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

Report No.: 50-261/95-08

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: March 6-10, 1995

Inspector: G. MacDonald, Reactor Inspector — 4/7/95 Date Signed

Inspector: J. Starefos, Project Engineer — 4/7/95 Date Signed

Approved by: M. B. Shymlock, Chief, Plant Systems Section, Engineering Branch, Division of Reactor Safety — 4-7-95 Date Signed

SUMMARY

Scope:

This routine, announced inspection was conducted in the areas of Plant Operations and Engineering Followup.

Results:

A concern with the implementation of the new corporate procurement engineeering procedures was identified.

Violation 50-261/95-08-01 was identified for an inadequate Abnormal Operating Procedure, AOP-14, Attachment 1, Emergency Cooling To Charging Pumps (paragraph 2).

Inspector Follow-up Item 50-261/95-08-02, Incorporate Emergency Diesel Generator (EDG) 24 Hour Load Test Into Technical Specifications (TS), was opened to track the required EDG TS change (paragraph 3).

Enclosure 2

Violation 50-261/93-07-01, EDGs Not Tested At Nameplate Rating As Required By TS 4.6.1.1 was closed (paragraph 3).

Unresolved Item 50-261/94-23-04, Exhaust Air Quality Through ASCO Solenoid Valve was closed (paragraph 4).

Licensee Event Report 93-17-00, Degraded Condition Due to Non-Safety Fuses Installed in Engineered Safety Features Application was closed (paragraph 5).

The inspectors noted the beginning signs of polyvinylchloride wire insulation plasticizer breakdown in protective relays located in the EDG generator control panels and the emergency buses (paragraph 6).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*R. Barnett, Manager Testing, Technical Support
*J. Boska, Manager, Electrical/Instrumentation and Control Engineering
*J. Brown, Manager Design Engineering
*G. Castleberry, Manager Plant Electrical Engineering
*R. Crook, Senior Specialist Licensing/Regulatory Programs
*T. Fay, Manager, Balance of Plant, Technical Support
*M. Forrester, Manager Robinson Engineering Support Services Administration and Programs
*A. Garrou, Project Specialist Licensing and Regulatory Programs
*C. Gray, Manager Materials & Contract Services
*C. Hinnant, Vice President Robinson
*K. Jury, Manager Licensing and Regulatory Programs
*K. Jensen, Robinson Engineering Support Services Manager Technical Support/Nuclear Steam Supply System
*R. Krich, Manager Regulatory Affairs
*R. Lambert, Procurement Engineer Materials and Contract Services
*B. Meyer, Manager of Operations
*J. Morris, Manager Plant Instrumentation and Controls Engineering
*P. Musser, Manager Plant Operations Assessment
*G. Shampy, Materials and Contract Services Supervisor
*V. Smith, Operations Procedures
*R. Wehage, Subunit Manager, Robinson Engineering Support Services Mechanical Design
*L. Woods, Manager, Technical Support
*P. Yandow, Project Management Engineering Services
*D. Young, Plant General Manager

Other licensee employees contacted during this inspection included engineers, technicians, and administrative personnel.

Other NRC employees:

*C. Ogle, Resident Inspector
*W. Orders, Senior Resident Inspector

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

2. Plant Operations (IP 71707)

The inspectors reviewed Abnormal Operating Procedure AOP-014, Component Cooling Water System Malfunction, Revision 6, Attachment 1, Emergency Cooling to Charging Pumps and the associated portion of the CCW system flow diagram.

During review of the AOP, the inspectors questioned the procedure directions for cooling two charging pumps. AOP-014, Step 11, provides the option to supply cooling water to two charging pumps. If the choice

is for two pumps, the procedure provides direction to attach a T connection. The procedure then directs the user to select a pump to be used. After connection of one pump, the procedure directs the operator to "throttle open the emergency cooling water supply valve from the source selected." There was insufficient procedural guidance to the operator to connect a second pump to the other half of the T fitting.

The main body of AOP-014 incorporates headers (STEP, INSTRUCTIONS, RESPONSE NOT OBTAINED) on each page to columnize the procedure. Although the procedural attachment was not consistent with the main body, in that the headings were not used in the attachment, it was evident that this attachment was of the two column procedure format. This was evidenced in Attachment 1 by a second (right) column with direction which was consistent in most cases with a no answer to the instructions provided in the left column. AOP-014, Attachment 1, Steps 13 a, b, and c, did not follow the two column format in that the direction in the right column required a yes response to the instructions in the left column. Specifically, Step 13 a. instructed "check pump to be used-CHARGING PUMP A," if the answer was no, you were directed by the second column to "go to step 14." Step 14 was instructions for the use of charging pump A. This procedural attachment could not be performed as written.

