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

Report No.: 50-261/91-17

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: July 13 - August 9, 1991

Lead Inspector: _____ 8/22/91
L. W. Garner, Senior Resident Inspector Date Signed

Other Inspectors: K. R. Jury, Resident Inspector
R. E. Carroll, Project Engineer

Approved by: _____ 8/22/91
for H. O. Christensen, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of operational safety verification, maintenance observation, onsite review committee activities, and followup.

Results:

A violation with two examples was identified for failing to adequately establish procedures (paragraph 2).

A violation was identified for failing to utilize a maintenance work request to perform maintenance activities (paragraph 3).

A non-cited violation was identified for failing to complete a procedure usage cover sheet prior to initiating work (paragraph 3).

REPORT DETAILS

1. Persons Contacted

R. Barnett, Manager, Outages and Modifications
*C. Baucom, Senior Specialist, Regulatory Compliance
D. Bauer, Regulatory Compliance Coordinator, Regulatory Compliance
*S. Billings, Technical Aide, Regulatory Compliance
*R. Chambers, Manager, Operations
T. Cleary, Manager - Balance of Plant Systems and Reactor Engineering, Technical Support
D. Crook, Senior Specialist, Regulatory Compliance
C. Dietz, Manager, Robinson Nuclear Project
*W. Dorman, Acting Manager, Nuclear Assessment Department Site Unit
J. Eaddy, Manager, Environmental and Radiation Support
S. Farmer, Manager - Engineering Programs, Technical Support
R. Femal, Shift Supervisor, Operations
*W. Gainey, Manager, Plant Support Unit
*P. Jenney, Project Specialist, Regulatory Compliance
J. Kloosterman, Manager, Regulatory Compliance
D. Knight, Shift Supervisor, Operations
*A. McCauley, Manager - Electrical Systems, Technical Support
R. Moore, Shift Supervisor, Operations
*A. Padgett, Manager, Environmental and Radiation Control
M. Page, Manager, Technical Support
D. Seagle, Shift Supervisor, Operations
*J. Sheppard, Plant General Manager, H. B. Robinson
*R. Smith, Manager, Maintenance
*D. Stadler, Onsite Licensing Engineer, Nuclear Licensing
W. Stover, Shift Supervisor, Operations
D. Winters, Shift Supervisor, Operations
*H. Young, Manager, Quality Control

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

*Attended exit interview on August 13, 1991.

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

2. 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, Operations' 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 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.

Inadequate EPP-10 Procedure

On July 22, 1991, the inspectors observed that the alternate hot leg recirculation flow path specified in EPP-10, Transfer To Hot Leg Recirculation, revision 4, did not open all the valves required for the flow path. The alternate flow path is from the RHR pump discharge header via the CVCS system to the B RCS hot leg. The pathway utilizes the normal charging line which enters containment at penetration 24. On March 1, 1991, EPP-9, Transfer To Cold Leg Recirculation, was revised to close manual valves CVC-202A, 282, and 309A, and to seal this penetration with IVSW. A combination of valves 282 and either 202A or 309A, are required to be open for alternate hot leg recirculation to be established via penetration 24. Prior to the EPP-9 revision which closes these valves, it was not necessary to verify that these valves were open during EPP-10 performance as a flow path through this penetration exists during normal operation. However, performance of the revised EPP-9 not only closes these valves within the first hour of a design basis LOCA, but would most likely result in radiation fields which would preclude subsequent reopening of these valves. Thus, when EPP-10 would be performed under accident conditions, i.e. approximately 18 hours after initiation of a LOCA, the alternate hot leg recirculation flow pathway could not be established. The safety significance of the flow path's unavailability is minor, in that, multiple failures must occur for the normal hot leg recirculation flowpath to be unavailable. However, if the plant design is such that an alternate hot leg recirculation flow path can be established, the inclusion of this flow path into EOPs is expected. The licensee is presently reviewing the availability of an alternate hot leg recirculation flow path via the RHR shutdown cooling suction line or re-establishment of the previously specified RHR/CVCS flowpath. Incorporation of a viable alternate hot leg recirculation flowpath into EPP-10 is anticipated to be completed by the end of August 1991.

The failure to identify that EPP-10 was adversely impacted by a revision to EPP-9 is of special concern, since the V & V process for EOPs was identified as a weakness in IR 89-16. In response to that weakness, a new V & V process was developed in 1990 to be utilized during and subsequent to, the EOP upgrade project which is scheduled for completion at the end of 1991. EOPs which had not been upgraded were not being verified and validated by this new V & V process. The individual responsible for the EOP upgrade project indicated that all future EOP revisions would now use the new V & V process. Because of the similarities between the past EOP review process and that used for other types of operating procedures, the weakness which allowed the EPP-9/EPP-10 problem to occur could exist for other procedure revision processes. The failure to adequately establish EPP-10 constitutes one example of a violation: Failure To Adequately Establish Procedures, 91-17-01.

