



Carolina Power & Light Company

IE FILE COPY

File: NG-3513(R)

Serial No.: NO-81-1039

Mr. Victor Stello, Director  
Office of Inspection and Enforcement  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

EA-81-46  
Recd 6/19/81

H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2  
DOCKET NO. 50-261  
LICENSE NO. DPR-23  
RESPONSE TO NOTICE OF VIOLATIONS AND  
IE INSPECTION REPORT NO. 50-261/81-10



Dear Mr. Stello:

Carolina Power & Light Company (CP&L) has received and reviewed your letter of May 12, 1981, transmitting your Notice of Violation and Proposed Imposition of Civil Penalties, and IE Inspection Report No. 50-261/81-10. Enclosed with this response to the subject letters, please find our check in the amount of forty thousand dollars (\$40,000). In addition, in accordance with our letter to you dated June 9, 1981 (Serial No.: NO-81-978) and as required by 10CFR20.405, is a detailed report concerning the overexposure of a contract worker which occurred on May 30, 1981.

Severity Level III Violation - I.A

10CFR20.201(b) requires licensees to make or cause to be made such surveys as may be necessary to comply with the regulations in 10CFR20. A survey as defined in 20.201(a) is an evaluation of the radiation hazards under a specific set of conditions. 10CFR20.202 requires licensees to supply appropriate personnel monitoring equipment to, and requires the use of such equipment by, each individual who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25 percent of the applicable value specified in Paragraph (a) of 10CFR20.101.

Contrary to the above, during the third calendar quarter of 1980, surveys or evaluations of the radiation hazards inside steam generator channel heads were not conducted adequately to assure compliance with the whole body dose limits specified in 10CFR20.101(b) in that individuals received quarterly whole body doses in excess of 3 rems. In addition, these surveys were not conducted adequately to assure compliance with 10CFR20.202 in that appropriate personnel monitoring equipment was not positioned to measure the dose to the head and gonads of individuals entering the steam generators.

IE13  
s  
1/1

8108190125 810818  
PDR ADDCK 05000261  
PDR

Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

IE13

## Response

Carolina Power & Light Company acknowledges that during the third calendar quarter of 1980, evaluations of the radiation hazards inside steam generator channel heads were not conducted adequately to assure compliance with the whole body dose limits specified in 10CFR20.101(b) in that it may be calculated, based on survey data, that two individuals could have received quarterly doses to a portion of the whole body in excess of three (3) rems. In addition, Carolina Power & Light Company acknowledges that evaluations were not conducted adequately to assure total compliance with 10CFR20.202 in that personnel dose monitoring devices were not appropriately positioned to measure the dose to the head and gonads of individuals entering the steam generator channel heads. This is based on closer review of the steam generator survey data.

## Designation of Apparent Cause

Dose rate surveys of the steam generator channel heads were performed during the third quarter of 1980 as required by our procedure HP-12, "Steam Generator Inspection and Maintenance." The survey information was obtained using both thermoluminescent dosimeters (TLD) and portable radiation survey instruments. Each survey consisted of dose rates measured at nine different points in each channel head with three of the points near the tubesheet, three of the points at the mid-level portion of the channel head, and three of the points in the lower areas of the bowl. The initial evaluation of the survey data resulted in the conclusion that the dose rates in the channel heads were relatively uniform. As a result, chest-worn personnel dose measuring devices were considered to be adequate for measuring the whole body doses to be received by individuals entering the channel heads and therefore were utilized as such.

During February, 1981, a review of this survey data by members of your staff raised some question as to the validity of the initial interpretation of the survey data. Subsequently, the services of a consulting firm were engaged to perform an independent evaluation of the survey data. The report indicated that sufficient survey data was obtained such that the radiation hazards in the channel heads could be adequately assessed but that the initial conclusion that the dose rates were relatively uniform was in error. Based on this reevaluation, a set of theoretical correction factors was derived which related the expected dose rates for the head and gonad portions of the whole body to that of the trunk of the body using the most conservative data points from the surveys for each channel head. These theoretical correction factors were then utilized to calculate worst case doses that individuals who entered the channel heads during 1980 could have received.

On February 19, 1981, CP&L informed your staff that of the eighty-six (86) individuals who entered the channel heads during 1980, preliminary calculations indicated that two (2) individuals may have received doses greater than 3 rems in a calendar quarter. A later review of these dose adjustments indicated that another individual may have received greater than 3 rems in a calendar quarter. In the final analysis, one individual was assigned a calculated whole body dose of 3.054 rems for the first quarter of 1980, and two individuals were assigned calculated whole body doses of 3.124 rems and 3.257 rems for the third quarter of 1980.

