

U.S. Department of Energy

OAK RIDGE OPERATIONS

ORO O 470
CHAPTER IX

Date: 5-15-96

SUBJECT: CONTROL AND ACCOUNTABILITY OF NUCLEAR MATERIALS

1. PURPOSE. This Chapter correlates to DOE O 474.1 (formerly DOE 5633.3B) CONTROL AND ACCOUNTABILITY OF NUCLEAR MATERIALS, dated September 7, 1994, by assigning responsibility and accountability and providing administrative and/or contractual guidance to Oak Ridge Operations (ORO) and its contractors. Nothing in this issuance changes any requirements contained in any DOE Order.
2. CANCELLATION. This Chapter cancels and replaces ORIG 5633.3C, CONTROL AND ACCOUNTABILITY OF NUCLEAR MATERIALS, dated August 4, 1995.
3. APPLICABILITY. The provisions of this Chapter apply to ORO Principal Staff and contractors and subcontractors, on a facility-specific basis, that have responsibility for nuclear materials at DOE-owned or -leased facilities or that have responsibility for DOE-owned nuclear materials at offsite facilities which are exempt from the Nuclear Regulatory Commission licensing and regulation.
4. RESPONSIBILITIES.
 - a. Director, Evaluation and Control Division.
 - (1) Performs those tasks identified in DOE O 474.1, subparagraphs 6f(1)(a), (4), (5), and (9); and 6h.
 - (2) Coordinates with the Director, Safeguards and Security Division, to ensure the practical integration of material control and accountability (MC&A) with physical protection systems, procedures, and operations (see DOE O 474.1, subparagraph 6f(1)(b)).
 - (3) Examines nuclear material storage reconfiguration plans to determine accessibility of the material for performance of MC&A requirements.
 - (4) Maintains follow-up on all MC&A findings disclosed by ORO safeguards and security surveys and Headquarters security evaluations and validates corrective actions prior to closure of findings.
 - (5) Requires that an annual facility-specific self-assessment plan be submitted by ORO facilities and monitors the adequacy of reports issued on assessments conducted.

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INITIATED BY: EVALUATION AND CONTROL DIVISION

- (6) Evaluates the adequacy of MC&A provisions in all agreements between Headquarters and ORO.
- (7) Notifies ORO program managers and the Manager of anomalous conditions identified in the review of material control indicators and recommends corrective actions.
- (8) Coordinates the MC&A activities associated with modification of existing or establishment of new operations in nuclear materials. Advises ORO organizations on the MC&A aspects of inspections by the International Atomic Energy Agency (IAEA).
- (9) Coordinates with the Director, Planning and Budget Division, the minimization of nuclear material inventory and scrap levels.
- (10) Maintains the International Nuclear Materials Tracking System (INMTS) Data Collection Procedures on a current basis. Provides copies of procedures to DOE offices that export or import nuclear materials and to DOE Headquarters (HQ), Nuclear Regulatory Commission (NRC), and Department of State oversight offices.
- (11) Maintains the Joint Notification Procedures on a current basis and provides copies to DOE-HQ, NRC, and Department of State oversight offices.
- (12) Maintains special procedures for the tracking of uranium of foreign origin involving the uranium enrichment plants.
- (13) Prepares reports for compliance with requirements in trilateral Safeguards Agreements among the United States, the individual nations the United States is cooperating with under bilateral agreements for cooperation on the civil uses of atomic energy, and the IAEA. Reports are forwarded to the IAEA and the foreign entities with which the United States has entered into bilateral agreements.
- (14) Provides guidance to the Contracting Officers' Representatives, as necessary, relating to documentation of transactions and other data into the Nuclear Materials Management and Safeguards System (NMMSS).

- b. Contracting Officers' Representatives.
 - (1) Perform those tasks identified in DOE O 474.1, subparagraphs 6f(1)(c)-(f); 6f(3), (6), and (8); and 6g.
 - (2) Ensure that facility commitments to discharge MC&A requirements are executed and included in evaluation of contractor performance.

- 5. REQUIREMENTS AND PROCEDURES. Procedures are outlined in Attachments 2 through 4 of this Chapter.

