



ENCLOSURE 2
UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-413/84-30 and 50-414/84-15

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

Docket Nos.: 50-413 and 50-414

License Nos.: CPPR-116 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection at Catawba site near Rock Hill, South Carolina

Inspector: J. R. Harris 4/2/84
J. R. Harris Date Signed

Approved by: T. E. Conlon 4/2/84
T. E. Conlon, Section Chief Date Signed
Engineering Program Branch
Division of Engineering and Operational Programs

SUMMARY

Inspection on March 13 - 16, 1984

Areas Inspected

This special unannounced inspection involved 26 inspector-hours on site in the areas of a previously identified enforcement item, IE Circular 81-08, IE Information Notice 84-40 and an employee concern regarding radioactive contamination of groundwater.

Results

Of the four areas inspected, no violations or deviations were identified.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *L. R. Davidson, Project QA Manager
- I. E. Pierce, Principal Engineer, Civil-Environmental Design
- R. Morgan, Senior QA Engineer
- T. Robertson, Construction Engineer, Civil
- J. Warren, QC Engineer, Civil
- C. Arnold, Civil Field Engineer
- H. D. Mason, QA Engineer, Civil
- D. P. Hensley, QA Technician

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 16, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection finding. The following item was opened:

Inspector Followup Item 413/84-30-01 and 414/84-15-01, Use of Epoxy Bonding Agent in Containment Building.

3. Licensee Action on Previous Enforcement Matters

(Closed) Violation 414/83-16-02, Improper Concrete Mix Placed. A 4,000 psi, 28 day compressive strength mix was placed in the diesel generator building No. 2 intake modification walls instead of the specified 5000 psi mix. The inspector examined the licensee's response dated September 9, 1983, December 15, 1983, and March 8, 1984, and implementation of the responses. A random statistical evaluation of previously completed work was conducted and 1,500 items were reviewed out of a total population of 4,200 placements. Only two other errors were found. In one case where a 3,000 psi mix was placed instead of the specified 5,000 psi mix, the compressive test cylinder breaks showed that the placed concrete strength exceeded 5,000 psi. In the other case a 3,000 psi mix was placed instead of the specified 4000 psi mix. Design re-evaluation of the concrete equipment hatch covers made with this mix showed that the 3,000 psi mix was adequate. Compressive test cylinder breaks representative of the 4,000 psi design mix placed in the Unit 2 diesel generator modification walls had an average strength of 5,600 psi. The analysis demonstrated a confidence level exceeding 95 percent for correct concrete placements and that mix designs used at the Catawba site are conservative. The sign-off for the Construction Engineer-Civil has been restricted to eight individuals with

experience in reviewing concrete drawings. All parties involved have been cautioned to be sure that all information listed on the prepour form is correct and that the information is checked against the appropriate drawings each and every time. This item is closed.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. (Closed) IE Circular 81-08, Foundation Materials (25128B)

The inspector reviewed the licensee's evaluation of IE Circular 81-08. The objective of the Circular is to verify that foundation and backfill materials supporting and proximate to safety-related structures were placed in accordance with design base requirements. Foundation and backfill activities at the site are complete. Procedures, specifications, drawings, work activities, and quality records on foundation and backfill activities were examined by several NRC inspectors during routine inspections conducted between 1975 and 1980. Inspection results are discussed in NRC Region II report numbers 413, 414/75-04; 413, 414/76-01; 413, 414/76-02; 413, 414/76-03; 413, 414/76-04; 413, 414/76-05 and 413, 414/80-01. Review of these reports and examination of procedures, specifications, and quality records for foundations and backfill controls during this inspection showed that foundation preparation, backfill operations, and inspection activities, were made in accordance with licensee commitments and NRC requirements. This item is closed.