Technical Specification 6.5.1.1 Procedures, Tests, and Experiments requires, in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in Appendix "A" of Regulatory Guide 1.33, Rev. 2, February 1978. Regulatory Guide 1.33, Appendix A, requires Procedures for Combating Emergencies and Other Significant Events, specifically Loss of Component Cooling System and Cooling to Individual Components.

The inspectors determined that Abnormal Operating Procedure AOP-014, Component Cooling Water System Malfunction, Revision 6, Attachment 1, Emergency Cooling to Charging Pumps, was inadequately maintained in that it could not be performed as written. This is identified as a violation of Technical Specification 6.5.1.1: Inadequate AOP-014 Attachment 1 (50-261/95-08-01).

In addition, the inspectors noted an incorrect valve identifier existed in Step 19 a. The valve should have been identified as "CC-862D, CC from chg pump A oil cool drain," when, in fact, it had been identified as "CC-862A, CC to chg pump A oil cool drain." The licensee had previously identified this incorrect identifier as a typing error with no need for an immediate change to the procedure even though the incorrect valve number, CC-862A, is a valve which is manipulated in another portion of this attachment if charging pump A is selected.

A walkdown of the as-built configuration of components associated with Attachment 1 was also performed. Some minor differences were noted between the field configuration and the portions of the CCW system flow diagram. The diagram did not reflect all pipe caps and connectors which

were located in the field. The contents of a lock box placed outside of the charging pump room appeared to be adequate.

3. Engineering Followup (IP 92903)

(Closed) VIO 50-261/93-07-01, Emergency Diesel Generator Loading

The inspectors reviewed the licensee's activities related to violation 50-261/93-07-01, EDGs Not Tested At Nameplate Rating As Required By TS 4.6.1.1. In response to the violation, the licensee stated that they would perform testing which would demonstrate the EDG's ability to carry accident KW and KVA loadings. The licensee indicated that this testing would be completed prior to the end of refueling outage 15.

The licensee submitted an amendment to the NRC for TS 4.6.1.1 and TS 4.6.1.4 to allow EDG testing to exceed the EDG continuous load rating. NRC SER dated October 5, 1993, approved TS amendment 147 to Facility Operating Licensee No. DPR-23. The SER determined that the EDG's capability to carry accident loads needs to be demonstrated. Further, the SER indicated that the demonstration should be performed as part of a 24-hour run test during each refueling outage at a power factor range of 0.8 to 0.9. The SER interpretation required that the EDG should be tested at a specific KW (2500kw) and a power factor of 0.8 to 0.9 in its refueling surveillance testing.

The SER indicated that the licensee has committed to implement a new TS that will specify testing during every refueling outage with a proper power factor to demonstrate the EDG's ability to carry accident loads.

The licensee has not submitted the proposed TS for the refueling interval 24-hour EDG surveillance at a power factor range of 0.8 to 0.9. The inspectors determined that a proposed TS revision was in process but had not been approved for submittal to NRC. The proposed TS change was submitted by engineering to regulatory compliance in August 1994 and was still in regulatory compliance under review.

Operations Surveillance Test Procedure OST-410, Emergency Diesel Generator "A" (Twenty Four Hour Load Test) (Refueling), revision 0 and OST-411, Emergency Diesel Generator "B" (Twenty Four Hour Load Test) (Refueling), revision 0 were prepared to perform the refueling interval 24 hour load tests of EDG A and B respectively. The A EDG was tested on October 21, 1993, as described in NRC Inspection Report 50-261/93-23. The B EDG was tested on October 23, 1993. Both EDG 24 hour tests were completed during refueling outage 15.

The inspectors reviewed the EDG Load Analysis Summary RNP-E-8.016 Revision 5, page 32 and confirmed that procedures OST-410 and OST-411 test acceptance criteria enveloped the accident analysis EDG loading. The 24 hour load test results for EDG B were reviewed. The inspectors confirmed that the data met the test acceptance criteria and demonstrated that the EDG could carry the LOCA/LOOP accident loads.

Refueling outage 16 EDG 24 hour load tests were scheduled for May 12-13, 1995, for EDG A (OST-410) and May 19-20, 1995, for EDG B (OST-411). The licensee has not yet revised the TS to incorporate the refueling interval EDG 24 hour load test surveillance requirement. Inspector Follow-up Item 50-261/95-08-02, Incorporate EDG 24 Hour Load Test Into TS Surveillance Requirements, was opened to track the TS revision.

