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

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Report No: 50-400/92-01

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

Docket No.: 50-400 License No.: NPF-63

Facility Name: Shearon Harris Nuclear Power Plant

Inspection Conducted: January 6 - 10, 1992

Inspector: R. P. Carrion 7 Feb '92
R. P. Carrion Date Signed

Approved by: J R Decker 2/7/92
T. R. Decker, Chief Date Signed
Radiological Effluents and
Chemistry Section
Radiological Protection and Emergency
Preparedness Branch
Division of Radiation Safety and
Safeguards

SUMMARY

Scope:

This routine, unannounced inspection was conducted in the areas of plant water chemistry; the post accident sampling systems (PASS); shipping of radwaste and spent fuel; environmental monitoring; organization of the Environmental and Radiation Control (E&RC) Department, the Radwaste Shipping Unit, and the Radiochemistry Section; Spent Fuel Pool (SFP) clean up status; contingencies for low level radwaste (LLW) storage facilities; audits; the Radiochemistry Count Room; the Meteorological Program; and contaminated soil on site.

Results:

The licensee's organization in the areas of Chemistry and Radioactive Waste was stable and staffed with competent personnel (Paragraph 2).

Recent audits were confusing and fragmented in presentation, making

their effectiveness difficult to assess. (Paragraph 3)
Plant water chemistry was maintained well within TS limits. (Paragraph 4)

The licensee is trying to resolve the problem with the gas stripper component of the PASS. (Paragraph 5)

The clean up of SFPs C and D continues. An engineering evaluation of the effects of introducing non-Harris spent fuel into the SFPs had been done. (Paragraph 6)

The licensee's Meteorological Monitoring Program was well maintained and fulfilled its required function. (Paragraph 7)

The calibration of an air sampling unit was done without incident. (Paragraph 8)

The licensee is making good progress in the effort to put the TS radiation monitors back into service. (Paragraph 9)

The Radiochemistry Count Room and associated instrumentation was well-maintained and the performance logs were complete. (Paragraph 10)

Contaminated soil was not a problem on site. (Paragraph 11)

The Radiation Control (RC) staff involved with the radwaste and spent fuel shipments is competent and carries out its duties in a professional manner. (Paragraph 12)

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*M. Boone, Radiation Control (RC) Supervisor
*A. Bostic, Radwaste Shift Supervisor
D. Cahill, Radiochemistry Supervisor
*R. Connolly, QAE Project Engineer
P. Doss, Technical Specialist
*C. R. Gibson, Programs and Procedures Manager
*C. S. Hinnant, General Manager - Harris Plant
*S. Johnson, Environmental and Chemistry (E&C) Supervisor
*J. L. Kiser, Radiation Control Manager
*J. Leonard, Project Specialist - Radwaste
J. McKay, Nuclear Assessment Department (NAD)
*R. Morgan, Project Assessment Manager
*T. C. Morton, Maintenance Manager
*D. C. McCarthy, Site Engineering Manager
M. E. McLeod, Air Quality Specialist
*B. Meyer, Environmental and Radiation Control (E&RC) Manager
*J. F. Nevill, Technical Support Manager
*C. S. Olexik, Regulatory Compliance Manager
*A. Poland, Manager, E&RC Support
*R. B. Richey, Vice President - Harris Nuclear Project
*K. B. Rogers, E&RC Technician/Radwaste
*B. Sears, E&RC Supervisor
*J. H. Smith, Radwaste Manager
*M. S. Staton, Power Agency - Site Representative
*M. G. Wallace, Senior Specialist, Regulatory Compliance
*R. A. Watson, Senior Vice President - Nuclear Generation
*W. R. Wilson, Spent Nuclear Fuel Manager

Other licensee employees contacted during this inspection included engineers, operators, technicians, and administrative personnel.

NRC Inspectors

*D. J. Roberts, Resident-In-Training
M. Shannon, Resident Inspector
*J. Tedrow, Senior Resident Inspector

*Attended exit interview

2. Organization (84750 and 86750)

Technical Specification (TS) 6.2 describes the licensee's organization.

The inspector reviewed the licensee's organization, staffing

levels, and lines of authority as they related to the Chemistry Department, Radioactive Waste Shipping Group, and the Radiochemistry Section of the Laboratory and Facility Services Section (L&FSS) to verify that the licensee had not made organizational changes which would adversely affect the ability to control radiation exposures or radioactive material.

