UNITED STATES
ATOMIC ENERGY COMMISSION
REGION II - SUITE 818
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DIRECTORATE OF REGULATORY OPERATIONS

RO Report Nos. 50-269/72-8, 50-270/72-7 and 50-287/72-5

Duke Power Company
Oconee 1, 2 and 3

License Nos. CPPR-33, 34 and 35

Oconee County, South Carolina

Docket Nos. 50-269, 50-270 and 50-287

Category A3/B1, A3/B1, A2

Type of Licensee: PWR-2452 MW(t) each, B&W

Type of Inspection: Routine, Announced

Dates of Inspection: August 22-25, 1972

Dates of Previous Inspection: June 27, 1972, and July 18-21, 1972

Principal Inspector: C E Murphy — 10/5/72
C. E. Murphy, Reactor Inspector — Date
Reactor Test and Startup Branch

Accompanying Inspectors: Frank Jape — 9-27-72
F. Jape, Reactor Inspector — Date
Reactor Test and Startup Branch

M S Kidd — 9/27/72
M. S. Kidd, Reactor Inspector — Date
Reactor Test and Startup Branch

W W Peery — 9/27/72
W. W. Peery, Radiation Specialist — Date
Reactor Operations Branch

W D Kelley — 9/27/72
W. D. Kelley, Reactor Inspector — Date
Reactor Construction Branch

Nick Economos — 9/27/72
N. Economos, Reactor Inspector — Date
(Metallurgy)
Reactor Construction Branch

Other Accompanying Personnel: C. M. Campbell, Radiation Specialist
Reactor Test and Startup Branch

Reviewed By: C. E. Murphy 10/4/72
C. E. Murphy, Acting Chief, Reactor Test and Startup Branch Date

Proprietary Information: None

SECTION I

Enforcement Action

A. Noncompliance Items

1. Criterion VI of Appendix B to 10 CFR 50 - Failure to provide approved procedures for electrical quality control. (See Section II, paragraph 9)

2. Criterion VII of Appendix B to 10 CFR 50 - Installation of cable without documentary evidence that cable met procurement specification. (See Section II, paragraph 15)

3. Criterion V of Appendix B to 10 CFR 50 - Failure to implement approved procedures for control of nonconforming items. (See Section II, paragraph 10)

4. Criterion VI of Appendix B to 10 CFR 50 - Failure to distribute welding procedures to welding stations where they would be used. (See Section III, paragraph 2)

5. Criterion XIV of Appendix B to 10 CFR 50 - Failure to establish measures to indicate the status of cable. (See Section II, paragraph 14)

6. Criterion XV of Appendix B to 10 CFR 50 - Failure to maintain accurate records of nonconforming cable. (See Section II, paragraph 8)

7. Criterion VIII of Appendix B to 10 CFR 50 - Failure to follow procedures which resulted in use of incorrect material in Class I systems. (See Section III, paragraph 5)

8. Criterion XVI of Appendix B to 10 CFR 50 - Failure to identify the cause of weld defects and to take corrective action; failure to report the weld defects to appropriate levels of management. (See Section III, paragraph 7)

9. Criterion XVIII of Appendix B to 10 CFR 50 - Failure to conduct effective audits of electrical construction QC activities. (See Section II, paragraph 12)

10. Criterion VI of Appendix B to 10 CFR 50 and Section IV, B of the Guide for Conducting the Oconee Preoperational Test Program - Major changes made to test procedure were handled as minor changes. (See Section V, paragraph 4)

11. Criterion VI, Appendix B to 10 CFR 50 and Section II, A of the Guide for Conducting the Oconee Preoperational Test Program - Approval of a test procedure was delegated to the operating engineer rather than be approved by the plant superintendent. (See Section V, paragraph 4)

12. Criterion VI of Appendix B to 10 CFR 50 and Attachment C to Guide for Conducting the Oconee Preoperational Test Program - Changes were made to a procedure which were not identified in the body of the procedure.

13. Criterion XI of Appendix B to 10 CFR 50 and Attachment B to the Guide for Conducting the Oconee Preoperational Test Program - Failure to document the results of a test. An item that requires signoff during performance of a test was not signed off. (See (Section V, paragraph 4)

Licensee Action on Previously Identified Enforcement Matters

None

Unresolved Items

A. Liquid Waste System

Calibration had not been completed on the flow meter for liquid waste discharges. (See Section VI, paragraph 1)

B. Gaseous Waste System

1. Five gaseous effluent monitors were not ready for operation. (See Section VI, paragraph 2)

2. Verification was not available that the stack sampling probe is isokinetic. (See Section VI, paragraph 3)

3. The possibility of air flow from waste handling areas to clean areas exists. (See Section VI, paragraph 4)

C. Solid Waste System

1. The solid waste compactor has not been installed nor exhaust duct attached. (See Section VI, paragraph 5)

2. A detailed procedure has not been written for solid waste packaging. (See Section VI, paragraph 5)

3. A procedure for spent resin transfers to a truck mounted cask had not been written. (See Section VI, paragraph 6)

D. Radiation Protection

1. Training of health physics personnel is continuing as well as health physics training of operations personnel. (See Section VI, paragraph 7)

2. The Beckman Beta Mate II counter in the health physics counting room had not been calibrated. (See Section VI, paragraph 8)

3. Change rooms in the pool area and hot machine shop have not been fully supplied. (See Section VI, paragraph 9)

4. Only one of twenty-one count rate meters has been installed at monitoring points for personnel. (See Section VI, paragraph 10)

5. None of the area monitors had been calibrated. (See Section VI, paragraph 11)

6. Seven process monitors were not ready for operation. (See Section VI, paragraph 12)

7. Decontamination facilities were not complete. (See Section VI, paragraph 13)

8. Hood flows have not been shown to be satisfactory. (See Section VI, paragraph 14)

9. Air filter tests had not been completed. (See Section VI, paragraph 15)

E. Environmental Monitoring

A flow control problem exists with the continous water sampler in the Keowee tailrace. (See Section VI, paragraph 16)

Status of Previously Reported Unresolved Items

A. Initial Fuel Loading Procedure (RO Report No. 50-269/72-3)

Action on RO's comments regarding the initial fuel loading procedure has not been completed yet. The author of the original procedure has terminated his employment with DPC and the procedure was completely rewritten and is currently being reviewed by the SRC. Smith stated that RO will receive a copy of the new procedure by mid-September. (See Section V, paragraph 3)

B. Drawing Control Procedure (RO Report No. 50-269/72-4)

Administration controls and procedures have been implemented. This item is resolved. (See Section V, paragraph 5)

C. Control of Lifted Leads and Jumpers (RO Report No. 50-269/72-7)

DPC provided RO with a list of tests to be redone prior to hot functional testing, fuel loading, and startup. The list is currently under review by RO. (See Section V, paragraph 6 and Exhibit A of this report.)

