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 REGION II  
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Report Nos.: 50-369/94-02 and 50-370/94-02

Licensee: Duke Power Company  
 422 South Church Street  
 Charlotte, NC 28242

Docket Nos.: 50-369 and 50-370

License Nos.: NPF-9 and NPF-17

Facility Name: McGuire 1 and 2

Inspection Conducted: January 3-7, January 20, and January 21, 1994

Inspectors: <u>W. B. Gloersen</u>	<u>2/9/94</u>
W. B. Gloersen	Date Signed
<u>G. B. Kuzo</u>	<u>2/9/94</u>
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Approved by: <u>T. R. Decker</u>	<u>2/12/94</u>
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, announced inspection was conducted in the areas of transportation of radioactive material, solid radioactive waste management, process and effluent radiation monitoring systems, offsite dose commitments, radiological environmental monitoring, results of Capability Test Program (CTP) sample analyses, and engineered-safety-feature filtration systems.

Results:

The radiological environmental monitoring program was implemented in accordance with the Offsite Dose Calculation Manual (ODCM) and implementing procedures. Radioactive material released in liquid effluents had shown a significant decreasing trend since 1990. Process and effluent radiation monitoring equipment did not experience any maintenance or operability problems during the last 12 months. A program weakness was identified for lack of maintaining Certificates of Compliance (CoC) onsite for shipping containers. The licensee's program for determining the concentrations of radionuclides in selected waste streams and guidance associated with low level radioactive waste classification and characterization was identified as a program strength.

In the areas inspected, the following violation (VIO) and non-cited violations (NCVs) were identified:

- One licensee-identified violation (LIV) for failure to perform a surveillance test of the Containment Purge Ventilation System within the time frame specified in Technical Specification (TS) 4.9.4.2.b (Paragraph 9).
- One NRC-identified NCV for failure to implement an adequate decommissioning record program to meet the requirements specified in 10 CFR 50.75(g) (Paragraph 10.d).
- One NRC-identified NCV of 10 CFR 71.5 for failure to meet Department of Transportation (DOT) emergency response information requirements specified in 49 CFR 172.600. Licensee corrective actions implemented prior to January 7, 1994 (Paragraph 11.d).
- One VIO for failure to maintain, and/or to implement packaging instructions in accordance with applicable CoC requirements (Paragraph 11.e).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- K. Barrow, Technical Specialist II
- \*W. Byrum, (Acting) Radiological Protection Manager
- \*J. Correll, Radiological Material Control Supervisor
- L. Criminger, Radiation Protection Relief Shift Supervisor
- R. Cross, Engineer, Regulatory Compliance
- G. Frix, Component Engineer
- \*E. Geddie, Station Manager
- C. Ingram, Senior Engineer, (General Office (G.O.))
- \*G. Johnson, Scientist, Radiation Protection
- \*L. Kunka, Nuclear Production Engineer, Regulatory Compliance
- C. Lan, Scientist Radiation Protection, Station Support Division (G.O.)
- C. Martinec, Scientist, Radiation Protection
- J. Miller, Engineer, Component Engineering Group
- \*S. Mooneyhan, Radiation Protection General Supervisor
- \*D. Motes, Engineer, Component Engineering
- J. Pope, Associate Scientist, Radiation Protection
- M. Schell, Associate Engineer

Other licensee employees contacted included engineers, technicians, operators, and office personnel.

#### Nuclear Regulatory Commission

- \*G. Maxwell, Senior Resident Inspector
- \*Attended exit interview on January 7, 1994

### 2. Audits (84750, 86750)

Technical Specification (TS) 6.5.2.9 requires that audits of unit activities be performed under the cognizance of the Nuclear Safety Review Board (NSRB) in the following areas: (1) the conformance of facility operation to provisions contained within the TSs and applicable license conditions; (2) the radiological environmental monitoring program; (3) the Offsite Dose Calculation Manual (ODCM) and implementing procedures; and (4) the PROCESS CONTROL PROGRAM (PCP) and implementing procedures for processing and packaging of radioactive wastes.

The inspector reviewed the following audit:

- QA Audit NG-93-06(MC): Chemistry and Radiation Protection, May 5, 1993

The above audit assessed, in part, the adequacy and effectiveness of the Chemistry and Radiation Protection (RP) programs, including waste gas and liquid waste processing systems. The audit covered the areas specified in TS 6.5.2.9. The inspector reviewed the audit report's content with respect to radiological effluents and chemistry. Although there were no findings identified in the chemistry program that required a written response, the following weaknesses were identified:

(1) unexplained chart biases and adverse trends; (2) inconsistencies in the labeling of stored chemicals; and (3) a relatively large number of outstanding Unusual System Alignments or Conditions (USACs) indicating either a deteriorating or an outdated liquid and gaseous waste system. With regard to the issue on USACs, the licensee had planned to implement nuclear station modifications (NSMs) in 1995. This area will be reviewed during subsequent inspections. It was noted that the scope of this audit did not include a review the ODCM and PCP. QA Audit NG-92-04, dated April 3, 1992, was the last audit of the ODCM and PCP. An audit of the ODCM and PCP was scheduled for the first half of 1994. In light of the concerns with respect to 10 CFR 71 requirements noted in this inspection, the inspector discussed with the licensee the need for a more frequent audit of the PCP and transportation programs.

No violations or deviations were identified.

3. Changes to the Radiological Effluent Monitoring and Reporting Program (84750)

The inspector and the licensee discussed any changes since the last inspection in organization, personnel, facilities, equipment, programs, procedures, the ODCM and PCP and in the reporting requirements for the Semi-Annual Effluent Release Report. The details of these changes are discussed below.

In a letter from NRC to Duke Power Company dated July 19, 1993, the NRC issued Amendment Number (No.) 137 to Facility Operating License No. NPF-9 and Amendment No. 119 to Facility Operating License No. NPF-17 for the McGuire Nuclear Station, Units 1 and 2. The amendments consisted of changes to the TSs in response to the licensee's application dated January 27, 1993, and supplemented on March 15 and June 4, 1993. The amendments modified the TSs by changing the frequency of reporting releases of radionuclides in liquid and gaseous effluents, and releases of solid wastes, from a semiannual to an annual basis. Hence, TS 6.9.1.7 now requires that an Annual Radioactive Effluent Release Report covering the operation of the unit during the previous calendar year shall be submitted before May 1 of each year. Other than the changes pertaining to the effluent and process radiation monitoring systems described in Paragraph 5, there were no other changes identified in this inspection to the program areas noted above.

No violations or deviations were identified.

## 4. Confirmatory Measurements (84750)

10 CFR 20.1501(a) requires that each licensee shall make or cause to be made such surveys as: (1) may be necessary for the licensee to comply with the regulations and, (2) are reasonable under the circumstances to evaluate the extent of radioactive hazards that may be present.

During the inspection conducted January 3-7, 1994, the inspector reviewed analytical results of three capability test samples containing the following beta emitting radionuclides: Iron 55 (Fe-55), tritium (H-3), and strontium 90 (Sr-90). The spiked samples were prepared by the Department of Energy's Radiological and Environmental Sciences Laboratory (RESL) and shipped to the licensee in July 1993. A comparison of the licensee results with the known values are provided in Table 1 below. The acceptance criteria for the comparison of results of analytical radioactivity measurements are provided in Attachment 1.