Inadequate Review Of SP-1023

As documented in IR 91-15, SP-1023, IVSW Leak Test of Penetration 6, was performed on July 11, 1991, to return the RCDT pump discharge outboard containment isolation valve, WD-1722, to service. The inspectors completed their test review and determined that the SP was adequately performed on the established configuration, and as such, successfully demonstrated valve integrity.

Prior to performing the test, the licensee identified that the SP provided a precaution and limitation which incorrectly referenced the applicable TS. The SP stated that the performance of the test would place the plant in a 24 hour LCO to hot shutdown per TS 3.3.6.1 and 3.3.6.2. However, TS 3.0 was applicable, which is an 8 hour to hot shutdown LCO. Subsequent to the issuance of the SP, and preparation for its performance, the operating shift reviewed the procedure and detected the LCO discrepancy. A temporary procedure change was implemented to correct this error prior to test initiation.

Evidently during the preparation of SP-1023, the procedure preparer had identified TS 3.0 as being applicable during the test; however, during the review process, discussions among operations and technical support personnel resulted in the incorrect determination that TS 3.3.6.1 and TS 3.3.6.2 were applicable, not TS 3.0. The failure to properly identify the applicable TS in SP-1023 constitutes a second example of violation: 91-17-01, Failure To Adequately Establish Procedures.

One violation with two examples was identified.

3. 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, approved procedures, and appropriate industry codes and standards. 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, radiological, and fire prevention controls were adhered to. In particular, the inspectors observed/reviewed the following maintenance activities:

WR/JO 91-AJJA1	Perform Current Traces on SI-876A, SI-867B, and SI-869 Using VOTES
WR/JO 90-AEUY1	Replace PT-121, CVCS Charging Pump Discharge Pressure Transmitter

Valve SI-867A Breaker Tripping

On July 29, 1991, while taking current traces and voltage readings on valve SI-867A, BIT inlet bypass valve, the valve's power supply breaker tripped instantaneously to the valve's switch manipulation on the RTGB. Concurrent with this action was a loss of indication on a voltmeter (multimeter) being used for voltage readings. The valve was declared out of service and TS 3.3.1.2.e (24 hour to hot shutdown LCO) was entered at 10:45 a.m. as one flow path was determined to be inoperable. The redundant flow path (valve SI-867B) was demonstrated to be operable by performing a stroke test per OST-152, SI system.

The voltage readings and current traces were being taken in support of AC MOV motor torque calculation RNP-E-7013, to better estimate rated locked rotor current, as neither actual field nor vendor data was available for the calculation. The 600 VAC rated power supply breaker evidently tripped when a 300 VAC multimeter (connected across B & C motor phases) shorted out. The multimeter is designed to measure a maximum of 300 VAC; however, it was being utilized on a 480 VAC system. Apparently, the impressed voltage (which is above the meter range) shorted the spark gap circuitry in the voltmeter, thus shorting the spike suppressor and tripping the breaker. Subsequent to the breaker tripping, the breaker was reset and WR 91-AKND1 was initiated to perform a current trace and stroke time test for the valve. Applicable portions of OST-152 were performed to verify proper operation of remote position indicators, measure stroke time, and to verify that the valve assumed proper position on loss of operating power. The current traces and OST-152 were both successfully performed and the valve (and flow path) was declared back-in-service at 2:00 p.m..

Upon reviewing the circumstances surrounding this situation, the inspectors concluded there were several work control breakdowns which occurred. The first involved the communications between NED, Technical Support, Maintenance, and Operations. There appeared to be a non-formalized communication process being utilized in accomplishing the valve's voltage readings. The apparent sequence occurred as follows: (1) NED requested the current and voltage readings be taken per a memorandum; (2) Technical Support subsequently requested a WR be generated, however, the generated WR (91-AJJA1) only required current traces be taken, not voltage readings; and (3) the maintenance technicians

were verbally requested to also take voltage readings, however, Operations was not informed nor aware voltage reading were going to be taken. While this non-formalized "communication" may not have been the root cause of the event, it appeared to be a contributor. The second breakdown involved the technicians performing the test being unaware that the multimeters being utilized were unacceptably rated to measure the power supply's voltage. However, labels were on the meters indicating they were only to be utilized up to a maximum of 300 VAC. These labels were placed on the meters due to a similar misapplication in early 1989 which resulted in a reactor trip. Maintenance Manual Procedure MMM-001, Maintenance Administration Program, revision 12, requires a proper work request be utilized in performing all maintenance activities and labor by craft personnel. If the voltage readings were specified to be taken and correctly ranged multimeters were identified to be used on the WR, this situation may have been precluded. Failure to adequately perform maintenance activities is a violation: Maintenance Activities Were Performed Without Utilizing A Work Request, 91-17-02.

