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CP&L

Carolina Power & Light Company

P. O. Box 1551 • Raleigh, N. C. 27602

SERIAL: NLS-90-203

OCT 01 1990

LYNN W. EURY
Senior Vice President
Operations Support

Director, Office of Enforcement
U. S. Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325, 50-324/LICENSE NOS. DPR-71, DPR-62
REPLY TO A NOTICE OF VIOLATION (EA 90-130)

Gentlemen:

On August 30, 1990, the Nuclear Regulatory Commission issued a Notice of Violation (NOV) and Proposed Imposition of Civil Penalty (EA 90-130) for alleged unplanned radiation exposures to individuals during activities associated with a traversing incore probe (TIP) event of July 5, 1990, at CP&L's Brunswick Steam Electric Plant. Carolina Power & Light Company (CP&L) hereby responds to the NOV. Attachment 1 to this letter is CP&L's "Reply to Notice of Violation" (10CFR2.201).

As noted in Attachment 1, CP&L acknowledges that the proposed violation constituted a violation of regulatory requirements. Enclosed is a check payable to the Treasurer of the United States in the amount of Sixty-Two Thousand Five Hundred Dollars ($62,500.00).

If you have any questions, please contact Mr. L. I. Loflin at (919) 546-6242.

Yours very truly,

L. W. Eury

DBB/ecc (829BNP)

Attachment

cc: Mr. S. D. Ebneter
Mr. N. B. Le
Mr. R. L. Prevatte
NRC Document Control Desk

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L. W. Eury, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

Delma C. Johnson
Notary (Seal)

My commission expires: 10/26/94

IE14
1/1

ATTACHMENT 1

Carolina Power and Light Company
Brunswick Steam Electric Plant

Reply to Notice of Violation
Enforcement Action 90-130
Inspection Report No. 50-325 & 324/90-25

I. INTRODUCTION

In accordance with 10 CFR 2.201 of the Commission's Rules and Practice Procedure, as described in the NRC Staff's August 30, 1990 letter transmitting the subject Notice of Violation, Carolina Power and Light Company (CP&L) hereby responds to the cited Notice of Violation (NOV) and Proposed Imposition of Civil Penalty.

II. REPLY TO INDIVIDUAL ALLEGED VIOLATIONS

In the NOV, the NRC Staff identified three violations which, as an aggregate, were categorized as a Severity Level III problem. These were denoted as A, B, and C, concerning alleged unplanned radiation exposures to individuals during activities associated with a traversing incore probe (TIP) event of July 5, 1990, at CP&L's Brunswick Steam Electric Plant (BSEP). In this response, for each example of the alleged violation, CP&L will (1) admit the allegations, (2) provide the reason(s) for the violation, (3) identify the corrective steps taken and the results achieved, (4) state actions to be taken to avoid future violations, and the date when full compliance will be achieved.

The NOV states the particular violations are as follows:

A. 10CFR20.201 (b) requires each licensee to make or cause to be made such surveys as (1) may be necessary for the licensee to comply with the regulations in this part and (2) are reasonable under the circumstances to evaluate the extent of radiation hazards that may be present. 10 CFR 20.201 (a) defines a "survey" as an evaluation of the radiation hazards incident to the production, use, release, disposal or presence of radioactive materials or other sources of radiation under a specific set of conditions.

Contrary to the above, on July 5, 1990, the licensee failed to adequately evaluate the extent of the radiation hazards present to preclude a substantial potential for an exposure in excess of 10 CFR 20 requirements for two individuals prior to their performing a modification on the Unit 1 "D" Traversing Incore Probe (TIP) Drive Mechanisms in the Unit 1 Reactor Building, in that the workers received unplanned radiation exposure when they were momentarily exposed to an activated TIP having a radiation dose rate of approximately 1000 rem per hour on contact.

B. Technical Specification 6.8.1 requires that written procedures be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide 1.33, November 1972.

Regulatory Guide 1.33, November 1972, paragraph 9.e, states general procedures for the control of maintenance, repair, replacement, and modification work should be prepared prior to beginning work. These procedures should include information on areas such as the following:

(1) Method for obtaining permission and clearance for operational personnel to work and for logging such work, and
(2) Factors to be taken into account, including the necessity for minimizing radiation exposure to workmen, in preparing the detailed work procedures.

Technical Specification 6.11 requires that written procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure.

Contrary to the above, on July 5, 1990, the licensee failed to establish adequate radiation protection procedures concerning TIP replacement or modification, in that the licensee's procedure for plant modification 87-241 did not include necessary precautions to prevent accidental withdrawal of a highly radioactive detector into unshielded and occupied areas of the licensee's facility, creating the potential for significant personnel radiation exposures.

C. 10 CFR 19.12 requires that all individuals working in a restricted area be kept informed of the storage, transfer or use of radioactive materials or of radiation in such portions of the restricted area, and be instructed in the health protection problems associated with exposure to such radioactive materials or radiation, and in the precautions or procedures to minimize exposure.

