UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

MAY 30 1986

bReport No.: 50-400/86-37

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket No.: 50-400 Construction Permit No.: CPPR-158

Facility Name: Harris 1

Inspection Conducted: May 5-8, 1986

Inspectors: W. B. Gloersen — May 27, 1986 Date Signed

S. S. Adamovitz — May 27, 1986 Date Signed

Approved by: P. G. Stoddart, Acting Section Chief — 5/27/86 Date Signed
Radiological Effluents and Chemistry Section
Division of Radiation Safety and Safeguards

SUMMARY

Scope: This routine, announced preoperational inspection involved an onsite assessment in the areas of liquid and gaseous radwaste systems, effluent treatment systems, effluent monitoring systems, and quality assurance and confirmatory measurements for in-plant radiochemical analyses.

Results: No apparent violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Applicant Employees

*R. W. Watson, V. P. Harris Nuclear Project
*A. W. Bowles, Director Onsite Nuclear Safety
*C. L. McKenzie, Acting Director - QA/QC (Operations)
*J. R. Sipp, Manager, Environmental and Radiation Control
*D. Tibbitts, Project Specialist
*J. H. Eads, Sr. Engineer, Nuclear Licensing
*H. Lippa, Environmental and Chemistry Supervisor
*E. Morgan, Environmental and Chemistry Principle Specialist
*M. Wallace, Specialist, Regulatory, Compliance
*J. L. Dority, Startup Supervisor
*L. J. Woods, Startup Supervisor
*L. Aspray, Startup Engineer
*B. Sears, Environmental and Chemistry Foreman
A. Poland, Project Specialist
W. Levi, Senior Specialist, Environmental

Other applicant employees contacted included engineers, technicians, and office personnel.

NRC Resident Inspectors

*G. Maxwell

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on May 8, 1986, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings. One inspector followup item concerning evaluation of certain plant effluent sampling and preparation procedures was identified (Paragraph 3). No dissenting comments were received from the applicant. The applicant did not identify as proprietary any of the material provided to or reviewed by the inspector during this inspection.

3. Procedures (84523, 84524, 84525)

The inspectors reviewed selected portions of the following approved procedures that were related to radiological effluent management:

- ERC-200, Conduct of Operations, Environmental, and Chemistry, Rev. 0, 6/20/83.

- CRC-004, Chemistry Logs, Records and Sample Handling, Rev. 1, 11/15/85
- CRC-010, Calibration of Instruments, Rev.0, 7/24/85
- CRC-020, Chemistry Quality Control Program, Rev. 2, 3/21/86
- CRC-250, Plant Vent Sampling, Rev. 1, 1/16/86
- CRC-251, Sampling Non-Pressurized Radioactive Gases, Rev 1 12/21/85
- CRC-255, Waste Gas Decay Tank Sampling, Rev. 1, 1/2/86
- CRC-828, Isotopic Analysis for Core Damage Evaluation, Rev. 0, 5/15/85
- CRC-853, Reporting Radioactive Gaseous Releases, Rev. 1, 2/6/86
- CRC-854, Reporting Radioactive Liquid Releases, Rev. 1, 2/6/86
- HPP-067, Collection of Particulate/Iodine Air Samples, Rev. 1, 11/12/85
- RCP-660, Sample Preparation for Determination of Radioactivity, Rev. 0, 5/1/85
- RCP-665, Standards Preparation of Counting Room Instrumentation, Rev. 0, 8/7/85
- RCP-701, Operation of the Canberra Series 90 Gamma Spectrometry System Rev. 0, 5/16/85.
- RCP-710, Operation of the Packard Model 4530 Liquid Scintillation System, Rev. 0, 5/16/85.
- RCP-711, Dose Equivalent Iodine - 131 Calculation, Rev 1, 1/3/86
- RCP-712, E-Bar Calculations, Rev. 0, 6/20/85
- RCP-720, Operation of the Tennelec LB 5100 Proportional Counter, Rev. 0, 7/22/85
- RST-204, Reactor Coolant System Chemistry and Radiochemistry Surveillance, Rev. 1, 11/18/85
- RST-210, Liquid Effluent Radiochemistry Surveillance, Rev. 1, 11/22/85.
- RST-211, Effluent Radiochemistry Surveillance, Rev. 1, 11/7/85

