UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-325/85-19 and 50-324/85-19

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket Nos.: 50-325 and 50-324 License Nos.: DPR-71 and DPR-62

Facility Name: Brunswick 1 and 2

Inspection Conducted: June 24-28, 1985

Inspector: W C Liu 7/15/85
W. C. Liu Date Signed

Approved by: B. R. Crowley for 7/16/85
J. J. Blake, Section Chief Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 33 inspector-hours on site in the areas of mechanical maintenance associated with modified and newly installed pipe support and restraint systems; pipe support baseplate designs using concrete expansion anchor bolts; and inspector followup items.

Results: Two violations were identified - Deficiencies in pipe support and anchor bolt installation and inspection; and failure to meet code requirements in pipe support weld design - paragraph 6.b.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*P. Howe, Vice President - Brunswick Nuclear Plant (BNP)
*C. Dietz, General Manager - Brunswick Steam Electric Plant (BSEP)
*T. Wyllie, Manager, Engineering and Construction
*E. Bishop, Assistant to General Manager
*J. Holder, Manager, Outages - BNP
*L. Jones, Director - Quality Assurance/Quality Control (QA/QC)
*C. Blackman, Jr., Superintendent - Operations
*K. Enzor, Director, Regulatory Compliance
*J. O'Sullivan, Manager, Maintenance
*B. Monroe, Principal Engineer
*J. McKee, QC Supervisor
*W. Dorman, QA Supervisor
*R. Poulk, Senior Regulatory Specialist

Other licensee employees contacted included QC inspectors, engineers, security force members, and office personnel.

NRC Resident Inspectors

*W. Ruland, Senior Resident Inspector
*L. Garner, Resident Inspector
*T. Hicks, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on June 28, 1985, 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.

(Open) Violation 325, 324/85-19-01, Deficiencies in pipe support and anchor bolt installation and inspection, paragraph 6.b.

(Open) Violation 324/85-19-02, Failure to meet code requirements in pipe support weld design, paragraph 6.b.

The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Inspector Followup Item (92701)

(Closed) Inspector Followup Item 324, 325/83-01-02, Plant Unique Analysis Report - Electric Penetration Box Relocation. The calculations showed that the maximum stresses at the bottom plate and at the door of the electric penetration box were unacceptable as compared with the allowable values. As a result, the licensee decided to eliminate the box and to utilize a splice approach. The inspector held discussions with licensee representative and reviewed related documents. It was found that the modification had been completed for both units. This item is considered closed.

6. Safety-Related Pipe Support and Restaint Systems, and Pipe Support Baseplate Designs Using Concrete Expansion Anchor Bolts (IE Bulletins 79-14 and 79-02)

a. Documents and Procedures Review

The inspector reviewed portions of the following documents and procedures pertaining to safety-related pipe supports and concrete anchor bolts to determine whether appropriate procedures have been established and whether they comply with NRC requirements and the licensee commitments.

- SDG-2, Structural Design Guide for Design of Pipe Supports, March 20, 1985

- Specification 248-107, Installation of Seismic Pipe Supports and Miscellaneous Structural Steel, May 11, 1985

- QCP-203, Inspection of Pipe Supports, June 14, 1984

b. Field Inspection of Pipe Supports and Concrete Anchor Bolts, Units 1 and 2

The inspector conducted a general inspection of pipe supports and concrete anchor bolts in the Units 1 and 2 Reactor Building areas. The inspector selected and examined the following pipe supports that had previously been QC inspected for a verification inspection to determine the effectiveness of the licensee's program.

Support Number	Pipe System	BNP Unit No.
*1SW-142-PG409, Rev. A	Service Water	1
1E11-128-PG600, Rev. A	Service Water	1
1E11-128-PG249, Rev. A	Service Water	1
PS-4349, Rev. A	Service Water	1
1RCC-10PG246, Rev. D	Closed Cooling Water	1

1PS-9, Rev. 0	Residual Heat Removal (RHR) (inside torus)	1
1PS-13, Rev. 0	RHR (inside torus)	1
1PS-14, Rev. 0	RHR (inside torus)	1
1PS-18, Rev. 0	RHR (inside torus)	1
*PS-3695, Rev. B	Radwaste Drain	2
*PS-7384, Rev. C	Radwaste Drain	2
*2E11-127-PG1002, Rev. A	RHR	2
2E11-128-PG251, Rev. B	RHR	2
2E11-126-PG1001, Rev. A	RHR	2

The above fourteen supports were partially inspected against their detail drawings for configuration, identification, location, fastener installation, welds, and damage/protection. These supports were either modified or newly installed as a result of the torus modifications, IE Bulletin 79-14 requirements, and the new pipe additions. In general, the appearance of the supports was good and the supports were installed in accordance with design documents with the exception of four supports identified below:

(1) Support No. 1SW-142-PG409, Rev. A, in the Unit 1 Service Water System was inspected. It was noted that portions of the support were not installed in accordance with the design drawing and the manufacturer's instructions. Both the design drawing and the manufacturer's instruction showed a bolt connection for the two strut assemblies. Studs were actually used in the installation. Furthermore, the studs were installed with double nuts on one side and a single nut on the other. No locking device was found on the single nut side.

