



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

Report No.: 50-400/85-30

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

Docket No.: 50-400

License No.: CPPR-158

Facility Name: Harris Unit 1

Inspection Conducted: July 20 - August 20, 1985

Inspectors:	<u>G. F. Maxwell</u>	<u>8-22-'85</u>
	G. F. Maxwell	Date Signed
	<u>G. F. Maxwell for</u>	<u>8-22-'85</u>
	R. L. Prevatte	Date Signed
	<u>G. F. Maxwell for</u>	<u>8-22-85</u>
	S. P. Burris	Date Signed
Approved by:	<u>P. Fredrickson</u>	<u>8/22/85</u>
	P. Fredrickson, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope: This routine, announced inspection involved 291 (resident) inspector-hours on site in the areas of licensee action of previous enforcement items; licensee identified items and IE Bulletins; heating, ventilation and air conditioning; electrical; fire prevention/protection; storage; preoperational test program implementation verification and operations training.

Results: Of the 8 areas inspected, no violations or deviations were identified in 7 areas; one violation was found in one area (violation - "Inadequate Inspection of HVAC Duct", identified in the details Section 6.g of the report). No apparent deviations were found.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

N. J. Chiangi, Manager, QA/QC Harris Plant  
J. M. Collins, Manager, Operations  
G. L. Forehand, Director, QA/QC  
J. L. Harness, Assistant Plant General Manager, Operations  
C. S. Hinnant, Manager, Start-up  
L. I. Loflin, Manager, Harris Plant Engineering Support  
D. A. McGaw, Superintendent QA  
C. L. McKenzie, Acting Director, Operations QA/QC  
G. A. Myer, General Manager, Milestone Completion  
R. M. Parsons, Project General Manager, Construction Confirmation  
Completion  
M. Thompson, Jr., Manager, Engineering Management  
D. L. Tibbitts, Director, Regulatory Compliance  
B. Van Metre, Manager, Harris Plant Maintenance  
M. D. Vernon, Superintendent QC  
E. J. Wagner, Manager, Engineering  
C. C. Wagoner, Project General Manager, Construction  
R. A. Watson, Vice President, Harris Nuclear Project  
J. L. Willis, Plant General Manager, Operations

Other licensee employees contacted included 51 construction craftsmen, 10 technicians, 18 operators, 8 mechanics, 12 security force members, and 11 engineering personnel.

### 2. Exit Interview

The inspection scope and findings were summarized on August 16, 1985, with the Plant General Manager. No written material was provided to the licensee by the resident inspectors during this reporting period. The licensee did not identify as proprietary any of the materials provided to or reviewed by the resident inspectors during this inspection. The violation identified in this report has been discussed in detail with the licensee. The licensee provided no dissenting information at the exit meeting.

### 3. Licensee Action on Previous Enforcement Items (92702)

- a. (Closed) Violation 400/85-04-02 "Inadequate Electrical Design". The inspector evaluated CP&L's responses to Region II dated April 11, 1985, April 29, 1985, June 10, 1985 and July 19, 1985. CP&L has replaced the subject #10 AWG conductor with a #2 AWG conductor per Field Change Request FCR-E-4052. A review has been conducted by EBASCO to insure correct cable sizing in other installations. Administrative instructions have been implemented by HPES design to prevent a recurrence of this

problem. This item will be routinely evaluated as a part of the ongoing inspection program. This item is closed.

- b. (Closed) Violation 400/85-16-30 "Failure to Follow Procedures to Control Electrical Field Modifications". The inspector evaluated CP&L's response to Region II dated July 3, 1985. CP&L has reviewed the Electrical Field Modifications Log and taken appropriate remedial action to correct the discrepancies. The control of the log has been transferred from Harris Plant Construction section to the Harris Plant Engineering section to insure more rigid control. Engineering personnel have been indoctrinated in this revised procedural requirement for control of this log and electrical modifications. A follow-up inspection by the resident inspector indicates that this problem is resolved. This item is closed.
- c. (Closed) Unresolved Item 400/84-44-01 "Structural Steel and Welding Inspection Improvement". This item addressed procedural and training changes that were being implemented by the applicant to improve the inspection and documentation review program for structural steel welding. The corrective action steps that were implemented have been followed by the resident inspector. Follow-up inspections by the resident inspector and a review of the QA surveillances conducted by CP&L in this area indicate that these corrective actions have resulted in improved inspector effectiveness. This item will continue to be evaluated as a part of the ongoing inspection program. This item is closed.

