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

Report Nos.: 50-269/87-28, 50-270/87-28, and 50-287/87-28

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

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

License Nos.: DPR-38, DPR-47, and DPR-55

Facility Name: Oconee 1, 2, and 3

Inspection Conducted: July 13-16, 1987

Inspector: N. Economos — Date Signed: 8/3/87

Approved by: J. J. Blake, Section Chief
Engineering Branch
Division of Reactor Safety — Date Signed: 8/5/87

SUMMARY

Scope: This routine, unannounced inspection was conducted in the areas of licensee action on previous open items, including follow-up on unusual event report(s) (LER), and response to IE Bulletin 83-05.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Licensee Employees Contacted

*M. S. Tuckman, Station Manager
*T. B. Owen, Superintendent Maintenance
*R. J. Brackett, Senior Quality Assurance (QA) Engineer
K. G. Rohde, Nuclear Production Engineer
B. Stengel, Station Training Instructor
B. W. Carney, Jr., Mechanical Technical Support Engineer
W. R. Hunt, ISI Coordinator, Oconee
C. R. Henson, Technical Support Welding
G. L. Blubaugh, QA Technician, Welding/Nondestructive Testing
F. E. Owens, Regulatory Compliance Specialist

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 16, 1987, with those persons indicated in the above paragraph. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The following previously identified open items were closed at this time.

(Closed) Unresolved Item 50-269, 270, 287/87-06-01, Material Traceability for UT Bolt Calibration Block 40363, paragraph 3.

(Closed) IFI 50-269, 270, 270, 287/87-06-03, Evaluation of Changing Nondestructive Examination Requirements of Class C, B31.7 Pipe Welds, paragraph 7.

(Closed) Unresolved Item 287/85-02-01, Leak Rate Acceptance Criteria for Individual Containment Isolation Valves, paragraph 3.

(Closed) Licensee Event Report 270/87-03, Reactor Shutdown due to Nonisolated Leak in Reactor Coolant System, paragraph 6.

(Closed) 83-BU-05 ASME Nuclear Code Pumps and Spare Parts Manufactured by the Hayward Tyler Pump Company, paragraph 5.

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

3. Licensee Action on Previous Enforcement Matters (92701)

(Closed) Unresolved Item (UNR) 50-269, -270, -287/87-06-01, Material Traceability for UT Bolt Calibration Block No. 40363 (73755)

This item was identified when the licensee could not provide objective evidence to verify that UT Calibration Block No. 40363 was made from ASTM A-540, Grade B-24 material. Results of a chemical analysis performed on the block material by Law Engineering Industrial Services showed the block to be ASTM A-540, Grade B-23 material. The analysis was consistent with material specification requirements for the RCP main flange studs for which the subject block was used as a calibration standard. The grade number on the calibration block drawing was changed from GR-24 to GR-23 to make it consistent with the analysis results.

(Closed) UNR 269, 270, 287/85-02-01, Leak Rate Acceptance Criteria for Individual Containment Isolation Valves. (92706)

This item was identified as a result of a review of the licensee's procedure for leak testing Containment Isolation Valves (CIVs). The applicable code was identified as ASME Section XI (80W80), Subsections IWV-3426 and -3427. The procedure under discussion was identified as PT/1/A/0150/06, September 27, 1984 Mechanical Penetration Leak Rate Test. Although this procedure applies to Unit 1, it is essentially the same as the procedures used on the other two units.

Based on discussions and the review conducted during the inspection documented in RII Report No. 50-287/85-02, the NRC inspector reported that the licensee used an approach in assigning individual valve leakage limits that appeared consistent with the intent of the NRC accepted approach. However, the inspector found that the individually assigned acceptance limits were not true acceptance limits in that the procedure permitted them to be exceeded upon evaluation.

Moreover, the inspector stated that he understood that the evaluation may permit leakage above the individual limits so long as the total containment leakage limits were not exceeded. The procedure did not require the evaluation to be documented. At the time, licensee test personnel informed the inspector that, in practice, the individual valve leakage limits were only permitted to be exceeded if it was not practical (e.g., due to long lead time in obtaining a valve part) to correct the condition before returning to power and if it did not appear that further degradation of leakage limits would occur and result in violation of containment leakage limits. The inspector informed the licensee that he was concerned that:

- The actual acceptance limits permitted through their evaluation exceeded limits the inspector understood to be considered generally acceptable to the NRC.