Contrary to the above, on July 5, 1990, a licensee employee moving a highly radioactive TIP had not received training on the radiological hazards of the TIP system and had not been instructed that continued take-up of the detector's cable could cause the TIP to enter an unshielded and occupied area that could result in unplanned exposures to high radiation levels.

This is a Severity Level III problem (Supplement IV).

Cumulative Civil Penalty - $62,500 (assessed equally among the three violations).

A. Admission of the Violation

CP&L admits that the deficiencies noted in Violations A, B, and C are correct in that:

1. For Violation A, adequate evaluations of the extent of the radiation hazards present to preclude a substantial potential for an exposure in excess of 10 CFR 20 requirements were not performed for the July 5, 1990 TIP event.

2. For Violation B, adequate procedures were not established to prevent accidental withdrawal of the highly radioactive detector into an unshielded and occupied area.

3. For Violation C, an individual inadequately trained in the potential hazards associated with the TIP drive mechanism was moving a highly radioactive TIP, which resulted in the TIP entering an unshielded and occupied area.

B. Reason for the Violations

The event investigations associated with this incident were performed under Plant Incident Report (PIR) 90-044 and Human Performance Evaluation (HPE) Report 90-017.

Violation A.

As noted in the Admission of the Violation, the radiation hazards associated with plant modification (PM) 87-241 were not properly identified as a part of the that modification package. PM 87-241, GAMMA TIP Replacement, involved the replacement of existing neutron TIPs with a Gamma TIP that would reduce TIP asymmetries, provide increased thermal limits margin, and support the use of GE10 fuel. The increased thermal limit margin would delay the start of coastdown operations on Unit 1 prior to the upcoming refuel/recirculation pipe replacement project. To allow for comparison of neutron TIP and Gamma TIP performance, and provide operational experience with the Gamma TIPs prior to Fuel Cycle 8, where their use is essential, it was necessary to install the Gamma TIPs prior to the upcoming refuel outage.

Prior experience with removal of TIPs at power has not produced significant radiological concerns. Emphasis of pre-job briefings has always been placed on the radiological hazards associated with the removal and disposal of the old irradiated TIP. Less emphasis was placed on the testing of the newly installed TIPs, as this was considered to be a routine maintenance evolution. The hazards associated with driving and retracting TIPs from the drive box were not appropriately addressed in either the pre-job briefing, the modification installation instructions or the maintenance procedure.

Violation B.

As stated in the Admission of the Violation, installation procedures for plant modification 87-241 did not include necessary precautions to prevent accidental withdrawal of a highly radioactive detector by a contractor technician into the unshielded and occupied area. The major reason for this violation was a failure to follow procedure by the involved technician. Specifically, the procedure used specified that the TIP be withdrawn to the 0001 position at the indexer; however, as noted in the PIR and HPE Report, there were several contributing factors to this event:

1. The lead technician with primary responsibility for telling the contract technician to stop withdrawal of the tip was focusing his attention on initiating corrective actions on a recently discovered clutch problem, and failed to signal the contract technician to stop withdrawal of the tip per procedure.

2. The modification procedure being used did not contain cautions which would warn personnel working on the TIPs of the potential radiation hazards associated with TIP withdrawal into the drive box. The modification package used a plant Maintenance Procedure for this work. The modification implementation group assumed the maintenance procedure was adequate an did not recognize the deficiency of the procedure relative to the training level of personnel involved and the lack of caution statements.

3. The high background noise and use of respirators affected communications between workers.

4. The contract worker performing the withdrawal of the TIP was not experienced with this evolution or this system, and did not understand that there were no interlocks to prevent the TIP from being withdrawn all the way into the drive box.

5. The responsible modification engineer did not discuss the hazards with working on the TIPs or the consequences of potential errors in job briefings held before starting work.

6. Health Physics coverage of this portion of the job had been reduced as a result of the fact that the insertion of the new TIPs into the core was not noted as part of the adjustment process, and that this was considered to be a routine evolution.

Violation C.

As stated in the Admission to the Violation, the individual contract worker moving the TIP during this event had not received

training or instructions that continued take-up of the TIP could cause the TIP to enter an unshielded and occupied area.

Contract personnel receive the specific training to perform the task at hand for modifications through the reading and understanding of applicable procedures, pre-job briefings, and supervision adequately instructing personnel on assigned activities and overseeing their actions. The training for this task was insufficient in the following ways:

1. The responsible modification engineer substituted an inadequately prepared technician as a replacement for an experienced technician that was familiar with the planned activities but had recently left the site. The replacement contract technician was not familiar with the TIP system or the planned activities, and had not participated in the preparations for the modification.

2. The lead technician on the job did not adequately instruct the contract technician on when to stop withdrawing the tip, or on the potential risks associated with the planned action.

3. The responsible modification engineer did not discuss the hazards with working on the TIPs or consequences of potential errors in job briefings held before starting work. The responsible modification engineer also did not review his expectations from the lead technicians for the work in the TIP tent being directed by the lead technician.

4. The modification procedure did not contain cautions which would warn personnel working on the TIPs of the potential extreme radiation hazard which could be present, that the normal stops would be ineffective when manually retracting the TIPs, or that continued manual withdrawal would result in direct exposure to the TIP detector.