#### 4. Licensee Identified Items and Bulletins (98700)

Prior to the inspection period, the licensee had identified the following items under 10CFR 50.55(e):

- a. (Closed) 400/CDR 85-207 "Cable Sizing Deficiency". On February 19, 1985 the licensee notified Region II of a 10CFR 50.55(e) item concerning the use of undersized #10 AWG conductor cables used in a 100 amp safety-related circuit. These conductors have a rating of approximately 15 amp. The final report on this item was submitted to Region II in July 1985. The reports have been reviewed and determined to be acceptable by RII. Corrective action included replacement of undersized cable with #2 AWG conductor per Field Change Request FCR-E-4052. EBASCO has performed a review of previously-installed cables to insure this does not exist in other applications. Procedural changes and additional training have been implemented to prevent recurrence. Follow-up inspection by the resident inspector indicates that this item has been corrected. This item is closed.
- b. (Closed) IEB 75-08 "PWR Pressure Instrumentation". As outlined in this Bulletin, continuously recorded data was required to verify adherence to pressure and temperature limitations under technical specifications. Shearon Harris has the capability to verify this adherence via

installed strip chart recorders in the control room. The inspectors consider this Bulletin closed.

5. Electrical (51053B, 51063B)

- a. The inspector observed the installation activities associated with class 1E cables with the following numbers: 11256B-SA, 10985D-SA, 11831Q-SA, 11970A-SA, 11869A-SA and 11831P-SA. These observations related to cable pulling and termination and various switchgear and cabinets. The following were evaluated during these observations:
- (1) The latest termination cards were in use;
  - (2) The size and type cable was correct;
  - (3) The cable identification (cable number and color code) was correct;
  - (4) The correct bending radius was applied;
  - (5) The cable routing was correct;
  - (6) The cables were protected from damage;
  - (7) Qualified electrical inspection personnel were monitoring the installation activities;
  - (8) Approved drawings and specifications were being used;
  - (9) Approved materials were being used;
  - (10) Cleanness;
  - (11) Calibration of tools and instruments;
  - (12) Approved work and inspection procedures were being used;
  - (13) Documentation of inspections and nonconformances.
- b. The inspector reviewed CP&L nonconformance trend reports for the month of July 1985 for the electrical raceway installation activities. This trend indicates that the rejection rate for first inspections and reinspection of previously rejected inspections is increasing in the areas of conduit, raceway and electrical boxes. This trend indicates that repetitive inspections are required in the above areas to achieve acceptable results. A review of the CP&L trend analysis for the first and second quarter of 1985 indicates that this problem has been increasing each quarter. The second quarter trend analysis report shows that this adverse trend was addressed to CP&L construction management at the second quarter trend meeting on July 19, 1985. The construction manager for electrical was required to provide cause and

preventive measures to correct this trend by August 23, 1985. The resident inspectors met with CP&L management on August 13, 1985 and discussed this trend and the actions being taken by electrical construction management to correct this trend. CP&L and construction management have taken steps to increase craft training, and provide stronger engineering and construction management and supervision involvement in these work areas to produce a product that will achieve a higher acceptability rate on its first inspection. This item will continue to be tracked by the resident inspector until this trend has shown significant improvement. This item is identified as an Inspector Follow-up Item "Electrical Nonconformance Trend Analysis" 400/85-30-02.

No violations or deviations were noted in the areas inspected.