Based on the satisfactory completion of 24 hour EDG load tests which demonstrated that the EDGs could carry LOCA/LOOP accident loads, violation 50-261/93-07-01 is considered closed.

3.1 (Closed) URI 50-261/94-23-04, Exhaust Air Quality Through ASCO Solenoid Valve

On September 8, 1994, the Resident Inspector witnessed maintenance on control room exhaust damper CRD1A which included replacement of the ASCO solenoid valve in the instrument air line to address a delay observed in the damper operation. EE 94-133, Equivalency Evaluation For Control Room Damper Solenoid Valves SV-6521 and SV-6522, dated September 7, 1994, was performed to allow the use of replacement ASCO solenoid valves in the control room damper control circuit which had Ethylene Propylene elastomers, different from the Viton elastomers previously installed. The EE was reviewed by the Resident Inspector and it was concluded that the EE failed to adequately address the impact of known instrument air contaminants documented in existing test results on the replacement solenoid valve. This was documented as a weakness in IR 50-261/94-23.

On September 14, 1994, the licensee received information from the vendor which included a statement which addressed "ASCO solenoid valves in nuclear power plant applications [which] serve as pilots." It stated, "The quality of the air flowing through the ASCO valve during the exhaust cycle as well as the pressurization cycle should meet the above recommendations."

On September 15, 1994, the Resident Inspector questioned the licensee on their compliance with the ASCO recommendation on exhaust air quality given the observed oily residue in the actuators air connection. [Reference IR 94-23]

On October 7, 1994, a CP&L Laboratory Services Section Metallurgy Unit Technical Report was issued discussing the failure analysis of the valve containing Viton elastomers which was removed during the September 8, 1994, maintenance evolution. The project summary of the report stated, "The cause of failure for the submitted solenoid operated valve...is sticking of the core assembly to the solenoid base subassembly plug nut due to degradation of silicone lubricant." It also states, "Analysis of samples from the SOV showed evidence that aliphatic hydrocarbons have probably been transferred from the actuator to the SOV. ...the use of SOV's having EPDM elastomers should be avoided because of the known propensity of EPDM to be degraded by hydrocarbons." The body of the report (Table 2) further states that in the samples identified as SOV Body Deposits and Exhaust Orifice Deposits, Fourier Transform Infrared

Analysis Results showed "phenyl methyl silicone with possibly aliphatic hydrocarbons present." In addition, Deposits from Inside Tubing showed "oxidized aliphatic hydrocarbons."

The work ticket was initiated on October 10, 1994, to replace the solenoid valves associated with control room dampers CRD1A and CRD1B and listed this work as a priority 3. An order for three solenoid valves was placed November 17, 1994. On December 13, 1994, the licensee received the order for the three solenoid valves with viton seals. On January 3, 1995, the three solenoid valves were receipt inspected.

On March 10, 1995, the solenoid valves, associated with control room dampers CRD1A and CRD1B, were replaced with valves with viton seals.

Based upon the facts reviewed, the inspectors concluded that the control room exhaust damper CRD1A solenoid valve could have been replaced in a more timely manner. The inspectors perceived the information in the Metallurgy Unit Technical Report as justification for a timely removal of the solenoid valve with the EPDM elastomer. However, the licensee stated that they continued to test the dampers on a biweekly basis in accordance with OST-750 and the valves "have continued to pass satisfactorily."

The licensee initiated CR 95-00677 on March 10, 1995, to address the inadequacy of EE 94-133, particularly that the EE "did not fully address the operating environment of the SOV."

Based upon the replacement of the valves and the event having been entered into the corrective action program in the form of a CR which addresses deletion of EE 94-133, this item is considered closed.

3.2 (Closed) LER 93-17-00, Degraded Condition due to Non-Safety Fuses Installed in Engineered Safety Features Application

This LER addressed a degraded condition due to the installation of inappropriately downgraded fuses in the B Instrument Inverter. This inappropriate downgrading occurred during the procurement process. It appears the fuses were originally ordered from the vendor as a quality grade product, but were downgraded to "Augmented Quality Non-Safety Related" following a telephone conversation between the licensee and the vendor. The licensee discovered on November 11, 1993, that four of these fuses (purchased in January, 1991) were installed in the B Instrument Inverter, a safety related component, during the Fall 1993 Refueling Outage. The licensee subsequently dedicated the fuses purchased in January 1991.

