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

Report Nos. 50-325/80-36 and 50-324/80-33

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

Docket Nos. 50-324 and 50-325

Facility Name: Brunswick Steam Electric Plant

License Nos. DPR-71 and DPR-62

Inspection conducted at Brunswick Plant near Southport, NC

Inspector: John M. Puckett 10/9/80
J. M. Puckett Date Signed

Approved by: A F Gibson 10/9/80
A. F. Gibson, Section Chief, FF&MS Branch Date Signed

SUMMARY

Inspection Dates: September 2-4, 1980

Areas Inspected

This special, unannounced inspection involved 24 inspector hours of on site time in the areas of radiation dosimetry and followup of commit-ments made by plant and corporate management to correct previously identified items of noncompliance and other items of concern in the Brunswick facilities' Radiation Protection Program.

Results

During the course of the inspection one item of noncompliance was identified: Infraction - failure to adequately determine the whole body radiation dose in accordance with 10 CFR 20.201.

DETAILS

1. Persons Contacted

*B. J. Furr, Vice President, Nuclear Operations, CP&L
*R. E. Morgan, Acting Plant Manager, BSEP
*W. J. Dorman, Project QA Specialist, CP&L
*J. A. Padgett, Director Nuclear Safety & QA, BSEP
B. A. Webster, Manager, Environmental and Radiation Control, CP&L
W. M. Tucker, Manager, Technical & Administrative, BSEP
*G. J. Oliver, Manager, Environmental & Radiation Control, BSEP
*L. F. Tripp, Radiation Control Supervisor, BSEP
*R. M. Poulk, Regulatory Compliance Specialist, BSEP
G. C. Bishop, Plant Project Engineer, BSEP
R. Cook, RC&T Foreman
R. Pasteur, RC&T Foreman

NRC Resident Inspector

*J. E. Ouzts Senior Resident Inspector, NRC RII
*J. M. Puckett, Radiation Specialist, NRC RII

*Present at Exit Interview

2. Exit Interview

The inspection scope and findings were discussed on September 4, 1980 with the licensee representatives indicated above. As a result of this discussion and a telephone conversation from the NRC RII IE Staff with Mr. B. J. Furr, a Confirmation of Action Letter was issued on September 5, 1980 by Mr. J. P.O'Reilly. Director of RII, IE. The reasons for issue and contents of that letter are discussed in this report.

3. Confirmation of Action Letter of March 28, 1980

The requirements of this letter are stated below:

a. The auxiliary steam system and condensate pipes in systems served by the auxiliary boilers will be cleaned and flushed before being returned to operation.

b. The auxiliary steam systems shall not be operated with known leakage of radioactivity into the system.

c. The steam and condensate of the auxiliary boiler shall be sampled daily until sufficient data is obtained to justify to the NRC that a reduced or modified sampling program can be implemented.

d. Other plant systems shall be evaluated to assure that there are no unknown potential pathways of radioactivity to the environment. The results of this evaluation will be reviewed at a meeting to be held in the Region II Office in the near future.

The inspector determined by direct observation of operations, interviews with licensee representatives, and examination of records that the four requirements of the letter of March 28, 1980 are being met. By the introduction of a package boiler system into the auxiliary steam system and restricting feedwater supply to that package to fresh water only, the potential for a repeat of the February 22, 1980, unmonitored radioactive material release to the environment has been eliminated. Engineering studies are currently underway to determine the feasibility of electrical element or other heat source replacement for radioactively contaminated systems currently supplied by auxiliary steam. The licensee stated his corrective actions in a letter dated April 22, 1980, and these actions were verified as continuing or completed by the inspector on September 2, 1980. The problems addressed in the March 28, 1980 letter no longer exist. The permanent engineering solutions mentioned above should ensure safe operation in the future. The inspector had no further questions, pending the outcome of the aforementioned studies.

4. Confirmation of Action Letter of May 2, 1980

a. The nine items in this letter were examined by the inspector during the course of this inspection. It should be noted that not all items can be regarded as complete as of September 4, 1980, but mitigating circumstances exist making their final resolution somewhat delayed.

Each item is addressed below:

Requirement:

1) The Radiation Control and Test (RC&T) group will survey all items removed from contamination controlled areas for unrestricted use. In this regard, health physics surveillance at the torus and drywell control points will be increased.

Finding:

The inspector examined records kept by the licensee regarding the "Frisking" (survey) of potentially contaminated items and personnel as performed by the RC&T group. Though personnel frisking was not a specific requirement of the May 2 letters, the licensee has chosen to do so as a conservative measure. The licensee representatives and supporting records indicate a net decrease by a factor of 10 in the occurance of the detection of radioactive contamination on items destined for uncontrolled release. The inspector stated that the current observed rate of 1/2 percent was in all likelihood as good could be achieved and was indicative of the positive changes in the radiation control program instituted by the licensee.

