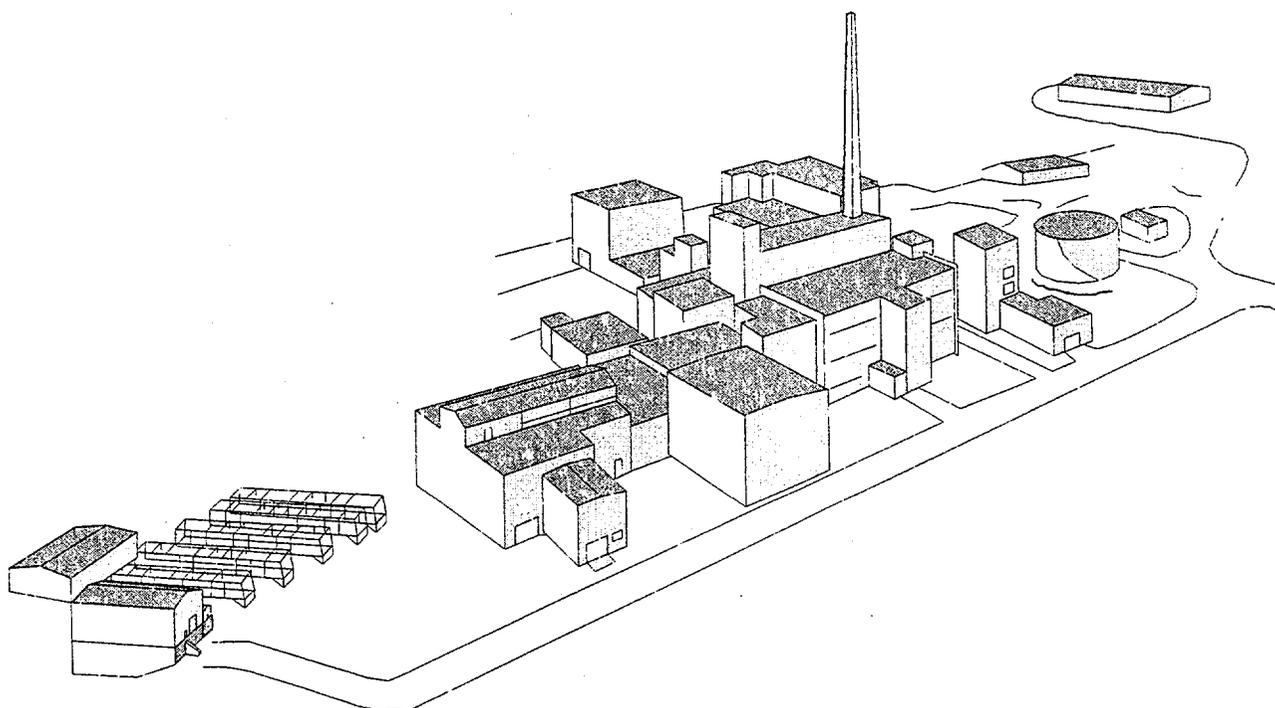




Westinghouse
Government Services Group

West Valley Nuclear Services Company

NUCLEAR MATERIAL CONTROL AND ACCOUNTABILITY PLAN



WVDP-007

West Valley Demonstration Project

West Valley, New York 14171

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Revised section 2.0 to reflect current assignments and responsibilities; added section 2.7 (Training), 10.0 (Performance Testing), 11.0 (Site Emergencies), 12.0 (Evaluations, Self Assessment and Audits), 14.0 (Records Maintenance), and Appendix A. Made miscellaneous updates throughout and deleted obsolete material.

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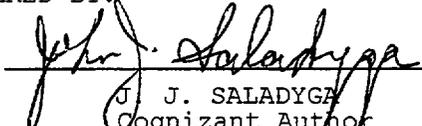
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NUCLEAR MATERIAL CONTROL AND ACCOUNTABILITY PLAN

PREPARED BY:



J. J. SALADYGA
Cognizant Author

12/20/99
Date

APPROVED BY:



W. L. ZUPPINGER
Cognizant Manager

12/20/99
Date



Westinghouse
Government Services Group

West Valley Nuclear Services Co.
10282 Rock Springs Road
West Valley, NY 14171-9799

WVNS RECORD OF REVISION

DOCUMENT

If there are changes to the controlled document, the revision number increases by one. Indicate changes by one of the following:

- Placing a vertical black line in the margin adjacent to sentence or paragraph that was revised.
- Placing the words GENERAL REVISION at the beginning of the text.
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<u>Rev. No.</u>	<u>Description of Changes</u>	<u>Revision On Page(s)</u>	<u>Dated</u>
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1	Revision to Document	All	06/83
2	Revision to Document	All	07/85
3	Revision to Document	All	07/86
4	Revision to Document	All	06/87
5	General Revision - Complete Rewrite	All	01/04/91
5	Reissue of document supersedes Rev. 5 dated 01-04-91	All	02/07/91
6	Update document to include new revisions to several DOE orders. Updated format per WV-100.	All	11/93
PC1	Incorporate DOE comments.	i, 3, 4, 24	04/13/94
7	General Revision	All	12/18/96

WVNS RECORD OF REVISION CONTINUATION FORM

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NUCLEAR MATERIAL CONTROL AND ACCOUNTABILITY PLAN

1.0 INTRODUCTION

1.1 Purpose

The purpose of the West Valley Demonstration Project Nuclear Material Control and Accountability Plan is to establish policy, identify responsibilities, and define requirements for control and accountability of all nuclear materials at the Department of Energy's (DOE) West Valley Demonstration Project.

1.2 Scope

The policies, procedures and responsibilities, as delineated in this plan, in conjunction with the West Valley Site Security Plan, provide for compliance with the Department of Energy's requirements for control and accountability of nuclear materials as specified in applicable DOE Orders for the West Valley Demonstration Project. The provisions of this plan apply to all functions involving nuclear material for the West Valley Demonstration Project.

