



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report No.: 50-261/94-19

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 Unit 2

Inspection Conducted: July 24 - August 20, 1994

Lead Inspector: *W. T. Orders* 8/2/94
W. T. Orders, Senior Resident Inspector Date Signed

Other Inspectors: C. R. Ogle, Resident Inspector
M. T. Janus, Resident Inspector, Brunswick
J. L. Starefos, Project Engineer

Approved by: *H. O. Christensen* 9/7/94
H. O. Christensen, Chief Date Signed
Reactor Projects Section 1A
Division of Reactor Projects

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of plant operations, surveillance observation, maintenance observation, plant support, and followup.

Results:

No violations or deviations were identified. One Unresolved Item was identified involving personnel respiratory equipment qualifications, paragraph 5.

The unit was manually tripped on August 2, 1994, due to Electro Hydraulic Control System problems, paragraph 2.

REPORT DETAILS

1. Persons Contacted

- A. Carley, Manager, Site Communications
- B. Clark, Manager, Maintenance
- D. Crook, Senior Specialist, Regulatory Compliance
- *F. Eckert, Manager, Integrated Scheduling-Work Control
- *D. Gudger, Specialist Regulatory Affairs
- *S. Hinnant, Vice President, Robinson Nuclear Project
- K. Jury, Manager, Licensing/Regulatory Programs
- *R. Krich, Manager, Regulatory Affairs
- R. Moore, Acting Operations Manager
- J. Moyer, Manager, Nuclear Assessment
- *M. Pearson, Plant General Manager
- *L. Williams, Manager, Security
- L. Woods, Manager, Technical Support

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

*Attended exit interview.

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Plant Status

The unit began the report period operating at 100% power. The unit operated at or near full power until 5:40 A.M. on the morning of August 2, 1994, when operators in the control room received an annunciator of "Governor Cabinet Monitor Trouble". The operators noted that generator megawatt output had rapidly decreased to zero, the turbine EHC system had shifted to manual, the steam dumps and the steam generator PORV's had opened to relieve secondary system pressure, reactor coolant pressure and temperature were increasing due to the mismatch between reactor power which was still at 100% and secondary system energy removal, and that primary PORV 455C had opened to relieve RCS pressure. Upon noticing that all turbine governor valves were closed, the operators initiated a manual reactor trip. During the transient, the operators noticed that RCS pressure was at approximately 1900 psig and that PORV 455C was indicating mid position, i.e. both open and closed lights on. Since the RCS pressure was below the point at which the PORV should close (2000 psig) they closed the PORV block valve. It was subsequently determined that the PORV had actually closed as required but the position limit switches required adjustment.

The unit was placed in hot shutdown and an event review team was formed to determine the cause of the trip. It was ultimately concluded that a fuse supplying power to a relay designed to send a signal to the turbine EHC system, had failed causing an erroneous output circuit breaker "OPEN" signal. The EHC system responded appropriately by closing the governor valves to prevent turbine overspeed.

Necessary repairs, reviews and analysis were completed, and the unit was restarted on August 6, 1994. The unit returned to, and operated at or near full power for the remainder of the report period.

3. Operational Safety Verification (71707)

The inspectors evaluated licensee activities to confirm that the facility was being operated safely and in conformance with regulatory requirements. These activities were confirmed by direct observation, facility tours, interviews and discussions with licensee personnel and management, verification of safety system status, and review of facility records.

The inspectors reviewed shift logs, Operation's records, data sheets, instrument traces, and records of equipment malfunctions to verify equipment operability and compliance with TS. Based on their observations, the inspectors concluded that the staff was knowledgeable of plant conditions, responded properly to alarms, adhered to procedures and applicable administrative controls, was cognizant of in-progress surveillance and maintenance activities, and was aware of inoperable equipment status. The inspectors performed channel verifications and reviewed component status and safety-related parameters to verify conformance with TS. Shift changes were routinely observed, to confirm that plant status was maintained and that proper control room staffing existed. Access to the control room was controlled and operations personnel carried out their assigned duties in an effective manner. Control room demeanor and communications were appropriate.