- Evaluations of excessive, individual CIV leakage rates were not documented.

During this inspection, the inspector discussed the aforementioned concerns with cognizant licensee personnel and reviewed changes in the aforementioned procedure that resolve the concerns described above.

Revisions to the procedures were completed on August 8, 1985.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. IE Bulletins (92703)

(Closed) 83-BU-05: ASME Nuclear Code Pumps and Spare Parts Manufactured by Hayward Tyler Pump Company.

By memorandum dated September 8, 1983, the licensee responded to the action items of this bulletin. The licensee's response stated that:

a. The only pump manufactured by the Hayward Tyler Pump Company (HTPC) currently installed at the Oconee Nuclear Station is located in Units 1 and 2 Spent Fuel Cooling System. Twelve (12) other pumps manufactured by HTPC were earmarked for installation in the radwaste facility which was considered to be non-safety-related and therefore, exempt from the action items required by this bulletin.

b. The HTPC pump, installed in the spent fuel pool cooling system of Oconee Units 1 and 2 is included in the Oconee Pump and Valve inservice testing program and is tested as required by:

ASME Section XI, IWP, 1980 Edition.

At the time of installation, motor rotation and phase current were checked and declared satisfactory. From the time of installation to the time of the licensee's response on September 8, 1983, the motor had no malfunctions and no problems had been experienced with the motor switchgear due to overload. A motor current check conducted in response to this bulletin showed 38 amperes per phase which was acceptable for the design load.

c. Acceptance tests run at the time of installation, July 1981, showed pump performance to be satisfactory and the pump has continued to operate satisfactorily since that time. Vibration amplitude is one of the parameters being monitored and documented as required by Code. A 48 hour endurance test required by this bulletin was completed successfully on August 12, 1983.

d. The subject pump and associated piping of the Spent Fuel Pool Cooling System were hydrostatically tested per Code requirements prior to system turnover with no leaks observed. The Spent Fuel Cooler area is checked during each shift. Inspection items include identification of operating pump and evidence of leakage. Leaks, if observed, are noted and necessary repairs are arranged.

e. At the time of the response, no spare parts manufactured by HTPC had been installed in any pumps at Oconee. The recommendation given in

Attachment 3 of the Bulletin, Installation of Replacement Parts, was incorporated into the disassembly/assembly procedure of the HTPC Spent Fuel Cooling Pump prior to September 16, 1983. The subject pump was identified as pump 1C, Model 4x6x12, N3; Serial Number 827401. Oconee station procedures related to pump maintenance and testing which were reviewed for content were as follows:

- MP/O/A/300/32, April 28, 1986 Pump - Hayward Tyler - Spent Fuel Coolant - Disassembly, Repair and Reassembly.

- PT/1/A/0251/02, December 19, 1986 Spent Fuel Pool Cooling Pumps Performance Test

- MP/O/A/1720/10, Hydrostatic Test
  NSM 1212, Part D-004

- Printout of Work Requests on the subject pump from July 1, 1981 until the present.

(Open) 83-BU-06: Nonconforming Materials by Tube-Line Corporation Facilities at Long Island City, New York; Houston, Texas, and Carol Stream, Illinois.

By memoranda dated November 18 and December 9, 1983 the licensee responded to the action items requested by this Bulletin. The response stated that the only Tube-Line (T-L) material supplied to Oconee was installed in the Unit 3 Auxiliary Feedwater System. The material in question involved weld-neck flanges, end caps and reducing tees - all of which were made of carbon steel material. Tests performed on a sample of SA-234 WPB material produced from the same heat as the caps and tees, in Oconee 3, showed the material properties equaled or exceeded the ASME Code requirement. However, in the case of the three inch (3") weld-neck raised face flanges, which are located on the risers that lead to the Auxiliary Feedwater Steam Generator Nozzles, laboratory tests conducted by Babcock and Wilcox (B&W), and T-L indicated that the material properties did not meet B&W's purchase specification requirements. Specifically, the yield and ultimate strength properties were below the ASME Section III standards. The Code of Record, the 1967 USAS B 31.1 Code, does not require a specific flange analysis. However, it does require that the material meet ASTM and B 16.5 standards. The laboratory test results were essentially identical to the material properties for materials which are acceptable per ANSI B 16.5 for Oconee. The reported test results and Code/ANSI standard requirements are as follows:

	Yield KSI at Ambient T°	Tensile KSI at Ambient T°
B&W Specified Material, ASME,SA-105	36	70
USAS, B 31.1/B 16.5 Requied Material Properties		
ASTM A-105Gr.1	30	60
Flange Material Properties	31.1	59.8

On the basis of these results, the licensee concluded the material meets B31.1 Code requirements for ASTM A-105 Gr.1 but not ASTM A-105 Gr-11/ASME SA-105 as specified.

