



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA ST., N.W., SUITE 3100  
 ATLANTA, GEORGIA 30303

Report No. 50-261/81-31

Licensee: Carolina Power & Light Company  
 411 Fayetteville Street  
 Raleigh, NC 27602

Facility Name: H. B. Robinson Steam Electric Plant

Docket No. 50-261

License No. DPR-23

Inspection at H. B. Robinson site near Hartsville, South Carolina

Inspector: C. Julian for 11/24/81  
 S. Weise Date Signed

Approved by: C. Julian for 11/24/81  
 C. Burger, Section Chief, Division of Resident and Reactor Project Inspection Date Signed

SUMMARY

Inspection on October 19 - November 10, 1981

Areas Inspected

This routine announced inspection involved 116 resident inspector-hours on site in the areas of technical specification compliance, plant tour, operations performance, reportable occurrences, housekeeping, site security, surveillance activities, maintenance activities, quality assurance practices, radiation control activities, outstanding items review, IE Bulletin, Circular, Notice followup, event followup, and fire protection.

Results

Of the fourteen areas inspected, no violations or deviations were identified in thirteen areas; one violation was found in one area (Failure to follow procedures, paragraph 5.f.).

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## DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*R. B. Starkey, Plant General Manager
- \*F. Lowery, Operations Supervisor Unit 2
- \*F. Gilman, Senior Specialist Regulatory Compliance
  - A. Eaddy, Environmental and Chemistry Supervisor
  - R. Chambers, Maintenance Supervisor Unit 2
- \*S. Crocker, Manager, Environmental and Radiation Control
- \*C. Wright, Specialist Regulatory Compliance
  - A. McCauley, Principal Engineer Onsite Nuclear Safety
- \*J. Curley, Manager, Technical Support
- \*C. W. Crawford, Manager, Operations and Maintenance

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

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on November 9, and 10, 1981, with those persons indicated in Paragraph 1 above. The licensee acknowledged the violation and stated that corrective action was in progress.

### 3. Licensee Action on Previous Inspection Findings

Not inspected.

### 4. Unresolved Items

Unresolved items were not identified during this inspection.

### 5. Plant Operations Review

- a. The inspector periodically during the inspection interval reviewed shift logs and operations records, including data sheets, instrument traces, and records of equipment malfunctions. The review included control room logs, auxiliary logs, operating orders, standing orders, jumper logs and equipment tagout records. The inspector routinely observed alertness and demeanor during plant tours. During abnormal events, operator performance and response actions were observed and evaluated. The inspector conducted random off-hours inspections during the reporting interval to assure that operations and security remained at an acceptable level. Shift turnovers were observed to verify that they were conducted in accordance with approved licensee procedures.

- b. On October 14, 1981, an auxiliary operator touring containment identified and reported what appeared to be a service water leak on the fan cooler of Reactor Containment Fan HVH-2. The plant was at 50% power. Due to the potential for an unmonitored and/or uncontrolled release in the event of a LOCA (as identified in the licensee's response to IE Bulletin 80-24 and LER 81-02), the licensee committed to treating service water leaks inside containment as a degradation of the containment boundary. This operating policy was transmitted to all Shift Foremen, Senior Control Operators, and Control Operators via a February 2, 1981, memorandum from the Operating Supervisor. This memorandum prescribed four actions following identification of such a service water leak. One action was to commence a plant shutdown to cold shutdown until the leak is isolated. No such operator action was taken until October 15, when a log review revealed that actions had not been taken as prescribed by the memorandum. A plant shutdown was commenced until the HVH-2 service water lines were isolated. Followup actions were taken and the NRC notified. After inspection of the cooler, including performance of a 50 pound air drop test, and pressurization of the service water lines to the static head of the service water booster pump, the licensee determined that there was no cooler leak. The water on the cooler was determined to have been condensation.

The inspector noted two concerns from this event:

- (1) The February 2, 1981 memorandum was not specifically addressed to auxiliary operators or shift engineers. The Operating Supervisor has since re-routed the above memorandum above to reemphasize the required actions.
- (2) A system has not been implemented to incorporate memoranda with significant plant safety ramifications into the plant operating manual.

