



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

Report No.: 50-261/88-07

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: April 11 - May 10, 1988

Inspectors:	<u>P. E. Fredrickson</u>	<u>5/25/88</u>
	for L. W. Garner, Senior Resident Inspector	Date Signed
	<u>P. E. Fredrickson</u>	<u>5/25/88</u>
	for R. M. Latta, Resident Inspector	Date Signed

Contributing Inspector: R. Prevatte, Senior Resident Inspector
 (V. C. Summer)

Approved by:	<u>P. E. Fredrickson</u>	<u>5/25/88</u>
	P. E. Fredrickson, Section Chief	Date Signed
	Reactor Projects Section 1A	
	Division of Reactor Projects	

SUMMARY

Scope: This routine, announced inspection was conducted in the areas of operational safety verification, physical protection, surveillance observation, maintenance observation, ESF system walkdown, onsite followup of events at operating power reactors and onsite review committee.

Results: One violation was identified involving failure to declare an Unusual Event after exceeding an RCS leak rate of 10 gpm (paragraph 9.b).

REPORT DETAILS

1. Licensee Employees Contacted

- R. Barnett, Maintenance Supervisor, Electrical
- *G. Beatty, Vice President, Robinson Nuclear Project Department
- C. Bethea, Manager Training
- R. Chambers, Engineering Supervisor, Performance
- *J. Curley, Director, Regulatory Compliance
- J. Eaddy, Supervisor, Environmental and Chemistry
- R. Femal, Shift Foreman, Operations
- W. Flanagan, Manager, Design Engineering
- W. Gainey, Support Supervisor, Operations
- P. Harding, Project Specialist, Radiation Control
- *E. Harris, Director, Onsite Nuclear Safety
- R. Johnson, Manager, Control and Administration
- D. Knight, Shift Foreman, Operations
- E. Lee, Shift Foreman, Operations
- F. Lowery, Manager, Operations
- R. Miller, Maintenance Supervisor, Mechanical
- R. Moore, Shift Foreman, Operations
- *R. Morgan, Plant General Manager
- D. Myers, Shift Foreman, Operations
- D. Nelson, Operating Supervisor
- D. Quick, Manager, Maintenance
- D. Sayre, Senior Specialist, Regulatory Compliance
- D. Seagle, Shift Foreman, Operations
- R. Steele, Shift Foreman, Operations
- *H. Young, Director, Quality Assurance/Quality Control (QA/QC)

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

NRC Resident Inspectors

- *L. Garner
- *R. Latta
- R. Prevatte (V.C. Summer)

*Attended exit interview on May 11, 1988

2. Exit Interview (30703)

The inspection scope and findings were summarized on May 11, 1988, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings listed below. Dissenting comments were not received from the licensee. Proprietary information is not contained in this report. No written material was given to the licensee by the Resident Inspectors during this report period.

Note: A list of abbreviations used in this report is contained in paragraph 12.

<u>Item Number</u>	<u>Status</u>	<u>Description/Reference Paragraph</u>
261/88-07-01	Open	VIOLATION - Failure to Declare an Event After Exceeding an RCS Leak Rate of 10 gpm.

3. Licensee Action on Previous Enforcement Matters (92702)

This area was not inspected.

4. Operational Safety Verification (71707)

The inspectors observed licensee activities to confirm 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. These activities were confirmed by: direct observations, tours of the facility, interviews and discussions with licensee management and personnel, independent verifications of safety system status and limiting conditions for operation, and reviews of facility records.

Periodically, the inspectors reviewed shift logs, operations records, data sheets, instrument traces, and records of equipment malfunctions to verify operability of safety related equipment and compliance with TS. Specific items reviewed include: control room logs, maintenance work requests, auxiliary logs, operating orders, standing orders, jumper logs, and equipment tagout records. Through periodic observations of work in progress and discussions with operations staff members, the inspectors verified that the staff was: knowledgeable of plant conditions, responding properly to alarm conditions, adhering to procedures and applicable administrative controls, and aware of equipment out of service, surveillance testing, and maintenance activities in progress. The inspectors routinely observed shift changes to verify that continuity of system status was maintained and that proper control room staffing existed. The inspectors also observed that access to the control room was controlled and operations personnel were carrying out their assigned duties in an attentive and professional manner. The control room was observed to be free of unnecessary distractions. The inspectors performed channel checks, reviewed component status and safety related parameters, including SPDS information, to verify conformance with the TS.

During this reporting interval, the inspectors verified compliance with selected LCO's. This verification was accomplished by direct observation of monitoring instrumentation, valve positions, switch positions, and review of completed logs and records. The inspectors verified the axial flux difference was within the values required by the TS.