The Material Control and Accountability Plan (MC&A) is a detailed description of the requirements for inventory, and the records and reports system as to accuracy and timeliness for reporting transactions.

1.3 References

- 1.3.1 DOE Order 200.1, "Records Management Program," dated 09/30/96
- 1.3.2 DOE O 474.1, "Control and Accountability of Nuclear Materials," dated 08/11/99
- 1.3.3 DOE M 474.1-1, "Manual for Control and Accountability of Nuclear Materials," dated 08/11/99
- 1.3.4 DOE M 474.1-2, "Nuclear Materials Management and Safeguards System Reporting and Data Submission," dated 11/16/98
- 1.3.5 WVDP-334, "Site Security Plan," dated 01/20/99
- 1.3.6 SOP 15-27, "Inventorying Nuclear Material in Nuclear Material Control Areas," Revision 4, dated 09/18/95
- 1.3.7 SOP 15-30, "Control, Installation and Removal of WVNS Tamper Indicating Devices for Nuclear Material Accountability," Revision 3, dated 09/18/95

- 1.3.8 "Safeguards Seal Reference Guide," DOE Office of Safeguards and Security
- 1.3.9 "Safeguards and Security Glossary of Terms," DOE Office of Safeguards and Security, dated 12/18/95
- 1.3.10 WVDP-242, "Event Investigation and Reporting Manual," dated 05/14/99
- 1.3.11 QM-8, "Identification and Control of Items," dated 5/7/99
- 1.3.12 SOP 1-14, "FRS Accountability," dated 8/10/99.

1.4 Definitions

- 1.4.1 Equipment Holdup - is an estimated or measured quantity of nuclear material which adheres so tenaciously to the equipment that it has become part of the equipment or requires special treatment to remove.
- 1.4.2 Inventory Difference (ID) - is the algebraic difference between the nuclear material book inventory (BI) and a physical inventory (PI), i.e., $ID = BI - PI$.
- 1.4.3 Material Balance Area (MBA) - is an identifiable physical area wherein the quantity of nuclear material being moved into or out of is represented by a measured value.

Material balance areas are established to provide material control and accounting capabilities which reflect planned operations of West Valley Nuclear Services Co.
- 1.4.4 Material Control Alarms - Alarms from loss detection elements (e.g., SNM monitors, material surveillance) which may indicate abnormal situations and/or unauthorized use/removal of nuclear material.
- 1.4.5 Material Custodian - is an individual assigned responsibility for the control of nuclear material in a localized area of a facility. The localized area should be limited, where practical, to a single material balance area.
- 1.4.6 Nuclear Materials - is a collective term which includes all materials designated from time to time and to which the provisions of this plan apply. Table I contains a listing of materials currently designated as nuclear materials and includes source material.

- 1.4.7 Reporting Identification Symbol (RIS) - consists of a unique combination of three or four letters which are assigned to each reporting facility by the Department of Energy (DOE) and/or the Nuclear Regulatory Commission (NRC) for purposes of identification in the nuclear materials management data base.
- 1.4.8 Source Material - refers to (a) Uranium, Thorium, or any other material determined pursuant to the provisions of Section 61 of the Atomic Energy Act of 1954, as amended, to be source material; or (b) ores containing one, or more, of the foregoing materials, in such concentration as may by regulation be determined from time to time.

Table 1				
REPORTABLE NUCLEAR MATERIALS				
Name of Material	Other Nuclear Materials	SNM	Source	Reportable Quantities
Depleted Uranium			X	Kilogram
Enriched Uranium		X		Gram
Normal Uranium			X	Kilogram
Uranium-233		X		Gram
Plutonium-242		X		Gram
Plutonium 239-241		X		Gram
Plutonium-238		X		Gram/tenth
Americium-241	X			Gram
Americium-243	X			Gram
Berkelium	X			Microgram
Californium-252	X			Microgram
Curium	X			Gram
Deuterium	X			Kilogram/tenth
Lithium-6	X			Kilogram
Neptunium-237	X			Gram
Thorium			X	Kilogram
Tritium	X			Gram/hundredth

- 1.4.9 Special Nuclear Material (SNM) - means (a) Plutonium, Uranium enriched in the isotope 233 or in the isotope 235, and any other material, which, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954, as amended, has been determined to be Special Nuclear Material, but does not include source material; or (b) any material artificially enriched by any of the foregoing, but does not include source material. Table I contains a listing of Special Nuclear Material.
- 1.4.10 Tamper-Indicating Devices (TIDs) - are devices which may be used on containers and areas, which, because of their uniqueness in design or structure, reveal violations of their containment integrity. TIDs include seals, mechanisms, containers, and enclosures.
- 1.4.11 Apparent Loss - is the inability to locate physically or to otherwise account for:
- A. Any identifiable or discrete item containing nuclear material.
 - B. An inventory difference in which the book inventory is larger than the physical inventory by an amount in excess of the established alarm limit.
 - C. A shipper/receiver difference involving a discrepancy in which fewer items were received than were shipped.
- 1.4.12 Discrepancy Indicator - Occurrences which could potentially indicate a system problem or a discrepancy involving nuclear material.
- 1.4.13 Material Control Area - an identifiable physical area wherein the activity, personnel/equipment/material, is limited by procedure and/or authorization. Nuclear material control areas are established to provide physical protection of nuclear material.

1.5 Site Description

The Department of Energy, West Valley Demonstration Project is located in Cattaraugus County, New York, approximately 30 miles south of Buffalo. The site includes a shutdown nuclear fuel reprocessing facility, a high-level waste tank farm containing fuel reprocessing wastes stored in underground tanks, a Vitrification Facility, Sludge Mobilization/Supernatant Treatment System, inactive Cement Solidification System, Liquid Waste Treatment System, a Fuel Storage Pool containing spent nuclear reactor fuel assemblies, Analytical Laboratories, an inactive Solid Waste Disposal Area, and auxiliary support facilities.