D. B&W Procedure for Control of Small Parts and Tools (RO Report No. 50-269/72-5)

B&W has written a procedure for control of small parts and tools during repairs to Unit 1 steam generators. The procedure, FCO # 2, NSS-2, Rev. 3, was issued May 29, 1972. This item is resolved.

E. DPC Audit of B&W Quality Assurance Program (RO Report No. 50-269/72-5)

This item has been resolved by virtue of an audit by DPC of the QA program generated by B&W to govern repair work on the reactor vessel and steam generators. The audit was conducted July 6, 1972, and showed that B&W had developed a satisfactory program.

Design Changes

None

Unusual Occurrences

None

Persons Contacted

DPC - Construction

*R. L. Dick - Vice President
**C. B. Aycock - Senior Field Engineer
**D. L. Freeze - Principal Field Engineer
**D. G. Beam - Project Manager
K. W. Schmidt - Associate Field Engineer - Electrical
D. E. Hatley - Assistant Field Engineer - Electrical
B. H. Webster - Associate Field Engineer - Systems
L. R. Davison - Associate Field Engineer - NDT
A. R. Hollins - Associate Field Engineer - Welding
J. M. Curtis - Senior Design Engineer (QA) - (Charlotte - Design Engineering)
M. Ray - Associate Engineer - Welding - (Charlotte - Construction Department)

Consultant

H. Thielsch - PE

DPC - Operations

**J. E. Smith - Plant Superintendent
**J. W. Hampton - Assistant Plant Superintendent
**L. E. Summerlin - Staff Engineer
R. M. Koehler - Technical Support Engineer
O. S. Bradham - Instrument and Controls Engineer
C. T. Yongue - Health Physics Technician
W. G. Itin - Laboratory Technician, Health Physics
J. R. Leonard - Laboratory Technician, Health Physics
D. Rains - Assistant Staff Engineer

Babcock and Wilcox Construction Company

W. Faasee - Field Project Manager
C. D. Thompson - Field Quality Control Supervisor

* These persons attended the first management interview.
** These persons attended both management interviews.

Management Interviews

At Dick's request, a management interview was held on August 24, 1972. A final management interview was held at the conclusion of the inspection on August 25, 1972. The following items were discussed:

1. Cable QC Documentation

Dick was advised by Murphy that cable had been installed prior to the receipt of certification in the field that the cable QC documentation was in order. Failure to have certification from engineering is contrary to the requirements of Oconee Procedure D1.0. and also to Criterion VII of 10 CFR 50. Freeze confirmed the inspector's understanding that henceforth completed certifications would be obtained prior to installing the cable. (See Section II, paragraph 15)

2. Use of Informal Procedures

Murphy advised Dick that the electrical QC group was using numerous informal procedures in performing their work. For example, there are no procedures approved by authorized personnel for the storage maintenance of motors and for batteries. Failure to provide procedures approved by authorized personnel is contrary to the requirements of Criterion VI of Appendix B to 10 CFR 50. Dick agreed to provide the inspector with a schedule of completion for the DPC procedures at the time of the next inspection. (See Section II, paragraph 9)

3. Familiarity with Procedures

Murphy advised Freeze that he had determined that Oconee had no established procedure to assure that inspectors and engineers were aware of new or revised procedures. Dick and Freeze agreed to develop a method prior to the next inspection. One method discussed was the use of a routing stamp on the procedures. (See Section II, paragraph 13)

4. Implementation of Procedures

Dick was advised by Murphy that he had found DPC procedure Q-1, "Nonconforming Items," for Oconee had not been implemented by the electrical group. In that this procedure is mandatory for Oconee 1 with an effective date of January 20, 1972, failure to implement the procedure is contrary to the requirements of Criterion V of Appendix B to 10 CFR 50. Dick agreed to provide the inspector a resolution to this problem at the next inspection. (See Section II, paragraph 10)

5. Construction Electrical Audits

Murphy advised Beam and Freeze that he had reviewed the documentation relating to an audit conducted on June 8, 1972, of the electrical construction QA program. Numerous deficiencies had been observed in the audit and the inspector did not consider that the audit met the intent of Criterion XVIII of Appendix B to 10 CFR 50. Beam concurred with the inspector and stated that a reaudit had been scheduled. Murphy also pointed out, however, that it was inconsistent for a management audit team to make a finding that work was being accomplished without written procedures and for management not to take immediate corrective action and provide procedures. Beam stated that this area was under review but he could not give any details of what corrective action would be taken. (See Section II paragraph 12)

6. Turnover of Electrical Equipment

Murphy advised Dick that contrary to DPC procedure S2, "Control of Records," and Criterion XIV of Appendix B to 10 CFR 50, records were not maintained in every case of cables turned over to operations by construction. Dick agreed that DPC would review this area and attempt to resolve the problem prior to the next inspection. (See Section II, paragraph 14)

7. Incomplete QC Documentation

Kidd stated that he found nine Report of Receiving Inspection (QC-31) forms which had not been signed by the principal field engineer during his review of electrical cable QC documentation for Unit 2. Freeze stated that these forms had been signed after the subject was brought to his attention. (See Section II, paragraph 8)

8. Inaccurate Records of Nonconforming Cable

Kidd stated that QC documentation for safety cable on reel No. 04521 was found to be in error. A letter from D. E. Roberts to Dick dated January 5, 1972, gives information that reel 04521 did not meet specification and should not be used in safety applications. However, this reel was cleared for installation in a safety application on form QC-31 on July 18, 1972. Aycock stated that this reel has been quarantined but not segregated and that the engineering department will be requested to correct the QC-31. Dick was advised that failure to properly document nonconforming material is contrary to the requirements of Criterion XV of Appendix B to 10 CFR 50. (See Section II, paragraph 8)

9. Painted Cable

Kidd stated that it is possible to have conflicting pieces of documentation for cable which is painted after installation. Aycock proposed that for Unit 2, a flagging statement to the effect that cable had been painted be written on the Cable Installation and Termination Report. For Unit 3, Aycock stated that a note would be made on the computer installation card if cable were painted. Kidd stated that RO saw no problems with the proposals.

