



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W., SUITE 2900  
ATLANTA, GEORGIA 30323-0199

Report No.: 50-261/93-25

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

Docket No.: 50-261

License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: October 18 - 22, 1993

Inspector: Rich C. Chou  
R. C. Chou

Nov, 16, 1993  
Date Signed

Approved by: J. J. Blake  
J. J. Blake, Chief  
Material and Processes Section  
Engineering Branch  
Division of Reactor safety

11/16/1993  
Date Signed

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of piping system modifications and Technical Specification snubber inspections.

Results:

In the areas inspected, two violations were identified. No deviations were identified. The violations are failure to verify eight missing welds in field for two supports and the purchase order for the material installed for a support by the quality control (QC) inspectors and construction foremen. The licensee has weaknesses in the review of the completed products performed by the QC inspectors and foremen.

## REPORT DETAILS

### 1. Persons Contacted

#### License Employees

- \*R. L. Barnett, Project Management Manager
- \*D. Baur, Regulatory Affairs Specialist
- \*R. Beverage, Quality Control (QC) Supervisor
- \*T. Cleary, Technical Support Manager
- D. Crook, Regulatory Affairs Senior Specialist
- \*J. M. Curley, Engineering Support Manager
- \*C. R. Dietz, Vice President on site
- \*D. Dyksterhouse, Project Manager - Civil
- \*W. Farmer, Inservice Inspection (ISI) Manager
- \*M. Pearson, Plant Manager
- \*C. S. Olexik, Assessment Section Manager
- \*D. Waters, Regulatory Affairs Manager
- J. Noble, Modification Coordinator

Other licensee employees contacted during this inspection included craftsmen, engineers, mechanics, technicians, and administrative persons.

#### Other Organizations

##### PPM

T. Roland, Modification Implementation Unit (MIU) Coordinator

##### NRC Resident Inspector

\*C. Ogle, Resident Inspector

\*Attended Exit interview

### 2. Piping System Modification

The licensee had completed several modifications in piping systems before and during the current refueling outage. A major modification is Mod. No. 1104 which includes the modification of about 150 pipe supports in several piping systems in the Containment, Reactor Auxiliary, and Turbine Buildings.

The inspector randomly selected 18 pipe supports with modifications completed before or during this refueling outage. The 18 pipe supports, in safety related systems and Non-Safety related systems with seismic design, were all in large bore piping. They involved Auxiliary Cooling System, Chemical and Volume Control System, Fire Protection System, and Safety Injection System in the pipe alley of Reactor Auxiliary Building and for Auxiliary Feedwater System (portions of supports inspected are in Non-Safety related system with seismic design) and Feedwater System in the Turbine Building. The licensee treated the non-safety related but seismically qualified piping systems as safety related piping systems

since those non-safety related but seismically qualified systems must be prevented from falling and damaging the safety related piping systems, structures, or equipment during earthquakes.

The walkdown reinspection was completed with assistance from the licensee's engineers and QC inspector who was also qualified as a welding inspector. The major acceptance criteria and procedures used by the licensee's QC inspectors for the modifications are listed below:

- Specification No. CPL-HBR2-C-011, Civil Inspection Requirements
- Modification Implementation Program MIP-200, Installation and Inspection of Equipment, Supports, and Components
- Corporate Weld Manual (CWM)
- Maintenance Management Procedure MMM-028, Control of Field Issued Material

The supports were partially reinspected, particularly for the current modifications, against the detail drawings and procedures. They were checked for configuration, identification, fastener/anchor installation, anchor size, anchor type, anchor marking, anchor edge distance, base plate size and thickness, plate warpage, member size, weld sizes, component identification numbers, component sizes and settings, dimensions, oxidation accumulation, maintenance, welder identification, purchase order, mark on materials, and damage protection. The supports reinspected during the current inspection are listed below:

Table 1

Walkdown Reinspection Supports

<u>Item No.</u>	<u>Support No.</u>	<u>Rev. No.</u>	<u>System</u>	<u>Bldg.</u>	<u>Discrepancies/ Comments</u>
1	AC-6-4055	A	AC	RAB	
2	CH-6-117	1B	CVC	RAB	Two additional attachments were not shown in the drawings.
3	CH-6-6004	A	CVC	RAB	
4	FP-1-155	A	FP	RAB	
5	FP-2-110	A	FP	RAB	
6	SI-20-237	OA	SI	RAB	

7	SI-20-1200	2A	SI	RAB	
8	WD-1-185	A	WD	RAB	
9	FW-1-6226	A	AFW	TB	
10	FW-1-7234	A	AFW	TB	
11	FW-1-7241	A	AFW	TB	
12	FW-6B-73	2A	FW	TB	Four welds are missing in two base plates between the stiffener plates and base plates.
13	FW-6C-109	2A	FW	TB	Same as FW-6B-73
14	FW-7-33A	A	AFW	TB	Construction ID SS-2232
15	FW-7-33C	A	AFW	TB	The purchase order PO 710701 Item 2 was found in east pipe clamps. The document was signed off as purchase order PO-7G0046, Item 1. Construction ID SS-2233.
16	FW-7-40A	A	AFW	TB	Construction ID SS-2234
17	FW-7-54B	A	AFW	TB	
18	FW-7-54C	A	AFW	TB	

