Canada's Nuclear Regulator

Guidance for Accounting and Reporting of Nuclear Material

GD-336

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Canada

Guidance for Accounting and Reporting of Nuclear Material
Guidance Document GD-336

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Document availability
This document is available in English and French on CNSC Web site at nuclearsafety.gc.ca. A paper copy of the document in either official language can be ordered from:

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Preface

Licensees possessing nuclear material (uranium, thorium, and plutonium) are required to report their holdings, and any inventory changes, to the Canadian Nuclear Safety Commission (CNSC). CNSC uses these reports to establish a national system of accounts for nuclear material. This system of accounts helps fulfill Canada's obligations pursuant to INFCIRC/164, *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*, related safeguards agreements, and Canadian bilateral nuclear cooperation agreements.

This guidance document provides information on how the requirements set out in regulatory document *RD-336 Accounting and Reporting of Nuclear Material* may be met, including information on nuclear material accounting reports and request forms and detailed instructions on how to complete them. Templates for the reports and request forms are available on the CNSC Web site at nuclearsafety.gc.ca.

CNSC staff can provide additional guidance upon request; contact CNSC at info@cnsc-ccsn.gc.ca.

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1.0 Introduction

This guidance document provides information on how the requirements set out in regulatory document RD-336 *Accounting and Reporting of Nuclear Material* may be met, including detailed instructions for completing nuclear material accounting reports and request forms. Templates for the reports and request forms are available on the CNSC Web site at nuclearsafety.gc.ca.

CNSC staff can provide additional guidance upon request; contact CNSC at info@cnsc-ccsn.gc.ca.

2.0 Nuclear Material Classification

Nuclear material is stored in material balance areas (MBAs) such that:

1. The physical inventory of nuclear material can be determined when necessary, in accordance with specified procedures, so the material balance for International Atomic Energy Agency (IAEA) safeguards purposes can be established; and
2. The quantity of nuclear material in each transfer into and out of MBAs can be determined.

For the purposes of accounting and reporting, nuclear material is divided into the following groups:

1. **Group 1** material is uranium, plutonium, and thorium that has reached the stage in the nuclear fuel cycle where it has a composition and purity suitable for fuel fabrication or isotopic enrichment;
    (i) **Group 1A** material requires detailed and regular nuclear material accounting and reporting to CNSC;

    Retained waste is a specific type of Group 1A material that has been identified as unrecoverable and is subject to less stringent accounting and reporting requirements than other Group 1A nuclear material;

    (ii) **Group 1B** material has been temporarily exempted from detailed nuclear material accountancy. Exempted material is expected to be re-classified as Group 1A material when the conditions for Group 1B material are no longer met; and
2. **Group 2** material contains natural uranium or natural thorium, including ores and ore concentrates, that has not reached the stage in the nuclear fuel cycle where it has a composition and purity suitable for fuel fabrication or isotopic enrichment.

Licensees may possess a combination of material groups.

3.0 General Accounting and Reporting Guidance

Supplementary information for specific reports and forms is provided in Sections 3.0 and 4.0. Section 6.0 provides detailed instructions for completing the data elements for the reports and forms available on the CNSC Web site at: nuclearsafety.gc.ca.

3.1 Report Entries

Nuclear material accounting provides licensee information from source records in the form of data elements. Data elements are units of information, such as codes, dates, and weights.

Data elements are identified by labels that are unique three- or four-digit numbers used to report the data elements to IAEA in the format specified in the Canada / IAEA Safeguards Agreements INFCIRC/164. A listing of the labels and data elements used in accounting reports is provided in Section 6.1.

3.1.1 Batches

All changes to inventory of nuclear material are reported on the basis of a batch quantity of nuclear material in the reporting MBA.

A batch is a portion of nuclear material handled as a unit for accounting purposes at a key measurement point. A batch consists of one or more items that:

1. Are located in the same physical-key measurement point (P-KMP) within the MBA;
2. Have the same physical and chemical characteristics; and
3. Have the same enrichment status (i.e., for enriched uranium, are all low-enriched (< 20%) or all high-enriched (≥ 20%)).

The nuclear material may be in bulk form or contained in a number of separate items.

3.2 Weight Units and Rounding

Rounding can lead to discrepancies. For this reason, individual weights should not be rounded. Where sums of weights are reported (e.g., List of Inventory Items), the sums can be rounded but only after the summation.

In order to minimize discrepancies, the full numeric value (that is, the integer and decimal portions of the weights) should be reported in the same way, to the same number of decimal places to the right of the decimal point for all reports pertaining to that reported weight. This is particularly important for the final balances of the General Ledger, the Physical-KMP Inventory Summary and the Reconciliation Statements in a given material balance period.

Weights must be reported to at least one decimal place to the right of the decimal point in the corresponding weight unit (see Table A. 13 : Material Group Element Codes and Labels and Table A. 14 : Isotope Codes and Labels for Group 1 Material. Weights may be reported up to six decimal places to the right of the decimal point.

In some special cases, and with the agreement of CNSC staff, weights may be reported to the nearest integer. An example of a situation where this might be acceptable to CNSC is when reporting large bulk quantities where measurements to one decimal place to the right of the decimal point or greater are not technically achievable.

3.3 Reporting of Foreign Obligations

When nuclear material is imported into Canada under a Nuclear Cooperation Agreement it is subject to foreign obligations. These foreign obligations include the requirement to track and report on the obligated material.

At the time an import/export licence is issued, CNSC informs the licensee, in writing, if the material is subject to foreign obligations. Foreign obligation codes are provided by CNSC on the import/export licence to assist in tracking and reporting the foreign obligation. This is typically done at the time of issuance of an import/export licence, but may occur at any other time. Where there has been no such notification by CNSC, the material in question is considered unobligated.

3.4 Reporting of Corrections to Inventory Changes

All corrections to a previously submitted inventory change are initially reported in the Inventory Change Document (see Section 4.1), followed by the General Ledger (see Section 4.2).

If any errors are discovered in a previous submission, the licensee submits a corrected report and identifies it as a revision. Reporting a correction to a previously submitted report should be done as soon as the error is realized by the licensee. On the correcting report, use the date that the correction was made.

Individual records should be maintained using the "by difference correction" principle (BDCP). Using BDCP, accounting for corrections to data elements reports the difference(s) between the corrected weight(s) and the original weight(s) and is based on the date when the correction is applied. The original entry does not get deleted; the correction is a new report.

When reporting a correction to a previously reported element or isotope weight, the correcting Inventory Change Document reports three values, each on a separate line:

1. Corrected weight;
2. Original weight; and
3. Weight difference.

The weight difference is referenced to the original value or to the previously reported correction as applicable.

The difference between the original record and the correcting record is recorded on the General Ledger. The correction is referenced to the line entries of the original transaction reported or to the previously reported correction, as applicable.

4.0 Nuclear Material Accounting Reports

4.1 Inventory Change Document

An inventory change is an increase or decrease of nuclear material.

A template for an Inventory Change Document is available on the CNSC Web site at: nuclearsafety.gc.ca. For instructions on how to complete individual labels, see Section 6.0 Data Element Descriptions and Instructions.

Inventory changes include:

1. Accidental gain;
2. Accidental loss;
3. Category change;
4. De-exemption use;
5. De-exemption quantity;
6. Exemption use;
7. Exemption quantity;
8. Inventory difference;
9. Measured discard;
10. Nuclear loss;
11. Nuclear production;
12. Receipt domestic;
13. Receipt foreign;
14. Receipt from non-safeguarded activity;
15. Receipt at starting point;
16. Re-batching – decrease in batch content;
17. Re-batching – increase in batch content;
18. Retained waste – transfer to;
19. Retained waste – transfer from;
20. Rounding differences;
21. Shipment domestic;
22. Shipment foreign;
23. Shipment to non-safeguarded activity;
24. Shipper-receiver difference; and
25. Termination of safeguards.

Inventory changes are reported to CNSC on an Inventory Change Document. An Inventory Change Document reports only one batch and one inventory change code per batch, except in a few accounting cases related to internal inventory changes. These accounting cases are discussed in Section 4.1.3.

A single physical transfer of nuclear material is not necessarily a single inventory change. It could be several inventory changes depending upon the number of batches of nuclear

material being transferred. For example, if a natural uranium dioxide fuel bundle and a drum of natural uranium dioxide powder were transferred together from one MBA to another MBA, this would be one physical transfer of nuclear material but two inventory changes and reported on two separate Inventory Change Documents.

4.1.1 International Shipments/Receipts and Foreign Obligation Tracking

International shipments/receipts are reported on two original Inventory Change Documents. The shipper/receiver retains one for their records and sends one to CNSC.

For imports and exports, foreign obligated material information is reported to CNSC, identifying the country(ies) by the foreign obligation country code(s) for each country of origin and the obligated material weights.

For exports, if the nuclear material will not be subject to IAEA safeguards in the recipient country it is expected that the shipper will submit acknowledgement of receipt, obtained from the foreign receiver, no later than two months after receipt of the material by the recipient.

4.1.2 Domestic Shipments/Receipts and Foreign Obligation Tracking

These inventory changes are reported on five original Inventory Change Documents. The shipper retains one for their records, sends one to CNSC, and sends three to the receiver. The receiver acknowledges receipt of the material by completing and signing the three Inventory Change Documents, retaining one for their records, returning one to the shipper and submitting one to CNSC.

For domestic shipments of nuclear material with foreign obligation(s), the shipper notifies the receiver of the foreign obligations, at which point the receiver assumes responsibility for tracking and reporting that obligated material to CNSC. Obligated material information is reported, identifying the country(ies) by the foreign obligation country code(s) for each country of origin and the obligated material weights.

4.1.3 Internal Inventory Changes

Internal inventory changes are initiated by the reporting MBA, and only affect that MBA. These inventory changes include exemption and de-exemption from safeguards, category changes, nuclear loss and production, shipper-receiver differences, re-batching, accidental gains and losses, measured discard, retained waste transfers, and rounding.

The following internal inventory changes are special accounting cases:

1. Category changes;
2. Re-batching;
3. Shipper-receiver differences; and
4. Retained waste transfers.

These cases involve either multiple batches reported with the same inventory change code on one Inventory Change Document, or one batch undergoing two or three inventory changes in one transaction. They are described in further detail below.

4.1.3.1 Category Changes

The categories for uranium are natural, enriched, and depleted. During processing or use, uranium may change from one category to another. Category changes occur through:

1. Blending different categories of uranium;
2. Enrichment;
3. Depletion; and
4. Burn-up.

Category changes decrease the inventory of one element category and increase the other.

Attention should be paid to the units of weights reported. For example, the weight of natural uranium is reported in kilograms and the weight of enriched uranium is reported in grams. To avoid a rounding difference, report the unrounded weight of natural uranium in kilograms, to at least three decimal places, which will convert to whole grams of enriched uranium.

4.1.3.2 Re-batching

The process of re-batching is used to report changes in the physical batch structure or a change in the unique identifier of the batch.

This inventory change is reported when:

1. A batch is divided into two or more batches, for example, to separate out a part of a batch for separate treatment;
2. Two or more batches of the same material type are combined into one batch; and
3. The material description code (MDC) changes due to a configuration change of the items, for example, bundles disassembled into individual fuel elements, or cementing of waste.

The increases and decreases in batch content resulting from re-batching are reported simultaneously in separate entries. Since these entries are of equal value and opposite sign, they do not change the total inventory.