Routine plant tours were conducted to verify equipment operability, assess the general condition of plant equipment, and to verify that radiological controls, fire protection controls, physical protection controls, and equipment tagging procedures were properly implemented.

No violations or deviations were identified.

4. Maintenance Observation (62703)

The inspectors observed safety-related maintenance activities on selected systems and components to ascertain that these activities were conducted in accordance with TS, approved procedures, and appropriate industry codes and standards. These activities did not appear to violate LCOs and the required redundant components were operable. The inspectors verified that required administrative, material, testing, radiological, and fire prevention controls were adhered to.

The maintenance activities observed were well executed and procedures were followed.

No violations or deviations were identified.

5. Surveillance Observation (61726)

The inspectors observed selected safety-related surveillance activities on systems and components to ascertain that the activities were conducted in accordance with applicable requirements. For the surveillance tests witnessed, the inspectors determined that precautions and LCOs were adhered to, the required administrative approvals and tagouts were obtained prior to test initiation, testing was accomplished by qualified personnel in accordance with an approved test procedure, test instrumentation was properly calibrated, the tests were completed at the required frequency, and that the tests conformed to TS requirements. Upon test completion, the inspectors verified the recorded test data appeared to be complete, accurate, and met TS requirements, that test discrepancies were properly documented and rectified, and that the systems were properly returned to service.

All observed surveillance activities were performed in accordance with procedures and demonstrated acceptable results.

No violations or deviations were identified.

6. Plant Support

Emergency Preparedness (82301)

On August 10, 1994, a RII inspector briefed the resident inspectors of the results of a NAD audit of the EP group. One of the NAD findings dealt with the fact that a relatively high percentage of the personnel composing the ERO were not respirator qualified. On August 14, 1994, after having studied the issue, and using the NAD finding as a basis, the resident inspectors asked the licensee to determine if the operators who would be required to use respiratory equipment during accident mitigation, were respirator qualified.

On August 15, 1994, the licensee informed the inspectors that a review of operating staff records revealed that 11 active operators were not respirator qualified. As an immediate corrective action, the licensee qualified the 11 operators prior to their returning to shift. The licensee's planned long term corrective actions include a review of the ERO organization to determine those positions which would require the use of respiratory equipment, and to ensure that those personnel are qualified to do so.

At the end of this report period, the resident inspectors' investigation of the event was incomplete. Pending the completion of that investigation, this issue will be tracked as Unresolved Item, URI: 94-19-01, Respiratory Equipment Qualification.

No violations or deviations were identified.

7. Licensee Action on Previous Findings (92701, 90702)

(Closed) URI 90-02-01, Determine if IST Program is Capable of Determining Pump Operability and Degradation.

This URI documented concerns with the IST program's ability to determine pump degradation and subsequent operability. Problems were observed in obtaining accurate and repeatable measurements of pump flow and pressure, as well as, observed problems with the procedural control of the testing methodology and testing locations. The inspectors reviewed the corrective actions taken by the licensee in response to this issue. These actions included: revising OST-908 to prevent flow fluctuation during testing by taking manual control of valve TCV-144 and setting the demand signal to 80%, obtaining a more accurate indication of flow by utilizing the Controlotron in the totalizer mode; and by installing new Controlotron dual beam, clamp-on, transit time ultrasonic flow meters which provide more stabilized flow readings. Based on a review of these corrective actions, no further questions remain and this item is considered closed.

(Closed) IFI 89-17-01, Review AFW System Hardware Modifications and Testing.

This item documented damage to the MDAFW pumps caused by recirculation cavitation due to inadequate NPSH caused by inadequately sized suction piping. This item was opened to track modification M-1018, which installed larger diameter AFW suction piping, and changed the piping material from carbon steel to stainless steel for corrosion protection. This item also tracked the concurrent evaluation of the pump testing methodology and recirculation flow analysis. The installation of the modification was completed in October of 1989. Subsequent long term corrective action, the installation of larger diameter min-flow recirculation piping, was completed during RFO 15. Based on an analysis of the test methodology and recirculation flow, the test methodology was changed to provide a consistently maintained flow to the steam generators with the recirculation piping system opened. Testing in this configuration will reduce pump wear, OST 201 was revised accordingly. The inspectors reviewed the completed actions and no additional questions remain, this item is considered closed.