The Chemistry Department was part of the Environmental and Radiation Control (E&RC) Department. The organizational structure had not changed since the last Inspection Report (IR 50-400/91-22). However, one change was to be implemented in the near future. A new position, that of Chemistry Manager, who would report to the E&RC Manager was being created. The two E&C Supervisors (Plant Operations and Count Room) would report to the Chemistry Manager rather than directly to the Plant Manager.

The Radwaste Shipping Section is one of four sections in the Radiation Control Operations Branch. It is composed of ten technicians and a supervisor, who reported to the Manager of Radiation Control Operations, who, in turn, reported to the E&RC Manager. In addition to preparing the normal radwaste shipments, this group was also responsible for receiving the spent fuel casks from the Brunswick and Robinson plants and assuring that they may be released from the Harris site upon removal of the spent fuel. There had been no changes in this organization since the last report.

The Radiochemistry Section was located off site at the Harris Energy and Environmental (E&E) Center. Organizationally, it was part of the L&FSS and had the responsibility of counting the environmental samples of all three Carolina Power and Light Company (CP&L) nuclear power plants. The staff included the Supervisor (who reported to the Manager-L&FSS), a Specialist, a member from Health Physics Support, and six Technicians, excluding one vacancy which was to be filled in the near future.

The inspector determined that staffing levels were adequate to accomplish their respective responsibilities and that the staff was knowledgeable and competent.

No violations or deviations were identified.

3. Audits (84750)

TS 6.5.4.1 specifies the types and frequencies of audits to be conducted under the direction of the Nuclear Assessment Department (NAD). The inspector reviewed audits and assessments conducted during the past two years by the NAD and its predecessor, the Quality Assurance Auditing Group, within

the scope of this report. In order to evaluate compliance with the TSs and assess quality of the licensee's programs, the inspector reviewed the following:

- Quality Assurance Audit of the Harris Nuclear Project Environmental and Radiological Controls, CQAD 90-1124, conducted July 9 through 20, 1990.

- Harris Maintenance and Environmental & Radiological Control (E&RC) Assessment, NAD 91-218, conducted April 1 through 19, 1991.

- Technical Services Department Assessment, NAD 91-447, conducted September 23 through 30 and October 1 through 4, 1991.

CQAD 90-1124 was found to be well-planned and documented, with a clearly-defined scope, methodology utilized in the course of the audit, conclusions which identified detailed findings of both strengths and weaknesses, and the status of previous audit nonconformances.

NAD 91-218 and NAD 91-447, while containing a clearly-defined scope, were not done to the same depth, were confusing and disjointed in presentation, and only nominally addressed the TS-required programs. The effectiveness of the licensee's audit program was difficult to determine because of this. The inspector noted that these two assessments were conducted by the newly-organized NAD.

The inspector could not conclude that the audit process was capable of identifying programmatic weaknesses and making recommendations for corrective action but did not cite the licensee with a violation because the TS-required items had been addressed, however modestly. Improvement in this area is expected and this issue will be reviewed during a subsequent inspection.

No violations or deviations were identified.

4. Plant Water Chemistry (84750)

TS 3.4.7 specifies that the concentrations of dissolved oxygen (DO), chloride, and fluoride in the Reactor Coolant System (RCS) be maintained below 0.10 parts per million (ppm), 0.15 ppm, and 0.15 ppm, respectively. TS 3.4.8 specifies that the specific activity of the primary coolant be limited to less than or equal to 1.0 microcuries/gram (uCi/g) dose equivalent iodine (DEI). These parameters are related to corrosion resistance and fuel integrity.

Pursuant to these requirements, the inspector reviewed

graphical daily summaries which correlated reactor power output to chloride, fluoride, and dissolved oxygen concentrations, and specific activity of the reactor coolant for the period of November 1, 1991 through December 31, 1991 and determined that the parameters were maintained well below TS limits. Typical values for DO, chloride, and fluoride were one part per billion (ppb), less than four ppb, and two ppb, respectively. Typical DEI values at steady-state conditions ranged from 9.0E-3 uCi/g to 1.0E-3 uCi/g. The inspector noted that even during a power reduction to 50% to repair a condensate booster pump and feedwater heater, DEI spiked only to 2.2E-2 uCi/g.