(2) Support No. PS-7384, Rev. C, in the Unit 2 radwaste drain system was examined. It was noted on sheet 5 that the 1'-3 1/2" and 1' - 1 1/2" measured dimensions were incorrectly marked down on the as-built drawing in that these two dimensions should have been interchanged.

(3) Support No. PS-3695, Rev. B, in the Unit 2 radwaste drain system was inspected. It was found that a 1/8" fillet weld was specified by the design drawing for connecting the end attachment to the baseplate. Since the end attachment is 3/8" thick and the base plate is 3/4" thick, in accordance with the American Welding Society (AWS D1.1) code requirements, the minimum size of fillet weld should be 1/4".

(4) Support No. 2E11-127-PG1002, Rev. A, in the Unit 2 RHR system was examined. It was noted that a 1/4" fillet weld was specified by the design drawing. The column and the baseplate had a thickness of 1/2" and 1", respectively. In accordance with the American Institute of Steel Construction (AISC) code requirements, the minimum size of fillet weld should be 5/16".

Paragraph 7.1 of Brunswick Structural Design Guide, SDG-2, for design of pipe supports, requires that welds shown on design drawings be in accordance with AISC and AWS D1.1 unless otherwise noted. In addition, the paragraph requires that welds which are to be in accordance with AISC and ANSI B31.1 conform to the weld detail and joint preparation requirements of AWS D1.1 code. Paragraph II.4 of Brunswick specification No. 248-107, Installation of Seismic Pipe Supports, requires that QC verifications shall be made to insure that catalogue components identified and called for on the design drawings have been used in the support and that construction shall be responsible for insuring that erection activities are in compliance with the design drawings. Paragraph XII.1 of the specification requires that all welding shall comply with AWS D1.1 unless the design drawing specifies particular welds to be made in accordance with ASME or ANSI B31.1. Procedure QCP-203, Inspection of Pipe Supports, requires that QA/QC verify that all hardware, such as bolts, nuts, clamps, etc., is installed as shown on the design drawings. Missing hardware will be documented per procedure QCP-401.

Discrepancies identified from the aforementioned (1) and (2) supports indicate that portions of the supports were not installed and verified in accordance with the design drawings and the above procedural requirements. This is a violation of 10 CFR 50, Appendix B, Criterion V, and is identified as an example of Violation 325, 324/85-19-01, Deficiencies in pipe support and anchor bolt installation and inspection.

Discrepancies identified from the aforementioned (3) and (4) supports reveal that portions of the supports were improperly designed in that the weld sizes specified by the design drawings did not meet the applicable code requirements. As a result, these supports may not be able to perform their intended function as required by the applicable codes. This is a violation of 10 CFR 50, Appendix B, Criterion III, and is identified as Violation 324/85-19-02, Failure to meet code requirements in pipe support weld design.

During the inspection, the inspector noted that the safety-related steel frame in the Unit 2 reactor building at elevation 50 foot was found in an unacceptable condition in that one anchor bolt in each of the two baseplates was improperly installed. There was no bearing contact between the nuts and the baseplates. As a result, these two anchor bolts may not be able to perform their intended function as required by the design. The inspector held discussions with licensee representatives with regard to the above anchor bolt status. The licensee subsequently took immediate action by inspecting 76 anchor bolts in the Unit 1 and 76 anchor bolts in the Unit 2 reactor building area. The licensee further identified seven anchor bolts in the Unit 1 area and 12 anchor bolts in the Unit 2 area that were improperly installed

in terms of no bearing contact between the nuts and the baseplates. The deficiencies identified above are a violation of 10 CFR 50, Appendix B, Criterion V, and are identified as another example of Violation 325, 324/85-19-01, Deficiencies in pipe support and anchor bolt installation and inspection.

In addition to the above findings, the inspector noted that no acceptance criteria were found in the licensee's inspection procedures relative to bolts versus studs installation, tightening of locknut installation, and torque requirements for strut and rigid rod installation. The inspector held discussions with the licensee representatives with respect to the above concern. It was found that the licensee was very responsive in resolving the above concern in that the related document was revised immediately to include the aforementioned acceptance criteria.

Within the areas inspected, two violations were identified.