Table 1

<u>Nuclide</u>	<u>Reported Results</u> <u>Concentration (uCi/ml)</u>		<u>Resolution</u>	<u>Ratio</u>	<u>Comparison</u>
	<u>Licensee</u>	<u>NRC</u>			
Sr-90	1.70E-05	2.19+/-0.11E-05	20	0.78	Agreement
H-3	1.13E-04	1.23+/-0.06E-04	21	0.92	Agreement
Fe-55	1.39E-05	1.19+/-0.06E-05	20	1.17	Agreement

Comparison of licensee results to the known values showed agreement in all cases; however, the result for Sr-90 was biased low by 22 percent. The acceptance range for the nuclide ratio was 0.75 to 1.33. The licensee was aware of this low bias and was planning to develop the capability to perform Sr-90 analyses at the General Office's environmental monitoring lab and discontinue use of the vendor.

No violations or deviations were identified.

## 5. Process and Effluent Radiation Monitors (84750)

TS 6.8.4.f.(1) specifies that the radioactive effluent control program include limitations on the operability of radioactive liquid and gaseous monitoring instrumentation including surveillance tests and set point determinations in accordance with the methodology in the ODCM.

The McGuire ODCM, Revision 34, Section B.3.0 specifies the requirements for radioactive liquid effluent and gaseous effluent monitor set point calculations.

The inspector discussed with licensee representatives changes to the effluent and process radiation monitoring program during the last 18 months and noted the following: (1) Primary gas calibration study initiated on 1-EMF-36 (see below); (2) Digital module replacement of analog signal processing equipment; and (3) Installation of "Nitrogen-16

(N-16)" radiation monitors on Units 1 and 2 steam generators (1,2-EMF-71, -72, -73, -74) for detecting small steam generator tube leaks. The inspector noted that the licensee had completed approximately 50 percent of the digital module replacements and that the project completion was scheduled for the end of 1994. A more detailed review of the digital module replacements will be made after the modifications are completed, including a review of the capability of the system's digital circuitry to tolerate electromagnetic interference (EMI) and radio frequency interference (RFI).

The inspector also discussed with the licensee operability and maintenance problems of the effluent and process monitors during the last 12 months. Based on a review of Problem Investigation Reports and discussions with the licensee, it was evident that the process and effluent radiation monitoring system experienced no significant maintenance nor operability problems, including recurring problems with electronic drift and spiking.

The inspector reviewed selected calibration procedures and records for the following Process and Effluent Radiation Monitoring Systems: (1) Liquid Radwaste Monitor (EMF-49); (2) Containment Gas Monitor (1,2-EMF-39); (3) Containment Ventilation Unit Monitor (1-EMF-44); (4) Unit Vent Radiation Monitoring System (1,2-EMF-35, -36, -37); (6) Waste Gas Monitor (EMF-50); (7) Condenser Air Ejector Monitor (1,2-EMF-33). The inspector did not note any apparent problems with the calibration procedures referred to above. The inspector reviewed in detail the calibration records for the Units 1 and 2 Plant Vent Radiation Monitoring System (1,2-EMF-35, -36, -37), which included the noble gas, particulate, and radioiodine channels. The inspector verified that the calibrations were performed within 18 months of the previous calibration, as required by the applicable procedures. There were no apparent problem areas noted. The inspector noted that the licensee took the initiative to perform a primary calibration study on 1-EMF-36 (Unit 1 Plant Vent Gas Monitor) using varying concentrations of Xe-133 and Kr-85 primary calibration gas standards. The guidance in the draft EPRI document, "Calibration of Radiation Monitors at Nuclear Power Plants," dated February 15, 1993, and IP/O/B/3006/16, RMS Gas Monitor Primary Calibration, dated November 11, 1993, was used to perform the calibration. The licensee indicated that other gas monitoring systems would be calibrated with primary gas standards. Since work on this study was still in progress and the data were still in draft, the inspector indicated that a more thorough review of the calibration data and comparison to previous calibration data using the transfer calibration sources would be performed during a subsequent inspection.

In addition, the inspector reviewed the licensee's methods for effluent monitor correlation determinations and set point determinations for selected effluent monitors. The following procedures pertaining to set point and EMF determinations were reviewed:

- PT/O/B/4600/08, Correlation of EMFs, August 27, 1992

- HP/O/B/1003/08, Determination of Radiation Monitor Setpoints (EMFs), January 1, 1994

The inspector reviewed the EMF correlation data for 1993 and verified that the correlation factors were calculated and performed annually as required. PT/O/B/4600/08 indicates that if the effluent stream activity is less than or equal to the minimum detectable range for the monitor, then the correlation factor (CF) shall be based on the primary calibration data. The procedure also indicated that the CF shall be within +/- 20 percent of the last correlation. CFs outside the tolerance would require an investigation to determine the cause of the deviation and take appropriate action. The inspector verified that the CFs were incorporated into HP/O/B/1003/08 for setpoint determinations as required. After reviewing the 1993 correlation data, the inspector noted that for the CFs outside the +/- 20 percent tolerance limit, the licensee investigated and resolved the problem as required. For 1-EMF-33 (Condenser Air Ejector), several samples were collected during the steam generator tube leak and the CF was revised (August 23, 1993). 1,2-EMF-39 (Units 1 and 2 Containment Gas Monitor) samples were collected during the steam generator tube leak event and the average range of the CFs were within +/- 20 percent so a CF revision was unnecessary.

The inspector and a licensee representative toured the facility and visually inspected selected radiation monitoring systems noted above. The inspector and a licensee representative attempted to perform a source check on liquid radwaste effluent monitor EMF-49. The licensee was required to perform a source check prior to each liquid radwaste release in accordance with the applicable effluent release procedures. The source check test passed and there were no apparent problems noted.

No violations or deviations were identified.

#### 6. Offsite Dose Commitments (84750)

TS 6.8.4.f.(5) requires the licensee to determine the cumulative and projected dose contributions from radioactive effluents for the current calendar quarter and current calendar year in accordance with the methodology and parameters in the ODCM at least every 31 days. Section B4.1 of the ODCM specifies the methodology to be used for the dose calculations.

The inspector reviewed records of 31-day dose projections for discharges of liquid and gaseous effluents containing radioactive materials to unrestricted areas for the period January - December 1993. The implementing procedure, PT/O/B/4600/25, Cumulative Offsite Dose from Liquid and Gaseous Effluents, dated January 11, 1993, specifying the requirements to perform these dose projections was also reviewed. The inspector verified that these surveillances were completed and performed in accordance with the requirements, frequency, and methodology specified in the technical specifications, ODCM and implementing procedure. The inspector verified that the calculations were performed

within the 31 day frequency plus the 25 percent extension of the surveillance interval allowed in TS 3/4.0.2. The inspector did not note any apparent problems in the areas reviewed.

No violations or deviations were identified.