10. Welding Review

Kelley stated that he had discussed the review of radiographs, repair welding, documentation of material on Unit 1 Class I piping with their consultant (Thielsch). It is RO's understanding that as each phase of the corrective action is completed, Thielsch will issue a separate report which will include his audit and when all corrective action is completed, Thielsch will issue a summary report. Dick stated that this understanding was correct. Kelley stated that RO would not audit these items until the consultant has issued his reports on each phase of corrective action and that the final audit would be made after the summary report is submitted.

Kelley stated that he had been informed by Thielsch that the corrective action being taken on Unit 2 regarding the artifacts (pencil marks) on radiographs was to correct all isometric drawings and apply correct weld identification numbers. Kelley stated that Thielsch had indicated that his summary report for Unit 1 would be submitted to DPC in January 1973, and in April 1973 for Unit 2. Dick stated that this was correct. (See Section III, paragraph 1)

11. Welding Procedures

Kelley advised Dick that welding procedures approved in June 1972 had not been issued to craft personnel or welding inspectors and they were in noncompliance with 10 CFR 50, Appendix B, Criterion VI. Freeze stated that the revised procedures would be issued by September 1, 1972. (See Section III, paragraph 2)

Kelley stated that his audit of welding procedures P7 and P8 revealed that they were extremely broad in scope. Dick stated that someone within their organization would review the procedures and discuss them during the next inspection. (See Section III, paragraph 3)

12. Improperly Punched Cards

Kelley stated that he had reviewed the corrective action DPC was taking on improperly punched IBM cards (Form QC-36) and had no comments. (See Section III, paragraph 4)

13. Use of Incorrect Materials

Kelley stated he had reviewed nonconforming item report sheets 84 through 91 and these indicated that 316 stainless steel pipe and fittings had been used instead of the 304 stainless steel specified and that DPC would be cited for being in noncompliance with 10 CFR 50, Appendix B, Criterion VIII.

Kelley stated that he had been advised by their consultant that he was studing the use of 316 stainless steel piping which had been incorrectly identified as 304 stainless steel in Unit 2 and the use of E308 welding filler metal and that his findings would be reported. Kelley stated that the report would be audited. (See Section III, paragraph 5)

14. Traceability of Material

Kelley stated that Thielsch advised him that it was impossible to trace welding filler metal material by heat number in Unit 1 and this may also be true for Unit 2 and possible to some extent on Unit 3. Kelley stated that he would audit Thielsch's report when completed.

15. Stop-Work Orders

Kelley stated that he had noted that only seven stop-work orders had been issued at Oconee since the first of 1972 with the last being May 25, 1972. This number for an eight-month period indicates the inspectors were not stopping deficient work. (See Section III, paragraph 6)

16. Weld Defects

Kelley stated that he had reviewed core flood spool piece (System 53A Iso 15) records and found that four 14-inch welds contained eleven defective areas that did not meet code for a total length of 18 inches and that neither the associate field engineer - welding or associate field engineer - NDT were aware of or had been informed of this

large number of defects. Kelley stated he could not find any corrective quality control action planned or initiated and that this was in noncompliance with 10 CFR 50, Appendix B, Criterion XVI. Kelley also stated that he could not locate the DPC welding inspector in his assigned area on two separate occasions. (See Section III, paragraph 7)

17. Health Physics Program

In the interview with management on August 24, 1972, Murphy reminded Smith of the outstanding items discussed at the conclusion of the last inspection of the health physics program (RO Report No. 50-269/71-7) which are also contained in the licensee's list. In the second management interview on August 25, 1972, Peery presented additional items as follows:

a. It was pointed out that air flows in sample and hot laboratory hoods had not been verified. Smith agreed with health physics personnel commitment to accomplish this. (See Section VI, paragraph 14)

b. Management was informed that the question of air flows from waste handling areas exists. Smith agreed that tests would be made to evaluate this. (See Section VI, paragraph 4)

c. The lack of completion of calibration of the flow meter on the liquid effluent line was pointed out. Smith indicated that completion was in progress. (See Section VI, paragraph 1)

d. Management was informed by Peery that the question exists of verification by the licensee that the stack sampler has been installed to be isokinetic. Smith indicated that this would be accomplished. (See Section VI, paragraph 3)

e. Peery pointed out that testing of air filters has not been completed. Smith indicated awareness of this. (See Section VI, paragraph 15)

f. Management was informed by Peery that a flow control problem exists with the continuous water sampler on the Keowee tailrace. Health physics personnel were aware of the valve problem associated with this inadequate flow control and already had plans to correct it. Smith indicated concurrence. (See Section VI, paragraph 16)

g. The remaining items that the inspector had reviewed during the inspection were reviewed briefly and Smith was advised by Murphy that all items must be completed prior to fuel loading.

18. Preoperational Test Program

Jape stated that during his review of the performance of the pre-operational test program, four items of noncompliance with Appendix B to 10 CFR 50 and the Guide for Conducting the Oconee Preoperational Test Program were discovered. (See Section V, paragraph 4)

19. Initial Fuel Loading Procedure

Jape indicated that RO is very much interested in reviewing this procedure. Smith stated that the newly rewritten procedure should be available for our review by mid-September. (See Section V, paragraph 3)

20. Unit 1 Test Plans

Jape asked if DPC has developed a test program for Unit 1 to be performed after repairs to the reactor coolant system are completed. Smith indicated that the complete package had not been finalized, but that they are currently working on the program. (See Section V, paragraph 7)

21. Reactor Coolant Systems Repairs

Murphy stated that Economos had reviewed B&W repair work on reactor coolant systems and that RO had no comments on this item.

22. Request for Guides

Canady promised to send copies of the DPC guides for preoperating testing and for the operating program to the inspector by September 1, 1972.