The licensee suspected two pin-hole leaks in the fuel, based on small iodine spikes without a corresponding increase in cesium.

The inspector concluded that the Plant Water Chemistry was being maintained well within the TS requirements.

No violations or deviations were identified.

5. Post Accident Sampling System (PASS) (84750)

NUREG-0737 requires that the licensee be able to obtain a sample of the reactor coolant and containment atmosphere. Furthermore, the sample must be promptly obtained and analyzed (within three hours total) under accident conditions without incurring a radiation exposure to any individual in excess of 3 and 18 3/4 rem to the whole body or extremities, respectively.

TS 6.8.4.e requires that a program be established, implemented, and maintained to ensure the capability to obtain and analyze, under accident conditions, reactor coolant, radioactive iodides and particulates in plant gaseous effluents, and containment atmosphere samples. The PASS should provide these capabilities and should enable the licensee to obtain information critical to the efforts to assess and control the course and effects of an accident.

The continuing inability of the stripped gas isotopic results to meet NUREG-0737 acceptance criteria had not been resolved at the time of this inspection. The inspector spoke to the cognizant licensee Technical Specialist responsible for the system to get a status update. The problem with the gas stripper was its inability to maintain a constant pressure or flow. The Technical Specialist showed the inspector a drawing (CPL-2165-S-0552S02, Rev. 5, issued June 8, 1989) of the system and explained a modification designed to prevent fluctuation of pressure or flow into the gas stripper due to leakage around pressure regulation valve 1SP-979. This was to

be accomplished by changing the configuration of the valves. Specifically, motor-operated valve (MOV) 1SP-978 was to be moved upstream of valve 1SP-979 in an effort to relieve surges and resultant by-pass leakage. Plant Change Request (PCR) 6161 had been initiated to make the change and it was expected to be done by the end of January, 1992. Testing of the valve was expected to be completed by the end of February, 1992, in time for the quarterly verification with the RCS.

In addition, the inspector was told that there was probable leakage around valve 1SP-1004, a small four-way valve utilized in obtaining diluted boron samples. This valve would be closely monitored upon the completion of PCR-6161.

Finally, when the valve problems have been resolved, tests on the gas stripper would be run to determine its efficiency. The efficiency had been taken to be 74%, but the Technical Specialist thought that it was higher, greater than 90%.

The inspector also reviewed training records of designated PASS Operators. Three had received retraining in August, one in October, and three in December. The inspector was satisfied that the licensee's retraining commitment to NRR was being met.

No violations or deviations were identified.

6. Spent Fuel Pool (SFP) Facility (84750)

The inspector met with cognizant licensee representatives to discuss the status of the clean-up effort of the SFPs and toured the SFPs for familiarization purposes. Pool A was used for storage of new fuel as well as some spent fuel and Pool B exclusively for the storage of spent fuel from all three CP&L nuclear facilities. Pools C and D were used for temporary storage of contaminated filters, scaffolding, etc.

The licensee had drained Pool C to less than ten feet in depth and planned to dispose of various miscellaneous items currently stored there and to decontaminate it in the near future. Upon completion of the decontamination, Pool C would be re-filled. Pool D was filled and continued to serve as a temporary repository for spent demineralizer filters and various other contaminated items. The water was not clear as in Pools A and B, but rather opaque and green in color, permitting the inspector to see only about a foot under the surface of the pool. The licensee hypothesized that this phenomenon was due to the carbon steel content of some of the items being stored in the pool. This condition was expected to be rectified upon removal of the components containing carbon steel.

The licensee had observed sulfate levels in all the pools/transfer canals, except Pools C and D, exceeding those of the administrative limits, 300 ppb vs. 100 ppb, respectively. The licensee could offer no explanation for the rise, but noted that had the increase was observed after the first spent fuel from Robinson had arrived in the autumn of 1991. The licensee was monitoring the levels while trying to determine its source.