7. Radiological Effluent Release Report (84750)

TS 6.9.1.7 specifies the requirements for the Semiannual Radioactive Effluent Release Report including timeliness, content, and format. The McGuire Nuclear Station (MNS) ODCM, Revision 34, Section B4.0 specifies the requirements for total dose determinations, including total dose from radioactive effluents and all other nearby uranium fuel cycle sources.

The inspector reviewed the second half 1992 Semiannual Radiological Effluent Release Report, dated February 25, 1993, to assess the yearly totals for liquid and gaseous effluents as well as cumulative doses from those effluents. As noted in Paragraph 3, TS 6.9.1.7 had been revised to require an Annual Radioactive Effluent Release Report before May 1 of each year, hence 1993 effluent release data were not available for review during this inspection.

Table 2 summarizes the cumulative doses from effluents for calendar year 1992:

Table 2

Cumulative Doses from Effluents - Calendar Year 1992  
McGuire Nuclear Station

<u>Dose Pathway</u>	<u>Dose per site</u>	<u>Annual Limit</u>	<u>Percent of Annual Limit</u>
Airborne-Gamma Air Dose	1.29E+0 mrad	10 mrad	12.9 %
Airborne-Beta Air Dose	2.08E+0 mrad	20 mrad	10.4 %
Airborne-Max Organ Dose	3.18E-1 mrem	15 mrem	2.1 %
Liquid-Total Body Dose	7.26E-2 mrem	3 mrem	2.4 %
Liquid-Max Organ Dose	1.68E-1 mrem	10 mrem	1.7 %
Total Dose-Thyroid	3.89E-1 mrem	75 mrem	< 1 %
Total Dose-Total Body Organ other than Thyroid	8.93E-1 mrem	25 mrem	3.6 %

As can be seen from the dose summaries presented above, the annual dose contributions to the total body and maximum organ from the radionuclides in gaseous and liquid effluents released to unrestricted areas were below the limits specified in the ODCM. Since the doses due to airborne and liquid releases were calculated on a per site basis, and the TS dose



limits are on a per unit basis, calculated doses are initially compared to the per unit limit. If this limit is exceeded, the release data would be reanalyzed to determine the per unit doses.

The inspector also reviewed the Report to examine liquid and gaseous effluents specified in this and previous reports to determine trends. Table 3 compares the effluents for the past three years:

Table 3

<u>EFFLUENT RELEASE SUMMARY FOR MCGUIRE STATION UNITS 1 AND 2</u>			
Activity Released (curies)	1990	1991	1992
Gaseous Effluents:			
Fission and Activation Products	1.04E+3	8.98E+2	8.10E+2
Halogens	2.74E-3	2.58E-3	5.18E-3
Particulates	8.46E-4	8.20E-4	4.68E-4
Tritium	5.00E+1	6.46E+1	6.00E+1
Liquid Effluents:			
Fission and Activation Products	4.00E+0	2.08E+0	6.54E-1
Tritium	9.16E+2	8.78E+2	8.66E+2
Gross Alpha	0.00E+0	0.00E+0	0.00E+0
Volume of Liquid Waste Released (liters)	no data	1.15E+7	1.03E+7
Inoperable Effluent Monitoring Instruments for greater than 30 days	1	0	0
Unplanned Releases	3	3	2

The radioactive effluents released during the reporting period were normal for a two unit pressurized water reactor plant with both units operating. The release of radioactive material to the environment from McGuire has been a small fraction of the 10 CFR 20 Appendix B and 10 CFR 50 Appendix I limits. As noted in Table 3, radioactive material released in liquid effluents had shown a significant decreasing trend since 1990. This decreasing trend was attributable to the installation of portable demineralization systems containing carbon beds for Co-60 reduction and zeolite beds for Cs-134 and Cs-137 reduction in the

effluent. In addition, the licensee had incorporated small micron filters for the reactor coolant system. During the last two years, the licensee had gradually reduced the mesh size of the reactor coolant filtration system from approximately 25 microns to two microns.

The inspector discussed with the licensee unplanned liquid or gaseous radioactive releases that occurred from January to December 1993. The licensee indicated that there were two unplanned radioactive liquid releases and no unplanned radioactive gaseous releases. The first unplanned liquid release occurred on February 22, 1992 via the Waste Water Collection Basin resulting in an approximately 30 gallon/day leak rate. Total gross activity released was  $3.03E-05$  curies. The second unplanned liquid release occurred on October 11, 1992, and involved 50-100 gallons of water leaking out of the Auxiliary Electric Boiler Room due to flooding. Operations personnel notified Radiological Protection personnel regarding an unknown volume of water released to the Waste Water Collection Basin via the yard drain. A sample of the water indicated  $5.2E-05$  uCi/ml of tritium. Using the maximum volume that could have been released, the licensee estimated that 19.7 uCi of tritium was released.

No violations or deviations were identified.

8. Radiological Environmental Monitoring Program (84750)

The MNS ODCM, Revision 34, Section B4.0 specifies the requirements for the Radiological Environmental Monitoring Program.

TS 6.9.1.6 specifies the requirements for the Annual Radiological Environmental Surveillance Report including timeliness, content, and format.

The inspector reviewed the Annual Radiological Environmental Surveillance Report for 1992. Environmental media samples have historically been trended over a 13 year period from 1979-1992. Analyses from 1977-1978 have been excluded since these results were much higher than other preoperational years due to outside influence such as weapons testing. Weekly average air sample results, including measurements of radioiodine concentrations for 1992 showed little change from the thirteen year average. Cs-137 activity which was present on the charcoal cartridge but not on the particulate filter was determined to be inherent in the charcoal and was not included for trending purposes. I-131 was not detected in any of the charcoal canisters during 1992. No man-made radionuclides were identified from isotopic analysis of regular milk samples during 1992. Except for tritium, all drinking water and surface water radionuclide analyses showed zero ranges for all indicator locations indicating that no other detectable activity was measured. There was a moderate to poor probability of an increasing trend for H-3 at the indicator locations for drinking water and surface water. This means the correlation coefficient was less than 0.7 but greater than 0.3. For broad leaf vegetation samples, one of 36 samples collected indicated Cs-137 activity. All other radionuclides

showed zero ranges indicating that no detectable activity was measured. The Cs-137 concentration resulted in only 2.45 percent of the reporting level. The correlation coefficients for the location with the highest annual mean indicated a poor to moderate probability of an increasing trend for Cs-137. In 1992, six shoreline sediment samples were analyzed, four from two indicator locations and two at the control location. The correlation coefficient with the highest annual mean indicated a moderate to poor probability of an increasing trend for Cs-137 in the shoreline sediment. There was no detectable activity measured in twelve fish samples in 1992 (six indicator and six control samples), except for Cs-137. The Cs-137 concentration did not significantly differ from the 13 year average and the corresponding correlation coefficient for the location with the highest annual mean indicated a moderate to poor probability of an increasing trend. In addition, there was no measurable radionuclide activity present in food products (crops) in 1992. The 1992 exposure rate, based on the analysis of 172 indicator thermoluminescent dosimeters (TLDs) and four control TLDs, at the indicator location with the highest annual mean did not differ significantly from the preoperational data or the 13 year average.