The inspectors discussed various aspects of the procedures with the applicant and the following observations were noted:

a. CRC-250, Plant Vent Sampling: This procedure did not specify the type of iodine collection cartridge (charcoal or silver zeolite) to use

during normal or emergency plant vent sampling conditions. The applicant agreed to evaluate this aspect of the procedure.

b. CRC-255, Waste Gas Decay Tank Sampling: Reference 3.d of this procedure listed the Tennelec LB-5100 Series II Proportional Counter. The Bicron Phoswich detector should also be listed since two phoswich detectors have been purchased for alpha/beta counting. Additionally, Step 11.3 described a method to determine the required sample volume to achieve the required lower limit of detection (LLD). In practice, the sample volume for gas samples will be either 100 cc or 1260 cc (the available geometries for gamma isotopic analyses). The elapsed time between sample collection and time of counting (for plant effluents) would be the limiting factor. The applicant indicated that the sample volume determination step was intended for obtaining a sample through a charcoal cartridge and particulate filter, although this intent was not identified clearly in the procedure. The applicant agreed to review this portion of the procedure and to indicate the purpose for determining the sample volume in order to achieve the required LLD.

c. RCP-660, Sample Preparation for Determination of Radioactivity: Section 10.3 indicated that a sample need not be distilled (for tritium analyses) if the gross activity was less than 1.0 E-5 uCi/ml. The applicant agreed to revise this portion of the procedure to include distillation of all samples. Additionally, Section 5.3 of the procedure indicated that caustic thiosulfate/potassium iodide solution could be added to the sample to suppress iodine volatilization while Section 7.2 indicated that sodium hydroxide could be added to achieve the same effect. The applicant agreed to evaluate this procedural discrepancy.

To summarize, the concerns discussed in the three procedures listed above were identified as one inspector followup item (50-400/86-37-01) and will be reviewed during a future inspection.

4. Liquid Radioactive Waste System and Gaseous Radioactive Waste System (84523 and 84524)

Installation of the liquid radwaste (LRW) system (#7060) was complete, and, according to the applicant, the preoperational testing of the various components of the system would begin around June 1, 1986. The inspectors reviewed selected electrical operability tests and hydrostatic tests of the liquid radwaste system. The inspectors noted approximately 85% of the floor drains had been checked for proper drainage with dyed water. The remaining portions of the preoperational inspection requirements will be reviewed during a subsequent inspection when the applicant has completed the preoperational testing of the LRW system.

Installation of the gaseous radwaste (GRW) system (#7070) was complete, and according to the applicant, the preoperational testing should be complete by May 23, 1986. The preoperational inspection module requirements will be

reviewed during a subsequent inspection when the applicant has completed the preoperational testing of the GRW System.

Additionally, the inspectors noted that the preoperational testing of the applicant's post-accident sampling system (PASS) and Containment Hydrogen Accident Monitoring System would be complete by June 1, 1986. Construction completion for the PASS was scheduled for May 12, 1986, since some back pressure regulators had to be installed.

5. Nuclear Air-Cleaning Systems (84524)

Engineered Safety Feature (ESF) ventilation exhaust treatment at the Shearon Harris Facility included the Fuel Handling Building Emergency Exhaust System Trains, the Control Room Emergency Filtration Systems, and the Reactor Auxiliary Building (RAB) Emergency Exhaust Systems. The non ESF ventilation exhaust treatment systems included the RAB normal exhaust system, containment building ventilation exhaust system (purge), main condenser vacuum pump effluent treatment system and the waste processing areas filtered exhaust system. Due to construction work in progress (painting, etc.) neither the charcoal nor HEPA filter installations had been made. The preoperational tests of both the ESF and non-ESF HEPA filter and charcoal and adsorber systems will be reviewed at a later date. The inspectors noted however, that the draft Technical Specifications (Revision 28 February 1986) 3/4.7.6, 3/4.7.7, and 3/4.9.12 referenced ANSI N510-1975, "Testing of Nuclear Air-Cleaning Systems" for certain preoperational and surveillance testing requirements. The applicant indicated that the later revision, ANSI N510-1980 will be used for the various tests and that the appropriate technical specifications will be revised.