6. Heating, Ventilation and Air Conditioning Systems (HVAC) (50100)

The inspector accompanied Construction Inspection (CI) personnel on an inspection of HVAC ductwork. This ductwork is identified on site drawings HV/1-G806-009, HV/1-G508-S01-003, HV/1-G508-S01-002 and HV/1-G525-S01-016, and had been previously inspected and accepted. The following were evaluated during this inspection:

- a. Proper location, configuration, identification, and damage, if any;
- b. Installation in accordance with approved drawings, procedures and instructions;
- c. Attachments properly installed;
- d. Fastening material type, identification and torquing;
- e. Interferences identified;
- f. Inspection personnel qualifications;
- g. Inspection results and nonconformances properly documented.

This inspection identified approximately 17 deficiencies, such as loose nuts, missing lockwashers, bent flanges, bolts not staked, drawing and documentation deficiencies and welds not in accordance with design requirements. No single identified item is considered of major significance, but numbers alone indicate a weakness in installation and inspection practices. These items have been discussed with CP&L management and have been documented in Nonconformance Reports 85-1791, 85-1804 and 85-1805.

The above instances are contrary to the requirements of 10CFR 50 Appendix B, Criterion X, ANSI N45.2 and the Preliminary Safety Analysis Report, section 1.8.5.10. This is a violation, "Inadequate Inspection of HVAC Duct" 400/85-30-01.

Except as noted, no violations or deviations were identified in the areas inspected.

7. Fire Prevention/Protection (42051C)

- a. The inspectors observed the fire prevention and protection activities related to containing combustible materials where the ignition of these materials could damage safety-related structures. The inspectors also observed the ongoing site training activities for the construction fire brigade.
- b. Some of the specific areas observed by the inspectors during this period were:
  - (1) Nonflammable protective coverings were observed over such equipment as the electrical control cabinets at elevation 286' of the reactor auxiliary building and over various safety-related pumps and components located throughout the plant.
  - (2) The inspectors observed during the various tours of the reactor auxiliary building and the containment building that the accumulation of combustible materials in these areas was being minimized.
  - (3) Flammable materials were stored to prevent or reduce the likelihood of combustion.
  - (4) Welding activities were observed in at least 30 separate locations throughout the site and in each instance it was observed that appropriate fire extinguishing equipment was available within close proximity of the welding activities. It was also noted that the portable fire extinguishers contained sufficient fire extinguishing medium, as evidenced by displaying current inspection stickers and having unbroken seals.
  - (5) The inspectors observed that at the various elevations throughout the reactor auxiliary building and the containment building, fire suppression devices were strategically located and readily available for use.
- c. A review of the fire brigade drill and training records showed that drills and training are conducted on a regular basis for the fire brigade members.

No violations or deviations were noted in the areas inspected.

8. Storage (50073C)

The inspector toured warehouses 1, 2 and 3, the operations warehouse, and various plant equipment storage areas. During the tours, the storage

