78-08. An inspector discussed actions regarding this bulletin with a licensee representative. The licensee stated that one area requiring access control had been identified and that it was his plan to lock the area and control the key. He also stated that a temporary test procedure had been issued based on information in the bulletin. The inspector stated that he would review the results of the licensee's actions during a subsequent inspection. This item remains open.

(Open) Open Item (78-19-01) Beta Calibration Factor for Portable Survey Instruments. An inspector discussed this item with a licensee representative who stated that a suitable source to perform beta calibrations was on order with a requested delivery date of January 1, 1979. The inspector stated that he would review the results of the licensee's efforts during a subsequent inspection. This item remains open.

(Open) Open Item (78-19-04) Determination of the Volumes of Liquid Waste Discharge Tanks. An inspector observed the licensee's effort, in progress, to use a flow integrator in order to determine the volume of one of the waste monitor tanks as well as to calibrate the tank volume indicator. The inspector discussed some of the problems associated with this work with a licensee representative; the licensee's responses to the inspectors questions were satisfactory. This item remains open pending the inspector's review of the final results of the licensee's efforts.

(Open) Unresolved Item (78-36-01) Improper Storage of High Efficiency Particulate Air Filters. An inspector discussed with a licensee representative the intended use of these filters and the controls to insure their proper use. The licensee representative stated that the filters were purchased for use in a non-safety-related system; however, controls may not have been adequate to prevent their use in a safety-related system. The licensee representative stated that evaluation of the administrative controls over the use of these filters was in progress. This item remains unresolved pending the licensee's final resolution of this issue.

3. Correction of an FSAR Statement Concerning Liquid Waste Release

The McGuire Nuclear Station FSAR Section 11.2.7 states, in part, that "All liquid waste to be discharged to the environment flows through the radiation monitor following the waste monitor tanks." An inspector

discussed this statement with a licensee representative and noted that it was in error since an independently monitored line from the ventilation unit condensate drain tank intersects the waste discharge line downstream of this monitor. The licensee representative acknowledged the inspector's comment and stated that the FSAR would be revised to reflect the as-built system. This is an open item pending the correction of the FSAR. (78-41-01)

4. Potentially Contaminated Air Streams

An inspector discussed with a licensee representative his plans to monitor ventilation exhausts with low potential for contamination, such as exhausts from the turbine building and the administrative building. The licensee representative agreed that it would be prudent to monitor the turbine building ventilation and stated that he would add this to his routine survey program on a minimum of a monthly basis. The licensee representative stated that he felt that planned routine surveys of the administrative building (which includes a smear of the ventilation outlet) would be sufficient to meet the small probability of significant airborne contamination in this building; the inspector agreed. The inspector had no further questions concerning this matter.

5. Volume Determination of the Waste Gas Decay Tanks

During a previous inspection (RII Report No. 50-369/78-36), an inspector discussed with a licensee representative the need for an accurate determination of the volumes of the waste gas decay tanks in order to properly account for the volume of waste gas released; a licensee representative agreed to take the problem under consideration. At the time of the present inspection, a licensee representative stated that this problem had been considered and that it had been decided that the best method available was physical measurements of the tanks and that these would be performed. The inspector stated that he would review the results of the licensee's efforts during a subsequent inspection.

6. Design Basis of Stack Sampling Probe

An inspector discussed with a licensee representative the general design of the stack sampling probe and requested of him the details used as its design basis. At the time of the inspection, the licensee was not able to provide the inspector with sufficient information to adequately review this question. A licensee representative stated that detailed information would be made available to the inspector during a subsequent inspection. At the time of the exit interview, the

inspector requested of, and received from, a licensee representative a commitment to perform a velocity profile on the stack both to confirm the design basis of the probe and to determine the volume flow rate out of the stack. This is an open item. (78-41-02)

7. Calibration of the Body Counter's Thyroid Detector For I-131

At the time of a previous inspection of the station body counter (RII Report No. 50-369/78-25), the lower limit of detection of the thyroid detector for I-131 had not been determined due to a difficulty in obtaining a proper radioactive source. Discussions with a licensee representative revealed that, since that time, source material had been obtained and that the most recent calibration of the detector (December 5, 1978) gave a lower limit of detection of approximately 4 nCi. The inspector had no further questions concerning this matter.