#### Corrective Action

Prior to the February 19, 1981 reevaluation, Health Physics Procedure HP-12, "Steam Generator Inspection and Maintenance," had been revised to require dosimeters to be worn at the head, chest, and gonads for all personnel making entries into the channel heads and for all personnel working on the steam generator platforms. This revision, which was implemented on January 12, 1981, was the result of CP&L's review of industry practices and followup to a West Coast utility over-exposure. Therefore, no additional changes were considered necessary.

#### Corrective Action to Prevent Recurrence

The corrective action stated above should be adequate to prevent a similar occurrence.

#### Date When Full Compliance Will be Achieved

Full compliance was achieved in regard to this violation when the action as described above was completed on January 12, 1981.

#### Severity Level III Violation - I.B

10CFR20.101(B) requires licensees to restrict the total occupational dose to the whole body of each individual in a restricted area to 3 rems during any calendar quarter.

Contrary to the above, two individuals received total occupational whole body doses of 3.124 rems and 3.257 rems during the third calendar quarter of 1980.

#### Response

Carolina Power & Light Company acknowledges that two individuals were calculated to have received total occupational whole body doses of 3.124 rems and 3.257 rems during the third calendar quarter of 1980.

#### Designation of Apparent Cause

The apparent cause for this violation is discussed above (see response to Severity Level III Violation - I.A).

#### Corrective Action

The corrective action for this violation is discussed above (see response to Severity Level III Violation - I.A).

#### Corrective Action to Prevent Recurrence

The immediate corrective action stated above should be adequate to ensure that appropriate personnel dosimetry is utilized for individuals working on the primary side of the steam generator. On a generic basis with regard to other high dose rate jobs, CP&L is revising the appropriate health physics procedures to provide definitive guidance to Health Physics personnel as to when multi-badging must be utilized to adequately measure a worker's whole body dose.

#### Date When Full Compliance Will be Achieved

With regard to ensuring that appropriate personnel dosimetry is utilized for individuals working on the primary side of the steam generators, full compliance was achieved on January 12, 1981. Full compliance for establishing procedural guidelines for situations that may require multi-badging of workers will be achieved by June 30, 1981.

#### Severity Level V Violation - II.A

10CFR20.401(b) requires licensees to maintain records showing the results of surveys required by 10CFR20.201(b). 10CFR20.401(c)(2) requires the results of surveys maintained pursuant to 10CFR20.401(b) be preserved for two years after completion of the survey.

Contrary to the above, radiation surveys of the hot leg compartment inside Steam Generators A, B, and C performed on September 17, 1980, were not maintained or preserved.

#### Response

Carolina Power & Light Company acknowledges that radiation surveys of the hot leg compartment inside Steam Generators A, B, and C performed on September 17, 1980, were not retrievable.

#### Designation of Apparent Cause

Health Physics Procedure HP-12, "Steam Generator Inspection and Maintenance," required that radiation surveys be performed; however, the procedure did not contain forms on which data could be properly

documented nor did it require retention of the survey information. The forms that were used were not part of any plant procedure and therefore were not adequately controlled. As a result, record of the subject survey data may have been misfiled or disposed of inadvertently.

Corrective Action

Health Physics personnel were cautioned regarding the importance of retaining all survey documentation. In addition, HP-12, "Steam Generator Inspection and Maintenance," will be revised to include forms on which survey data will be properly documented. Completed copies of HP-12 survey data will be required to be stored in the plant's permanent file. This procedure change will be implemented on June 30, 1981.

Corrective Action to Prevent Recurrence

The corrective action stated above should be adequate to prevent a recurrence.

Date When Full Compliance Will be Achieved

Full compliance was achieved in regard to this violation when the corrective action described above was completed on May 15, 1981.

If you have any questions regarding this information, please contact me or my staff.

Yours very truly,

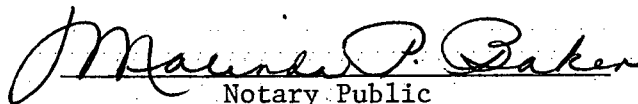


E. E. Utley  
Executive Vice President  
Power Supply and  
Engineering & Construction

WLM/jc (9651)  
Enclosure

cc: Mr. James P. O'Reilly

Sworn to and subscribed before me this

  
Notary Public

My commission expires:

9/19/84

Enclosure A

Report On May 30, 1981 Overexposure

H. B. Robinson Unit No. 2 was in a cold shutdown condition performing eddy current (E/C) inspection of the three steam generators to satisfy a commitment made to the NRC. The following is a description of the circumstances surrounding the exposure of a contract worker to greater than 3 rem for the second quarter of 1981 which occurred during the inspection. This information was determined as a result of an investigation that CP&L conducted immediately after the incident.

