



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30323

FEB 10 1986

Report Nos.: 50-413/86-01 and 50-414/86-01

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

Docket Nos.: 50-413 and 50-414

License Nos.: NPF-35 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection Conducted: January 6-10, 1986

Inspector: bo kyp 4 February 1986  
for P. Stoddart Date Signed

Approved by: bo kyp 4 February 1986  
for W. E. Cline, Section Chief Date Signed  
Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, unannounced inspection entailed 32 inspector-hours at the site during normal duty hours, in the areas of liquid and gaseous radwaste systems, effluent monitoring and post-accident sampling systems.

Results: No violations or deviations were identified.

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## REPORT DETAILS

## 1. Persons Contacted

## Licensee Employees

- \*J. Hampton, Manager, Catawba Nuclear Station
- \*P. LeRoy, Licensing Engineer
- \*W. Beaver, Performance Engineer
- P. McNamara, Health physicist
- S. Bhatnagar, Test Engineer
- T. Bohart, HVAC Consultant
- R. Charest, Station Chemist
- P. Deal, Station Health Physicist
- G. Courtney, Health Physicist
- A. Jackson, System Engineer
- M. Kowalewski, Systems Engineer
- H. Nicholson, Systems Engineer

Other licensee employees contacted included four technicians.

## NRC Resident Inspectors

- \*K. Vandoorn

- \*Attended exit interview

## 2. Exit Interview

The inspection scope and findings were summarized on January 10, 1986, with those persons indicated in paragraph 1 above. The inspector discussed the following items; inspector followup item (IFI) to evaluate modification to the post accident liquid sampling systems (PALSS) involving rerouting of undiluted reactor coolant residues (Units 1 and 2); and a generic unresolved item (URI)\* concerning losses of radioiodine in long runs of sampling lines. The licensee acknowledged that work orders had been initiated prior to the inspection to modify the PALSS at the first refueling outages of each unit and that the plant staff had previously initiated an investigation of the iodine line loss problem.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

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\* An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. NUREG-0737 Items (TMI Action Plan, Units 1 and 2)

a. NUREG-0737, Item II.B.3 Post Accident Sampling Capability

(1) II.B.3/1. Design Review (Units 1 and 2: Liquids)

The inspector reviewed the design of the post Accident Liquid Sampling Systems (PALSS) with respect to the design criteria of NUREG-0737, Clarification of TMI Action Plan Requirements. The review included the design and functional descriptions, piping and instrument diagrams (P&IDs), and plant operating procedures. The design meets the criteria of NUREG-0737, Item II.B.3, with the exception of one part of clarification item 11a, which required that the residues of sample collection be returned to containment or to a closed system. In the original system design for all Duke Power Company Plants, sample residues were diluted and flushed to the plant's liquid radwaste system. This exception to the NUREG-0737 criteria was identified by the licensee based on the April 1984 RII evaluation of the McGuire post accident sampling system. The licensee (Catawba Plant) initiated corrective action to re-route undiluted sample residues to the containment floor drain and equipment drain sump; the diluted section of the PALSS will continue to be drained to the plant liquid radwaste system. The necessary modifications were scheduled for the first refueling outages of both Units 1 and 2. This is considered to be an inspection followup item (IFI) to be reviewed during a subsequent inspection (50-413/86-01-01, 50-414/86-01-01). With the modifications to return the undiluted sample residues to containment, the design review concluded that the Catawba Plant post accident liquid sampling systems (PALSS) for both Units 1 and 2 fulfill the design criteria of NUREG-0737, Section II.B.3.

(2) II.B.3/2. Corrective actions (Units 1 and 2: Liquids)

Not Applicable

(3) II.B.3/3. Procedures (Units 1 and 2: Liquids)

The inspector reviewed the operating procedure for the Unit 1 PALSS and the draft operating procedure for the Unit 2 PALSS. Both procedures appeared to be sufficiently detailed and had been reviewed and approved by appropriate plant supervision. Procedures included sample collection, sample transfer or transport, and sample analyses. The inspector determined that the procedures fulfilled the documentation requirements of NUREG-0737, Item II.B.3.

