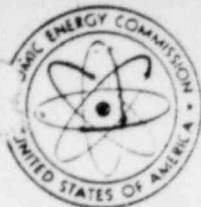


UNITED STATES
ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION II - SUITE 818
230 PEACHTREE STREET, NORTHWEST
ATLANTA, GEORGIA 30303

TELEPHONE: (404) 626-4503



RO Inspection Report No. 50-270/73-8

Licensee: Duke Power Company
Power Building
422 South Church Street
Charlotte, North Carolina 28201

Facility: Oconee Unit 2
Docket No.: 50-270
License No.: CPPR-34
Category: A3/B1

Location: Seneca, South Carolina

Type of License: B&W, PWR, 2568 Mw(t)

Type of Inspection: Routine, Unannounced

Dates of Inspection: June 20-22, 1973

Dates of Previous Inspection: June 10-17 and 19-21, 1973

Inspector In Charge: W. D. Kelley
Reactor Inspector
Facilities Test and Startup Branch

Accompanying Inspectors: None

Other Accompanying Personnel: None

Principal Inspector: Frank Jape
F. Jape, Reactor Inspector
Facilities Test and Startup Branch

7-25-73
Date

Reviewed By: C. E. Murphy
C. E. Murphy, Chief
Facilities Test and Startup Branch

7/25/73
Date

7911270552

SUMMARY OF FINDINGS

I. Enforcement ActionA. Violations

None

B. Safety Items

None

II. Licensee Action on Previously Identified Enforcement MattersA. Violations1. Welding Program Deficiencies (RO:II letter to DPC, dated March 8, 1972, Item 5)

The review of the welding deficiencies and documentation continues. This item remains open. (Details, paragraph 2)

B. Safety Items

There were no identified safety items.

III. New Unresolved Items73-8/1 Body Wall Thickness of Valves 2-51-244 and 2-51-245

Justification for body wall thickness of valves 2-51-244 and 2-51-245 being less than that permitted by RO letter, dated June 30, 1972, paragraph 3, remains to be resolved. (Details, paragraph 3)

73-8/2 Valve Wall Thickness of Valve 2-RV-67

Calculation of valve wall thickness of valve 2-RV-67 in accordance with the applicable codes remains to be resolved. (Details, paragraph 3)

IV. Status of Previously Reported Unresolved Items73-1/1 Core Flooding System Testing Requirement

The results of TP 201/7, "Core Flooding System Flow Test," remains to be analyzed by the licensee and reviewed by the inspector. This item remains open.

73-6/1 Test Sequence for the Reactor Building Structural Integrity Test and the Integrated Leak Rate Test

An acceptable test sequence has been used by the licensee when conducting the subject tests. This item will be inspected following completion of the tests.

V. Design Changes

None

VI. Unusual Occurrences

None

VII. Other Significant Findings

None

VIII. Management Interview

A management interview was held on June 22, 1973, attended by the following personnel:

Duke Power Company (DPC)

J. T. Moore - Special Assistant to the Project Manager
D. L. Freez - Principal Field Engineer
L. R. Barns - Quality Assurance Engineer

- A. DPC was informed that their corrective action relating to the welding program deficiencies had been reviewed and the RO inspector had no comment. (Details, paragraph 2)
- B. DPC was informed that their measurements of the thin wall valves and their report "Reactor Coolant System Pressure Boundary

Valve - Minimum Wall Thickness," Appendix "A," had been reviewed and discussed with their mechanical engineer. DPC will review their engineering evaluation and will take any necessary action to assure that the valves will meet their purchase specification as required by RO letters of June 30, 1972, and February 15, 1973. (Details, paragraph 3)

DETAILS

Prepared by: W. D. Kelley 7/25/73
 W. D. Kelley, Reactor Inspector Date
 Engineering Section
 Facilities Construction Branch

Dates of Inspection: June 20-22, 1973

Reviewed by: J. C. Bryant 7/25/73
 J. C. Bryant, Senior Inspector Date
 Engineering Section
 Facilities Construction Branch

1. Individuals Contacteda. Duke Power Company (DPC)

- A. R. Hollins - Associate Field Engineer - Welding
- L. R. Davison - Associate Field Engineer - NDT
- D. G. Beam - Project Manager
- *T. F. Wyke - Principal Mechanical Design Engineer

b. DPC Consultant

*H. Thielsch - Professional Engineer

* By telephone conference only.

2. Welding Program Deficiencies

Welding program deficiencies at the Oconee site are listed in the letter of March 8, 1972, from Region II to DPC. The action taken by DPC to resolve these deficiencies on Oconee Unit 1 are described in RO Report No. 50-269/73-1.

On the current inspection, the inspector examined the DPC weld review program in progress at Oconee Unit 2. He also examined welding procedures, welding procedure qualifications and documentation of welding. The program was found to be essentially the same as that of Unit 1.

The current status of the program is as given below. If the program is carried out as planned, the inspector anticipates that the deficiencies will be resolved after review of the consultant's final report.

a. Radiographic Inspection

All radiographs have been reevaluated by independent Level II and Level III examiners and all reradiography has been completed but has not been accepted by the consultant.

b. Weld Data Records

The consultant required DPC to review and correct all errors or illegible information on the weld data cards. This required the review of other documentation where the identical information was recorded. All errors have been corrected but the consultant has not performed his audit.

c. Documentation - Weld Material

The weld material documentation has been broken into the following four categories:

- (1) List of weld material heat numbers for which actual material certifications are available.
- (2) List of weld material heat numbers for which typical material certifications are available.
- (3) List of weld material heat numbers contain obvious transposition of mill heat numbers or misprints of numerals or letters. An explanation will be given for each error and the correct heat number listed.
- (4) List of weld material heat numbers for which no data is available nor an explanation of the deficiency.

