CP&L

Carolina Power & Light Company

Brunswick Steam Electric Plant
P. O. Box 10429
Southport, NC 28461-0429

April 15, 1988

FILE: B09-13510C
SERIAL: BSEP/88-0407

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT UNITS 1 AND 2
DOCKET NOS. 50-325 AND 50-324
LICENSE NOS. DPR-71 AND DPR-62
RESPONSE TO INFRACTIONS OF NRC REQUIREMENTS

Gentlemen:

The Brunswick Steam Electric Plant (BSEP) has received I&E Inspection Report 50-325/88-09 and 50-324/88-09 and finds that it does not contain information of a proprietary nature.

This report identified two items that appeared to be in noncompliance with NRC requirements. Enclosed is Carolina Power & Light Company's response to this violation.

Very truly yours,

C. R. Dietz, General Manager
Brunswick Steam Electric Plant

MJP/hg

Enclosure

cc: Dr. J. N. Grace
Mr. E. D. Sylvester
BSEP NRC Resident Office

IE01
1/1

VIOLATION A

Technical Specification 6.12.2 requires that each high radiation area, in which the intensity of radiation is greater than 1,000 millirem per hour, be provided with locked doors to prevent unauthorized entry into such areas.

Contrary to the above, on November 12, 1987, an Auxiliary Operator (AO), while performing daily rounds of plant systems, unlocked the entrance to the Unit 2, 80-foot east fuel pool heat exchanger room, a high radiation area with radiation levels in excess of 1,000 millirem per hour, and left the area unattended.

This is a Severity Level IV violation (Supplement IV).

RESPONSE

I. Admission or Denial of the Alleged Violation

CP&L admits this violation occurred as described.

II. Reason for the Violation

This violation occurred due to the Auxiliary Operator performing his duties in an irresponsible manner. The Auxiliary Operator was aware of the requirement to not leave the high radiation area unlocked and unattended; however, this individual, while making his rounds accompanied by the NRC resident inspector, made repeated mistakes due to his attitude toward his job (see Violation B for another example).

III. Corrective Steps Which Have Been Taken And Results Achieved

On the day of this event, the Auxiliary Operator was relieved of his duties and his employment with CP&L was subsequently terminated. Following this event, additional reviews of Auxiliary Operator compliance with radiation protection requirements were performed by the on-site Quality Assurance and Radiation Control groups. This event was determined to be an isolated case and not indicative of Auxiliary Operator performance in general.

The Radiation Control Supervisor conducted training sessions with Operations personnel to discuss this event and radiation protection practices for operators.

IV. When Full Compliance Will Be Achieved

Full compliance with this requirement has been achieved.

VIOLATION 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, Appendix A, Section I.3, recommends that procedures for the repair or replacement of equipment be prepared; Section G.5 recommends that procedures for personnel radiation monitoring and special work permits be prepared; and Section I.5.b recommends that factors be taken into account, including the necessity for minimizing radiation exposure to workmen, in preparing detailed procedures.

Technical Specification 6.11.1 requires that procedures for personnel radiation protection be prepared consistent with the requirements of 10CFR, Part 20, and shall be approved, maintained, and adhered to for all operations involving radiation exposure.

Plant procedure ENP-46, SRM/IRM Dry Tube Replacement, covers the removal, transfer, and storage of startup source range monitor dry tubes.

Radiation Control and Protection Procedure, Volume III, Section 6.6.2, requires that personnel dosimeters shall be worn at all times and that self-reading pocket dosimeters should be observed at periodic intervals when working in radiation or high radiation areas.

Radiation Control and Protection Procedure, Volume VIII, Section 6.6.3, specifies that required items of protective clothing shall be worn by all personnel while in radiation controlled areas.

Contrary to the above, the licensee failed to establish adequate radiation protection procedures concerning handling of irradiated dry tubes and using personnel monitoring devices and to adhere to a radiation control procedure in that:

1. On November 12, 1987, an Auxiliary Operator, while making daily rounds of plant systems, failed on two occasions to wear the required protective clothing while in radiation controlled areas.