(4) II.B.3/4. Completed Actions (Unit 1: Liquids)

The inspector reviewed the licensee's records verifying the operability of the Unit 1 PALSS. The licensee's verification of operability provided data on the collection, processing and analysis of ten (10) reactor coolant samples. Results of all analyses were within the accuracy guidelines of NUREG-0737 and of the October 5, 1984 letter from J. P. O'Reilly to Duke Power Corporation. Chloride analyses were performed at the corporate analytical facility located near the McGuire Plant. The Catawba PASS design did not provide for the use of online analytical measurements; all analyses were performed in the plant laboratory facilities. Five plant staff personnel and approximately ten plant technicians were trained and qualified on the PALSS system.

On the basis of the information provided by the licensee, on the inspector's review of the licensee's design, and on the inspector's examination of the installed facilities, the inspector concluded that the Unit 1 PALSS was fully operational.

(5) II.B.3/4 Completed Actions (Unit 2)

The Unit 2 PALSS was completely installed at the time of the inspection but had not undergone preoperational acceptance testing. The preoperational test packages will be reviewed at a later date. Operability of the Unit 2 PALSS will be determined at a later date on the basis of sampling and analysis with the reactor at full power.

(6) II.B.3/1. Design Review: (Units 1 and 2: Gases)

The inspector reviewed the design of the Post Accident Sampling System (PASS) with respect to sampling of the containment atmosphere. In the Duke Power Company design, containment atmosphere samples are obtained by means of a sampling system which is independent of the reactor coolant sampling system (Post Accident Liquid Sampling System - PALSS). This is the Post Accident Containment Sampling (PACS) system. The PACS samples containment atmosphere by means of a connection to the containment hydrogen sampling system (NUREG-0737, Item II.F.1, Attachment 6). The question of representativeness of samples obtained by this method was raised during the RII evaluation of the McGuire PACS. A licensee representative stated that the McGuire procedure for determining line losses and accuracy of sampling would be adapted for use in testing the Catawba PACS and that the sampling line for Unit 2 would be tested prior to exceeding the 5% power level; the Unit 1 test was also to be accomplished in the near future. The PACS design was sized to obtain a 1.4 cm<sup>3</sup> sample of containment atmosphere at containment pressure. The PACS would dilute the 1.4 cm<sup>3</sup> sample by a factor of 10,000:1. 100 cm<sup>3</sup> of the diluted sample would then be collected in a sample "bomb" and taken to the plant

analytical facility for analysis. Pending evaluation of the projected studies of line losses and sampling accuracy, the inspector determined that the design of the PACS met the criteria of NUREG-0737, Item II.B.3.

(7) II.B.3/2. Corrective Actions (Units 1 and 2 - Gases)

Not applicable.

(8) II.B.3/2. Procedures (Units 1 and 2 - Gases)

The inspector reviewed the operating procedure for the Unit 1 PACS and the draft operating procedure for the Unit 2 PACS. Both procedures appeared to be sufficiently detailed and had been reviewed and approved by appropriate plant supervision. Procedures included sample collection, sample transfer or transport, and sample analyses. The inspector determined that the procedures fulfilled the documentation requirements of NUREG-0737, Item II.B.3.

b. NUREG-0737, item II.F.1, Attachment 6, Containment Hydrogen).

Units 1 and 2 of the Catawba plant are each provided with redundant hydrogen monitors which are designed to function after a reactor accident to measure the hydrogen gas concentration in containment. Technical Specification 3/4.6.4 requires that each unit have two operable hydrogen monitors. A licensee representative stated that the hydrogen sensors are Teledyne thermal conductivity monitors.

