



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA ST., N.W., SUITE 3100  
ATLANTA, GEORGIA 30303  
MAY - 5 1980

Report Nos. 50413/80-05 and 50-414/80-05

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

Facility Name: Catawba Nuclear Station, Units 1 and 2

Docket Nos. 50-413 and 50-414

License Nos. CPPR-116 and CPPR-117

Inspection at Catawba site near Rock Hill, South Carolina

Inspector: G. F. Maxwell 4-16-80  
Date Signed

Approved by: J. K. Rausch 4-16-80  
J. K. Rausch, Acting Section Chief, RC&ES Branch Date Signed

SUMMARY

Inspection on March 5-31, 1980

Areas Inspected

This routine resident inspection involved 77 inspector-hours onsite in the areas of unit 2 reactor vessel installation, storage of electrical equipment, electrical equipment handling, Class 1E equipment installation, nondestructive examination, Class 1E cable installation and followup inspection on a previously identified unresolved item related to fire protection and prevention.

Results

Of the seven areas inspected, no items of noncompliance or deviations were identified in three areas; six apparent items of noncompliance were found in four areas (Infraction - Failure to provide adequate procedure for rigging near Class 1E equipment, paragraph 5.d; Deficiency - Failure to follow drawing requirements, paragraph 5.f; Infraction - Failure to take sufficient corrective action to prevent repetition of a nonconforming condition, paragraph 5.g; Deficiency - Failure to provide procedural requirements for actual practices - relative to inspection personnel, paragraph 5.h; Infraction - Failure to translate SAR requirements into drawings and specifications - relative to identification of Class 1E equipment, paragraph 5.i; Deficiency - Failure to require procedures that provide for qualifying NDE inspectors as "Limited" Level II (RT), paragraph 7.b).

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## DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*D. G. Beam, Project Manager
- W. O. Henry, Quality Assurance Manager of Construction
- \*D. L. Freeze, Project Engineer
- \*R. A. Morgan, Senior QA Engineer
- \*L. R. Davison, Senior QC Engineer
- \*S. W. Dressler, Senior Construction Engineer
- \*W. G. Rixon, Senior Planning & Facilities Engineer
- \*C. F. York, Senior Project Engineer
- \*H. D. Mason, QA Engineer
- R. L. Hembree, QC Electrical Inspector
- T. Coleman, QC Electrical Inspector
- C. M. Vargas, Document Control Supervisor
- J. C. Allgood, Electrical Engineer
- J. W. Rowell, Construction Electrical Engineer
- R. Hannay, Supervisor Electrical and Instrumentation
- W. Heffner, QC Electrical Inspector
- J. N. Warren, QC Civil Engineer
- C. R. Baldwin, Welding/NDE Technical Supervisor
- C. M. Melton, Senior Site Safety Assistant

#### Other Organizations

Hartford Steam Boiler Inspection and Insurance Company

- \*J. W. Kosko, Authorized Nuclear Inspector (ANI)
- C. F. Toegel, ANI

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on March 14 and 28, 1980, with those persons indicated in Paragraph 1 above.

### 3. Licensee Action on Previous Inspection Findings

(Closed) Unresolved Item 413-414/80-40-02, Failure to follow work and inspection instructions for fire protection and prevention. Weekly inspections are being conducted on the QA vaults suppression system and those responsible have been briefed of procedural requirement (SQAP-1A). Site QA has generated a surveillance checklist that will be implemented to ascertain that fire protection and prevention procedures are and will be complied with.

4. Unresolved Items

There were no unresolved items identified during this inspection period.