8. Ventilation Systems

The inspector, accompanied by a licensee's representative, reviewed the functional layout of the engineered safety features filtration systems. These systems are (1) the Auxiliary Building Ventilation System, detailed on drawing number MC-2577-1, (2) the Annulus Ventilation System, detailed on drawing number MC-2564-1, (3) the Control Area Ventilation System, detailed on drawing number MC-1578-1, and (4) the Fuel Handling Building Ventilation System, detailed on drawing number MC-1577-3. At the present time neither the activated carbon nor the HEPA filters are installed in any of the above systems. Procedures have been written for the preoperational testing of the systems, but these procedures have not been approved. The inspector verified that there was appropriate space and mounting devices for the moisture separators, pre-filters, HEPA filters, and activated carbon beds in the Annulus Ventilation Filter Trains 1A and 1B. The inspector also noted that all the mounting frames joints for the carbon beds and HEPA filters are continuously welded, that electric heaters are installed and that the system should be able to filter approximately 8,000 cfm. The inspector verified that there was appropriate space and mounting devices for the prefilters, HEPA filters and carbon beds in the Auxiliary Building Filter Units 1 and 2. The inspector also noted that each system had a capacity of approximately 55,000 cfm. The inlet and outlet plenums were partially made of sheet metal, the remainder being the structural concrete walls and floors. The inspector verified that there was appropriate space and mounting devices for the activated carbon, HEPA filters and pre-filters for the Control Room Area Filter Packages. Each unit should be able to process approximately 2000 cfm. The inspector verified that there was appropriate space and mounting

devices for the prefilters, HEPA filters and activated carbon for the Fuel Handling Area Filter Train. The inspector noted that at the present time injection ports for testing agents could not be found in the ductwork, although ports were installed on the trains. The inspector had no further questions at this time.

9. Demineralizers

- a. While reviewing the functional layout of the Unit #1 demineralizers on the 739 foot elevation, the inspector noticed that the CVCS 1B mixed-bed demineralizer cubicle contained about 20 valves. Most of those valves were diaphragm valves which require servicing on an approximate frequency of 1 to 5 years. The inspector also noticed that a valve gallery had been provided adjacent to the demineralizer cubicles, but not utilized. The inspector also noted that there was only one drain line and valve for sluicing spent resin from the demineralizer, that entry into the demineralizer cubicle was difficult and time consuming due to space restrictions, and that working space was limited. In addition, the inspector noted several reach rod mechanisms in the cubicle, which also will require servicing. After discussions with licensee representatives the inspector found that the problem of valves in the demineralizer cubicles had been identified by a health physics supervisory review approximately eighteen months earlier. The review ascertained that mixed bed demineralizers at similar plants attain levels of approximately 1000 rem/hour in less than 50 days of operation. The review further indicated that the demineralizers must be isolated from further inputs for about a month to reduce radiation levels by decay by a factor of two. Experience at other facilities has shown that sluicing of resins is effective in reducing the radiation levels by only 80 to 90%. Licensee representatives stated that the present resolution calls for the addition of five inches of lead shot supported in a steel frame around each demineralizer. The shielding begins at the bottom of the demineralizer tank, approximately 18 inches above the floor, and ends at the top of the demineralizer. Shielding is not planned for the top or bottom of the demineralizer or for pipes attached to the demineralizer. The steel frame containing the lead shot will be supported by bracing which will add congestion to the cubicle. The inspector stated that the health physics supervisory review, as called for in paragraph 5, Section 12.1.3 of the FSAR, was being adequately conducted, but implementation of timely corrective action appeared lacking. Although the CVCS 1B Mixed Bed Demineralizer is detailed above, similar conditions

exist at the other CVCS and waste demineralizers. This is an open item (78-41-03).

10. Spent Resin Sluice Line

- a. While touring the Auxiliary Building pipe chases with a licensee's representative, the inspector noticed the spent resin sluice line from the spent resin storage tank to the spent resin batching tank was constructed with several (8 observed) 90° street elbows. FSAR, Figure 11.5.3-1, Rev. 21, calls for the use of 5 diameter bends in the line from the spent resin storage tank to the drumming room. The inspector told licensee representatives that failure to install 5 diameter elbows in the resin sluice line is an open item (78-41-04).
- b. The inspector noted that the motor and gear box for the mixer on the spent resin batching tank was installed without shielding. Discussions with the licensee representatives indicated that the problem of maintaining the motor and gear box had been previously identified and some solution would be forthcoming. The inspector had no further questions at this time. This item will be followed up as an open item 78-41-03.

11. Exit Interview

At the conclusion of the inspection on December 15, 1978, the inspectors met with licensee representatives (denoted in paragraph 1). The inspectors summarized the scope and findings of the inspection, including the concerns over the demineralizers, spent resin sluicing line and the motor on the spent resin batching tank.