



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

Report No.: 50-261/86-31

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

Docket No.: 50-261

License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: December 11, 1986 - January 10, 1987

|              |  |                |
|--------------|--|----------------|
| Inspectors:  | <u>P. Mellen</u>                             | <u>1/29/87</u> |
|              | FOR H. E. P. Krug, Senior Resident Inspector | Date Signed    |
|              | <u>P. Mellen</u>                             | <u>1/29/87</u> |
|              | FOR R. M. Latta, Resident Inspector          | Date Signed    |
| Approved by: | <u>P. E. Fredrickson</u>                     | <u>1/29/87</u> |
|              | P. E. Fredrickson, Section Chief             | Date Signed    |
|              | Division of Reactor Projects                 |                |

SUMMARY

Scope: This routine, announced inspection was conducted in the areas of Technical Specification (TS) compliance, plant tour, operations performance, reportable occurrences, housekeeping, site security, surveillance activities, maintenance activities, quality assurance practices, radiation control activities, outstanding items review, IE Bulletin and IE Notice followup, organization and administration, independent inspection, Plant Status Report, Systematic Assessment of Licensee Performance (SALP) and enforcement action followup.

Results: No violations or deviations were identified within the areas inspected.

## REPORT DETAILS

### 1. Licensee Employees Contacted

R. Barnett, Maintenance Supervisor, Electrical  
G. Beatty, Manager, Robinson Nuclear Project Department  
J. Benjamin, Supervisor, Operations  
R. Chambers, Engineering Supervisor, Performance  
D. Crocker, Principal Health Physics Specialist  
J. Curley, Director, Regulatory Compliance  
J. Eaddy, E&RC Supervisor  
W. Flanagan, Manager, Design Engineering  
W. Gainey, Maintenance Supervisor, Mechanical  
P. Harding, Project Specialist (Acting), Radiation Control  
E. Harris, Director, Onsite Nuclear Safety  
D. Knight, Shift Foreman, Operations  
E. Lee, Shift Foreman, Operations  
F. Lowery, Manager, Operations  
M. Marquick, Senior Specialist, Planning and Scheduling  
D. McCaskill, Shift Foreman, Operations  
A. McCauley, Principal Specialist, Onsite Nuclear Safety  
R. Moore, Shift Foreman, Operations  
R. Morgan, Plant General Manager  
M. Morrow, Specialist, Emergency Preparedness  
D. Nelson, Operating Supervisor  
B. Murphy, Senior Instrumentation and Control Engineer  
M. Page, Engineering Supervisor, Plant Systems  
R. Powell, Principal Specialist, Maintenance  
D. Quick, Manager, Maintenance  
B. Rieck, Manager, Control and Administration  
W. Ritchie, Supervisor (Acting), Radiation Control  
D. Sayre, Senior Specialist, Regulatory Compliance  
D. Seagle, Shift Foreman, Operations  
R. Smith, Manager, Environmental and Radiation Control  
R. Steele, Shift Foreman, Operations  
R. Wallace, Manager, Technical Support  
L. Williams, Supervisor, Security  
H. Young, Director, Quality Assurance/Quality Control (QA/QC)

Other licensee employees contacted included technicians, operators, mechanics, construction personnel, security force members, and office personnel.

### 2. Exit Interview (30702, 30703)

The inspection scope and findings were summarized on January 12, 1987, with the Site Vice President and the Director of Regulatory Compliance. The licensee acknowledged the findings without exception. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. No written material was given to the licensee by the Resident Inspectors during this report period.

3. Licensee Action on Previous Enforcement Matters (92702)

(Closed) Violation 50-261/86-26-01: The inspectors conducted interviews with licensee personnel and reviewed the administrative controls designating responsibility for the development and annual submittal to Region II offices of a summary description of facility changes, tests, and experiments; including a summary of the safety evaluation of each. The inspectors determined that the corrective steps taken by the licensee to assure submittal of the subject summary report at the required periodicity appeared to be adequate.

4. Plant Tour (71707, 62703, 71710)

The inspectors conducted plant tours periodically during the inspection interval to verify that monitoring equipment was recording as required, equipment was properly tagged, operations personnel were aware of plant conditions and maintenance activities, and plant housekeeping efforts were adequate. The inspectors determined that appropriate radiation controls were properly established, excess equipment or material was stored properly, and combustible material was disposed of expeditiously. During tours the inspector looked for the existence of unusual fluid leaks, piping vibrations, pipe hanger and seismic restraint abnormal settings, various valve and breaker positions, equipment clearance tags and component status, adequacy of fire fighting equipment, and instrument calibration dates. Some tours were conducted on backshifts. Plant housekeeping and contamination control were observed to be outstanding.

