



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

Report Nos. 50-413/81-26, 50-414/81-26

Licensee: Duke Power Company
P. O. Box 2178
Charlotte, North Carolina 28242

Facility Name: Catawba

Docket Nos. 50-413, 50-414

License Nos. CPPR-116, CPPR-117

Inspection at Catawba site near Lake Wylie, South Carolina

Inspector:

J. L. Coley
J. L. Coley

11-24-81

Date Signed

Approved by:

A. B. Herdt
for A. B. Herdt, Section Chief
Engineering Inspection Branch
Engineering and Technical Inspection Division

11-27-81

Date Signed

SUMMARY

Inspection on November 2-6, 1981

Areas Inspected

This routine, unannounced inspection involved 36 inspector-hours on site in the areas of reactor coolant pressure boundary pipe welding (Unit 2), reactor coolant pressure boundary piping weld records (Units 1 and 2), safety related structures (Units 1 and 2), safety related component (Unit 1) and previous inspection findings (Units 1 and 2).

Results

Of the 5 areas inspected, no violations or deviations were identified.

8112230324 811201
PDR ADDCK 05000413
Q PDR

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *S. W. Dressler - Senior Construction Engineer
- *J. C. Shopshire - QA Engineer Supervisor
- *C. B. Cheezem - ISI Coordinator
- *W. T. McClure - QA Technician
- *R. L. Medlin - Corporate QA
- *J. E. Cherry - Assistant ISI Coordinator

Other licensee employees contacted included construction craftsmen, technician, mechanic and office personnel.

Other Organizations

- *D. J. Patterson, Group Leader, Babcock & Wilcox (B&W)
- *C. R. Meredith, Assistant Group Leader (B&W)

NRC Resident Inspector

- *P. K. Van Doorn

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 6, 1981 with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below, no dissenting comments were received from the licensee. On November 9, 1981 Duke Power was requested by phone to re-radiograph weld joint 1CF24-1 using techniques that could improve the radiographic contrast of a previous supplemental radiograph. The supplemental radiograph was exposed using a double wall technique in lieu of a panoramic exposure which initially had revealed an indication of concern. The licensee agreed to make the supplemental exposure (paragraph 3.C(1)(d)).

Unresolved Item 413, 414/81-26-01: "Review of Drawings and Work Instructions Appear Inadequate" - Paragraph 9.

3. Licensee Action on Previous Inspection Findings

- a. (Closed) Unresolved Item 413, 414/81-10-05, Transfer Method Not Addressed in UT Procedure. The licensee had initially stated that the transfer method had been omitted from their procedure based on code case no. 1698 which established a waiver for this method. The

inspector acknowledged the code case and NRC's acceptance of this code case as delegated in Regulatory Guide 1.85. However, the Regulatory Guide makes exceptions to this code case which are not addressed in B&W's ISI procedure. During discussions with the licensee it was found that the licensee's preservice plan addressed the NRC exceptions by identifying each joint to be inspected and listing the appropriate UT block to be used. The licensee stated that in each case the calibration block was of the same P number and product form and would have received the same heat treatment as the material being UT inspected.

This item is considered closed.

- b. (Closed) Unresolved Item 413, 414/81-10-04, Code of Record for PSI. The inspector had questioned whether the licensee had made a detailed comparison between the inspection requirements as outlined in the licensee preservice inspection program, which is in accordance with Section XI of the 1974 edition of ASME code, and the inspection requirements of Section XI of the 1977 edition of ASME code, which appears to be the code that the licensee will use for inservice inspection. There are noted differences in the inspection requirements between these two code editions. The inspector was concerned that a sufficient baseline would not be performed on items added as a result of increased inspection required by the 1977 edition. The licensee's ISI representative stated that Duke Power has made a complete review of the differences between the two codes and has incorporated these differences into the preservice inspection program presently being performed at the Catawba site. In addition to the code differences, regulatory guides were also considered and added to the program as applicable. This item is considered closed.
- c. (Open) Unresolved Item 413, 414/81-24-01, Verification of Appropriate Corrective Action for Nonconformance Items. At the request of the senior NRC resident inspector for the Catawba site, the inspector reviewed radiographs noted in this unresolved item and reported by the licensee in nonconforming item reports (NCI) No. 10360 and No. 13187.
 - (1) The inspector noted the following conditions as a result of a review of the radiographic film and other supporting documentation for NCI-10360:
 - (a) An undocumented weld had been made on the carbon steel pipe (PC MK CT-CF-26) adjacent to weld joint ICF-24-1.
 - (b) An apparent area of lack of fusion (5" long) was noted in the undocumented weld volume
 - (c) The film cassette was loaded with three film, the two darkest film revealed the indication to be approximately .250" long. At this length the indication would not be classified as a

linear indication. However, the lightest film, which exhibited better film control apparently due to the additional filtering, revealed the indication as lack of fusion.

