



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

SEP 23 1988

Report Nos.: 50-325/88-28 and 50-324/88-28

Licensee: Carolina Power and Light Company  
 P. O. Box 1551  
 Raleigh, NC 27602

Docket Nos.: 50-325 and 50-324

License Nos.: DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: August 1-5, 1988

Inspector: *C. A. Hughey* 8/31/88  
 C. A. Hughey Date Signed

Approved by: *J. B. Kahle* 9/1/88  
 J. B. Kahle, Section Chief Date Signed  
 Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, unannounced inspection was conducted in the areas of liquid and gaseous radwaste management, radiological effluent monitoring instrumentation and environmental monitoring.

Results: In the areas inspected, violations or deviations were not identified. The inspector concluded from discussions with plant personnel and a review of appropriate records that liquid and gaseous effluents for 1987 were within 10 CFR 50, Appendix I design objectives (ALARA), 40 CFR 190 dose limitations and the radiological effluent technical specifications.

Inoperability of the Unit 1 and Unit 2 reactor building and turbine building ventilation flow measurement devices and the radwaste liquid effluent flow measuring device had kept the licensee continuously in ACTION statements of the Technical Specifications for up to three years. Since the licensee also indicated no immediate plans for repairing or replacing this instrumentation, the inspector concluded that there was a lack of licensee management involvement in assuring quality in the maintenance of Technical Specification required effluent flow measuring devices.

8810130008 880923  
 PDR ADOCK 05000324  
 Q PNU

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. Davis, Project Specialist, Environmental and Chemistry (E&C)
- S. Fitzpatrick, Specialist, E&C
- \*J. Harness, General Manager, Brunswick
- T. Harris, Regulatory Compliance Specialist
- \*P. Howe, Vice President, Brunswick Nuclear Project
- D. Manqis, Senior Specialist, E&C
- W. Nurnberger, Foreman, E&C
- \*R. Poulk, Project Specialist
- J. Price, Technician, E&C
- \*C. Robertson, Supervisor, E&C
- T. Roeder, Foreman, E&C
- B. White, Senior Specialist, E&C

Other licensee employees contacted during this inspection included engineers, operators, security force members, technicians, and administrative personnel.

#### NRC Resident Inspectors

- L. Garner
- \*W. Levis

\*Attended exit interview

### 2. Licensee Actions And Previously Identified Inspection Findings (92701)

- a. (Open) Inspector Followup Items (IFIs) 324/85-12-01 and 325/85-12-01: Inoperable condition of hydrogen gas monitoring instruments in the Augmented Offgas System to be corrected and instruments returned to service.

The hydrogen gas monitoring equipment in the Augmented Offgas Systems continued to be inoperable in both units. These instrument failures had placed the licensee in an ACTION statement of the Technical Specifications (TSs) (3.3.5.9) continuously for over three years. The licensee continued to abide by the periodic sampling and monitoring requirements of the ACTION statement.

As described in Inspection Report No. 87-32/87-33 dated October 1, 1987, new in-line hydrogen analyzers (gas chromatograph (GC)) will replace the old detectors (electrodes). At the time of this inspection the Unit 2 GC system was installed and in the testing phase. Completion of both systems was tied with the implementation

of hydrogen water chemistry (HWC), GC operability and HWC implementation was estimated to take place during September 1988 for Unit 2 and late in 1990 for Unit 1. The licensee planned to continue to operate under the ACTION statement of the Technical Specifications until continuous offgas hydrogen monitoring could be achieved with in-line gas chromatographs. This item remains open.

- b. (Open) IFIs 324/87-32-01 and 325/87-33-01: Licensee committed to have reactor building and turbine building ventilation flowrate measurement devices operational and returned to service by January 13, 1989.

The reactor building and turbine building ventilation flowrate measurement devices continued to be inoperable in both Units 1 and 2. The devices had been continuously inoperable for approximately three years. This placed the licensee in a continuous ACTION statement of the Technical Specifications (3.3.5.9) for the entire period, which requires periodic flow estimations of the ventilation exhausts.