(Closed) VIO 90-22-03, Failure to Correct an Exercise Weakness Concerning Event Classification.

This violation involved the failure to correct an exercise weakness identified during the 1989 Emergency Exercise. The identified weakness was the failure of the Shift Foreman to recognize the occurrence of an initiating condition for entry into an Emergency Action Level. This weakness was identified as not being corrected, in that during a release of Freon gas on September 11, 1990, the Shift Foreman failed to recognize the

occurrence as an initiating condition for an Alert. Failure to recognize the HVAC equipment room as being a vital area resulted in the event being initially classified as an Unusual Event and subsequently reclassified as an Alert. In the licensee response letter dated December 7, 1990, the licensee committed to performing the following corrective actions: information within the PEPs identifying plant Vital areas will be clarified; specific PEPs used for event classification and the EAL flowcharts will be reviewed to identify and clearly define key decision making words; information on toxicity and other properties of various gases used onsite will be provided for emergency response use; and utilizing the above corrective actions to identify other needed clarifications, definitions and interpretations in a form readily available during emergency classification activities. The inspector has reviewed the above completed corrective actions, and finds them adequate to prevent the recurrence of this event and for the closure of this item.

(Closed) IFI 89-13-01, Review of Corrective Actions to Ensure Improved HVH Unit Reliability.

This issue documented concerns with the reliability of the HVH unit cooling coils. Currently the licensee is repairing/replacing the existing room cooler cores with the same type of material and design. These repairs are expected to be completed by January 1995. Concurrent with this repair, the licensee is discussing a permanent solution to the problem with the vendor. This permanent fix is expected to be implemented within 2-3 years. The inspectors will continue to follow and evaluate these evolutions as they progress. Based on efforts undertaken to resolve his problem, this item is considered closed.

(Closed) URI 91-20-05, Determine If the Existence of a Second LOCA Peak is in Accordance with 10 CFR 50.46.

This item documented concerns about a second PCT associated with the transfer to recirculation with only one SI pump available during a SBLOCA. An NRC review of the licensee analysis indicated that this peak was not bounded by the LBLOCA analysis. Subsequent analysis by both the licensee and NRR resolved the safety concern associated with this issue. The resolution of this issue is documented in a CP&L letter to the NRC dated July 12, 1992. Based on this letter and discussions with NRR, this item is considered closed.

(Closed) IFI 92-11-02, Review C CCW Pump Trip Circuit Modification Installation.

This item tracked the completion of the installation of plant modification 1151, Activation of Emergency Bus E2 Undervoltage Trip Function for C CCW Pump Supply Breaker. This modification installed the second undervoltage channel trip circuitry for the

C CCW pump. This circuitry had been previously installed as a temporary modification. The permanent modification was installed and declared operable on September 1, 1993. This item is considered closed.

(Closed) VIO 92-27-03, Failure to Isolate Gas Analyzer CV Penetration Within 4 Hours With Deactivated Isolation Valves As Required by TS 3.6.3.

This violation involved the failure to take the appropriate TS required actions within the required time period. The licensee failed to isolate the gas analyzer sample control valve penetration with deactivated isolation valves within the 4 hours following the identification of its failure as required by TS. In a response dated December 4, 1992, the licensee identified personnel error as the primary cause of the event, indicated that the involved operating shift had completed training on the event and TS 3.6.3, and committed to perform and further corrective actions as identified by ACR 92-363 which was initiated to track further investigation of this issue. The ACR identified the following additional corrective actions which the licensee has completed: trained operation personnel on OMM-39, Operability Determination, TS sections 1.7, 3.6, and AOP-23, Loss of Containment Integrity; communicated management expectations on identification of inoperable equipment; and revised OST-701 and OST-707 to add note of required actions for an inoperable containment isolation valve. The inspectors have reviewed these corrective actions and find them acceptable for closure of this item.

(Closed) URI 92-11-04, Determine If CCW System Design Included Pump Suction Strainers.