Examples of batch changes that are not reported as re-batching are:

1. Re-naming a batch upon receipt from an outside shipper;
2. Irradiation of material that generates nuclear loss or nuclear production or category changes;
3. Batch changes during processing at bulk handling facilities; and
4. Extraction of small samples from large batches for analysis.

4.1.3.3 Shipper-Receiver Differences

All receipts are reported using the element/isotope weights as provided by the shipper.

If the receiving MBA measures the received batch and the measurement results are different from the shipper's weights, the receiver reports the difference as a shipper-receiver difference.

The shipper-receiver difference is the shipper's weight minus receiver's weight.

The Inventory Change Document reporting the shipper-receiver difference has the same batch name as reported for the original.

4.1.3.4 Retained Waste Transfers

Nuclear material that has been identified as unrecoverable and stored in the MBA can be transferred to retained waste upon approval of CNSC. After transfer, the only reporting requirement is to provide an inventory listing upon request. Retained waste is kept physically separate within the MBA. It is first returned to the regular Group 1A nuclear material inventory before it is transferred out of the MBA.

4.2 General Ledger

A General Ledger is a monthly listing of all inventory changes occurring during that month. It provides a running balance of the material in the MBA.

A template for a General Ledger is available on the CNSC Web site at: nuclearsafety.gc.ca. For instructions on how to complete individual labels, see Section 6.0 Data Element Descriptions and Instructions.

A General Ledger is submitted for each element and isotope in the MBA, reporting all inventory changes that occurred during the month. Before submitting a General Ledger, the licensee should ensure that the:

1. Opening balance of a General Ledger is identical to the ending balance of the previous General Ledger;
2. Weights reported on each line of the General Ledger are identical to the weights reported on the corresponding Inventory Change Document;
3. A running balance is clearly identified; and
4. Ending balance of the General Ledger is clearly identified.

If a physical inventory taking (PIT) is conducted on the last day of a reporting month, then only one General Ledger is required for that month. In all other cases when a PIT is conducted, two General Ledgers are required. The first general ledger reports transactions from the first day of the month up to and including the date of the PIT (as of 2400 hours on this date). The second General Ledger reports transactions from the day after the PIT up to and including the last day of the month.

If there are no inventory changes in a given month, a null General Ledger is still submitted. A null General Ledger requires an opening and ending balance.

It is recommended that General Ledgers be maintained for each foreign obligation country for Group 1A and Group 2 material.

4.3 Summary of Inventory Changes

A Summary of Inventory Changes shows the total number of transactions for each inventory change code for a corresponding month.

A template for a Summary of Inventory Changes is available on the CNSC Web site at: nuclearsafety.gc.ca. For instructions on how to complete individual labels, see Section 6.0 Data Element Descriptions and Instructions.

The Summary of Inventory Changes is submitted monthly, with the corresponding General Ledger. The information for an inventory change recorded on the Summary of Inventory Changes is consistent with the information reported on the corresponding General Ledger.

A Summary of Inventory Changes is submitted to CNSC for each element and isotope. Before submitting the summary the licensee should ensure that the:

1. Reporting period for the Summary of Inventory Changes is the same as the corresponding General Ledger;
2. Opening balance of the Summary of Inventory Changes is identical to the ending balance of the previous Summary of Inventory Changes report;
3. Number of each type of inventory change is equal to the number of Inventory Change Documents reported for that inventory change type, including corrections;
4. Weights are reported to the same number of decimal places as reported on the corresponding General Ledger balances;
5. Totals of all the weight increases and decreases are clearly identified;
6. Ending balance of the Summary of Inventory Changes is the total of the weights of the opening balance plus all of the inventory changes; and
7. Ending balance of the Summary of Inventory Changes is clearly identified.

If a PIT is conducted on the last day of a reporting month then only one Summary of Inventory Changes is required for that month. In all other cases when a PIT is conducted, two Summary of Inventory Changes are required, as per the corresponding General Ledger.

4.4 List of Inventory Items

A List of Inventory Items reports each material item for each element/isotope in each Group 1A or 1B nuclear material present in the MBA.

A template for a List of Inventory Items is available on the CNSC Web site at: nuclearsafety.gc.ca. For instructions on how to complete individual labels, see Section 6.0 Data Element Descriptions and Instructions.

4.4.1 Group 1A Material

The List of Inventory Items is compiled for each element/isotope, as of 2400 hours on the PIT date, and is sorted by P-KMP and MDC, in a consecutively numbered sequence to avoid double counting or omissions. Before submitting a List of Inventory Items, the licensee should ensure that:

1. Individual items are reported. If the number of items in the inventory is very large, the items may be grouped into a batch and the number of items in the batch is reported; and

2. The element and isotope weight of each item or batch on the List of Inventory Items is reported in unrounded numbers.

It is recommended that items with the same P-KMP and MDC be sub-totalled on the List of Inventory Items.

4.4.2 Group 1B Material

The List of Inventory Items for Group 1B material is submitted annually. Separate lists should be prepared for material that has been exempted on the basis of use and quantity.

4.5 Physical-Key Measurement Point Inventory Summary (P-KMPIS)

The P-KMPIS is a summary roll-up of batches of items listed on the List of Inventory Items, for each element/isotope with the same MDC and stratum. In consultation with CNSC, MBAs that have only a few items of inventory are not required to submit the P-KMPIS.

A template for a P-KMPIS report is available on the CNSC Web site at: nuclearsafety.gc.ca. For instructions on how to complete individual labels, see Section 6.0 Data Element Descriptions and Instructions.

The final total of the P-KMPIS for each element/isotope is rounded to the same number of decimal places as the ending balance for that element/isotope as recorded on the General Ledger.

A P-KMPIS is not required for retained waste, Group 1B, or Group 2 material.

4.6 Obligated Material Inventory Summary

The Obligated Material Inventory Summary shows the opening and ending balances for a calendar year, by country of foreign obligation, for each Group 1A and Group 2 element/isotope at the licensee's premises.

A template for an Obligated Material Inventory Summary report is available on the CNSC Web site at: nuclearsafety.gc.ca. For instructions on how to complete individual labels, see Section 6.0 Data Element Descriptions and Instructions.

In addition to submitting nuclear material accounting reports for Group 1A and Group 2 material, Canada is required to submit other annual reports on foreign obligated material held within Canada.

Before submitting an Obligated Material Inventory Summary, the licensee should ensure that:

1. In cases where the licensee has no foreign obligated material or for a new country of obligation, opening balances are set at "0" (zero); and
2. The ending balances for each obligated element/isotope are derived from the ending balances from the General Ledgers for each obligated material element.

Throughout the year, the licensee is expected to maintain a record of the balance of foreign obligated material and this information is provided to CNSC upon request.

4.7 Reconciliation Statement

The Reconciliation Statement, prepared at the time of a PIT, shows the book adjusted ending, the physical inventory, and the difference between them for each element/isotope.

A template for a Reconciliation Statement is available on the CNSC Web site at: nuclearsafety.gc.ca. For instructions on how to complete individual labels, see Section 6.0 Data Element Descriptions and Instructions.

A Reconciliation Statement indicates for each element/isotope:

1. Book adjusted ending (BA) transcribed from the ending balance of the General Ledger;
2. Physical ending (PE) transcribed from the P-KMPIS; and
3. Inventory difference (ID = BA – PE).

Any resulting non-zero inventory difference is reported on an Inventory Change Document.

4.8 Request Forms to Re-classify Nuclear Material

Under certain circumstances, in order to comply with the safeguards agreement, the status of the nuclear material must be changed. Prior to the licensee completing any such transaction, a request for approval for re-classification of the material is made by completing the appropriate request form and submitting it to CNSC.

Re-classification of Group 2 nuclear material is not applicable.

4.8.1 Request for Exemption

An exemption temporarily exempts material from Group 1A reporting requirements. The Request for Exemption provides information about the nuclear material, its location(s), and intended use.

A template for a Request for Exemption is available on the CNSC Web site at: nuclearsafety.gc.ca.

4.8.1.1 Request for Exemption Process

There are two bases under INFCIRC/164 for exempting Group 1A material: on the basis of its non-nuclear use (Article 36), and on the basis of quantity (Article 37). The steps for the request process are:

1. Licensees request an exemption by completing a Request for Exemption;
2. If CNSC's preliminary determination is that the nuclear material may qualify for exemption, then a request is made to IAEA on the licensee's behalf with a tracking identifier; and
3. CNSC informs the licensee of IAEA's decision and the tracking identifier (if approved).

If the request is denied, the nuclear material remains Group 1A material.

Upon review, CNSC or IAEA may change the basis of the request. In this case, the licensee will be informed of the new basis.

4.8.1.2 Instructions for Completing a Request for Exemption

The following information is provided for a Request for Exemption:

1. Facility name and address, MBA code, contact name, telephone, and fax numbers;
2. Article under which the exemption is requested;
3. Reason for request;
4. Intended use of exempted material;
5. The element to be exempted;
6. The element weight, in either grams or kilograms, and, for enriched uranium, the isotope weight in grams;
7. Present physical and chemical form of the material to be exempted, as well as the batch name and the MDC;
8. Intended physical and chemical form of the exempted material, and the MDC;
9. If the material will be physically moved out of the MBA, the date and location where the exempted material will be transferred;
10. Requested date for the exemption to take effect;
11. Destination of exempted material (name and address, MBA code if applicable); and
12. Licensee authority name, signature, and date.

4.8.1.3 Accounting for Exemptions

Exemptions are implemented by:

1. Reporting via an Inventory Change Document for each exemption, including the tracking identifiers;
2. Entering the exemption into the General Ledger for Group 1A material; and
3. Entering the exemption into the General Ledger for Group 1B material.

4.8.2 Request for De-exemption

A de-exemption returns Group 1B material within an MBA to Group 1A status. Licensees submit a request for de-exemption for use or quantity.

A template for a Request for De-exemption is available on the CNSC Web site at: nuclearsafety.gc.ca.

Group 1B material is de-exempted before being exported, irradiated, or terminated, or being processed or stored with Group 1A material. Upon de-exemption, the material is once again considered Group 1A material.

Some exceptions are permitted for export of Group 1B material when it temporarily leaves Canada but does not change ownership; for example, for depleted uranium that is part of a shielded shipping container, or for material that is part of a device or instrument that is being exported for repairs.

4.8.2.1 Request for De-exemption Process

The steps for the request process are:

1. Licensees request a de-exemption by completing a Request for De-exemption;
2. If CNSC's preliminary determination is that the nuclear material may qualify for de-exemption, then a request is made to IAEA on the licensee's behalf with a tracking identifier; and
3. CNSC informs the licensee of IAEA's decision and the tracking identifier (if approved).

If the request is denied, the nuclear material remains Group 1B material (exempted).

4.8.2.2 Instructions for Completing a Request for De-exemption

The following information is provided for a Request for De-Exemption:

1. Facility name and address, MBA code, contact name, telephone, and fax numbers;
2. The Article under which the original exemption was granted; the basis of the de-exemption must be the same as the basis for the original exemption;
3. Batch name of the material when originally exempted;
4. The tracking identifier provided by CNSC when the material was re-classified as Group 1B, if known;
5. Location from where the exempted material was transferred from, including the licensee's name and/or MBA code, and address;
6. A brief explanation for why de-exemption for the material is being requested, for example, to export or process material, or to store with other material subject to safeguards;
7. Indicate the element/isotope, as applicable, of the nuclear material to be de-exempted: natural uranium, depleted uranium, enriched uranium (uranium-233, uranium-235), thorium, or plutonium;
8. Element weight of the material in the required units (grams or kilograms) and, for enriched uranium, the isotope weight in grams;
9. Description of the present physical and chemical form of the material to be de-exempted, and give the MDC;
10. Approximate date when Group 1A status will be re-applied for the material; and
11. Licensee authority name, signature, and date.