The environmental doses for 1992 compared well with the doses calculated from effluent releases. The similarity of the doses indicated that the radioactivity levels in the environment did not differ significantly from those expected based on effluent measurements and modeling of the environmental exposure pathways. The doses, although calculable using environmental sample results, were well below the regulatory limits (see Paragraph 7) and posed no measurable environmental or public health impact.

From the review of the environmental report, the inspector noted that the report was generally well organized, detailed, and informative. The licensee acknowledged the inspector's comments.

No violations or deviations were identified.

9. Engineered Safety Feature Air Cleaning Systems (84750)

TS 6.8.1.a requires that written procedures be established, implemented, and maintained covering the activities in Appendix A, Regulatory Guide 1.33, Revision 2, February 1978.

Regulatory Guide 1.33, Appendix A, Quality Assurance Program Requirements, requires procedures for the operation of safety related systems, including atmospheric cleanup systems.

The inspector reviewed procedures and filtration system surveillance testing results associated with selected engineered safety feature (ESF) nuclear air cleaning systems. In particular, procedures and selected surveillances conducted in 1992 and 1993 required by the TSs for the following ventilation systems were reviewed in detail: (1) Control Area Ventilation System (TS 3/4.7.6); (2) Annulus Ventilation System

(TS 3/4.6.1.8); (3) Auxiliary Building Filtered Ventilation Exhaust (TS 3/4.7.7); (4) Reactor Building Containment Purge Exhaust System (TS 3/4.9.4); and (5) Fuel Handling Ventilation Exhaust System (TS 3/4.9.11).

From a selected review of the filter testing procedures, the inspector noted that the established criteria met TS requirements for the ESF air filtration systems. In particular, the inspector verified that carbon adsorber testing was conducted in accordance with the requirements of ASTM D 3803-89, Standard Test Method for Nuclear-Grade Activated Carbon, when applicable, and that the established acceptance criteria met the TS requirements. In addition, the inspector reviewed selected records to verify completion of ESF ventilation system surveillance tests conducted in 1992 and 1993. In general, the inspector noted that the surveillance activities were conducted in accordance with the technical specification requirements and that no apparent operability problems were noted.

However, during a review of problem investigation reports, it was noted that the licensee had identified that on October 13, 1993 the run time across the carbon adsorber bed of the Containment Purge Ventilation System (2BVP) as specified in TS 4.9.4.2.b had been exceeded. TS 4.9.4.2.b requires carbon sampling and testing in accordance with ASTM D 3803-89 testing criteria once per 720 hours of charcoal adsorber operation. The total run time across the charcoal bed was 929 hours which exceeded the 25 percent grace period allowed by TS 4.0.2 by 29 hours. The licensee documented the missed surveillance in PIP 2-M93-0997. Although the TS 4.9.4.2.b surveillance requirement was missed beyond the grace period, the limiting condition for operation (LCO) was not violated. The filtration system was only required to be operable during Mode 6 (refueling operations) or when moving irradiated fuel assemblies within the containment building. Neither of the above conditions occurred while the filter train was declared inoperable. Thus, there was no operation in a condition prohibited by the TSs and this item was not reportable. The root cause was apparently personnel error and oversight. When the equipment run time was compared to the scheduled run time hours, a work request to sample the carbon was not generated immediately. The licensee's corrective actions included the following: (1) develop a computer program to provide a self-checking method; (2) add a step to the surveillance procedure to assure that a work request is written whenever equipment run times or sampling dates exceed the values in the procedure; and (3) add check offs/sign offs to the performance test procedures. The inspector informed the licensee that the failure to conduct charcoal sampling and testing of the Containment Purge Ventilation System within the frequency specified above would be identified as a violation of TS 4.9.4.2.b requirements. The inspector informed the licensee that this violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B of the Enforcement policy for licensee-identified violations (LIV: 50-369, 370/94-02-01).

The inspector also reviewed the fire event which occurred on the Unit 1 Spent Fuel Pool (SFP) on August 12, 1993, with respect to the performance of the Unit 1 SFP Ventilation System. This event was documented in PIP-1-M93-0756, dated August 12, 1993. The roof fire occurred due to a roofing process which in turn caused old insulation to ignite. The apparent cause of the fire was that the roof was not built per the design standard. The metal deck plate, which should have extended to the east parapet, stopped nine inches short which left an opening for air to flow into the fuel building. The gap was filled with asphalt and insulation. When the new roof was installed, the old filler insulation was left in place. The excess asphalt, left over from the original construction of the roof, ignited due to the heating process used to apply the new roof, and the air flow through the gap into the fuel building. During the roof fire event, the SFP ventilation system was in the bypass mode, that is, the inlet and outlet isolation dampers were in the closed position and the bypass damper was in the open position, thus directing the air stream around the filtration bed. The inspector and a licensee representative visually examined the SFP filter train housing, including an inspection of the interior of the filter housing, and with the isolation dampers in the closed position noted no apparent inleakage into the filter banks. In addition, the inspector reviewed the Unit 1 Equipment Running Time Report and noted that during the time period that the roof fire occurred on August 12, 1993, the Fuel Handling Ventilation Filter Train had not operated in a 24 hour period. Thus, the system was technically not in communication with the ventilation zone where the fire occurred and, consequently, the licensee did not perform an operability test. TS 4.9.11.2 requires, in part, that the Fuel Handling Ventilation System be demonstrated operable following painting, fire, or chemical release in any ventilation zone communicating with the system by verifying that the system satisfies the in-place penetration and by-pass leakage testing acceptance criteria and verifying, within 31 days after removal, that a laboratory analysis of a representative carbon sample meets the testing criteria as specified. Since the Fuel Handling Ventilation System was not in communication with the ventilation zone where the fire occurred, the licensee was not required to demonstrate that the system was operable.

One LIV was noted for the failure to conduct charcoal sampling and testing of the Containment Purge Ventilation System within the frequency specified in TS 4.9.4.2.b.

#### 10. Radioactive Waste Management (86750)

During the inspection, licensee program guidance, implementation, current initiatives, and documentation completed to meet requirements of 10 CFR 20.2006, Appendix F to 10 CFR 20.1001-2401, and 10 CFR Sections (§§) 61.55 and 61.56, as applicable to Low Level Radioactive Waste (LLRW) reduction, onsite storage, and subsequent classification and characterization activities required for final disposal at a licensed burial site were reviewed and discussed in detail.

a. LLRW Storage Areas

During the onsite inspection, tours were conducted of selected LLRW storage areas to review housekeeping and posting and labeling requirements.

The inspector toured selected storage locations established to receive and temporarily store LLRW generated from onsite activities. No significant concerns regarding housekeeping and radiological controls, i.e. posting and labeling, associated with the LLRW storage areas were identified.

No violations or deviations were identified

b. Part 61 Analyses and Waste Classification

10 CFR 20.2006(d) requires, in part, that each licensee prepare all wastes so that the waste is classified according to 10 CFR 61.55 and meets the waste characteristics requirements in § 61.56 of the chapter. Further, the NRC Branch Technical Position (BTP) on Radioactive Waste Classification, dated April 11, 1983, provides acceptable guidance for determining the presence and concentrations of radionuclides for classifying waste for near surface disposal.

