



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W. SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-400/82-35 and 50-401/82-35

Licensee: Carolina Power and Light Company
411 Fayetteville Street
Raleigh, NC

Facility Name: Shearon Harris

Docket Nos. 50-400 and 50-401

License Nos. CPPR-158 and CPPR-159

Inspection at Harris site near Raleigh, North Carolina

Inspector: J. J. Lenahan 12/2/82
J. J. Lenahan Date Signed

Approved by: T. E. Conlon 12/7/82
T. E. Conlon, Section Chief Date Signed
Engineering Inspection Branch
Division of Engineering and Technical Programs

SUMMARY

Inspection on November 16-19, 1982

Areas Inspected

This routine, unannounced inspection involved 26 inspector-hours on site in the areas of structural concrete work activities and quality records and a previously identified inspector follow-up item.

Results

In the areas inspected, no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *G. L. Forehand, Site Director-QA/QC
- *A. M. Lucas, Assistant Project General Manager
- J. F. Nevill, Senior Civil Engineer, Nuclear Engineering Dept.
- R. M. Parsons, Project General Manager
- *W. O. Pridgen, Civil Engineer
- *W. Seyler, Civil Resident Engineer
- *G. M. Simpson, Principal Construction Specialist
- *D. C. Whitehead, QA Supervisor
- *H. L. Williams, Civil Engineer

Other licensee employees contacted included four civil QC inspectors.

NRC Resident Inspector

- *G. F. Maxwell

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 19, 1982, with those persons indicated in paragraph 1 above. The licensee was informed of the inspection findings listed below. The licensee acknowledged the inspection findings with no dissenting comments.

Unresolved Item, 400, 401/82-35-01, Review of results of tests performed on concrete aggregates and cement

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph 7.

5. Independent Inspection Effort

The inspector examined the following:

- a. Procedures which control grouting under equipment frames, base plates, and other similiar foundations
- b. Revision 6 of Technical Report entitled "Field Results of ITT Phillips Red Head Wedge Type Anchors" dated October 17, 1981
- c. Unit 1 construction status

Within the areas examined, no violations or deviations were identified.

6. Containment (Structural Concrete II) - Observation of Work and Work Activities - Unit 1 (module 47054B)

The inspector observed partial placement and inspection of pour number 1CBX-433001 on the Unit 1 containment building dome. Acceptance criteria examined by the inspector were as follows:

- a. PSAR Section 5
- b. EBASCO Specifications CAR-SH-CH-6, "Concrete"
- c. CP&L procedures CQC-13, WP-3 through WP-5, TP-15, QCI 13.2 and QCI 13.3
- d. Drawing numbers CAR 2167-G-0640(R5), CAR 2167-G-0562(R1), CAR 2167-G-0660(R4), CAR 2167-G-0661(R4) and CAR 2167-G-0662(R5).
- e. Field change requests (FCR) numbers C-2483, C-3061, C-3706 and C-3707

Reinforcing steel and forms were properly installed and clean. Placement activities pertaining to delivery time, free fall, flow distance, layer thickness and consolidation conformed to specification requirements. Concrete placement activities were continuously monitored by construction and QC inspectors. Examination of batch tickets indicated that the specified design mix was being delivered. Samples of plastic concrete were obtained from the pumpline discharge and tested in accordance with specification requirements. Test results indicated that plastic concrete being placed met the specification requirements for slump, air content and temperature.

Examination of the batch plant indicated materials were being controlled and accurate batch records were being generated. Storage of materials (aggregates, cement and admixtures) were observed to be in accordance with specification requirements. Batch plants activities were continuously monitored by QC inspectors.

The inspectors were interviewed regarding procedures and their inspection requirements.

Within the areas examined, no violations or deviations were identified.