- 6. REFERENCES. None.

- 7. DEFINITIONS. None.

- 8. CONTRACTOR REQUIREMENTS DOCUMENT. See Contractor Requirements Document, Attachment 1 of this Chapter.

- 9. ATTACHMENTS.
 - a. Attachment 1 - Contractor Requirements Document.
 - b. Attachment 2 - Basic Requirements.
 - c. Attachment 3 - Materials Accountability.
 - d. Attachment 4 - Materials Control.

CONTRACTOR REQUIREMENTS DOCUMENT

Contractors that are identified in paragraph 3 of this Chapter shall accomplish the following:

For each facility, develop an MC&A program consistent with the requirements of DOE O 474.1, Chapters I, II, and III; and the provisions of this Chapter.

BASIC REQUIREMENTS

1. **General.** Each facility's initial materials control and accountability (MC&A) plan and any subsequent MC&A plan modification that alters the MC&A program shall be forwarded to the cognizant Contracting Officers' Representative (COR) and the Evaluation and Control Division (ECD) for review and approval. The MC&A Branch, ECD, shall coordinate the Oak Ridge Operations (ORO) review and approval process. The plan shall contain the following signatures of approval: (1) the facility nuclear MC&A manager; (2) the facility manager or designated alternate; (3) the Chief, MC&A Branch; and (4) the cognizant COR.

The MC&A Branch shall be notified immediately of any deviation from the plan that would decrease the control and accountability requirements identified in the plan.

Components described in Figure 1-1 of this Attachment shall be included in the facility MC&A Plan.

The scope and content of the MC&A Plan for Category III and IV facilities shall be the same as for Category I and II facilities except as specifically authorized by ORO.

The MC&A Branch shall be notified when it is determined that the proposed removal of Attractiveness Level D or higher Special Nuclear Material (SNM) from the facility's inventory would create a significant vulnerability. The facility shall not discard the material in question until an assessment is made and appropriate safeguards measures are implemented. For Attractiveness Level D or higher SNM that has been previously removed from the facility's inventory and for which a significant vulnerability exists, the MC&A Branch shall be given written notification within five working days from when it is first determined that the previous discard(s) created a significant vulnerability.

2. **Graded Safeguards.** A graded MC&A program shall be established consistent with the requirements of this Chapter and DOE O 474.1. In keeping with the graded safeguards concept, ORO facilities may operate under varying safeguards requirements due to different material types, forms, quantities and flows. Deviations from specific requirements of this Chapter and DOE O 474.1 shall be approved when alternative measures are deemed appropriate. Deviations shall be approved in accordance with DOE O 470.1.
3. **Materials Control and Accountability Requirements for Source and Other Nuclear Materials.**
 - a. **Tritium.** Because tritium has strategic importance, graded safeguards programs for tritium are required in accordance with the requirements of DOE O 474.1, Chapter I,

subparagraph 3b. The contractor shall prepare special procedures at facilities having tritium and forward them to the MC&A Branch for review.

- b. Depleted Uranium. If the quantity of depleted uranium in a facility's inventory is such that it is not required to be handled as Category IV, Attractiveness Level E, material, the contractor may propose to apply the minimum requirements of DOE O 474.1, Chapter I, subparagraph 3c(3). The contractor shall document how the minimum requirements shall be implemented and shall forward the proposed requirements to the MC&A Branch for concurrence.

4. Loss Detection Element Evaluation.

- a. Vulnerability Assessment (VA). Prior to development of detailed VAs, which identify and evaluate the capability for detection of a loss of a Category I quantity of SNM and are required for the preparation of the Site Safeguards and Security Plan (SSSP), the contractor shall develop a plan for the assessment and forward it to the MC&A Branch for approval.
- b. Performance Testing. The results of performance testing done to satisfy the requirements of DOE O 474.1, Chapter I, subparagraph 4c, may be used to satisfy the requirements of DOE O 474.1, Chapter I, subparagraph 4b, if such tests can be designed to meet the requirements of both subparagraphs.
- c. Materials Control and Accountability Performance Requirements. The contractor shall notify the MC&A Branch of each performance test failure that indicates a significant vulnerability, SNM at risk, or a systemic MC&A program weakness. Criteria for determining significance and requirement for notification of the MC&A Branch shall be included in the facility performance testing program plan. Notification of significant performance test failures shall be made to the MC&A Branch prior to the issuance of test reports, as soon as practical following contractor evaluation of test results.