On the morning of May 30, 1981, Mr. [REDACTED]

"signed-in"

on a Radiation Work Permit (RWP) for eddy current work on "C" steam generator. Mr. [REDACTED] is a contract employee with Protractor which is a subcontractor of Westinghouse, the supplier of the E/C services. In accordance with the requirements of this RWP, Mr. [REDACTED] was issued head, trunk of body, and gonad TLD badges; a high range (0 - 5R) and a low range (0 - 500 mR) pocket dosimeter; and a full-face air-purifying respirator. The pocket dosimeters are normally worn on the chest unless the individual is going to enter the steam generator channel head, in which case, the dosimeters are then moved to a shoulder. He was assigned an allowed dose of 400 mrem for this job. The RWP specified that a health physics technician in the containment vessel must be contacted prior to starting work.

Mr. [REDACTED] dressed out and entered the containment vessel. He was in communication with Westinghouse personnel in the eddy current trailer via headphones. He did not contact any health physics personnel as required upon his entry into the containment vessel and, therefore, health physics personnel in the containment vessel were not aware of his presence. He did not report to "C" steam generator because he was apparently directed by personnel in the Westinghouse trailer to report to "B" steam generator, although his name appeared on the "C" steam generator RWP, and mark tubes in preparation for plugging in that generator. The marking of tubes is not considered steam generator

head work but rather "platform work." Platform work does not require that the pocket dosimeter be placed on the worker's shoulder nor does it require full time HP coverage. The entrances to all steam generator areas were posted with the appropriate radiation caution signs including a sign which required all personnel to contact health physics inside the containment vessel prior to entering the steam generator area. Mr. [REDACTED] entered the "B" steam generator area without contacting health physics personnel inside the containment vessel and began marking tubes.

During the course of his work, Mr. [REDACTED] was found sitting on a filter housing by an Engineering Technician who was inspecting some equipment in the area. This technician told him to move off the filter housing because it was probably "hot." Mr. [REDACTED] complied with this request, and the technician went on about his duties and then left the area. Later, during a routine inspection, a Radiation Control Technician discovered Mr. [REDACTED] with his head inside the steam generator channel head marking tubes. The technician asked to read his pocket dosimeter. His pocket dosimeter (chest-worn) indicated 270 mrem. Mr. [REDACTED] told the technician that he had one more tube to mark and then he would be finished. The technician was concerned that other persons might be working in the other steam generator areas without the knowledge of health physics personnel in the containment vessel, so knowing that the marking of one more tube would not exceed the allowed dose based on the pocket dosimeter reading, she left "B" steam generator to check the other steam generators. When the Radiation Control Technician returned to "B" steam generator, Mr. [REDACTED] had finished his work and had exited the containment vessel.

Upon his exiting the containment vessel, Mr. [REDACTED] pocket dosimeters were read. His low range chamber indicated 370 mrem and his high range chamber indicated 400 - 500 mrem. His TLD badges were read and indicated a head dose of 2807 mrem, a chest dose of 1019 mrem, and a gonad dose of 178 mrem. Steps were immediately taken to ensure that

Mr. [REDACTED] could not return to any Radiation Area. The Radiation Control Foreman, the Manager, Environmental and Radiation Control, and an Environmental and Radiation Control Engineer were notified of the TLD readings. An investigation of the incident was immediately initiated by these personnel. The findings of this investigation were as follows:

1. Mr. [REDACTED] admitted that he failed to comply with the RWP and the area posting in that he neglected to contact health physics personnel in the containment vessel prior to starting work. As a result, health physics personnel in the containment vessel were not aware of his presence or his mission and therefore were unable to exercise health physics control over the work.
2. Mr. [REDACTED] apparently thought that the engineering technician who found him sitting on the filter housing was a radiation control technician.
3. The apparent discrepancy between Mr. [REDACTED] pocket dosimeter readings and his chest TLD badge reading could be explained by the orientation of his body in the manway. This was determined by placing him in the H. B. Robinson steam generator mockup and examining the orientation of his dosimetry with respect to the known radiation fields.
4. There was no reason to suspect the accuracy of the TLD readings. The dose to his head (2807 mrem) when combined with his previous whole body dose of 302 mrem for the second quarter of 1981 yielded a whole body dose of 3.109 rem for the second quarter of 1981 which is in excess of the 3 rem per quarter limit prescribed by 10CFR20.101(b)(1).