5. Electrical Components and Systems Units 1 and 2

- a. The inspector observed that the established storage requirements for electrical penetrations are being complied with; based on a random selection and inspection of stored in place (installed) and some penetrations stored in a site warehouse. The penetrations, which were inspected, included those identified by identification numbers E-592, E-566, E-520, E-540, and E-576.
- b. The inspector observed that the warehouse containing the major part of Class 1E equipment:
  - (1) Had an established "HOLD" area for nonconforming items.
  - (2) Did not contain excessive amounts of dust and debris.
  - (3) Provided sufficient dunnage for Class 1E equipment.
  - (4) Provided identification via purchase order numbers and/or part number(s) for Class 1E equipment.
- c. During tours of the various plant work areas the inspector noted:
  - (1) Space heating was energized for 10 of 11 pieces of electrical switchgear checked. The inspector was advised that the one switchgear in question (Essential Service Switchgear numbered 2ETB) had its spare heaters inadvertently de-energized shortly before the NRC inspector found them de-energized. The inspector observed that the ambient temperature in the area surrounding switchgear number 2ETB exceeded 60°F. The heaters were immediately de-energized. The inspector had no further questions about this matter at this time.
- d. The inspector observed a motor control center (IEMXS) located in unit 1 at elevation 577', column line BB-49. The motor control center was attached to an overhead hoist which was suspended from a piece of "Unistrut" channel iron laying inside a safety related cable tray (identified as being a part of the unit 1 train "A" electrical cable tray system). The inspector observed no apparent damage to the supporting cable tray; however, as a result of questioning the workers responsible for the movement of the motor control center, the inspector observed:
  - (1) The project did not have adequate procedures/instructions to provide guidance to those responsible for rigging Class 1E equipment, as demonstrated by the above unsatisfactory rigging practice.

- (2) Workers were not properly trained in the lifting and rigging of Class 1E equipment to prevent damaging adjacent Class 1E equipment.

A nonconformance report was initiated as a result of the inspector's observations (NIR 7878, dated 3/5/80). The corrective action resulting from the nonconformance report was: a revision of a DPC procedure (CP-371) to make specific warnings to workers to not use such installed Class 1E equipment as rigging points; the responsible electrical workers and other site personnel that are involved in rigging of safety related equipment were given training sessions on the proper application of procedure CP-371 and rigging practices to preclude damaging installed equipment. From the time of the initial observation, by the NRC inspector, of the aforementioned unsatisfactory rigging practices (March 5, 1980) until the end of this IE inspection reporting period (March 31, 1980) the inspector did not observe any similar unsatisfactory site rigging practices.

The inspector informed the licensee that the above unsatisfactory rigging practice was an item of noncompliance (an infraction); however, since corrective action has been taken and verified by the inspector prior to completion of this reporting period a written response will not be required (413-414/80-05-01).

- e. The inspector observed the installation of an installed control cabinet. The cabinet, Process Control Cabinet 3, is located in unit 1 side of the control room at elevation 594 feet. As a result of the observation the inspector found:
  - (1) The cabinet was in its proper location (near column lines BB-54 and BB-55).
  - (2) There were indications that the foundation weldments had been inspected and were found acceptable.
  - (3) The hold-down bolts were of the proper grade and type.
  - (4) There were indications that the proper fastening technique has been used in making fast the hold-down bolts (QA surveillance checklist E-1, dated 2/29/80).
- f. The inspector observed the installation of the battery racks for three Class 1E 125VDC instrumentation - control batteries (IEBB, IEBC, and IEBCD). The batteries were located in the control complex, battery room at elevation 554 feet. As a result:
  - (1) The battery racks have not been "signed off" as having been inspected by the responsible QC group.

- (2) The racks were found to be fastened to their support pedestals by the use of concrete anchor bolts; a close inspection of the anchor bolts revealed most to be identified as three inches in length.
- (3) The racks were of the physical dimensions described on drawing DNM-1356-01-01, revision D.
- (4) The racks were located near columns CC-55, CC-54, and BB-55 for IEBC, IEBC, and IEBC respectively - as described on electrical layout drawing CN1710-03.01, revision 9.
- (5) The inspector observed that the site electrical QC inspectors have been using "Electrical Equipment Location and Layout" drawings for installation inspection Class 1E equipment, even though CN-1214 series drawings (seismic mounting of electrical equipment) references "General Arrangement" drawings (CN1200 series) as the drawings to be used for properly locating Class 1E equipment. The inspector discussed this condition with the senior electrical inspectors; a nonconformance report was issued to document this condition (NCI #7958 dated March 13, 1980). The corrective action that resulted from the nonconformance report included: requiring the "General Arrangement" drawings to be revised to remove requirements that CN1200 series drawings be used for locating Class 1E equipment; a warning to all site electrical QC inspectors to become more attentive to drawing details which do not agree with actual "intent" or on design requirements and to properly document drawings in accuracy or inconsistency.