4.8.2.3 Accounting for De-exemptions

De-exemptions are implemented by:

1. Reporting via an Inventory Change Document for each de-exemption, including the tracking identifier;
2. Entering the de-exemption into the General Ledger for Group 1B material; and
3. Entering the de-exemption into the General Ledger for Group 1A material.

4.8.3 Request for Termination

Accounting and control can be terminated on Group 1A material when it is determined that the material has been consumed or has been diluted in such a way that it is no longer usable for any nuclear activity or has become, in practice, irrecoverable.

A template for a Request for Termination is available on the CNSC Web site at: nuclearsafety.gc.ca.

The completed Request for Termination form provides information about the nuclear material, its location(s), and intended non-nuclear use. This information forms the basis of the submission by CNSC to IAEA for approval to terminate from IAEA safeguards. There are two bases under INFCIRC/164 for terminating IAEA safeguards: on the basis of the material having been consumed or diluted in such a way that it is no longer usable for any nuclear activity (Article 11), and on the basis of the material having become "practically irrecoverable" (Article 13).

4.8.3.1 Request for Termination Process

The steps for the request process are:

1. Licensees request a termination by completing a Request for Termination;
2. If CNSC's preliminary determination is that the nuclear material may qualify for termination, then a request is made to IAEA on the licensee's behalf; and
3. CNSC informs the licensee of IAEA's decision.

If the request is denied, the nuclear material remains Group 1A material.

Upon review, CNSC or IAEA may change the basis (Article) under which termination is requested. In this case, the licensee will be informed of the new basis.

4.8.3.2 Instructions for Completing the Request for Termination

The following information is provided for a Request for Termination:

1. Facility name and address, MBA code, contact name, telephone, and fax numbers;
2. Article under which termination is requested;
3. Explanation for why termination for this material is requested;
4. Batch name of the material to be terminated;
5. Element/isotope (as applicable) of the nuclear material to be terminated;

6. Element weight of the material in the required units, and for enriched uranium, the isotope weight in grams;
7. Description of the present physical and chemical form of the material and the MDC;
8. Present use of the material and description of the containment as appropriate;
9. Reason the nuclear material will be practicably irrecoverable;
10. Requested date of termination;
11. Destination of material (name and address, MBA code if applicable);
12. Approximate date of transfer out of the MBA, if applicable; and
13. Licensee authority name, signature, and date.

4.8.3.3 Accounting for Terminations

Terminations are implemented by:

1. Reporting the termination via an Inventory Change Document for each material;
2. Entering the Inventory Change Document transaction into the General Ledger as Group 1A material; and
3. Where the terminated material contains plutonium, high enriched uranium or uranium-233, report any subsequent transfer out of the MBA via an Inventory Change Document.

Nuclear material for which a termination has been granted is not reported on the List of Inventory Items.

5.0 Reporting Frequency

Table 1 – Reporting Frequency is reprinted from RD-336 *Accounting and Reporting of Nuclear Material*. It details the reporting frequency for the required reports and forms that must be submitted to CNSC. The frequency of submissions may be extended upon approval from CNSC.

Table 1 – Reporting Frequency

Reports and Forms	RD-336 Section	Reporting Frequency		
		Group 1		Group 2
		1A	1B	
Inventory Change Document	6.1	Next business day following transaction	Next business day following transaction	Next business day following transaction
General Ledger	6.2	By the seventh business day after the end of the reporting month	Upon request by CNSC	Not required
Split General Ledger	6.2	First report: seven business days after a Physical Inventory Taking (PIT) is conducted	Upon request by CNSC	Not required

Reports and Forms	RD-336 Section	Reporting Frequency		
		Group 1		Group 2
		1A	1B	
		Second report: by the seventh business day after the end of the reporting month	Upon request by CNSC	
Summary of Inventory Changes	6.3	Required with every corresponding General Ledger	Not required	Not required
Split Summary of Inventory Changes	6.3	Required with every corresponding split General Ledger in month of a PIT	Not required	Not required
List of Inventory Items	6.4	Required seven business days after a PIT (for retained waste upon request by CNSC)	Annually and upon request by CNSC	Not required
P-KMP Inventory Summary	6.5	Required with the corresponding List of Inventory Items above	With the List of Inventory Items above (this and the List of Inventory Items may be the same report)	Not required
Obligated Material Inventory Summary	6.6	Annually on January 31st and upon request by CNSC	Not required	Annually on January 31st and upon request by CNSC
Reconciliation Statement	6.7	Required seven business days after a PIT [1]	Not required	Not required
Request For Exemption	6.8.1	CNSC approval required prior to exempting any material from safeguards	Not applicable	Not applicable
Request For De-exemption	6.8.2	Not applicable	CNSC approval required prior to reapplying any material to safeguards	Not applicable
Request for Termination of Safeguards	6.8.3	CNSC approval required prior to terminating any material from safeguards	Not applicable	Not applicable

1. Following an audit or a Physical Inventory Verification (PIV), the licensee must make any required adjustments to the original List of Inventory Items and P-KMP Inventory Summary, recalculate the physical endings of the affected elements/isotopes as applicable, and revise the Reconciliation Statement.

6.0 Data Element Descriptions and Instructions

6.1 General Information

Templates for all reports listed below are available on the CNSC Web site at: nuclearsafety.gc.ca.

Table 2 lists the labels and data elements used in accounting reports for nuclear material. Not all labels are applicable to all reports. For instructions on how to complete the individual labels, see Section 6.2 Instructions for Completing Reports.

Table 2 – Labels and Data Elements Used in Accounting Reports

Labels and Data Elements Used in Accounting Reports			
Legend			
GL	**General Ledger**	ICD	**Inventory Change Document**
LII	**List of Inventory Items**	OMIS	**Obligated Material Inventory Summary**
P-KMPIS	**Physical-Key Measurement Point Inventory Summary**	RS	Reconciliation Statement
SIC	**Summary of Inventory Changes**		

Label	Data Element	Applicable Report						
001	Reference number	for CNSC use only						
002	Entry number/total number of entries	for CNSC use only						
003	Report date	for CNSC use only						
006	Encoder's name	for CNSC use only						
010	Report type	for CNSC use only						
015	Reporting period		GL	SIC	LII	P-KMPIS	OMIS	RS
099	Concise note reference	for CNSC use only						
207	Facility code		GL	SIC	LII	P-KMPIS	OMIS	RS
307	Material balance area code		GL	SIC	LII	P-KMPIS	OMIS	RS
309	Entry status and cross-reference code	ICD						
310	State accounting system record identification	for CNSC use only						
370	From	ICD	GL					
372	To	ICD	GL					
390	Concise note indicator	for CNSC use only						
391	Concise note text	for CNSC use only						
407	Key measurement point code	ICD	GL		LII	P-KMPIS		
411	Type of inventory change	ICD	GL	SIC				

Label	Data Element	Applicable Report						
412	Date of inventory change	ICD	GL					
430	Material description code (MDC)	ICD			LII	P-KMPIS		
435	Operator's material description	optional use						
436	Chemical and physical description	ICD						
446	Batch name (receiver/internal inventory changes)	ICD	GL			P-KMPIS		
447	Shipper's batch name	ICD	GL					
469	Measurement basis code	ICD			LII	P-KMPIS		
470	Number of items in batch	ICD	GL		LII	P-KMPIS		
600	Element weight – unified uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
620	Element weight – depleted uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
640 - 690	Isotope weight – enriched/unified uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
700	Element weight – plutonium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
710 - 760	Isotope weight – plutonium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
770	Isotope weight – natural uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
780	Isotope weight – depleted uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
800	Isotope weight – thorium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
1000	Line number		GL	SIC				
1001	Item identification				LII			
1002	Corrections - previous date		GL					
1003	Corrections - line number(s)		GL					
1004	Comments / remarks	ICD	GL	SIC	LII	P-KMPIS	OMIS	
1005	Stratum identification				LII			
1006	Element code	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
1007	Irradiation status				LII	P-KMPIS		
1013	Net weight	ICD						
1020	IAEA safeguards status	ICD						
1021	Correction number	ICD	GL					
1023	Units	ICD		SIC	LII	P-KMPIS	OMIS	RS
1024	Isotope code for uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
1025	Unique identifier (optional)	ICD	GL		LII			
1026	Number of inventory changes			SIC				
1027	Shipper	ICD						
1028	Receiver	ICD						
1030	Element weight balance		GL	SIC				
1031	Isotope weight balance		GL	SIC				
1032	Element weight – natural uranium concentrate	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS

Label	Data Element	Applicable Report						
1634	Element weight – thorium concentrate	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
1635	Element weight – low enriched uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
1636	Element weight – high enriched uranium	ICD	GL	SIC	LII	P-KMPIS	OMIS	RS
2001	Export licence number	ICD						
2002	Import licence number	ICD						
2003	Country of origin	ICD	GL					
2004	Foreign obligation country code	ICD	GL				OMIS	
2005	Holding account code	ICD						
2006	Foreign obligated element weight	ICD	GL				OMIS	
2007	Foreign obligated isotope weight	ICD	GL				OMIS	

6.2 Instructions for Completing Reports

In this section, instructions are given for completing each label. Additional information for the completion of some specific reports has been included. See Appendix A for the reference tables containing the required codes.

Label	Data Element Description and Instructions

001 Reference number

For CNSC use only.

002 Entry number/total number of entries

For CNSC use only.

003 Report date

Provide the date when the report was produced in the format yyyy/mm/dd.

006 Encoder's name

For CNSC use only.

010 Report type

For CNSC use only.

015 Reporting period

General Ledger

Provide the following dates:

1. FROM: the date of the first day of the ledger, usually the first day of the month, for the beginning balance, in the format yyyy/mm/dd; and
2. TO: the date of the last day of the period, usually the last day of the month, for the ending balance, in the format yyyy/mm/dd.

If a PIT is conducted on the last day of a reporting month, then only one General Ledger is required for that month. In all other cases when a PIT is conducted, two General Ledgers are required. The first general ledger reports transactions from the first day of the month up to and including 2400 hours of the date of the PIT. The second General Ledger reports transactions from the day after the PIT up to and including the last day of the month.

Summary of Inventory Changes (Group 1A Material)
Provide the same beginning and ending dates as reported on the corresponding General Ledger.

List of Inventory Items, P- KMP Inventory Summary,* and *Reconciliation Statement
Provide the date of the PIT using the format yyyy/mm/dd.

Obligated Material Inventory Summary
Provide the following dates:
1. FROM: the first day of the period, usually the first day of the calendar year, in the format yyyy/mm/dd; and
2. TO: the last day of the period, usually the last day of the calendar year, in the format yyyy/mm/dd.

099 Concise note reference

For CNSC use only.

207 Facility code

This label is used in all reports except the *Inventory Change Document*
Provide the appropriate code for the reporting facility. Facilities reporting Group 1 material are listed in Table A.1 : Group 1 Facility Codes. Locations outside facilities (LOF) reporting Group 1 material are listed in Table A. 2 : Group 1 Locations Outside Facilities Codes.

