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

Report No: 50-400/91-17

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

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

Facility Name: Harris 1

Inspection Conducted: June 24-28, 1991

Inspector: Rich C. Chon for 7-18-91
N. Economos, Reactor Inspector Date Signed

Approved by: Frank Jape 7/18/91
J. J. Blake, Chief Date Signed
Materials and Processes Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine unannounced inspection was conducted in the areas of design changes and plant modification, preventive maintenance, and actions taken in response to NRC initiatives.

Results:

Records of the above activities were reviewed, evaluated and found satisfactory. Plant inspection showed equipment and housekeeping to be satisfactory.

The inspector found that procedures used to control check valve, preventive maintenance inspections and boric acid induced corrosion monitoring, require enhancement i.e. data management and personnel training requirements - these matters were discussed in detail with licensee management.

Report Details

1. Persons Contacted

Licensee Employees

*P. L. Brady, Senior Engineer ISI/Technical Support (TS)
*C. R. Gibson, Manager - Plant Programs and Procedures
*R. Graybeal, Manager - Balance of Plant, TS
*S. Hinnant, General Manager, Harris Plant
R. Libitz, Systems Engineer
L. March, Engineer Technician/ISI
*D. McCarthy, Manager Site Engineering
*J. Navill, Manager TS
*C. Olexik, Manager Regulatory Compliance
*M. Pugh, Manager ISI
*F. Strehle, Manager QA Engineering
*L. Woods, Manager Systems Engineering, TS

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

NRC Resident Inspector

*M. Shannon, Resident Inspector

*Attended Exit Interview

2. Independent Inspection Effort, Design Changes and Plant Modifications (37700/55050)

Several design changes affecting balance of plant (BOP) systems were performed during this outage. Of these, the inspector selected four packages for a review and evaluation of engineering documents, drawings, procedures, and other field generated records to ascertain their technical adequacy and compliance with applicable industry standards, code and regulatory requirements.

The program for inspecting BOP piping systems for wall thickness was implemented in response to Generic Letter 89-08 and industry initiatives i.e. SOER 82-11 and NP-3944. The licensee's program for these inspections is implemented by Procedure ISI-107, Erosion/Corrosion Program, Rev. 3 which incorporates the aforementioned documents by reference. EPRI's chec and checmate computer programs are utilized to identify susceptible components/piping for inspection. Examinations are conducted during refueling outages, with Panametrics Model 26DL data loggers using 0.312"d dual element transducers. During the 1991 outage, approximately 140 components were examined in suspect systems, which included extraction steam, heater drains, condensate, feedwater main steam, blowdown and auxiliary steam. Of these, extraction steam produced results showing wall

thickness slightly below minimum requirements. Accordingly, engineering replaced one 12" dia. elbow and one 20" dia elbow in this system. Two other locations on the condensate system, line CE 20-14-1, showed wear which was corrected by applying weld overlay on the area in question. The selected modifications and engineering work requests were as follows:

- Work Request and Authorization (WR&A), 91-AFRG1-P: Extraction Steam, Replace Pipe and Elbow, Line 6ES-12-2
- WR&A 91AFRH1-P: Replace Elbow and Pipe, Line 6ES-12-1
- WR 91-AGDY-1: Weld Repair (Overlay) Elbows, Feedwater Heater, Line 6CE-20-14-1
- WR 91-AGDZ-1: Replace Elbow and do Weld Repair (Overlay), Feedwater Heater, Line 6ES20-4-1

Within these areas the inspector reviewed welding materials certifications, welder qualification weld fabrication records, inspection results and hydro pressure test results. Records were found to be complete and accurate. Technical personnel were adequately trained to perform their assigned task.

Within the areas inspected violations and deviations were not identified.

3. Boric Acid Corrosion Prevention Program

Generic Letter GL 88-05 dated March 17, 1988, requested all the licensee of pressurized water reactor (PWR) plants, to establish a program for preventing corrosion of carbon steel components resulting from leaks in lines containing boron treated primary coolant. The GL requested that the program include the following matters of interest.

a. Identify locations where leaks smaller than allowable by technical specification limits can cause degradation of the primary pressure boundary by boric acid corrosion.

b. Establish procedures for locating small coolant leaks.

c. Establish a programmatic methodology for conducting examinations and performing engineering evaluations to determine impact on the pressure boundary when leakage is located.

d. Establish a program for corrective action(s) to prevent recurrence of this type corrosion. This should consider design modifications or a change in operating procedures. Design modification options should include materials replacement or protective coating, applications/ claddings.

The subject GL required the licensees to respond within sixty (60) days after its receipt: providing assurances that such a program was in place or provide a schedule for promptly implementing such a program if one was not in place.

By memorandum dated May 5, 1988 (serial number NSL-88-110), the licensee indicated that a formal program would be in place and implemented by January 1, 1989.

Within these areas the inspector ascertained that the licensee has developed a program which is documented under Procedure PLP-600 Rev. 2, and implemented through procedure OPT-1519 Rev. 0. The program places a greater emphasis on inspection of pressure boundary systems inside containment. Walkdowns in this area, are scheduled for every outage, during normal opening of the Reactor Coolant System, and during maintenance activities. Inspections are conducted prior to cooldown (Mode 3) to allow for identification of leaks subject to repair. Management is kept informed through a summary report of leak repairs and a justification for not repairing certain identified leaks is required. Reactor coolant system leakage is monitored on a daily basis through established plant procedures. Results are evaluated and trended.

