



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA STREET, N.W.  
 ATLANTA, GEORGIA 30303

Report No.: 50-400/84-42

Licensee: Carolina Power and Light Company  
 411 Fayetteville Street  
 Raleigh, NC 27602

Docket No.: 50-400

License No.: CPPR-158

Facility Name: Harris 1

Inspection Conducted: November 26-30, 1984

Inspectors:	<u><i>C.M. Upright for</i></u>	<u><i>12/28/84</i></u>
	R. W. Wright	Date Signed
	<u><i>C.M. Upright for</i></u>	<u><i>12/28/84</i></u>
	L. H. Jackson	Date Signed
Approved by:	<u><i>C.M. Upright</i></u>	<u><i>12/28/84</i></u>
	C. M. Upright, Section Chief	Date Signed
	Division of Reactor Safety	

SUMMARY

Scope: This routine, unannounced inspection involved 68 inspector-hours on site in the areas of procurement, receiving, and storage; onsite design activities; followup on previously identified inspector items (IFIs); and licensee identified 10 CFR 50.55(e) items.

Results: Of the four areas inspected, no violations or deviations were identified.

8502060208 850102  
 PDR ADOCK 05000400  
 Q PDR

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees Contacted

- \*R. M. Parsons, Project General Manager, Completion Assurance
- \*E. J. Wagner, Manager, Engineering
- \*A. H. Rager, Manager, Construction Inspection
- \*K. O. Hate, Principal QA Engineer
- \*E. M. Harris, Principal Engineer Mechanical
- \*T. C. Bell, Senior Specialist, Document Control
- \*G. L. Forehand, Director QA/QC
- \*G. M. Simpson, Principal Construction Specialist
- \*H. L. Williams, Principal Engineer, Civil Unit, HPES
- \*R. C. Ross, Senior Engineer, Mechanical, Fire Protection
- D. Hethcock, Engineering Specialist, Civil Unit, HPES
- E. Croteau, Engineering Specialist, Civil Unit, HPES
- L. Runbold, Clerk, Civil Unit, HPES
- I. Phelps, Clerk, Document Control Unit, HPES Satellite
- J. McKay, Resident Civil Engineer, Field Engineering
- H. Mutnick, Project Engineer, Drafting and Computerized Graphics
- C. Brafford, Senior Engineer, Drafting and Computerized Graphics
- M. Thompson, Supervisor, Engineering Management Section
- G. Goodman, QC Receiving Inspector
- D. McGaw, QA Superintendent
- D. Whitehead, QA Supervisor
- C. Rose, QA Supervisor-Startup
- H. Wagner, QA Specialist
- T. White, Maintenance Foreman
- J. Barefoot, Materials Supervisor
- C. Chavis Jr., Lead Receiving Inspector
- T. Harrington, Purchasing Agent
- J. F. Pinto, Fire Protection Group Supervisor, HPES
- J. V. Gailey, Principal QA Specialist - Vendor Surveillance
- C. Hensley, Project QA Specialist

#### Other Organizations

- \*G. F. Cole, Vice President, Daniel Power
- D. Maupin, Project Manager, Automatic Sprinkler Corporation of America (ASCOA)
- D. Meyer, Piping Engineer, ASCOA

#### NRC Resident Inspectors

- \*G. F. Maxwell
- \*R. Prevatte

\*Attended exit interview

## 2. Exit Interview

The inspection scope and findings were summarized on November 30, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged the following inspection finding:

Inspector Followup Item 400/84-42-01: Computerized Drawing Control and FCR/PW/DCN Log Transition Corrections, paragraph 6.d.

## 3. Licensee Action on Previous Enforcement Matters

Not inspected.

## 4. Unresolved Items

Unresolved items were not identified during this inspection.

## 5. Procurement, Receiving, and Storage (35065)

### a. Inspection Objective

This inspection was conducted to determine whether equipment procurement specifications include applicable quality assurance (QA) and technical requirements identified in the safety analysis report (SAR) and whether receipt inspection and storage activities are conducted in compliance with QA program requirements.