The licensee's corrective actions included, but were not limited to, the following: initiated Adverse Condition Report 93-288; addressed "acceptability of the fuses installed in the "B" Inverter" through Engineering Evaluation EE-93-198; determined that the B Instrument Inverter was the only place that the fuses from this Purchase Order were installed; trained Procurement Engineers; and revised "Procurement

Engineering procedures...to require System Engineer reviews of downgrading."

Regarding the last of the corrective actions listed above, the licensee revised Procurement Engineering procedure PE-010, Part Functional Classification. Revision 5 of procedure PE-010 was identified as the revision where the corrective action was included. Procurement Engineering procedure PE-010, Revision 6, states "An evaluation which downgrades a part currently classified as safety-related to augmented quality or nonsafety-related shall also be reviewed with Technical Support." Site Procurement Engineering no longer used their PE procedures due to corporate issuance of a new general procedure MCS-01, Material Acquisition. The new MCS procedure did not include the site specific committment for System Engineer reviews of downgrading. The 10 CFR 50.59 review of MCS-01 indicated that this procedure and associated TI procedures would replace previous site/corporate procedures. The following concerns were identified: interface process between the new procedures and site specific procedures; how site specific commitments would be addressed/implemented in the new procedure; and potential generic implications due to these corporate procedures being implemented at other CP&L sites. The licensee initiated a H. B. Robinson site CR to address the site specific commitment issue.

This LER is closed.

3.4 NRC Information Notice 94-78, PVC Wiring in Protective Relays

The inspectors noted PVC wiring insulation breakdown on the wiring inside the protective relays located on the EDG A and B generator control panels. NRC Information Notice IN 94-78 documented a Westinghouse protective relay failure due to the breakdown of the PVC insulation on the relay internal wiring resulting in a release of the PVC plasticizer which fouled the relay contact surfaces.

The licensee performed a technical evaluation of IN 94-78 and recommended that the technical evaluation be routed to I&C Electrical personnel. The technical evaluation also indicated that all the procedures for Westinghouse relays with PVC wiring would incorporate a requirement to inspect the relays for signs of green oily substance.

The inspectors noted the beginning of the PVC breakdown phenomenon which was evident by the shiny patches on the surface of the relay internal wiring insulation. The wiring was identified to be the same type described in IN 94-78. The protective relays which were identified as exhibiting the beginning of PVC plasticizer breakdown were:

EDG A 51 V-A	Overcurrent with voltage restraint relay (located on EDG A Generator Control Panel)
EDG B 51 V-B	Overcurrent with voltage restraint relay (located on EDG B Generator Control Panel)

UV relay 271	480 Volt Bus E1 undervoltage relay (located on 480 Volt Bus E1)
UV relay 271	480 Volt Bus E2 undervoltage relay (located on 480 Volt Bus E2)

The plasticizer had not accumulated to levels where it was visible at the ends of the wires and it was not collecting near the relay contacts and thus did not pose an immediate operability concern. The licensee was tracking this issue as Rail item No. 95R0053.

4. Exit Interview

The inspection scope and findings were summarized on March 10, 1995, with those persons indicated in paragraph 1. The licensee did not identify as proprietary any material provided to the inspectors and proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

Item Number	Status	Description
VIO 50-261/95-08-01	Open	Inadequate AOP-14 Attachment 1
IFI 50-261/95-08-02	Open	Incorporate EDG 24 Hour Load Test Into TS Surveillance Requirements
VIO 50-261/93-07-01	Closed	EDGs Not Tested At Nameplate Rating As Required By TS 4.6.1.1
URI 50-261/94-23-04	Closed	Exhaust Air Quality Through ASCO Solenoid Valve
LER 50-261/93-17-00	Closed	Degraded Condition Due To Non Safety Fuses Installed in ESF Application

5. Acronyms and Abbreviations

ACR	Adverse Condition Report
AOP	Abnormal Operating Procedure
CCW	Component Cooling Water
CP&L	Carolina Power and Light
CR	Condition Report
EDG	Emergency Diesel Generator
EE	Equivalency Evaluation
EPDM	Ethylene Propylene Elastomer
ESF	Engineered Safety Features
IFI	Inspector Follow-up Item
IN	Information Notice
IP	Inspection Procedure
IR	Inspection Report
KVA	Kilovolt Amperes
KW	Kilowatts

LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
MCS	Materials and Contract Services
NRC	Nuclear Regulatory Commission
OST	Operations Surveillance Test
QA	Quality Assurance
RAIL	Regulatory Action Item List
RMP	Records Management Procedure
RNP	Robinson Nuclear Plant
SER	Safety Evaluation Report
SOV	Solenoid Operated Valve
TI	Topical Instruction
URI	Unresolved Item
VIO	Violation