Based on item 2, the inspector reviewed memoranda disseminated to plant operations personnel over the last two years and identified two memoranda that appear to need incorporation into the plant operating manual:

- (1) Concerning the February 2, 1981 memo previously discussed, licensee has indicated that this information will be incorporated in Abnormal Procedure -23, Loss of Containment Integrity.
- (2) There is a July 29, 1981 memo to all Shift Foremen advising them not to defeat the rod position indication runback feature above 70% power. This item is covered by an Operations Work Procedure (used for major maintenance) but is not addressed in the system operating procedure or in the precautions and limitations documents.

Licensee memorandum such as the above are routed to selected operations personnel and filed in the Operating Supervisor's files. Copies of memorandum having long term plant operations impact are not filed in the control room for periodic review, therefore incorporation in the plant operating manual appears necessary. The inspector is concerned that lack of formal promulgation of changes in plant operations contributed to the HVH-2 operator action error and has the potential to lead to future operator errors. This is an open item. (50-261/81-31-01).

- c. On November 1, 1981, with the reactor at 50% power, operators noted an abnormal increase in Waste Holdup Tank level and found that the containment sump pumps were cycling on at a higher than expected rate. A containment entry was made and a 35 gpm leak on a strainer in the fire suppression water system was identified. The leak was isolated by shutting the fire water suppression system containment isolation valves, which secured water to all containment fire hose stations and the reactor coolant pumps fire suppression system. The system was inoperable for about three hours while the strainer O-ring was repaired. The inspector reviewed and had no questions concerning the licensee's corrective actions. The inspector is concerned however, that the fire suppression water system does not appear to meet the single failure criteria since the failure of one strainer rendered the suppression water system and all fire hose stations in containment inoperable. This information was discussed with the NRC Regional fire protection inspector and is previous unresolved item 50-261/80-26-04.
- d. The unit was shutdown on November 6, 1981, for a planned two week outage. Outage work included a differential pressure test of the steam generator tubes to verify integrity, a modification to the Engineered Safety Features reset circuitry to correct deficiencies discussed in Inspection Report 50-261/81-26, and a modification to the plant T-average control scheme and associated protective and control system setpoint changes. NRR is presently reviewing the licensee's proposed Technical Specification Changes associated with the T-average setpoint modification.
- e. On November 8, 1981, with the plant shutdown and being cooled down, operators attempted to release 'C' Waste Condensate Tank (WCT). An alarm was received on the liquid waste radiation monitor which automatically terminated the release. About 16 gallons of water containing  $3.87 \times 10^{-4}$  micro ci-/ml gross activity and  $2.13 \times 10^{-3}$  micro ci-/ml tritium was released at a rate of 20 gpm. For this activity, the release was less than that allowed by 10 CFR 20 Appendix B. This event was reported as an unplanned release pursuant to 10 CFR 50.72. Investigation revealed that the release occurred due to confusion between the auxiliary operator and the chemistry technician. 'C' WCT contained more waste condensate than the other two tanks and was intended to be reprocessed. 'E' WCT was the tank scheduled to be released and was, in fact, the tank sample for the release. Lack of knowledge of WCT valve arrangements for sampling contributed to the

chemistry technician sampling 'E' WCT, but making out the release document for 'C'. The procedures used for liquid releases, Operating Procedure -34 and Environmental Surveillance Procedure-3, require that the operator performing the lineup and the chemistry technician coordinate to ensure the proper tank is released.

Apparently, sufficient communications between the auxiliary operator and the chemistry technician did not occur. Additionally, the Shift Foreman did not identify the error due to confusion over whether 'C' WCT was to be reprocessed or released. The licensee has taken interim action to require more formal control of waste releases. The inspector considers the major causes of this event to be due to poor communication between the plant personnel involved and lack of positive Shift Foreman control over tanks to be released. The licensee has indicated that changes to the plant operating manual will be developed to prevent recurrence of this event. Training for Environmental and Chemistry Control personnel will be held on this event and on the operation and sampling of liquid and gaseous waste tanks. Until the above corrective actions are completed, this is an inspector followup item (50-261/81-31-05). The release was of no significant safety or environmental impact, and the radiation monitor protective system operated as required to stop the release.

