



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

Report No 50-400/88-36

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

Docket No 50-400

License No NPF-63

Facility Name: Shearon Harris

Inspection Conducted: September 26-30, 1988

Inspector:

S. E. Sparks

10/20/88
Date Signed

Approved by:

F. Jape, Chief
Test Programs Section
Engineering Branch
Division of Reactor Safety

10/20/88
Date Signed

SUMMARY

Scope: This routine, unannounced inspection was conducted in the areas of emergency diesel generator modifications as required by Item 6 of Attachment 1 to the Harris Operating License NPF-63, and reactor coolant system leakage determination.

Results: The emergency diesel generator modifications implemented and completed by the licensee adequately address the requirements of Item 6 of Attachment 1 to the Operating License.

Within the areas inspected, no violations or deviations were identified.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *W. H. Batts, Mechanical Maintenance Supervisor
- *R. T. Biggerstaff, Principal Engineer, ONS
- *C. S. Hinnant, Plant General Manager
- *C. L. McKenzie, Principal QA Engineer
- *T. C. Morton, Maintenance Manager
- W. T. Shenton, Project Engineer
- *D. L. Tibbits, Director, Regulatory Compliance
- M. Turner, Senior Engineer
- *M. G. Wallace, Senior Specialist, Regulatory Compliance

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

NRC Resident Inspectors

- *W. H. Bradford, Senior Resident Inspector
- M. C. Shannon, Resident Inspector

*Attended exit interview

2. Emergency Diesel Generator Licensing Condition Inspection, (92701)

The purpose of this follow-up inspection was to verify completion of all emergency diesel generator (EDG) requirements as a result of an amendment as agreed to per Item 6 of Attachment 1 to the Shearon Harris Operating License NPF-63. These requirements, which were to be completed prior to restart following the first refueling outage, involve various system modifications and additional inspections of the Transamerica Delaval Incorporated (TDI) EDGs. This inspection is a follow-up of NRC Inspection Report No. 50-400/88-30, which was performed while many of the required modifications were still in progress.

The NRC inspection consisted of a review of the TDI Diesel Generator Design Review and Quality Revalidation Report (DR/QR), comparison of modifications with the original recommendations as stated in the DR/QR and as agreed to per Item 6 of Attachment 1 to the Operating License, a review of the Plant Change Request (PCR) packages, and a review of post-maintenance testing, as appropriate.

The following is a delineation of the Operating License EDG requirements and an assessment of adequacy.

- a. Item 6.a - Licensee inspection of the engine base for degenerate microstructure (Widmanstaetten graphite) and submittal of results to the NRC for evaluation.

The licensee has completed this item and results were submitted to the NRC on April 26, 1988. Results of the licensee's inspection, performed by Failure Analysis Associates, indicated that the engine bases can be classified as being made from nominal class 40 grey cast iron that does not contain Widmanstaetten graphite.

- b. Item 6.b - The exhaust manifold capscrew torques shall be checked/corrected for both engines.

The licensee has satisfactorily completed this item. The licensee will revise Corrective Maintenance Procedure CM-M0150, EDG Cylinder Head Removal, Disassembly and Reassembly, to reflect the proper capscrew torques (54-66 ft-lb) in conjunction with use of a C5-A antiseize lubricant.

- c. Item 6.c - Licensee to perform a visual inspection, liquid penetrant test, and dimensional check of EDG 1A governor shaft.

This item was satisfactorily completed under work request (WR) 88-AEED1. Results of the liquid penetrant test revealed no fatigue cracks. In addition, dimensional checks of the governor shaft performed under the same WR were also satisfactory.

- d. Item 6.d - Licensee to perform a liquid penetrant test of EDG 1A governor drive gear and shaft for fatigue cracks.

This item has been satisfactorily completed. Results from the liquid penetrant test revealed the governor drive gear and shaft had no fatigue cracks.

- e. Item 6.e - Installation of an acceptable jacket water standpipe level transmitter on both diesel generators.

The licensee has completed the installation of a level transmitter that is compatible with the jacket water environment for EDG 1A and 1B. The previous level transmitter was compatible only with specific gas and air systems, and as such was not compatible with the jacket water.

- f. Item 6.f - Installation of Dresser couplings on to the engine driven lube oil pump suction line to mitigate thermal expansion loading and stress on the pump inlet nozzle.

The inspector reviewed the modification package, safety evaluation, installation of the coupling, and selection of the appropriate Dresser coupling with the licensee, and had no comments.

- g. Item 6.g - Replace the 2-1/2 inch Dresser coupling located between the turbocharger and lube oil sump tank for both drain lines with a 2-1/2 inch 150 lb. flange with A307 bolts.