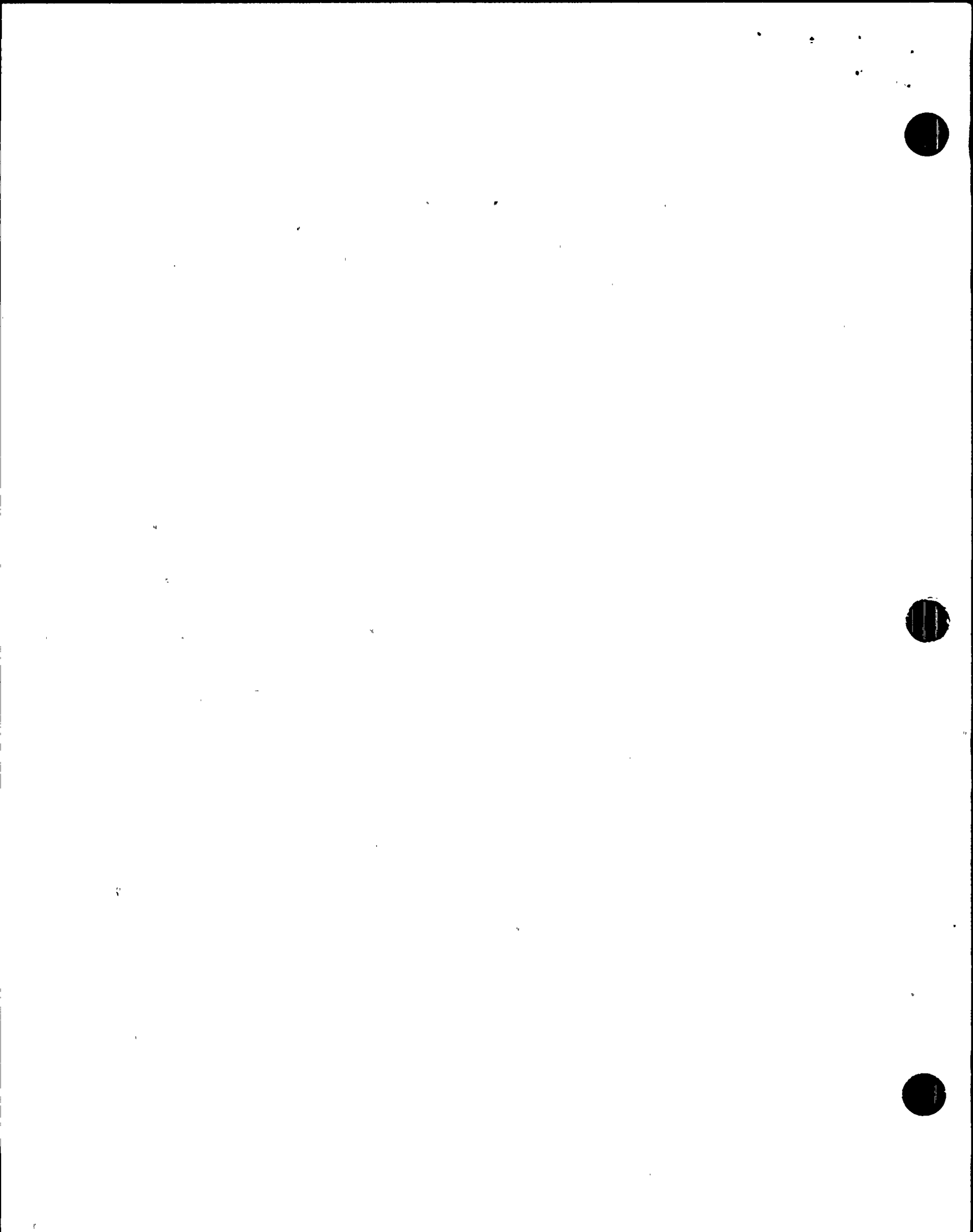
conditions of the equipment were evaluated to determine whether requirements are being met as follows:

- a. Piping and equipment, in general, were stored off the ground or floors to prevent entry of dirt into them, or contamination from environmental conditions.
- b. The storage areas were identified sufficiently to provide identity and locations as required by those who may be seeking the locations of parts or equipment.
- c. Access was adequate for placement or removal of parts and equipment.
- d. Warehouse equipment was stored in the correct position.
- e. The temperature and humidity controls were being maintained as required.
- f. Access to plant storage areas was being maintained.
- g. Equipment installed heaters were energized as required.
- h. Protective covers were in place.

No violations or deviations were identified in the areas inspected.

9. Preoperational Test Program (71302, 42400B)

- a. The inspectors toured various plant areas to verify that the following items were evaluated to assure compliance with requirements:
  - (1) The general condition of the plant's housekeeping and the overall condition of the equipment were observed.
  - (2) The plant was found to be free of any major fire hazards. Fire extinguishing equipment was readily available, and flammable materials were being protected from ignition sources and were being controlled in accordance with site administrative procedures.
  - (3) The inspectors observed electrical personnel placing cables in their respective cable trays and conduits. Sufficient care was being taken to prevent damage to the cables being placed, and to cables which had already been installed.
  - (4) The inspectors looked for uncontrolled openings in previously cleaned or flushed systems or components. Where system openings were identified, cleanness controls were established during flushing.