- f. On November 8, 1981, with the plant shutdown and being cooled down with a bubble in the pressurizer, the operators transferred cooldown control to the Residual Heat Removal (RHR) system and experienced difficulties controlling RHR flowrate and, ultimately, cooldown rate. The operators shut the RHR return valves to the cold legs after the cooldown rate approached 70°F/hour. This cooldown rate exceeded the licensee's administrative cooldown rate limits of General Procedure-6, but did not violate the Technical Specification limit of 100°F/hour. Investigation revealed that RHR-764, the bypass valve for the RHR heat exchanger outlet flow controller, was locked open and should have been locked shut. Positioning of this valve is controlled by RHR system valve checkoff list OP-38A. This valve lineup was completed by a qualified auxiliary operator who did not reposition the valve as required. This valve is the only valve on OP-38A that has its position changed. Failure to highlight this change may have contributed to the error. The operator's failure to follow procedures is a violation (50-261/81-31-04). Discussions with the licensee indicate that valve checkoff lists will be reviewed and corrective action taken to clarify when valves are to be re-positioned. Additionally, the significance of valve lineups will be stressed with operations personnel.

## 6. Technical Specification Compliance

During this reporting interval, the inspector verified compliance with selected limiting conditions for operation (LCOs) and reviewed results of selected surveillance tests. These verifications were accomplished by direct observation of monitoring instrumentation, valve positions, switch positions, and review of completed logs and records. The licensee's

compliance with selected LCO action statements were reviewed as they happened.

#### 7. Plant Tour

The inspector conducted plant tours periodically during the inspection interval to verify that monitoring equipment was recording as required, equipment was properly tagged, operations personnel were aware of plant conditions, and plant housekeeping efforts were adequate. The inspector insured that appropriate radiation controls were properly established, excess equipment or material was stored properly, and combustible material was disposed of expeditiously. During tours the inspector looked for the existence of unusual fluid leaks, piping vibrations, pipe hanger and seismic restraint abnormal settings, various valve and breaker positions, equipment clearance tags and component status, adequacy of firefighting equipment, and instrument calibration dates. Some tours were conducted on backshifts. The inspector performed major flowpath valve lineup verifications and system status checks on the following systems:

- a. Selected containment isolation valves
- b. Emergency Diesel Generators
- c. Containment Spray System
- d. Safety Injection System

The inspector noted no violations or deviations.

#### 8. Physical Protection

The inspector verified by observation and interview during the reporting interval that measures taken to assure the physical protection of the facility met current requirements. Areas inspected included the organization of the security force, the establishment and maintenance of gates, doors and isolation zones in the proper condition, that access control and badging was proper, that search practices were appropriate, and that escorting and communications procedures were followed.

#### 9. Nbfd Relay Failures

(Open) Open item 80-18-01. This item concerns the ongoing failure of Nbfd relays used in the Reactor Protection System (RPS). On December 3, 1980, Westinghouse, the relay supplier, provided CP&L with an interim report of their investigations of the relay failures. The condition that appears to be causing the problem is that the starting lead is either touching or very close to the outer layers of the relay coil. This is apparently due to a combination of the insulation between the soldered pigtail leads and the coil windings being of insufficient voltage rating and the existence of sharp solder points on the pigtail leads. The proximity of the start lead in conjunction with the high voltage generated when the relays are de-energized causes an internal short in the coil. Westinghouse indicated that manufacturing changes would be made to rectify the problems. Since March, 1980, Robinson's RPS has had 20 Nbfd relay failures that appear

attributable to the coil failure mechanism. All the relays have been normally energized and have failed-safe, that is, the failure would not prevent required safety circuit actions. The new style relays were received onsite in August, 1981, and all Nbfd relays in the RPS Logic Trains (about 20 relays) were replaced in late August.

On October 16, 1981, Westinghouse notified CP&L of a potential substantial safety hazard concerning Nbfd relay performance. Although all Nbfd relay failures reported to Westinghouse have been in normally energized relays, the failure mechanism is possible in a normally de-energized relay. This type coil failure in a normally de-energized relay could result in prevention of required safety circuit actions under certain conditions. Due to the potential safety hazard, Westinghouse recommended that normally de-energized relay coils be tested for continuity immediately and that plant test procedures be amended to require a continuity test after any cycling of the relays. In the interest of plant availability, Westinghouse recommended that normally energized relays be inspected visually to insure re-energization after relay cycling. Additionally, Westinghouse stated that the new style relays should not be susceptible to this coil failure.