The licensee had satisfactorily completed this modification, and performed an inservice leak test of the welds per Mechanical Modification Procedure MMP-012, Hydrostatic and Pneumatic Testing of Piping Systems. This modification was performed in conjunction with PCR-875, which involved the installation of two additional U-bolt supports downstream of the new flanges to validate the stress analysis. The inspector reviewed the work package and inspected the modification, verified proper flange and bolt specifications, and had no comments.

- h. Item 6.h - Implementation of the the four starting air manifold support modifications specified in the DR/QR.

The inspector reviewed the licensee's modifications, which consisted of the following:

- Stiffening of the two U-bolt supports adjacent to the strainers in the lateral direction
- Reinforcement of the 10 support members on the two headers running parallel to the length of the engine, and bolt hole elongations in the east-west direction
- Reinforcement of support members located on the riser north of the valves (left bank) and on the riser south of the valves (right bank), and bolt hole elongations in the north-south direction
- Reinforcement of support members located on the riser south of the valves (left bank) and on the riser north of the valves (right bank)

The inspector reviewed the safety evaluation for the above modifications to the emergency air system, along with applicable design sketches and field change requests. The licensee's planned modifications appeared to adequately address those identified in the DR/QR. The inspector reviewed the technical justifications for field changes made as a result of emergency air header warping, and after discussions with licensee personnel had no comments.

- i. Item 6.i - Reinforcement of jacket water pipe and fitting support members.

The inspector verified through observation that additional welds had been added as indicated per the design sketches to reinforce the jacket water pipe supports for EDG 1A and 1B.

- j. Item 6.j - Modification of the two-directional restraints on each fuel oil drip header (2 per engine) to three-directional restraints to provide axial restraint of the header and to minimize the effects on all associated tubing.

The licensee had completed this modification for both diesels, which consisted of the addition of 2 U-bolt type restraints. The licensee's original design for this modification was revised due to congestion which prohibited the use of a calibrated torque wrench to set the torque (8-11 FT-LB). The revised procedure to set the torques involved the use of a lockwasher, which was tightened until flat. The U-bolt assembly would then be secured by a double nut method.

- k. Item 6.k - Installation of an anchor (six way restraint) on the fuel-oil-to-day-tank return piping (two lines per engine) to reduce the unsupported span length and to minimize the effects of the off engine piping.

The licensee had satisfactorily completed this modification for both diesels, which involved the installation of two Bergen Patterson friction type anchors welded to the modified hanger steel to provide a six way restraint. The inspector reviewed the safety analysis and structural design, and had no comments.

- l. Item 6.l - Coat one side of the adjustment screw for each of the five adjustment potentiometers on the printed circuit board of the voltage regulator with glyptol lacquer, and revise procedures accordingly. The lug arrangement for the heatsink connections shall be modified so that there are no more than two lugs on each bolt. In addition, for the bridge rectifier assembly, the diodes shall be mounted on the heatsinks with drilled holes, nuts, and lockwashers and tightened to the proper torque.

The inspector reviewed the above item, and had no comments.

The inspector also performed a walkdown of the diesel generator building, and observed that the jacket water heat exchanger had a small leak around the floating divider plate gasket. This item had recently been identified by the licensee through a deficiency tag. The inspector reviewed procedure MPT-M0045, Emergency Diesel Generator Jacket Water Heat Exchanger Inspection, and the licensee's vendor manual, and questioned licensee personnel about the bolting configuration of the floating divider plate. Specifically, the procedure was unclear on the position of the jam nut after re-assembly. This nut is to be 'snug' tight against the outlet box flange, and is used to help prevent overtightening of the flange. However, it could not be determined if the small flange leak was due to the mispositioning of the jam nuts. The licensee agreed to revise procedure MPT-M0045 to clarify the bolting configuration of the floating divider plate. This item has been identified as Inspector Follow-up Item (IFI) 88-36-01.

3. Reactor Coolant System Leakage Determination (61728)

Using data provided by the licensee from a completed copy of procedure Operation Surveillance Test OST-1026 (Revision 3), Reactor Coolant System Leakage Evaluation Daily Interval, the inspector calculated using the microcomputer program RCSLK9 an unidentified leakage rate of 0.25 gpm. This result was in acceptable agreement with the licensee's result of 0.24 gpm, as were the individual calculations of changes in inventory of the pressurizer, volume control tank, and the balance of the reactor coolant system.

Within the areas inspected, no violations or deviations were identified.

4. Exit Interview

The inspection scope and findings were summarized on September 30, 1988, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Description and Reference</u>
400/88-36-01	IFI - Revision of procedure MPT-M0045 to clarify jacket water heat exchanger divider plate bolting configuration