As a result of the letter of May 2, the licensee permanently ceased shipment of uncontaminated waste to the Brunswick County Sanitary landfill facility located near Southport, NC. The licensee has subsequently obtained a sanitary landfill permit to operate a landfill on

the Brunswick Steam Electric Plant owner controlled property. On August 21, 1980, a procedure entitled, "Control and Monitoring of non-radioactive Plant Waste and Scrap" RC&T Procedure 0216, Revision 5, was submitted to the RII IE Staff for review prior to final approval by the BSEP Plant Nuclear Safety Committee. The NRC Staff review generated two comments regarding this procedure: a calibration technique should be employed for the Sodium Iodide (NaI) detector to lend greater meaning to its readings and a precaution should be added to warn technicians about self-shielding effects on some components or items. The staff concluded that use of this procedure should effectively control the release of radioactively contaminated plant waste or scrap to unrestricted areas.

In discussions with licensee representatives, the inspector indicated that it no longer appeared necessary for RC&T personnel to actually perform frisking of personnel, but that a more appropriate use of the limited RC&T staff would be for RC&T to observe individuals perform their own personal frisking. This would lead to a learning experience for radiation workers which would prove beneficial, as well. The licensee agreed to consider this observation, but reserved action until the use of more sensitive portal monitors was evaluated. The inspector had no further questions.

Requirement:

2) All plant workers will be instructed that RC&T is to be notified of each case of skin contamination so that they can supervise decontamination efforts.

Findings:

During the training mentioned in item (5) below, the requirement was met. In addition, a memorandum to all plant workers was issued by the plant general manager which included this topic. Finally, an RC&T technician has been assigned to provide surveillance of the personnel decontamination station to ensure proper notification is made. The inspector had no further questions.

Requirement:

3) Action will be initiated to reduce radiation background levels at "frisking" locations, and a procedure will be prepared establishing a maximum "frisker" background level and alarm setpoint.

Finding:

RC&T Procedure 0216 established background limits for survey of scrap and waste materials prior to release to uncontrolled areas. RC&T Procedure 0110 establishes background limits for personnel frisking and requires the alarm setpoint to be 100 cpm above the background level. Radiation background levels were observed by the inspector to have been substantially reduced. This is further addressed in item 9.

Requirement:

4) A program will be implemented to assure that protective clothing and equipment issued to workers is in good physical condition and meets required radiation and contamination limits required by procedures.

Finding:

RC&T procedure 0211 was revised and reflects the requirements as stated above. The inspector randomly checked clothing which had been made available for issue to workers and found no items which were unacceptable in accordance with the procedure.

Requirement:

5) A training program will be implemented for all contract workers authorized to work in contaminated areas, except for contract HP technicians. This training program will provide for retraining of contract workers in all pertinent health physics practices and procedures, with emphasis on contamination control. The performance of permanent plant workers will be evaluated to determine the need for their retraining. The initial HP training will be changed to reflect any deficiencies identified in the present training program.

Finding:

The licensee chose to retrain all workers at the plant, re-evaluated the contents of the training and testing associated with the training, and made the appropriate changes.

In addition, a program of seminars, conducted by upper level management is underway. These meetings attempt to emphasize the purpose and importance of good health physics practices to workers at or above the foreman level. The inspector noted this voluntary initiative on the part of the licensee could, if properly handled, lead to a greater understanding of the need for good health physics practice by all workers and increased cooperation and efficiency in the conduct of plant work. The licensee representatives stated that plans were being made to extend the use of the seminar format to the licensee's H. B. Robinson facility.

Requirement:

6) Health Physics Controls applied to the contract clothing dry-cleaners will be upgraded. Air sampling in this area will be increased.

Finding:

As an immediate response the licensee installed a continuous air sampler in this trailer facility and increased HP surveillance. Since that time, the unit has been removed from the site. The inspector had no further questions.

Requirement:

7) The use of polyethylene as the outer container for outside storage of radioactive material will be stopped.

Finding:

The inspector toured the facility on September 2, 1980 and found no instance where radioactive material was stored outside with polyethylene used for the outer covering. Plant management stated that a routine check was perfomed outside by RC&T personnel to detect and deter this practice. The inspector had no further questions.

Requirement:

8) With regard to contaminated plant scrap metals:

   a) All offsite shipments will be terminated and not resumed without NRC concurrance.

   b) A thorough evaluation will be made of vendors who might have received material suspected of being contaminated.

   c) Thorough surveys will be made of all vendors identified in item 8.b above. Any radioactively contaminated material disposed of in this fashion will be retreived and returned to the Brunswick facility.

Finding:

The licensee responded on May 14, 1980 to RII IE and described the action taken in response to item 8. The inspector had no further questions on this topic.