The inspector discussed the current position of the Crud Oversight Group as related to precleaning future spent fuel shipments from Brunswick. The consensus of the Group was to clean 51 Brunswick spent fuel assemblies prior to shipping. This would fill out the remaining Boiling Water Reactor (BWR) racks in Pool A. From this action, cost effectiveness data would be gathered and analyzed to determine the future course of action. Also, ALARA issues could be addressed, i.e. would higher personnel exposures result from prewashing the spent fuel at Brunswick vs. handling unwashed fuel at Harris. A safety analysis addressing such issues would be completed before shipments resumed. The next shipment from Brunswick was schedule for Spring, 1992.

The licensee had undertaken an extensive effort to determine the impact of Brunswick spent fuel crud on the SHNPP Design Basis, including:

- Determining the maximum design activity concentrations within the SFP liquid, SFP Cleanup System, and the Refueling Water Storage Tank (RWST).

- Determining the effect of this maximum design activity on the public during an accident condition.

- Determining the normal operational activity concentration of the spent fuel liquid during plant operation and refueling.

- Determining the effect of SFP liquid discharge to Radwaste.

The inspector reviewed Engineering Evaluation RET-0252, Rev. 2, entitled "Brunswick Nuclear Project (BNP) Spent Fuel Crud on Harris Nuclear Project (HNP) Design Basis." It was done to update the Shearon Harris Nuclear Power Plant (SHNPP) Final Safety Analysis Report (FSAR) to include the introduction of the radioactive crud attached to spent fuel from Brunswick (and Robinson) for storage in the SFP at Harris as well as to account for other sources of activity introduced into the SFP. Engineering Calculations SF-0034, Rev. 1,

entitled "Analysis for SHNPP for BNP Spent Fuel Crud on HNP Design Basis," was done to determine the design basis maximum activity concentration within the fuel pool and the effect of this activity on the public for a postulated radioactive release to surface water and to ground water via a failure of the RWST. Engineering Calculation SF-0035, Rev. 0, entitled "Analysis for SHNPP for Spent Fuel Pool Demineralizer Activity Concentration," was also done to determine the maximum activity concentration within the SFP demineralizers resulting from increasing SFP activity levels due to the storage of spent fuel from Brunswick and Robinson. SF-0034 concluded that a rupture of the RWST with a completely full SFP with a resulting homogeneous mixing of the SFP water and RWST water would result in a release to the public of 52.7% of the unrestricted 10 CFR 20 dose, broken down as 18% due to crud and 34.7% due to tritium. SF-0035 concluded that the higher activity levels within the SFP demineralizers due to the introduction of spent fuel and associated crud from Brunswick and Robinson exceeded those of the FSAR and recommended that the demineralizers be monitored and resin replaced at a pre-determined dose level, as dictated by plant management. This action would assure that dose levels to plant personnel would not exceed the allowable dose levels. The evaluation concluded that in a worst case scenario, storage of non-SHNPP spent fuel would change the FSAR but that the safe operation of safe shutdown of the plant remained unaffected.

The inspector determined that the evaluation was detailed and complete and that plant operation would not be affected.

No violations or deviations were identified.

7. Meteorological Monitoring Program (84750)

The information obtained from the Meteorological Monitoring Program is integral to the determination of off-site dose projection. TS 6.9.1.4 requires an annual summary of hourly meteorological data collected over the previous calendar year, including wind speed, wind direction, atmospheric stability, and precipitation (if measured).

The inspector reviewed the Meteorological Monitoring Program at SHNPP. The review included direct observation, discussions with a cognizant licensee representative, and a review of records. The inspector determined that SHNPP had one meteorological tower. The tower had two sets of instrumentation, located at the 10- and 60-meter levels. Wind speed, wind direction, wind variance, and differential temperature were measured at both levels. Total precipitation, solar radiation, dew point, and barometric pressure instrumentation were located near ground level

inside the security fenced-in area of the instrumentation shack. The program utilized two redundant systems; an ADAC System 1200, with a visual display readout of fifteen variables, and a Westinghouse system pulse counter, with four channels and a 36-day continuous-recording tape, which could be monitored from corporate headquarters.

The location of the tower was such that there would be no interference with the flow of air. In the event that the tower is out of service, there is no back-up system on the site. However, the essential parameters could be obtained from the nearby commercial airport of Raleigh-Durham, North Carolina.