The inspectors performed system status checks on the following systems:

- a. Safety Injection System
- b. Component Cooling Water System
- c. Auxiliary Feedwater System
- d. Vital Station Batteries
- e. Electrical Switchgear
- f. Chemical and Volume Control System
- g. Diesel Generators
- h. Service Water System

No violations or deviations were identified within the areas inspected.

5. Technical Specification Compliance (71707, 62703, 61726)

During this reporting interval, the inspectors verified compliance with selected limiting conditions for operation and reviewed results of certain surveillance and maintenance activities. These verifications were accomplished by direct observation of monitoring instrumentation, valve positions, switch positions, and review of completed logs and records.

No violations or deviations were identified within the areas inspected.

6. Plant Operations Review (71707, 62703, 61726, 61707, 61711)

Periodically during the inspection interval, the inspectors reviewed shift logs and operations records, including data sheets, instrument traces, and records of equipment malfunctions. This review included control room logs, maintenance work requests, auxiliary logs, operating orders, standing orders, jumper logs, and equipment tagout records. The inspectors routinely observed operator alertness and demeanor during shift changes and plant tours. The inspectors conducted random off-hours inspections during the reporting interval to assure that operations and security were maintained in accordance with plant procedures.

While the inspectors were in the control room at 6:08 a.m., on December 12, 1986, they witnessed the response of the fire brigade to an unannounced fire drill. The simulated fire was located near the "C" inverter in the emergency 480 volt bus switchgear room. The inspectors witnessed the response of the fire brigade team leader (senior reactor operator on duty) as well as the actions of other plant personnel who were utilizing Fire Protection Procedure FP-001 (Revision 10) titled "Fire Emergency". The drill was terminated at 6:16 a.m.

The inspectors periodically verified the reactor shutdown margin. The inspectors also periodically observed the reactor axial flux difference and compared the observed values with those required by the TS.

No violations or deviations were identified within the areas inspected.

7. Physical Protection (71707)

In the course of the monthly activities, the inspectors included a review of the licensee's physical security program. The inspectors verified by general observation, perimeter walkdowns and interviews that measures taken to assure the physical protection of the facility met current requirements. The inspectors routinely observed the alertness and demeanor of security force personnel during plant tours.

The performance of various shifts of the security force was observed in the conduct of daily activities to include: protected and vital areas access controls; searching of personnel, packages and vehicles; badge issuance and retrieval; escorting of visitors; and patrols and compensatory posts. In addition, the inspectors observed protected area lighting, protected and vital areas barrier integrity and verified an interface between the security organization and operations. Additionally, the resident inspectors visited central and secondary alarm stations.

No violations or deviations were identified within the areas inspected.

8. Determination of Reactor Shutdown Margin (61707)

The inspectors reviewed the following current revisions to the licensee procedures for conformance to the TS, technical accuracy and completeness:

FMP-012 (Revision 5) titled "Manual Determination of Shutdown Margin Boron Concentration"

FMP-010 (Revision 1) titled "Manual Determination of Xenon and Samarium Worths"

FMP-015 (Revision 0) titled "EXSPAC"

The inspectors reviewed the shutdown margin calculation performed by licensee personnel on December 12, 1986. The calculation was performed and verified by qualified personnel using the CP&L Nuclear Computer Program titled EXSPAC (Version PNR02012). The inspectors questioned licensee personnel concerning the use and meaning of the various printout quantities. The inspectors also verified selected reactivity results printed out against the corresponding information provided by the graphs in the plant curve book. Agreement between the results was acceptable in every case.

The inspectors also verified that the frequency of calculations, including all conditions and actions prescribed by TS, were met; and that changes made in boron concentration as a consequence of the shutdown margin calculation results were properly verified by chemical analysis.

No violations or deviations were identified within the areas inspected.

9. Monthly Surveillance Observation (61726, 61700, 71710)

The inspectors observed certain surveillance related activities of safety-related systems and components to ascertain that these activities were conducted in accordance with license requirements. The inspectors observed portions of selected surveillance tests including all aspects of one major surveillance test involving safety-related systems.