During the previous inspection in this area (87-32/87-33, September 14-18, 1987), the licensee committed to have these flow measurement devices operable by January 13, 1989. In a letter to the NRC dated June 22, 1988, the licensee postponed this commitment one year to January 13, 1990 because of "project scheduling considerations." The licensee informed the inspector that although these items would be given a high priority, it could not be guaranteed that these items would be completed in 1990. This item remains open.

### 3. Radiological Effluents (84723, 84724)

#### a. Sampling Observation

The inspector observed the weekly changeout of the particulate and charcoal filters in the Unit 1 reactor building vent particulate, iodine and noble gas radiation monitor. Proper technique and procedural compliance was observed during the changeout. The inspector did note that since the monitor is located over open grating directly over the Unit 1 spent fuel pool, the possibility exists for dropping tools and equipment into the spent fuel pool. The licensee also expressed concern over this problem and agreed to look into it further.

#### b. Process Monitor Calibrations

The inspector reviewed the records of the follow process monitor channel calibrations:

- o Unit 1 Service Water Effluent Radiation Monitor
- o Unit 2 Service Water Effluent Radiation Monitor
- o Liquid Radwaste Radioactivity Effluent Monitor

- ° Unit 1 Turbine Bldg. Roof Vent Radiation Monitor
- ° Unit 2 Turbine Bldg. Roof Vent Radiation Monitor
- ° Unit 1 Reactor Bldg. Roof Vent Radiation Monitor
- ° Unit 2 Reactor Bldg. Roof Vent Radiation Monitor
- ° Stack Radiation Monitor
- ° Unit 1 Detector Linearity/Sensitivity Determination for NUMAC  
SJAE Off-gas Radiation Monitor
- ° Unit 2 Detector Linearity/Sensitivity Determination for NUMAC  
SJAE Off-gas Radiation Monitor

The inspector noted no items of concern and verified that the channel calibrations were performed within the requirements of Technical Specification Tables 4.3.5.9-1.

c. Semiannual Effluents Reports

TS 6.9.1.8 requires the licensee to submit, within 60 days of January 1, and July 1 of each year, routine Radioactive Effluent Release Reports covering the operation of the unit during the previous six months of operation. The reports shall include a summary of the quantities of radioactive materials released from the unit as outlined in Regulatory Guide 1.21. Additionally, the reports that are submitted 60 days after January 1 of each year shall include an assessment of radiation doses from primary effluent pathways.

The inspector reviewed the semiannual radiological effluent release report for the period July 1 - December 31, 1987. The review included an examination of the liquid and gaseous effluent release data. A large increase in liquid waste volume released occurred between 1986 and 1987 (4.96 E+6 gallons to 1.28 E+7 gallons). Also noted was a large increase in potential dose to adults, due to fish consumption, by a factor of 100. The licensee attributed the volume increase to a heavy outage schedule during 1987, and attributed the dose increase to the volume increase and to an abnormal release of radioactivity from the residual heat removal system through the service water system. This release was discussed in detail in Inspection Report Nos. 50-325/87-33 and 50-324/87-32 dated October 1, 1987.

d. Nuclear Air Cleaning Systems

The inspector reviewed records of in-place DOP leak tests of HEPA filters, in-place leak tests of charcoal absorber banks, and methyl iodide retention efficiency laboratory tests of filtration system charcoal for the control rooms dated May 7, 1988. These tests met the requirements of TS 4.7.2. The HEPA filters passed the first time. Charcoal absorber banks passed only after they were replaced.

e. Reactor Coolant System

The technical specification specifies maximum limits, sampling and analysis frequencies for reactor coolant chlorides, conductivity, dose equivalent Iodine-131, isotopic analyses for Iodine including I-131, I-133, and I-135, gross activity determinations, and radiochemical determination for E-Bar. The inspector reviewed selected plant chemistry records for the period January 1988 - July 1988, and verified that these various reactor coolant system parameters were within Technical Specification limits.

The inspector discussed with licensee representatives from the chemistry group the status of hydrogen water chemistry (HWC) implementation. Unit 2 implementation was planned beginning Fall 1988. The licensee estimated Unit 2 hydrogen injection rates would be between 9-10 standard cubic feet per minute (SCFM). This would drop the electrochemical potential (ECP) of the RCS to well below the recommended -230 millivolts to retard crack growth in welds.