7. Containment (Structural Concrete II) - Review of Quality Records - Unit 1 (module 47056B)

The inspector examined quality records listed below which pertain to various concrete placements in the reactor containment building wall and dome. Acceptance criteria examined by the inspector are those procedures which are listed in paragraph 6, above. Records examined were as follows:

- a. Results of mixer efficiency tests performed on the central batch plant in February and August, 1981, and February and August, 1982
- b. Results of sulfate soundness, reactivity, and Los Angeles abrasion tests performed on coarse aggregate sampled in February and August, 1981 and February and August, 1982
- c. Results of sulfate soundness and reactivity tests performed on fine aggregate sampled in February and August, 1981, and February and August, 1982
- d. Results of chemical tests performed on cement sampled in February and August, 1982
- e. Concrete mix designs for concrete mix numbers M-56, M-78, and M-81
- f. Summary of averages of results of compression tests performed on concrete cylinders tested through July, 1982 from mix numbers M-56 and M-72

Review of the results of the chemical tests performed on cement sampled in August, 1982 and review of the results of reactivity tests performed on coarse aggregate sampled in August, 1982 disclosed the following problems:

- a. The reactivity test indicated that the coarse aggregate may be reactive with the alkaline in cement (i.e., aggregate was deleterious).
- b. The loss on ignition (LOI) of the cement was determined to be 4.18 percent. The maximum allowable value for LOI stated in the acceptance criteria referenced in the site procedures (ASTM C-150) is 3.0 percent
- c. The percent silicon dioxide (SiO₂) in the cement was determined to be 20.39 percent. ASTM C-150 states that the SiO₂ content in Type II cement is to be a minimum of 21.0 percent. The cement used at the site is Type II.

The licensee identified the problems with the aggregate reactivity test results and the results of the LOI test performed on the cement. Nonconformance number C-512 was written to disposition these problems. However, the licensee had not identified the problem of the SiO₂ content of the cement being below the ASTM C-150 minimum value of 21.0 percent. This was due to an error on the form reporting the test results which indicated that 20.0 percent was the minimum acceptable value for SiO₂ content of the cement, instead of the correct value of 21.0 percent.

The failing test results discussed above were reported to the licensee by the offsite contract laboratory performing the tests by letter in October, 1982, two months after the materials were sampled. Since the results of all reactivity tests performed on the aggregate and all chemical tests performed on the cement had been satisfactory over the past several years, the licensee suspected that the test failures were most likely due to laboratory errors. The licensee decided to perform additional tests on these materials to confirm that the material met project requirements. However, an additional month elapsed prior to the licensee requesting the contractor to perform the additional testing. The inspector expressed concern to licensee management regarding the length of time required to receive and review the test results and request additional confirmatory testing. This matter will be reviewed by the inspector in a future inspection to determine if the nonconformance was promptly identified and corrected as required by Criterion XVI of Appendix B to 10 CFR 50. The inspector also expressed concern regarding the failure of QA/QC personnel to identify the fact that the SiO₂ content of the cement did not meet ASTM C-150 requirement. The safety significance of this item will be determined in a future inspection. The cement and aggregates are used in concrete in both Units 1 and 2. Pending further review by NRC, the licensee was informed that these problems would be classified as Unresolved Item 400, 401/82-35-01, Review of results of tests performed on concrete aggregates and cement.

Within the areas inspected, no violations or deviations were identified.

8. Inspector Followup Item (IFI)

(Open) IFI 400/81-04-01, Installation of chemical and volume control pumps. This item was identified by the resident inspector during his review of WP-105, "Installation and Inspection of Equipment" since the acceptance criteria to be used for tightening of nuts on anchor bolts were not clear. The inspector discussed this item with the resident inspector and responsible licensee engineers and reviewed a draft of a proposed change (Procedure Deviation Notice, Revision No. 8) to WP-105 which will clarify the bolting requirements. This item will remain open pending issuance of the deviation notice and further review of the construction inspection procedures affected by the proposed change to the work procedure in a future inspection.

Within the areas examined, no violation or deviations were identified.