In particular, the inspectors witnessed the conduct of Engineering Surveillance Test EST-005 (Revision 3) titled "Safety Injection Pump Bearing Temperature Test" as executed on High Head Safety Injection Pumps "A" and "B". The purpose of this surveillance test is to comply with subsection IWP of Section XI, ASME Code with regard to the annual measurement of the Safety Injection (SI) Pumps bearing temperatures. The inspectors determined that the prerequisites for the performance of this surveillance test were met and that all precautions and limitations were observed. The inspectors also verified that the portable test equipment utilized in this test, as well as the stationary pressure gauges on the mini-flow recirculation line, were in current calibration. During the conduct of the test, the inspectors witnessed the recording of test data for both the "A" and "B" SI pumps and reviewed the completed surveillance test data sheets.

The inspectors determined that the surveillance test procedure conformed to TS requirements, that all precautions and Limiting Conditions for Operations (LCOs) were met and that the surveillance test was completed at the required frequency. The inspectors also verified that the required administrative approvals and tagouts were obtained prior to initiating the test, that the testing was accomplished by qualified personnel in

accordance with an approved test procedure and that the required test instrumentation was properly calibrated. Upon completion of the testing, the inspectors observed that the recorded test data were accurate, complete and met TS requirements; verified that test discrepancies were properly rectified, and; independently verified that the systems were properly returned to service.

The inspectors also witnessed portions of the bi-weekly maintenance surveillance test MST-003 (Revision 8) titled "Tavg and Delta-T Protection Channel Testing". This test was conducted to determine the operability of the overtemperature and overpower channel sets I, II, and III and to satisfy the requirements of TS.

The inspectors observed the redundant verification of test channel positions by the operations personnel stationed at the reactor turbine generator board and by the instrumentation and control technician involved. The inspectors also verified that the test limitation that only one protection channel set was in test and that only one protection channel rack door was open at any given time was complied with.

The inspectors determined by direct observation and by review of the completed MST that all annunciators required for this test provided the proper status and alarm function and that the test voltages as measured in the protection channel cabinets were within the required tolerance.

No violations or deviations were identified within the areas inspected.

10. Monthly Maintenance Observation and Maintenance Program Evaluation (62703, 62700, 62704, 62705)

The inspectors observed several maintenance related activities of safety-related systems and components to ascertain that these activities were conducted in accordance with approved procedures, TS and appropriate industry codes and standards.

The inspectors witnessed the repair activities associated with the replacement of the 24 volt DC solenoid starter and switch on the engine driven fire pump (EDFP). The replacement of the redundant starter was precipitated by a component failure detected during surveillance testing of the EDFP. The inspectors noted that the instrumentation and control technicians assigned to this job were well versed with the equipment, had prestaged all required tools and equipment, and executed the repair adroitly.

Post repair operability verification was accomplished by performing applicable portions of OST-603 (Revision 2) "Motor Driven Fire Water Pump and Engine Driven Fire Water Pump Test". The inspectors witnessed three successful starts of the EDFP and independently verified that the system was returned to service.

The inspectors also observed the maintenance activities associated with the replacement of valve SI-888P on the "C" High Head Safety Injection Pump on December 11, 1986. This safety-related maintenance activity was necessitated because of excessive main seat leakage.

Specifically, the inspectors reviewed the controlling Work Request and Authorization Form with its attached receipt inspection tags, Weld Data Report, Welding Instructions, Plant Stores Requisition Form, and the Welding and Brazing Material Control Form. The inspectors determined that the station welding procedures; cleanliness controls; QC hold points; and the design, fabrication and installation documents and records used during this safety related repair activity appeared adequate.

The inspectors determined that the preceding activities were not violating LCOs and that redundant components were operable. The inspectors also determined (1) that the procedures used were adequate to control the activity, (2) that QC hold points were established where required, (3) that required administrative approvals and tagouts were obtained prior to work initiation, (4) that proper radiological, and appropriate ignition and fire prevention controls were implemented, and (5) that replacement parts and materials used were properly certified. The inspectors verified that these activities were accomplished by qualified personnel using approved procedures. The inspectors independently verified that equipment was properly tested before being returned to service.

Additionally, the inspectors reviewed several outstanding job orders to determine that the licensee was giving priority to safety-related maintenance and that a backlog which might affect its performance was not developing on a given system.

No violations or deviations were identified within the areas inspected.