5. Occurrence Investigation and Reporting. Each facility's MC&A procedures shall contain provisions covering incident investigation, reporting procedures, and requirements, as described in DOE O 474.1, Chapter I, paragraph 5.

- a. The facility internal notification and reporting system procedures shall, if possible, include notification to the MC&A Branch of each reportable inventory difference and shipper/receiver difference before the occurrence report is filed. In addition, the procedures shall require that a copy of each occurrence reported in accordance with

DOE O 232.1 be forwarded to the MC&A Branch within two days after issuance. This requirement pertains to the initial report and to interim and final reports.

- b. When pertinent data, such as action limits, inventory differences, or shipper/receiver differences are classified and therefore omitted from the occurrence report, the contractor shall provide that data by separate, classified transmittal to the MC&A Branch.
- c. Information documenting that routine monitoring of MC&A loss detection elements was performed shall be retained by the contractor for one year, or until the next ORO Safeguards and Security survey of MC&A is conducted at the facility, whichever is longer. Information documenting emergency and unusual occurrences shall be permanently retained.
- d. The MC&A Branch shall coordinate the incident investigations and preparation of reports with the Office of Safeguards and Security (NN-51) and the cognizant Secretarial Office.

6. Administrative Controls.

- a. The facility program for periodic assessments and reviews shall contain the following procedures:
 - (1) An annual plan for the number of assessments and the topics to be covered shall be prepared by the contractor and submitted to the MC&A Branch by August 15 for the next fiscal year. The contractor shall advise the MC&A Branch of any change to the annual assessment plan which materially alters the scope and/or schedule of the plan as such changes occur. Other changes may be reflected in periodic status reports issued to the MC&A Branch.
 - (2) A copy of each report issued on assessments or reviews shall be provided to the MC&A Branch upon issuance.
 - (3) An independent audit of the facility's MC&A function shall be conducted annually in accordance with the requirements of DOE O 474.1, Chapter I, subparagraph 6g.
- b. The contractor shall update by April 1 of each year its historical accountability report for activity through the end of the previous fiscal year and forward it to the MC&A Branch. The report shall contain yearly data on throughput, inventory differences, operating losses, and other book adjustments, along with a narrative explaining the data.

**FIGURE 1-1
ADDITIONAL MC&A PLAN COMPONENTS**

The following components, as applicable, shall be included in the facility MC&A Plan:

1. A copy of each DOE letter or memorandum, specific to the facility's activities, that clarifies requirements or grants a deviation from the requirements of this Chapter or DOE O 474.1.
- *2. Vulnerability assessments on which the MC&A program is based.
- *3. Procedure manuals used in the material balance areas for performance of MC&A requirements, emergency plans, and security directives that promote understanding of the overall MC&A program.
- *4. Description of safeguards measures implemented for Attractiveness Level D or higher SNM that has been removed from inventory as waste and for which a significant vulnerability exists.
- *5. Security procedures being used as alternates for MC&A procedures required by Chapter III of DOE O 474.1, shall be documented and submitted to the ORO MC&A Branch for concurrence.
- *6. Documentation that contains ORO approval of facility-specific limits beyond which a response plan for evaluating and resolving waste discharges is required (see DOE O 474.1, Chapter III, subparagraph 5c(2)).

*Inclusion in the MC&A Plan by reference is required; however, actual inclusion of document in the MC&A Plan is at the contractor's option.