- (5) The inspectors observed one instance where construction personnel were working on electrical equipment which had already been turned over to the start-up group. The work was being accomplished under the proper administrative controls provided in the Start-up Manual.
- b. The inspectors reviewed log books maintained by the test group to identify problems or plant activities that may be appropriate for additional follow-up.
- c. The inspectors evaluated the activities being conducted by the CP&L operations QA surveillance personnel. QA surveillance personnel were present and observed the major preoperational tests conducted during this reporting period. The results of their observations were promptly documented and distributed to those responsible for the activities which were observed.
- d. The inspectors observed operations personnel deenergizing electrical components as required by the clearance program when equipment is being placed out of commission for repairs, tests or rework.
- e. The inspectors observed the status of the plant being correctly identified in the control room by operations personnel.
- f. During this inspection period the inspectors reviewed and witnessed the conduct of the Emergency Diesel Generator Phase Verification and Initial Synchronization, 1-5095-0-1. The inspectors reviewed the procedure to verify the following:
- (1) An approved test procedure was available and in use by the test personnel;
  - (2) Test equipment being used was calibrated and any jumpers installed were controlled by the applicable administrative procedures;
  - (3) Changes to the procedure were documented in accordance with administrative procedures.

The inspectors witnessed all portions of this test and noted several identified material deficiencies. These problems were identified during testing and were consequently corrected by the site personnel prior to test completion as identified below:

- (1) Several diesel shutdowns occurred due to low jacket water flow; this item was resolved by the licensee by identifying a downstream pneumatic pressure switch which was leaking, causing a false signal. The licensee replaced this switch, thereby correcting the problem.
- (2) Diesel shutdown by the loss of K-1 relay. This item occurred due to the fact that the AC and DC contacts were improperly installed

making the K-1 relay inoperable. The licensee replaced the K-1 relay with one from onsite and completed this test.

- (3) The inspectors were informed by the licensee that the diesel generator turbo exhaust piping had exhibited excessive movement and noise during the initial 24 hour run period. The licensee investigated these abnormalities and found that the south bank turbocharger discharge piping thermal expansion piece (bellows) showed excessive deterioration. The licensee determined that the root cause for this deficiency occurred when the high temperature and flow rate of the exhaust gases eroded the material, causing bellows failure. In addition to this justification, the licensee and technical representative have performed a thorough inspection of the turbocharger internals to insure that no bellows material was entrained back to the internals of the turbocharger. Corrective action by the licensee has included:
- (a) Replacement of the damaged bellows;
  - (b) Addition of a second thermal expansion joint prior to the exhaust pip entry to the muffler, which includes cutting the flange off the exhaust pipe and welding a new flange piece onto the exhaust pipe to allow bolting the new thermal expansion piece into place.
- g. The inspectors observed both construction and test personnel during performance of selected activities for the 1A-SA diesel generator. These evaluations included high pressure air compressor runs, air receiver and dryer operations, diesel generator control board and motor control center maintenance, and inspection of the generator windings. The inspectors interviewed test personnel and the diesel generator representative to determine the current status of the diesels. From these interviews the inspectors have determined that there are not unidentified problems with the diesels to date.

Harris management continues to actively institute a security program for the diesel generator building.

No violations or deviations were identified in the areas inspected.

#### 10. Operations Training (36301B)

The inspectors reviewed the operational training for personnel at the Harris Site. The review included interviews with the operational staff and management and an evaluation of operations personnel training records. The evaluation was conducted on ten percent of the the CP&L personnel who have applied for cold licensing approval as reactor operators or as senior reactor operators.

The inspectors evaluated the training records for the plant general manager and the radiation protection supervisor. The records were found to be

legible and were documented on the forms required by the applicable operations training instruction (TI-906).

As a result of the record review, the inspectors found one instance where the training history sheet for the plant general manager, did not reflect his current training status. This concern was discussed with responsible CP&L supervision and is being further evaluated by CP&L operations QA surveillance personnel. This condition is identified as an unresolved item "Training Records for Operations" 400/85-30-03.

No violations were identified in the areas inspected.