During the onsite inspection, current guidance and results for classification of LLRW generated from selected licensed operations were reviewed and discussed with cognizant personnel. General program guidance for conducting waste classification as specified in § 61.55 is detailed in MNS 10 CFR Part 61 Waste Classification and Waste Form Implementation Program manual issued October 1992, and subsequent revisions thereto. The current guidance denotes approximately 20 waste streams requiring radionuclide analyses to be used for classification. Analyses are conducted on either an "annual basis" for common waste streams or "as needed" for infrequently generated waste types. Classification of waste is determined through several methods including direct measurement of the waste; indirectly, using scaling factors; or for selected materials through activation analysis calculations. For the routine waste streams the established guidance requires a comparative evaluation of both the percentage composition and the actual concentration values of predominant radionuclides with previous waste stream analyses. Limits were established regarding the percent differences noted for the required comparisons. Guidance for establishment of routine sampling of waste streams to implement the 10 CFR 61.55 radionuclide analyses is provided in licensee procedure PT/OB/4600/69, Sample Analysis Requirements for Determination of Waste Classification Scaling Factors, dated October 26, 1993. From review of the current 10 CFR Part 61.55 analyses and subsequent discussion, the inspector noted that responsible personnel were knowledgeable of the current waste stream sampling guidance and the program was

implemented in accordance with established guidance. The procedural guidance exceeded the requirements specified in 10 CFR 20.2006 and 10 CFR 61.55, and the guidance presented in the applicable BTP. The licensee's current guidance for determining the concentrations of radionuclides in selected waste streams was identified as a Radiation Protection (RP) program strength.

The inspector reviewed and discussed with cognizant licensee representatives selected 10 CFR Part 61.55 analyses results for nine LLRW shipments made to licensed burial facilities from June 16 through November 17, 1993. The inspector reviewed radionuclide analysis conducted for the following waste stream types included in the shipments.

- Filter Waste
- Primary Resin Waste
- Dry Active Waste (DAW)
- Secondary Waste

The inspector verified that radionuclide analyses applied for 10 CFR Part 61.55 classification were current, technically correct, and used appropriately by the licensee for waste classification for the waste consignments shipped to a licensed burial site from June 16 through November 17, 1993. In addition, the responsible individuals' understanding of the current guidance and the use of detailed and complete documentation detailing the bases for deviations from the current procedural comparison limits were identified as program strengths. All questions by the inspector regarding the waste stability classification or radionuclide quantity limitations were answered appropriately.

The inspector identified the guidance associated with LLRW classification and characterization and its subsequent implementation as a RP program strength.

No violations or deviations were identified.

c. Waste Manifests

10 CFR 20.2006(b) requires, in part, that a manifest system be used for shipments of waste to a licensed land disposal facility.

The inspector reviewed licensee manifests for nine LLRW shipments made to a licensed land disposal facility between July 14 through November 17, 1993. All manifests were completed in accordance with the requirements specified in 10 CFR 20.2006(b). For selected shipments, the inspector reviewed classification determinations using the licensee's Part 61 analyses. All waste was classified appropriately. In addition, the inspector

discussed licensee waste processing activities and verified that the licensee's characterization for the waste shipments was appropriate.

No violations or deviations were identified.

d. Decommissioning Records

10 CFR 50.75(g) requires, in part, that licensees maintain records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Commission. If records of relevant information are kept for other purposes, references to these records and their locations may be used. Information considered important by the Commission for decommissioning includes records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment, or site. The records must include any known information on the identification of involved nuclides, quantities, forms, and concentrations and, in addition, as-built drawings and modifications of structures and equipment in restricted areas where radioactive materials are used and/or stored and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination.

During the onsite inspection, the licensee's current program for maintaining records of radioactive spills or contamination events as required for decommissioning in accordance with the requirements of 10 CFR 50.75(g) were reviewed and discussed with selected licensee representatives. Licensee representatives provided notes from corporate staff which referenced discussions conducted between July through September of 1993, regarding a review of 10 CFR 50.75(g) requirements and the proposed establishment of two separate MNS files to retain applicable decommissioning records. However, at the time of the inspection, no spill or contamination event records or documentation had been incorporated into the referenced files. Further, from discussions with selected onsite licensee representatives, the inspector noted that neither General Office nor site personnel had established approved written guidance nor agreed upon a consistent understanding of what criteria would be used to include selected records or other applicable documentation of contamination events into the subject decommissioning files. Licensee representatives stated that additional meetings were to be scheduled to establish acceptable criteria for records, and that any documents or data which would be included in the decommissioning files currently were maintained within other record files which had been established previously for other operations. During the January 7, 1994 Exit Meeting, the inspector informed licensee representatives that the issue would be considered as an unresolved item (URI) pending additional review and discussion of the licensee's current decommissioning program with NRC management. During a subsequent January 20, 1994 teleconference



between Mr. S. Mooneyhan, Radiation Protection General Supervisor, MNS, and Mr. W. Gloersen, NRC RII, the inspector noted that there was no concern that licensee records regarding contamination events generated for other purposes, had not been maintained. However, the lack of implementing a program to incorporate those records, or a reference to those records into a current file for future decommissioning activities was considered a violation of 10 CFR 50.75(g) requirements.

Licensee representatives stated that following the onsite inspection the following actions were to be implemented in regard to their decommissioning records program. Discussions were held and the General Office was to issue guidance in a Station Directive detailing the decommissioning records program. The proposed guidance was to be issued within approximately three months. In the interim, the licensee was initiating their own decommissioning file. The file was to contain records selected from review of applicable radiological incident reports and all records of disposals on site made in accordance with the applicable state permit. The inspector noted that the proposed program implementation was expected to address the current concerns regarding the decommissioning records regarding spills and contamination events. The inspector informed licensee representatives that because of the low safety significance of the current issues and the corrective actions initiated, the identified violation met the criteria specified in Section VII.B of the Enforcement Policy and would not be cited. The failure to implement a program to maintain decommissioning records was identified as a non-cited violation (NCV) of 10 CFR 50.75(g) requirements (NCV: 50-369, 379/93-02-02).

One NCV regarding failure to maintain adequate records to meet requirements specified in 10 CFR 50.75(g) was identified.

#### 11. Transportation Activities (86740)

During the onsite inspection, licensee programs associated with receipt, and the preparation and shipping of NRC certified packages of radioactive material containers were reviewed. Program areas reviewed and discussed included procedural guidance and implementation, training, quality control (QC) activities, record completeness and accuracy, and emergency response capabilities as specified in 10 CFR 20.1906, 10 CFR Part 71, and 49 CFR Parts 171-178.

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

## a. Package Receipt

10 CFR 20.1906 details requirements for receiving and opening packages containing radioactive materials.

10 CFR 20.1906(c) requires, in part, each licensee to perform the monitoring required by paragraph (b) of this section as soon as practicable after receipt of the package, but not later than three hours after the package is received at the licensee's facility if received during normal working hours or not later than three hours from the beginning of the next working day if it is received after working hours.