MATERIALS ACCOUNTABILITY

1. General. The provisions of DOE O 474.1, Chapter II generally apply to all categories of material balance areas (MBAs). Limitations to general applicability are specifically expressed. Facility-specific deviations may also limit applicability. All such deviations shall be formally approved and incorporated into the facility MC&A Plan and Site Safeguards and Security Plan (SSSP).
2. Accounting Systems. The contractor shall prepare and maintain documentation to provide evidence of conformance with the Generally Accepted Accounting Principles of the Financial Accounting Standards Board.
3. Inventories.
 - a. Physical Inventories.
 - (1) Physical Inventories. Inventory values shall be based on measured quantities unless an alternative is approved by the MC&A Branch. Proposed alternatives shall be submitted by the contractor for approval. For material which is inaccessible for measurement by sampling during processing and recovery operations, the process monitoring parameters, material control procedures, measurements or specific action criteria for tracking materials in process until operations permit a complete inventory, shall be approved by the MC&A Branch.
 - (2) Conduct of Inventories. Statistical sampling plans prepared by the contractor for verification of the presence of items shall be forwarded to the MC&A Branch for approval.
 - (3) Physical Inventory Frequencies. Inventory frequencies are facility specific and shall be approved by the Chief, MC&A Branch. Any proposed revisions that would reduce the minimum physical inventory frequency requirements stated in DOE O 474.1 shall require approval in accordance with the requirements of DOE O 470.1.
 - b. Special Inventories. Requests by ORO for special inventories shall be forwarded to the MC&A Branch for approval. This requirement does not apply to activities conducted during ORO Safeguards and Security surveys or Office of Security Evaluations (OSE) reviews, which are part of system performance tests.
 - c. Inventory Verification/Confirmation Measurements.

- (1) Statistical sampling plans and quantity thresholds for inventory verification/confirmation measurements testing item attributes shall be approved by the MC&A Branch.
 - (2) The control limits for inventory confirmation/verification measurements for Category I and II items shall be reviewed and approved by the MC&A Branch.
4. Measurements and Measurement Control. The contractor shall strive to optimize accuracy and precision of its measurement of nuclear materials inventories and transactions. Use of external measurements and measurement control expertise in pursuit of improvement is encouraged. The scope and content of the measurements and measurement control programs for Category I and II facilities are defined in DOE O 474.1, Chapter II, subparagraphs 4a through 4e. The scope and content for Category III and IV facilities shall be approved by the MC&A Branch.
- a. Organization. The tasks required by the contractor to perform the measurements and measurement control program for Category I and II material shall be documented.
 - b. Selection and Qualification of Measurement Methods. The level of precision and accuracy of the measurement methods for Category I and II material shall be updated every two years and submitted by the contractor to the MC&A Branch for approval.
 - c. Measurement Control.
 - (1) Statistical Controls. The target values for the statistical control limits shall be submitted by the contractor to the MC&A Branch for review and concurrence.
 - (2) Measurement Method Qualification. The control measurement frequency for nondestructive assay (NDA) measurements, if different from the requirements of DOE O 474.1, Chapter II, subparagraph 4e(1)(i) shall be approved by the MC&A Branch.

5. Material Transfers.

a. External Transfers.

- (1) Prior to transfer, written verification shall be obtained that the intended receiver is authorized to accept the material, and shall be retained until all transfers are complete. Required verification may be in the form of the intended receiver's written acknowledgement/acceptance of shipper's request to transfer the material.
- (2) When "safeguards closure" is applied to a transaction, in accordance with DOE O 474.1, Chapter II, subparagraph 5a(4)(f), records of transfer checks shall be retained until the next ORO Safeguards and Security survey of MC&A is conducted at the facility following final closure of the transaction.
- (3) Measurement Requirements for External Transfers of Nuclear Materials. The requirement for measured values for Category III and IV quantities shall be made by the MC&A Branch and be included in the facility MC&A Plan upon its reissuance. Requests for deviations allowing material to be put into process prior to completion of the required accountability measurement shall be submitted by the contractor to the MC&A Branch. Designation of materials on which receiver verification cannot be performed without destroying the item, such as weapons assemblies or subassemblies, and certain reactor fuel elements, shall be approved by the MC&A Branch and included in the facility MC&A Plan.
 - (a) The receiver's accountability measurements for transfers of other than Category I or II quantities of SNM may be required by the MC&A Branch. Precision and accuracy goals for measurement may be established by the MC&A Branch.
 - (b) When the receiver's accountability measurement performed subsequent to a safeguards closure indicates a significant shipper/receiver difference as described in DOE O 474.1, Chapter II, subparagraph 6a(1)(b), the MC&A Branch shall be notified with necessary documentation to permit initiation of a resolution process with the shipping partner's Operations Office.
 - (c) Shipper-receiver agreements shall be approved by the responsible facility and MC&A managers and by contractor and program managers. The agreements shall be forwarded to the MC&A Branch for coordination and approval.