The inspectors verified by direct observation and by records review that the meteorological monitoring instrumentation channels were operable and maintained. The inspectors reviewed selected portions of meteorological monitoring instrumentation channel calibration/verification records for the time period of February to June, 1991. These calibrations/verifications included the following instruments: wind speed and direction monitoring systems, the ambient temperature and differential temperature monitoring system, barometric pressure, and solar radiation instrumentation.

The inspector determined, through conversations with the cognizant licensee representative, that the calibration/verification of the various meteorological instrumentation sensors were performed by personnel from the Meteorology Unit from CP&L's corporate office. Personnel from this unit perform six-, twelve-, and eighteen-week interim verifications, and semiannual and annual calibrations. The semiannual and annual calibrations included the change out of many of the monitoring systems (i.e. wind and temperature systems).

The inspector also checked the monitor in the Control Room to assure that the required meteorological parameters were available to the reactor operators. He found wind speed and wind direction at both 10- and 60-meter levels as well as differential temperature readings on the Group Display on the Plant Computer. In addition, the information could be obtained via a computer modem and dedicated telephone line to the tower. This system was demonstrated to the inspector.

Based on the scope of this review, the inspector determined that the Meteorological Measurement System was capable of fulfilling its required functions.

No violations or deviations were identified.

8. Radiological Environmental Surveillance Program (84750)

The purpose of the Radiological Environmental Surveillance Program is to measure accumulation of radioactivity in the environment, to determine whether this radioactivity is the result of operations at the plant, and to asses the potential dose to the off-site populations bases on the cumulative measurements of any plant-originated radioactivity via the monitoring of specific elements of exposure pathways.

To assure accuracy, instrumentation and equipment used in the Program is periodically calibrated. The inspector observed a technician calibrate an air sampling unit. The technician read and closely followed the Laboratory & Facility Services Section Instruction: RC-ER-3, entitled "Operation and Calibration of SHNPP Environmental Air Samplers," Rev. 4, approved on September 19, 1991. Specifically, the technician referred to Section 5.2, "Air Sampler Calibration." He went about his task in a knowledgeable, competent manner and completed the work without incident.

The inspector concluded that the technician was experienced and capable in fulfilling his duties.

No violations or deviations were identified.

9. Out of Service Monitors (84750)

Out of service monitors were addressed in Paragraph 5.b of Inspection Report 50-400/91-22. The inspector followed up this item with a status review to determine when the monitors were expected to be placed back in service.

- PCR 4746, which addressed fixing process flow rate monitors FT-21WL-6119 (for the Waste Monitor Tanks (WMTs)) and FT-*1WL-6193 (for the Treated Hot Shower Tank), had been turned over with exceptions. The installation had been completed and a hydro test of the system had been done. Originally, only two flow transmitters (FT-6119 and FT-6193) were to be replaced with new ones. However, the scope of the work expanded to include a cross tie between the Secondary Waste Storage Tank, Waste Monitor Tank, and Waste Evaporator Condensate Tank. Calibration of the monitors was expected to be completed by the end of February, 1992, by the successful completion of two Maintenance Surveillance Tests (MSTs).

- PCR 3170, which addressed the Flow Rate Monitors for the Reactor Auxiliary Building (RAB) Vent Stack 1, Waste Processing Building Vent Stack 5, and Waste Processing Building Vent Stack 5A, had completed the installation of

the monitors. Equipment turnover was expected to begin by the end of January, 1992. Rewriting of procedures remained to be completed to accommodate the newly-installed equipment.

- PCR 2290 addressed the reliability of the gas analyzers associated with the Waste Gas Decay Tanks (WGDTs). The original system was obsolete and constantly broke down. The PCR replaced the analyzers with upgraded technology. All work was done, except for the optional field work of adding two five-point terminal boards to enhance the calibration of the oxygen analyzers. Calibrations were to begin in mid-January, 1992 and were expected to be finished by the end of the month. Turnover and operability testing was expected to be completed by mid-February, 1992. Portions of the "A"-side had been walked down and turned over in the fourth quarter of 1991.

- PCR 5107 addressed modifications to the flow measurement system to correct moisture interferences which resulted in discrepancies between actual and expected flow rates of the flow rate monitor for Turbine Building Vent Stack 3A. The moisture subjected the flow velocity probe to burnout. No design change was made by this PCR. Rather, new equipment of the same type was to be installed. The licensee expected the delivery of a new flow velocity probe from the vendor by the end of January, 1992.