23. Request for Procedures

Smith committed DPC to supply the fuel loading procedure by September 8, 1972, and the controlling procedure for zero power physics test by October 1, 1972. The status of the procedures for ascension to power with expected completion date will be given the inspector at the time of the next inspection.

SECTION II

Prepared By: M. S. Kidd, Reactor Inspector, Reactor Test and Startup Branch

ADDITIONAL SUBJECTS INSPECTED, NOT IDENTIFIED IN SECTION I, WHERE NO DEFICIENCIES OR UNRESOLVED ITEMS WERE FOUND

1. Plant Schedule

The following dates were provided by Smith:

	Unit 1	Unit 2	Unit 3
Start Hot Functional Testing	12/01/72	2/15/73	12/01/73
Core Loading	1/15/73	4/15/73	2/01/74
Commercial Operation	6/01/73	9/01/73	6/15/74

2. Instrument Air

The instrument air lines have been removed from the battery rooms.1/

3. Fire Alarm System

The inspector witnessed a satisfactory test of the Unit 1 cable spreading room fire detector.

4. Electrical Cable Installation Inspection

a. Flamastic will be used between congested cable trays of Unit 1 cable spreading room for fire protection. Example: Southeast corner of room above emergency power switching logic panel.

b. Cable and cable tray installation was inspected in Unit 2 cable spreading room. No deficiencies were noted.

c. Cable associated with Unit 2 control batteries 2DCB and 2DCA, static inverters 2DIC and 2DID, and 4160 volt standby breakers B2T-6 and B1T-8 were inspected in the field. No deficiencies were noted.

5. Electrical Cable QC Documentation

The inspector reviewed QC documentation for cable used for the following Unit 2 instruments:

1/ RO Report No. 50-269/72-4

a. Primary coolant temperature - from sensor to B&W cabinet.
b. Primary coolant pressure - from transducer to B&W cabinet.
c. Uninterrupted a.c. power source - d.c. cable from batteries to tie breakers.
d. Instrument batteries - from batteries to panel board.

Documentation for these cable was in order.

6. Electrical Component Installation Inspection

The following Unit 2 electrical equipment was inspected. No deficiencies were noted.

a. Control batteries 2CA, 2CB.
b. Static inverters 2DIA, 2DIB, 2DIC, 2DID.
c. 4160 volt breakers B2T, B1T.

7. Electrical Component QC Documentation

The inspector reviewed QC documentation for static inverters 2DIA, 2DIB, 2DIC, and 2DID; breaker cabinets B1T and B2T; and control batteries 2CA and 2CB. No deficiencies were noted.

DETAILS OF SUBJECTS DISCUSSED IN SECTION I

8. Electrical Cable QC Documentation

The inspector reviewed QC documentation for cable used for Unit 2 breakers 2EB1T and 2EB2T. The engineering folders contained nine QC-31, Report of Receiving Inspection, forms which had not been signed by the principal field engineer. In each case, the cable reels involved had been checked as clear for installation-QC documentation in order. These forms were signed by Freeze after the deficiency was brought to his attention.

This folder also contained two pieces of QC documentation for cable on reel No. 04521 which were not in agreement. A letter from D. E. Roberts (January 5, 1972) to Dick gives information that reel No. 04521 contains cable which does not meet specification and should not be used in safety applications. Contrary to the requirements of this letter, however, the QC-31 form for this reel had been marked clear for installation - documentation in order by the engineering department

on July 18, 1972. This reel was marked with two quarantine tags after the letter to Dick was received at the site but was not segregated from cable whose use had been approved. The inspector received a commitment from Aycock to request the engineering department to correct the QC-31. The inspector stated during the management interview that failure to identify and document nonconforming material is contrary to the requirements of Criterion XV of Appendix B to 10 CFR 50.

9. Use of Unapproved Procedures for Electrical Quality Control

Murphy reviewed the electrical QC procedures in use at Oconee Nuclear Station for Units 2 and 3. The inspector determined that the procedures fell into three categories. Most of the procedures were informal documents that had been prepared by the electrical QC engineer for use during the construction of Unit 1 (Category 1). The second category of procedures were those prepared under the direction of the principal field engineer and approved by the project manager. The third category are those procedures prepared under the direction of and approved by the Vice President, Construction, for use at all DPC facilities.

A DPC audit team in the report of its audit conducted on June 8, 1972, made reference to the informal procedures. This report stated that these procedures were not approved and should not be used. Schmidt advised the inspector that these procedures included those for such operations as storage inspection of electric motors, inspections of batteries, and the procedures used by the electrical inspectors in performing QC reviews of cable installation.

Murphy advised Aycock and Schmidt that the failure to provide procedures that had been approved by authorized personnel was contrary to the requirements of Criterion VI, Appendix B to 10 CFR 50. This item was discussed in the management interview.

10. Failure to Implement Approved Procedures for Nonconforming Electrical Items

Procedure Q-1, "Control of Nonconforming Items," a Category 3 procedure, establishes the requirements for the handling of nonconforming material at Oconee. This procedure was to have been implemented by January 20, 1972. Schmidt stated, however, that the electrical QC group had not fully implemented this procedure, e.g., nonconforming material is not always placed in separate storage. Both Schmidt and Aycock stated that the informal procedures used in the

electrical group would accomplish the same results as Q-1, but required less paperwork. This item was discussed in the management interview and Dick was advised that failure to implement approved procedures was contrary to the requirements of Criterion V of Appendix B to 10 CFR 50.

11. Work Stoppage Procedure

In reviewing the Category 3 procedure, R-1, "Work Stoppage Procedure," and in discussing this procedure with Freeze, the inspector found that in practice, work is not stopped until the Work Stoppage Notification Form had been completed by the inspector. Freeze agreed to review this procedure with his management to determine if agreement could be reached to require that work be stopped prior to the completion of the paperwork. This item will be reviewed during a subsequent inspection.