- (d) When limited processing of "difficult-to-measure" material is necessary to perform a receipt measurement and no shipper/receiver agreement covering the material exists, the MC&A Branch shall be notified to obtain the approval of the shipper's Operations Office and concurrence of NN-51.
 - b. Internal Transfers. The MC&A Branch shall be notified if any abnormal situation is detected in evaluating internal transfers.
6. Material Control Indicators.
- a. Shipper/Receiver Difference Assessment.
 - (1) The contractor, unless specifically excluded in writing by the MC&A Branch, shall provide a copy of a quarterly summary report on analyses of shipper/receiver trend data to the cognizant COR and MC&A Branch. This requirement applies to standard, measured flows suitable to trend analysis. The quarterly report shall be submitted within 60 days after each calendar quarter.
 - (2) The MC&A Branch shall be notified immediately of any significant shipper/receiver difference which requires an occurrence report. Requests for extension of the 30 working days to complete the investigation shall be made to the MC&A Branch.
 - (3) The MC&A Branch shall be notified if there is a question about the validity of the shipping partner's limit of error calculations.
 - (4) The MC&A Branch shall be notified of any shipper/receiver differences resulting from a discrepancy in the number of items.
 - (5) For resolution of statistically significant shipper/receiver differences, the MC&A Branch coordinates with the shipping partner authorities (Operations Office, NRC, etc.) regarding the validity of the measurements and limits of error.
 - (6) When there is a significant unresolved shipper/receiver difference, the material shall be quarantined unless continued processing is approved by the MC&A Branch.

b. Inventory Difference Evaluation.

(1) The contractor shall provide the cognizant COR and MC&A Branch a summary report on evaluations of facility inventory difference data. Reports shall include SNM (including tritium) and cascade uranium. The summary report shall include the following:

(a) Certified Material Balance Report, Nuclear Materials Management and Safeguards System (NMMSS) Report M-742, for the current reporting period and fiscal year-to-date information.

For each facility, the contractor shall review Material Balance Reports generated by the NMMSS. The facility representative shall note changes required, certify the reports are correct as noted, and submit data reflecting any changes to the NMMSS, with a copy of the certified report forwarded to the MC&A Branch.

Reporting frequencies for ORO facilities are as follows:

<u>Facility</u>	<u>RIS Codes</u>	<u>Frequency</u>
ORISE	FBF	semiannually
B&W	FCW	semiannually
ORGDP*	BWD,FZE	semiannually
ORNL	FZG	bimonthly
Paducah GDP*	BYC,FYC	bimonthly
Portsmouth GDP*	BXA,FXA,SXA,FXC	bimonthly
Y-12	FZF,FZH	bimonthly

*ORO oversight on RIS Codes BWD, BYC, and BXA to terminate when the NRC assumes MC&A oversight.

(b) For inventory differences by Category I and II MBAs, the following data presentations shall be included, unless specifically excluded in writing by the MC&A Branch:

(1) tables showing element and isotope differences for each regular inventory for the past 24 inventory periods, and (2) chart showing isotope differences for each regular

inventory for the past 24 inventory periods. The chart shall also depict warning and alarm limits.

Note: The report shall be submitted to the MC&A Branch within 45 calendar days after closure of the reporting period. For those reporting periods in which NMMSS is late in closing out, the 45 days shall be extended by the number of days that NMMSS is late in closing.