The inspector concluded that the licensee had taken positive steps in the resolution of the problem associated with its out-of-service monitors and that they should be back in service in the near future.

No violations or deviations were identified.

10. Count Room (84750)

10 CFR 20.201(b) requires the licensee to perform surveys as necessary to evaluate the extent of radiation hazards. The inspector toured the Chemistry Count Room, which was equipped with two computer-based gamma spectroscopy counting systems with three operational intrinsic Germanium detectors, two proportional counters used for gross alpha and gross beta determinations, and a new liquid scintillation counting system used for tritium (H-3) determination.

The inspector reviewed control charts and calibration curves and found them to be current and sufficient. Daily calibration checks and system resolution checks were performed

on the gamma spectroscopy system. The values obtained from the calibration checks were recorded and trended on control charts with specified predetermined limits in order to confirm detector stabilities and system operability. In the April-May-June time frame, the control charts and logs showed numerous occasions when the counts fell outside the three-sigma tolerance bands. The inspector was told that during that period, the air conditioning in the Count Room frequently malfunctioned and the instrumentation got too warm, resulting in erroneous counts.

The intrinsic Germanium detectors were calibrated annually. The inspector reviewed the calibration for Detector 1. It had been calibrated in June, 1991 for twenty-two geometries.

The two proportional counters had been calibrated in March (for No. 1), and April (for No. 2). Daily background and response checks were performed on the proportional counters and recorded in a monthly log, which was reviewed by the inspector and determined to be acceptable.

The liquid scintillation counter was calibrated annually, the last time being March, 1991. Daily background checks were also performed on this counter.

Calibration sources were traceable to the National Institute of Standards and Technology (NIST).

From the observations made during this inspection, the inspector concluded that the licensee demonstrated that a good Count Room radiochemical analysis program was in place and was implemented by knowledgeable, proficient staff.

No violations or deviations were identified.

11. Contaminated Soil (84750)

The inspector discussed the issue of contaminated soil with the E&RC Manager to determine on-site quantities, activity levels and associated isotopic characterization, contamination sources, and plans for dealing with it.

The inspector was told that to avoid the possibility of spills of contaminated liquids on the ground, all tanks in which contaminated liquids were collected, stored, or processed were contained within concrete structures with sumps which were tied into the radwaste processing units.

However, sandblasting activities had generated forty-one 55-gallon drums of spent sand. Isotopic analysis determined that thirty-seven drums contained only naturally-occurring isotopes, while four proved to have demonstrable fission

product (Co-60) contamination. The four drums in question were removed form the site as part of Shipment D-01-92 on January 7, 1992. The remaining drums were turned over to Plant Services and placed in the on-site clean landfill.

No other known contaminated soil was on site.

The inspector concluded that contaminated soil did not pose a problem on this site.

No violations or deviations were identified.

12. Radwaste Processing and Transportation (86750)

10 CFR 71.5 (a) requires that each licensee who transfers licensed material outside of the confines of its plant or other place of use, or who delivers licensed material to a carrier for transport, shall comply with the applicable requirements of the regulations appropriate to the mode of transport of the Department of Transportation (DOT) in 49 CFR, Parts 170 through 189.

Pursuant to these requirements, the inspector reviewed the licensee's activities affiliated with these requirements, to determine whether the licensee effectively processes, packages, stores, and ships radioactive solid materials.

The licensee's program for the packaging and transportation of radioactive materials, including solid radwaste, was conducted by the Radioactive Waste Group within the Health Physics Department. Radwaste was processed and packaged by the Radwaste Group, including compacting contaminated material, loading shipments, and preparing shipping documentation.

a. Radwaste Shipping Documentation

The inspector reviewed shipping logs for 1991. The logs showed that 18 burial shipments and 114 special, non-burial shipments were made for the year. The inspector reviewed four burial shipment packages, including D-05-91, D-08-91, D-13-91, and D-16-91 as well as five non-burial shipments, including S-31-91, S-50-91, S-65-91, S-89-91, and S-103-91 for completeness and compliance with the regulations. The non-burial shipments included a wide variety of items, from empty spent fuel shipping casks to samples to be counted at the E&E Center. The packages documented the shipments and included items such as unique shipment and shipping container numbers, waste content and volume, total activity, analytical summary and breakdown of isotopes with a half-life greater than five years. The radiation and contamination survey results were within the limits

specified and the shipping documents were being maintained as required.