This item documented concerns involving the identification of temporary construction screens still within the suction piping of the CCW system. Review of the system drawings indicated that the screens were temporary in nature and should have been removed following initial flushing and testing of the system. During the removal of the screens, the licensee removed a large piece of rubber lodged within the screens, which could have restricted flow at the impeller inlet. Based on this finding, engineering initiated an evaluation of installing new screens in the CCW system. The evaluation determined that the installation of new screens would not adversely impact flow to the pumps. Installation of the new screens has been completed with provisions to monitor differential pressure across the screens if pump suction pressures should drop. The inspectors have reviewed the above noted actions and find them acceptable to close this item.

(Closed) VIO 92-22-01, Failure To Implement Alarm Procedure When High CST Level Alarm Was Received.

This violation involved the licensee's failure to take the required procedural actions in response to a control room alarm. In the licensee response dated September 21, 1992, the primary cause of the event was identified as personnel error on the part of the individuals who did not adhere to the procedural requirements. In response to this event, the licensee completed the following corrective actions: revised OMM-001, Operations - Conduct of Operations to incorporate guidance on eliminating the diagnosed cause of the annunciator and correct usage of the APPs; and reviewed the event with all the operations shifts to develop an action plan for the improvement of procedural compliance and annunciator response. The licensee has completed this action plan and incorporated the input received. Based on a review of these completed actions, the inspectors find them acceptable for closure of this item.

(Closed) VIO 92-24-01, Failure to Adequately Implement Cleanliness Requirements, Resulting In SI Pump Being Declared Inoperable.

This violation documented the licensee failure to preclude the introduction of the Derlin plastic material into the RHR system which rendered a pump inoperable due to orifice blockage. In response to this violation dated November 20, 1992, the licensee indicated that the causes of this event were inadequate sensitivity to foreign material exclusion, inadequate control of material, and the failure to perform an adequate QC inspection following the completion of the work. The corrective actions implemented in response to this event were: revised the Corporate Welding Manual to include directions on the installation, removal, and documentation for use of non-soluble purge dams; visual inspection and high velocity flushing of piping runs in the SI, RHR, and Containment Spray systems following the second identification of foreign material; revised OMM-10, Cleanliness and Flushing Requirements, to include clarification of daily entry logs, performance of remote camera inspections, and guidance on the evaluation of plastics and similar materials in use; training was conducted on this event and the revisions to the two procedures noted above; and a revision to the work instruction to require the presence of craft supervision at all times during work activities which invoke the material control requirements of OMM-10. The inspectors have reviewed this event in detail, and have reviewed and discussed the above noted corrective actions. Based on a review of the completed corrective actions, this event is considered closed.

(Closed) VIO, 91-20-06, Inadequate Engineering Design Controls And Interfaces.

Corrective actions appear adequate to address the examples of the violation which is the subject of the December 16, 1991, Notice of Violation and Proposed Imposition of Civil Penalty. However, further engineering deficiencies have been noted in NRC Inspection Report 50-261/94-16. Additional long term corrective action will therefore be addressed under apparent violation 94-16-04. This item is closed.

(Closed) VIO 93-03-03, Failure To Install The Heat Trace Cable Type Specified IN The WR/JO.

This violation documented the failure to install the heat trace cable type specified in the WR/JO. Corrective actions taken by the licensee included: counseling maintenance personnel to ensure that they understand that deviations from material specified in a WR will be discussed with their Supervisor or Maintenance Planner to obtain the specification for alternate material; instructing Stores personnel to ensure that non-warehouse control personnel are not to be allowed in the Warehouse Control Area unescorted and to ensure that any material or equipment leaving the warehouse be electronically recorded; instructing Maintenance personnel that material and equipment used while performing maintenance shall be recorded on the WR; and revising procedure TMM-003 to reflect the non-Q status of Heat Trace Cable. The inspector has reviewed these actions and considers them adequate for closeout of this item.

(Closed) VIO 93-03-04, Failure To Verify Welder's Qualification

This violation addressed the failure of a welder's supervisor to verify the qualification status of a welder using the Welder's Qualification Status Report, in accordance with the Corporate Welding Manual, NW-03. Maintenance Supervisors received training related to the requirements of the Corporate Welding Manual, Section NW-03. This item is closed.