6. Information Notice No. 83-40, Need To Environmentally Qualify Epoxy Grouts and Sealers.

This Information Notice is intended to alert licensees to potential degradation of epoxy formulations by heat and radiation. The inspector reviewed the licensee's evaluation of this Notice and discussed the licensee's use of epoxy materials with responsible engineers. Discussions and examination of documentation showed that two epoxy type materials are being used in areas that will be subjected to high heat or radiation. One is being used to grout behind base plates to insure 100 percent bearing and the other is being used as a bonding agent in repairing concrete honeycomb. Analysis showed that the worst temperature conditions during accident conditions would be 145°F in the doghouse and auxiliary building and 160°F in the reactor building. Laboratory testing showed that the material being used to grout the base plates would have a strength decrease from 8,208 psi at 73°F to 3,000 psi at 160°F. Design of hanger base plates is based on a compressive strength of 3,000 psi. Thus during the worst postulated conditions the bearing of the plates would equal or exceed design requirements.

Testing has shown that the material being used as a bonding agent for honeycomb repairs is twenty percent of its normal capacity between 120°F and 160°F. The licensee is investigating usage of this material and effects it

would have on safety-related supports. Use of an epoxy bonding agent in the containment building was identified to the licensee as Inspector Followup Item 413/84-30 and 414/84-15.

7. Employee Concern, Discussions and Findings

Concern - Contamination of groundwater with radioactive materials during an accident.

A concern was expressed that during initial excavations concrete was placed in water that was leaking into the excavation. The worker thought the water may have been groundwater and he indicated that he was concerned that there was a possibility of radioactive materials contaminating ground water.

Discussion

The inspector examined FSAR requirements, construction photos, and quality records for foundation excavations and preparation in the area of the reactor and auxiliary building. In addition, the inspector discussed foundation preparation activities with responsible QC inspectors, engineers and craft foremen. Examination of records and drawings showed that the foundation excavations for the reactor and auxiliary buildings extend below the groundwater table into bedrock and that groundwater did seep into the excavation during foundation preparation activities. Drawings, records, construction photographs, and discussions with responsible personnel showed that control of the seepage was achieved during construction by gravity drainage through ditches and sumps. Water accumulating in the sumps or lower areas was removed by pumps. Discussions indicated that some fill concrete may have been placed in low sump areas before all the water was removed. The fill concrete was used for providing a level work mat in the bedrock. Occasional placement of fill concrete in standing water in low sump areas would not have any affect on the bearing capacity of the foundation. A permanent groundwater drainage system has also been installed to permanently maintain a normal groundwater level at or near the base of the foundation mat and basement walls. The drainage system consists of interconnected foundation underdrains and continuous wall drains. The foundation underdrains consist of a grid of interconnected flow channels at top of excavated rock or at top of fill concrete on 20 foot centers. In flow channels on top of fill concrete, 2-5/8 inch diameter holes were drilled through the concrete into the rock at a maximum spacing of eight feet on center to provide a controlled pathway for seepage. The exterior wall drains consist of a two foot zoned filter extending from the bottom excavation to within five feet of yard grade. Twelve permanent groundwater wells have been installed in the zoned wall filter around the reactor and auxiliary building walls. Continuous monitoring devices have been installed in six of the wells to monitor groundwater levels. Any release of radioactive liquid during an accident condition would seep through the soil to the zoned wall filter and eventually flow to the auxiliary building ground-

water sumps. The contaminated liquid would then be pumped to the storm drain system which discharges directly into Lake Wylie. The postulated accident resulting in the highest potential liquid radioactive release to the groundwater is the rupturing of the refueling water storage tank. Analysis of this event showed that in the worst case the resultant concentrations are within the limits of 10 CFR 20.

Findings

Groundwater did seep into the excavation during preparation for the foundation of the auxiliary and reactor buildings and some fill concrete may have been placed in water in low sump areas. Construction photographs, records and drawings showed that the groundwater seepage was controlled by a system of gravity drains and sumps. A permanent monitored groundwater drainage system consisting of foundation underdrains and exterior wall drains has been installed to control groundwater seepage and any contaminated liquids resulting from an accident.