One shipment, D-13-91, was of particular note. It was a LSA shipment of dewatered bead resin, shipped "exclusive use" on a low boy trailer/cask configuration destined for burial at Barnwell, South Carolina. The loaded cask was picked up by the shipping company. However, before it left the protected area, the trailer disengaged from the cab and dropped about six inches to the asphalt pavement. Radiological surveys were immediately taken. No increase or shift in radiation levels were noted. The cask and trailer were roped off and posted to prevent unwarranted personnel entry. A certified inspection of the trailer was performed onsite to check for any structural damage, such as separated weldments, to ensure its integrity. The cab was sent offsite to get a DOE-certified inspection.

Action Item Assignment 91H1249 was initiated to investigate the incident, determine its root cause, and make recommendations to prevent recurrence. The investigation determined that the driver failed to verify that the "fifth wheel" of the tractor was engaged before leaving the cask loading area. Proposed corrective actions included an evaluation of the shipping procedures to determine if and how to require closer inspection of the transport vehicles "by the carrier" before leaving the site. The inspector noted that the Radiation Control Technician had fulfilled all items on the shipping check list, as required by procedure, but that checking the "fifth wheel" for more than appearance was not on the check list. It was the sole responsibility of the driver to assure that the "fifth wheel" had been properly engaged.

The inspector concluded that the Radwaste Shipping Section had acted in a competent, professional manner to assure that any radiological conditions resulting from the incident were mitigated. Overall, the inspector concluded that the Radwaste Shipping Section was capable of discharging its duties efficiently while being cognizant of ALARA considerations.

b. Radwaste Shipments

Shipment of radioactive materials was the responsibility of the Radwaste Shipping Section, which prepared all shipping documents and procured the necessary disposal containers and shipping casks.

One radwaste shipment was made during the period that the inspector was on site. Therefore, the inspector observed

the activities involved therein to evaluate the effectiveness of training, activities of personnel, procedures, etc. A shipment (D-01-92) of Low Specific Activity (LSA) material in the form of two large metal containers of non-compacted metal scrap, wood scrap, soil, and dry active waste (DAW) was being sent to a volume reduction center for processing and disposal. The inspector reviewed Health Physics Procedure HPP-133, Rev. 2, entitled "Shipment of LSA-Type A Radioactive Waste to Scientific Ecology Group, Inc. (SEG)," approved December 9, 1991. Its purpose was to provide procedural guidance in the preparation of shipments of LSA-Type A material to SEG and to ensure compliance of such shipments with all applicable regulations and requirements. The inspector observed part of the process of loading the boxes on the truck and noted that the technicians were closely following the procedure, including conducting radiation surveys and checking labels and package markings on the shipping boxes prior to loading.

Before the truck left the site, the inspector reviewed the final survey record of the truck and conducted a "spot check" of several of the survey points. The inspector found that the survey points checked were in agreement. In general, the inspector thought that the survey was properly done and well documented.

The inspector concluded that the Radwaste Group was stable, staffed with competent personnel, and executed its responsibilities in a professional manner.

No violations or deviations were identified.

13. Low Level Radwaste (LLW) Storage (84750)

a. Background

In 1985, the Federal Government enacted the Low Level Radioactive Waste Amendments Act, which required all states to provide for disposal of LLW. Eight southeastern states voted to form the Southeast Compact for this purpose. Barnwell, South Carolina has served as the Compact's LLW disposal site since that time but it is scheduled to close on December 31, 1992. North Carolina was chosen as the next host state for the LLW burial facility. In 1987, the North Carolina General Assembly established the North Carolina Low Level Radioactive Waste Management Authority, chartered with the responsibility to site, build, lease, or operate a LLW disposal facility in North Carolina for the Southeast Compact so that members could properly dispose of waste by-product materials produced by nuclear generators.