6. Liquid and Gaseous Radioactive Effluent Monitoring (84523 and 84524)

Installation of the gaseous and liquid effluent monitoring and sampling systems was essentially complete. The inspectors noted that there were four major gaseous release points: turbine building stack, plant vent stack, and two waste process stacks. The inspectors examined the four-point sampler in radwaste Stack #5 and noted the following three flow paths used for monitoring and sampling the gas stream: (1) particulate, iodine, and gaseous (PIG) monitor; (2) wide range noble gas monitor (both normal and high ranges); and (3) normal range sampling units for radioiodines and particulates and additional sampling equipment for drawing samples of radioiodines and particulates under accident conditions. It should be noted that the radioiodine and particulate post accident samples would be removed for analysis at a remote location in the event of an accident resulting in high levels of airborne radioactive material in gaseous effluents. The installed equipment was manufactured by General Atomics. The applicant indicated that the preoperational testing of the various monitors including calibration would be completed during July 1986.

7. Laboratory Facilities (84525)

The inspectors and applicant representatives toured radiological sample preparation and counting laboratories to observe the construction progress and to examine the equipment that will be used for radiological counting activities. Sample preparation and storage would be carried out in the hot and cold labs which had respectively 3364 and 1017 square feet of space. Discussions with lab personnel indicated that the laboratory would be accessible during accident conditions. In addition to the two feet of concrete shielding surrounding the entire building, the count room was surrounded by an additional two feet of concrete. One hood in the hot lab was fitted with lead brick shielding for handling radiologically "hot" samples and additional hoods could be fitted with extra shielding if required. The Harris Energy and Environmental Center (HEEC) would be a final back-up for accident sample analysis and also provide routine radiochemical analysis.

Analytical equipment in the count room included three Canberra Series 90 multichannel analyzers, four Canberra intrinsic-germanium (IG) detectors, two Tennelec LB5100 Series alpha/beta counters equipped with Phoswich detectors, and one Packard Tri-Carb 4530 liquid scintillation counter. Data processing and management will be accomplished by a VAX11/730 computer system. A back up computer has been budgeted for this fiscal year but has not been ordered as yet. Equipment calibrations were in progress, and preliminary IG calibrations were complete with the exceptions of charcoal and silver zeolite cartridges in aluminum cases. The applicant had contracted with an independent consultant for a final review of equipment calibrations and count room activities. The applicant provided the NRC inspectors with empty sample containers for confirmatory measurement spiked samples. The inspectors informed laboratory personnel that spiked samples would be submitted for analysis during the next inspection.

The inspectors discussed the sample collection, preparation and analysis related procedures listed in Paragraph 3 with laboratory personnel. Sample collection was covered in CRC procedures Series 200. Data reporting, including sample handling was covered in CRC-004. Equipment calibrations were included in individual operational procedures, specifically RCP-701, RCP-710, and RCP-720, and guidelines for a quality control program were listed in CRC-020. Procedures CRC-004 and RCP-660 covered sample processing in the laboratory.

The inspectors reviewed the applicant's quality assurance program for the radiological sample preparation and counting laboratories. The inspectors used the guidance contained in Regulatory Guide 4.15 (Quality Assurance for Radiological Monitoring Programs (Normal Operations) - Effluent Streams and the Environment, February 1979) to evaluate the applicant's program.

The inspector's reviewed an informal (handwritten) organizational chart for the Environmental and Radiological Control group. The inspectors noted that the applicant was in the process of developing a more formalized structure

of the organization as it related to management and operation of the monitoring programs.

Discussions with laboratory management concerning personnel qualifications indicated lab technicians had a minimum educational background of a two-year associate degree in science or engineering. Lab personnel with no plant experience have been sent to other Carolina Power and Light nuclear plants for several weeks of offsite training. A training program implemented in August 1985 identified 99 tasks with sign off cards for environmental and chemistry technicians.

The inspectors reviewed the applicant's ability to track and control various plant samples. All samples would be logged in a bound notebook, an identifying number assigned, and an analysis request form completed. Data review would be accomplished by the lab technician, lab foreman, and the chemistry supervisor.

Laboratory quality control included the use of NBS traceable standards. Daily performance checks were performed and charted for laboratory gamma counting systems, and procedural requirements of daily performance checks of other counting systems would be implemented as the systems were calibrated. To check laboratory performance, the applicant had contracted with an independent consultant for monthly unknown spikes and indicated that the HEEC would also provide spiked samples. The inspectors noted the applicant did not plan to perform replicate analyses, but the applicant indicated quality control spikes would be counted on all detectors. Additionally, the applicant indicated that quality assurance audits would be performed quarterly onsite by onsite personnel and annually by corporate staff.