Radiation levels in the main steam lines were estimated to increase about 10%. This would be due to the reducing environment produced in the RCS during hydrogen injection. The hydrogen injection reduces the nitrates and nitrites normally seen in the RCS during power operations to more volatile nitrogen compounds ( $\text{NH}_3$  and  $\text{N}_2$ ). This would result in more Nitrogen-13 and Nitrogen-16 carryover into the main steam. Dissolved oxygen levels in the RCS recirculation loops were also anticipated to decrease from the normal 150 part per billion (ppb) seen from radiolysis to less than 15 ppb.

The licensee anticipated that a lower ECP along with the lower dissolved oxygen levels in the RCS would significantly retard crack growth within the recirculation piping weld areas.

Implementation of HWC for Unit 1 was not planned until late 1990.

f. Procedures

TS 6.8.1 requires the licensee to establish, implement and maintain procedures covering areas such as liquid and gaseous radwaste management. The inspector reviewed selected portions of the following procedures for completeness, accuracy and organization and noted no items of concern:

- ° E&RC-2002, Sampling of Airborne Effluent Releases, Rev. 9, April 11, 1988
- ° E&RC-2003, Reporting of Radioactive Airborne Effluent Releases, Rev. 4, April 15, 1988
- ° E&RC-2009, Radioactive Liquid Effluent Releases and Reports, Rev. 5, December 10, 1987

## g. Audits and Appraisals

TSs 6.5.5.1 and 6.5.5.2 require the licensee's Performance Evaluation Unit (PEU) of the Corporate Quality Assurance Department to perform periodic audits including: The Environmental Monitoring Program and results (once per 12 months); the Offsite Dose Calculation Manual (once per 24 months); the Process Control Program (once per 24 months); and the Quality Assurance Program to meet the provisions of Regulatory Guide 1.21, Revision 1, June 1984 and Regulatory Guide 4.1, Revision 1, April 1975 at least once per 12 months. The inspector reviewed audit QAA/0021-88-03, conducted April 4-13, 1984. This audit appeared to satisfy the TS requirements and licensee identified findings had been resolved or were being tracked until final resolution.

## h. Radwaste Liquid Effluent Flow Instrument

The inspector discussed with the licensee, the inoperability of the radwaste liquid effluent flow measurement device which had been inoperable since 1984. It was first identified in Engineering Work Request No. 84-578 dated June 20, 1984.

Although this inoperable instrument had placed the licensee continuously in another ACTION statement of the TS (3.3.5.8), the licensee indicated no immediate plans for replacing this obsolete instrument (replacement parts were difficult to obtain). This project had recently been postponed because it was considered a "plant betterment item" and not of safety concern. This item will be followed under an IFI (50-324/88-28-01).

No violations or deviations were identified.

## 4. Environmental Protection (80721)

The inspector, along with a licensee representative, examined several fixed, offsite environmental monitoring locations. This included:

- ° 6 thermoluminescence dosimeters (TLD) locations (2 locations collocated with NRC TLDs)
- ° 2 vegetable sampling plots (turnips and collards)
- ° meteorological tower
- ° storm drain stabilization pond
- ° intake and discharge liquid sampling stations
- ° 4 continuous air sampling stations

All equipment observed was in working order and properly maintained. The inspector reviewed procedure E&RC 3101, Radiological Environmental Technical Specifications Monitoring Program, Rev. 7, for accuracy and content and noted no items of concern.

No violations or deviations were identified.

5. Followup On Information Notices (92701)

Information Notice (IN) 88-22, Disposal of Sludge From Onsite Sewage Treatment Facilities at Nuclear Power Stations, had been received by the licensee, reviewed for applicability and distributed to the appropriate plant personnel for action.

Samples of sewage treatment sludge were periodically analyzed for radioactivity and, to date, had not contained detectable amounts of licensed material. All sludge was being held at the plant site awaiting licensing action by the State of North Carolina. This item is considered closed.

No violations or deviations were identified.

6. Exit Interview

The inspection scope and results were summarized on August 5, 1988, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.