Accountable nuclear material present on the site is located in the Fuel Storage Pool (Fuel Receiving and Storage Area).

The Lag Storage System, High-level Waste Tank Farm, Drum Cell, and the Nuclear Regulatory Commission licensed burial area contain material designated as waste. This material is not carried on the active accountability records.

1.6 Site Operation

The West Valley Site is operated by West Valley Nuclear Services Co. (WVNS), a wholly-owned subsidiary of Morrison Knudsen Corporation under contract to the Department of Energy's Ohio Field Office for the purpose of carrying out a demonstration project for high-level radioactive waste management, the West Valley Demonstration Project (WVDP).

2.0 ORGANIZATION AND RESPONSIBILITIES

The West Valley Nuclear Services Co. organizational structure, as shown on Figure 1, and functional responsibilities under the Nuclear Material Control and Accountability Plan are as described below.

2.1 President, WVNS

The President, WVNS, reports to the Westinghouse Government Services Group President and has full responsibility for all Project activities under the Department of Energy/West Valley Nuclear Services Co. contract, including nuclear material control and accountability. Functional responsibility for preparation and implementation for the Nuclear Material Control and Accountability Plan is delegated in writing to the MC&A, Cognizant Staff Manager, a staff level manager. The President, WVNS, shall also designate in writing the MC&A Alternate Cognizant Staff Manager, also a staff level manager. The DOE-OH/WVDP representative, the Plant Security Manager and the Accountability Representative will be notified in writing of these appointments.

Responsibility for the West Valley Nuclear Services Co. Safeguards and Security Plan and physical security is delegated to the Plant Security Manager in the West Valley Nuclear Services Co. Human Resources department.

2.2 Material Control and Accountability Plan, Cognizant Staff Manager

The MC&A Cognizant Staff Manager is the Site Operations and Facility Closure Project Manager, reports to the President, WVNS, and is designated the West Valley Nuclear Services Co. management official directly responsible for control and accountability of nuclear material in accordance with this plan.

The MC&A Cognizant Staff Manager shall designate the Fuel Receiving and Storage Material Balance Custodian, and the Accountability Representatives in writing. The DOE-OH/WVDP representative, the Plant Security Manager and the Accountability Representatives will be notified in writing of these appointments.

2.3 Material Control Accountability Plan, Alternate Cognizant Staff Manager

The MC&A Alternate Cognizant Staff Manager is the High-Level Waste Projects Manager reporting to the President, WVNS. The MC&A Alternate Cognizant Staff Manager assumes the duties outlined in 2.2 in the absence of the MC&A Cognizant Staff Manager.

2.4 Plant Security Manager

The West Valley Nuclear Services Co. Plant Security Manager reports to the President, WVNS, through the Human Resources Manager and is responsible for maintaining physical security for nuclear material at West Valley in accordance with applicable DOE Orders and the Site Security Plan.

2.5 Material Balance Custodian - Manager, Spent Fuel Shipping and Main Plant Operations

The West Valley Nuclear Services Co. Material Balance Custodian is responsible for ensuring all control and accountability activities for the Fuel Storage Pool are completed in compliance with the Nuclear Material Control and Accountability Plan and implementing procedures and the West Valley Site Security Plan. For the purpose of nuclear material accountability, the Material Balance Custodian reports to the MC&A Cognizant Staff Manager. Responsibilities of the Material Balance Custodian for nuclear material activities include the following:

- 2.5.1 Ensure all nuclear materials activities are conducted in accordance with written procedures.
- 2.5.2 Ensure physical inventories of nuclear materials are conducted at specified frequencies and in accordance with detailed procedures.
- 2.5.3 Ensure only qualified personnel are assigned responsibility of nuclear material control and accountability activities.
- 2.5.4 Ensure all nuclear material transactions are documented in accordance with the requirements of this plan.
- 2.5.5 Report discrepancies and/or apparent losses of nuclear material immediately to the MC&A Cognizant Staff Manager, the Accountability Representative, and the Plant Security Manager for investigation.

2.6 Accountability Representative

2.6.1 The West Valley Nuclear Services Co. Accountability Representatives are appointed by and report to the MC&A Cognizant Staff Manager through line management. Currently a Supervisor in Spent Fuel Shipping and a Safety Engineer in Site Operations and Facility Closure serve as Accountability Representatives. The Accountability Representatives have the responsibility for maintaining the Nuclear Material Control and Accountability Plan and nuclear material control and accountability procedures in compliance with applicable DOE Orders. The Accountability Representatives are responsible for the following activities:

- A. Review the plan at least every three years for any necessary revisions.
- B. Prepare the procedures that are required to implement this Nuclear Material Control and Accountability Plan.
- C. Maintain accountability and inventory records.
- D. Prepare nuclear material transaction forms and data.
- E. Prepare nuclear material control and accountability reports in accordance with Department of Energy requirements.
- F. Establish and maintain measurement and statistical control programs in accordance with Department of Energy requirements, as required.
- G. Establish qualification and training requirements for personnel engaged in nuclear material control and accounting activities.
- H. Report discrepancies and/or apparent losses of nuclear material immediately to the MC&A Cognizant Staff Manager and Security Manager for investigation.
- I. Perform physical inventories of nuclear material in accordance with SOP 15-27.

2.7 Training

Nuclear Material Control and Accountability Training shall be required of the Accountability Representatives. This training shall consist of formal training in Nuclear Materials Management and Safeguards System (NMMSS) reporting requirements as soon as possible after appointment. Accountability Representatives must also be knowledgeable in the operation of the computer programs for decay calculations.