### b. Site Procurement

Safety-related equipment and materials received at the site are either NSSS supplied or CP&L procured from specifications prepared by Ebasco, the A-E, and reviewed and approved by CP&L. Site procurement is from Ebasco and CP&L pre-approved specifications. CP&L performs audits, maintains an evaluated supplier list, evaluates bids, issues contracts, and provides engineering and quality assurance controls in procurement of safety-related items.

### c. Procurement Action Review

The inspector selected the following listed procurement item contracts to determine that the following elements were included:

- Applicable regulatory, technical, and quality assurance requirements
- Procurement documents adequately reviewed
- Changes to technical and QA requirements adequately reviewed

- Purchaser notification points, hold points, and access rights incorporated in, or provided for, in the documentation
- 10 CFR 21 reporting requirements appropriately addressed
- Documentation to confirm acceptability of the item required to be furnished
- QA requirements applicable to subcontractors

<u>Purchase Order</u>	<u>Specification</u>	<u>Vendor</u>
H-52120A	055, R7 and/or 056, R8	Guyon Alloys Inc.
H-55027-2	055, R7 and/or 056, R8	Hub Inc.
H-54514	HX-M-003, RA	Henry Vogt.
H-57021	056, R8	Hub Inc.
H-54480	055, R7	DuBose Steel
H-51288	off-the-shelf	Raychem Mfgr.
H-52539	CAR-SH-E-10B	Gould Inc.
H-50820	055, R7	DuBose Steel

The inspector concluded that the above procurement documents contained appropriate QA requirements, that documents required to accompany shipment were specified, equipment specifications were attached when required, and that certified material test reports or certifications of compliance were required to accompany the shipment.

d. Source Selection

CP&L maintains an Approved Suppliers List which is updated quarterly; the most recent copy dated October 5, 1984, was reviewed by the inspector. All of the vendors listed under paragraph c above were on the Approved Suppliers List. This list contains all CP&L suppliers of Q-list safety-related engineering equipment or ASME Section III materials. Audit expiration dates, applicable ANSI standards which the vendor's program are required to meet, and type of materials or equipment approved to supply are shown on the Approved Supplier List. ASME certification stamp number and date of expiration are also shown.

CP&L performs triannual audits of vendors and yearly evaluations.

e. Receiving Inspection

The inspector examined the system established for performing receiving inspection and verified the following:

- Facilities were adequate
- Construction Quality Control (CQC) procedure CQC-6, Revision 4, was adequate.

- Construction Quality Instruction (CQI) procedure CQI-6.6, Revision 0, was adequate.
- Receiving records were available and identified discrepancies were properly dispositioned.
- Certified material test reports were reviewed and approved by CP&L.
- Procurement documents required documentation to verify acceptance of the item.
- Certificates of compliance identified the applicable purchase order and were signed by an appropriate member of the supplier's QA organization.

The inspector reviewed receiving inspection reports, certified material test reports, receiving inspector's qualifications, and Certificates of Compliance, applicable to the material received on the purchase order listed in paragraph c above. The receiving inspections were conducted in accordance with the QA program.

f. Storage

The inspector reviewed CP&L Policy 5, Revision 6, Material and Equipment Control, and verified that this procedure was in compliance with ANSI N45.2.2.

The inspector toured the warehouse, laydown areas, Unit 1 containment, reactor building, and auxiliary building and determined the following:

- Storage facilities for Class A equipment included an environmentally controlled atmosphere and provisions to prevent animals from entering.
- Facilities for Class B, C, and D equipment storage were satisfactory.
- Protection from damage during storage was adequate.
- Periodic surveillances of storage were made.
- Warehouse access was controlled.
- Stored items were identified.
- Nonconforming items were segregated and/or controlled.
- Items in storage received the required preventive maintenance.
- Equipment in the power block was adequately protected.



The quality assurance program and implementation of adequate storage were found satisfactory.

g. Surveillance and Audits

The inspector reviewed eight surveillances which evaluated the adequacy of procurement, receipt inspections, and storage. These surveillances identified deficiencies and followup surveillances confirmed adequate corrective action.

The next corporate QA Audit of material storage and maintenance activities is scheduled to be performed December 10-14, 1984.

