



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

Report No.: 50-261/93-17

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 19-23, 1993

Inspector: S. B. Rudisail
S. Rudisail

8/5/93
Date Signed

Accompanying Personnel: N. Salgado

Approved by: M. Shymlock
M. Shymlock, Chief
Plant Systems Section
Engineering Branch
Division of Reactor Safety

8-10-93
Date Signed

SUMMARY

Scope:

This routine announced inspection was conducted in the area of electrical maintenance to assess the scope and implementation of the switchyard circuit breaker replacement modification.

Results:

The licensee had given an appropriate level of attention to risk management for the 230 kV switchyard circuit breaker replacement project. The inspectors observed performance of work in the switchyard, and considered the implementation of the risk management effort satisfactory. In the areas inspected, violations or deviations were not identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- J. Benjamin, Shift Outage Manager
- *B. Clark, Manager, Maintenance
- C. Coffman, System Engineer
- *D. Crook, Senior Specialist Regulatory Affairs
- *C. Dietz, Vice President, Robinson Nuclear Project Department
- *W. Flanagan, Jr., Acting General Manager
- *D. Gause, Senior Engineer, Technical Support
- J. Jenkins, Systems Planning
- T. McNamara, Senior Engineer, Technical Support, Electrical
- J. Prim, Senior Staff Engineer Transmission Maintenance
- C. Pritchard, Senior Control Operator
- *M. Scott, Manager, Technical Support (Acting)
- *R. Wallace, Manager, Operations (Acting)
- *K. Williams, Project Engineer, Technical Support
- *C. Winters, Manager, Shift Operations (Acting)

Other licensee employees contacted during this inspection included craftsmen, engineers, operators, and technicians.

NRC Employees

- *M. Ernstes, NRC, Operator Licensing, Section Chief
- *W. Orders, Senior Resident Inspector
- *C. Payne, Senior License Examiner

* Attended Exit Interview

Acronyms and abbreviations are listed in paragraph 9.

2. Electrical Maintenance (62705)

Scope of the Switchyard Circuit Breaker Replacement Modification

The Carolina Power and Light (CP&L) Transmission Department is replacing all twelve 230 kV oil circuit breakers (OCBs) in the Robinson 230 kV switchyard. Ten of the 230 kV circuit breakers are utilized for control and protection of the transmission system. Two of the circuit breakers are used for control of the output from the Robinson Nuclear Plant (RNP) main generator. The OCBs are being replaced with two cycle, independent pole, gas circuit breakers (GCBs). The circuit breakers are being replaced to improve the grid system stability around the Robinson and Darlington generating plants. The Darlington plant consists of a series of combustion turbine generators within close proximity to the Robinson plant. Because of the large generation capacity in this area, analyses by system planning personnel demonstrated a need to reduce the

circuit breaker clearing times to improve system stability. The new circuit breaker have a two cycle clearing time versus a three cycle clearing time for the OCBs.

Prior to the circuit breaker replacement the foundation work for the circuit breakers was completed. The new GCBs required a larger foundation. The existing foundations were extended to accommodate the GCBs dimensions.

After completion of the foundation work, new potential transformers were installed which required independent, but consecutive East and West 115 kV Bus outages to complete the station service conversion.

3. Risk Management

The licensee performed a review of past switchyard events which have occurred throughout the nuclear industry. Based on the results of this review, the licensee developed a risk management program for the switchyard modification project. This program established initiatives to minimize the possibility of similar switchyard events from occurring at the RNP. Some of the features specifically addressed to enhance risk reduction were project management, communications, coordination of personnel and equipment in the switchyard, and work planning.

A Project Coordinator was assigned responsibility for the switchyard modification. The project coordinator was responsible for interfacing between the Transmission Department and RNP operations personnel. The Project Coordinator attended the daily control room briefings, and communicated the scope of work being performed each day in the switchyard to operations personnel. The briefing highlighted which breakers would be taken out of service or placed back in service, tests which would be conducted during the day, and movement of any heavy vehicles within the switchyard. The Project Coordinator was also responsible for personnel and vehicle entry in the switchyard.

The risk posed by movement of vehicles and equipment within the switchyard was reduced by monitoring the crane clearances during crane movement, minimizing use of the crane, ground guides for heavy vehicle movement, and mandatory backing guides.

4. Schedule of Gas Circuit Breaker Installation

The licensee was progressing ahead of schedule with the 230 kV GCBs installation project. The following GCBs have been installed: 52/3, 52/12, 52/6, 52/10, 52/1, 52/2, and 52/4. No switchyard problems have resulted from the replacements.

