



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

Report No.: 50-261/92-28

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: October 10 - November 13, 1992

Lead Inspector: H. O. Garner for L. W. Garner, Senior Resident Inspector 11/27/92
Date Signed

Other Inspector: C. R. Ogle, Resident Inspector

Approved by: H. O. Christensen for H. O. Christensen, Chief 11/27/92
Reactor Projects Section 1A
Division of Reactor Projects
Date Signed

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of operational safety verification, surveillance observation, maintenance observation, and engineered safety feature system walkdown.

Results:

A violation was identified for failure to declare an Unusual Event when a pressurizer powered operated relief valve indicated that it had failed to fully close (paragraph 3).

A violation was identified for failure to adequately establish a procedure in that OP-202 was inadvertently revised to open a valve which was required to be closed to prevent diversion of safety injection flow (paragraph 6).

Documentation of completed surveillance activities was deficient in that a procedure step which was partially completed, as verbally directed by a Shift Supervisor, was signed as completed with no notation that the step was only partially performed (paragraph 5).

A weakness was identified for failure to calibrate a non-safety related RTGB instrument which was contained in the calibration program (paragraph 6).

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Operations management's expectations were not met in that after a new valve lineup revision became effective, the older revision which was in the process of being performed, continued to be utilized (paragraph 6).

REPORT DETAILS

1. Persons Contacted

- *R. Barnett, Manager, Outages and Modifications
- C. Baucom, Senior Specialist, Regulatory Compliance
- D. Bauer, Regulatory Compliance Coordinator, Regulatory Compliance
- *R. Chambers, Plant General Manager, Robinson Nuclear Project
- *B. Clark, Manager, Maintenance
- *T. Cleary, Manager, Technical Support
- *D. Crook, Senior Specialist, Regulatory Compliance
- C. Dietz, Vice President, Robinson Nuclear Project
- R. Downey, Shift Supervisor, Operations
- R. Femal, Shift Supervisor, Operations
- *W. Gainey, Manager, Plant Support
- *J. Harrison, Manager, Regulatory Compliance
- *P. Jenny, Manager, Emergency Preparedness
- D. Knight, Shift Supervisor, Operations
- A. McCauley, Manager, Electrical Systems, Technical Support
- R. Moore, Shift Supervisor, Operations
- D. Morrison, Shift Supervisor, Operations
- A. Padgett, Manager, Environmental and Radiation Control
- A. Wallace, Manager, Shift Operations, Operations
- D. Winters, Shift Supervisor, Operations

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

*Attended exit interview on November 13, 1992.

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

2. Plant Status

Excluding reduced power operations during October 23 - 26 and October 31 - November 4, 1992 time periods, the unit operated at full power. The power reductions were in response to HDT LCV-1530A malfunctions (see paragraph 3). On October 31, a rapid power reduction in response to a LCV-1530A malfunction and subsequent feedwater/condensate transient resulted in lifting of a PZR PORV. When the primary system pressure decreased to below the PORV reset point, both the open and close position lights were lit, indicating that the PORV had not fully closed.

Although the PORV was later verified to have properly closed, operating personnel failed to identify, until approximately 12 hours later, that this condition had required a NOUE to be declared (see paragraph 3).

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.

To verify equipment operability and compliance with TS, the inspectors reviewed shift logs, Operation's records, data sheets, instrument traces, and records of equipment malfunctions. Through work observations and discussions with Operations staff members, the inspectors verified the staff was knowledgeable of plant conditions, responded properly to alarms, adhered to procedures and applicable administrative controls, cognizant of in-progress surveillance and maintenance activities, and 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 observed, verifying that system status continuity 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.

Plant tours and perimeter walkdowns 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.

Feedwater/Condensate Transients Due To HD System Perturbations

During the report period, the unit experience two power reductions as a result of operating problems on the HD system. The power reductions were due to a malfunction of HDT LCV-1530A (valve failed to respond to control signal) and HD system flow oscillations which resulted in feedwater/condensate flow reduction transients. The cause of the October 23 LCV-1530A malfunction was attributed to valve positioner nozzle blockage by a small metal particle. During this transient, the plant was stabilized initially at approximately 90% power and power was subsequently reduced to approximately 60% to allow troubleshooting and repair of the system.