3.0 NUCLEAR MATERIAL AREAS

Nuclear material is currently only stored in one designated area of the West Valley Demonstration Project.

3.1 Fuel Receiving and Storage (FRS) Area

The Fuel Receiving and Storage Area is designated as a Material Control Area and a Material Balance Area. Nuclear material activities in the Fuel Receiving and Storage Area include storage and shipping of spent fuel.

3.1.1 Spent fuel assemblies from two utility reactor plants are stored in the Fuel Receiving and Storage Area (FRS). The spent fuel assemblies are stored in canisters in the Fuel Storage Pool (FSP) under a minimum of 11 feet of water. The area is bordered on the north, east and most of the south sides by the FRS area walls, which are structural steel beams and two layers of sheet metal paneling. The west wall and 22 feet of the south wall are common with the Process Building and are of concrete block or reinforced concrete construction. The Fuel Receiving and Storage Area boundaries and the inner security fence line are shown in Figure 2.

Only authorized personnel are allowed access to the FRS. Personnel access and egress is controlled through the use of a Card Access Control System.

Security measures consistent with the requirements for category IV quantities of special nuclear material, (SNM), are defined in the Site Security Plan.

4.0 MATERIAL ACCOUNTING SYSTEM

The Material Accounting System employed at the West Valley Demonstration Project complies with the requirements and conforms to the basic principles for control and accountability of nuclear material as set forth in the Department of Energy Order 474.1. The system serves as an information source capable of locating nuclear material and providing data for material balance calculations around each material balance area and facility as a whole. The system involves the use of documents and forms for source data generation and the technique of double-entry bookkeeping for centralized accounting.

NOTE *Throughout this document, the term DOE Order 474.1 also includes DOE M (Manual) 474.1-1. See references 1.3.2 and 1.3.3.*

In its current form, the system consists of documents and records in support of accounting entries for irradiated fuel assemblies stored in the Fuel Receiving and Storage Facility.

The system has the capability to handle and process documentation for the:

- o Shipment of accountable nuclear material;
- o Receipt of accountable nuclear material;
- o Prepare journal entry adjustments for isotopic decay, rounding, normal-operational-loss, approved material discards, and other miscellaneous entries as may be required at the West Valley Demonstration Project.

A listing of the Accounting Reports and their frequency of submittal is shown in Section 5.

4.1 Description of System

The basic accounting system employed at West Valley Nuclear Services Co. consists of measurement and material flow data generated by operating and/or analytical personnel. Special Nuclear Material flow quantities from the basic data are used by the Accountability Representative. Reports are prepared and distributed. The Accountability Representatives maintain a double-entry bookkeeping system and report transaction and inventory data to the Nuclear Material Management and Safeguard System.

4.2 Documentation

Nuclear materials transactions, balances and inventories shall be documented and reported in accordance with guidance provided in DOE Order 474.1.

Accounting forms and records are the sources of information used to generate and document all nuclear material transactions at the West Valley Demonstration Project Facility.

Detailed instructions for completing documentation are contained in DOE M 474.1-2.

4.2.1 Accounting Forms

The basic accounting forms used to record and transmit accounting data are as follows:

- A. DOE/NRC Form 741, Nuclear Material Transaction Report shows nuclear material transactions (receipts, shipments, transfer of custodianship).
- B. WVNS Form 10 (Fuel Transfer Record), as shown in Appendix B, is used to transmit operational data on fuel storage. This includes placement into storage, movement within the storage pool and transfer to a shipping container. Assembly identification numbers, storage canister identification numbers and storage positions are recorded.

4.2.2 Accounting Records

The following documents are retained as part of the accounting records:

A. Source Documents

DOE/NRC Form 741
WVNS Form 10 (Fuel Transfer Record) - Appendix B
WVNS Internal Memo

B. Accounting Records

Pool Status Map
General Ledger Accounts
Subsidiary Decay Ledger

C. Accounting Reports

Accounting reports are found in Section 5, Reporting Requirements.

4.2.3 Record Storage

Storage of nuclear material accounting documents, forms, and reports is the responsibility of the Accountability Representative.

Storage for source documents is in the accountability files in the Accountability Office. Accounting ledgers and reports are maintained in a locked and fireproof file in the Accountability Office. Access to the file is controlled by the Accountability Representative, and shall be designed to prevent and/or detect unauthorized access. Redundancy and/or capabilities for reconstructing lost or destroyed records must also be maintained.

Retention of records is also the responsibility of the Accountability Representative and is provided in accordance with requirements of DOE Order 200.1.

Records of physical inventory, waste measurements, material balance reports, and materials held under tamper-proof seals are retained for a period of at least five years. Inventory difference and all records relating to the receipt, storage, transfer, or shipment of nuclear materials will be retained until authorization for disposal is obtained from the DOE-OH/WVDP representative.

4.3 Entry

The source data used as the basis for entries to the accounting records are identified in 4.2.

4.3.1 Ledgers

- A. The general ledger is the primary accounting document for accounting records. A double-entry accounting system is used whereby a debit entry to one account is compensated for by an equivalent credit entry(ies) in an offsetting account(s). All material balance areas (MBAs) are represented by accounts in the general ledger.

Debit entries for shipment or decay of nuclear material in the Fuel Receiving and Storage account are offset by credit entries into the individual utility accounts. All transactions are recorded as they occur and are cross-referenced to their corresponding account.

- B. A Plutonium 241 decay ledger is maintained to account for losses in plutonium inventory due to decay of the Plutonium 241 isotope. Entries into this ledger are made every September and March to coincide with the semiannual material balance report. The source documents for this ledger are the DOE/NRC-741 Forms, which accompanied the fuel shipments, letters from the utilities providing isotopic distribution and base date calculations, and DOE M 474.1-2. An increase in the Plutonium decay account is offset by decreases in the Fuel Storage and Utility accounts.

