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

Report No.: 50-400/89-04

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

Docket No.: 50-400 License No.: NPF-63

Facility Name: Harris Unit 1

Inspection Conducted: January 30 - February 3, 1989

Inspector: C. Smith 3-2-89
C. Smith Date Signed

Accompanying Personnel: E. Lea
P. Balmain

Approved by: 3/2/89
F. Jape, Section Chief Date Signed
Quality Performance Section
Division of Reactor Safety

SUMMARY

Scope

This routine, unannounced inspection was in the areas of design, design changes, and plant modification.

Results

Design control deficiencies were identified with the design engineering process concerning the omission of EQ requirements as design inputs for design changes made to environmentally qualified equipment. The licensee identified this error and has implemented corrective action to re-establish EQ for the affected equipment.

Deficiencies were identified with the technical adequacy of the licensee implemented corrective action. The basis used by the licensee to establish EQ for commercially procured replacement limit switch rotors was a letter from the Vendor. The replacement parts were not identical to the original parts, and the licensee did not dedicate the commercially procured replacement parts prior to using them in basic components. The licensee is presently pursuing corrective actions to re-establish EQ for the basic components based on additional information to be provided by the vendor.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*N. Blair, Director, Site Planing and Scheduling/Modification Projects
*P. Bradly, Senior Engineer, Technical Support
*J. Brown, Senior Specialist, Quality Assurance
*J. Duncan, Project Engineer
*C. Gibson, Director, Programs and Procedures
*C. Hinnant, Plant General Manager
*C. McKenzie, Principal Quality Assurance Engineer
*E. McLean, Senior Engineer
*E. Mitchell, Project Engineer
*E. Stedudel, Site Engineering Unit Manager
*D. Tibbitt, Director of Regulatory Compliance
*M. Wallace, Senior Specialist, Regulator Compliance
*L. Woods, Engineering Supervisor, Technical Support
*R. Zula, Project Engineer, Technical Support

Other licensee employees contacted during this inspection included engineers, and administrative personnel.

NRC Resident Inspectors

*W. Bradford, SRO
*M. Shannon, RI

*Attended exit interview

2. Action on Previous Inspection Findings (92702)

a. (Closed) Severity Level IV Violation (50-400/87-38-02): Failure to follow ANSI N45.2-11, 1974 Section 3.1 and 4.1 for PCR 2292.

The licensee's response to Item 2, PCR 2292, in their letter dated February 12, 1988, was considered acceptable by Region II. The inspectors reviewed procedure MOD-204 and verified that it had been revised to include requirements for specifying special installation instructions in modification packages. Additional corrective action implemented by the licensee regarding the preparation of a guideline for providing PCRs with special installation instructions was also reviewed by the inspectors.

b. (Closed) Violation 400/87-38-01: Failure to Follow Procedure While Performing Maintenances Surveillance M0016.

The licensee responded to this item in correspondence dated February 12, 1988. The inspector reviewed the corrective action taken and considers this item closed. The licensee provided counselling concerning procedure violations to responsible personnel. This was documented in a memorandum dated December 4, 1987. Further instructions were provided to all unit managers, per SHF/10-13500, Letter Number MS-880250 (0) dated February 11, 1988, to review the requirements for procedural compliance with personnel under their supervision.

The inspectors concluded that the licensee had determined the full extent of the violations, taken action to correct current conditions, and developed corrective actions needed to preclude recurrence of similar problems. Corrective actions stated in the licensee response have been implemented.

3. Design Control Program (37700)

a. PCR 2075, Containment Spray Valve Position Indication.

IEB 85-03, "Motor Operated Valve Common Mode Failure During Plant Transients Due to Improper Switch Setting," was issued by the NRC to require licensees to develop and implement a program that ensured valve operator switches are selected, set, and maintained properly for certain safety related MOVs. In response to IEB 85-03 licensee management determined that the torque open by-pass limit switch for selected valves should be set a 15% of stroke travel. This switch setting allows for lost motion caused by operator backlash, high differential pressure, or water hammer spikes, and accommodates these transients without de-energizing the motor-operator. The torque open by-pass limit switch and the valve closed position indicating light limit switch are actuated by the same rotor. This wiring arrangement, along with the above torque by-pass limit switch setting resulted in erroneous close valve position indication. PCR 2075 was developed and implemented to correct the erroneous valve close indication at the MCC and the MCB for the following MOVs:

2CT-V25SA-1 and 2CT-V49SB-1, Containment Spray Pump Recirculation Valves

2CT-V21SA-1 and 2CT-V43SB-1, Containment Spray Header Isolation Valves

2CT-V2SA-1 and 2CT-V3SB-1, Containment Spray Injection Supply Valves

2CT-V6SA-1 and 2CT-V7SB-1, Containment Spray Sump Recirculation Isolation Valves

The recommended corrective action described on PCR 2075 Form 1, required changing the wiring for the red indicating light from limit switch ac, contacts 3-4 on close rotor #2 to intermediate rotor #4.