12. Electrical QA Audits

The inspector reviewed the records of an audit of the Oconee electrical QC program. The following weaknesses were observed by the inspector:

a. The audit team did not identify the limited scope of their inspection nor refer to the controlling procedures.

b. The audit team did not determine the basis for the electrical equipment storage requirements.

c. The basis for QC reinspections was not determined nor was the acceptability of reinspections determined.

d. The audit team did not inspect for instrument calibrations.

e. The audit did not cover documentation of corrective actions nor the methods used and documentation relating to nonconforming items.

f. The audit team did not determine the need for field installation procedures. The audit team did not complete their checklist for this audit.

g. The checklits used by the audit team did not reference the governing codes, regulations or procedures.

In discussions with Freeze and Beam, the inspector advised them that the audit was superficial and did not meet the intent of Criterion XVIII of Appendix B to 10 CFR 50. Beam advised the inspector that he had objected to the adequacy of the audit to Dick and Dick had promised a reaudit. This item was discussed in the exit interview.

13. Inspector Training

During the discussions of the electrical QC procedures, Murphy asked Schmidt to describe the methods used by DPC to insure that each inspector was familiar with each procedure and revision. Schmidt stated that every inspector was required to take a test to demonstrate his knowledge of applicable procedures. He admitted that there was no followup and that procedures and procedure revisions were somtimes filed in the procedures manuals without the inspectors being made aware of their existence. This item was discussed in the management interview and Freeze stated that all procedures and revisions would be routed through all the affected inspectors. The initials on the routing stamp would become the record confirming that each inspector had seen the procedure.

14. Transfer of Systems

A Category 3 procedure, S-1, specifies the requirements for the transfer of systems from construction to operations. In response to the inspectors' questions, Schmidt stated that the identification of cable involved in the turnover of safety related systems was not always known and was not identified in the turnover records. This item was discussed in the management interview. Dick was advised that failure to maintain records of the operating status of systems was contrary to the requirements of Criterion XIV of Appendix B to 10 CFR 50.

15. Receipt Inspection

The procedures for receipt inspection and storage are detailed in procedure D.1.0, "Receiving Inspection of Safety Related Material and Equipment," a Category 2 procedure. Although DPC has a Category 3 procedure for receipt inspection, it has not been implemented at Oconee. Murphy reviewed the implementation of procedure D1.0 with Schmidt. In response to Murphy's questions, Schmidt admitted that on occasion cable and equipment was installed on the basis of verbal concurrence from engineering rather than waiting for written approval as required by procedure D.1.0. There is no

record maintained of these verbal approvals and no system to assure that written approval is eventually received. Murphy advised Aycock and Schmidt that the installation of cable without documentary evidence that cable met procurement specifications was contrary to the requirements of Criterion VII of Appendix B to 10 CFR 50. This item was discussed in the exit interview.

SECTION III

Prepared By: W. D. Kelley, Reactor Inspector, Reactor Construction Branch

ADDITIONAL SUBJECTS INSPECTED, NOT IDENTIFIED IN SECTION I, WHERE NO DEFICIENCIES OR UNRESOLVED ITEMS WERE FOUND

None

DETAILS OF SUBJECTS DISCUSSED IN SECTION I

1. Radiographic Artifacts (Pencil Marks)

The DPC consultant (Thielsch) informed the RO inspector that four lists had been prepared on Unit 1 for following the review of the radiographs for artifacts, reradiography, and reinterpretation. Thielsch also informed the inspector that DPC had found radiographs shot as late as March 1972 that had artifacts (pencil marks). The first list is called "List of 141" which is a list of all pipe buttwelds - 10-inch nominal pipe size and larger that are to be reradiographed 100%. The reradiography is 40% complete and has been reviewed by the consultant. If a repair is required of the buttweld by the reradiography, it is added to one of the subsequent lists. Completing the reradiography is handicapped by water being in some of the piping system which interfers with the radiography. The consultant stated that some of the buttwelds may be embedded in concrete but these will be evaluated on an individual basis.

The second list is called "List of 52" which are the 52 buttwelds, selected at random, from the 708 buttwelds that are 8-inch nominal pipe size and smaller, that are to be used for the basis of the engineering evaluation for acceptance of the balance (656) which have radiographic film with artifacts (pencil marks). A total of 2857 radiographic film for the 708 buttwelds had artifacts (pencil marks). An attempt was made by DPC personnel under the direction of the consultant to clean the pencil marks from the radiographic film using a Kodak film cleaner but it damaged the film where heavy pressure was exerted on the pencil. Approximately 10% of the 52 buttwelds has been reradiographed and reviewed by the consultant.

All radiographs for Unit 1 have been reviewed by Level II radiographers and the radiographs of the buttwelds they questioned were added to the "List of 164." The buttwelds on this list are to be reradiographed to resolve lack of radiographic film overlap, film artifacts, density not meeting code requirements, and where griding was required to meet code requirements.

The last list is the "List of 44" which are buttwelds that must be repaired and reradiographed. This list may have buttwelds that were first listed on either the "List of 141" or the "List of 52." The repair and reradiography is 100% complete but the radiographs have not been reviewed by the consultant.

Presently, DPC personnel are comparing the installed piping system in Unit 2 with the piping isometric drawings to ascertain that the piping was installed in accordance with the drawings and that the buttweld identification numbers are correct. The drawing and the buttweld identification numbers will be corrected if necessary. After the review and corrective action is completed, the radiographic film will be reviewed for artifacts (pencil marks). When the tabulation of the number of buttwelds that have radiographic film with artifacts (pencil marks) is complete, the consultant will meet with DPC management to determine the course of action to be taken for the engineering evaluation.

The consultant stated that each problem encountered during the investigation of the welding procedures and documentation in answers to RO citations of DPC's failure to comply with 10 CFR 50, Appendix B would be covered in separate reports; however, a summary report which will include his summary audit would be issued by him by January 1973 for Unit 1, and April 1974 for Unit 2.

2. Approved Welding Procedures Not Issued

The RO inspector audited the DPC welding procedures P1 through P9 in their fabrication shop, weldor qualification shop, Unit 3 inspector's office, and the quality control engineer's office and found that 23 out of 24 had approval dates prior to the RO inspection of December 9-10, 1971, when DPC was cited for their welding procedures being in noncompliance with 10 CFR 50, Appendix B, Criterion VI.

The RO inspector (Kelley) informed DPC in a management interview on December 10, 1971, at the Oconee site[1/] that his audit revealed their welding procedures were deficient. The welding procedures did not receive a thorough review until April when DPC associate field engineer, M. Ray, (Charlotte - Construction Engineering), reported to work. Two of the deficient welding procedures required requalification, one because of thickness range and the second to increase the shielding gas flow.