The circuit breaker replacement project will be complete when the following GCBs are installed: 52/5, 52/11, 52/9, 52/8, and 52/7. The generator breakers 52/9 and 52/8 will be replaced during RFO 15 which is scheduled to begin in September 1993. Outage planning personnel will provide a time-frame on the schedule for the generator GCBs

installation. Outage planning will ensure that the EDG maintenance does not coincide with the generator GCBs installation.

5. Observations

During this inspection period, the inspectors observed work performed in the switchyard. The inspectors attended the daily briefings. The scope of the briefings were adequate to convey the extent of work performed that day and any special precautions needed.

The inspectors observed circuit breaker 52-2 being placed back in service after installation of the new breaker. Prior to placing the breaker back in service, breaker performance testing was performed. A representative from the GCB vendor, High Voltage Breakers Incorporated (HVBI) was in the switchyard during the performance of the testing. The tests performed were to demonstrate that speed and timing of the breakers were within the manufacturer's tolerances. Stroke, velocity, and wipe were the parameters which were recorded during the test using a Doble testing apparatus. The circuit breaker parameters were measured for four different breaker operations. The four operations were open, close, re-close (open then immediately close), and trip free (close then immediately open).

After completion of the manufacturer's testing, Transmission Department personnel performed other tests to ensure proper installation and operation of the circuit breaker. These included a power factor test and meggering as appropriate to verify integrity of insulation and bushings. Additionally, all wiring was verified correct and metering and alarm functions were tested. The breaker was then placed back in service.

The inspectors observed OCB 52-5 being removed from service. Proper tagging, verification, and clearances were observed. The inspectors witnessed the preparation for the removal of the oil from the circuit breaker. Proper escorts and guides were utilized when the oil tanker truck was brought into the switchyard.

The inspectors noted that on July 19, 1993, that operations personnel were performing Preventative Maintenance (PM) on the "A" emergency diesel generator. Through proper coordination between operations and transmission maintenance personnel, no critical work was allowed to be performed in the switchyard during this evolution.

6. Modification Development

The inspectors reviewed the preliminary modification, M-1133, Replace 230 kV Generator Breakers, which will cover activities associated with the plant controls for generator breakers 52-8 and 52-9. Transmission personnel will be performing all work involving the circuit breaker installations. However, RNP maintenance personnel will be installing the cables for the circuit breaker controls.

7. Follow-up on Previous Inspection Findings (92701)

(Open) Violation 92-25-01: Inadequate Procedural Guidance For Operation of 4kV Breaker 52/12.

The licensee responded to Violation 92-25-01, and acknowledged that it occurred as described in the Notice. As part of their corrective action, ACR 92-340 was initiated to determine the root cause, and recommend corrective actions. The inspectors reviewed ACR 92-340. The licensee had not completed any of the ACR 92-340 recommended corrective actions. All corrective actions should be achieved by the established completion dates documented on the associated corrective action assignment forms. This item will remain open.

(Open) IFI 92-25-02: Weak Work Control And Modification Control In The Switchyard Equipment.

The licensee's action to review control of modifications on switchyard equipment was not complete. The review should be complete by September 1, 1993. This item will remain open.

(Open) IFI 92-25-03: Startup Transformer Reliability Improvements

The licensee had not completed it's engineering evaluation of weatherproofing specific types of equipment such as the main transformer, auxiliary transformer, and startup transformer. The evaluation should be complete prior to RFO 15. This item will remain open.

(Closed) IFI 92-25-04: Offsite Power Backfeed Procedure Unsuitable For LOSP Conditions

The inspectors reviewed the revised procedure, OP-603, Electrical Distribution. The licensee had incorporated the necessary guidance for backfeeding via the main and auxiliary transformers following a LOSP condition with the startup transformer unavailable. This item was closed.

8. Exit Meeting

The inspection scope and results were summarized on July 23, 1993, with those persons indicated in paragraph 1. The inspectors described those areas inspected. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

9. Acronyms and Abbreviations

ACR	Adverse Condition Report
CP&L	Carolina Power And Light Company
GCB	Gas Circuit Breaker
HVBI	High Voltage Breakers Incorporated
IFI	Inspector Follow-up Item
kV	Kilo-Volts
LOSP	Loss Of Offsite Power
OCB	Oil Circuit Breaker
PM	Preventative Maintenance
RNP	Robinson Nuclear Plant
RFO	Refueling Outage