(Closed) URI 94-17-03, RHR System Concerns Resulting From FI-605 Inspection Effort.

As reported in Inspection report 94-17, the inspectors questioned the licensee on the impact of the failure of FI-605, Residual Heat Removal Total Flow Indicator, on the operators' capability to execute their End Path Procedures. This was based on the finding that with the RHR pumps secured, the indicator registered approximately 1000 gpm flow. The inspectors were concerned that since the instrument is used during End Path Procedures, EPP-9, Transfer To Cold Leg Recirculation, and EPP-10, Transfer to Long Term Recirculation, the erroneous reading could impact the plant's ability to efficiently and conservatively enter recirculation.

As a follow-up to this concern, RII inspectors included in their inspection efforts, a simulator scenario to determine if a typical operating crew could successfully mitigate the consequences of a hypothetical accident given the above described failure of the FI-605. The inspectors concluded that although the failed indication resulted in the operators combating the accident in a less efficient and slightly less conservative manner, there was no significant increase in the probability of core damage.

As reported in Inspection report 94-17, on July 15, 1994, the inspectors requested that the licensee evaluate the potential that the history of a plethora of previous instances of venting FT-605 which may have been symptomatic of air trapped in the dead leg of RHR piping immediately downstream of flow element. This request was based on the inspectors' personal observations that the upwardly sloping RHR line and lack of a high point vent on the RHR piping downstream of the flow element could create a potential water hammer situation. Subsequently, the licensee performed UT testing of the piping in question and verified that it was water solid. The licensee plans to evaluate this issue further during the next outage.

As documented in Inspection Report 94-17, ACR 93-315 made reference to RHR system flow anomalies documented in a 1990 engineering analysis by Horace Cofer Associates. The ACR stated that RHR system enhancements recommended by the study were not implemented but instead, alternate improvements were pursued. Near the end of inspection 94-17, the inspectors requested that the licensee provide additional information on historical RHR system performance problems and efforts implemented to correct them. A review of the licensee's response indicated that a second study had been initiated to qualify the findings of the original analysis, and that selected corrective actions had been implemented. This item is closed.

(Closed) IFI 90-05-01, Review SW MIC Monitoring Program Changes Required by Accelerated MIC Growth Rates.

M-1082 replaced the SW piping that lies under the Fuel Transfer Canal because it had developed radiography indications due to MIC. M-1113 replaced the four SW CV penetration liners which were found to have MIC. As previously documented in NRC IR 92-34, M-1001 replaced the stainless steel SW piping which was known to be susceptible to MIC attack with a more resistant material. The licensee's actions were considered adequate. This item is closed.

(Closed) VIO 92-28-01, Failure To Recognize That Indication Of A Not Fully Closed PZR PORV Constituted A NOUE.

This violation involved an October 31, 1992, event during which Operations personnel observed indication that PCV-456, a pressurizer relief valve, did not fully close after reduction of pressure. Subsequently, PCV-456 was determined to have closed. However, at the time of the event and for a period of time afterwards, Operations

personnel did not verify that the observed PCV-456 position indications were incorrect. During the time of the event PEP-101 (Initial Emergency Action) was not implemented in that an Unusual Event was not declared and therefore, PEP-102 (Emergency Control - Unusual Event) was not implemented as required when Operations personnel observed the dual indication on PCV-456 (valve not fully closed). In a response dated December 28, 1992, the licensee identified personnel error as the cause of the event and committed to perform the following corrective actions: issue a memorandum to site management to emphasize importance of minimizing telephone calls and visits to the Control Room during and immediately following plant transients; revise the Abnormal Operating Procedures to refer the operator to the EAL's to determine any actions required by the Emergency Plan; Operations Manager will review with the Shift Supervisor his duties and responsibilities with respect to the Emergency Plan and population control in the control room; and request that simulator instructors train on classification of Unusual Events as well as other more significant events during simulator scenarios.