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

6. Onsite Design Activities (37055)

Inspection Objective

This inspection was conducted to determine whether the licensee's, architect engineer's, and contractor's onsite design activities, including controls for engineering and construction initiated field changes, are conducted in compliance with the quality assurance requirements described in the facility safety analysis report.

a. Functional Responsibilities for Onsite Design

Section 3 of the CP&L Corporate QA Program Manual specifies the design control responsibilities assigned within CP&L, the Architect/Engineer (Ebasco), the Nuclear Steam Supply System Supplier (Westinghouse), and any contractors (currently Automatic Sprinkler). The design control program incorporates measures for identification and control of design interaction between CP&L, the A/E, NSSS Supplier, and contractors.

The CP&L Nuclear Engineering and Licensing Department (NELD) and Harris Plant Engineering Section (HPES), located on site, are responsible for providing the design and engineering for the Shearon Harris Nuclear Power Plant (SHNP) project. They are also responsible for including engineering support of site activities and for accompanying corporate, group, and departmental goals associated with the project. They fulfill these responsibilities by managing the A/E contract and other engineering and/or consulting services by providing technical direction for project design, by performing design activities, and by managing the procurement of engineered equipment. CP&L has continued to increase the number of personnel and the design responsibilities of the HPES with the intent that this section will eventually handle all design responsibility for the plant. The HPES is currently comprised

of approximately 364 personnel employed in the civil, hanger, mechanical, electrical, and instrument and control units of this section. The HPES and Harris Engineering Management Section (HEMS) processed approximately 1654 field change requests/permanent waivers (FCRs/PWs), 404 pipe hanger problems (PHPs), and 50 Ebasco design change notices during the month of October 1984. The extent of original facility design participation by HPES has increased with their capability and the Manager of HPES carefully directs, controls, and coordinates these activities. Approximately 85% of Ebasco's plant drawings have been turned over to CP&L to date. For the most part, Ebasco (New York) and CP&L incorporate design changes as revisions to drawings and specifications for those pertinent documents under their respective control.

In accordance with the SAR, Harris design activities involving "Q-List" equipment, systems, structures or other work performed are controlled by ANSI N45.2.11-1974 as endorsed by Regulatory Guide 1.64, Revision 2.

b. Design Procedure Review

Design Activities (including control of the design process) of the HPES personnel are governed by NELD procedures and the HPES manual of instructions. The following procedures and instructions were reviewed of verify the adequacy of these documents and to query various onsite design staff personnel of their knowledge of pertinent design control requirements contained therein:

Nuclear Engineering and Licensing Department (NELD) Procedures

- 3.1 Design Control Procedure
- 3.1.A Design Basic Document
- 3.1.B Preparation and Control of Design Analysis
- 3.1.C Preparation and Control of Design Drawings
- 3.1.D Preparation and Control of Specifications
- 3.1.E Preparation and Control of Other Design Documents
- 3.1.F Control and Use of Computer and Calculator Codes or Programs Used for Analysis or Design of Safety-Related Functions
- 3.2 Design Change Control
- 3.3 Design Verification
- 3.4 Review of Externally Generated Design Documents
- 3.5 Handling of Controlled Documents
- 3.6 QA Records
- 3.7 Preparation and Control of Interface Documents
- 3.8 Initiating and Updating Plant "Q-List"
- 3.9 Handling of Reportable Items Under 10 CFR 50.55(e)
- 3.11 Handling of Reportable Items under 10 CFR 21
- 3.12 ALARA In Design

Harris Plant Engineering Section Manual of Instructions

- 2.8 Processing of I.E. Information Notices, Circulars, Bulletins
- 3.1 Processing and Control of DCNs
- 3.2 Processing and Control of PHPs and FMs
- 3.3 Processing and Control of FCRs/PWs
- 3.4 Processing and Control of Nonconformances
- 3.5 QA Records
- 3.7 Alara Review
- 3.8 Review and Approval of FSAR and Environmental Report Changes
- 3.11 Processing and Control of Interface Documents
- 3.12 In-House Use of Design Guidelines
- 3.13 Numbering HPES Site Originated Design Drawings
- 3.14 Preparation and Control of HPES Site Originated Design Drawings
- 3.15 Revision of Original Design Drawings for Incorporation of Approved Design Changes
- 3.16 Preparation and Control of Component Level Q-List
- 3.17 Review and Approval of Vendor Documents for Incorporation into the Site EMDRAC System

Procedures reviewed and knowledge of individuals interviewed were verified to be adequate.

c. Design Process Review

(1) New Design

The inspector conducted discussions with CP&L engineering personnel (including two Central Technical Services specialists working under CP&L supervision and procedures) from the HPES Civil Unit to determine whether they understood their applicable design control procedures/instructions and to verify proper implementation of these procedures/instructions.