Health Physics (HP) procedure HP/O/B/1004/01, Receipt and Opening of Radioactive Material Packages, dated October 26, 1993, details the licensee current program implementing monitoring of radioactive material packages following their receipt. The inspector verified that the current guidance met the time requirements specified in 10 CFR 20.1906(c).

During review of selected package receipt survey records, the inspector noted that both the receipt and survey times documented were identical. Discussions with cognizant licensee representatives indicated that the times documented referred to the technicians receipt of the package from the Receiving Department. At that time an immediate survey was conducted. The inspector noted that the actual receipt of the material should indicate when the licensee's Receiving Department took possession of the material. Further discussion of this issue with cognizant Radioactive Material Control (RMC) and Receiving Department personnel indicated that, RP personnel were informed immediately following receipt of any radioactive labeled package and packages were surveyed within three hours of their receipt. However, no records were maintained by the Receiving Department to document this fact. Following this discussion, licensee representatives stated that to facilitate the verification of compliance with the requirements specified in 10 CFR 20.1906(c) and their current procedure, the Receiving Department would document the time when receipt of any radioactive material package occurred.

No violations or deviations were identified.

## b. Review of Shipping Paper Documentation

During the onsite inspection, licensee transportation activities regarding shipments of empty packaging previously containing fissile material, and LLRW shipped to either licensed burial sites or processors were reviewed. The inspector reviewed in detail and discussed with RMC staff involved in transportation activities, selected records for selected radioactive material consignments

made between January 1993, and November 17, 1993. The record review included the following empty and/or radioactive material shipments.

- Radioactive Material LSA, NOS UN 2912, for 10 separate shipments containing various quantities of radionuclides in DAW or of drums of bead resin (LLRW) shipped to a licensed burial site or LLRW processor from June 16 through November 17, 1993.
- Radioactive Materials, Empty Packaging, NOS UN 2910, for 14 shipments of empty packages previously used to transport fissile material from February 9 through November 17, 1993.

The inspector reviewed and discussed in detail the following documentation used, and subsequently maintained in the licensee's records for each LLRW or empty package shipment, as applicable.

- Bill of Lading
- Isotopic Analysis
- Checklist for Preparation of Package for Shipment
- Driver Instruction Sheet
- Radioactive Material Shipment Manifest
- High Integrity Container (HIC) Certification
- HIC User's Checklist
- Container Rad Level Report
- Radioactive Waste Shipment Checklist
- Emergency Response Guide
- Vehicle Inspection Report
- Receipt and Loading Verification Checklist
- South Carolina Department Health and Environmental Control (SCDHEC) Shipment Certification
- Prior Notification and Manifest Form

Subsequent to detailed reviews of specific shipment documentation, the following regulatory compliance issues regarding shipping paper documentation were reviewed and discussed with cognizant licensee representatives.

- 49 CFR 172.201(c) requires shipping papers consisting of more than one page to be consecutively numbered and the first page to bear a notation specifying the total number of pages included in the shipping paper.

The inspector noted that the required shipping paper descriptions required by 49 CFR 172.201-205 for the LLRW consignments shipped were listed on consecutively numbered pages. However, the inspector noted that page numbers on additional information data sheets provided to the driver of the vehicles could result in possible confusion in identifying the actual shipping papers required by 49 CFR 172.201(c) and the supplemental data sheets.

Following discussions of this issue, licensee representatives stated that page numbers on the supplemental data sheets would be deleted prior to being provided to the drivers.

- 49 CFR 172.201(d) requires, in part, that shipping papers must contain an emergency response telephone number, as prescribed in Subpart G of part 172 of this subchapter.

During review of shipping papers, the inspector noted that for all LLRW consignments, the emergency response telephone number was difficult to readily identify among other telephone numbers on the shipping papers. Licensee representatives stated that additional highlighting of the subject phone number would be conducted to enhance its visibility within the shipping paper information.

- 49 CFR 172.203(c)(2) requires, in part, that the letters "RQ" be entered on the shipping paper either before or after the basic description required by § 172.202 for reportable quantities of hazardous substance as defined in 49 CFR 171.8 and listed in Column 3 of the Appendix to § 172.101.

Where appropriate, the shipping paper descriptions for selected LLRW consignments shipped between May 13 and September 14, 1993, were listed properly as having reportable quantities (RQ) of radioactive materials before the basic description required by § 172.202.

- 49 CFR 172.203(d)(vi) requires, in part, that shipping papers for a consignment of fissile radioactive materials include the words "Fissile Exempt," if the package is exempt from the requirements of 49 CFR 173.451-459 pursuant to § 173.453 of the subchapter.

Shipping paper descriptions for shipments of LLRW, which included packages containing fissile material exempted from the requirements of 49 CFR 173.451-459 in accordance with § 173.453, were verified to include the additional description of the hazardous material as "Fissile Exempt."

- 49 CFR 173.427 requires, in part, that a package which previously contained radioactive materials and has been emptied of contents as far as practical, is excepted from the shipping paper and certification, marking and labeling requirements of this subchapter, and for the requirements of this subpart, provided that (b) the package is unimpaired and securely closed, and (c) internal contamination does not exceed 100 times the limits specified in § 173.443.

During discussions and review of records associated with a shipment of empty packages which previously contained fissile material, the inspector noted that survey records regarding internal contamination levels immediately prior to shipping were not available. Licensee representatives stated internal contamination surveys were conducted for each empty container after removal of the fuel assemblies. Each container was closed immediately in accordance with Radiation Protection Manual Section 16.15, New Fuel Receipt, Revision 6, dated February 16, 1993. The containers were not re-opened prior to shipment from the licensee's facility. Based on the sequence of operations for opening, unloading and resealing the containers, the inspector noted that the original survey would satisfy the survey requirements for the shipment of empty containers.

Overall, no additional questions or comments regarding, shipping paper documentation and preparation activities were identified.

No violations or deviations were identified.

c. Procedural Guidance

During the onsite inspection the procedural guidance specified for the shipment of radioactive materials was reviewed against the selected criteria specified in 49 CFR Parts 171-178 and 10 CFR 71.87. In addition to the shipping paper requirements specified in 49 CFR Subpart C, procedural details were reviewed against requirements established for packaging (49 CFR Part 173), marking and labeling (49 CFR Part 172, Subpart D, §§ 172.400-407 and §§ 172.436-440), monitoring (49 CFR Part 171, Subpart I), and emergency response information (49 CFR, Subpart G). The following HP procedures and Radiation Protection Manual sections were reviewed and discussed with licensee representatives.

- HP/O/B/1004/01, Receipt and opening of radioactive material packages, dated October 26, 1993
- HP/O/B/1004/02, Preparation and shipment of radioactive materials, dated October 4, 1993
- HP/O/B/1004/04, Preparation and shipment of mechanical radwaste filter media, dated October 6, 1993
- HP/O/B/1004/09, Preparation and shipment of processed radwaste material and irradiated components, dated October 4, 1993
- HP/O/B/1004/10, Preparation and shipment of dry-active radwaste material, dated October 6, 1993

- HP/O/B/1004/14, Preparation and shipment of dewatered resins, dated October 19, 1993
- Radiation Protection Manual, Section 16.15, New Fuel Receipt, Revision 6, dated February 16, 1993

The inspector reviewed and evaluated the above procedures regarding selected Department of Transportation (DOT) and NRC requirements. Overall, the procedural guidance was determined to be appropriate for documentation, marking and labeling, monitoring and emergency response information. Further, the inspector verified that for shipments not exempt under 10 CFR 71.10, the routine determinations required by § 71.87 were performed and documented as applicable.