- (2) Statistically-valid techniques to derive inventory difference control limits, other than variance propagation, may only be used if justified on the basis of factors such as limited data, low transfer rates, material categories, or other process variations and approved by the MC&A Branch.

c. Evaluation of Other Inventory Adjustments (and Explanations).

- (1) The contractor shall provide a facility control data sheet reporting summary explanations on inventory data adjustments to the MC&A Branch and cognizant COR. These data sheets are required on SNM (including tritium) and cascade uranium for reporting periods in which there is activity in lines 74 (Normal Operating Losses), 75 (Accidental Losses), 76 (Approved Write-Offs), or 77 (Inventory Differences) of the Material Balance Report. High-enriched and low-enriched uranium data shall be reported separately. Also, explanations for nonroutine losses or discards, including Attractiveness Level D or higher SNM that has been removed from inventory as waste, shall be provided as an attachment to the control data sheet. These facility control data sheets, when required, shall be included with the inventory difference evaluation reports when they are submitted for the facility reporting period. An example of the facility control data sheet is included as Figure 2-1 of this Attachment.
- (2) The contractors shall report radioactive decay on the Material Balance Report to the NMMSS on a quarterly basis for reportable quantities.

Note: The MC&A Branch shall coordinate a quarterly meeting with each facility contractor to discuss actions resulting from evaluations of material control indicators.

7. Documentation and Reporting.

a. Nuclear Material Transaction Report.

Contractors shall have internal controls in place at the facilities to ensure the data transcribed to the DOE Forms DP-740, DP-740A, DP-749, or DP-749A and submitted to the NMMSS agree with the data reported on the source documents (e.g., DOE/NRC Form 741).

Implementing instructions specific to certain problem areas follow:

(1) Shipments/Receipts.

- (a) Transactions Involving International Accounts. To the extent receiver's data is provided by a foreign recipient, it will be entered into the NMMSS by the domestic shipper.

Closure of Foreign Transfers. For shipments of Category I and II nuclear materials to a foreign entity, the shipper must obtain the required documentation to effect closure as described in DOE O 474.1. For shipments of Category III or IV nuclear materials, the shipper may effect closure based on the following:

- 1 When a Form DOE/NRC-741 has been received, it must be properly endorsed by the appropriate officials from within the foreign entity to which the material was shipped.
- 2 For shipments of nuclear material being donated to foreign countries and for shipments of asterisk quantities, the shipping facility shall close the receiver's side of the transaction by submitting the receiver's data to NMMSS at the same time the shipper's data is submitted to NMMSS.
- 3 For shipments of nuclear material to foreign countries for which payment has been received in advance and for which no inquiries or receipted documents (DOE/NRC-741) have been received within 90 days following shipment, the shipper shall close the receiver's side of the transaction.

- 4 For shipments of nuclear material to foreign countries for which payment is to be made after delivery, and for which a receipted document (DOE/NRC-741) has not been received, but according to financial records payment has been made, the shipper shall close the receiver's side of the transaction upon notification of payment.
- 5 When notification that shipment has been received (i.e., TWX, facsimile, telephone, letter, with or without additional shipper's request) from an appropriate official within the foreign entity to which the material was shipped, the shipper may effect closure.

Note: In all of the above, the shipper should take whatever steps are necessary to ensure that the notification that is being relied on for closure relates to the shipment transaction being closed.

- (b) Transactions Involving Licensees. In those instances in which the other party to a transaction is a licensee and is not required to report shipper or receiver data (e.g., a transaction involving tritium), facility personnel shall nevertheless prepare the required data for entry into the NMMSS. The transaction is a one-party type and shall show an "M" action code.
- (c) Material in Transit (Domestic Shipments). The following supplemental guidance is intended to clarify the material-in-transit rule:
 - 1 Transaction Reporting. Receiving facility personnel shall use DOE Form DP-740 to submit to the NMMSS data reporting project receipts of DOE-owned nuclear materials that are in transit at the end of the month.

The weight values must match those of the shipper and an action code of "J" must be used. A Form DOE/NRC-741 should not be completed for a "J" action code.