These monitors do not utilize a catalyst bed device in the detector as in the case of the monitors referenced in IE Information Notice 84-22. The monitors sample from three locations: (1) Upper containment; (2) the 600 elevation operating deck; and (3) steam generator 1B compartment. The Unit 1 hydrogen monitors were acceptance tested at the time of Unit 1 startup and have undergone quarterly surveillance tests using gas standards of 1% and 4% hydrogen concentration. The instrumentation is maintained in a continuous standby condition and requires no warmup period for operation. The Unit 2 hydrogen monitors will be subjected to acceptance testing prior to plant operation. The inspector will review the Unit 2 hydrogen monitor acceptance tests at a later date.

Open Item (Inspector Followup Item 50-413/86-01-01, 50-414/86-01-01)

Review modification to post accident liquid sampling system (PALSS) routing undiluted sample residues to containment sump.

No violations or deviations were identified.

5. Liquids and Liquid Wastes (84523 - Preoperational, Unit 2)

No preoperational test procedures packages had been completed for liquid radwaste systems since the last inspection (50-414/85-65, December 2-5, 1985).

No violations or deviations were identified.

6. Gaseous Waste System (84524 - Preoperational, Unit 2)

The inspector reviewed acceptance test procedure package TP/2/B/1200/14, Containment Hydrogen Sample and Purge System Test, which was performed June 14, 1985 and June 21, 1985. Test package management review was completed January 7, 1986. The test procedure appeared to be completed satisfactorily, all changes had been incorporated and initialled and all blanks had been filled in and initialled. The inspector made a visual external inspection of the system and found it to be in satisfactory condition.

The inspector witnessed testing of the containment purge system HEPA filter and charcoal absorber housing (Plant System "VP"). While the system was not an Engineered Safety Feature (ESF) system, all tests were conducted in accordance with ANSI/ASME N510-1980, Testing of Nuclear Air-Cleaning Systems. (ANSI/ASME: American National Standards Institutes, The American Society of Mechanical Engineers). The testing was also conducted in conformance to Regulatory Guides 1.52, Revision 2, and 1.140, Revision 1, except that in accordance with the Technical Specifications, all testing followed the guidelines of ANSI/ASME N510-1980; in cases of conflicts between the Regulatory Guides, which referenced ANSI/ASME N510-1975, and the Technical Specification which referenced ANSI/ASME N510-1980, the guidance of the Technical Specifications and ANSI/ASME N510-1980 prevailed.

Tests which were witnessed included visual inspection, air flow distribution, volumetric air flow, DOP (di-octyl phthalate) smoke penetration testing of HEPA filters, and freon penetration testing of charcoal absorber beds. The test supervisor briefed the test personnel prior to starting each set of tests, reviewed each step of the procedures, and checked all calculations. The inspector observed all steps of the test procedures, reviewed the data points and calculations entered in the procedure form, and verified the calibration status of the test instrumentation. The inspector confirmed that the test results were within the limits specified by Regulatory Guides 1.52, Revision 2 and 1.140, Revision 1, by ANSI/ASME N510-1980, and by the Technical Specifications. The inspector will review the procedure package again after the package has been approved by plant management.

No violations or deviations were identified.



7. Effluent Radioactivity Monitoring (84524, Preoperational, Unit 2)

The inspector discussed monitoring of radioactivity in plant effluents with licensee personnel. In the discussion and in the exit interview, the licensee was informed of a generic issue concerned with the loss of airborne radioiodine in long runs of sampling lines used in the sampling of radioiodines in plant effluents (from stacks or other environmental release vents). Technical Specification 4.11.2.1.2 requires representative sampling of plant effluents; unless iodine line losses can be quantified, iodine determinations based on sample analyses cannot be assured to be representative and may be considered to be in violation of the specification. As noted in Inspection Report 50-414/85-64, Catawba staff had initiated a study of iodine sample line losses and had obtained some preliminary results. Until such times as this can be fully resolved in a generic basis, the issue will be carried as an Unresolved item.

Open Item (Unresolved Item - URI - 50-413/86-01-02, 50-414/86-01-02): Sampling of radioiodine aerosols has been identified as being subject to substantial but unquantified losses in long sampling lines. This is a generic item applicable to all power reactor facilities.

No violations or deviations were identified.