307 Material balance area code

This label is used in all reports except the *Inventory Change Document*
Provide the appropriate MBA code.

MBAs possessing and reporting Group 1 materials are listed in Table A.1 : Group 1 Facility Codes.

Locations outside facilities possessing and reporting Group 1 material are listed in Table A. 2 : Group 1 Locations Outside Facilities Codes.

MBAs possessing and reporting Group 2 material are listed in Table A. 3 : Group 2 Material Balance Area Codes.

309 Entry status and cross-reference code

Inventory Change Document
Indicate whether the entry is new, a correction, an addition or a deletion. Provide the appropriate code from
Table A. 4 : Entry Status Codes.

310 State accounting system record identification

For CNSC use only.

370 From

Inventory Change Document
This label identifies the shipper of the nuclear material or, in cases of internal inventory changes, the MBA/LOF reporting the inventory change.

Provide the MBA/LOF/country using the applicable table:

1. Table A.1 : Group 1 Facility Codes;
2. Table A. 2 : Group 1 Locations Outside Facilities Codes;

3. Table A. 3 : Group 2 Material Balance Area Codes; or
4. Table A. 5 : Country Codes (for imports).

For licensees who do not have an MBA code, provide the company name instead. This applies to transactions involving Group 1B material.

General Ledger
Provide the same code as reported on the corresponding Inventory Change Document.

372 To

Inventory Change Document
This label identifies the receiver of nuclear material or, in cases of internal inventory changes, the MBA/LOF reporting the change. Provide the appropriate MBA/LOF/country code:

1. Table A.1 : Group 1 Facility Codes;
2. Table A. 2 : Group 1 Locations Outside Facilities Codes;
3. Table A. 3 : Group 2 Material Balance Area Codes; or
4. Table A. 5 : Country Codes (for exports).

For licensees who do not have an MBA code, provide the company name instead. This applies to transactions involving Group 1B material.

General Ledger

Provide the same code as reported on the corresponding Inventory Change Document.

390 Concise note indicator

For CNSC use only.

391 Concise note text

For CNSC use only.

407 Key measurement point code (flow or physical)

For this label there are two fields to complete, one for the shipper and one for the receiver. Flow-key measurement point (F-KMP) and physical-key measurement point (P-KMP) codes are specified by CNSC.

Inventory Change Document
Provide the appropriate code:

1. For transfers between MBAs,
   a) Shipper of nuclear material provides the F-KMP code for the shipment in label 407 under the shipper's name, and
   b) Receiver of nuclear material provides the F-KMP code for the receipt in label 407 under the receiver's name;
2. For internal inventory changes provide the F-KMP in the shipper's field; and
3. For re-batching, provide the physical-key measurement point (P-KMP) code instead of the F-KMP code.

General Ledger
Provide the F-KMP code or the P-KMP code, as reported on the Inventory Change Document.

List of Inventory Items
Provide the P-KMP code where the item resides at the date of the PIT.

Physical-Key Measurement Point Inventory Summary (P-KMPIS)
List each P-KMP for the reporting MBA.

411 Type of inventory change

Provide the appropriate code from Table A. 6 : Inventory Change Codes or Table A. 7 : Inventory Change Codes for Entry Status U.

Inventory Change Document
For shipments/receipts, the shipper and receiver each provide the applicable inventory change code, in the appropriate field.

For internal inventory changes, the initiating MBA provides the applicable code in the shipper's field.

Internal inventory changes are reported as follows:

1. Category changes
   Report the two element categories on one Inventory Change Document on separate line entries. For low (element L) or high (element H) enriched uranium, the inventory change code is NE;
2. Changes due to re-batching
   Report using separate Inventory Change Document reports with the same transaction date; and
3. Shipper-receiver differences
   Shipper-receiver differences (DI) can be reported for both foreign and domestic receipts and only apply to weights (not to the number of items). The DI label 446 must be the same as the label 446 in the original ICD receipt. A DI only relates to one receipt. If the receiver measures a greater element and/or isotope weight than that reported by the shipper, the DI is reported with a negative sign. The opposite holds true for a decrease.

General Ledger
On each line, provide the inventory change code for the transaction as reported on the corresponding Inventory Change Document.

Summary of Inventory Changes
Provide each inventory change code reported during the reporting period on a separate line.

412 Date of inventory change

Provide the date, in the format yyyy/mm/dd, on which the inventory change occurred or was established. If the entry is a correction to a previously reported inventory change, provide the date that the correction was made.

Inventory Change Document
Use the shipper field for shipments and internal inventory changes and corrections.
Use the receiver field for receipts.

General Ledger
Enter the date reported on the Inventory Change Document, in the format yyyy/mm/dd.

430 Material description code (MDC)

This label consists of a four character code indicating the:

1. Physical and chemical form;
2. Type of container; and

3. Irradiation status of the material.

Provide the code using Table A. 9 : Material Description Codes.

Inventory Change Document
The domestic shipment of a given batch from one MBA and its receipt in another MBA is reported with the same MDC.

List of Inventory Items
Provide the MDC for each item or group of items.

P-KMP Inventory Summary
Provide the MDC for each batch. A batch has only one code.

435 Operator's material description code

Licensees may reference their own code.

436 Chemical and physical description

Inventory Change Document
Provide a textual description of the batch of material reported on the Inventory Change Document. Use a maximum of 100 characters.

446 Batch name (receiver/internal inventory changes)

The batch name is provided in alphanumeric format, up to a maximum of 16 characters.

Inventory Change Document
This label is used for reporting batch names related to receipts and internal inventory changes.

When reporting a receipt, the batch name can be either one assigned by the receiver or the same one used by the shipper as reported in label 447.

If the inventory change code in label 411 is "DI" (shipper/receiver difference), the batch name is the same as that reported for the original ICD receipt.

General Ledger
Provide the name of the batch given on the Inventory Change Document.

List of Inventory Items
Items with the same MDC/stratum and in the same P-KMP are expected to be grouped into batches. Where this is not possible, each item is assigned a batch name.

P-KMPIS
For each P-KMP, provide the batch names listed on the List of Inventory Items.

447 Shipper's batch name

The batch name is provided in alphanumeric format, up to a maximum of 16 characters.

Inventory Change Document
This label is used for reporting batch names related to shipments.

For imports, provide the foreign shipper's batch name or provide the keyword "unknown".

In the case of multiple batch names, provide the keyword "multiple" and attach a list of the batch names to the Inventory Change Document.

General Ledger
Provide the name of the batch(es) given on the Inventory Change Document.

469 Measurement basis code

Provide the appropriate measurement basis (MB) code using Table A. 10 : Measurement Basis Codes.

Inventory Change Document

This label has two fields to complete, one for the shipper and one for the receiver.

Provide the MB code in the "Shipper" field for:

1. An internal inventory change that decreases the material balance; and
2. A shipment of material (export and domestic).

Provide the MB code in the "Receiver" field for:

1. An internal inventory change that increases the material balance; and
2. Receipt of material (export and domestic).

List of Inventory Items and *P-KMPIS*

Provide the appropriate MB code using Table A. 10 : Measurement Basis Codes.

470 Numbers of items in batch

Inventory Change Document

Provide the number of items involved in the inventory change. If there is more than one line entry, also provide the total number of all items reported.

General Ledger

Provide the total number of items as reported on the Inventory Change Document.

List of Inventory Items

If more than one item is included on the line entry, provide the total number of items. In the case of bulk material, and generally when a number would not be meaningful, the number "1" should be placed in label 470. The label cannot be left blank.

P-KMP Inventory Summary

Provide the total number of items for each Batch of items reported from the List of Inventory Items, in each assigned batch name.

600 Element weight – unified uranium

All reports

Report the element weight of each category of nuclear material in the batch. The individual numeric labels for this data element are in Table A. 13 : Material Group Element Codes and Labels. Refer also to Section 3.2 Weight Units and Rounding.

Inventory Change Document

If applicable, provide the element weight of the item subdivided by countries of origin (see label 2003).

Category Changes require reporting of two material elements and their respective weights on one Inventory Change Document on separate line entries: the weight of the first element (prior to the irradiation) is reported on the first line; and the weight of the second element (transformed) is reported on the second line, with the same weight as the first.

Special attention should be given to reporting the same number of decimal places and the same units for both element weights on the Inventory Change Document. When the two elements normally have different weight units, the units of both should be those of the highest category element (i.e., grams for enriched uranium or plutonium).

General Ledger

Provide the element weight(s) of each material element, exactly as reported on the corresponding Inventory Change Document.

Increases in element weight: Beginning on line "1", provide the element weight of the increase, exactly as reported on the corresponding Inventory Change Document

Decreases in element weight: Beginning on line "1", provide the element weight of the decrease, exactly as reported on the corresponding Inventory Change Document.

The General Ledger running balance must retain the same number of decimal places as the previous line entry running balance.

Summary of Inventory Changes

Provide the total weight reported for each IC code and sum the total increases and decreases.

List of Inventory Items

The weights of individual items on the List of Inventory Items are unrounded, and up to six decimal places may be used.

P-KMP Inventory Summary

Provide the sum of the element weights of all items on the List of Inventory Items, grouped into batches with the same MDC and stratum. Maintain decimal accuracy, and the batch total may then be rounded to the agreed number of decimal places used on all other reports.

Reconciliation Statement

The element weights for book adjusted ending (BA) are taken from the ending balance of the General Ledger Report of the PIT month.

The element weights for physical ending (PE) are taken from the totals of each element balance at PIT closing, as reported on the P-KMPIS.

See Table A. 11 : Reporting Codes for Reconciliation Statement. The weights should be reported to the same rounded number of decimal places as on the General Ledger and P-KMPIS reports.

Reporting L and H codes within Table A. 13 : Material Group Element Codes and Labels requires consultation with CNSC staff.

Obligated Material Inventory Summary

The licensee is required to report the inventory changes via Inventory Change Document reports for specified transactions of obligated material. From records of these Inventory Change Document transactions, the licensee is expected to maintain foreign obligated material transaction ledgers for each obligation country, in its source records for each reporting period.

The opening balances for each element weight, for each obligation country, are taken from the ending balances of the ledgers from the previous reporting period.

The first time a country of obligation is reported on a List of Inventory Items for an element/isotope, the opening balance for that material is "0" (zero).

The ending balances for each element weight are derived by adding the total of increases to the opening balance for each obligated material, and subtracting the total decreases from the obligated material balances, that occurred throughout the reporting period.

The weights should be reported to the same rounded number of decimal places as on the General Ledger and P-KMPIS reports.

610 Element weight – natural uranium

See description for label 600.

620 Element weight – depleted uranium

See description for label 600.

640-680 Isotope weight – enriched/unified uranium

All reports

Report the isotope weight of each category of nuclear material in the batch. The individual numeric labels for this data element are in Table A. 14 : Isotope Codes and Labels for Group 1 Material. See also to Section 3.2 Weight Units and Rounding.

Inventory Change Document

If applicable, subdivide the isotope weight of the item/batch by country of origin (see label 2003). The total isotope weight is allocated to at least one country of origin.

General Ledger

Provide the isotope weight(s) for each material element exactly as reported on the corresponding Inventory Change Document.

Increases in weight: Beginning on line "1", provide the isotope weight of the increase, exactly as reported on the corresponding Inventory Change Document.