4.3.2 Recording Transactions

- A. The minimum reporting level for maintaining MC&A inventory records and for documenting internal transfers is established as one-half (0.5) of a reporting unit. One-half of a reporting unit shall be interpreted as the amount before rounding; e.g., documentation is not required for quantities of 0.49 reporting units or less. For all quantities greater than the minimum reporting level, whole reporting units shall be used and rounding procedures followed as specified in DOE M 474.1-2.

- B. The minimum reporting level shall be applied to the element weight for accountable nuclear material; where necessary, an asterisk shall be used in the isotope field to indicate less than one-half reporting unit.
- C. For external shipment:

When the rounded quantity to be transferred is between 0.05 and 0.49 of the reporting unit, the quantity shall be documented as an asterisk on DOE/NRC Form 741. Subtraction of this material from the inventory prior to transfer will not be required.

When the rounded quantity to be transferred is less than 0.05 of the reporting unit, accountability documentation is not required.
- D. Receipts of nuclear material transferred on DOE/NRC Form 741 shall be acknowledged in accordance with current practices.
- E. Transactions are recorded when they occur (or as indicated) providing a chronological listing of all activity except in the case of Plutonium 241 decay, which is recorded semiannually.
- F. In no way should the MC&A minimum reporting levels be construed as affecting policies of requirements of other areas such as (but not limited to) safety, radiological control, and transportation. In addition, internal reporting units may be set at levels lower than those discussed above, if deemed necessary to maintain sound control and accountability of nuclear materials in possession.

4.3.3 Normal-Operational-Losses

All Normal-Operational-Losses (NOLs) will be authorized by the DOE-OH/WVDP representative.

5.0 REPORTING REQUIREMENTS

The following reporting requirements are established to comply with Department of Energy's requirements for reporting of nuclear materials control and accountability activities.

- 5.1 Nuclear Materials Management and Safeguards System (NMMSS) submissions shall be prepared by the Accountability Representative in accordance with DOE M 474.1-2.
 - 5.1.1 Transaction Data - any transaction that affects the quantity of accountable nuclear material on site, is to be submitted to Nuclear Materials Management and Safeguards System each Thursday. After the last Thursday in a month, transaction data for the month shall be submitted to NMMSS on a daily basis until the deadline on the eighth work day of the subsequent month.
 - 5.1.2 Inventory Data - will be reported using DOE Form DP-733 on a quarterly basis covering the quarters ending December 31, March 31, June 30, and September 30, and shall be submitted to Nuclear Materials Management and Safeguards System by the fifteenth (15th) calendar day of the following month.
- 5.2 Inventory Difference Reports shall be prepared by the Accountability Representative and submitted by the MC&A Cognizant Staff Manager semiannually covering the periods October 1 through March 31 and April 1 through September 30. These reports shall be submitted to DOE-OH/WVDP representative by May 10 and November 10, respectively.
- 5.3 Semiannually, a Material Balance Report (MBR) covering the periods October 1 through March 31 and April 1 through September 30 shall be prepared by the Accountability Representative, and submitted to the DOE-OH/WVDP representative by April 15 and October 15, respectively. Requirements for the Material Balance Report are covered in DOE M 474.1-2.

In addition to the provisions of DOE Order 474.1-1, the following requirements apply to issuance of semiannual facility Material Balance Reports (DOE Form 742).

- 5.3.1 A certification statement shall be signed by the president/general manager of the company, or the official acting in that capacity. A single statement will suffice for each facility, covering the entire set of MBR's generated for the reporting period. The authority to sign the certification statement may be transferred to a lower level of contractor management by a written delegation.

- 5.3.2 The certification statement should read: "To the best of my knowledge and belief, the information given in this set of Material Balance Reports and in any attached schedules is true, complete, and correct." The date and signature-title line should be included.
- 5.3.3 A separate schedule shall be appended to individual MBRs for Special Nuclear Material, listing the categories of inventory difference i.e., reporting codes 88 through 97 defined in DOE M 474.1-2. These supporting schedules should include the code number, category title, and total quantities reported for each category during the semiannual period.
- 5.4 Annual Physical Inventory Reports shall be prepared by the Accountability Representative and submitted by the MC&A Cognizant Staff Manager to the DOE-OH/WVDP representative. Physical inventory reports shall be submitted within 30 days of completion of physical inventory.
- 5.5 Documentation of nuclear material transaction shall be accomplished in accordance with requirements of DOE M 474.1-2. Nuclear materials covered by this requirement, with associated reporting characteristics, are listed in Table 1 of this document.
- 5.6 Decay Reporting. Radioactive decay shall be reported as described in DOE M 474.1-2 for material in transit. For material maintained in inventory on-site, decay should be entered into the records semiannually, as of March 31 and September 30, prior to issuance of the Material Balance Reports. Decay measurements are calculated according to the instructions in Appendix A.
- 5.7 DOE/NRC-741 Distribution Instructions. In addition to distribution requirements outlined in the DOE M 474.1-2:
- 5.7.1 Copies shall be distributed to the facility and cognizant field organizations that have programmatic responsibility for material involved in a transaction, but are not on the standard distribution. For example:
- A. Facility reported in "To" and/or "For" account(s) differs from the shipper or receiver.
 - B. Project number for the reported material indicates programmatic responsibility of a facility other than the shipper or receiver.

6.0 INVENTORY

Physical inventory of nuclear materials at the West Valley Demonstration Project shall be conducted annually by trained personnel in accordance with SOP 15-27, "Inventorying Nuclear Material in Nuclear Material Control Areas."

6.1 Frequency and Schedule

Physical inventory will be conducted annually, normally in September of each year.