Plant tours were routinely conducted: to verify the operability of standby equipment, assess the general condition of plant equipment, and verify that radiological controls, fire protection controls and equipment tag out procedures were being properly implemented. These tours verified: the absence of unusual fluid leaks, the lack of visual degradation of pipe, conduit and seismic supports, the proper positions and indications of important valves and circuit breakers, the lack of conditions which could invalidate EQ, the operability of safety related instrumentation, the calibration of safety related and control instrumentation including area radiation monitors, friskers and portal monitors, the operability of fire suppression and fire fighting equipment, and the operability of emergency lighting equipment. The inspectors also verified that housekeeping was adequate and areas were free of unnecessary fire hazards and combustible materials.

On April 22, 1988 at 3:21 a.m., the inspectors observed control room response to a fire alarm and fire system deluge valve actuation alarm. The senior control operator expeditiously proceeded to the area to assess the situation. Upon arrival, he determined that the station air compressor had overheated such that oil fumes had activated the area fire detectors. The compressor was secured. There were no indications of an actual fire. The inspectors observed that the fire header was properly drained and the deluge valve was properly returned to service. Because no sprinkler head had actuated, no equipment had been wet down. Removal of the air compressor from service had no significant effect on plant operations.

No violations or deviations were identified within the areas inspected.

5. 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 performance of various shifts of the security force was observed to verify that daily activities were conducted in accordance with the requirements of the security plan. Activities inspected included: protected and vital areas access controls, searching of personnel, packages and vehicles, badge issuance and retrieval, patrols, escorting of visitors, and compensatory measures. In addition, the inspectors routinely observed protected and vital area lighting and barrier integrity.

No violations or deviations were identified within the areas inspected.

6. Monthly Surveillance Observation (61726)

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. For the surveillance test procedures listed below, the inspectors determined that: precautions and LCO's were met, the test were completed at the required frequency, the test conformed to TS requirements, the required administrative approvals and tagouts were obtained prior to initiating the test, the testing was accomplished by qualified personnel in accordance with an approved test procedure, and the required test instrumentation was properly calibrated. Upon completion of the testing, the inspectors observed that: the recorded test data was accurate, complete and met TS requirements, and test discrepancies were properly rectified. The inspectors independently verified that the systems were properly returned to service. Specifically, the inspectors witnessed/reviewed portions of the following test activities:

a. EST-070 (revision 6) Power Distribution Control Code Verification

The purpose of this test is to verify that the constant values used in the power distribution control code (delta flux program) are in agreement with the values utilized in the ERFIS system. The inspectors determined that the test acceptance criteria including target and operating bands were within the allowable limits.

b. MST-004 (revision 11) T Avg and Delta-T Protection Channel Testing

The bi-weekly performance of this surveillance test is designed to meet TS requirements regarding the operability of the overtemperature and overpower channel, sets I, II, and III. The inspectors observed that the proper annunciator status and alarms were received on the RTGB and that the recorded test voltages were within the acceptable range.

c. MST-021 (revision 2) Reactor Protection Logic Train "B" at Power

The inspectors witnessed performance of the successful completion of this surveillance test which ensures that the "B" protection logic functions properly.

d. OST-201 (revision 19) Motor Driven Auxiliary Feedwater System Component Test

The inspectors witnessed the operational verification testing of the "A" MDAFW pump following maintenance activities associated with the calibration of the pump discharge flow transmitter. The inspectors determined that the subject pump started and achieved acceptable suction and discharge pressures and that the discharge flow control

valve operated properly. During the surveillance test the inspectors questioned the auxiliary operator conducting the test regarding the verification of the AFW flow computers as stipulated in paragraph 7.1.2 of the reference procedure. Though the auxiliary operator initially appeared uncertain as to the required indication which constituted acceptable performance of the flow computers, he contacted the control operator for clarification and subsequently performed the step correctly. The inspectors discussed this with the cognizant shift foreman.

e. OST-401 (revision 17) Emergency Diesels

The inspectors witnessed the operability testing of both EDG A and B. Specifically, the inspectors observed the preoperational checks conducted by the operations personnel performing the test as well as the starting and manual synchronization of the diesels. Additionally, the inspectors determined that the operational check of the redundant solenoid air start valves were properly accomplished, that the recorded operational parameters were within the specified tolerance and that both diesel generators assumed and maintained the desired load.

f. OST-402 (revision 6) Diesel Fuel Oil System Flow Test

The inspectors witnessed all aspects of this surveillance test which is conducted to verify the flow capacity of the diesel fuel oil transfer pumps. The inspectors determined that the fuel oil system was properly aligned for the test, that the fuel oil transfer pumps delivered the required flow, and that the EDG was correctly returned to standby operation configuration.