Decreases in weight: Beginning on line "1", provide the isotope weight of the decrease, exactly as reported on the corresponding Inventory Change Document.

Summary of Inventory Changes

Provide the total weight reported for each IC code and sum the total increases and decreases.

List of Inventory Items

The individual numeric labels for this data element are defined in Table A. 14 : Isotope Codes and Labels for Group 1 Material. The weights of individual items on the List of Inventory Items should be reported with the number of decimal places representative of the full accuracy of the measurement.

P-KMP Inventory Summary

Provide the sum of the isotope weights of all items on the List of Inventory Items group of items comprising the batch, maintaining decimal accuracy; the batch total may then be rounded to the agreed number of decimal places used on all other reports.

Reconciliation Statement

The isotope weights for book adjusted ending (BA) are taken from the ending balance of the General Ledger Report 1 of the PIT closing month. See Table A. 11 : Reporting Codes for Reconciliation Statement for an explanation of BA.

The isotope weights for physical ending (PE) are taken from the totals of each isotope balance at PIT closing, as reported on the P-KMPIS. See Table A. 11 : Reporting Codes for Reconciliation Statement for an explanation of PE.

The weights are reported to the same number of decimal places as on the General Ledger and P-KMPIS reports.

Obligated Material Inventory Summary

The opening balances for each isotope weight, for each country of obligation, are taken from the ending balances of the ledgers from the previous reporting period.

The first time a country of obligation is reported on a List of Inventory Items report, for an isotope, the opening balance for that material will be "0" (zero).

The ending balances for each isotope weight are derived by adding the total of increases to the opening balance for each obligated material, and subtracting the total decreases to the obligated material balances, that occurred throughout the reporting period.

700 Element weight - plutonium

See description for label 600.

710-760 Isotope weight - plutonium

See description for label 640.

770 Isotope weight – natural uranium

See description for label 640.

780 Isotope weight – depleted uranium

See description for label 640.

800 Element weight - thorium

See description for label 600.

1000 Line number

General Ledger* and *Summary of Inventory Change Report
Each line entry is consecutively numbered with an integer:

1. The first line number is "0" (zero), and the opening balance is reported on line "0" (zero);
2. The first inventory change is reported on line "1", the second on line "2", etc.; and
3. The ending balance is reported on the last line of the report.

1001 Item identification

List of Inventory Items
Provide the identification number or item name for individual items. For example, bundle serial number, drum number, uranium hexafluoride cylinder number.

1002 Corrections - previous date

General Ledger
In the case of corrections, provide the month of the General Ledger that the Inventory Change Document being corrected was reported.

1003 Corrections - previous line number

General Ledger
In the case of corrections, provide the line number of the General Ledger on which the original Inventory Change Document or latest correction to this inventory change was reported.

1004 Comments/remarks

Provide any additional information to explain or assist in identifying the batch or items reported, as applicable.

1005 Stratum identification

List of Inventory Items

If one has been assigned, provide the stratum name for the batch or item. This name is usually assigned by IAEA for verifications.

1006 Element code

All reports

In all relevant reports, provide the appropriate element code from Table A. 13 : Material Group Element Codes and Labels.

Inventory Change Document

A batch of items of nuclear material is reported with only one element code.

If the batch is composed of items that have different element codes, the batch of these items may be reported on one Inventory Change Document, depending on the combination of elements/isotopes. For example, a batch of fuel bundles composed of natural uranium and depleted uranium pins may be reported as one batch on the same Inventory Change Document with each element/isotope reported on separate lines.

Whenever various categories (elements) of material are blended and combined into a single category within an item, or when a material changes its category due to processing (e.g., blending, enrichment, irradiation), the batch cannot be reported as two material elements; it must be reported as a category change.

An element weight data label (600 to 800) may be reported only once per inventory change. For example, it is not permissible to report label 1635 (low enriched uranium) and label 640 (uranium-233) together with label 1636 (high enriched uranium) and label 640 (uranium-233) on a single Inventory Change Document.

Consideration must also be given to whether re-batching applies to cases when reporting a combination of elements in a batch. An explanation of re-batching is addressed in Section 4.1.3.2.

1007 Irradiation status

Provide the code “F” for fresh, non-irradiated material, and “I” for irradiated material, for each item on the List of Inventory Items and for each line entry on the P-KMPIS.

1013 Net weight

Inventory Change Document

Provide the total weight of the material, excluding the weight of containers and packaging.

1020 IAEA safeguards status

Inventory Change Document

This label identifies if the nuclear material is subject to IAEA safeguards. Label 1020 has four options:

1. “Yes” for Group 1A material;
2. “No” for Group 2 material;
3. “Exempt U” for Group 1B material, exempted on the basis of use; and
4. “Exempt Q” for Group 1B material, exempted on the basis of quantity.

1021 Correction number

Provide the information using Table A. 4 : Entry Status Codes**.**

Inventory Change Document
If the Inventory Change Document is reporting a material inventory change for the first time, with entry status in label 309 "N", then the correction number is "0" (zero) to indicate this is the original Inventory Change Document for the inventory change.

If the Inventory Change Document is reporting a correction to the original or subsequent correction, with entry status "C" in label 309, the correction number is greater than "0" (zero).

If the Inventory Change Document is reporting a deletion of a previously reported inventory change, with entry status "D", the correction number remains the same as the Inventory Change Document it is deleting.

General Ledger
Provide the same correction number as reported for this inventory change for the Inventory Change Document correction.

1023 Units

Provide the appropriate weight unit for the element/isotope reported. See Table A. 13 : Material Group Element Codes and Labels and Table A. 14 : Isotope Codes and Labels for Group 1 Material.

1024 Isotope code for uranium

In all relevant reports, provide the appropriate isotope codes using Table A. 14 : Isotope Codes and Labels for Group 1 Material.

Inventory Change Document
An isotope code may be reported only once per inventory change. For example, it is not permissible to report label 1635 (low enriched uranium) and label 640 (uranium-233) along with label 1635 (low enriched uranium) and label 670 (uranium-235) on a single Inventory Change Document.

1025 Unique identifier (optional)

Inventory Change Document, General Ledger,* and *List of Inventory Items
Provide any unique batch identification such as the lot number or cylinder number. This name may also be the same as the batch name (446).

1026 Number of inventory changes

Summary of Inventory Changes
Provide the number of transactions reported for each type of inventory change, including corrections.

1027 Shipper

Inventory Change Document
Provide the full name and address of shipper, or the initiator of an internal inventory change that decreases the amount of material in the MBA.

1028 Receiver

Inventory Change Document
Provide the full name and address of receiver, or the initiator of an internal inventory change that increases the amount of material in the MBA.

1030 Element weight balance

General Ledger

On line "0" (zero), provide the opening balance of the element weight, which is the ending balance of the previous General Ledger period.

Beginning on line "1", provide the running element weight balance (i.e., the difference between the previous line balance and the new entry). This balance may be reported to a maximum of six decimal places.

On the last line of the ledger, provide the ending balance of the element weight in the MBA for the reported period.

Summary of Inventory Changes

On line "0" (zero), provide the opening balance of the element weight, which is the ending balance of the previous Summary of Inventory Changes period.

1031 Isotope weight balance

General Ledger

On "0" (zero), provide the opening balance of the isotope weight, which is the ending balance of the previous General Ledger period.

Beginning on line "1", provide the running isotope weight balance (i.e., the difference between the previous line balance and the new entry).

On the last line of the ledger, provide the ending balance of the isotope weight in the MBA for the reported period.

Summary of Inventory Changes

On line "0" (zero), provide the opening balance of the isotope weight, which is the ending balance of the previous Summary of Inventory Changes period.

1032 Element weight – natural uranium concentrate

See description for label 600.

1634 Element weight – thorium concentrate

See description for label 600.

1635 Element weight – low enriched uranium

See description for label 600.

1636 Element weight – high enriched uranium

See description for label 600.

2001 Export licence number

Inventory Change Document

This label is used to identify the CNSC Export Licence under which the shipment (export) of nuclear material has been authorized.

This label is also used to identify the CNSC letter of consent number when reporting a transfer of nuclear material from a holding account. In such a case, it is also necessary to provide the abbreviation "HA" (holding account) in label 411, and to provide the code for the holding account from which the transfer was made in label 2005.

2002 Import licence number

Inventory Change Document
This label is used to identify the CNSC Import Licence under which the receipt (import) of nuclear material has been authorized.

2003 Country of origin

Inventory Change Document* and *General Ledger
If applicable, identify the country of origin of the nuclear material on the Inventory Change Document report. For multiple countries of origin, enter only one country of origin on each line of the form using Table A. 5 : Country Codes.

2004 Foreign obligation country code

Inventory Change Document, General Ledger,* and *Obligated Material Summary
The relevant foreign obligation code(s) is provided by CNSC to the licensee at the time an import/export licence is issued, using Table A. 5 : Country Codes. If the material has no foreign obligations, this field and the obligated weight fields are left blank.
It is possible that only a portion of the element/isotope weight has foreign obligations, because obligated material may be mixed with non-obligated material.

A shipment may have more than one foreign obligation. For example, half of the nuclear material is obligated to country X and the other half to country Y. A proportional approach is used to assign the appropriate quantity of nuclear material with the appropriate foreign obligation code. Separate line items are required for label 2004 to identify the various obligated portions of nuclear material.

When nuclear material has more than one foreign obligation on the entire quantity, the nuclear material is obligated to both countries simultaneously. It does not result in portions of the nuclear material being obligated to each country. For example, if the entire shipment of 100 kg of nuclear material is obligated to both country X and country Y, then 100 kg is reported as obligated to country X and 100 kg is obligated to country Y.

2005 Holding account code

Inventory Change Document
Provide the applicable holding account code where nuclear material is exported to or transferred from, using Table A. 8 : Holding Account Codes.

2006 Foreign obligation element weight

Inventory Change Document, General Ledger,* and *Obligated Material Summary
Provide the element weight for each foreign obligation code provided in label 2004. Provide the element weights in the units as specified in Table A. 13 : Material Group Element Codes and Labels. For unobligated and Canadian material, this field is left blank.

2007 Foreign obligation isotope weight

Inventory Change Document, General Ledger,* and *Obligated Material Summary
Provide the isotope weight (in grams) for each foreign obligation code provided in label 2004. For unobligated and Canadian material, this field is left blank.