On October 31, at 7:14 p.m., the unit experienced a more severe feedwater/condensate flow transient, probably due to a similar LCV-1530A positioner malfunction. Quick actions by the Operations crew resulted in preventing the unit from tripping on low steam generator levels. When the operator attempted to reduce turbine generator load in the "OPER AUTO" mode, a very rapid load reject of approximately 400 MWe occurred. This was terminated when the operator placed the turbine generator E-H controls in manual. However, the loss of turbine load without a corresponding decrease in reactor power, eventually resulted in a primary system pressure increase (peak pressure approximately 2315 psig) and the opening of primary PZR PORV PCV-456. The plant was stabilized approximately 15 minutes after the transient's initiation. Dual position indication (valve in mid-position) was received on PCV-456 at the time primary system pressure was reduced below the valve's reset

pressure, i. e., approximately 2 minutes after the PORV opened. About 80 seconds after the dual position indication occurred, the PORV's block valve, RC-535, was manually closed as required by operating procedures. At 8:42 p.m., the dual position indication on PCV-456 cleared, and at 1:11 a.m., the following day, the PORV block valve RC-535 was re-opened with no indication of PCV-456 leakage.

The inspectors discussed the October 31 transient with the operators and SS involved in the transient. Review of the Tavg and PZR pressure chart recorders indicated that it was probable that PORV-456 had closed. The inspectors later reviewed an engineering evaluation of ERFIS data which supported the contention that PCV-456 had operated properly. The dual position indication resulted, most likely, from a position switch malfunction. The inspectors agreed with these conclusions.

Subsequent to the October 31 event, the LCV-1530A positioner was replaced and an inline filter was installed upstream on the air supply to the pneumatic positioner. Following these repairs and modification, there have been no subsequent malfunctions of LCV-1530A.

Since the last RO, there has been flow oscillations (random in frequency, duration and magnitude) in the HD system. The licensee has not been able to determine the cause(s) of the oscillations; however, it was suspected that internal MSR leakage may be a significant contributor to these oscillations. The licensee plans to gather additional data during the next scheduled power reduction for valve testing (November 21 - 22) and was making contingency plans for a unit shutdown in December to inspect and repair the MSRs.

Failure To Identify A NOUE

On October 31, 1992, PORV PCV-456 was thought not to have fully closed during the plant transient discussed in the preceding paragraph. PEP-101, Initial Emergency Actions, revision 9, step 5.1.4 required that if an EAL for an Unusual Event is exceeded, implement PEP-102, Emergency Control - Unusual Event. Unusual event matrix item D.1 of EAL-2, revision 3, indicates that "failure of any pressurizer safety or relief valve to close following reduction of pressure" is an NOUE. Furthermore, OMM-001, Operations - Conduct Of Operations, revision 32, step 5.14.1 required that Shift Operating personnel must consider control indications to be true unless they are proven wrong. Thus, in accordance with OMM-001 and PEP-101, an NOUE should have been declared since the indication that the PORV was partially open was not proven to be false until approximately 80 minutes after the partially open indication was received. However, it was not until shift turnover between the SS, approximately 7:00 a.m. the following day, that it was discovered that if the PORV had not closed, as thought, then a condition existed for approximately two minutes which required an NOUE declaration. Plant management was informed and the failure to declare a NOUE was subsequently reported to the NRC. In response to the inspectors' inquiries, the SS who was on shift during the transient indicated that he had failed to consult the EAL procedures. The failure

to classify the event as an NOUE based upon the perceived PORV condition is a failure to implement procedures. This is identified as a VIO: Failure To Recognize That Indication Of A Not Fully Closed PZR PORV Constituted A NOUE, 92-28-01

Although two Alert (CO₂ gas releases) and two NOUE (inoperable EDGs and startup transformer loss) conditions had been properly classified during 1992 (see IRs 92-11, 92-24 and 92-27), the licensee's performance in this area has been erratic. Exercise weaknesses relating to the failure to properly classify emergency events had been identified in both the 1989 and 1990 exercises (see IRs 89-27 and 90-13). However, in the 1990 redemonstration and 1991 exercises, classifications were proper. Violations were issued in 1988 for failure to properly classify two actual NOUEs (IR 88-07 and 88-16) and in 1990 for failure to initially classify an Alert as required (IR 90-22). However, during the period extending from the 1988 violation until the 1990 violation all four events requiring emergency declarations were correctly classified. In addition, four events, all in 1992, which occurred between the 1990 violation and the present event, were properly classified.

One violation was identified. Except as noted above, the area/program was adequately implemented.

4. Monthly Surveillance Observation (61726)

The inspectors observed certain safety-related surveillance activities on systems and components to ascertain that these activities were conducted in accordance with license requirements. For the surveillance test procedure listed below, the inspectors verified the recorded test data was complete, accurate (except as noted below), and met TS requirements, and test discrepancies were properly documented and rectified. Specifically, the inspectors witnessed/reviewed portions of the following test activities:

OST-052 RCS Leakage Test And Examination Prior To Startup
Following An Opening Of The Primary System

OST-052 Documentation Discrepancy

The inspectors reviewed OST-052 which had been completed on September 21, 1992. The inspectors noted that Attachment 8.2, RCS System Walkdown Results, item 8.2.1.34 was initialed as being complete with the notation that the high pressure side of seal table isolation valve E-1 was wet and a WR/JO had been initiated. However, this step had been only partially completed. The step required leakage examination of the "Sub-vessel Area - Including Incore Detector Tubing; Including Seal Table." However, during the health physics briefing prior to the CV entry to perform the procedure, the inspectors asked if the CV sump area, i. e., under vessel area, was to be entered. The inspectors were informed that the SS had indicated that entry into this area was not planned since this area had been entered and inspected at the end of the last RO.