Computerized programs (STUDL, STARDYNE, EZHANG, BASEPLATE II) and hand calculations are utilized by the Civil Unit to perform their design analyses. Error notices to computer codes received by CP&Ls Information Management Department are required to be transmitted to the HPES Principal Engineer and end user by controlled transmittals. User Manuals and revision thereto are also handled by controlled transmittals. Additionally, NELD Procedure 3.1.F. requires a verification program in that benchmark testing of computer codes/programs are to be performed prior to use and copies of the benchmark testing are to be transmitted to QA Records.



The below listed original design calculations and pertinent drawings for the Containment Building Loop-3 RHR Valve Access Platform were examined by the inspector. Stress analysis of the platform members was accomplished by the STARDYNE computer stress analysis program and manual calculations were utilized to check each critical member for acceptable shear, bending, and buckling properties. Discussions were conducted with the Civil Unit design specialists from the HPES concerning the subject calculations relative to design inputs employed, criteria used, review, approval, and interface required. The applicable drawings were examined for proper identification, that they were properly reviewed and signed off by a checker (an individual other than the originator who has a level of design qualification at least sufficient to perform the design work being checked), responsible engineer, and Unit supervisor.

- Calc. No. FCR/SAAS - 269, Stardyne Stress Analysis of Platform Members - RHR Valve Access Platform Justification for FCR/SAAS - 269 - (manual calculations).
- Drawing Nos. CPL-2168-39123, 24; RO-Containment Building Elev. 236', Loop 3, RHR Valve Access Platform.

Based on these discussions, review of design procedures and criteria utilized, examinations of the above platform design calculations, and drawing controls exercised, the inspector concluded that the HPES Civil Unit was performing its onsite design function in accordance with the licensee's PSAR commitments and NRC requirements.

## (2) Design Changes

The inspector selected four recent field change requests (FCRs C-5400, C-5372, C-5371, C-5057) and permanent waiver PW C-5058 for review to determine the following:

- Reason/need for the change.
- Do the changes compromise the original design intent.
- The change was reviewed subject to controls commensurate with the original design and approved by other than originator.
- Design drawings affected were updated or are in the process of being updated to reflect the design change as appropriate.

The inspector concluded the above design changes had been properly addressed and handled in accordance with CP&Ls procedures and commitments.

## d. Control of Drawings

The inspector interviewed supervisory and clerical personnel responsible for control and distribution of drawings and design changes to confirm the drawing control system was adequate and providing the latest revisions of these documents to the field for construction. The following drawings, FCRs, PWs, and DCN were selected for review in the field of the Fuel Handling Building controlled drawing station:

CAR 2167-G-2328, R6	DCN 550-1162, R1
	FCR C-5410
CAR 2167-G-1180, R8	FCR C-5400
CAR 2167-G-2051, R1	FCR C-5400
CAR 2167-G-2035, R6	FCR C-5060
CAR 2167-G-2014, R6	FCR C-5060
CAR 2167-G-2174, R5	PW C-5058
CAR 2167-G-0512, R7	FCR C-5375
CAR 2167-G-0843, R7	FCR C-5371
CAR 2167-G-2845, R7	PW C-4667, R1
	PW C-4668
Specification FCRs	FCR C-3834
	FCR C-3897

Based on the above sample, the inspector concluded that the facilities, control and distribution of the above listed documents was satisfactory.

However, although the latest design documents were found to be transmitted to the field for construction of the plant, the inspector's review of the computerized drawing control list (DCL) and the computerized FCR/PW/DCN cross reference log revealed that they needed some updating. For example, R7 and R5 were listed as the latest revisions of Drawings CAR 2167-G-1180 and CAR 2167-G-2014 respectively in the DCL; however, these drawing revisions are one revision behind what the crafts are working to in the field. Also PW C-3854 R1, FCRs C-3834, and C-3897 written against various specifications exist in field and document control center but were not loaded into the FCR/PW/DCN computerized cross reference log.