By this review and through discussions held with cognizant personnel, the inspector ascertained that the program is biased towards pressure boundary systems inside containment. As such, component failures and/or repairs outside containment are not included in this report nor are they reported to the coordinator in charge of the subject program. It is the inspector's understanding that at present there is no single person responsible for logging, evaluating and trending component failures on a plant wide basis, and therefore there is no comprehensive report on the effects of boric acid corrosion on plant components.

These observations were discussed with plant management who agreed to look further into this matter.

Within the areas inspected violations or deviations were not identified.

4. Check Valve Maintenance Program

The licensee's check valve maintenance program is implemented through procedure TMM0116 Rev. 1, Check Valve Monitoring. As such the procedure, directly or by reference provides guidelines for conducting check valve monitoring. Industry initiatives i.e. EPRI, NP-5479 and INPO SOER-86-3, are invoked by reference.

Under the procedure, the technical support group is responsible for monitoring the program's effectiveness and for reporting results and discrepancies to plant management upon request. The manager of Inservice

Inspection (ISI) is responsible for selecting the method(s) of inspection, monitoring results and data analysis. The inspector reviewed the subject procedure for technical content and adequacy. Areas of specific interest included nonintrusive testing methods, trending, preventive maintenance, personnel training, documentation/computerized data base input and inspection frequency. The program was discussed with the manager of ISI and the designated individual within his group assigned to this task. Through these efforts the inspector ascertained that: (1) 10% of the check valves are inspected per refueling outage - sample selection is based on model and manufacturer, (2) the licensee is currently evaluating nonintrusine inspection methods, as such check valves are disassembled and visually inspected until such time that a nonintrusive inspection system becomes available, (3) the aforementioned procedure does not address training requirements for craft and other technical personnel including those performing root cause evaluations and design reviews etc. Item (3) above was discussed in detail with the ISI manager and plant management who agreed to look further into this matter.

During the recently completed outage, thirteen (13) check valves were disassembled, inspected and found to be acceptable. Two check valves, out of these thirteen, were included in the sample in order to inspect for possible changes to degradation identified on the previous inspection. Records showed that the suspect areas exhibited no significant changes from previous measurements.

Within the areas inspected violations or deviations were not identified.

5. Maintenance Assessment Inspection (TI 2515/108)

Between July 31 and August 18, 1989, Region II conducted a Maintenance Team Inspection (MTI) at the Shearon Harris Plant to asses and evaluate the effectiveness of maintenance activities. Results of this inspection were documented in Region II Report 50-400/89-16. Although the overall maintenance program and its implementation were rated as GOOD, the team identified some weaknesses in the area of predictive maintenance. These included vibration analysis and lube oil analysis. The inspector reviewed licensee action(s) in these two areas and on NRC Bulletin 88-09, Thimble Tube Thinning in Westinghouse Reactors. A discussion of these three items is as follows:

- Vibration Analysis: The MTI observed that only continuously operated safety related rotating equipment were being analyzed, that intermittently operated safety related pumps were monitored and trended for vibration through the ASME Code, Section XI program and that work requests were initiated for further testing if vibration problems were identified by ISI.

  The MTI concluded that code required vibration surveillance(s) were no substitute for vibrational analysis and considered that as a programmatic weakness. The inspector, through discussions with cognizant engineering personnel and by review of the licensee's

procedure PPP-304 Rev. 0 dated February 2, 1990, Vibration Tending and Analysis, ascertained that monthly vibration tests are performed for normal operation plant equipment with more frequent tests on a machine-by-machine as needed basis. Safety related equipment not normally operated are vibration tested per procedure ISI-800. This procedure provides acceptance criteria which is monitored through computer programming. Trending is performed and analyzed over all levels and frequency spectra.

- Lube Oil Analysis: The MTI team observed that the licensee's lube oil analysis did not include certain equipment i.e. emergency diesel generators, reactor coolant pumps and charging pumps. At the time, a revision to procedure PM-M0074 Equipment Lube Oil Sampling, was in process which would add these and other equipment to the program. By review of change #2 to the subject procedure the inspector ascertained that the licensee has expanded the list of equipment to be tested. The list includes the aforementioned equipment.

- (Closed) NRC Bulletin 88-09, "Thimble Tube Thinning in Westinghouse Reactors"

  In reference to this item, the MTI team reported that actions requested by the subject Bulletin had been addressed acceptably in the November 10, 1988 response. However, the maintenance team determined that the licensee had not formally considered wear scar length (minimum wall thickness) or instrument operability with a shortened thimble tube length in selecting repositioning and acceptance criteria. By revision changes 1 and 2, to applicable procedure EPT-114, "Eddy Current Requirements for the Incore Instrumentation Thimble", the licensee has incorporated requirements for measuring wear depths, calculating predicted wear and repositioning guidelines when necessary due to service related wear. The inspector reviewed the revised procedure for content and technical adequacy and, reviewed results of tests performed during the 1991 refueling outage.

  In the areas inspected violations or deviations were not identified.

6. Housekeeping

The inspector conducted a walk through inspection of the emergency diesel generator room and the auxiliary building. Plant conditions of particular interest included area and equipment cleanliness, equipment with leaking connections evidence of boric acid corrosion and/or accumulation, repair tags with old dates, outdated calibration stickers, loose or missing nuts/bolts on equipment and oil reservoirs with unusually low fluid levels. The inspector noted that the areas inspected were relatively clean and the equipment well maintained.

7. Exit Interview

The inspection scope and results were summarized on June 28, 1991 with those people indicated in paragraph 1. The inspector described the areas inspected and discussed in detail inspection findings. No dissenting comments were received from the licensee.