## Notes:

## 1. Abbreviation Symbols:

- a. AC - Auxiliary Coolant System
- b. CVC - Chemical and Volume Control System
- c. FP - Fire Protection System
- d. SI - Safety Injection System

- e. WD - Waste Disposal System
- f. AFW - Auxiliary Feedwater System
- g. FW - Feedwater System
- h. RAB - Reactor Auxiliary Building
- i. TB - Turbine Building

2. Item 14 FW-7-33A to Item 18 FW-7-54C are non-safety related but seismically qualified supports.

Support AC-6-4055 required a partial penetration weld to connect a new base plate to the existing base plate. Support CH-6-117 required a full penetration weld to connect a new base plate to the existing base plate. The inspector could not determine if those two new welds were full or partial penetration welds by visual inspection since the new and existing base plates had been painted.

Support WD-1-185 required a full penetration weld to connect two plates in the air off walls or floors to restrain the pipe. The inspector could see evidence of weld on both sides of the plate and therefore, concluded that this weld connection was a full penetration weld even though the plates were painted over.

Support CH-6-117 was found to have two additional attachments, a tube track unistrut and an instrument support FI-60168, which were not shown in the drawings. Prior to the modifications, the licensee's design engineers had requested field information and found that the two new attachments added about 10 percent additional loads, but decided not to include them in the analysis due to the relatively small addition. The licensee's engineers recognized the mistake of not including those loads in the analysis and agreed to revise the calculations and drawings to include those additional supports.

Support SI-20-237 was found with Item 14, angle steel, shown on the wrong side of Item 1 in the drawing. The licensee's engineers stated that they had found this problem during their previous inspection and were in the process of revising the drawings.

Supports FW-6B-73 and FW-6C-109 were found to have four welds missing in each support between the connections of base plates and long stiffener plates. The licensee's engineers stated that those missing welds were part of modification for plant Mod. 988 during Refueling Outage 13 (the last refueling outage). The design for that modification required those welds. The QC documentation for support/restraining welding, the Seismic Weld Data Report (SWDR) was signed off as having all required welds complete. The SWDR used at that time does not delineate specific welds inspected therefore the specific inspection of the weld in question can not be identified. The licensee concluded that the installers did not make the missing welds and the QC inspectors did not note that the welds

had not been made. The licensee's engineers re-reviewed the calculation and concluded that the missing welds are not required, therefore, there is no impact on the safety of the unit. The licensee will revise the drawings to reflect the as-built weld configuration. 10 CFR 50, Appendix B, Criteria X, requires that examinations, measurements, or tests of material or products processed shall be performed for each work operation where necessary to assure quality. Robinson Nuclear Plant Unit 2 Specification No. CPL-HBR2-C-011, Civil Inspection Requirements required, at Section 6.2.3, welded connection, verify that welds are in accordance with design documents. Section 9.0 of this specification and, at Section 3.2.2 of Attachment G, requires that when restraint sketches provide weld information, size, type, length if any defect were detected they shall be verified. Contrary to the above, four welds at each support were missing in the field and were not noted by the installers and QC inspectors. This missing weld problem is identified as Violation 50-261/93-25-01, Missing Welds at Supports FW-6B-73 and FW-6C-109.

During the inspection, the inspector could not find the welder identification (ID) number and material purchase order marked or stenciled in half of the 10 sway struts inspected due to the combination of paint and "light" marks. To show the welder ID and purchase order having been marked in the installed materials, the licensee removed paint from four sway strut supports. The welder ID and purchase order are required to be marked by procedures. Support FW-7-33C also called SS-2233 was found to have material purchase order PO-710701 marked in the pipe clamps in the east side. The Installation Data Report (IDR) for Support No. SS-2233 (this is the construction identification number for the support in the field) was signed off as PO-7G0046, Item 1 by the installer and verifier (QC inspector) on September 22, 1993.

Per the purchase and warehouse procedures, the sway strut supports normally consisting of end attachment, strut pipe and adjusters, and pipe clamps, are purchased as an assembly, with the same purchase order, and which were marked individually on the three parts by the Quality Assurance (QA) inspectors after the assembly had been received and accepted. Therefore, the purchase order marked on the three parts of the installed sway strut support No. FW-7-33C should be the same and as documented in the IDR. (Per construction coordinator, it is a normal process to discard the entire assembly if part or portion of the assembly was damaged or could not be repaired.) The materials installed with the different purchase order without the approval from the supervisor and without the document revision were unacceptable. The construction foremen and the QC inspector apparently did not adequately review or verify that the final installed products met the requirements and were as received from the warehouse. There may have been some existing problems between receiving the right materials and installing the wrong materials without the notice of the construction foremen and QC inspectors. CP&L Robinson Technical Specification in Section 6.5.1, Procedures, Tests, and Experiments, requires that written procedures shall be established, implemented, and maintained covering the activities recommended in Appendix "A" of Regulatory Guide 1.33, Rev. 2, February 1978.