Appendix A
Reference Tables

This appendix contains the following reference tables:

- **Table A.1 : Group 1 Facility Codes**
- **Table A. 2 : Group 1 Locations Outside Facilities Codes**
- **Table A. 3 : Group 2 Material Balance Area Codes**
- **Table A. 4 : Entry Status Codes**
- **Table A. 5 : Country Codes**
- **Table A. 6 : Inventory Change Codes**
- **Table A. 7 : Inventory Change Codes for Entry Status U**
- **Table A. 8 : Holding Account Codes**
- **Table A. 9 : Material Description Codes**
- **Table A. 10 : Measurement Basis Codes**
- **Table A. 11 : Reporting Codes for Reconciliation Statement**
- **Table A. 12 : Reporting Deviations from Reconciliation Statement**
- **Table A. 13 : Material Group Element Codes and Labels**
- **Table A. 14 : Isotope Codes and Labels for Group 1 Material**

Table A.1 : Group 1 Facility Codes

Group 1 Facility / Material Balance Areas (MBA)	Facility Code Label 207	MBA Code Labels 307, 370, 372
AECL Chalk River Laboratories, NM	CNA-	CNA1
AECL Chalk River Laboratories, NM	CNA-	CNA2
AECL Chalk River Laboratories, NRX	CNB-	CNB1
AECL Chalk River Laboratories, Dedicated Isotope Facility	CNBM	CNBM
AECL Chalk River Laboratories, NRU	CNC-	CN-C
AECL Chalk River Laboratories NFFF	CND-	CND1
AECL Chalk River Laboratories Metallurgy	CND-	CND2
AECL Chalk River Laboratories Mo-99 Production Facility	CND-	CND4
AECL Chalk River Laboratories Shielded Facilities	CND-	CND5
AECL Chalk River Laboratories Waste Management Area B	CNDA	CNDA
AECL Chalk River Laboratories Waste Management Area G	CNDB	CNDB
AECL Chalk River Laboratories Fuel Fabrication 405	CNDC	CNDC
AECL Chalk River Laboratories Waste Management Area	CNDD	CNDD
AECL Chalk River Laboratories Liquid Waste Storage Facility	CNDE	CNDE
AECL Chalk River Laboratories Health Sciences	CNE-	CNE1
AECL Chalk River Laboratories Chemistry	CNE-	CNE2
AECL Chalk River Laboratories Reactor and Radiation Physics	CNE-	CNE4
AECL Chalk River Laboratories Fuel and Fuel Channel Safety	CNE-	CNE5
AECL Chalk River Manufacturing 466	CNE-	CNE6
AECL Chalk River Laboratories FPSF	CNJ-	CN-J
AECL Whiteshell Laboratories	CNP-	CN-P
AECL Gentilly-1 Waste Management	CNN-	CN-N
AECL Douglas Point Waste Management	CNO-	CN-O
Best Theratronics Ltd.	CNS1	CN1S
Bruce Power Bruce Generating Station “A”	CNK-	CN-K
Bruce Power Bruce Generating Station “B”	CNKB	CNBK
Cameco Blind River Refinery	CNBR	CNBR
Cameco Port Hope Conversion Facility	CNFN	CNFN
Cameco Fuel Manufacturing (formerly Zircatec Precision Industries Limited)	CNG-	CNG1
Dalhousie University SLOWPOKE	CNT-	CN-T
École Polytechnique SLOWPOKE	CN6Y	CNY6
GE – Hitachi Canada Inc., Peterborough	CNI-	CN-I

Group 1 Facility / Material Balance Areas (MBA)	Facility Code Label 207	MBA Code Labels 307, 370, 372
GE – Hitachi Canada Inc., Toronto	CNH-	CN-H
Hydro-Québec Centrale Nucléaire Gentilly-2	CNNB	CNBN
McMaster University	CNQ-	CN-Q
MDS Nordion	CNS-	CN-S
New Brunswick Power Point Lepreau Generating Station	CNNC	CNCN
OPG Pickering Generating Stations A & B	CNM-	CN-M
OPG Pickering Used Fuel Dry Storage Facility	CNMS	CNSM
OPG Darlington Generating Station	CNAA	CNAA
OPG Darlington Used Fuel Dry Storage Facility (to be established)	CNAS	CNAS
OPG Western Used Fuel Dry Storage Facility	CNKS	CNKS
Royal Military College SLOWPOKE	CNX-	CN-X
Saskatchewan Research Council SLOWPOKE	CNU-	CN-U
University of Alberta SLOWPOKE	CNW-	CN-W
University of Toronto SLOWPOKE	CNR-	CN-R

Table A. 2 : Group 1 Locations Outside Facilities Codes

Locations Outside Facilities (LOFs)	Facility Code Label 207	MBA Code Label 307, 370, 372	KMP Code Label 407
AECL Sheridan Park, Ontario	CNZ-	CN-Z	C
Kinectrics Inc., Ontario	CNZ-	CN-Z	E
Mississauga Metals & Alloys, Ontario	CNZ-	CN-Z	D
Stern Laboratories, Ontario	CNZ-	CN-Z	B
TRIUMF, British Columbia	CNZ-	CN-Z	J
Canadian LOF – Industry Locations	CN-2	CN-2	A
Canadian LOF – Laboratory Locations	CN-2	CN-2	B
Canadian LOF – University Locations	CN-2	CN-2	C
Canadian LOF – Hospitals and Clinics	CN-2	CN-2	D

Table A. 3 : Group 2 Material Balance Area Codes

Group 2 Material Balance Areas	Location	MBA Code Labels 307, 370, 372
Refineries		
Cameco Corp., Blind River Refinery	Ontario	DBR
Cameco Corp., Port Hope	Ontario	F1S
Cameco Corp., Port Hope	Ontario	DAY
Mine/Mill Facilities		
Areva Resources Canada Inc., Cluff Lake	Saskatchewan	DAM
Areva Resources Canada Inc., McArthur River	Saskatchewan	DMR
Areva Resources Canada Inc., McClean Lake	Saskatchewan	DML
Areva Resources Canada Inc., Kiggavik Project (Baker Lake)	Nunavut	DKP
Areva Resources Canada Inc., Shea Creek	Saskatchewan	DSP
Cameco Corp., Key Lake	Saskatchewan	DKL
Cameco Corp., Rabbit Lake	Saskatchewan	DGM

Table A. 4 : Entry Status Codes

Code	Purpose	Permissible Inventory Change Code Label	Corresponding Correction Entry Label 1020
A	Add a new transaction to a previous report.	Table A.6	0 (zero)
C	Correct a previous transaction referenced by this entry.	Table A.6	1, 2, or higher (not zero)
D	Delete a previous transaction referenced by this entry.	Table A.6	Same correction entry number as the report it is deleting.
N	Report a new Inventory Change transaction.	Table A.6	0
U	Identify an Inventory Change code.	Table A.7	0, 1, 2, or higher

Table A. 5 : Country Codes

Country	Code	Country	Code
A			
Afghanistan	AF	Albania	AL
Algeria	DZ	Andorra	AD
Antigua & Barbuda	AB	Argentina	RA
Armenia	AM	Australia	AS
Austria	AU	Azerbaijan	AR
B			
Bahamas	BA	Bahrain	BH
Bangladesh	BD	Barbados	BB
Belgium	BL	Benin	BE
Bhutan	BT	Bolivia	BO
Bosnia and Herzegovina	HB	Botswana	RB
Brazil	BR	Brunei Darussalam	BN
Bulgaria	BG	Burkina Faso	HV
Burundi	RU		
C			
Cambodia	KR	Cameroon, Republic of	TC
Canada	CN	Cape Verde	CV
Central African Republic	CA	Chad	CD
Chile	CE	China, People's Republic of	X
China, Republic of (Taiwan)	TW	Columbia	CO
Cormoros	KM	Congo, People's Republic of	CB
Cook Islands	KS	Costa Rica	CR
Croatia	CT	Cuba	CU
Cyprus	CY	Czechoslovakia, Republic of	CZ
D			
Denmark	DK	Djibouti	DJ
Dominica	DM	Dominican Republic	DO
E			
Ecuador	EC	Egypt	ET
El Salvador	SV	Equatorial Guinea	GE
Estonia	EA	Ethiopia	EP
EURATOM	W		

Country	Code	Country	Code
	F		
Fiji	IF	Finland	SF
France	F		
	G		
Gabon	GA	Gambia	GM
Georgia	GO	Germany	DF
Ghana	GH	Grenada	GD
Guatemala	GT	Guinea	GN
Guinea-Bissau	GI	Guyana	GU
	H		
Haiti	RH	Holy See	HS
Honduras	HO	Hungary	HU
	I		
IAEA	IA	IAEA Japan Regional Office	IJ
IAEA Toronto Regional Office	IC	Iceland	IS
India	IN	Indonesia	RI
Iran, Islamic Republic of	IR	Iraq	IQ
Ireland	ID	Israel	IL
Italy	IT		
	J		
Jamaica	AJ	Japan	J
Jordan	HJ		
	K		
Kazakhstan	KA	Kenya	KN
Korea, Democratic People's Republic of	KD	Korea, Republic of	KO
Kuwait	KW	Kyrgyzstan	KY
	L		
Lao People's Democratic Republic	LA	Latvia	LV
Liberia	LB	Libyan Arab Jamahiriya	LI
Liechtenstein	LN	Lithuania	LT
Luxembourg	LX		

Country	Code	Country	Code
M			
Madagascar	RM	Malawi	MW
Malaysia	MY	Maldives	MD
Mali	ML	Malta	MT
Marshall Islands	MH	Mauritania	MU
Mauritius	MS	Mexico	MX
Micronesia	MF	Moldova	MO
Monaco	MC	Mongolia	MN
Morocco	MA	Mozambique	MB
Myanmar	BU		
N			
Namibia	NM	Nauru	NU
Nepal	NP	Netherlands	NL
Netherlands Antilles	NA	New Caledonia	NC
New Zealand	NZ	Nicaragua	NI
NIUE	NE	Niger	NG
Nigeria	NF	Norway	NO
O			
Oman	AO		
P			
Pakistan	PK	Panama	PA
Papua New Guinea	PN	Paraguay	PY
Peru	PE	Philippines	PI
Poland	PL	Portugal	PO
Q			
Qatar	S		
R			
Romania	RO	Russian Federation	Z
Rwanda	RW		

Country	Code	Country	Code
	S		
Samoa	SS	San Marino	SM
Sao Tome and Principe	ST	Saudi Arabia	SA
Senegal	SE	Seychelles	SY
Sierra Leone	SL	Singapore	SG
Slovakia	SX	Slovenia	VE
Solomon Islands	SB	Somalia	SO
South Africa	AZ	Spain	ES
Sri Lanka	CL	St. Kitts, Nevis	SK
St. Lucia	SC	St. Vincent Grenadines	VG
Sudan	SN	Surinam	SI
Swaziland	SD	Sweden	SW
Switzerland	CH	Syrian Arab Republic	SR
	T		
Taiwan	TW	Tajikistan	TK
Tanzania, United Republic of	TA	Thailand	TH
Togo	TG	Tonga	TO
Trinidad and Tobago	TT	Tunisia	TN
Turkey	TR	Turkmenistan	TM
Tuvalu	TU		
	U		
Uganda	EU	Ukraine	UR
United Arab Emirates	AE	United Kingdom	Q
Uruguay	GY	USA	U
Uzbekistan	KT		
	V		
Vanuatu	VU	Venezuela	NV
Viet Nam, Socialist Republic of	RV		
	Y		
Yemen, Republic of	YE	Yugoslavia	IU
	Z		
Zaire	CK	Zimbabwe	MI

Table A. 6 : Inventory Change Codes

Keyword	Code	Explanation
Accidental gain	GA	Nuclear material unexpectedly found to be present in the MBA, except when detected in the course of a physical inventory taking.
Accidental loss	LA	Irretrievable and inadvertent loss of a known quantity of nuclear material as the result of an operational accident.
Category change (not applicable to MBAs that report in terms of "unified uranium")	DE DN ED EN ND NE	Quantity of uranium that has changed category as a result of blending, enrichment, depletion or burn-up. The first letter denotes the original, the second letter the resulting category: (E = enriched, N = natural, D = depleted uranium).
De-exemption quantity	DQ	Reapplication of safeguards on nuclear material previously exempted from safeguards.
De-exemption use	DU	Reapplication of safeguards on nuclear material previously exempted from safeguards.
Exemption quantity	EQ	Exemption of nuclear material from safeguards.
Exemption use	EU	Exemption of nuclear material from safeguards.
Measured discard	LD	Operational loss, i.e., loss of a measured or estimated (on the basis of measurement) quantity of nuclear material from processing that has been disposed of in such a way that it is not suitable for further nuclear use.
Nuclear loss	LN	Consumption of nuclear material due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions.
Nuclear production	NP	Production of fissionable material in a reactor (plutonium, uranium-233).
Receipt domestic	RD	Domestic receipt of nuclear material from another MBA.
Receipt foreign	RF	Import of nuclear material into Canada.
Receipt from non-safeguarded activity	RN	Domestic receipt of nuclear material from non-safeguarded (permitted military) activity.
Receipt at starting point	RS	Domestic receipt of nuclear material at starting point of safeguards.
Re-batching - decrease in batch content	RM	Quantity by which the batch mentioned in the entry is diminished due to re-batching.
Re-batching - increase in batch content	RP	Quantity of material added to the batch mentioned in the entry from another batch due to re-batching.
Retained waste - retransfer from	FW	Retransfer of material that had been stored at the MBA as retained waste, to the nuclear material inventory. This applies whenever material in the retained waste category is removed from storage either for processing at the MBA or for transfer from the MBA.
Retained waste - transfer to	TW	Transfer to the retained waste category of measured nuclear material that is deemed to be irrecoverable, to be stored at the MBA and to be deleted from the inventory of the MBA.
Shipment domestic	SD	Domestic transfer of nuclear material to another MBA.
Shipment foreign	SF	Export of nuclear material out of Canada.

