U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 79-01

Docket No. 50-271

Safeguards Group: 4

License No. DPR-28 Priority 4 Category C

Licensee: Vermont Yankee Nuclear Power Corp.
20 Turnpike Road
Westborough, Massachusetts 01581

Facility Name: Vermont Yankee

Inspection at: Vermont Yankee and Westborough, Massachusetts

Inspection conducted: January 3 and 4, 1979

Inspectors: R. J. Summers
R. J. Summers, Auditor — 1/24/79 date signed

E. T. Shaub
E. T. Shaub, Safeguards Technician — 1/24/79 date signed

_____ date signed

Approved by: J. H. Joyner
J. H. Joyner, Chief, Nuclear Material Control Support Section, Safeguards Branch — Jan 25, 1979 date signed

Inspection Summary:

Inspection on January 3 and 4, 1979 (Report No. 50-271/79-01)
Areas Inspected: Routine, unannounced material control and accounting inspection including review of facility organization and operation, measurement and controls, shipping and receiving, storage and internal control, physical inventory, records and reports, and management of material control system. The inspection involved a total of 28 man-hours onsite by two NRC regional based inspectors.
Results: Of the seven areas inspected, no apparent items of noncompliance were found.

DETAILS

1. Persons Contacted

** W. F. Conway, Plant Superintendent
* A. R. Soucy, Assistant Treasurer, Yankee Atomic Electric Company
R. Cacciapouti, Senior Titled Engineer
M. Kowalczyk, Junior Accountant
** S. Jefferson, Reactor Engineer
** B. Webber, Computer Engineer
** D. Girroir, Engineering Assistant

* denotes those present at exit interview at the corporate office in Westborough, Massachusetts.

** denotes those present at exit interview at the Vermont Yankee Reactor site.

2. Facility Organization and Operation

The licensee has established an organizational structure responsive to nuclear material control and accounting requirements. The overall custody of special nuclear material (SNM) and management of the nuclear material control and accountability program is the responsibility of the Reactor Engineer. A sufficient number of item control areas (ICAs) have been established for the physical and administrative control of special nuclear material. Vermont Yankee Nuclear Power Corporation utilizes the accounting department of the Yankee Atomic Electric Company, located in Westborough, Massachusetts, for maintenance of central accountability records. In addition, plant records (fuel element transfer documents, fuel element history forms, and element location charts for the core, new fuel pool and spent fuel pool) are maintained at the Vermont Yankee site.

A walk-through inspection of the facility was conducted. As a result of this inspection it was determined that the possession and use of SNM have been confined to the locations and purpose authorized in the license. All operations involving SNM are the responsibility of the Reactor Engineer.

The nuclear material activity for the period covered by this inspection is shown in Exhibits I and II of this report.

No items of noncompliance were identified.

3. Measurement and Controls

The inspector verified that the licensee has a method of computing thermal output, uranium and uranium-235 depletion, and plutonium production. Isotopic burnup and production data are calculated using the GE OD-12 program. The site process computer monitors plant parameters and conducts calorimetric measurements. This data is used in the OD-12 program to develop core exposures which are then translated into burnup and production results for each fuel assembly.

An NRC independent determination of the uranium-235 depletion and plutonium production agrees with the licensee's reported figures as shown on their Material Status Reports submitted for the period June 30, 1976 to September 30, 1978.

No items of noncompliance were identified.

4. Shipping and Receiving

The licensee has established and maintains procedures to assure that all special nuclear material shipped or received is accurately accounted for.

A review was performed of all Forms NRC-741 generated during the period covered by the inspection to determine proper signature, timely dispatch and accuracy of data.

No items of noncompliance were identified.

5. Storage and Internal Control

The licensee has established a system of storage and internal control of SNM that provides current knowledge of the quantity, identity and location of all SNM within the facility.

Perpetual inventory records are maintained at both the Vermont Yankee and corporate office sites. These records include grid maps of the reactor core, spent fuel pool and new fuel storage area. The inventory records are reconciled to the physical inventory. In addition to the above records, the fuel element history cards and the SNM transfer forms are used to maintain item control.

The inspectors selected 100 fuel assemblies at random and traced their movement within the facility. In addition, the present location of the assemblies was traced to the tag boards and grid maps. No discrepancies were noted.

No items of noncompliance were identified.

6. Inventory

The licensee conducts a physical inventory every six months to conform to the reporting periods for Material Status Reports (Form NRC-742).

The inspectors performed an inventory verification which consisted of a piece count of fuel assemblies in the spent fuel pool and cross checking the core loading schematic to the tag boards and fuel element history cards. No discrepancies were noted. The inspectors verified the serial numbers of six assemblies in the spent fuel pool. The serial numbers agreed with the perpetual inventory records.

Results of the inventory are as follows:

Location	Fuel Assemblies
New Fuel Storage	0
Reactor	368
Spent Fuel Pool	694

No items of noncompliance were identified.

7. Records and Reports

A 100% audit of the Material Transaction Reports (Form NRC-741) generated during the period June 30, 1976 to September 30, 1978 was performed. The documents were reviewed for completeness, accuracy, signature and timely dispatch. Material Status Reports (Form NRC-742) submitted during this period were also reviewed for proper signature, time of submission and accuracy of data.

No items of noncompliance were identified.

8. Management of Material Control System

The licensee has established, maintained and follows a management system which provides for the development, revision and implementation of nuclear material control and accounting procedures. The licensee QA section performs an annual audit of the material control and accountability system at both the Vermont site and the corporate office.

No items of noncompliance were identified.

9. Exit Interview

The inspectors met with the licensee representatives (denoted in Paragraph 1) at the completion of the inspection at both Westborough, Massachusetts and Vernon, Vermont. The scope and findings of the inspection were summarized by the inspectors.

EXHIBIT I

Vermont Yankee

June 30, 1976 to September 30, 1978

Material Balance Summary
Enriched Uranium

RIS:YMX

	Grams	
	Element	Isotope
Beginning Inventory @ 6/30/76	163,613,349	2,818,476
Receipts	32,517,383	916,436
Material to Account For	196,130,732	3,734,912
Removals:		
Shipments	22,523	675
Burn-up	1,363,848	713,867
MUF	0	0
Total Removals	1,386,371	714,542
Ending Inventory @ 9/30/78	194,744,361	3,020,370
Material Accounted For	196,130,732	3,734,912

EXHIBIT II

Vermont Yankee

June 30, 1976 to September 30, 1978

Material Balance Summary
Plutonium

RIS:YMX

	Grams	
	Element	Isotope
Beginning Inventory @ 6/30/76	614,581	510,006
Receipts	0	0
Production	332,603	237,499
Material to Account For	947,184	747,505
Removals:		
Shipments	0	0
Decay	3,272	3,272
Total Removals	3,272	3,272
Ending Inventory @ 9/30/78	943,912	744,233
Material Accounted For	947,184	747,505