Requirement:

9) Plans and schedules will be developed and provided to the Director, Region II for review, by May 14, 1980 for the following activities:

   a) Relocation of radioactive material onsite so as to reduce radiation background levels and personnel exposure.

   b) Decontamination of the Condensate Storage Tank (CST) and Auxilary Surge Tank. (AST)

Finding:

The licensee has made progress in the area of removal of stored radioactive waste previously kept at the plant site inside the restricted area. The creation of a temporary holding area on the owner controlled property has removed a large amount of material and effectively reduced background levels in areas frequented by personnel. The licensee has applied to the burial facility for an additional allotment for burial volume to expedite permanent disposal of waste, and has begun shipments to another, more distant facility for some types of waste previously being held at the plant. All of these activities should have produced a greater background reduction than is apparent, and when questioned by the inspector about the amount of radioactive material still present within the controlled areas, licensee representatives stated that the accelerated generation of waste due to the ending of the Unit 1 outage had caused an accumulation which could not be expeditiously handled. The inspector observed that this circumstance was not unusual during plant startup from an extended shutdown and was satisfied that the continued efforts planned by the licensee should reduce overall quantities of waste.

With regard to the CST decontamination effort, the inspector was told that several methods had been tried including recirculation through demineralizers, a swimming pool type vacuum device, and that currently divers were being used to attempt to reduce the radiation levels. Subsequently, the inspector was informed that a tightly adherent substance was found on the inside walls of the CST and efforts were underway to identify it and evaluate the best means for its removal.

Air sparging and letdown to the liquid radioactive waste system was utilized to reduce overall radiation levels in the AST by a factor of ten. Dose rates still remain on the order of 100-300 millirem per hour at the base of the tank.

Because of the unusual technical problems encountered with the tank decontamination efforts, and due to the accelerated generation of large quantities of radioactive waste resulting from the Unit 1 startup, the inspector stated he did not feel the requirements noted in items (9) a & b, above had been met; though he conceded that circumstances, rather than any lack of effort on the part of the licensee, appeared to be the cause of the situation. The acting plant general manager agreed with the inspector's evaluation of the situation and stated that these items would continue to receive attention until resolved. The inspector stated that these efforts would be reviewed during a later inspection.

5. Radiation Dose Monitoring

a. As described in another inspection report (50-325/80-39, 50-324/80-36, 50-261/80-27) problems with the thermoluminescent dosimeter (TLD) system were reported to Region II by the licensee.

The inspector examined the corrective actions taken at the Brunswick plant in this regard on September 3, 1980. All actions taken by the licensee regarding correction of erroneous TLD readings and the timeliness and appropriateness of those actions were adequate to ensure no NRC requirements were exceeded.

b. During the examination of selected dosimetry records, the inspector discovered that the licensee had failed to provide written records justifying the use of TLD exposure values when large discrepancies existed between the TLD reading and that of the self-reading pocket dosimeters (PDR) in use during the same time period. A licensee representative stated that these evaluations were performed at the time they were discerned, but that no record was kept. When the inspector asked for justification for TLD value use vs. PRD in selected cases, RC&T representatives could not recall the specifics in any case.

10 CFR 20.101 sets forth Radiation dose standards for individuals in restricted areas and provides specific occupational dose limits which shall not be exceeded. 10 CFR 20.201 (b) requires licensees to make or cause to be made such surveys as may be necessary to comply with the requirements of 10 CFR 20. Survey, in this context, is defined by 10 CFR 20.201 (a) 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, thermoluminescent dosimeter (TLD) results were routinely utilized despite the presence of higher self reading pocket dosimeter (PDR) results in cases where, had PDR results been used, individuals would have exceeded the limits of 10 CFR 20.101. In the absence of justification for this routine practice, the inspector concluded that the evaluations performed were inadequate.

This is an infraction (50-325/80-36-01; 50-324/80-33-01).

A Confirmation of Action letter dated September, 1980, from Mr. James P. O'Reilly, Director, Region II, addressed this problem and placed the following requirements upon the licensee:

1) Evaluate the discrepancy between TLD and PDR results when the dose on either monitor exceeds 500 millirem and the PDR exceeds the TLD dose by greater than 25%. This evaluation is to be performed for the current calendar quarter (July-September 1980) and the preceeding calendar quarter (April-June 1980). The evaluation will include when appropriate:

   a) survey results
   b) exposures to others working in the area
   c) TLD reader and PDR test results
   d) interviews with exposed workers.

These evaluations will be documented and a record kept on file. In the absence of evidence to support the lower of the two readings, the higher will be used. This evaluation will be completed by October 31, 1980.

2) Take immediate steps to assure that workers, for which TLD or PDR results indicate exposures in excess of or closely approaching NRC limits, are restricted from further exposure pending completion of the above evaluation.

3) Establish a program for routine evaluation of future exposure discrepancies by September 8, 1980.

4) Based on the large rejection rate of PDR's due to test failure, evaluate the reliability and adequacy of the pocket dosimeter program. This evaluation is to be completted by October 15, 1980.

5) Evaluate the feasibility of exposure investigation for prior calendar quarters. Provide this evaluation to RII by October 31, 1980.

That correspondence also requested licensee concurrence on these items and requested replies as noted in the items above. These corrective actions and their results will be examined in a future inspection.