CVCS Charging Pump Pressure Transmitter, PT-121, Replacement

During the replacement of PT-121 per WR 90-AEUY1, the inspectors noted that after the technicians began implementing Process Instrumentation Calibration Procedure PIC-006, Pressure Transmitter, revision 1, the Procedure Usage Cover Sheet had not been filled out. Maintenance Management Manual Procedure MMM-001, Maintenance Administration Program, Revision 12, Section 5.1.8, requires that procedures issued for performance of maintenance shall be provided with a Procedure Usage Cover Sheet. The inspectors discussed this concern with a technician performing the test and a NAD representative. The technician subsequently left the work site and had the cover sheet completed as required. Apparently, the fact that the maintenance supervisor failed to complete the cover sheet was overlooked by the technicians performing the work. Upon cover sheet completion, it was determined that PIC-006 was to be used as "reference", and that each segment is required to be verified after completion. As the technicians were just in the process of setting up their testing apparatus and the procedure was to be used as a reference, the failure to have this cover sheet completed was not considered to be of significant concern and appears to be an isolated event. Not completing the Procedure Usage Cover prior to work initiation is considered a violation; however, this violation meets the criteria specified in Section V.A. of the NRC Enforcement Policy for not issuing a Notice of Violation and is not cited. This violation is identified as a NCV: Failure to Complete Procedure Usage Cover Sheet as Required, 91-17-03.

Two violations (one being non-cited) were identified.

4. Onsite Review Committee (40500)

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 July 19, 1991 special PNSC which reviewed the MFRVs' fuse installation procedure, SP-1026, and proposed FW line leak repair. All potential concerns with the SP were thoroughly discussed and resolved. It was ascertained that provisions of the TS dealing with membership, review process, frequency, and qualifications were satisfied.

No violations or deviations were identified.

5. Followup (92700, 92701, 92702)

(Closed) Part 21 89-12 and 89-18, Potential Failures Of Limitorque SMB-00 And SMB-000 Torque Switches. On November 3, 1988, Limitorque issued a 10 CFR 21 Notification (89-18) regarding post mold shrinkage on Melamine torque switches used in their old style SMB-00 and SMB-000 actuators. On September 29, 1989, Limitorque issued a second 10 CFR Notification (89-12) regarding the loosening of stationary contact screws on the side of SMB-00 and SMB-000 cam-type torque switches with fiber spacers under their contact bridge. In response to these notifications, the licensee identified 83 potentially affected valves (63 of which were safety-related). Through a discussion with the licensee's MOV Technical Support Coordinator and a review of associated work documents, the inspector confirmed that the recommended verifications/replacements were appropriately accomplished. This item is closed.

(Closed) IFI 89-07-02, Review Permanent Solution To RTD Thermowell Cracking Phenomena. During RO 12, the RCS bypass temperature manifolds were removed and fast response RTD thermowells were installed in their place. Unlike loops B and C, physical interferences prevented installation of the A loop hot leg thermowells inside the existing RTD bypass piping scoops. Instead, the three A loop hot leg thermowells were modified to facilitate installation in an elbow of thicker wall pipe further downstream. As discussed in IR 89-07, the A loop hot leg thermowells were subsequently redesigned when vibration induced fatigue failure resulted in through-wall leakage. Since conservative analysis demonstrated that the redesigned thermowells would last at least 0.8 years, the licensee authorized unit operation for up to 9 months while working on a final resolution. Based on subsequent analysis, the redesigned thermowells are now expected to last for the life of the plant. The inspector reviewed associated engineering evaluations 89-52 (which utilized a forcing function that reflects the redesigned thermowell insertion length of 3.5 inches versus the earlier 4.5 inches) and 90-101 (which is based on vibration data taken at the start of RO 13), and had no further concerns regarding this matter.