This change would provide the capability to independently set the torque open by-pass limit switch and the red indicating light limit switch to show closed valve travel position, i.e. red light de-energized and green light energized. The design scope specified on PCR 2075, Form 2, Design Details, Implementing Instructions and Functional Testing, required replacing rotor #3 of valves 2CT-V2SA, 2CT-V3SB, 2CT-V6SD and 2CT-V7SB with new rotors, CP&L part number 732-610-83. Implementing instructions for wiring the valves in accordance with an add/delete summary and CWDs were also included.

The inspectors performed an independent design review of the PCR to verify that the hardware changes shown on the CWDs were consistent with the design scope; and that the safety evaluation performed in accordance with 10 CFR 50.59 was technically adequate. Pursuant to this review the inspectors determined that the recommended corrective action described on PCR 2075 Form 1 was implemented for MOVs 2CT-V25SA-1, 2CT-V49SB-1, 2CT-V21SA-1, and 2CT-V43SB-1.

This corrective action could not be implemented for the remaining MOVs because of the arrangement of the spare rotor contacts. A deviation from the standard rotor arrangement was required and Purchase Order 445865B was initiated for procuring limitorque limit switch rotors having 3 in-line contacts with 1 alternate contact located away form the gearbox (Vendor part #60-701-0077-1). These rotors were procured as off-the-shelf, commercial grade. Additional reviews of PCR 2075 Form 2TR, Technical Evaluation, completed in accordance with the requirements of TS paragraph 6.5.12, showed entries for seismic and EQ marked as not being applicable to the design change. Based on review of PCR 2075 the inspectors verified that the hardware changes were consistent with the design scope; post-modification test requirements and test acceptance criteria were adequately specified and achieved; and the design objectives were met.

Pursuant to review of design basis document SD#112, Containment Spray System, the inspectors requested information concerning the EQ status of the MOVs which had their rotors replaced via implementation of PCR 2075. Licensee management confirmed that all the MOVs within the scope of PCR 2075 required environmental qualification. They further added that the omission of EQ requirements as design inputs for PCR 2075 was previously identified and documented on Interdiscipline

Review Request Form, Initiator No. CDO-258, dated June 6, 1988. Corrective action in the form of PCR 3663, Replacement of Limitorque Rotors (EQ), was initiated on September 6, 1988, and at the time of the inspection was still being reviewed prior to approval. The omission of EQ requirements as design inputs for plant modification PCR 2075 was characterized as a licensee identified violation, 50-400/89-04-01. However, because the licensee identified the violation, corrective action plans were being implemented, and the requirements specified in 10 CFR part 2, Appendix C, Section V were satisfied, this violation is not cited.

Prior to completion of the inspection, PCR 3663 was approved by licensee management. The inspectors reviewed the PCR to verify the technical adequacy of licensee's corrective action. The inspectors determined that Limitorque Corporation in a letter to Mr. Jim Presson dated February 18, 1988, stated that the replacement rotor (Vendor part #60-701-0077-1) was interchangeable with the original rotor (Vendor part #60-701-0067-1) for their specific applications in regards to function and material. They further stated that both parts meet the original requirements of Test Report #B0003 and #B0058. The licensee used this letter as the basis for re-establishing EQ for the following valves:

2CT-V2SA-1, and 2CT-V3SB-1, Containment Spray Injection Supply Valves

2CT-V6SA-1 and 2CT-V7SB - 1, Containment Spray Sump Recirculation Isolation Valves

The inspectors expressed concern regarding the technical adequacy of licensee's corrective action. Specifically, the replacement rotors which were procured commercial grade were not identical to the parts removed. The licensee did not dedicate the commerical grade parts prior to using them in basic components; nor was a Certificate of Conformance attesting to the quality of the replacement parts obtained by the licensee to assure suitability for end use application. The licensee had concluded that the affected MOVs were environmentally qualified without an adequate basis to establish qualification as required by 10 CFR 50.49(f). Additionally, 10 CFR 50 Appendix B, Criterion 3, requires the design process to ensure that measures are established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety related function of structures, systems, and components. The licensee's corrective action did not appear to meet either of these regulatory requirements.

Licensee management did not agree with the inspectors. However, they stated that corrective action would be taken to address the above concerns. A Certificate of Conformance will be obtained from the Vendor and a PCR will be prepared to incorporate this information into the EQDP of the affected MOVs. PCR 2075 will also be revised to included this information. Pending completion of licensee corrective action this is identified as Unresolved Item 50-400/89-04-02, Indeterminate EQ Status of Replacement Limit Switch Rotors.

b. PCR 2851, Boric Acid Tank Lo and Lo-lo Alarm Setpoints

PCR-2851 "Boric Acid Tank (BAT) Lo and Lo-Lo Alarm Setpoints" was developed and implemented to raise the Lo and Lo-Lo Alarm setpoints to 65% and 62% respectively. These setpoint modifications were needed to allow appropriate margin to Technical Specification (TS) limits which were modified in response to the cycle 2 core reload strategies. The cycle 2 core design requires a large volume to be present in the BAT to accommodate cooldown from Mode 1 to Mode 5 and to provide the shutdown margin required by TS while in Modes 5 or 6.