2. On January 23, 1988, a licensed individual was preparing a feedwater nozzle for inservice inspection. The worker failed to monitor his self-reading pocket dosimeter (SRPD) during the time spent in the high radiation area and received an exposure of 800 millirem. Plant Procedure VIII, Section 6.6.2, was inadequate in that the procedure did not require the worker to frequently read his SRPD while working in a high radiation area.

3. On January 31, 1988, while transferring a startup source range monitor dry tube to a storage location in the spent fuel pool, a section of the dry tube broke the surface of the water (shielding) and exposed workers for a very short time period to high levels of radiation. Plant procedure ENP-46, used during the operation, did not contain adequate instructions and precautionary steps to ensure that the dry tube remained under water and radiation exposure to personnel were minimized.

This is a Severity Level IV violation (Supplement IV).

RESPONSE

I. Admission or Denial of the Alleged Violation

CP&L admits the violation occurred as described.

II.(a) Reason For First Example Of Violation B

The Auxiliary Operator failed to wear an anti-C hood while in a radiation area with posted requirements for wearing a full set of anticontamination clothing including a hood.

This event occurred due to an Auxiliary Operator performing his duties in an irresponsible manner. The Auxiliary Operator was aware of the requirement to wear a hood into the radiation controlled area; however, this individual, while making his rounds accompanied by the NRC resident inspector, made repeated mistakes due to his attitude toward his job (see Violation A for another example).

III.(a) Corrective Steps Which Have Been Taken And Results Achieved

On the day of the event, the Auxiliary Operator was relieved of his duties due to this and other errors and, subsequently, his employment with CP&L was terminated. Following this event, additional reviews of Auxiliary Operator compliance with radiation protection requirements were performed by the on-site Quality Assurance and Radiation Control groups. This event was determined to be an isolated case and not indicative of Auxiliary Operator performance in general.

The Radiation Control Supervisor conducted training sessions with Operations personnel to discuss this event and the requirement to comply with posted dress requirements to enter radiation controlled areas.

IV.(a) When Full Compliance Will Be Achieved

Full compliance with this requirement has been achieved.

II(b). Reason For Second Example of Violation B

The Notice of Violation references the Radiation Control and Protection Procedure, Volume VIII, as being inadequate. This particular procedure is, in fact, Book 1 of the Radiation Control and Protection section, Volume VIII, of the Brunswick plant Operating Manual. Book 2 contains the specific radiation control procedures which implement the requirements of Book 1.

It is believed the inadequacy was in failing to have a statement requiring frequent reading of the SRPD in the specific radiation control procedure of Volume VIII, Book 2.

III.(b) Corrective Steps Which Have Been Taken And Results Achieved

The involved Radiation Control procedures were reviewed and it has been determined that E&RC Procedure 0230, Issue and Use of Radiation Work Permit, should contain additional requirements.

IV.(b) Corrective Steps Which Will Be Taken To Avoid Further Violations And When Full Compliance Will Be Achieved

By August 1, 1988, a revision will be made to E&RC-0230 to clearly state the requirements for frequently reading SRPDs in radiation control areas.

II.(c) Reason For Third Example of Violation B

During the removal of a dry tube, a bow develops as the tube is moved across the cattle chute from the reactor pressure vessel (RPV) cavity into the fuel pool due to the physical length of the tube and the geometry of the transfer and storage area. As the dry tube is pulled further into the fuel pool, this bow should rotate downward. When the refueling bridge is at the far section of the fuel pool, the gripper end of the dry tube is lowered as far into the fuel pool as possible. Approximately 10 feet of the cold end of the dry tube is then pulled out of the water with a J-hook. The dry tube is then bent approximately in half to allow storage in the spent fuel pool.