No violations or deviations were identified within the areas inspected.

7. Monthly Maintenance Observation (62703)

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 determined that these activities were not violating LCO's and that redundant components were operable. The inspectors also determined that: activities were accomplished by qualified personnel using approved procedures, QC hold points were established where required, required administrative approvals and tagouts were obtained prior to work initiation, proper radiological controls were adhered to, appropriate ignition and fire prevention controls were implemented, replacement parts and materials used were properly certified, and the effected equipment was properly tested before being returned to service. In particular the inspectors observed/reviewed the following maintenance activities:

- a. WR/JO 88BSL171 - Calibrate Auxiliary Feed Water Pump Flow Transmitters FT-1424, 1425, and 6416.
- b. WR/JO 88-AEHD1 - Replace Flow Transmitter on C Loop.

In witnessing this maintenance activity, the inspectors noted that proper radiological controls were maintained including the utilization of respiratory protection equipment for operations inside the containment.

- c. WR/JO 88BWT111 - Calibrate Charging Pump Pressure Instruments PI-121 and PT-121.
- d. WR/JO AFNSI- Replace C Accumulator Relief Valve.

No violations or deviations were identified within the areas inspected.

8. ESF System Walkdown (71710)

The inspectors verified the operability of an ESF system by performing a walkdown of the accessible portions of the RHR system. The inspectors confirmed that the system lineup procedures matched plant drawings and the as-built configuration. The inspectors examined piping and component configurations in the RHR pump pit, pipe alley, and in the RHR heat exchanger room. Observed conditions were determined to be in agreement with flow diagram 5379-1484 (revision 16), Residual Heat Removal System, sheet 1. The inspectors examined the general condition of valves in the system and verified that they were installed correctly, that they did not exhibit excessive packing leakage, and that adverse or degraded conditions were not identified. The inspectors noted that major components were properly labeled, that equipment coatings appeared adequate, and that system flow indications were properly displayed. The inspectors also verified that: valves were locked as required, pipe and conduit supports appeared to be installed correctly, the system pumps were lubricated, service water was available to the pump seal heat exchangers, valves required for automatic operation were energized, and local and remote indications agreed with actual valve stem positions.

No violations or deviations were identified within the areas inspected.

9. Onsite Followup of Events at Operating Power Reactors (93702)

- a. On April 22, 1988 at 9:09 p.m., with Unit 2 operating at 60% reactor power (1380 MWT) an electronic defect in the E-H control system relay card resulted in a momentary increase in reactor power to approximately 64.5%. The event occurred when a control operator attempted to adjust the turbine load using the E-H control system on the RTGB. The turbine load initially decreased rapidly and then quickly increased to 520 MWT net. The transient which lasted approximately three minutes was terminated by operator intervention. The turbine control system was placed in manual and turbine load was

returned to 60% reactor power. The E-H control system was left in manual and repairs to the E-H control system were completed. It is noted that the TS currently limits power to 1380 MWT which is equivalent to 60% reactor power. Though the licensed power limit was exceeded by 4.5% no Notice of Violation is being issued because the event occurred as a result of a hardware failure and prompt operator action restored the power within its limit in a timely manner. A related problem described below caused a reactor trip on May 2, 1988.

- b. On April 29, 1988 at 11:10 p.m., Unit 2 was reduced from 60% power to hot shutdown in order to repair valve RC-557C. This valve, the loop C cold leg RTD bypass manifold isolation valve, exhibited a packing leak rate of approximately 7 gpm. The licensee notified the NRC of this event at 11:04 p.m. on April 29, 1988, via the Emergency Notification System. By 4:05 a.m. on April 30, 1988, the reactor was subcritical. At 12:10 p.m., the calculated RCS leak rate as determined by OST-051 was 11.89 gpm. A subsequent RCS leak rate performed approximately one hour later indicated a leakage rate of 13.3 gpm. At 2:43 p.m., the NRC duty officer was notified that the RCS leak rate had exceeded 10 gpm. At 6:10 p.m. an Unusual Event was declared. The Unusual Event was terminated at 10:00 p.m. on the same day following the determination that RCS leakage was less than 10 gpm.

The inspectors determined that following the declaration of the Unusual Event, the licensee implemented PEP-102, Emergency Control - Unusual Event, including emergency notifications as required. However, the licensee had failed to declare an Unusual Event per PEP-101 at 12:10 p.m. when the leakage rate had been determined to have exceeded 10 gpm. PEP-101 (revision 5) Initial Emergency Actions, Attachment 9.1, Item 3 states that for a leak which results in an RCS leakage greater than 10 gpm an Unusual Event shall be declared. This item is identified as a violation: Failure to Declare an Unusual Event After Exceeding an RCS Leak Rate of 10 gpm (261/88-07-01).