In addition, the inspector reviewed procedural guidance and verified licensee calculations for LSA calculations made for resins shipped to a burial site. During review of supplemental licensee calculations, the inspector noted the RMC staff to be well-trained and knowledgeable regarding the appropriate procedural methods.

No violations or deviations were identified.

d. Transportation Program Implementation

During the onsite inspection, selected activities associated with the transportation of radioactive materials were reviewed to determine adequacy of staff training and program implementation. In particular, program activities associated with preparation of, and emergency response capabilities for a January 4, 1994 consignment of LLRW were reviewed and discussed in detail.

On January 4, 1994, the inspector conducted direct observation of RMC staff activities performed during final loading of LLRW for shipment to a waste processor. All radiation and contamination surveys were determined to be appropriate, and all documentation was completed in accordance with the specifications outlined in 49 CFR 173.200. All radiation and contamination survey results were within the exclusive-use limits specified in 49 CFR §§ 173.441 and 173.443.

In addition, the licensee's emergency response capabilities to meet 49 CFR 172.600 requirements for use in the event of an emergency involving the transport of radioactive materials were evaluated by conducting a test call while the radioactive material shipment was in transit.

49 CFR 172.604 requires, in part, that a person offering a hazardous material for transportation must provide a 24-hour emergency response telephone number for use in the event of an emergency involving the hazardous material. The telephone number

must be the number of a person knowledgeable of the hazardous material being shipped and who has comprehensive emergency response and incident mitigation information for that material, or who has immediate access to a person possessing such knowledge and information.

The inspector telephoned the licensee's 24-hour emergency response number listed on the shipping manifest at approximately 19:50 hours on January 4, 1994. The call was answered by a RP staff member who was informed that the call was being placed as a test of their emergency response capabilities for a shipment currently in transit and the staff member was requested to proceed as if the call was the result of an actual transportation emergency involving an accident of the transport vehicle. The staff member deferred the call to the on-duty Health Physics Shift Supervisor (HPSS). The inspector again explained the reason for the call and requested the HPSS to proceed. The HPSS detailed the shipment and its contents from shipment documents available in the HPSS office. However, no comprehensive emergency response and accident mitigation information was provided during the conversation until approximately 18-20 minutes into the conversation when the inspector specifically requested that emergency response information be provided.

The status of licensee programs associated with transportation emergency response activities was reviewed in detail. The inspector verified that the licensee had received Information Notice (IN) 92-62, Emergency Response Information Requirements for Radioactive Material Shipments, dated August 24, 1992. Discussions with other licensee representatives, indicated that training regarding transportation emergency response activities consisted of a brief overview of the documentation provided to the HPSSs. However, no formal training or drills regarding this emergency response information had been conducted at the time of the onsite inspection. Discussions with selected HPSSs indicated that personnel were unaware of how they might be requested to use the information provided to and maintained by the HPSS office during radioactive material shipments. Further, review of the emergency response documentation provided to the HPSS office identified that one of three additional telephone numbers for additional personnel to contact in the event of a transportation emergency was incorrect. The inspector informed licensee representatives that for in-transit hazardous waste shipments made after normal working hours, the failure of the emergency response telephone contact to provide comprehensive emergency response incident mitigation information in a timely manner in accordance with 49 CFR 172.600 was a violation of 10 CFR 71.5(a) requirements.

During subsequent discussions, the licensee stated that they believed that all the pertinent information was available for the staff to use for emergency response guidance but that additional

training and clarification of the current guidance was needed to improve the response of the HPSSs. Prior to the end of the onsite inspection, licensee representatives discussed and documented a plan regarding corrective actions to address the identified issue. Actions included immediate retraining of the HPSS staff regarding the transportation emergency response information provided, editing the HPSS information to improve information content and develop a check-off list of information to be provided to and requested from emergency responders in the event of an actual emergency. In addition, the licensee stated that unannounced drills to verify all telephone contacts and to test response capabilities and timeliness during a transportation event were to be incorporated into routine emergency response activities. The inspector informed licensee representatives that as a result of the low safety significance of the identified issue and corrective actions to be taken, the violation met the criteria specified in Section VII.B of the Enforcement Policy and would not be cited. The failure to provide timely emergency response incident mitigation information for hazardous material in accordance with 49 CFR 172.600 was identified as a NCV of 10 CFR 71.5(a) requirements (NCV 50-369, 370/94-02-03).

One NRC-identified NCV of 10 CFR 71.5 for failure to implement adequately the DOT emergency response information requirements specified in 49 CFR 172.600 was identified.

e. Authorized Packages

10 CFR 71.10 requires, in part, that a licensee is exempt from all requirements of this part, other than § 71.5 with respect to shipment for packages containing no more than Type A quantities of radioactive material.

10 CFR 71.12 (Subpart C) requires, in part, that (a) a general license is issued to any licensee of the Commission who delivers to a carrier for transport, licensed material in a package for which a license, Certificate of Compliance (CoC), or other approval has been issued by the NRC and; applies only to a licensee who (c)(1) has a copy of the specific CoC, and other approval of the package and has the drawings and other documents referenced in the approval relating to the use and maintenance of the packaging and to the actions to be taken prior to shipment and (c)(2) complies with the terms and conditions of the license, CoC, or other approval as applicable, and the applicable requirements of Subparts A, G, and H of this Part.

49 CFR 173.415 authorizes pursuant to § 173.416, shipment of Type B, B(U), or B(M) packages that do not contain quantities exceeding  $A_1$  or  $A_2$ , as appropriate.



49 CFR 173.416(c) authorizes pursuant to § 173.471, shipping of Type B, B(U), or B(M) packaging that meets the applicable packaging requirements in the regulations of the NRC (10 CFR Part 71) and that has been approved by that Commission.

49 CFR 173.471(a) requires, in part, for Type B, B(U), or B(M) packaging approved by the USNRC in accordance with 10 CFR Part 71, that shippers be registered with the USNRC as a party to the approval, and the shipment must be made in compliance with the terms of the approval.

During the onsite inspection, licensee activities associated with packaging of LLRW materials were reviewed in detail. In particular, packaging activities associated with shipments made using two NRC-approved packages, that is, USA/9094/A, CoC 9094, Revision 11, dated January 13, 1993, and USA/9111/A, CoC 9111, Revision 12, dated February 6, 1989, were reviewed and discussed in detail. For both CoCs reviewed, the licensee was a registered user of the packages in accordance with 10 CFR 71.12(c)(3) or 49 CFR 173.471. However, based on reviews of selected procedures and applicable shipping papers, and, in addition, from discussions regarding selected radwaste shipments, the inspector noted the following issues regarding CoC associated maintenance procedural details:

- The inspector determined that licensee personnel responsible for developing packaging procedures were not maintaining a complete CoC and applicable documents for the CNS 14-195-H package, USA/9094/A, CoC 9094. Cognizant licensee representatives were uncertain of when the current revision of the applicable CoC was reviewed previously and, in addition, if the current operating procedure had been reviewed against the vendor specifications detailed in the current revision of the CoC.