- (d) The licensee had performed supplemental radiography and had concluded that the defect and undocumented weld area had been removed by additional surface conditioning. This assumption however may be incorrect since the initial radiographs were exposed using the panoramic technique and the supplemental radiographs were exposed using the double wall technique. The double wall technique radiographs did not have the film contrast quality that the initial radiographs exhibited as demonstrated by the difference between two ID pittings recorded on both film in the area near the undocumented weld. It is likely that if the source were backed off further and a proper combination of film and lead screen used, the weld and the indication would reappear.
- (e) The licensee evaluation of the NCI 10360 completely ignores the fact that all of the initial radiographs revealed that an undocumented weld had been made on the pipe. As a result, magnetic particle examination of the pipe OD area of concern had not been performed as required by the ASME Code.

The inspector and licensee agreed that the following actions would be taken to insure that the defect indication and the undocumented weld have been completely removed.

1. The area where the undocumented weld was observed will be re-radiographed using the techniques discussed in (d) above or the technique used in the initial radiograph.
 2. If the supplemental radiograph discussed above verifies that the undocumented weld was in fact on the OD surface and has been removed, then a magnetic particle examination of the OD surface will be performed as required by the ASME code.
 3. An acid etch test will also be performed to determine if all the undocumented filler metal has been removed.
- (2) The inspector also reviewed the radiographs noted in NCI-1387. This NCI is still unresolved awaiting vendor UT reports that may aid in the interpretation of where an indication is oriented in relation to the weld. This NCI was written to address the difference of opinion between the licensee level III and the authorized nuclear inspector concerning the type and location of an indication. In the licensee level III opinion, the indication

is an inclusion and is in the base material (Valve No. 1FW56). The authorized nuclear inspector feels the indication is a crack that propagates from a porosity indication. In the view of the NRC inspector there are two indications involved. One indication appears to be porosity in the weld on the valve side. The other indication appears to be an inclusion in the base material that starts below the porosity indication and runs toward the valve body. In order for this indication to be classified as an acceptable base material indication, the licensee would have to prove that the indication is outside the area to be examined (weld and heat affected zone). A distance of at least 3/16" would be needed for this assurance. The inspector and the licensee agreed that radiographs of the indication using the parallax technique to determine location should be made. This may be difficult because of the thin material involved, but the chances of success are as good as the probability of the vendor having detected the indication with UT. In addition to the above radiographs, the inspector and the licensee agreed that radiographs would be taken approximately 10° in each circumferential direction from the initial perpendicular radiograph. These two radiographs should adequately characterize the indication so that there will be no difference in opinion between examiners as to the type of indication in the valve nozzle.

If adequate separation cannot be verified between the base metal defect and the weld heat affected area or if supplemental radiography concludes there is a crack in the material, the weld must be repaired.

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 9.

5. Independent Inspection Effort (Units 1 and 2)

The inspectors conducted a general inspection of the Unit 1 and 2 containments, auxiliary buildings, fuel buildings, and electrode issue station to observe construction progress and construction activities such as welding, material handling and control, housekeeping and storage.

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

6. Reactor Coolant Pressure Boundary Piping (Unit 2)

The inspector observed welding work activities for reactor coolant pressure boundary (RCPB) piping. The applicable code for the installation of RCPB piping is the ASME B and PV Code Section III Subsection NB, 1974 Edition plus addenda through summer 1975.

The inspector observed field welding of the reactor coolant pressure boundary piping welds listed below at the root layer stage of completion. The welds were examined to determine whether: the specified weld procedure used, physical appearance of weld, welder identification and qualification, evidence of QC verification of root pass and weld identification/location, meet applicable procedures.

| <u>JOINT NO.</u> | <u>UNIT</u> | <u>SIZE</u> | <u>WELDER ID</u> |
|------------------|-------------|--------------------|------------------|
| 2NI-55-9 | 2 | 10" Dia. X sch.140 | H-99 |
| 2NI-55-11 | 2 | 10" Dia. X sch.140 | H-99 |
| 2NI-55-16 | 2 | 10" Dia. X sch.140 | H-99 |

The inspector observed activities at weld material issue stations to determine adequacy of: weld material storage/segregation, oven temperatures, issue records and return of unused weld material. Also the inspector observed work areas for uncontrolled weld material.

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

7. Reactor Coolant Pressure Boundary Piping (Welding). Review of quality Records (Units 1 and 2)

The inspector reviewed quality records for reactor coolant pressure boundary piping welds as described below to determine whether applicable code and procedure requirements were being met. See paragraph 6. above for the applicable code.

- a. Complete weld packages including RT film were reviewed for the following welds:

| <u>WELD NO.</u> | <u>SIZE</u> | <u>CLASS</u> | <u>UNIT</u> |
|-----------------|-------------------|--------------|-------------|
| 2NI-55-8 | 6" Dia. sch.160 | 1 | 2 |
| 2NI-55-14 | 10" Dia. sch. 140 | 1 | 2 |
| 2NC-42-12 | 12" Dia. sch. 140 | 1 | 2 |
| 2NC-42-11 | 12" Dia. sch. 140 | 1 | 2 |
| *2NI-63-17 | 10" Diameter | 1 | 2 |
| 2NC-42-4 | 6" Dia. sch.160 | 1 | 2 |
| 1NC-190-32 | 6" Dia. sch.160 | 1 | 1 |
| 1NC-190-2 | 6" Dia. sch.160 | 1 | 1 |
| 1NC-44-20 | 4" Dia. sch.160 | 1 | 1 |
| 1NC-46-17 | 4" Dia. sch.160 | 1 | 1 |
| 1NI-162-14 | 10" Diameter | 1 | 1 |
| 1NC-29-4 | 10" Dia. sch 160 | 1 | 1 |

Note* Visual examination only was performed, because records were still in the field.