Since the procedure was performed due to opening of the B RCS loop (B RCP seal work), inspection of this area was not required. Entry into this area was not performed and hence examination for leakage in this area was not performed. However, failure to note that the step was only partially completed as expected was misleading in that the completed documentation implied that the step had been fully performed. This documentation deficiency was discussed with Operations management.

In a response to the inspectors questions, it was determined that the manner in which step 8.2.1.34 was performed varied widely among Operations staff members. Activities to complete this step ranged from entry into the CV sump for direct inspection to indirect means such as standing outside the sump area and listening for leakage. The Shift Operations Manager indicated that OST-052 would be reviewed and additional guidance would be provided as appropriate as to what is to be examined and how this should be accomplished.

No violations or deviations were identified. Except as noted above, the area/program was adequately implemented.

5. Monthly Maintenance Observation (62703)

The inspectors observed safety-related maintenance activities on systems and components to ascertain that these activities were conducted in accordance with TS and approved procedures. The inspectors determined that these activities did not violate LCOs and that required redundant components were operable. The inspectors verified that required administrative, material, testing, and fire prevention controls were adhered to. In particular, the inspectors observed/reviewed the following maintenance activities:

WR/JO 92-AQST1 A EDG Exhaust Manifold Gasket Replacement

WR/JO 92-AQSY1 A EDG Fuel Oil Strainer Leak Repair

Steam Dump System Malfunction

During RPS testing, i. e., verification that a turbine trip will initiate a reactor trip, an annunciator associated with the steam dump arming signal was not received as expected. Troubleshooting of the steam dump system revealed two bad relays and a blown fuse on a circuit board. The components were replaced and the system returned to service. During review of this event, the licensee determined that most steam dump system features were not in a periodic test program and many system components were not in the preventive maintenance program. The licensee plans to review testing and preventive maintenance associated with this system and develop procedures as deemed prudent. The lack of testing and preventive maintenance reflected inadequate attention to a BOP system which can either help limit the severity of a plant transient or make the transient more difficult to respond to depending upon the system's performance. The licensee indicated that compliance with the maintenance rule would address such items.

No violations or deviations were identified. Based on the information obtained during the inspection, the area/program was adequately implemented.

6. ESF System Walkdown (71710)

The inspectors performed an inspection of the SI system to ensure that it was properly aligned in its safety standby mode and necessary instrumentation was valved into service and was functioning properly.

As a portion of this inspection effort, the inspectors verified the calibration of pressure, flow, and level instrumentation associated with the SI system. This included reviewing the calibration data sheets for approximately 50 SI system transmitters, indicators, and comparators. For PI-934, which provided a BIT pressure indication on the RTGB and a high pressure alarm, the last recorded calibration was in 1988. However, Appendix A to MMM-006, Calibration Program, specified that this indicator, as well as the associated transmitter (PT-934) and pressure comparator (PC-934), be calibrated every refueling cycle. Both the pressure transmitter and pressure comparator were within the calibration frequency specified in MMM-006. The indicator was subsequently calibrated on November 9, 1992.

The inspectors reviewed a 1991 engineering memo which indicated that it was acceptable to delete PT-934, PI-934, and PC-934 from service and hence, the calibration program. However, the memo was not implemented in that MMM-006 was not revised to delete the instrumentation. Failure to calibrate a non-safety related RTGB instrument, which was listed in the calibration program, was considered a weakness. ACR 92-399 has been issued to address the cause of this oversight. In addition, a review has been initiated to verify that other instruments on the RTGB were calibrated as required.

During the preparation for the system walkdown, OP-202, Safety Injection And Containment Spray System, Attachment 9.1, Valve Lineup For Safety Injection and Containment Vessel Spray, was compared to system drawing CP-380 5379-1082 sheet 1 revision 31. It was noted by the inspectors that OP-202 revision 27 (current revision) required SI-895K, High Head SI Cold Leg Header To Test Line Isolation, be open whereas the system drawing specified the valve be shut. During the walkdown the inspectors observed that SI-895K was shut. At the inspectors' request, SI-895K was then verified to be shut by Operations personnel. Subsequent investigation revealed that OP-202 revisions 26 and 27 (effective September 5 and October 7, 1992, respectively) were in error and the valve was in its desired position. During the revision process associated with revision 26, a typist had inadvertently entered the wrong valve position in the valve lineup list. The review process failed to detect the error and the procedure revision was approved for use.