During the week of October 19, 1981, CP&L institutes a program to identify all affected Nbfd relays in protection or safeguards circuitry, so that the Westinghouse recommendations could be applied. Licensee personnel identified 66 normally energized Nbfd relays in the RPS, 19 normally de-energized Nbfd relays in the RPS, and 14 normally de-energized Nbfd relays in the safeguards circuitry. Of the 99 relays checked/tested, one normally energized relay had failed. The licensee is developing a new periodic test (PT) to require the Westinghouse-recommended post-testing actions. This PT will be implemented until all affected Nbfd relays are replaced with the new style relay.

#### 10. Onsite Spill of Radioactively Contaminated Liquid

On October 27, 1981, a 20,000 gallon portable storage tank containing decontamination cleaning solution began leaking through a defective weld. The tank contained an estimated 20 mCi of cobalt-60 at a maximum concentration of about  $3 \times 10^{-4}$  micro Ci/ml. of solution. A retaining wall was immediately constructed to contain the approximately 5000 gallons released over several hours. An area of about 3500 square feet around the tank was contaminated. No offsite release of radioactivity occurred. The decontamination solution remaining in the tank plus about 2500 gallons of the spilled solution was transferred to a replacement tank. The licensee has monitored the spill site, and the inspector will verify that CP&L disposes of contaminated soil and the cleaning solution consistent with regulatory requirements. The spill was of no significant safety or environmental impact.

#### 11. Environmental Protection

The inspector toured selected environmental monitoring stations inside and outside the plant site boundaries to verify that monitoring equipment is

installed and operational. In addition, the inspector observed the licensee's sample collecting techniques and preventive maintenance activities on equipment in the field. The latest semiannual environmental report was reviewed with respect to completeness and any adverse trends. No violations or deviations were identified.

12. Review of IE Bulletin 80-24, Prevention of Damage Due to Water Leakage Inside Containment

The inspector reviewed the CP&L response to this Bulletin dated January 19, 1981, and a plant memorandum dated February 2, 1981. Through review of the Plant Operating Manual, Modification Package 445-0, Modification Package 525, and plant Controlled Wiring Diagrams (CWDs) and through discussions with licensee personnel, the inspector determined that the licensee had provided the desired information in their response. However, the inspector discovered several areas of concern, as discussed below.

- a. Paragraph 2.c. of the Bulletin required the licensee to verify or establish at least monthly surveillance procedures to assure plant operators have at least two methods of determining water level per location where water may accumulate. In the containment keyway sump, the licensee has two separate level switches which provide indication of sump water level of 0.5 foot. Additionally, a 600,000 gallon Containment Water Level Measuring System (CWLMS) has been installed per NUREG 0578. The CP&L response indicates that monthly surveillance on the water detection systems are not possible because the equipment is in high radiation areas during power operation and are not necessary for several reasons. A review of the CWLMS shows that open or short circuits in the leads from the system to the control room indication can cause a failed-low level indication, i.e. no water level. Since such a failure could easily be detected by use of the installed test switch and since present system surveillance is on a refueling frequency, the inspector feels that a monthly operability check of CWLMS is warranted. Additionally, the CWLMS is a new system with its reliability not yet established. This item is open pending institution of such a surveillance program. (50-261/81-31-02).
- b. Paragraph 2.b. of the Bulletin requires the licensee to provide positive means for control room operators to determine flow from the containment sumps. CP&L's response states that such flow indication is not installed and provides reasons why no modifications are necessary. This requires further NRC followup for acceptability.
- c. CP&L has taken exception to the paragraph 2.c. requirement that if either the detection or removal systems become inoperable, surveillance frequencies be increased and power operation be limited to seven days. Present Technical Specifications do not require such a limiting condition for operation.

The inspector reviewed the 10 CFR 50 Appendix J testing of the Fire Water containment isolation valves addressed by Bulletin paragraph 1.g. Test

acceptance criteria appeared to have been met. Due to the exceptions taken by CP&L to some of the Bulletin requirements and to the anticipated NRC generic actions on this issue, Bulletin 80-24 will remain open.