Receiving facility personnel shall prepare a Form DOE/NRC-741 in the month when the shipment is actually

received. The form must show the actual date of physical receipt. Shipping facility personnel shall show the shipping date on these forms. The fact that shipment was initiated in a prior month has no bearing on the entry of date of physical receipt, nor does the end of a fiscal year occurring between date of shipment and date of receipt alter the fundamental rule that the DOE/NRC-741 must show the date of physical receipt. For example, a shipment from Company X on September 30 which was received on October 2 will be reported as shipped on September 30 and received on October 2. In this case if the material is DOE-owned, a "J" action code would be reported by the intended receiver to the NMMSS with an action date on or following the date of the shipment but not later than the last day of the month.

- 2 Inventory Reporting. Material in transit at the end of a reporting period, whether month or fiscal year, shall be entered on the intended receiver's inventory records in the NMMSS by the receiving organization. This shall be reported on Forms DOE/DP-733 and DP-733A or in computer readable form.
 - 3 Material Balance Report. The NMMSS-generated Form DOE/NRC-742 is based on DOE/NRC-741 input. In-transit shipments shall be added to the receiver's balance based on the shipper's DOE/NRC-741 data. No other DOE/NRC-741 input is required. In the example above, the DOE/NRC-742 would show an in-balance situation.
- (d) Notification of Uranium Enrichment Shipments. The nuclear materials accountability organizations at the uranium enrichment plants and the Y-12 Plant are to inform the U.S. Enrichment Corporation through the Order Processing and Tracking System when a uranium enrichment shipment occurs. For notification purposes, a shipment occurs when title to the material passes to the customer either through physical shipment or in-place transfer (constructive delivery). Notifications should be made the same day shipments are made so that customer billing can be done promptly.

- (e) TI Code for Y-12 Plant Uranium Enrichment Shipments. An "F" TI code is used by the Y-12 Plant for all its uranium enrichment product shipments.

- (2) Shipper's and Receiver's Data, Form DOE/NRC 741.
 - (a) Heels in Enriched Feed Cylinders. The following procedure is used to document the movement of a cylinder containing an enriched uranium heel.
 - 1 When the cylinder is received, the DOE/NRC-741 shall show the total quantity of the material in the cylinder, an "F" transaction code, and the material as a "G" owner code.

 - 2 When the cylinder is fed into the cascade or emptied into another cylinder, a correction to the DOE/NRC-741 shall be made in which the total quantity of the material in the cylinder in 1 above shall be shown as a negative quantity and shall be replaced by two lines as follows:
 - a One line showing the quantity of material fed into the cascade or emptied into another cylinder as a "G" owner code.

 - b The second line as the balance of the material shown as a privately-owned (J or R owner code) heel (composition code 773).

 - 3 When the cylinder is returned to the supplier, a DOE/NRC-741 shall be prepared to document the transfer of privately-owned heel back to the supplier (see subparagraph 2b above). This document shall have a blank transaction code.

 - (b) Shipments Awaiting Reprocessing. The following guidance is given concerning materials being received that are awaiting reprocessing.
 - 1 On shipments that shall be measured within 30 days, record as an "N" action code.

- 2 On shipments that shall be measured beyond 30 days, record as a "U" action code.
- 3 After determination of measured values, the transaction shall be closed using either the "B" or "E" action codes.

If it appears that a shipment will not be reprocessed within a 2-year time period, notify the MC&A Branch so a determination can be made as to how to handle the transaction.

- (3) Distribution of Copies of Form DOE/NRC-741.
 - (a) Distribution of copies of DOE/NRC-741 and 741A to ORO organizations is specified in Table 2-1.