Additional inspection activities into this area revealed that the licensee had implemented a temporary change to OP-202 to correct four

other valve positions (SI-867A, SI-867B, SI-870A, and SI-870B) which had inadvertently been changed during revision 26. Additionally, SI-857B, a relief valve removed from the system was inadvertently added to the lineup by revision 26. These errors were not noted during the review process and it was not until approximately 12 days after the revision became effective that Operations personnel noted the inadvertent changes to revision 26. On September 17, 1992, Operations instituted a temporary change to OP-202 to correct the identified deficiencies and ACR 92-347 was written to determine the root cause of the inadvertent changes to OP-202. However, since plant personnel were unaware of the inadvertent position change of SI-895K by revision 26, the error in the specified SI-895K position was subsequently carried forward in revision 27. The failure to note the inadvertent changes to Revision 26 prior to it becoming effective were indicative of weaknesses in the review process.

A preliminary corporate fuel section review has determined that if revision 26 had been implemented, i. e., SI-895K positioned in the open position, the plant would have been placed in an unanalyzed condition. With the SI-895K valve open during certain SBLOCAs, the partial diversion of SI injection flow back to the RWST could result in the ECCS acceptance criteria of 10 CFR 50.46 not being met. The improper SI-895K valve position specification in OP-202 is a VIO: Failure To Adequately Establish OP-202 In That SI-895K Was Required To Be In The Open Position Whereas The Analyzed Position Was Closed, 92-28-02.

The inspectors noted that the last completed OP-202 attachment 9.1, which was maintained in the control room, was revision 25. However, as noted above, revision 26's effective date was September 5, 1992 which was after attachment 9.1 was started but before it was completed. The subject of which revision should have completed was discussed with the Shift Operations Manager. In general, it was management's expectation that the latest revision should be utilized. The Shift Operations Manager indicated that Operations would evaluate if additional guidance or training is warranted in this area.

One violation was identified. Except as noted above, the area/program was adequately implemented.

7. Exit Interview (71701)

The inspection scope and findings were summarized on November 14, 1992, 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> |
|--------------------|---|
| 92-28-01 | VIO - Failure To Recognize That Indication Of A Not Fully Closed PZR PORV Constituted A NOUE (paragraph 3) |
| 92-28-02 | VIO - Failure To Adequately Establish OP-202 In That SI-895K Was Required To Be In The Open Position Whereas The Analyzed Position Was Closed (paragraph 6) |

8. List of Acronyms and Initialisms

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| a.m. | Ante Meridiem |
| ACR | Adverse Condition Report |
| BIT | Boron Injection Tank |
| CFR | Code of Federal Regulations |
| CV | Containment Vessel |
| EAL | Emergency Action Level |
| ECCS | Emergency Core Cooling System |
| EDG | Emergency Diesel Generator |
| E-H | Electro-Hydraulic |
| ERFIS | Emergency Response Facility Information System |
| ESF | Engineered Safety Feature |
| HD | Heater Drain |
| HDT | Heater Drain Tank |
| i.e. | That is |
| IR | Inspection Report |
| LCV | Level Control Valve |
| MMM | Maintenance Management Manual |
| MWe | Megawatts electric |
| MSR | Moisture Separator Reheaters |
| NAD | Nuclear Assessment Department |
| NCV | Non-cited Violation |
| NOUE | Notice of Unusual Event |
| NRC | Nuclear Regulatory Commission |
| OMM | Operations Management Manual |
| OP | Operations Procedure |
| OST | Operations Surveillance Test |
| p.m. | Post Meridiem |
| PC | Pressure Comparator |
| PCV | Pressure Control Valve |
| PEP | Plant Emergency Procedure |
| PI | Pressure Indicator |
| PORV | Power Operated Relief Valve |
| Psig | Pounds per square inch - gage |
| PT | Pressure Transmitter |
| PZR | Pressurizer |
| RC | Reactor Coolant |
| RCS | Reactor Coolant System |
| RO | Refueling Outage |
| RPS | Reactor Protection System |

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|--------|--------------------------------------|
| RTGB | Reactor Turbine Gauge Board |
| RWST | Refueling Water Storage Tank |
| SBLOCA | Small Break Loss of Coolant Accident |
| SCR | Significant Condition Report |
| SI | Safety Injection |
| SS | Shift Supervisor |
| TAVG | Temperature Average |
| TS | Technical Specification |
| VIO | Violation |
| WR/JO | Work Request/Job Order |