The main portion of the investigation was conducted late in the afternoon on the same day of the incident. The Plant General Manager was notified of the incident and the aforementioned conclusions of the preliminary investigation. It was then decided to terminate all work on



the steam generators and to clear the containment vessel until the incident and corrective actions were discussed and understood by all personnel at the plant site. To facilitate this, the supervisors of the various work groups were summoned to a meeting chaired by the Plant General Manager, and the incident was discussed. The following corrective actions were adopted:

1. All personnel on shift were to be instructed on the incident and corrective actions before work in the containment vessel would be started again. Personnel coming in on subsequent shifts would receive the same instructions before starting work.
2. All personnel were to be instructed that in addition to steam generator "jumping," entry of any part of the body into the steam generator channel head would require full time coverage by health physics personnel.
3. Entries into the steam generator channel head would be controlled by pocket chamber reading and stay time calculation based on the known radiation field. In addition, Health Physics Procedure HP-12, "Steam Generator Inspection and Maintenance," will be revised to clarify these means of controlling entries into the steam generator channel head.
4. All health physics personnel working in the containment vessel will wear a unique identifier such as an armband which identifies them as health physics personnel.
5. A health physics technician will be specifically assigned to Westinghouse and Westinghouse contractor personnel in the containment vessel.
6. The cause of the incident would be documented and the corrective actions reviewed by all plant personnel.

After this meeting, all personnel on site were instructed as described above and work in the containment vessel was restarted late in the evening on the same day of the incident. A Health Physics Technician was stationed at the containment hatch to monitor the activities of Westinghouse and Westinghouse contractor personnel. All health physics technicians in containment were given identifying armbands. The required documentation was drafted and reviewed by all plant personnel by June 10, 1981. As an additional measure to improve the control of work in high radiation areas, HP-12, "Steam Generator Inspection and Maintenance" will be revised, and HP-7, "Special Radiation Work Permits" will be reviewed and revised as necessary to reinforce each individual's obligation to read the requirements of the RWP under which they are working. These revisions (HP-12 and HP-7) will be implemented by June 30, 1981. These corrective actions should be adequate to prevent a similar recurrence.

# BILL FOR COLLECTION

*Central File*  
**THE FILE COPY**  
Bill No. \_\_\_\_\_

U. S. Nuclear Regulatory Commission

Date June 19, 1981

(Department or Establishment and Bureau or Office)  
Washington, DC 20555

(Address)

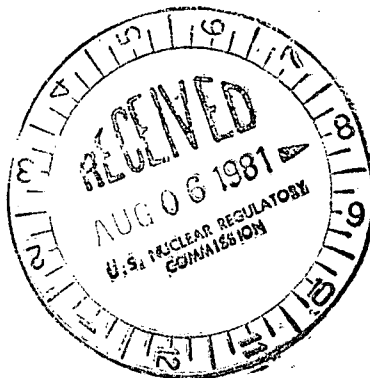
PAYER:

Carolina Power and Light Company

*This bill should be returned by the  
payer with his remittance.*

**SEE INSTRUCTIONS BELOW.**

Date	DESCRIPTION	Quantity	Unit Price		Amount	
			Cost	Per		
6/19/81	Received full payment of civil penalty for Notice of Violation for H. B. Robinson Steam Electric Plant Unit No. 2 Docket No. 50-261, License No. DPR-23.				\$40,000.	00
					AMOUNT DUE THIS BILL, \$ 40,000.00	



***This is not a receipt***

## INSTRUCTIONS

Tender of payment of the above bill may be made in cash, United States postal money order, express money order, bank draft, or check, to the office indicated. Such tender, when in any other form than cash, should be drawn to the order of the Department or Establishment and Bureau or Office indicated above.

Receipts will be issued in all cases where "cash" is received, and only upon request when remittance is in any other form. If tender of payment of this bill is other than cash or United States postal money order, the receipt shall not become an acquittance until such tender has been cleared and the amount received by the Department or Establishment and Bureau or Office indicated above.

Failure to receive a receipt for a cash payment should be promptly reported by the payer to the chief administrative officer of the bureau or agency mentioned above.

*Designated original  
TC*

Raleigh, North Carolina 27602

CHECK NO.

2007840

Carolina Power & Light Company

06-17-81 PAY EXACTLY

\$40,000 DOLLARS AND

00 CENTS

\$40,000.00

DOR NO.

DATE

Pay to the  
order of:

TREASURER OF THE UNITED STATES  
C/O US NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION & ENFORCEMENT  
WASHINGTON DC 20555

First Union National Bank of North Carolina  
Chapel Hill, N. C.

by

COUNTERSIGNED

⑈2007840⑈ ⑆053101561⑆ 7999801653⑈