In the instance of the SRM B dry tube, as it was pulled across the cattle chute into the fuel pool, the bow rotated upward rather than downward. When the refueling bridge was in position, the gripper tool was lowered; however, the hydraulic cables on the gripper tool did not have enough slack to allow the end to be lowered as far as normal. The individual with the J-hook also began raising the cold end of the dry tube prematurely. The combination of the upwardly rotating bow, inadequate voice communication between personnel resulting in premature raising of the dry tube, and the inadequate slack in the hydraulic hoses all contributed to the incident.

historically, SRM/IRM dry tube and LPRM replacements have been performed successfully by GE at numerous nuclear plants. There is one other known incident similar to that described herein, which occurred at another facility. The two incidents occurred during the phase of the replacement evolution where the component is being handled in preparation for storage in the spent fuel pool. The component is either bent into approximately an L-shape or is cut into two or more pieces. The bending method is used at Brunswick and has been used successfully for approximately 700 total dry tube and/or LPRM replacements. GE uses this bending method at approximately 60% of the plants that it services. The remainder use the cutting method. In either case, the procedure relies heavily upon the qualification and training of the personnel performing the work. The NSSS supplier's generic procedure (GEK) provides no specific handling instructions.

The plant operation procedure (ENP-46) is based on this generic procedure. In ENP-46, several precautions and steps are provided to ensure that the dry tube remains under water. Step 4.2.2.3 states that the cable from the hoist must be marked such that the SRM/IRM/LPRM will stay at least 5 feet under water. Step 5.4 cautions that "the old dry tubes will be highly radioactive. Maintain 5 feet of water shielding over the irradiated (upper) end of the dry tube while removing it from the RPV. Health Physics coverage is required." Step 10.2.6 details the marking of the cable described in Step 4.2.2.3 to keep the component under 5 feet of water. Steps 10.2.2 8 through 10.2.30 detail the moving and storage of the dry tubes:

10.2.28 Move the refueling bridge maneuvering the SRM/IRM through the cattle chute into fuel pool, keeping the dry tube at least 5 feet below the water surface.

CAUTION: Continuously monitor radiation levels while the SRM/IRM is being raised

10.2.29 As the bottom end of the SRM/IRM passes through the fuel transfer canal, raise the bottom of the SRM/IRM to just below the surface with a J-hook and attach a rope to it.

10.2.30 If desired, position the dry tube in the cutter and cut to desired length or bend the dry tube. Position and tie dry tube to the fuel pool rail in the designated storage area.

Given the rigorous training and experience of the refueling personnel provided by GE, the above precautions and instructions were considered more than adequate to safely perform the evolution. However, based on the results of the investigation into the incident, more detailed instructions and precautions in the procedure may have prevented the incident.

III.(c) Corrective Steps Which have Been Taken and Results Achieved

Immediately following the incident and prior to work resuming on the refuel floor, the personnel involved were counseled on the following:

- The personnel assigned to handle the dry tube from the refuel bridge were designated as the lead crew in charge of the handling activities. The technician with the J-hook will proceed only on directions from the lead crew.

- An additional person was assigned to the refuel bridge (making a total of three people). During in-vessel activities other than LPRM and SRM/IRM dry tube replacements, there are two underwater technicians on the bridge. Since there are at least twice as many cables, hoses, and ropes used during the dry tube replacements, the third person was added to ensure these devices do not become entangled.

- The importance of performing dry tube handling activities in the fuel pool in sequence rather than in parallel was reiterated.

The remaining dry tube removals and replacements were completed without incident.

IV.(c) Corrective Steps Which Have Been Taken, Results Achieved, and When Full Compliance Will be Achieved

ENP-46, the procedure for dry tube replacement, and FH-16A, the procedure for LPRM removal and replacement will be revised by August 1, 1988, to incorporate details for cutting the components for storage in the spent fuel pool. Additionally, further details on bending to the components for storage will be incorporated into the plant procedures as a supplemental step in ensuring that this incident is not repeated.