TABLE 2-1

Distribution of Forms DOE/NRC 741 and 741A to ORO Organizations

ORO Organizations		
Type of Transaction	U.S. Enrichment Corporation	Y-12 Site Office
1. Uranium enrichment plant receipts from feed suppliers.	X	--
2. Uranium enrichment plant umpire analyses.	X	--
3. Uranium enrichment plant transactions involving constructive delivery material.	X	--
4. Uranium enrichment transactions involving Y-12 product and umpire analyses.	X	X

- (b) If the transaction involves DOE-owned californium, NMMSS-Program Control (QFA) shall send copies of the advance notification copy and signed receiver's copy to:

U.S. DOE
DOE Oak Ridge Operations
Financial Management Division
P. O. Box 2001
Oak Ridge, Tennessee 37831-8771

- (c) All NMMSS submissions shall be sent to the following address:

Lockheed Martin Energy Systems Inc.
NMMSS Program Control
P.O. Box 2009
Oak Ridge, Tennessee 37831-8162

- b. ADP Transcription Sheets for Inventory Data and Physical Inventory Listing.
- (1) Nuclear Material Composition Codes and Description. For total values to be entered on line 899 of DOE/DP-733, DOE/DP-733A, and Form DOE/NRC-742C, use the appropriate material type code from Table 2-2.

TABLE 2-2

Nuclear Material Types

Name of Material	Material Type Code
Uranium, Depleted in U-235	10
Uranium, Enriched in U-235	20
Plutonium-242	40
Plutonium	50
Lithium, Enriched in Li-6	60
Uranium, Enriched in U-233	70

- (2) Authorized Profiles of Inventory Data.

To make changes to an inventory profile, contact the MC&A Branch and provide the following information for submission to DOE Headquarters:

- (a) Reporting Identification Symbol (RIS) code.
- (b) Line number.
- (c) Deletion or addition.
- (d) Material type.
- (e) Count (piece, bulk, or combination).

The approved change is communicated to NMMSS authorizing the addition to the requestor's inventory profile.

**FIGURE 2-1
OAK RIDGE OPERATIONS
FACILITY CONTROL DATA SHEET**

Reporting Facility _____
RIS _____ Material Type _____ Period _____

A. Inventory Difference Summary

<u>Information Categories</u>	<u>Element Weight</u>	<u>Isotope Weight</u>
77. Inventory Difference (Book-Physical ID, BPID)	_____	_____
88. Redetermination of Discrete Items on Inv.	_____	_____
89. Redetermination of Material in Process	_____	_____
90. Process Holdup Differences _____	_____	_____
91. Equipment Holdup Differences	_____	_____
92. Measurement Adjustments _____	_____	_____
93. Rounding _____	_____	_____
94. Recording and Reporting Errors	_____	_____
95. Shipper-Receiver Adjustments	_____	_____
96. Identifiable Item Adjustments	_____	_____
TOTAL EXPLAINED ID (EID)	_____	_____
97. Actual Inventory Difference (AID)	_____	_____
<u>Control Limits:</u> Alarm - Upper Limit	_____	_____
Lower Limit	_____	_____
Warning - Upper Limit	_____	_____
Lower Limit	_____	_____

B. Losses/Writeoffs.

74. Normal Operating Losses	_____	_____
75. Accidental Losses	_____	_____
76. Approved Writeoffs	_____	_____

	<u>Element Wt., Kg.</u>	<u>Isotope Wt. Kg.</u>
C. 80. Ending Inventory	_____	_____

MATERIALS CONTROL

1. General. Materials Control procedures required by DOE O 474.1, Chapter III may be covered by existing security procedures at the option of the contractor and be incorporated by reference in the MC&A Plan.
2. Access Controls.
 - a. Materials Access. The documented access control program shall be referenced in the MC&A Plan.
 - b. Data Access. Facility documentation shall identify the data and information to which this requirement applies.
 - c. Equipment Access. Facility documentation shall identify the equipment to which this requirement pertains and shall identify the nature of the access control that pertains to each category of equipment.
3. Material Surveillance. The documented material surveillance program shall be referenced in the MC&A Plan.
4. Material Containment. The documented material containment program shall be referenced in the MC&A Plan.
5. Detection/Assessment. Documentation substantiating that daily administrative checks were made shall be retained for one year or until the next ORO Safeguards and Security survey of MC&A is conducted at the facility, whichever is longer.

Documentation of the scope and extent of the facility daily administrative checks shall be prepared and forwarded to the cognizant COR and MC&A Branch for approval. Documentation may be in the form of a letter or may be included in the facility MC&A Plan provided that the plan document is kept current.