13. Licensee Event Report (LER) Followup

- a. The inspector reviewed the following LER's to verify that the report details met license requirements, identified the cause of the event, described appropriate corrective actions, adequately assessed the event, and addressed any generic implications. Corrective action and appropriate licensee review of the below events was verified. The inspector had no further comments.

LER	Event
80-14	Electrical Penetration Qualification
81-07	ECCS Analysis Error

- b. LER 81-02 - Service Water Unmonitored Release Path. The inspector reviewed the licensee's submittals dated January 27 and October 20, 1981. Additionally, a February 2, 1981 memorandum from the Operating Supervisor to all Shift Foreman, Senior Control Operators, and Control Operators was reviewed. This memorandum informed these operating personnel that a service water leak in containment was to be considered a degradation of the containment boundary and stated required operator actions. These actions, if taken, appeared adequate. (See paragraph 5.b). The licensee is developing a modification to install sample lines from each HVH unit motor cooler to a presently installed radiation monitor to permanently resolve the potential unmonitored release path. This area will be reviewed when this modification is complete. Inspector followup item 50-261/81-31-03. The LER is closed.

14. Review of IE Circulars and Notices (IEC's and IEN's)

The inspector verified that IE Circulars and Notices had been received onsite and reviewed by cognizant licensee personnel. Selected applicable IE Circulars and Notices were discussed with licensee personnel to ascertain the licensee's actions on these items. The inspector also verified that IE Circulars and Notices were reviewed by the Plant Nuclear Safety Committee in accordance with facility administrative policy. Licensee action on the following IE Circulars and Notices were reviewed by the inspector and are closed.

IE Circulars	IE Notices
81-09	81-25
	81-28

## 15. Outstanding Items

- a. (Closed) Inspector Followup Item 81-26-06. This item concerned the lack of redundant level indication for the condensate storage tank. LI-1454B was returned to service on October 20, 1981. This item is closed.
- b. (Closed) Open Item 81-27-06. This item concerned the implementation of the procedure distribution and change control program. A review of control room working files being used by the operations personnel identified that several working copies of periodic tests (PT), operation work procedures (OWP), checksheets, and valve lineups were not current. Further review determined that two out-of-date procedures had been used during the period of May 31 - July 17, 1981:

- (1) OWP DG-1, Revision 4, for working on the A Diesel Generator air start solenoids was used on June 29, 1981. Revision 6 to DG-1 was issued on June 2, 1981 and established the independent verification requirements.
- (2) PT 48.1, Weekly Test of Dedicated Shutdown Diesel Generator, was run twice during the period using Revision 1 instead of Revision 2 which was issued July 2, 1981. Revision 2 did not change the diesel operation but consisted of typing error corrections, component location additions, and normal expected parameter bands.

A review of working files conducted on September 30, 1981, revealed that PT's 1.1 and 1.3 files concerning nuclear instrumentation testing were out-of date, but had not been used. A similar review of October 17, 1981 revealed no discrepancies.

Through discussions with licensee personnel the inspector reviewed the program for keeping working files updated and preventing use of out-of-date procedures. An Operations Clerk is responsible for providing an updated current revision list to the control room and removing the previous week's copy. The new list should have any changes from the previous week annotated. Outdated copies of procedures, etc., are to be removed from the working file when the new list is provided and up-to-date working file copies put in their place. The operators are expected to check any procedure, etc., taken from the file against the revision list. The inspector noted there was no mention of the operations program for maintaining current working files in the plant operating manual. The licensee has since written an operating note describing the above implemented program and requires operators to use the current revision list to assure current procedures are used during plant operations. This item is closed.

- c. (Closed) Inspector Followup Item 81-19-06. This item required the inspector to review the corporate program for feedback of operating experience. A new Onsite Nuclear Safety Group reporting to Corporate Nuclear Safety management and interfacing with plant personnel has been

instituted and has assumed many of the functions previously performed by plant personnel. The inspector is satisfied that the new program, as addressed in Corporate and Onsite Nuclear Safety Instructions, satisfies the requirements of NUREG 0737. Implementation of the program is too recent to adequately make performance evaluations, and this area will be reviewed at a later date under the routine inspection program.

- d. (Closed) Open item 80-38-01. This item concerned the excessive time between completion of safety-related maintenance and QA review. A review of 1981 work requests determined that the time span of concern has been cut at least in half with few exceptions. This item is closed.