6.2 Personnel Performing Inventory

Only qualified personnel who have been trained in the requirements of SOP 15-27 shall be authorized to conduct physical inventories.

6.3 Special Inventories

Special inventories shall be conducted as a result of routine disassembly of critical assemblies, changes in custodial responsibilities, missing items, inventory differences exceeding established control limits, abnormal occurrences, or at the request of the DOE-OH/WVDP office.

6.4 Verification Requirements

Physical inventories of material stored in the nuclear material control area shall be performed in accordance with SOP 15-27.

6.5 Discrepancies

Discrepancies found during the performance of physical inventories shall be reported immediately to the Material Balance Custodian and the MC&A Cognizant Staff Manager for further investigation and reporting to the DOE-OH/WVDP on-site representative.

6.6 Inventory Techniques

6.6.1 Physical inventory of nuclear material in the Fuel Receiving and Storage Area shall be by piece-count verification of the storage location for each of the two types of spent fuel assemblies stored in the fuel storage pool [Big Rock Point (BRP) and Robert E. Ginna (REG)].

7.0 ACCOUNTABILITY MEASUREMENT, STATISTICAL ANALYSIS, AND ASSEMBLY VERIFICATION

Current inventories are maintained by piece-count method as noted in Paragraph 6.6.

Prior to fuel shipment, the assembly identification number for each canister location shown on the accountability board in the FRS will be verified. This will be done by observing each assembly serial number and comparing it to the identification number for the assembly in that canister location shown on the board. Any discrepancies between the observed identification number and the recorded identification number will be resolved prior to shipment.

The FRS Material Balance Custodian will designate which fuel assemblies are to be shipped. When the fuel assemblies are shipped from the FRS, the Operations Supervisor or Cognizant Engineer responsible for the fuel shipment, and a representative of Quality Assurance (QA) will observe the identification number for the assembly being prepared for shipment. This identification number will then be recorded on the procedure data sheet with a verification sign-off by the Operations Supervisor/Cognizant Engineer and Quality Assurance. The Accountability Representative will verify that the fuel assembly identification number as identified on the procedure data sheet is the one identified on the DOE/NRC 741 form and if required, on the Radioactive Material Shipment Record. (Operations Supervisor/Cognizant Engineer or Quality Engineer may not verify as Accountability Representative.) The nuclear material transaction reports will show the same material type and description of nuclear material for each assembly as when the assembly was received except for the Pu-241 decay. The amount of decay shown on the transaction reports will reflect the total decay which has occurred since the core in which the assembly was in was shut down. This will be in agreement with what has been reported on the Nuclear Material Transaction data cards.

8.0 REQUIREMENTS FOR TAMPER INDICATING DEVICES

Tamper indicating devices (TIDs) used in the control of nuclear material shall meet the requirements of DOE M 474.1-1 and DOE/DP-0035, "Safeguards Seal Reference Manual." TIDs utilized at West Valley will be paper (fragile, adhesive), cup (Type E) or other DOE approved seal. TIDs utilized at West Valley shall be controlled and installed in accordance with Standard Operating Procedure (SOP) 15-30, "Procedure for the Control Installation and Removal of WVNS Tamper-Indicating Devices for Nuclear Material Accountability."

9.0 NUCLEAR MATERIAL CONTROL AND ACCOUNTABILITY PROCEDURES

9.1 Nuclear Material Control and Accountability Plan Implementing Procedures

All changes to this plan shall be approved by the West Valley Nuclear Services Co. MC&A Cognizant Staff Manager and submitted to DOE-OH/WVDP for approval prior to implementation in accordance with DOE Order 474.1.

9.2 Nuclear Material Work Procedures

Operational-type activities involving the processing, receipt, shipment, storage analysis, physical inventory, or transfer of accountable quantities of nuclear materials at the West Valley Demonstration Project shall be performed in accordance with approved, written procedures. Procedures for the above activities shall be prepared in compliance with this Plan and implementing procedures and be approved prior to use by the Material Balance Custodian.

10.0 PERFORMANCE TESTING

10.1 Following are performance tests and compliance criteria for material control and accountability system elements at WVDP:

10.1.1 Tamper Indicating Devices (TIDs) - Used for shipment of fuel assemblies. 100% of casks shipped will have TIDs installed. Documentation is required to show TIDs were installed on casks.

10.1.2 Accounting Record System - The annual physical inventory shall serve as the performance test. 100% of fuel assemblies must be accounted for by position in pool.

11.0 SITE EMERGENCIES

Fuel assemblies in the Fuel Storage Pool in the FRS are considered self-protecting due to their underwater location, weight and radiation levels; thus, loss of control is not possible. For fuels in casks to be shipped out by rail, TIDs must be examined for integrity prior to shipment. Should an emergency cause a temporary loss of control of a loaded cask, accountability and control would be re-established. The size and weight of a cask makes it highly improbable it could be moved or diverted without WVNS knowledge.

12.0 EVALUATIONS, SELF-ASSESSMENTS AND AUDITS

12.1 The Accountability Representative shall evaluate the significance of all quantities reported as inventory differences.

12.2 Self-Assessments

An Accountability Representative will perform a self-assessment of the WVNS Nuclear Material Control and Accountability Program (essentially WVDP-007) once every twelve months. The basis for the self-assessments will be the following requirements of this plan:

12.2.1 Current, up-to-date letter from WVNS President appointing the Material Control and accountability (MC&A) Cognizant Staff Manager and the Alternate MC&A Cognizant Staff Manager.