#### 11. Operational Safety Verification (71707, 82301)

The inspectors observed licensee activities to ascertain that the facility was being operated safely and in conformance with regulatory requirements; and that the licensee management control system was effectively discharging its responsibilities for continued safe operation by direct observation of activities, tours of the facility, interviews and discussions with licensee management and personnel, independent verification of safety system status and limiting conditions for operation, and reviewing facility records.

On December 17, 1986, the inspectors observed portions of an emergency preparedness exercise conducted by the licensee. The exercise commenced at 5:30 a.m., and was concluded at approximately 12:30 p.m. The accident scenario was based on a small loss of coolant accident with initial fuel damage caused by loose parts in the core. Subsequent simulated electrical failures increased the severity of the initial conditions through loss of feedwater and loss of emergency cooling systems. Activity passed from the primary to the secondary system via leaking steam generator tubes.

This emergency exercise included participation by licensee personnel in the control room, technical support center, operational support center, emergency operations facility, corporate Emergency operations center, and plant media center. A representative from the State of South Carolina observed the exercise.

The licensee assigned an evaluation team to overview and critique the drill and to assure that the intended objectives were achieved. The stated objectives included successful demonstration of the following activities:

- Accident Assessment and Emergency Classification
- Notification, Mobilization, and Communication
- Dose Calculation and Radiological Assessment
- Protective Response
- Emergency Response Facility Operation
- Public Information Services
- Recovery Operations

The inspectors witnessed the initiating event response by operations personnel in the control room and the subsequent progression of events which led to assembly of the emergency response staff. The inspectors also observed the establishment of emergency communications; the assessment of simulated plant off-normal conditions; the activation of the technical support center and the emergency operations center; and the simulated recovery efforts initiated by the licensee.

No violations or deviations were identified within the areas inspected.

12. ESF System Walkdown and Monthly Surveillance Observation (71710, 61726, 56700)

The inspectors verified the operability of an engineered safety features system by performing a walkdown of the accessible portions of the safety injection system. Specifically, the inspectors observed the successful surveillance testing of the "A" and "B" Safety Injection (SI) pumps. This test was conducted in accordance with OST-151 (Revision 18) titled "Safety Injection System Component Test". The monthly performance of this test is designed to meet TS requirements by verifying the mechanical performance and assessing the operational readiness of the safety injection system components to fulfill their required safeguard functions.

Prior to starting the SI pumps, the inspectors determined that adequate component cooling water flow from the SI pump seal water heat exchanger was available, that the thrust bearing cooling outlet valves were opened, and that SI system valves were properly aligned for the test.

The inspectors witnessed the recording of the following operating parameters: pump differential pressure (as measured from the discharge mini-flow recirculation line), pump bearing vibration amplitude, and bearing lubricating oil level. The inspectors determined that all components associated with the subject SI pumps appeared to function properly and that the recorded readings were within the acceptable range.

The inspectors confirmed that the licensee's system lineup procedures matched plant drawings and the as-built configuration. The inspectors looked for equipment conditions and items that might degrade performance (hangers and supports were operable, housekeeping, etc.) and inspected the interiors of electrical and instrumentation cabinets for debris, loose material, jumpers, evidence of rodents, etc. The inspectors verified that valves were in proper position, power was available, and valves were locked as appropriate. The inspectors compared both local and remote position indications.

No violations or deviations were identified within the areas inspected.

13. Cold Weather Preparations (71714)

The inspectors conducted a review of licensee cold weather preparations to ascertain that the licensee maintained effective implementation of the program of protective measures for extreme cold weather. During the inspection, the inspectors verified that the licensee had inspected systems susceptible to freezing to verify the presence of heat tracing, strip heaters and insulation; the proper setting of thermostats; and that the heat tracing and strip heating circuits were energized.

The inspectors witnessed the operability verification, performed by instrumentation and control technicians, of various freeze protection panels throughout the plant. The inspectors observed channel current testing in the subject panels and, for those freeze protection channels which indicated a faulted condition, the inspectors determined that corrective maintenance work requests were initiated. Subsequent to the completion of the cold weather preventative maintenance testing, the inspectors independently witnessed the return to service of the affected equipment.

No violations or deviations were identified within the areas inspected.

