U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 70-371/87-07

Docket No. 70-371

License No. SNM-368 Safeguards Group I

Licensee: UNC, Inc.

UNC Naval Products

67 Sandy Desert Road

Uncasville, Connecticut 06382

Facility Name: UNC Naval Products

Inspection At: Uncasville, Connecticut

Inspection Conducted: September 21-25, 1987

Type of Inspection: Routine, Announced Material Control and Accounting

Inspectors: A. Della Ratta 11-9-87
A. Della Ratta, Safeguards Auditor date

Harvey Zibulsky 11-9-87
H. Zibulsky, Chemist date

A. Della Ratta for 11-9-87
C. M. Schulingkamp date
Physical Security Inspector

Approved by: R. Keimig 11.13.87
R. Keimig, Chief, Safeguards Section, date
Nuclear Materials Safety and Safeguards Branch

Inspection Summary: Routine, Announced Material Control and Accounting Inspection on September 21-25, 1987 (Report No. 70-371/87-07)

Areas Inspected: Organization and management controls; operations and internal controls; measurement systems; and records and reports.

Results: The licensee was in compliance with NRC requirements in the areas examined during this inspection.

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Details

1. Key Persons Contacted

*R. Gregg, Director, Technical Services
*N. Grenon, Supervisor, Nuclear Material Control
D. Rodgers, Nuclear Material Controller
J. L'Heureux, Nuclear Material Control Specialist
J. Cacciapouti, Internal Control Custodian
C. Pavelski, Internal Control Custodian
M. Hine, Lead Technician
*J. Lawrence, Facility Engineering Manager
*A. Santaniello, Lab Manager
*S. Ververis, Chem Lab Supervisor

The inspectors also interviewed other employees involved in the control and accounting of special nuclear material (SNM).

*present at exit interview

2. Independent Inspection Effort

The inspectors reviewed and observed implementation of the licensee's access control procedures for visitors to the facility and determined that the licensee complied with the NRC-approved physical security plan.

3. Facility Organization and Management Controls

The inspectors determined through a review of the licensee's material control and accounting (MC&A) procedures, that the licensee is maintaining and following a management system that provides for the development, revision, implementation and enforcement of MC&A procedures. The system provides for written approval of MC&A procedures and any revisions to those procedures by the individual with overall MC&A responsibility and by plant management.

Records of training were reviewed that indicated implementation of the licensee's Fundamental Nuclear Material Control Plan (FNMCP) commitments to have staff members and SNM custodians, assigned to material control and accounting functions, receive training that is commensurate with job responsibilities.

4. Measurement Systems

Nine standards with varying matrices and concentrations of uranium were provided to the licensee for analyses by the NRC inspector. The liquid standards were prepared with normal uranium and certified by New Brunswick Laboratory (NBL). The uranium concentrations and matrices were within the normal range of the material the licensee routinely analyses.

The inspector observed a technician analyze three of the standards using the spectrophotometric TOPO extraction procedure. This procedure is used to analyze low level uranium concentrations found in laboratory waste solutions.

Except for the lowest concentration, the analyses of the NRC uranium standard solutions compared well, with good precision. The source of error for the lowest concentration standard was the large dilution that was made (2ml diluted to 1000ml). The results are indicated in the following table:

NRC Standard	Relative % Bias	Uncertainty
.0000136g U/g	+2.9	±2.4
.0000057g U/g	+2.6	±7.0
.0000011g U/g	+54.6	±26.5

The inspector observed another technician analyze three NRC standards representing unfinished fuel, using the gravimetric Davies and Gray titration method. The analyses of the NRC standard solutions compared well, with good precision. The results are indicated in the following table:

NRC Standard	Relative % Bias	Uncertainty*
0.014681g U/g	-0.05	±0.07
0.020029g U/g	+0.04	±0.13
0.025461g U/g	-0.03	±0.02

The inspector also observed two technicians analyze the remaining three NRC standards, representing finished fuel, using the gravimetric Davies and Gray titration method. During NRC Inspection No. 86-13, the analyses of these NRC standards identified a positive bias which was attributed to a low room temperature (20°C). Since then, the licensee has recorded the room temperature which showed a fluctuation from 20°C to 27°C. The plant was recently air conditioned and this improved the temperature and humidity control in the laboratory. Management will now concentrate on limiting temperature fluctuations in specific areas of the laboratory to ±2°C. When the techinicians analyzed these standards during this inspection, the temperature in the laboratory was more stable. However, significant bias still resulted because of the temperature fluctuations. The results, for each techinician, are indicated in the following table:

*Uncertainty values are based on 2 sigma

	ANALYST #1			ANALYST #2		
NRC Standard	Rel. % Bias	Uncertainty*		Rel. % Bias	Uncertainty*	
0.024970g U/g	+0.26	±0.19	**	+0.26	±0.22	**
0.030010g U/g	+0.08	±0.38		+0.25	±0.18	**
0.035064g U/g	+0.11	±0.20		+0.04	±0.07	

* Uncertainty values are based on 2 sigma
** Statistically significant bias

5. Records and Reports

The inspectors audited the nuclear material control records and reports for the material balance periods ending March 13, 1987, May 15, 1987, and July 17, 1987. All line items on the SNM inventory reports for the three material balance periods were traced to source documents and compared to the records maintained by the licensee and to the DOE-NMMSS computer tabulations. The licensee's general ledger was also checked for accuracy. Nuclear Material Transaction Reports (DOE/NRC Form-741), which documented receipts, shipments, measured discards, and inventory changes, were reviewed for timeliness, format, and accuracy of content. No discrepancies were found.

Material Status Reports (DOE/NRC Form-742), submitted for the material balance period ending March 31, 1987, were also reviewed for the same attributes. No discrepancies were identified.

The inspectors determined that the licensee's control and subsidiary records for the periods under review were adjusted to the results of the physical inventories, as required by NRC regulations.

6. Exit Interview

The inspectors met with the licensee representatives indicated in paragraph 1 at the conclusion of the inspection on September 25, 1987, and summarized the scope and findings of the inspection.

At no time during this inspection was written material provided to the licensee by the inspectors.