Keyword	Code	Explanation
Shipment to non-safeguarded activity	SN	Domestic transfer of nuclear material to non-safeguarded (permitted military) activity.
Shipper-receiver difference	DI	Difference between the batch quantity reported as received (always on shipper's data) and the quantity of the same batch as measured by the operator of the receiving MBA.
Termination	TU	Termination of safeguards on nuclear material.

Table A. 7 : Inventory Change Codes for Entry Status U

The following inventory change codes may be used only with the authorization of CNSC:

Keyword	Code	Explanation
Negative interim inventory difference	L-	Decreases the balance of the General Ledger to agree with the measured physical inventory weight.
Positive interim inventory difference	L+	Increases the balance of the General Ledger to agree with the measured physical inventory weight.
Rounding up correction	R+	The difference between the rounded and unrounded quantity of a batch of nuclear material when the rounded quantity is greater than the unrounded quantity. "R+" increases the balance of the General Ledger.
Rounding down correction	R-	The difference between the rounded and unrounded quantity of a batch of nuclear material when the rounded quantity is less than the unrounded quantity. "R-" decreases the balance of the General Ledger.

Table A. 8 : Holding Account Codes

Holding Account	Country	Code Label 2005
Allied Signal	United States	UUSCA
British Nuclear Fuels Limited	United Kingdom	CUKHD
British Nuclear Fuels Limited	United Kingdom	UUKCA
Comhurex (Cameco)	France	CFRHD
Comhurex (Uranerz)	France	UFRCA
Converdyn	United States	CCCHD
Eurodif	France	ELD8405
Urenco (Almelo)	Netherlands	NLHLD
Urenco (Capenhurst)	United Kingdom	UKHLD
Urenco (Gronau)	Germany	GEHLD
USEC	United States	UNHLD

Table A. 9 : Material Description Codes

Material Description Codes – Four Characters required		
First Two Characters - Physical and Chemical Forms		
First Keyword	**Second Keyword**	**First Two Characters**
Ceramics	Pellets	CP
	Spheres	CS
	Other	CO
Fuel	Rods, pins	ER
	Plates	EP
	Bundles	EB
	Assemblies	EA
	Other	EO
Liquid waste	Low active	WL
	Medium active	WM
	High active	WH
Metal	Pure	MP
	Alloys	MA
Powder	Homogeneous	PH
	Heterogeneous	PN
Sealed sources	---	SS
Small quantities, samples	---	QS
Scrap	Homogeneous	SH
	Heterogeneous (cleanouts, clinkers, sludge, fines, other)	SN
Solid waste	Hulls	AH
	Mixed (plastics, gloves, papers, etc.)	AM
	Contaminated equipment	AC
	Other	AO
Solution	Nitrate	LN
	Fluorides	LF
	Other	LO

Material Description Codes – Four Characters required		
Third Character - Container Types		
	Third Keyword	**Third Character**
	Cylinder	C
	Pack	P
	Drum	D
	Discrete fuel units (fuel only)	S
	Bird cage	B
	Bottle	F
	Other	O
Fourth Character - Characterization of Material		
	Fourth Keyword	**Fourth Character**
	Fresh (not irradiated) material	F
	Irradiated material	I
	Retained waste	W
	Irrecoverable material	N
	Recoverable material	R

Table A. 10 : Measurement Basis Codes

MB Code	Description of Use	Examples
L	Batch data are based on measurements made at another MBA and have been reported for the present MBA in a preceding Inventory Change Document or List of Inventory Items.	New measurements to verify and correct previous estimated values of inventory.
M	Batch data are based on fresh measurements made at the MBA.	1. Reporting of shipper-receiver differences based on re-measurement of receipts by the MBA; and 2. Calculations of NP and LN. See 3. Table A. 6 : Inventory Change Codes.
N	Batch data are based on measurements made at another MBA.	1. Receipts accepted at shipper's values; and 2. Sample measurements made by an outside MBA.
T	Batch data are based on measurements made at the present MBA and have been reported on a preceding Inventory Change Document or List of Inventory Items; the measurements have not been repeated.	New measurement of existing inventory.

Table A. 11 : Reporting Codes for Reconciliation Statement

Term	Code	Explanation
Book adjusted ending	BA	The algebraic sum of the beginning physical inventory and of the inventory changes over the period, adjusted to take account of the shipper-receiver differences. The beginning physical inventory is equal to the ending physical inventory of the previous reconciliation statement relating to the same category of nuclear material. BA is the balance of the General Ledger as of the effective date of the physical inventory verification.
Physical ending	PE	The sum of all measured and derived batch/item quantities of nuclear material on hand at the date of the physical inventory taking, i.e., the total of the List of Inventory Items.
Inventory difference	ID	The difference between the book adjusted ending (BA) and the physical ending (PE), i.e., ID = BA - PE. Any non-zero ID should be reported on an Inventory Change Document dated on the date of the PIT. Also last transaction to be reported on the last General Ledger ending the material balance period.

Table A. 12 : Reporting Deviations from Reconciliation Statement

Licensees reporting interim L+ and L- inventory differences should consult with CNSC for a revised Reconciliation Statement. The revised statements include additional line entries for the sum of the L+ and calculate an adjusted inventory difference.

Term	Code	Definition/Explanation
Minus the sum of L±	L±	The sum of all interim differences reported as L± on an Inventory Change Document for each material category is provided in these fields of the revised form.
Adjusted inventory difference	AID	The difference between the ID and the sum of L±, i.e., AID = ID - sum of L±.

Table A. 13 : Material Group Element Codes and Labels

Element Code 1006	Element	Weight Units Label 1023	Weight Label
Group 1A and 1B			
Request from CNSC	Unified uranium	g	600
N	Natural uranium	kg	610
D	Depleted uranium	kg	620
E[1]	Enriched uranium	g	630
L[2,3]	Low enriched uranium	g	1635
H[4,5]	High enriched uranium	g	1636
P	Plutonium	g	700
T	Thorium	kg	800
Group 2			
Request from CNSC	Unified uranium	g	600
C	Natural uranium concentrate	kg	1032
TC	Thorium concentrate	kg	1634

1. Element code E (IAEA code 10) applies to uranium enriched in either the isotope uranium 235 or uranium 233 or a combination of uranium-233 and uranium-235.
2. Element code L (CNSC code) is used in place of element code E for uranium enriched in the isotope uranium-235 or uranium-233 less than 20%.
3. Uranium enriched in a combination of uranium-233 and uranium-235 less than 20% is to be reported with element code L.
4. Element code H (CNSC code) is used in place of element code E for uranium enriched in either isotope uranium-235 or uranium-233 greater than or equal to 20%.
5. Uranium enriched in a combination of uranium-233 and uranium-235 greater than or equal to 20% is to be reported with element code H.

Table A. 14 : Isotope Codes and Labels for Group 1 Material

Isotope Code 1024	Isotope[1]	Weight Units Label 1023	Weight Label
K	Enriched/unified uranium-233 content	g	640
J	Enriched/unified uranium-233 + uranium-235 content	g	660
G	Enriched/unified uranium-235 content	g	670
Isotopes reported as required for:			
Not currently used	Enriched/unified uranium-234 content	g	650
	Enriched/unified uranium-236 content	g	680
	Enriched/unified uranium-238 content	g	690
	Plutonium-238 content	g	710
	Plutonium-239 content	g	720
	Plutonium-240 content	g	730
	Plutonium-241 content	g	740
	Plutonium-242 content	g	750
	Plutonium-239 + plutonium-241 content	g	760
	Natural uranium fissile content	g	770
	Depleted uranium fissile content	g	780

1. Isotopes are not reported for natural uranium, depleted uranium, plutonium or thorium.

Appendix B
Abbreviations

Code	Description
BA	Book adjusted ending, BA = BE – DI (shipper-receiver difference)
BE	Book ending
C	Element code for natural uranium ore concentrates
D	Element code for depleted uranium
DE	Depleted uranium to enriched uranium category change
DI	Shipper/receiver difference
DN	Depleted uranium to natural uranium category change
DQ	De-exemption quantity
DU	De-exemption use
E	Element code for enriched uranium (see HEU and LEU)
ED	Enriched uranium to depleted uranium category change
EN	Enriched uranium to natural uranium category change
EQ	Exemption quantity
EU	Exemption use
FW	Retransfer from retained waste
G	Isotope code for uranium enriched in uranium-235
GA	Accidental gain
HA	Holding account
HEU	High enriched uranium
ID	Inventory difference
J	Isotope code for uranium enriched in uranium-235 and uranium-233
K	Isotope code for uranium enriched in uranium-233
LA	Accidental loss
LD	Measured discard
LEU	Low enriched uranium
LN	Nuclear loss
N	Element code for natural uranium
ND	Natural uranium to depleted uranium category change
NE	Natural uranium to enriched uranium category change
NP	Nuclear production
P	Element code for plutonium

Code	Description
PE	Physical ending
R+, R-	Rounding decimal difference between the rounded and unrounded quantity of a batch of nuclear material
RD	Receipt domestic
RF	Receipt foreign
RM	Decrease in batch content
RN	Receipt from non-safeguarded (permitted military) activity
RP	Increase in batch content
SD	Shipment - domestic
SF	Shipment - foreign
SN	Shipment to non-safeguarded (permitted military) activity
T	Element code for thorium
TC	Element code for non-safeguarded thorium concentrates
TU	Termination use
TW	Transfer to retained waste
U	Element code for uranium

Glossary

Accounting
A system of records and reports that shows, for each MBA, the inventory of nuclear material and the changes in that inventory including receipts into and transfers out of the material balance area.

Account audit
An examination by IAEA or CNSC inspectors of the nuclear material accounts, records, and reports at a facility to check for completeness, correctness, internal consistency, and consistency with the State Reports.