- 12.2.2 Current letter from MC&A Cognizant Staff Manager designating by name the Fuel Receiving and Storage Area Material Balance Custodian and two Accountability Representatives.
- 12.2.3 Accountability Representatives have attended Nuclear Materials Management and Safeguard Systems (NMMSS) Course I.
- 12.2.4 Required reports have been submitted on time:
 - A. Transaction Data
 - B. Quarterly Inventory Reports
 - C. Semi-Annual Inventory Difference Reports
 - D. Semi-Annual Material Balance Report
 - E. Annual Physical Inventory
- 12.2.5 Performance Testing:
 - A. Determine there is documentation that each shipped fuel assembly cask had required TIDs installed. Compliance Criteria - 100%.
 - B. Physical inventory of fuel assemblies performed every twelve months. Compliance criteria - 100% of assemblies accounted for.
- 12.2.6 Only Accountability Representatives have the Decay Calculation Program on their computers.
- 12.2.7 Documentation that Decay Calculation Program has been removed from computers of persons no longer serving as an Accountability Representative.
- 12.3 Quality Assurance audits of nuclear materials control and accountability functions shall be conducted at least once every twelve months using WVDP-007 and QM-8 as a source of requirements for the audit.

13.0 NUCLEAR MATERIAL INCIDENT RESPONSE PLAN

13.1 Introduction

Various types of emergencies and occurrences involving nuclear materials at DOE facilities require actions to give assurance that nuclear material inventories are as stated and that no diversion has occurred. Types of nuclear incidents that may require assessment actions include:

- 13.1.1 Apparent losses;
- 13.1.2 Discrepancy indicators;
- 13.1.3 Evacuations (planned or unplanned), e.g., tests of safety systems; and,
- 13.1.4 Nuclear threats.

Factors impacting the assessment of a given occurrence include incident category and credibility, material type and quantity, and required response time.

13.2 Apparent Losses

13.2.1 Apparent losses means the inability to physically locate or to otherwise account for any identifiable or discrete item containing nuclear material. Such losses also include an inventory difference quantity where the book inventory is larger than the physical inventory by an amount which is in excess of the established control limits; or unexplained significant shipper/receiver differences; or statistically significant differences (lower) in physical measurement attributes, e.g., weight, NDA counts, etc., between current and prior periods. Material or an item is considered missing when it cannot be found in its customary or recorded location and when an immediate search of the area fails to locate it.

13.2.2 Verbal Notification

The apparent loss of nuclear material shall be promptly reported to the MC&A Cognizant Staff Manager and Security Manager. Inventory differences and associated reporting and investigation activities may be classified. Therefore, activities will be performed in conformance with Department of Energy classification guides.

The apparent loss shall be promptly reported by the MC&A Cognizant Staff Manager and/or the Security Manager to the DOE-OH/WVDP on-site representative. The incident shall be investigated immediately, by the Accountability Representative and WVNS site Security.

13.2.3 Occurrence Investigation and Reporting

The categorization of materials control and accountability occurrences are contained in WVDP-242, Event Investigation and Reporting Manual. The DOE-OH/WVDP representative shall notify the DOE-OH representative of reportable occurrences. For reportable occurrences involving category IV nuclear materials (FRS fuel assemblies), the manager of DOE-OH/WVDP will determine the extent of investigation required to resolve the differences. WVDP only has Category IV nuclear material.

13.3 Nuclear Materials Missing in Transit

Notification shall be made immediately when a shipment, or any container thereof, of nuclear material does not arrive at the intended destination on schedule and its location is unknown. The notification shall be made by telephone to the DOE-OH/WVDP representative.

13.4 Material Control Alarms

Abnormal situations involving material control alarms shall be reported and investigated immediately as in Section 13.2.

13.5 Accidental Losses

All losses of nuclear material shall be reported as in 13.2 above and promptly investigated.

13.6 Shipper/Receiver Differences

Shipper/Receiver (S/R) differences should be resolved in accordance with DOE M 474.1-1, Chapter III, Section 6.

13.7 Discrepancy Indicators

Discrepancy indicators - are occurrences which could potentially indicate a system problem or a discrepancy involving nuclear material. Items in this category include broken seals, unsecured repositories, differences between inventory records and observations, measurement or descriptive differences on transfers, abrupt custodian termination or departure, measurement/quality Control (QC) results indicative of an out-of-control situation, inventory difference quantities where the book inventory is smaller than the physical inventory by an amount which is in excess of the established control limits, material surveillance alarms/abnormalities, etc.

Investigation and reporting requirements for discrepancy indicators are specified in section 13.2.

13.8 Nuclear Threats

These are events where possession of nuclear material is claimed which may have been obtained from WVDP facilities.

Normally a nuclear threat requiring an assessment of WVDP nuclear material holdings is received by the WVNS General Manager from the DOE-OH manager or DOE-OH/WVDP Directors who initiate the response. Nuclear threat messages received directly at WVDP shall immediately be reported to the Site Operations Manager who is the Material Control and Accountability Staff Manager. DOE-OH/WVDP and DOE-OH are then notified as soon as possible. During off shift notification will be given to

the Security Shift Supervisor who will initiate the notification to the MC&A Cognizant Staff Manager.

In general, the assessment activity will be based on a graded concept with the time and effort expended determined by the actual threat.

Assessment actions may be chosen from those below by DOE-OH/WVDP and/or DOE-OH.

- A. A status review of in-transit material.
- B. Examination of nuclear material records to determine which inventories/transaction must be verified.
- C. A confirmatory check of stored spent nuclear fuel in the FRS.
- D. Re-examining control indicators for the past twelve months (or the threat time frame, if shorter) for trends and abnormal occurrences.
- E. Performing a complete inventory, including determination of Inventory Differences and Limit of Error on Inventory Difference.
- F. Performing a review of all accountability and measurement data since the last inventory.
- G. Conducting a complete review of the Material Control and Accountability System including performing Safeguard and Security systems tests which may assist in resolving the threat.

NOTE *For physical threats to accountable nuclear material, response will be according to the Site Security Plan or as determined by the Site Security Manager.*

14.0 RECORDS MAINTENANCE

No records are generated as a result of implementing this document.