1/ RO Report No. 50-269/71-11

All welding procedures had been revised between June 2 and 26, 1972 (approval dates), incorporating the RO inspector's comments and to meet ASME Code. These procedures have been informally reviewed by their consultant but he has not performed a formal audit. The procedures were not issued because DPC wanted to issue them as a "package" rather than "piecemeal." Therefore, the inspector advised Dick that DPC was in noncompliance with 10 CFR 50 Appendix B, Criterion VI.

3. Audit of Welding Procedures

The RO inspector reviewed DPC welding procedures P7 and P8 and they are extremely broad in scope covering the welding of materials that were not used on the Oconee site. Welding procedures P7 and P8 both require the welding of 304 to 304 use 308 welding filler metal, 304 to 316 is to be welded with either 308 or 316. However, if 316L is welded to 316L, then 316L welding material is to be used or if 304L is welded to 316L, then 304L or 316L welding material is to be used. The RO inspector was informed by the DPC associate engineer-welding (Ray) that it took him a week to review their welding procedure P-5 and the associated data to determine that it met Section IX of the ASME Code. With the broad scope of procedure P7 and P8, DPC could not expect a welding inspector with no technical education to interpret these procedures. DPC vice president, construction (Dick) stated he was aware of the broad scope of some of the welding procedure and that someone within their organization would review the procedure for possible corrective action.

4. Improperly Identified Material

The RO inspector audited DPC nonconformance report No. 40 which identified that their IBM card QC Form 36 had been incorrectly punched identifying the piping material as 304 stainless steel where the material was actually 316 stainless steel. The audit revealed that all of the QC Form 36 cards for 20-1/2 inch socket welds had been signed off at the same time and stamped with the same date for all inspections. The RO inspector had been informed by their associate field engineer-NDT (Davison) that prior to December 1971, the QC Form 36 cards were punched for an isometric drawing and given to the inspector and after that portion of a system was completed, all cards were then stamped with the date. The RO inspector had been informed that DPC procedure E-1 was approved in December 1971 which established card boxes at the work area with mandatory hold points. DPC was informed that the RO inspector had no comment on their corrective action.

5. Nonconforming Material

DPC Nonconforming Item Report, Form Q1-A, for Unit 2 shows on sheet numbers 84 through 91 that 316 stainless steel material was used rather than the 304 stainless steel specified. Report No. 86 states welds 36E and 36F on isometric drawing 27 were welded with 308 filler metal in violation of the welding procedure. Serial No. 84 states "Attached sheet for weld nonconformity to be covered in report by Hilmut Thielsch."

Attached to the above form Q1-A are the isometrics indicating where 316 stainless steel fittings and pipe were used and were welded to the 304 stainless steel welding procedure requirements. The use of nonconforming material is in noncompliance with 10 CFR 50, Appendix B, Criterion VIII.

The consultant stated he was aware that 316 stainless steel pipe and fitting in Unit 2 had been welded with E308 welding filler metal and that he was conducting tests for an engineering evaluation of the welding and the test results would be included in a report and also in his summary report.

6. Stop Work Orders

The following DPC stop work orders were audited:

No. 1 - Weldor in Unit 2 in possession of 308L and 316L welding filler metal. Only 308 was authorized material for welding in this area. Q-1A form states weld was cut in center and prepared for rewelding but did not specify or require the removal of all heat affected zone.

No. 2 - Weld in Unit 2 completed without root being inspected, weld cut out and rewelded. Work was completed and work stoppage used as means of applying hold tag.

No. 3 - Approximately 10 pounds of 308L welding material was deposited in first layer of the cladding of Unit 3 main coolant loop. Q-1A form states that cladding was removed and weld area sketched to show complete removal of heat affected zone.

Only seven work stoppages have been issued since January 1972 and the latest May 25, 1972.

7. Lack of Corrective Action on Welding

The RO inspector audited the quality control records of a 14-inch core flood system spool piece (System A53 Iso-15) fabricated onsite

by DPC employees. It was found that four of the welds contained a total of eleven defective areas that did not meet the applicable code requirements for a total length of eighteen inches. The records revealed that one weldor (74) had welded on each of the welds and that only one heat of electrodes (Arcoloy 33302C) had been used in the area of the defects. Neither the associate field engineer-welding or the associate field engineer - NDT was aware of the defects in the spool piece welding nor were they aware of the defects. The RO inspector was unable to locate the DPC welding inspector assigned to the shop area on two different occasions to discuss the welding difficulty. The failure to identify conditions adverse to quality and report them to management is in noncompliance with 10 CFR 50, Appendix B, Criterion XVI.

SECTION V

Prepared By: F. Jape, Reactor Inspector
Reactor Test and Startup
Branch

ADDITIONAL SUBJECTS INSPECTED, NOT IDENTIFIED IN SECTION I, WHERE NO DEFICIENCIES OR UNRESOLVED ITEMS WERE FOUND

1. Preoperational Test Program Status

a. The status on August 25, 1972, of the preoperational test program for Oconee 1 is summarized below:

	Total Number	Approved Procedures		Tests Completed		Results Approved or Tests Signed off	
Tets before hot functional	380	380	100%	380	100%	380	100%
Tests during hot functional	161	159	99%	117	73%	103	64%
Tests prior to core loading	138	136	99%	103	75%	90	65%
Total preoperational tests	679	675	99.4%	600	88%	573	84%

The above summary does not include the testing required as a consequence of the damage to the reactor coolant system. Information relating to the tests that must be repeated will be obtained during the next inspection.

b. The preoperational test program for Oconee 2 is currently in preparation. To date, four tests have been performed and two others are partially complete.

2. Dates for Oconee Nuclear Station

The following dates were received from Smith, Plant Superintendent:

Plant	Core Loading	100% Power
Oconee 1	1-15-73	6-1-73
Oconee 2	4-15-73	9-1-73
Oconee 3	2-1-74	6-15-74

DETAILS OF SUBJECTS DISCUSSED IN SECTION I

3. Initial Fuel Loading Procedure

The initial fuel loading procedure, which was reviewed by RO and comments discussed with DPC, has been completely rewritten. RO has been told that all of our comments have been incoorporated into the newly prepared procedure and that a copy should be available by mid-September for rereview.