CP&L recently (August 84) acquired Ebasco's computerized DCL program and during the transition period, clerical and data entry errors have been discovered. CP&L has been aware of the problem and the Drafting and Computer Graphics Unit has been going through the DCL program to assure the latest revision number and revision date are current and the same as issued to document control.

Likewise, CP&L's document control initiated the FCR/PW/DCN computerized cross reference program in August 1983, and consequently had to back load every such document into the computer prior to that date. The identified PW and FCRs represent only 3 out of approximately 21,000 documents backfitted into the program.

CP&L has committed to recheck both programs and resolve errors identified. Since the document control center's distribution of the latest drawings and design changes is independent of the computerized DCL and FCR/PW/DCN systems and consequently the current revisions of these documents are being distributed for the construction of the plant, the inspector identified this at the exit meeting as Inspector Followup Item 400/84-42-01, Computerized Drawing Control and FCR/PW/DCN Log Transition Corrections.

e. Design Control by Licensee

The inspector interviewed CP&L QA personnel who are responsible for auditing onsite design activities to determine the following:

- They are aware of each contractor who prepares and/or issues design documents for construction.
- That audits are performed on HPES and any contractors performing onsite design activities. The inspector examined CP&L corporate audit report Nos. QAA/100-26 and QAA/100-28 to verify that:

The audited organization received a copy of the audit report.

Appropriate standards were referenced for measure of performance.

That auditors were selected in accordance with QA Manual procedures.

That adverse findings received effective corrective action, were examined for significance, and reaudits were scheduled as necessary.

f. Onsite Design Activities by Contractors (Automatic Sprinkler)

Other than HPES, Automatic Sprinkler Corporation of America (ASCOA) is the only organization currently performing onsite design activities at the Harris Plant and this contract was recently commenced. ASCOA has been contracted by CP&L to design, fabricate, furnish, and deliver the water spray for fire protection system for containment, reactor auxiliary, fuel handling, and portions of the turbine buildings. ASCOA will perform field and design checks, prepare conceptual designs, stress analysis of all seismically - supported piping, and design all related supports/restraints. The ASCOA approved pipe stress calculations, hanger calculations, and design drawings are to be submitted to the HPES Project Engineer, Mechanical, for CP&L review and approval. The Harris Plant Construction Section will install the piping and fabricate/install piping hangers per applicable established site procedures. CP&L's Construction Inspection group will inspect the work and CP&L QA will audit these activities.

The inspector conducted discussions with the CP&L fire protection group supervisor concerning the management of the contract and examined the following pertinent documents provided by him:

- Design Criteria for Hangers dated October 26, 1984
- Preliminary Copy of The Fire Protection Interface Document dated October 29, 1984
- CP&L Corporate Audit Conducted on ASCOA's QA Manual Procedures

The inspector had the ASCOA piping engineer discuss the design inputs and output resulting from a HYDE final computer program calculation identified as SHNPP 42-866 SH, Fuel Handling 1-4-1-236, System "H" dated November 16, 1984. The HYDE User Manual was verified to be available at the work activity.

Within this area, no violations or deviations were identified.

7. Inspector Followup Items (IFIs) (92701B)

(Closed) IFI 400/84-11-02: Revision/Clarification of Procedure CQA-3, Nonconformance Control, To Include Auditable Provisions Which Insure That Subordinate Nonconformance Documents Are Trended And Reviewed For Reportability. The inspector examined Revision 6 to procedure CQA-3 and determined that it now contains adequate, auditable provisions for assuring subordinate nonconformance documents are trended for adverse conditions and properly reviewed for reportability.

8. Licensee Identified Items 10 CFR 50.55(e) (92700B)

(Closed) Item CDR 83-117: Welding on Breakers Not Inspected by Ebasco's Vendor QA Representative (10 CFR 50.55(e)). The final report was submitted on March 29, 1984, and addendum No. 1 on May 22, 1984. These reports have been reviewed and determined to be acceptable. The inspector held discussions with responsible licensee representatives, examined supporting documentation, and confirmed that the licensee had welding inspectors perform inprocess inspections during repair of the breakers to verify that corrective actions identified in the report have been completed. The breakers have been returned to the jobsite and are energized.