The siting process is approximately two years behind schedule and the facility is not anticipated to be completed when the current facility closes. If that happens, the members of the Southeast Compact will be without a disposal facility for an estimated two-year period.

b. SHNPP Contingencies

The inspector requested to see the licensee's long-term LLW storage facilities to review issues such as ensuring integrity of packaging and maintenance of waste form (shielding from the elements and extremes of temperature and humidity); procedures and equipment available to repackage waste, should the need arise; and locating wastes in a restricted area secured against unauthorized removal.

The E&RC Manager explained to the inspector that SHNPP did not currently have a LLW storage facility. However, the issue was being addressed by CP&L management via a study which evaluated the generation rate of processed radwaste vs. the existing capacity to store that waste for an extended period of time. Assumptions made in the development of the evaluation included:

- All DAW/resin volume are reduced to the maximum extent possible (by supercompaction/incineration and/or dewatering).

- Resin/filter storage areas are modified (shielded) to be in conformance with current regulatory guidelines.

- No event occurs to increase radwaste generation.

- Existing inventories of radwaste are shipped for disposal prior to the closure of the burial facility.

The study included an inventory of site storage capacity. It included approximately 4500 cubic feet in the waste processing building to accommodate the storage of low activity DAW. The Waste Processing Building (WPB) was equipped to handle short-term storage of radwaste in drums. Metal boxes were envisioned for extended storage. This would require extensive modifications to the existing facilities or the construction of new storage capacity. Also, higher activity DAW, which could not be reprocessed or incinerated, would require a separate, heavily shielded storage area that utilized remote handling techniques. There were other enclosed areas at

the plant that could be used for radwaste storage but which would require further review and possibly extensive modification. Storage for an extended period would require additional storage capacity. Also, there were three concrete shields in an outside area which could be utilized for storage of resins and liquid process filters in 100- to 200-cubic foot liners. An additional storage shield has been budgeted to be purchased. Storage of resins/filters would be limited to less than one year. Higher activity resins would pose significantly greater shielding problems if storage were attempted using the current storage shields. Therefore, the concrete shields would require modification or replacement prior to extended storage use.

Numerous recommendations to management were made including to dispose of all DAW, resins, filters, and other identified radioactive wastes prior to the projected closure of the current burial facility. Management was expected to determine which course of action to pursue by midyear.

The inspector concluded that the study was complete and that the licensee's management was acting in a prudent manner.

No violations or deviations were identified.

14. Exit Interview

The inspection scope and results were summarized on January 10, 1992, with those persons indicated in Paragraph 1. The inspector described the areas inspected and discussed the inspection results, including likely informational content of the inspection report with regard to documents and/or processes reviewed during the inspection. The licensee did not identify any such documents or processes as proprietary. Dissenting comments were not received from the licensee.

15. Acronyms and Initialisms

ALARA - As Low As Reasonably Achievable
BNP - Brunswick Nuclear Project
BWR - Boiling Water Reactor
CFR - Code of Federal Regulations
Ci - curie
CFR - Code of Federal Regulations
CP&L - Carolina Power and Light
DAW - Dry Active Waste
DEI - Dose Equivalent Iodine
DO - Dissolved Oxygen
DOE - Department of Energy
DOT - Department of Transportation
E&C - Environmental and Chemistry
E&E - Energy and Environmental
E&RC - Environmental and Radiation Control
FSAR - Final Safety Analysis Report
FT - Flow Transmitter
HNP - Harris Nuclear Project
IR - Inspection Report
L&FSS - Laboratory and Facility Services Section
LLW - Low Level Radwaste
LSA - Low Specific Activity
MOV - Motor-Operated Valve
MST - Maintenance Surveillance Test
NIST - National Institute of Standards and Technology
PASS - Post Accident Sampling System
PCR - Plant Change Request
ppb - parts per billion
ppm - parts per million
QA - Quality Assurance
QAE - Quality Assurance Engineering
RAB - Reactor Auxiliary Building
RC - Radiation Control
RCS - Reactor Coolant System
RWST - Refueling Water Storage Tank
SEG - Scientific Ecology Group, Inc.
SFP - Spent Fuel Pool
SHNPP - Shearon Harris Nuclear Power Plant
TS - Technical Specification
uCi - micro-Curie (1.0E-6 Ci)
WGDT - Waste Gas Decay Tank
WMT - Waste Monitor Tank
WPB - Waste Processing Building