4. Conduct of the Preoperational Test Program

An audit of the "Guide for Conducting the Oconee Preoperational Test Program" (Guide) was conducted to determine if the test program was being conducted as described in the Guide. The findings were as follows:

a. TP 1/B/202/72-5, "HPI Operational Test." A section was added as Change No. 3 to "assure proper valve alignment of HPIP C before operation." Another section was added to check the CRD dilution interlock.

Both of these additions were handled as minor changes but should have been treated as major changes.

b. TP 2/B/250/6, "HPSW Hydro Test." This procedure was approved by the Operating Engineer on June 13, 1972, rather than by the plant superintendent as required by the Guide. Although DPC is currently revising their Guide to allow this delegation of authority, the approved revision has not yet been issued.

Failure to obtain approvals for changes from authorized personnel is contrary to the requirements of Criterion VI of Appendix B to 10 CFR 50. Apparently the revised guide, if approved, will allow the operating engineer and the technical support engineer to approve flushing and hydrotesting procedures.

c. TP 1/B/25J/2, "Loss of Instrument Air." The test was conducted on June 29,30, 1972, and changes No. 1 and No. 3 are not in the body of the procedure as stated on the cover sheet. This is contrary to instructions stated in the current Guide. Failure to properly document procedure changes is contrary to the requirements of Criterion VI of Appendix B to 10 CFR 50.

d. TP 2/B/250/6, "HPSW System Hydro Test." Item 9, which required that the test coordinator check to ensure that he is using the latest RO drawing when performing the hydrotest, was not initialed to indicate that it had been done as required by the Guide. This omission occurred in Section 12.1 of the procedure for both the orange and purple portions of the test.

Item 9 was handwritten in and Summerlin stated that this item was added to the procedure before it was approved and, hence, was not an addition to the test. Thus, it does not appear on the cover sheet as a change. However, in discussing this item with Smith, he agreed that such changes should be identified by an explanatory note or treated as a change to avoid confusion. Failure to document that the check had been made is contrary to the requirements of Criterion VIII of Appendix B to 10 CFR 50.

5. Drawing Control

During a field audit in March 1972, it became evident that there was a looseness of control of drawings that were removed from a controlled file. At that time, the licensee had agreeded to place into effect a record control system. This was checked by the inspector and found to be satisfactory. The drawing control procedure which is described in DPC's administrative procedure No. 1, dated February 22, 1972, was not being followed at the time of the audit.

6. Control of Lifted Leads and Jumpers

A concern had been expressed regarding the validity of tests results following repairs to the RC system. (See RO Report No. 50-269/72-7.) To provide assurance that lifted leads and jumpers have not negated the results of test performed prior to damage to the RC system, Smith presented a list of tests to be rerun before hot functional testing, fuel loading and startup. The list is given in Exhibit A of this report. RO is currently reviewing this list to ensure that it does resolve the lifted lead and jumper question.

7. Unit 1 Test Plans

A discussion was held with Summerlin regarding test plans for Unit 1 following completion of repair to the reactor coolant system. Summerlin stated that they are currently working on a schedule for resuming hot functional testing. The list of tests to be rerun, which was received during the July inspection, is under review by RO. (See RO Report No. 50-269/72-7).

SECTION IV

Prepared By: N. Economos, Reactor Inspector, Reactor Construction Branch

ADDITIONAL SUBJECTS INSPECTED NOT IDENTIFIED IN SECTION I, WHERE NO DEFICIENCIES OR UNRESOLVED ITEMS WERE FOUND

General

An inspection was made of the progress by B&W in repairing and modifying the reactor coolant system components.

DETAILS OF SUBJECTS DISCUSSED IN SECTION I

None

SECTION VI

Prepared By: W. W. Peery, Radiation Specialist

ADDITIONAL SUBJECTS INSPECTED, NOT IDENTIFIED IN SECTION I, WHERE NO DEFICIENCIES OR UNRESOLVED ITEMS WERE FOUND

None

DETAILS OF SUBJECTS DISCUSSED IN SECTION I

1. Smith advised the inspector that the calibration of the flow meter on the liquid waste system was in progress and expected to be completed in a few days.

2. Incomplete gaseous effluent monitors were the unit vent particulates, unit vent iodine, reactor building particulates, reactor building iodine and spent fuel building gas. Assurance was received from management that these monitors will be completed promptly.

3. Smith indicated that verification would be obtained that the stack sampling probe has been installed to be isokinetic.

4. Smith agreed that a study would be made to determine that in-plant air flows are not from waste handling areas to clean areas.

5. Management acknowledged that the solid waste compactor, its exhaust system and operating procedures will be completed with priority.

6. Management indicated that as soon as exchange of information with the vendor is complete, a procedure will be completed for spent resin transfers to a truck mounted cask.

7. Training of health physics personnel and operations personnel in health physics is continuing. Management was made aware of the need for updated and complete records of this training.

8. Management acknowledged that the calibration of the Beckman Beta Mate II counter in the Health Physics counting room will be completed within a few days.

9. Management was informed that it is understood that on-hand protective clothing will be supplied to the pool area and machine shop change rooms promptly.

10. Management was informed that the inspection revealed that only one of twenty-one count rate meters had been installed at monitoring stations although the installation of racks for the instruments was noted to be in progress.

11. Although all area monitors RIA 1 through 17 have been installed, it was pointed out to management that none had been calibrated. Management duly noted this.

12. Process radiation monitors RIA 31 through 51 were installed but calibration on seven units was not complete. Also, right angle turns in sample lines to four of the units are to be removed. Management agreed that the right angle turns will be removed and calibrations completed as soon as possible.

13. The drain was not operable to a large ultrasonic unit in the decontamination facility. A special hood had not been installed over the stainless steel decontaminated tank in this facility. Management was provided this information through the health physics group.

14. Management acknowledged that air flows on sampling hoods and the hoods in the health physics and radiochemistry laboratories will be measured and any inadequacies corrected.

15. Management agreed that tests of reactor building purge and hydrogen system filters will be completed in accordance with licensee procedures promptly.