Closed IFI 89-23-02, Review Planned PM Schedule For AFW Components. This item addressed the concern that AFW pump cavitation damage and motor rotor bar cracking identified in 1989, could have been detected earlier through a more comprehensive PM program. As discussed in IR 91-15 the motor rotor bar cracking concern has evidently been resolved and monitoring of rotor bar condition is routinely being performed. The licensee also developed a comprehensive PM schedule for the AFW pumps, motors, and system

components. Included in the pump PM schedule are: overhaul/teardown, vibration analysis, flow checks, bearing inspections, and SDAFWP overspeed trip mechanism inspection. The AFW pump motors are scheduled for a rotating overhaul/teardown sequence which consists of the motor scheduled for refurbishment being replaced with the motor most recently refurbished. In addition, motor diagnostic analysis and vibration analysis will be regularly performed. Also scheduled for PMs are FCVs 1424, 1425, and 6416, and air operated valves. System Check valves and MOVs will be maintained in accordance with the MVMP. Additionally, system flow orifices will be replaced on a refueling intervals and SDAFWP steam traps and strainers will be inspected on the same interval. The inspectors verified that WRs have been generated for selected PM activities that are to be accomplished during the next RO. Based on the established schedule, this item is closed.

(Closed) VIO 89-23-04, Failure To Adequately Establish Measures For Suitability of Processes Essential To Safety-Related Functions As Required By 10 CFR 50 Appendix B Criterion III. This violation addressed two unrelated examples. The first example involved an incorrect application of Bernoulli's Equation in an AFW modification acceptance test procedure. The other example concerned a SW modification which did not adequately take into account the affects of the welding process utilized on the coal tar lined pipe. In the first example, the AFW acceptance test procedure was revised to account for elevation and velocity head losses, and the modified piping was retested with satisfactory results. With respect to the second example, subsequent coal tar fouling was detected in the SW tubes of containment fan coolers HVH 1-4. Immediate corrective actions, which are discussed in detail in IR 89-23, included such things as cleaning the HVH units and flushing the loose coal tar pieces from all affected piping (i.e., from the suction of the SW booster pumps to the outlet piping of the HVH units). The affected SW piping was subsequently replaced in RO 13. The inspector reviewed associated design deficiency reports (89-45 and 90-06) which were generated as a result of these two issues and considered the indicated post event reviews conducted with design personnel to be appropriate. This item is closed.

No violations or deviations were identified.

6. Exit Interview (30703)

The inspection scope and findings were summarized on August 13, 1991, 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.

Item Number	Description/Reference Paragraph
91-17-01	VIO - Failure to Adequately Establish Procedures as Required (paragraph 2).
91-07-02	VIO - Failure to Utilize a Work Request to Perform Maintenance Activities (paragraph 3).
91-17-03	NCV - Failure to Complete Procedure Usage Cover Sheet (paragraph 3).

7. List of Acronyms and Initialisms

a.m.	Ante Meridiem
AC	Alternating Current
AFW	Auxiliary Feedwater
BIT	Boron Injection Tank
CFR	Code of Federal Regulations
CVCS	Chemical Volume Control System
CVS	Chemical Volume System
EOF	Emergency Operations Facility
EOP	Emergency Operation Procedures
EPP	End Path Procedures
FCV	Flow Control Valves
FW	Feedwater
HVE	Heating Ventilation Exhaust
HVH	Heating Ventilation Handling
IFI	Inspector Followup Item
i.e.	That is
IR	Inspection Report
IVSW	Isolation Valve Seal Water
LCO	Limiting Condition for Operation
LOCA	Loss of Coolant Accident
MFRV	Main Feedwater Regulating Valve
MMM	Maintenance Management Manual
MOD	Modification and Design Control Procedure
MOV	Motor Operated Valve
MVMP	Managed Valve Maintenance Program
NAD	Nuclear Assessment Department
NCV	Non-cited Violation
NED	Nuclear Engineering Department
NOV	Notice of Violation
NRC	Nuclear Regulatory Commission
OST	Operations Surveillance Test
PIC	Process Instrument Calibration
p.m.	Post Meridiem
PM	Preventive Maintenance
PNSC	Plant Nuclear Safety Committee
RCDT	Reactor Coolant Drain Tank

RCS	Reactor Coolant System
RHR	Residual Heat Removal
RNP	Robinson Nuclear Project
RO	Refueling Outage
RTB	Reactor Trip Breaker
RTGB	Reactor Turbine
SDAFWP	System Driven Auxiliary FeedwaterPump
SI	Safety Injection
SO	Senior Operator
SP	Special Procedure
SW	Service Water
TS	Technical Specification
V & V	Verification & Validation
VAC	Volts Alternating Current
VIO	Violation
VOTES	Valve Operation Test And Evaluation System
W/R	Work Request
WR/JO	Work Request/Job Order