The inspector informed the licensee that failure to comply with the requirements of design documents is a noncompliance ( a deficiency), as engineering indicated that design documents (CN-1214 series drawings) were not "intended" to be used for properly locating Class 1E equipment and as "Electrical Equipment Location and Layout" drawings were intended to be used for this purpose. However, since corrective action has been taken to resolve the inspectors concern prior to completion of this reporting period a written response will not be required (413-414/80-05-02). The inspector has no further questions about this matter at this time.

- g. The inspector reviewed a randomly selected number of electrical installation drawings, procedures and specifications. The documents were selected from site locations where safety related construction activities were being conducted (the documents taken from three work locations totaled 25). As a result of checking to determine if the documents were of the most current revision, the inspector observed:
  - (1) Both drawings CN-1711-17.01-02, revision 4 and CN-1711-17.04-02, revision 0 were clearly stamped by site document control as not being "NUCLEAR SAFETY RELATED" documents. As such, these drawings

do not require the same control and use as "NUCLEAR SAFETY RELATED" drawings require, i.e., return of superseded drawings to document control.

- (2) The inspector observed that both of these drawings depicted cables that are nuclear safety related. They were designated as being Class 1E (cables identified as 1\*EIA653 and 1\*EIA654 for the former and 1\*EOA919 and 1\*EOA920 for the latter drawing).
- (3) There were no indications on the two drawings, nor on their transmittal letters from design engineering to indicate that these drawings contained safety related items; the governing Design Engineering QA Manual section, PR-130, paragraph 4.1, requires that drawings for safety related items or services be conspicuously identified with the words "NUCLEAR SAFETY RELATED".
- (4) The inspector discussed the above unsatisfactory condition with document control, QC, QA, design and technical personnel and was informed that similar conditions have also occurred on mechanical and civil design drawings (reference NCI numbers 5756 and 6104). The inspector was informed that the aforementioned two drawings should have been clearly conspicuously identified by design engineering with the words "NUCLEAR SAFETY RELATED". The condition was explained as possibly being caused by "human error". The inspector observed that DPC drawing review and approval process requires verification signatures/initials of several persons other than just those of its originator.

The inspector informed the licensee that failure to take sufficient corrective action, relative to resolution of the similar occurrences of this condition identified in DPC nonconformance reports numbered 5756 and 6014, is contrary to Criterion XVI of Appendix B to 10 CFR 50, and implemented by DPC Topical Report, paragraph 17.1.16.2 which requires analysis and determination to correct the nonconforming conditions and to preclude repetition. The fix or resolutions which were provided for nonconformance reports 5756 and 6104 were not adequate as demonstrated by similar conditions observed by the NRC inspector and listed above. This is an item of noncompliance (an infraction) (413-414/80-05-03).

- h. The inspector selected and evaluated the qualification records for four of the seventeen designated site electrical QC inspectors. As a result:
  - (1) It was observed that one of the inspectors was re-certified as a Level I on or about January 10, 1980. The records had no indications that the QC inspector could distinguish between the various colors which he may be required to distinguish between, i.e., red, yellow, and blue - the colors distinguishing the colors of the various tags/ paints placed on the Class 1E cables and cable

trays. The records of the other three inspectors reflected that they had been previously examined to assure their capability to distinguish between various colors. Prior to the completion of this IE reporting period the inspector observed and was advised that:

- (a) The qualification records of all site electrical QC inspectors have been reviewed and as required color vision examinations have been administered.
  - (b) Even though the applicable DPC procedure (J-1) does not require color examinations for site electrical QC inspectors; all are examined on approximately a yearly basis.
- (2) It was observed that one of the four inspector was re-certified on July 18, 1979, as a Level I electrical inspector. The evaluation comments on his re-certification indicated in part;..."has been Electrical and Instrumentation Inspector Supervisor over the past five years starting at McGuire and presently at Catawba". The current site organization chart designates the same Level I inspector as the supervisor technical electrical for electrical QC inspections. The inspector observed no other job descriptions or records in the individual's qualification folder which may have further described the limit of the individuals inspection and test functions and none were offered. The inspector evaluated the current requirements of DPC procedure J-1 (the applicable procedure for qualification of DPC site inspection personnel) and found no guidance of functional description which allows a Level I electrical inspector to supervise, direct or otherwise give technical direction to other Level I inspectors. The inspector discussed this concern with the Senior QC Engineer, the DPC QA Manager of Construction, the Project Engineer and the Project Manager and as a result was advised that:
- (a) Since DPC procedure J-1 does not disallow a Level I inspector from being a supervisor or otherwise place any level of capability (technical) on an inspection supervisor, that the DPC Level III inspector responsible for qualifications of electrical inspection personnel does not feel that the Catawba project needs a Level II electrical inspector. Further, that the site electrical inspection procedures do not require that the electrica' inspectors efforts/inspection results would require any complex evaluations by electrical QC that would require a Level II inspector.
  - (b) Other site QC inspection personnel in similar first line supervisory positions are certified as Level II; i.e., receiving inspection, welding, civil and mechanical. There are no Level II electrical inspectors at the Catawba Project.

The inspector observed that the aforementioned Level I inspector's records indicate that he has the necessary education and experience requirements to be certified as a DPC Level II inspector per procedure J-1. The inspector was advised that the same individual has taken the required DPC written exam for Level II inspector.

During this inspection period the NRC inspector observed that the above Level I inspector ("Electrical and Instrumentation Inspector Supervisor") giving technical advice/direction to several of the other site Level I electrical inspectors. The advice ranged from how to implement specification and drawing requirements to rejecting cable tray hanger details provided by design engineering.

The inspector informed the licensee that failure of the applicable procedure (J-1) to: take into account the need for requiring visual color examinations of electrical inspection personnel and specifying the inspection "Level" requirements for technical inspection supervisory personnel is contrary to Criterion V of Appendix B to 10 CFR 50 and implemented by DPC Topical Report, paragraph 17.1.5.2. This is an item of noncompliance (a deficiency) (413-414/80-05-04).

- i. The inspector evaluated the various construction procedures, relating the identification of Class 1E equipment and components other than cables and cable tray. The inspector discussed the procedures with the site electrical technical staff, the site construction senior-electrical personnel and the senior electrical QC inspectors. As a result of the evaluations and discussions the inspector observed that there have been no drawings, specifications or procedures developed by the design department to describe the method(s) to be used in distinctively identifying protection equipment to distinguish between redundant portions of the protection system - other than cables and cable tray.
  - (1) The station PSAR, Section 8.1 commits to comply with IEEE 279-1971.
  - (2) IEEE 279-1971 Section 4.22 states, in part: "In order to provide assurance that the requirements given in this document can be applied during the design, construction, maintenance, and operation of the plant, the protection equipment (for example, interconnecting wiring, components, modules, etc.) shall be identified distinctively as being in the protection system. This identification shall distinguish between redundant portions of the protection system. In the installed equipments, components, or modules mounted in assemblies that are clearly identified as being in the protection system do not themselves require identification."

- (3) The station FSAR, Section 8.3.1.3 states, in part: "All Class 1E equipment, cables, and raceways are identified according to the particular safety train or channel with which they are associated."

During various plant tours, the inspector observed that Class 1E cables and raceways are being distinctively identified by color coding. However, the inspector observed that "all" Class 1E equipment is not being identified per FSAR commitments; for example: the Class 1E control cabinets located in unit 1 cable room, Class 1E main control panels in the control room, panel IELMC0006, 4KV nuclear service water pump motor and component cooling water pump motors.