During review of the AOPs, the inspector verified that AOP-020, Loss of Residual Heat Removal (Shutdown Cooling), revision 11 had been revised, as committed in the licensee's reply to the NOV, to incorporate a step referring operators to the EALs. However, in the current approved revision of AOP-020, revision 14, dated April 14, 1994, the procedure no longer contained the statement directly referring the operators to the EALs. It appears the statement was unintentionally removed in revision 12 of AOP-020. Upon discussion with the licensee, it was determined that the currently unapproved revision of the procedure reestablished the statement referring the operators to the EALs. This revision is being done in conjunction with the EOP/AOP upgrade effort addressed by the licensee in their reply, dated May 9, 1994, to a Notice of Violation issued with NRC IR 94-07.

Procedure AP-004 (Procedure Control), revision 41, addresses tracking of commitments for procedures without reference sections (i.e., Emergency Operating Procedures), as the work group responsible for that procedure or type of procedures is responsible for tracking the status of commitments associated with these procedures via a controlled process. Based upon discussions with the licensee, it appears that previous to the current EOP/AOP upgrade effort, there was not a controlled process in place to track AOP commitments. This upgrade effort, however, is developing a basis document for each AOP.

These examples are similar to the deficiencies noted in NRC IR 94-07 (EOP Team Inspection). Therefore, these items will be addressed upon review of the long term corrective actions associated with NRC IR 94-07. Other corrective actions associated with this violation are adequate. This violation is considered closed.

8. Review of LERs (90703)

The below listed LERs were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description, verification of compliance with Technical Specifications and regulatory requirements, corrective action taken, existence of potential generic problems, reporting requirements satisfied, and the relative safety significance of each event.

(Closed) LER 92-025-00, Spent Fuel Pit Temperature Below Analyzed Limits.

As documented in NRC IR 92-34, the inspectors reviewed operability determination 92-025 at the time of the event and had no additional concerns regarding the impact of the reduced SFP temperature. Corrective actions addressed in the LER included installing temporary equipment to provide adequate temperature indication until a permanent modification could be designed and installed. The permanent spent fuel pit temperature monitor was installed under M-1152 and declared operable on December 31, 1993. This LER is closed.

(Closed) LER 92-026-00, Breach Of Containment Integrity Due To Failure Of Personnel Airlock Door.

As stated in the LER, on December 18, 1992, during performance of a scheduled Containment Personnel Airlock Leakage Test, test pressure dropped below the acceptance criteria. On December 19, 1992, inspection of the inner door shaft seal (upper shaft) revealed that the inner door shaft seal flange bolts were loose. The bolts were tightened. EST-010 was then performed on the airlock with satisfactory results.

Additional corrective actions included: replacing the inner door shaft seal during the Fall 1993 refueling outage; and revise procedure PM-038 (CV Personnel Airlock Maintenance and Inspection) to include inspection of the shaft seal gasket bolts for proper torque. The licensee has completed the corrective actions indicated. This LER is closed.

9. Exit Interview (71701)

The inspection scope and findings were summarized on August 19, 1994, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection findings listed below and in the summary. Dissenting comments were not received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

<u>Item Number</u>	<u>Description/Reference Paragraph</u>
URI: 94-19-01	Respiratory Equipment Qualification.

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations.

10. List of Acronyms and Initialisms

ACR	Adverse Condition Report
AOP	Abnormal Operating Procedure
APP	Annunciator Panel Procedure
CCW	Component Cooling Water
CV	Containment Vessel
EHC	Electro Hydraulic Control
EPP	End Path Procedure
ERO	Emergency Response Organization
FI	Flow Indicator
HVAC	Heating Ventilation and Air Conditioning
HVH	Heating Ventilation
IST	Inservice Testing
MDAFW	Motor Driven Auxiliary Feedwater
MIC	Microbiological Induced Corrosion
NPSH	Net Positive Suction Head
OMM	Operation Management Manual
OST	Operation Surveillance Test
PCT	Peak Clad Temperature
RCS	Reactor Coolant System
SFP	Spent Fuel Pit
SI	Safety Injection
SW	Service Water
WR/JO	Work Request/Job Order