The inspector informed licensee representatives that for LLRW exceeding Type A quantities using CoC USA/9094, made prior to January 7, 1994, the failure to maintain appropriately, the applicable CoC and drawings and other documents referenced in the approval relating to the use of the packaging and to specify selected Safety Analysis Report (SAR) packaging requirements to be taken prior to shipment was a violation of 10 CFR 71.12 requirements.

From further review and discussions with cognizant licensee individuals the inspector noted that no CoCs were being maintained as controlled documents onsite. The lack of control for the CoC was identified as a program weakness.

- Licensee procedure MP/O/A/7550/11, Chem-Nuclear Cask CNS 14-195H Handling, Loading, and Unloading, dated March 14, 1989, Step 11.8.5.5 did not follow the applicable vendor

procedural guidance referenced in the Application/Safety Analysis Report referenced in the CoC in that the 16 cask hold-down bolts were to be tightened "snug" rather than the 100 foot-pounds (ft./lbs) specified. Further, the procedure did not specify tolerance limits for selected torque wrench settings associated with loading procedures. For example, the CoC-referenced vendor procedure section 7.1.14 requires that for loading of the package, the primary lid is to be bolted to  $200 \pm 10$  ft/lbs torque, that is, within five percent tolerance. From review of the current procedure details and subsequent discussions regarding equipment tolerances, the inspector noted that no guidance to specify the tolerance limit in the procedure or to verify limits for the equipment used to conduct loading activities had been developed. Further, no controls had been established on the equipment used. During the onsite inspection, licensee representatives stated that additional review would be required to verify that the torque wrenches were capable of meeting the stated tolerance criteria.

In addition, a similar concern regarding CoC specified torque tolerances was identified for the USA/9111/A packaging, CoC No. 9111, Rev. 12, used to ship the majority of LLRW either as less than or greater than Type A quantities.

Additionally, for those LLRW shipments made in USA/9111/A packaging, CoC No. 9111, between January 1 and December 31, 1993, the failure to specify fastener torque values and associated tolerances listed in the CoC-referenced vendor procedures was identified as an additional example of a violation of 10 CFR Part 71.5 requirements.

The inspector informed licensee representatives that the failure to maintain the applicable CoC and associated documentation for shipments of greater than Type A quantities of radionuclides and the failure to specify torque values and associated tolerances for fasteners as listed in the CoC referenced vendor procedures were identified as examples of a violation of 10 CFR Part 71 requirements (VIO 50-369, 370/94-02-04).

During a subsequent January 21, 1994 teleconference, Mr. D. Moats, MNS, informed Mr. G. B. Kuzo, NRC, Region II, that review of torque wrench tolerances for the equipment used in packaging activities indicated that based on equipment specifications for the wrenches used, the tolerance requirements specified by the applicable CoC documents would have been met. In addition, the licensee representative note that although the applicable procedure MP/O/A/7550/11, Chem-Nuclear Cask CNS 14-195H Handling, Loading, and Unloading, dated March 14, 1989, Step 11.8.5.5 stated that the 16 cask hold-down bolts were to be tightened "snug" rather than the 100 foot-pounds (ft. lbs) specified; further

review of the Enclosure 13.1, Data Sheet 3, Section D specified that the initial pass for bolt tightening required that a torque of 225 ft/lbs to be applied. Since the data sheet torque requirements exceeded the vendor values, the licensee believed that there was no concern regarding the integrity of any shipments which were made using the USA/9094/A packaging. The inspector noted that although, the value exceeded the CoC-specification values, use of the authorized container requires compliance with the appropriate CoC details.

One violation of 10 CFR Part 71 requirements for failure to maintain and implement packaging instructions in accordance with selected CoC requirements was identified.

## 12. Exit Interview

The inspector met with licensee representatives indicated in Paragraph 1 at the conclusion of the inspection on January 7, 1994, and via teleconferences on January 20 and 21, 1994. The inspector summarized the scope and findings of the inspection, including the URI, VIO, and NCVs. The inspector also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspector during the inspection. The licensee did not identify any proprietary documents or processes during this inspection. Dissenting comments were not received from the licensee.

During the January 20, 1994 telephone conversation with the licensee, the inspector discussed records and related memos pertaining to the requirement of 10 CFR 50.75(g) to maintain decommissioning files which was identified as an URI during the inspection. After further review of the 10 CFR 50.75(g) requirements and subsequent discussions with Region II management, it was determined that this issue would be identified as an NRC NCV.

<u>Type</u>	<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
LIV	50-369, 370/94-02-01	Closed	Failure to conduct charcoal sampling and testing of the Containment Purge Ventilation System within the frequency specified by TS 4.9.4.2.b (Paragraph 9).
NCV	50-369, 379/94-02-02	Closed	Failure to implement a program to maintain decommissioning records in accordance with 10 CFR 50.75(g) requirements (Paragraph 10.d).

NCV	50-369, 370/94-02-03	Closed	Failure to implement adequately the DOT emergency response information requirements specified in 49 CFR 172.600 (Paragraph 11.d).
VIO	50-369, 370/94-02-04	Open	Failure to maintain and implement packaging instructions in accordance with selected CoC requirements (Paragraph 11.e).

## ATTACHMENT 1

### CRITERIA FOR COMPARING ANALYTICAL MEASUREMENTS

This enclosure provides criteria for comparing results of capability tests and verification measurements. The criteria are based on an empirical relationship which combines prior experience and the accuracy needs of this program.

In this criteria, the judgement limits denoting agreement or disagreement between licensee and NRC results are variable. This variability is a function of the NRC's value to its associated uncertainty. As the ratio of the NRC value to its uncertainty, referred to in this program as the resolution<sup>1</sup> increases, the range of acceptable differences between the NRC and licensee values should be more restrictive. Conversely, poorer agreement between NRC and licensee values must be considered acceptable as the resolution decreases.

For comparison purposes, a comparison ratio<sup>2</sup> of the licensee value to the NRC value for each individual nuclide is computed. This ratio is then evaluated for agreement based on the calculated resolution. The corresponding resolution and calculated ratios which denote agreement are listed in Table 1 below. Values outside of the agreement ratio for a particular nuclide are considered in disagreement.

TABLE 1

Confirmatory Measurements Acceptance Criteria  
Resolutions vs. Comparison Ratio

<u>Resolution</u>	<u>Comparison Ratio for Agreement</u>
< 4	
4 - 7	0.40 - 2.5
8 - 15	0.50 - 2.0
16 - 50	0.60 - 1.66
51 - 200	0.75 - 1.33
> 200	0.80 - 1.25
	0.85 - 1.18

<sup>1</sup> Resolution =  $\frac{\text{NRC Reference Value for a Particular Nuclide}}{\text{Associated Uncertainty for the Value}}$

<sup>2</sup> Comparison Ratio =  $\frac{\text{Licensee Value}}{\text{NRC Reference Value}}$