14. Onsite Followup of Events and Subsequent Written Reports of Nonroutine Events at Power Reactor Facilities (92700, 90714, 93702)

For onsite followup of nonroutine events, the inspectors determined that the licensee had taken corrective actions as stated in written reports of the events and that these responses to the events were appropriate and met regulatory requirements, license conditions, and commitments. During this reporting period, the inspectors reviewed LER 86-08, AFW Station Black-out Procedures to verify that the report details met license requirements, identified the cause of the event, described appropriate corrective actions, adequately assessed the event, and addressed any generic implications. When licensee identified violations were noted, they were reviewed in accordance with enforcement policy. The inspectors had no further comments.

H. B. Robinson Unit 2 tripped from 100% power at 12:18 p.m., on Monday, December 22, 1986. All rods inserted normally and no safety system abnormalities were observed. The first out annunciator indicated a turbine

trip. The turbine trip initiated a reactor trip. The turbine trip resulted from a "B" steam generator hi hi level; which was consistent with the operators other indications.

The feedback linkage arm on the "B" feedwater regulating valve, which provides the feedwater regulating valve actual position indication to the valve controller circuitry, separated from its connection. This movement provided a false indication that the feedwater regulating valve was closed; so that the regulating circuitry fully opened the valve - resulting in the overfilling of the "B" steam generator.

The inspectors examined the allen screw connecting the feedback linkage arm to the valve stem assembly. Neither the threads on the allen screw nor the female threads on the stem assembly showed indications of damage. Thus, it appeared that the allen screw backed out of its socket due to vibration.

The licensee installed locking wires on the feedback linkage arms of the three main, and the three bypass, regulating valves. These locking wires are expected to prevent the allen screws from backing out of their holes.

No violations or deviations were identified within the areas inspected.

#### 15. Organization and Administration (36700)

The inspectors reviewed the on-site licensee organization to ascertain whether changes made to the licensee's onsite organization are in conformance with the requirements of the TS by verifying that (1) the established organization is as described in the TS and is functioning effectively, (2) personnel qualification levels are in conformance with applicable codes and standards, and (3) the lines of authority and responsibility are in conformance with TS and applicable codes and standards.

Comprehensive discussions of current safety-related activities were conducted with plant management and technical personnel during this reporting period including Operations, Environmental and Radiation Controls, Quality Assurance, Regulatory Compliance and Onsite Nuclear Safety organizations. Topics discussed included licensee activities associated with plant operations activities; plant modifications, including the security system upgrade; the fire protection system; ongoing construction activities; and communications interfaces.

On December 10, 1986, the inspectors attended a meeting of the Emergency Response Facility Information System (ERFIS) Project Implementation Task Force. The purpose of this meeting was to establish the current status of the ERFIS and Safety Parameter Display System (SPDS) implementation schedule. The inspectors determined that the licensee was actively pursuing commitment dates on the ERFIS and SPDS integrated schedule and that they were controlling corrective measures to improve system operation.

The inspectors also attended the refueling pre-outage meeting conducted on January 7, 1987. The inspectors observed that notable management involvement in pre-planning efforts were being devoted to the upcoming refueling outage in that concerns relative to NSSS responsibilities, outage contract and material status, modifications, schedule reviews and pertinent action items including ALARA were reviewed in detail.

No violations or deviations were identified within the areas inspected.

16. Onsite Review Committee (40700, 60705)

The inspectors reviewed certain activities of the plant nuclear safety committee (PNSC) to ascertain whether the onsite review functions were conducted in accordance with TS and other regulatory requirements. The inspectors (1) attended part of the regular monthly PNSC meeting held on December 18, 1986, and observed the conduct of the meeting, (2) ascertained that provisions of the TS dealing with membership, review process, frequency, qualifications, etc., were satisfied, and (3) followed up on previously identified PNSC activities to independently confirm that corrective actions were progressing satisfactorily. The inspection emphasized the licensee's evaluation of the fuel characteristics for the high Gadolinia rods planned for inclusion in cycle 12.

No violations or deviations were identified within the areas inspected.

17. Followup on Headquarters Requests (92704)

The inspectors have continued to monitor the onsite activities associated with the erection of the Independent Spent Fuels Storage Facility. As reported previously in Inspection Report 50-261/86-29, the construction phase of operations pertinent to reinforced concrete placement for the Horizontal Storage Module is complete, with activities currently centered on installation of the Dry Shielded Canister (DSC) support assemblies, heat shielding and door plates. Current licensee schedules stipulate the shipment of the DSCs from Spain in early March of 1987 with testing and closeout of deficiencies scheduled for the July/August 1987 time frame. Actual movement of fuel is not scheduled until approximately November of 1987.

No violations or deviations were identified within the areas inspected.