- c. On May 2, 1988 at 5:59 p.m. with the unit operating at 60% power the unit experienced a turbine trip/reactor trip when the turbine governor valves went closed as a result of a faulted timing device and a loose connection in the governor valve position limiter control circuitry. All control rods inserted normally and all safety systems functioned as designed. I&C personnel, assisted by a Westinghouse technical representative, performed a post-trip analysis of the turbine E-H control system and completed repairs and turbine testing on May 5, 1988. The unit was subsequently placed on line the same day. At the end of this report period no further discrepancies with the turbine E-H control system have been noted.
- d. At 9:39 a.m. on May 4, 1988 with the unit in hot shutdown and while attempting to close the RTB's and latch the turbine, the A RTB indication on the RTGB momentarily flashed closed and then went out.

Upon replacement of the control fuse the breaker was successfully cycled. A blown control power fuse, though resulting in the loss of indication and prevention of closing the RTB, would not have precluded the opening function of the RTB in that the power supply for the UV coil is provided by a separate vital power supply.

Preliminary investigation by I&C personnel revealed some indication of mechanical binding in the DB-50 type breaker latching mechanism. The breaker was replaced with a spare unit which had been recently reconditioned and shop tested. Because the failure mode of the A RTB had not been determined, the B RTB was also replaced with a recently refurbished and tested breaker prior to resumption of power operation.

The inspectors witnessed the disassembly and trouble shooting evolutions on the removed A RTB including the measurement of the "G" gap and contact gap, and inspections of: the primary disconnects, breaker contacts, the pole unit of the breaker, arcing contacts, breaker opening mechanism, coil opening plunger, UV trip coil, and the movable and stationary pole contacts. During the trouble shooting process, two electrical connections on the RTB control relay were found loose and some indication of mechanical contact was noted between the breaker operating mechanism housing and the toggle linkage to the closing coil plunger connecting pin. The licensee is continuing to examine the removed RTB in order to determine the cause of the blown control power fuse and the observed binding.

The inspectors also reviewed the recently completed monthly surveillance test results for the reactor protection and safeguards relay rack tests as well as the results of the annually performed preventive maintenance procedure. There were no apparent previous indications of abnormalities with the operational characteristics of the RTB's.

One violation was identified within the areas inspected.

10. Onsite Review Committee (40700)

The inspectors evaluated certain activities of the PNSC to determine whether the onsite review functions were conducted in accordance with TS and other regulatory requirements. In particular, the inspectors attended the special PNSC meeting held on May 6, 1988, concerning the proposed TS amendment which would allow return to 100% reactor power with only two SI pumps capable of automatic initiation from separate emergency buses. It was ascertained that provisions of the TS dealing with membership, review process, frequency, and qualifications were satisfied. Previous meeting minutes were reviewed to confirm that decisions and recommendations were accurately reflected in the minutes. The inspectors also followed up on selected previously identified PNSC activities to independently confirm that corrective actions were progressing satisfactorily.

No violations or deviations were identified within the areas inspected.

11. Backup Inspector Inspection

The Senior Resident Inspector from V. C. Summer, one of the designated backup inspectors for HBR, assisted the Resident Inspectors by performing inspections in the areas of control room, maintenance and surveillance observations as well as acting in the capacity of senior resident inspector during the absence of the resident inspectors. In addition, he participated in site training to maintain a current access badge and respirator qualification and conducted meetings with plant management.

12. List of Abbreviations

AVG	Average
EDG	Emergency Diesel Generator
E-H	Electro-hydraulic
EQ	Environmental Qualifications
ERFIS	Emergency Response Facility Information System
ESF	Engineered Safety Feature
HBR	H. B. Robinson
I&C	Instrumentation & Control
LCO	Limiting Conditions for Operation
MDAFW	Motor Driven Auxiliary Feed Water
MST	Maintenance Surveillance Test
MWT	Megawatts Thermal
NRC	Nuclear Regulatory Commission
OST	Operations Surveillance Test
PEP	Plant Emergency Procedure
PNSC	Plant Nuclear Safety Committee
QC	Quality Control
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RTB	Reactor Trip Breaker
RTD	Resistance Temperature Detector
RTGB	Reactor Turbine Generator Board
SPDS	Safety Parameter Display System
TS	Technical Specification
UV	Undervoltage
WR/JO	Work Request/Job Order