The above will be the subject of a separate report by the consultant.

d. Welding Procedure Qualifications

The consultant reviewed all welding procedures with their revisions and tabulated his findings. The review included the welding procedure qualification test coupons. If the test coupons did not meet the dimensions of ASME Code, Section IX, the procedures were requalified. One new procedure had to be written for the welding of carbon steel pipe with E 309 stainless steel welding wire. The consultant reported that all welding procedures are now qualified in accordance with ASME Code, Section IX; however, the new procedure must be approved by DPC engineering.

e. Weldor Qualification Tests

The weldor qualification test coupons were reviewed by the consultant and those weldors onsite whose test coupons did not conform to the dimensions specified by ASME Code, Section IX were requalified. The weldor qualification test coupons of weldors who are not presently employed by DPC were reviewed

by the consultant. He evaluated them as being acceptable for qualification even though they did not meet the ASME Code, Section IX dimensions.

A computer printout is used to inform the welding supervisor of the status of weldor qualifications. The welding supervisor is informed 30 days before the expiration of a weldor's qualifications so that the weldor may be assigned welding requiring the specific process in order to keep his qualifications current.

The inspector took no exception to the consultant's evaluation of the weldor qualification test coupons.

f. Inspection Procedures and Personnel

The DPC nondestructive testing procedures were reviewed by the consultant and he required that they be qualified by a demonstration test. He reviewed the qualifications of the nondestructive test personnel and his evaluation is that they were qualified to perform the tests.

The inspector took no exception to the consultant's evaluation.

g. Final Systems Audit

The consultant has not performed his final systems audit.

He has insisted that all systems piping be inspected and all isometric erection drawings be revised to the "as built" status by DPC before he performs his audit. All isometric drawings are being revised and the isometric revision sheets must be approved by DPC's mechanical engineer, associate field engineer-welding, and associate field engineer-NDT.

The consultant will select for audit, from the field weld joint checkoff list, buttwelds that were not reradiographed in the radiograph inspection program. At least one buttweld per isometric drawing will be selected for audit.

After the weld is selected by the consultant for audit, all information stenciled on the pipe will be recorded, photographs will be taken of the weld, and the weld width and ferrite content will be measured and recorded. The stenciled information to be recorded is the weldor identification symbol and the pipe and/or fitting heat number. The nearest branch weld to the buttweld will also be selected for audit and the above information recorded.

The weld data cards will be reviewed by the consultant to determine that the information pertaining to the weldor's symbol, NDT technician identification, weld procedure, weld material heat

number, and weld repair history is recorded. The weldor's symbol must agree with the weldor's symbol stenciled on the pipe, and the weldor's qualification must have been valid at the time the weld was made.

The welding material heat numbers for the butt welds on the weld data cards will be audited by the consultant to determine if they agree with the specifications on the isometric drawings. The radiographs will then be evaluated and audited for film overlap and will be compared with the weld photograph.

3. Thin Wall Valves

DPC has completed their program of measuring valve wall thickness and identified those valves important to nuclear safety that were below the minimum wall thickness specified by the standard or code referenced in their purchase order.

The entire valve body wall thickness of these valves was measured although this is not clearly stated in their report "Reactor Coolant System Pressure Boundary Valves."

The valve wall thickness measurements were made by technicians previously qualified as Level I-Ultrasonics per SNT-TC-1A who were given an exercise in thickness measurements using specimens made from wrought pipe.

An ultrasonic calibration block was made from a forged valve body of ASTM A-182, F316 material, and its acoustic properties were compared with a calibration block machined from ASTM A-296, T316 bar stock that covered the full range of thickness to be measured. There was no difference in measurements of the two specimens due to acoustic properties from 0.105 inch through 0.450 inch. A cast stainless steel bar of CF8M material was used as a calibration block for measuring cast valve body wall thickness. DPC noted that there was a difference in the acoustic properties of the cast material for a given thickness and that an error existed between physical valve body wall thickness measurement and the acoustic measurement.

The RO letter of February 15, 1973, states that if a measurement error of 2% cannot be met, measured wall thickness must meet the required thickness by an amount at least equal to the maximum measurement error. DPC has verified that their measurement error is less than 2% and has included the documentation in their report.

The thin areas of the valve body wall thickness were not mapped and available to the design engineer who prepared appendix "A" to the report nor were the radiographs of the casting thin wall area evaluated for casting defects that might require an engineering evaluation in order to use higher stress values.

The wall thickness of valves 2-51-244 and 2-51-245 is less than the 90% of the specified code permitted by RO letter of June 30, 1972, paragraph 3.

The method of determining the wall thickness of valve number 2RV-67 was changed by the vendor from B16.5 to the 1968 Edition of ASME Section III, Nuclear Vessels, Article I-2, paragraph 1-222(2). This edition of Section III is for nuclear vessels and the paragraph and section referenced are for cylindrical shells. They do not apply to valve bodies. It was not until the 1971 Edition of Section III that subarticle NB 3500 was included for the design of Class I valves. At that time, this section was broadened to include nuclear power plant components.

This does not meet the requirements of the RO letter of June 30, 1972, paragraph 4, which states that the wall thickness must meet the requirements of the codes and standards in effect on the date of purchase.

Thin wall valves will remain an unresolved item pending resolution of the following:

- a. Justification for body wall thickness of valves 2-51-244 and 2-51-245 being less than that permitted by RO Letter of June 30, 1972, paragraph 3.
- b. Calculation of valve wall thickness of valve No. 2-RV-67 in accordance with the applicable codes.