CP&L Robinson Maintenance Management Procedure No. MMM-028, Control of Field Materials, requirements are as stated below:

- Section 5.4.1.1 - This number (purchase order number) is the primary identification for traceability of most material used.
- Section 5.4.1.2 - All identification transfer operations shall include the transfer of this number (purchase order number) unless authorized otherwise by Maintenance or Modification Implementation Unit (MIU) Supervision.
- Section 5.9.2 - Maintenance and MIU Supervision shall ensure that the proper material is used and installation documents are properly marked to indicate the job on which the material was installed.

Contrary to the above, the purchase order number PO-710701, Item 2 at pipe clamps installed in east side for Pipe Support FW-7-33C (Special Support SS-2233) was different from the purchase order number PO-7G0046, Item 1 for the material received from the warehouse. This problem is identified as Violation 50-261/93-25-02, Material Purchase Order Differences between the Field Installation and Documents for Support FW-7-33C.

During the inspection in the Turbine Building area, the inspector noticed that two anchor bolt nuts for support FW-6B-59 have gaps (no contact) between the nuts and base plates. The licensee's engineers will issue a nonconformance report to repair the gaps.

The inspectors asked the licensee's engineers about the current practice for establishing hold points on welding. They provided an example consisting of page 29 of Attachment 6, of IDR for construction of Support ID SS-2232 (design drawing No. FW-7-33A). This page contained seven QC hold points as indicated by the licensee hold point terminology. They considered that each step requires QC to verify or sign on the document as a hold point. Actually, some steps can be combined and signed at one time because the succeeding step would not cover up and preclude inspection of the previous step. Therefore, the actual hold point may be that QC verifies and signs a couple of steps in the documents.

There were seven steps in this example for a weld inspection for the connection between the cut end of a strut pipe and the adjuster. These are:

1. Verify use of approved fixture and fixture number
2. Verify end preparation on extension piece (pipe)
3. Fit-up (including tack weld)

4. Surface inspection
5. Visual examination of root pass weld
6. Visual examination of final weld
7. Verify location of sight hole

The normal practice is that the above seven steps are combined into four hold points as:

1. Hold point 1: QC inspector will inspect steps 1 to 4 at same time.
2. Hold point 2: for step 5
3. Hold point 3: for step 6
4. Hold point 4: for step 7

The inspector did not see any problems for the above hold points and signing off steps 1 to 4 in the same time for one hold point.

### 3. Snubber Inspection

All snubbers in safety-related systems, and non-safety related systems required to protect safety-related systems, are required to be operable. Technical Specification (TS) 4.13.1 requires 100 percent visual inspection and ten percent functional testing of these snubbers during each refueling outage. There are a total of 53 snubbers in Robinson plant and most of them have been inspected during this refueling outage. Three snubbers, No. 16, 32, and 36 had been found out of cold setting ranges and were transferred to the engineering department for evaluation of impact on the piping systems. The procedures used for snubber inspection and reinstallation are listed below:

- Engineering Surveillance Test Procedure EST-032, Visual Inspection of Hydraulic and Mechanical Shock Suppressors, Rev. 17.
- CM-401, Removal and Reinstallation of Hydraulic and Mechanical Shock Suppressors, Rev 13.

The inspector randomly selected seven snubbers for inspection. They are Snubber Nos. 28, 29, 30, 31, 32, 33, and 34. All the snubbers inspected are acceptable.

During the inspection, the inspector noticed that the current inspection procedure did not require the snubber inspectors to inspect the supporting structure for the snubbers and the gaps between washers and spherical bearings at the both ends. The current practices are:



- The snubber inspector will inspect the snubber from the end bracket attachment point to the other attachment including the base plate and anchor bolts if present. But the snubber inspectors can go beyond and inspect the whole support if they want. Inspection of the whole support is an option.
- The snubber inspector will inspect the snubber rod paddle swing angles to be within 5 degrees in each direction.

The above practices have deficiencies. If a snubber inspector just inspects end-to-end of the snubber and is not required to inspect the whole support structure for existing defects, the snubber may be in good shape but the supporting structures might have defects which could not support intended function of the snubber. The inspection of swing angle within 5 degrees in each direction will prevent binding, but it could not prevent excessive shifting or wear-out in the bearing and pin due to vibrations or transients. A limited gap between washers and spherical bearings at the both ends is required to prevent the excessive movement and wear-out between the bearing and pin. The licensee's engineers agreed to add the requirements in the next procedure revision to include inspecting the whole support structure visually and establishing inspection and acceptance criteria for the inspection of the gap between washers and spherical bearings at the rod ends, near the brackets, or the piston rod eyes, near the pipe clamps. No violations or deviations were identified in this area.

#### 4. Exit Interview

The inspection scope and results were summarized on October 22, 1993, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed below. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

Violation 50-261/93-25-01, Missing Welds at Supports FW-6B-73 and FW-6C-109.

Violation 50-261/93-25-02, Material Purchase Order Differences Between the Field Installation and Documents for Support FW-7-33C.