16. Smith was agreeable to the proposed replacement by health physics of a valve on the continuous water sampler on the Keowee tailrace to achieve needed flow control.

Attachment:
Exhibit A

Test required by Tech Spec

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
125/1	Strong Motion Rec		X	
125/2	Peak Recorder		X	
150/1G	RB Temp		X	
200/10	Press Level & Temp	X		
201/1A	C.F. Level		X	
201/1B	C.F. Press		X	
202/1D	HP Flow		X	
202/1F	LDST Level		X	
203/1A	BW ST Level		X	
203/1C	LP Flow		X	
203/1E	RB Emerg Sump Level	X		
210/1B	Boric Acid Mix Temp		X	
210/1C	Boric Acid Mix Tank Level		X	
210/4	Gas Analyzer		X	
231/7	Conc B.A. Storage Tank Level & Temp		X	
275/5P	S.G. S.U. & W.R. Level	X		
275/3Q	S.G. OPER Level	X		

EXHIBIT A

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
280/12	Turbine – Gen Trips	X		
301/3A	NI Source Range		X	
301/3B	" " "		X	
301/3C	NI Inter Range		X	
301/3D	" " "		X	
301/3E	NI Power Range		X	
301/3F	" " "		X	
301/3G	" " "		X	
301/3H	" " "		X	
305/1A	RPS A – Pump Power			X
305/1B	" B " "			X
305/1C	" C " "			X
305/1D	" D " "			X
305/1E	RPS A Temp Inst		X	
305/1F	" B " "		X	
305/1G	" C " "		X	
305/1H	" D " "		X	
305/1I	RPS A Flow Inst	X		
305/1J	" B " "	X		
305/1K	" C " "	X		
305/1L	" D " "	X		

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
305/1M	RPS A Press INST	X		
305/1N	" B " "	X		
305/1O	" C " "	X		
305/1P	" D " "	X		
305/3A	RPS A ON LINE TEST			X
305/3B	" B " " "			X
305/3C	" C " " "			X
305/3D	" D " " "			X
305/5A	RPS A RB Press Trip			X
305/5B	" B " " "			X
305/5C	" C " " "			X
305/5D	" D " " "			X
310/3A	ES A Analog Pwr Supply	X		
310/3B	ES A Analog RC Press	X		
310/4A	ES B Analog Pwr Supply	X		
310/4B	ES B Analog RC Press	X		
310/5A	ES C Analog Pwr Supply	X		
310/5B	ES C Analog RC Press	X		

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
310/3C	ES A Analog N. RB Press			X
310/4C	" B " " " "			X
310/5C	" C " " " "			X
310/3D	ES A Analog Hi R.B. Press			X
310/4D	" B " " " "			X
310/5D	" C " " " "			X
310/6	ES 1&2 Logic Fan Failure			X
310/7A	ES 1 Logic Subsystem HPI			X
310/8A	ES 2 Logic Subsystem HPI			X
310/7B	ES 1 Logic SUBSYS LPI			X
310/8B	" 2 " " "			X
310/7C	ES 1 Logic Sub sys RB Isol.			X
310/8C	" 2 " " " "			X
310/7D	ES 1 Logic Sub sys RB Spray			X
310/8D	" 2 " " " "			X
310/9	ES 2 & 3 Logic test			X

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
310/10A	ES Module Interlock			X
310/10B	" " "			X
310/10C	" " "			X
310/11A	" " "			X
310/11B	" " "			X
310/12A	ES HP Inj on Line Test CH1			X
310/12B	" LP " " " " CH3			X
310/12C	ES RB Isol " " " CH5			X
310/12D	ES RB SPRAY " " " CH7			X
310/13A	ES HP Inj CH2			X
310/13B	ES LP " CH4			X
310/13C	ES RB Isol CH6			X
310/13D	ES RB Spray CH8			X
310/14A	ES Analog CH A ON Line			X
310/14B	" " CH B " "			X
310/14C	" " CH C " "			X
330/2A	CRD TTIP	X		X
330/2D	Patch verification	X		X
1340/4	CRD API calib	X		X

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
340/5	CRD RPI Calib	X		X
360/15	RIA ON Line Test			X.
360/1A	RIA - 43			X
/1B	" - 44			X
/1C	" - 45			X
/1D	" - 46			X
/2	" - 50			X
360/3A	" - 47			X
/3B	" - 48			X
/3C	" - 49			X
360/4A	" - 33			X
/4B	" - 34			X
/4C	" - 37			X
/4D	" - 38			X
360/5	" - 40			X
/6	" - 36			X
/8	" - 31			X
/9	" - 32			X
/10	" - 35			X
/11	" - 39			X
/12	" - 41			X
/13	" - 42			X
/14	" - 51			X

Procedure #	DESCRIPTION	PRIOR TO HFT	FL	SU
361/1A	RIA Area monitors			X
361/1B	RIA Visitors Center			X

UNIT # 1 Test requiring completion

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
120/5A	M Bridge position		X	
120/5B	A. Bridge position		X	
120/5C	SF Bridge position		X	
120/5E	FH computer		X	
120/5F	FH Dillion Load cell		X	
200/6A	RC Temp Narrow			X
200/6B	RC Temp Wide			X
200/9	RC Press narrow			X
200/11	RC Flow	X		
200/23A	RC pump motor	X		
200/24	RC Pump	X		
234/3	Ⓓ GWD DISCH Flow	X		
253/3	H_2 System	X		
255/1B	Breathing air			X
220/5F	FWPT Auto SPEED	X		
275/11A	Ⓓ Heater Level Control	X		
20/6A	turbine Speed	X		

Procedure #	DESCRIPTION	PRIOR TO		
		HFT	FL	SU
290/1A	Gen Rotor Cooling	X		
290/1B	Gen Stator Cooling	X		
290/4	(D) Gen H2 Seal Oil	X		
301/3K	NI Source Range Check		X	
301/3L	NI HV Interlock		X	
301/30	RPS DC Power Supply & Fan		X	
302/2	Incore Inst. Elec Test		X	
302/3	Incore Inst. Recorder		X	
306/4	NI Detector Leakage		X	
330/1	CRD INT TEST		X	
340/15	CRD PI Tube Align	X		
600/18	RPS Functional	X		

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