The inspectors reviewed the Nuclear Safety Evaluation Attachment included in the modification package and found it to be adequate as required by 10 CFR 50.59. Post modification test results were reviewed and found to be acceptable. In addition the inspector verified that Loop Calibration Procedures LP-L-0106 Rev. 1 and Maintenance Surveillance Test MSI - I0103 Rev. 1 were updated to reflect the modified alarm setpoints as directed by PCR-2851. The inspector also reviewed Annunciator Panel Procedure APP-ALP-006 Rev. 2 "Main Control Board" and verified that the setpoint change were incorporated appropriately.

The inspector observed that a controlled document entitled "Setpoint Document" dated 5/9/88 did not reflect the modified BAT alarm setpoints. This document resides on microfiche and is located throughout the facility, therefore a possibility exists that an outdated setpoint could be used in future evaluations if the document was used as references. It was noted, however that the computer database used to generate this document (Construction Control System) contained the current setpoints.

Within this area no violations or deviations were identified.

c. PCR 2461, Steam Generator Blowdown Isolation Valves

PCR 2461, Steam Generator Blowdown Isolation Valves, replaced the old plug and gage style globe valves with new gate valves and motorized valve operators. The licensee initiated the PCR to improve system performance and reduce the chance of water hammer. The engineering evaluation and the design summary/specifications provided with the package were detailed and addressed all technical and safety issues

associated with a plant modification. The acceptance test procedure, provided per plant procedure, was also detailed. It clearly stated the purpose and objectives of the modification performed under PCR 2461. The acceptance criteria provided were adequate to verify that the desired results were achieved.

d. PCR 02860, Verification of ESF Actuation

Several of the PCRs reviewed were in response NRC identified items. PCR 2860 Verification of ESF Actuation, results from Notice of Violation 50-400/86-76. As a result of this violation the licensee initiated PCR 2860 to implement a system where operators could verify that correct ESF actuation had occurred. The modification, which installed a satellite display system (SDS), is presently being implemented. The inspectors were informed by the licensee that most major modifications associated with PCR 2860 were completed. The vendor, Science Applications International Corporation, is presently working on a method to incorporate the remaining ESF signals into the system.

e. Management Involvement In Resolving Plant Problems

Management involvement in assuring that adequate attention is given to reoccurring problems was demonstrated following a trip of the turbine driven auxiliary feedwater pump. On several occasions the AWF pump tripped on over speed on initial start-up. The trip was believed to be caused by large amount of condensate going through the AFW pump on initial startup, causing an over speed. Several modifications to the drain system were implemented in an attempt to eliminate the problem. The most recent modification PCR 03509 rerouted the AFW drip leg drain line to atmosphere. This modification failed to eliminate the problem as was evident following the recent trip of the turbine driven auxiliary feedwater pump. The Plant Nuclear Safety Committee identified the need to perform design review of the Turbine Driven Auxiliary Feedwater System to determine root cause. A special task force, Turbine Driven Auxilitary Feedwater Pump Task Force, was organized by direction of the Plant General Manager to recommend solutions for resolving the problem. Those members of the task fore were instructed to consider the assignment as their highest priority.

Within this area no violations or deviations were identified.

4. Exit Interview

The inspection scope and results were summarized on February 3, 1989, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results listed below. Proprietary information is not contained in this report.

a. Failure to include EQ requirements as design inputs for PCR 2075 was characterized as a licensee identified violation, 50-400/89-04-01, for which a NOV will not be issued.

b. An Unresolved item, 50-400/89-04-02, was identified concerning additional corrective action to be completed by the licensee to re-establish environmental qualification for the following MOVs:

2CT-V2SA-1 and 2CT-V3SB-1, Containment Spray Injection Supply Valves

2CT-V6SA-1 and 2CT-V7SB-1, Containment Spray Sump Recirculation Isolation Valves

Licensee management agreed to obtain a Certificate of Conformance from the Vendor for the replacement limit switch rotors. They stated that this action does not imply their agreement with the inspectors regarding the indeterminate EQ status of the MOVs. They maintain that information provided by the Vendor in their letter was considered technically adequate, and was the basis for their corrective action.

5. Acronyms and Initialisms

BAT - Boric Acid Tank
CWD - Control Wiring Diagram
EQ - Environmental Qualification
EQDP - Environmental Qualification Date Package
MCC - Motor Control Center
MOV - Motor Operated Valve
MCB - Main Control Board
PCR - Plant Change Request
SD - System Description
TS - Technical Specification