APPENDIX A

DECAY MEASUREMENT CALCULATIONS

Amount of radioactive decay is measured (actually calculated) by a computer program available to MC&A Accountability Representatives only. Directions for running the program are:

1. Proceed to dBase in the computer's local applications.
2. At the file select screen, select the exit-Esc key.
3. At the dot prompt, enter SET CENTURY ON, and hit Enter.
4. At the dot prompt, enter DO SEMIBAL, hit Enter.
5. Enter the required dates for the previous and current reporting decay periods.

NOTE *After entering the last digit of the current decay period, the program will begin performing the decay calculations.*

The printer will also automatically begin printing a hard copy of the inventory.

6. At the dot prompt, enter QUIT to exit the program.

When an individual no longer is to serve as an Accountability Representative, the program shall be removed from the computer by an Accountability Representative and removal must be documented.

APPENDIX B

FUEL TRANSFER RECORD

West Valley Nuclear Services Co.
 West Valley, New York

LOA. SHIPMENT NO. DATE SHIPPED

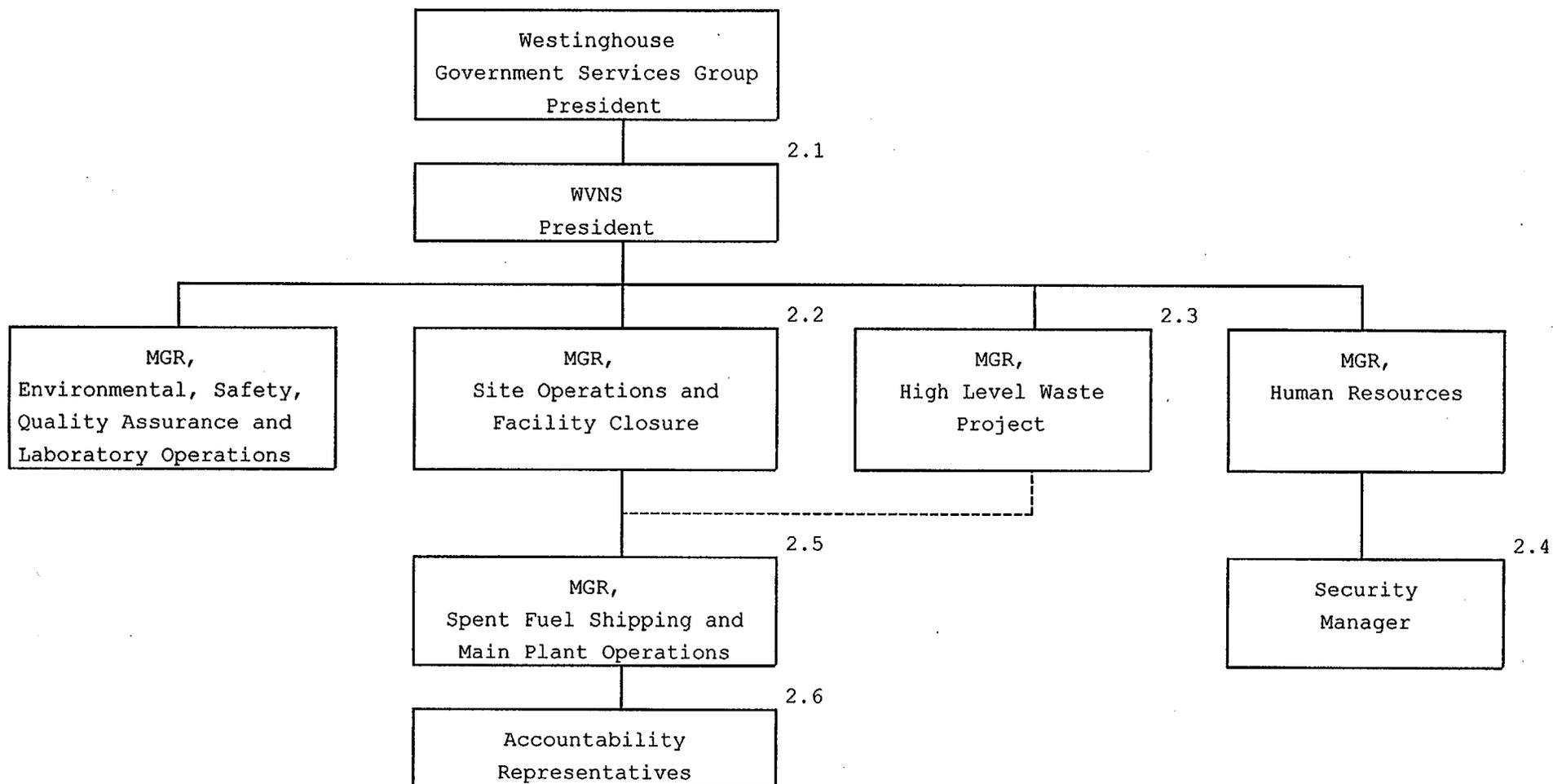
FORM 10

	DATE	TIME	CANISTER NO.	POOL GRID	ASSEMBLY NO. OR PIECE COUNT & LENGTH	OPERATOR	SHIFT	SHIFT SUPERVISOR	REMARKS
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									

Within-Pool Transfer: Make all line entries just as is usually done for a fuel shipment, then enter the old pool grid under "REMARKS."

FIGURE 1

WEST VALLEY NUCLEAR SERVICES CO. ORGANIZATIONAL STRUCTURE
 FOR NUCLEAR MATERIAL CONTROL AND ACCOUNTABILITY



2.2 MC&A, Cognizant Staff Manager

2.3 MC&A, Alternate Cognizant Staff Manager

2.5 Material Balance Custodian

FIGURE 2

FUEL RECEIVING AND STORAGE