The inspector informed the licensee that failure to translate the above listed SAR commitments into design drawings, specifications or procedures (to be implemented during construction) is contrary to Criterion III of Appendix B to 10 CFR 50 as implemented by Duke Power Company Topical Report, paragraph 17.1.3. This is an infraction (413-414/80-05-05).

Except as noted no items of noncompliance or deviations were identified.

6. Electrical Cable Installation Units 1 and 2

- a. During tours of unit 1 control complex the inspector observed electrical workers installing reactor protection cable 1\*IPE505; NSSS instrumentation and control system cable 1\*EIA639; out-of-core instrumentation system cables 1\*ENB533, 1\*ENB531, 1\*ENB523, 1\*ENB522, and 1\*ENB521.
- b. The inspector observed the presence of the responsible electrical QC inspectors during the above cable installations and further observed:
- (1) Awareness of the applicable procedural requirements (M-40, revision 6), to both units.
  - (2) Cables were checked for size, type color, routing, and their reel numbers.
  - (3) Cables being fastened down in their respective cable trays by the workers and verified by the QC inspectors.
  - (4) At their points of origin and destination the identification of each cable with temporary markers.
  - (5) The workers sealing the ends of the electrical cables with a sealing tape. This was noted throughout the site.
- c. The inspector checked the routing of the above listed cables at selected points during their routing and compared those points with the routing that was designated on the respective cable pull cards.

- d. The inspector compared the cable pull card for one of the cables (1\*IPE505) with its respective routing drawings (CN1710-01.11-06, revision 11 and associated drawings) and found the cable pull card to reflect the same routing.

In the areas inspected no items of noncompliance or deviation were identified.

7. Weld Inspection (N/E) Units 1 and 2

- a. The inspector observed the implementation of the site's nondestructive examination (NDE) procedure for radiography (RT) on weld joints in the nuclear service water system. The personnel conducting the type NDE being applied (RT) were aware of the procedural requirements (NDE-10) and have current qualification records as NDE Level I (RT) inspectors.
- b. The inspector randomly reviewed the qualification records for six Level I and Level II (RT) inspection personnel. The inspector observed that Duke QA had qualified one of their NDE inspectors as a "Limited" Level II RT inspector. The governing procedure, NDE-B paragraph 3.6.1.6, made provisions for only one type of "limited" qualifications; those of a "Limited" Level I ultrasonic inspector.
  - (1) The inspector brought this unsatisfactory condition to the attention of the senior site QA representative. As a result, the procedure (NDE-B) has been revised to allow "limited" qualifications for the various NDE specialties including RT. The NRC inspector was provided documentary evidence showing that the Level II inspector in question has been examined by the DPC Level III NDE examiner and has been found qualified to function as only a "Limited" Level II RT film reader. Further, that the inspector has functioned in this capacity at the Catawba Project only since February 20, 1980 and has been under close supervision by another DPC site QA Level II RT inspector. The NRC inspector was assured that the proficiency of the "Limited" Level II has met the requirements of any NDE Level II RT inspector, relative to reading RT film.
  - (2) The inspector informed the licensee that the above condition was an item of noncompliance (a deficiency); however, since sufficient corrective action has been taken prior to completion of this reporting period a written response will not be required (413-414/80-05-06).

Except as noted no items of noncompliance or deviation were identified.

8. Reactor Vessel Installation - Unit 2

- a. The inspector observed parts of the placement of unit 2 reactor vessel onto its supports during the placement the following was noted:
  - (1) The support "shoes" which were provided by Westinghouse, were found to be too narrow to accept the reactor support "feet". This condition was documented on nonconformance report NCI 7926. The shoes were returned to Westinghouse where they were machined to the proper width.
  - (2) The support shims were made to fit with a seating surface of at least 75 percent.
- b. The bearing, alignment and levels have been established by DPC and is awaiting Westinghouse acceptance. If accepted, the vessel will be covered with temporary protective coverings until the construction schedule permits further work on the vessel.

In the areas inspected no items of noncompliance or deviation were identified.