Results of a rigorous analysis used to evaluate the subject flanges, caused the licensee to conclude that one of the 12 installed flanges did not meet Code stress allowables for the flange stresses and flange bolt stresses during operating conditions. However, the licensee concluded that, on the basis of these evaluations, Unit 3 could return to power until the spring 1984 Refueling Outage. During that outage all the flanges were visually inspected and checked for hardness. All material except one flange was found acceptable and the one that failed was replaced. Because the licensee could not provide stress analysis calculations for the inspector review and a description of the general concerns as expressed in paragraph 4 of the bulletin, i.e. short-term and long-term corrective actions as applicable was not included in the licensee's reponse, this item will remain open.

Within the areas inspected no violatins or deviations were identified.

6. Nonroutine Events (92700)

(Closed) Licensee Event Report (LER) 270/87-03 Reactor Shutdown Due to Non-Isolable Leak in the Reactor Coolant System

This work effort was conducted as a follow-up to that performed earlier by the Oconee resident inspectors and documented in Report 50-270/87-03. As stated in the subject LER, on April 6, 1987, the unit was taken off-line and brought to 240 degrees F and 170 psig to determine the efficiency of the Decay Heat Coolers. While at 240 degrees F and 170 psig, maintenance personnel entered the Reactor Building to measure for a pipe support. At 0600 on April 8, 1987, personnel observed water coming from a welded connection. The licensee's investigation concluded that section of pipe containing the leak could not be isolated. Therefore, at 0607 an unusual event was declared and at 0708 the unit was taken to cold shutdown.

The root cause of this event has been attributed to a weakening of the pipe wall from stresses induced by material frequency vibration. The circumstances that caused the pipe to react in this manner stem from an error made by a pipe-fitter during fabrication. Apparently, the pipefitter cut the pipe to length without taking into account the radius of the 12" connecting pipe and thereby cut the pipe section 6" too long. The pipe being too long caused the vibration problem.

The leak emanated from a crack in the heat affected zone of the pipe to coupling weld of one of the RVLIS level transmitters. The pipe was approximately one inch in diameter with a minimum wall thickness of .219 inch (Schedule 160). The crack propagated circumferentially about 180 degrees around the pipe.

The licensee's records showed that the repair was performed in accordance with construction Code B31.7 and ASME Section XI requirements. The inspector reviewed the weld process control sheet and other related QA/QC records for completeness and accuracy. Other quality records reviewed included welder qualifications, filler metal certifications and NDE records.

Other corrective actions planned and subsequently implemented were as follows:

- Develop training for craft personnel, management, and all other personnel who install modifications to interpret the correct dimensions of piping installation from isometric drawings.

- Inspect all modifications that were installed with isometric drawings that have the possibility of similar consequences.

- Perform safety analyses and initiate changes to modifications where appropriate.

Records on file show these actions have been implemented.

7. Inspector Follow-up Items

(Closed) IFI 259, 260, 287/87-06-03 Evaluation of Changing Non-destructive Examination Requirements of Class C, B31.7 Pipe Welds (55050)

This item was identified when the inspector noted that Variation Notice VN-0587 had been issued to document a switch from B31.7 to ASME Section III non-destructive examination requirements on Duke class "C" welds.

By Revision 13 to Piping Installation Specification OS-0243, 00-00-0001, the licensee has adopted the requirements of ASME Section XI repairs and replacements, which meet the following Section III requirements and are exempted from certain NDE requirements as described below (Ref. Section XI IWA-4120 and IWA-7210):

a) Duke Class C (B31.7 Class III) welds, for which both the welds and welders meet the examination and qualification requirements of ASME Section III 1974 edition, Summer 1975 Addendum, are not required to meet the random radiograph requirements of B31.7 chapter 3-VI.

b) Duke Class C welded repairs of defects in materials which meet the exemption and examination requirements of ASME Section III subarticle ND-4130 of the 1974 edition, winter 1976 addendum, are not required to be radiographed.

This revision became effective as of July 1, 1987.