The records were reviewed in the areas of:

- (1) Inspection records covering visual and dimensional inspection
 - (2) Weld history records
 - (3) Preheat and interpass temperature control
 - (4) NDE records (including a review RT film)
 - (5) Weld repair records as applicable to each joint
 - (6) Welding material controls
 - (7) Welder Qualification - welder qualification records for all the above welds were reviewed
 - (8) Inspector qualifications - The inspector reviewed all the welding and NDE examiner qualifications for the above welds
- b. The inspector reviewed the following nonconforming item reports (NCI) to determine whether the nonconforming activity or component is specifically identified or described and whether the records are complete, legible, retrievable, and properly closed out.

| <u>NCI NO.</u> | <u>UNIT</u> | <u>SYSTEM</u> |
|----------------|-------------|------------------|
| 011718 | 1 | Reactor Coolant |
| 011628 | 1 | Reactor Coolant |
| 011499 | 1 | Reactor Coolant |
| 011270 | 1 | Reactor Coolant |
| 011161 | 1 | Reactor Coolant |
| 010966 | 1 | Reactor Coolant |
| 010863 | 1 | Reactor Coolant |
| 10859 | 2 | Safety Injection |
| 11151 | 2 | Safety Injection |
| 11167 | 2 | Safety Injection |
| 11207 | 2 | Safety Injection |
| 11343 | 2 | Safety Injection |
| 010138 | 2 | Safety Injection |

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

8. Safety Related Components (Unit 1)

The inspector reviewed records and observed work activities for the components listed below.

| <u>COMPONENT VERIFIED</u> | <u>ITEM NO</u> | <u>CLASS</u> |
|---|----------------|--------------|
| Main Coolant Pump | 1A | 1 |
| Steam Generator Blowdown Heat Exchanger | 1A & 1D | 2 |
| Motor Driven Valves | 1NC-20 & 19 | 1 |
| RHR Pump | 1B | 2 |

The following activities were verified for the components listed above.

a. Installation

- (1) Work and inspection activities
- (2) Location
- (3) Placement and Mounting/supporting
- (4) Generation and maintenance of inspection records

b. Protection after installation

- (1) Scope and frequency of inspection activities
- (2) Protection provided as required, including protection against adverse temperature, humidity and foreign material

c. Nonconforming activities

- (1) Documented and identified clearly
- (2) Segregated (as applicable)
- (3) Corrective action adequate

Within the areas examined no violations or deviations were identified.

9. Safety Related Structures - Structural Steel and Supports (Units 1 and 2)

The inspector observed field welding activities associated with safety related structures and supports inside and outside the containment during various stages of work completion. Observations were made in order to determine whether the requirements of applicable specifications, standards, drawings, work and/or inspection procedures are being met for the activities involved.

Work activities for the following structures/supports were verified.

| <u>STRUCTURE/ SUPPORT</u> | <u>UNIT</u> | <u>DRAWING</u> |
|---|-------------|------------------------|
| Diesel Generator Plenum | 1 | CN-1684-VD-000H Rev. 3 |
| Diesel Generator Plenum | 2 | CN-2684-VD-000H Rev. 0 |
| Containment Spray Pump Foundation 2B | 2 | CN-1220-21 Rev. 13 |
| Containment Spray Pump Foundation 1A | 1 | CN-1220-21 Rev. 13 |

Specific attributes verified as a result of this inspection consisted of the following.

- (a) Use of specified materials
- (b) Installation and erection as per drawing/instructions
- (c) Utilization of qualified NDE and inspection (QC) personnel
- (d) Record keeping
- (e) Testing and NDE

The inspector noted two minor errors in the instructions/drawings for the installation/erection of the Unit 2 diesel generator plenum. The M-18A form, "Structural Steel Erection Inspection Report" listed a Unit 1 drawing in lieu of a Unit 2 drawing and the Unit 2 drawing flagged incorrectly braces for the subcontractor to install in lieu of the licensee. The inspector also reviewed the field changes for the plenum that had been made as a result of the installation of Units 1 and 2. The result of the inspector's review revealed that the licensee's craft and craft inspectors had written an abnormal amount of variation notices (VN's) on these structures. Most of the VN's were written because of design errors that should, in the inspector's opinion, have been caught if an adequate review had been made by design and Quality Assurance. The licensee stated that a review would be made to determine the extent of the problem and what steps can be taken to correct the problem. This item was reported as Unresolved Item 50-413, 414/81-26-01, Review of Drawing/Work Instructions Appear Inadequate.