5. No discussions were held on what action to take if the TIP detector were to be withdrawn into the box. TIP adjustment was considered to be a routine maintenance task, with unrealized potential for exposure.

C. <u>Corrective Steps Which Have Been Taken and Results Achieved</u>

Immediate corrective actions for the violations involved in this event included:

1. Work on PM 87-241 was immediately halted.

2. Event investigations were completed, including event review meetings.

3. Work was restarted on 7/6/90, with the following controls in place:

- The Manager of Unit 1 I&C/Electrical Maintenance provided direct supervision of the activities at the TIP drive box tent.

- Maintenance generated a detailed set of instructions to supplement the steps in the plant modifications.

- Maintenance conducted lengthy pre-job reviews/briefings with technicians and all groups involved in the mod installation work.

- Constant HP coverage for the TIP drive box work was provided.

- Work restart was begun only after plant management approval.

4. The Manager of Outage Management and Modifications evaluated on-going modification activities to ensure that adequate work control procedures were in place for modification implementation.

5. Appropriate personnel and their supervision have received disciplinary action.

Work on the installation of the new TIPs was completed without further incident.

D. Corrective Actions to Prevent Recurrence and Date of Full Compliance

This event was investigated through the Plant Incident Report process. In addition, a Human Performance Evaluation was performed to ensure adequate root causes and corrective actions were identified.

Violation A.

1. Procedural changes have been made to the Unit 2 plant modification 87-099 and permanent Maintenance and applicable E&RC procedures for TIP replacement to reflect lessons learned from this incident. Included in these revisions are specific Health Physics instructions, to provide strong cautions regarding possible retraction of TIPs to the drive box, and to enhance steps involved in replacing the TIPs.

2. An Engineering Work Request (EWR) has been generated to investigate interlocks to prevent a TIP from being able to be retracted into the TIP box.

3. Health Physics personnel will document pre-job briefing for any TIP Box or TIP Room entry/work.

4. Restricted Area locks, similar to those required for entry into the TIP room and other plant areas where significant radiological hazards are present, have been installed on the TIP drive boxes for both units.

Violation B.

1. As noted in item 1 under Violation A, procedural changes have been made to include specific Health Physics instructions and cautions concerning withdrawal of TIPs into a drive box.

2. The "Conduct of Operations" philosophy statements in procedures of appropriate organizations have been revised to express that one aspect of correct preplanning of work activities includes research of prior industry events for application to the work activity.

3. The Plant General Manager met with 1st and 2nd line supervision to discuss their responsibilities and accountabilities and associated consequences in the event they fail to exercise these responsibilities.

Violation C.

As noted in the reason for violation, qualification of contract personnel involved in modification work is ensured through the reading and understanding of applicable procedures, pre-job briefings, and supervision adequately instructing personnel on assigned activities and overseeing their actions. To ensure the effectiveness of this philosophy, the following corrective actions have been determined necessary:

1. As noted in item 1 under Violation A, procedural changes have been made to include specific Health Physics instructions and cautions concerning withdrawal of TIPs into a drive box.

2. Real Time Training and review of this incident was completed by E&RC personnel, Maintenance I&C personnel, OM&M project managers, engineers, and other supervisory personnel, NED discipline personnel, and Technical Support Personnel. These reviews addressed the generic implications of verifying personnel remain sensitized to working critical or complex evolutions, including assurance that personnel remain sensitized to the importance of the use of proper procedures, using qualified personnel to perform the tasks, and completion of task reviews and briefing prior to task initiation.

3. NED has developed an on-going program to train engineers and designers on industry events which are applicable to design.

General

As noted in the NOV and Proposed Imposition of Civil Penalty letter, escalation of the proposed fine by 100 percent was deemed appropriate for the factor of prior notice of similar events in that Information Notice (IN) 88-63, High Radiation Hazards From Irradiated Incore Detectors and Cables, specifically warned licensees about the potential problems associated with maintenance on TIP systems.

CP&L acknowledges that it failed to initiate appropriate actions to ensure incidents of the type specified in IN 88-63 would not occur at its Brunswick facility. This is considered to be an isolated occurrence based on the investigations conducted. Upon reviewing the responses provided relative to IN 88-63, controls had been established to adequately address this issue for work done by site maintenance personnel. However, personnel performing this work and utilizing Maintenance procedures included contract personnel that did not have the level of experience, training and knowledge of the use of maintenance procedures as that of plant maintenance personnel. The basic concern is utilizing maintenance procedures for plant modification installation by personnel with less experience than those for which the procedure was written.

A memorandum was issued from the Maintenance Manager to the onsite NED Manager, expressing the concern of utilizing maintenance procedures for plant modification installation by personnel with less experience than those for which the procedure was written. NED is performing a potential design deficiency analysis (90-32), addressing the concerns identified in this memorandum.

This event has also been reviewed by the plant management staff at CP&L's other two nuclear sites.

CP&L feels it is in compliance with the regulations and requirements identified relative to this event.