Accounting records
A set of data kept at each facility or location outside facilities showing the quantity of each category of nuclear material present, its distribution within the facility and any changes affecting it. Accounting records contain in respect of each MBA:

1. All inventory changes, so as to permit a determination of the book inventory at any time;
2. All measurement results that are used for determination of the physical inventory; and
3. All adjustments and corrections that have been made in respect of inventory changes, book inventories, and physical inventories.

Batch
A portion of nuclear material handled as a unit for accounting purposes at a key measurement point. The composition and quantity are defined by a single set of specifications (material description code) or measurements (concentration, enrichment). The nuclear material may be in bulk form or contained in a number of separate items.

Items included in a batch must contain nuclear material of the same element concentration and enrichment. Items of different material description codes must be reported as separate batches.

Batch data
The total weight of each element of nuclear material and its isotopic composition as applicable.

Book adjusted ending
The algebraic sum of the beginning physical inventory and of the inventory changes over the period, adjusted to take account of the shipper-receiver differences.

Book inventory
The algebraic sum for a given point in time of the most recent physical inventory of an MBA and all inventory changes that have occurred since that physical inventory was taken.

Bulk form
Material in bulk form such as a liquid, gas, powder, pellets, or pebbles, that is not individually identified for accounting purposes. Bulk form material may be contained in a tank, drum, tote, or box.

Burn-up
See definition for nuclear loss below.

By-difference correction principle (BDCP)
The procedure by which a correction to an inventory change data element in a report is applied within the material balance period in which the change is dated. The weight difference between the original record and the correcting record is recorded in the accounts (i.e., General Ledger) as of the date the correction to the inventory change is realized and recorded.

Category change
A change in one of the three categories of uranium: depleted uranium, natural uranium, and enriched uranium. Uranium can change category as a result of blending, enrichment, depletion or burn-up. For example, natural uranium can become depleted uranium as a result of the burn-up of uranium-235. Category change results in the reduction of one category of uranium and a corresponding increase in another.

Code 10
Chapter 10 of the subsidiary arrangements of the Canada/IAEA Safeguards Agreement.

Concentrate

An extracted product, containing uranium or thorium, resulting from the physical or chemical separation from ore.

Correction
Entry into an accounting record or a report to rectify an identified mistake or to reflect an improved measurement of a quantity previously entered into the record or report.

Country of supply
Country of supply is identified as the country from where the nuclear material was shipped prior to entering Canada.

Country of obligation
Country of obligation is identified as the country with which Canada has agreed to accept conditions on the use of the nuclear material received from that country.

The country of obligation is not necessarily the country of origin or of supply. The countries of obligation, origin, and supply may all be different. For a given quantity of nuclear material, there may be a single country of obligation, multiple countries of obligation, or no foreign obligation. Material that has no specified obligations is referred to as unobligated.

Country of origin
Country of origin is identified as the country where the nuclear material was mined.

Data element
Unit of information in the Material Balance Area records.

Depleted uranium
Uranium that contains uranium-235 in a concentration of less than 0.7%, which is less than that normally found in nature.

Effective kilogram
A unit of measurement used in accounting and reporting of safeguarded nuclear material:

Element	Enrichment (for uranium)	Effective Kilogram
Uranium	enrichment of 1 percent and higher	weight in kilograms multiplied by the square of its enrichment
Uranium	enrichment less than 1 percent and more than 0.5 percent	weight in kilograms multiplied by 0.0001
Depleted uranium	enrichment of 0.5 percent or less	weight in kilograms multiplied by 0.00005
Plutonium		weight in kilograms
Thorium		weight in kilograms multiplied by 0.00005

Enriched uranium
Uranium that has a higher abundance of the fissile isotopes (uranium-235, uranium-233, or a combination of both) than natural uranium.

Exempted material
Any nuclear material that was initially classified as Group 1A and has been granted a temporary classification to Group 1B. The material remains classified as Group 1B until it is re-classified to Group 1A. Material may be exempted on the basis of non-nuclear use or by quantity less than 1 effective kilogram.

Facility
A reactor, critical facility, conversion plant, fabrication plant, reprocessing plant, isotope separation plant, or a separate storage installation; or any location where nuclear material in amounts greater than one effective kilogram is customarily used.

Fertile material
Nuclear material that can be converted into a special fissionable material through the capture of one neutron per nucleus. There are two naturally occurring fertile materials, uranium-238 and thorium-232. Through the capture of neutrons followed by two beta decays, these fertile materials are converted to fissionable plutonium-239 and uranium-233, respectively.

Fissile isotopes
Plutonium, uranium-235, and uranium-233.

Foreign obligations
When nuclear material is imported into Canada under a Nuclear Cooperation Agreement (NCA), it is deemed to have foreign obligations.

Foreign obligations include, among other conditions, the requirement to track and report on nuclear material transferred to Canada subject to an NCA, and transferred within Canada. Nuclear material transferred subject to an NCA is identified by way of government-to-government communications. In cases where nuclear material transferred to Canada is made subject to a bilateral NCA by the supplying country, CNSC informs the licensee at the time an import/export licence is issued that the nuclear material has foreign obligations.

The country of foreign obligation is not necessarily the country of origin or of supply. The countries of obligation, origin and supply may all be different. For a given quantity of nuclear

material, there may be a single country of obligation, multiple countries of obligation or no foreign obligation. Material that has no specified obligations is referred to as ubobligated,

High enriched uranium
Uranium containing 20 % or more of: isotope uranium-235, isotope uranium-233, or combined uranium-233 and uranium-235.

Holding account
A holding account is a holding area at an identified foreign facility to which unallocated Canadian-origin nuclear material can be exported and temporarily held pending the conclusion of a commercial arrangement for nuclear material held in the account.

Inventory change
An increase or decrease of nuclear material, in terms of batches, in a Material Balance Area.

Inventory difference
The difference between the book adjusted inventory and the physical ending as reported on the Reconciliation Statement. (also known as Material Unaccounted For (MUF)).

Item
Individually identifiable units of nuclear material, for example, a fuel assembly, or material in bulk form in a container, such as a tank or box, that are kept intact while stored in the Material Balance Area.

Key measurement point (KMP)
A location in an MBA where nuclear material is processed or stored. A physical-KMP is a storage location where the quantity of the material can be determined. A flow-KMP is a place where the movement of the material is determined.

Label
Unique three or four digit numbers used to clearly identify information in nuclear material accountancy.

Location outside facility (LOF)
Any installation or location, that is not a facility, where nuclear material is customarily used in amounts of one effective kilogram or less, and is subject to full nuclear material accounting and reporting.

Low enriched uranium
Enriched uranium containing less than 20 % of: isotope uranium-235, uranium-233, or combined uranium-233 and uranium-235.

Material balance area (MBA)
An area within a facility, or a location outside of a facility (LOF), such that:

1. The quantity of nuclear material in each transfer into and out of the area can be determined; and
2. The physical inventory of nuclear material in each material balance area can be determined when necessary, in accordance with specified procedures, so the material balance for IAEA safeguards purposes can be established.

Material balance period
The time between two consecutive physical inventory takings.

Measurement basis code (also measurement identification code)
The data element for the method used to measure or determine the weight or mass data of a nuclear material element and isotope.

The Measurement Basis (MB) code indicates whether the weight data was determined in the current MBA or another MBA and whether the data was new or previously reported.

Material category
For the purpose of nuclear accounting, element material categories are: natural uranium, depleted uranium, enriched uranium, thorium and plutonium. Isotope material categories are: uranium-235, uranium-233, and plutonium-239.

Material description code (MDC)
A four character code used to describe nuclear material batches by physical form, chemical composition, containment or type of container and irradiation status and quality.

Natural uranium
Uranium that contains the isotope uranium-235 in a concentration that is normally found in nature.

Non-safeguarded material
Source material and special fissionable material under IAEA safeguards (Agreement INFCIRC/164) that has not reached the stage of the nuclear fuel cycle as described in Article 34 (c).

Nuclear loss
Loss of nuclear material due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions. Nuclear loss also includes burn-up of nuclear material in a reactor and decay during storage.

Nuclear material
For the purposes of this document, nuclear material includes natural uranium, depleted uranium, enriched uranium, plutonium, and thorium.

Material within the scope of this document requiring reporting to CNSC includes all material under the Canada/IAEA safeguards agreement. Group 1 is nuclear material that is safeguarded under the Canada/IAEA safeguards agreement, Article 34 (c). Group 2 is source material excluding both ore residues and depleted uranium.

Nuclear production
The generation of special fissionable material through the irradiation of fertile material in a reactor.

Obligations
See *Foreign obligations.*

Operator
The person or organization responsible for the nuclear material inventory.

Ore
A mineral or chemical aggregate containing uranium (or thorium) in a quantity and of a quality that makes mining and extracting the uranium (thorium) economically viable.

Physical ending
The sum of all measured and derived batch/item quantities of nuclear material on hand at the date of the physical inventory taking, i.e., the total of the List of Inventory Items.

Physical inventory
The sum of all the measured or derived estimates of batch quantities of nuclear material at a given time within an MBA obtained in accordance with the licensees' (CNSC-approved) programs and procedures.

Physical inventory verification (PIV)
An inspection activity that follows closely, or coincides with, the Physical Inventory Taking by the operator and closes the material balance period. The basis for the PIV is the List of Inventory Items prepared by the operator.

Re-batching
Accounting for changes to the physical inventory (e.g., chemical and physical form, irradiation status) of an individual batch of nuclear material.

Retained Waste
A subset of Group 1A , retained waste is nuclear material that has been identified as unrecoverable and is stored in the MBA. This nuclear material can be transferred to retained waste upon approval of CNSC staff. After transfer, the only reporting requirement is to provide an inventory listing upon request.

Safeguarded nuclear material
Source material and special fissionable material under IAEA Safeguards (Agreements INFCIRC/164, Subsidiary Arrangements, and Additional Protocol INFCIRC/164/Add 1) that has reached the stage of the nuclear fuel cycle, as described in Article 34 (c), that it is suitable for fuel fabrication or for isotopic enrichment. In Canada, this is uranyl nitrate. Further to Article 34 (c), nuclear material at or beyond this stage of the fuel cycle is subject to all safeguards procedures specified in the safeguards agreement.

Shipper/receiver difference
The difference between the quantities of nuclear material in a batch as stated by the shipping material balance area and as measured at the receiving MBA.

Source material
Uranium containing the mixture of isotopes occurring in nature; uraniumdepleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate. Ore concentrate is considered to be source material. For the purposes of this document, the term source material is not interpreted as applying to ore or ore residue.

Special fissionable material
Group 1 nuclear material that contains plutonium-239, uranium-233, and uranium enriched in the isotopes 235 or 233, and any material that contains any of the foregoing. The term "special fissionable material" does not include source material.

Starting point of safeguards
The starting point of IAEA safeguards under the Canada/IAEA Safeguards Agreement is:

1. When any nuclear material of a composition and purity suitable for fuel fabrication or for isotopic enrichment leaves the plant or the process stage in that it has been produced; and
2. When such nuclear material, or any other nuclear material produced at a later stage in the nuclear fuel cycle, is imported into Canada.

In Canada the starting point of IAEA safeguards is the introduction of uranium ore concentrate feed from a mill or imported and processed into uranyl nitrates at a refinery. The IAEA safeguards under the Canada/IAEA Safeguards Agreement do not apply to material in mining or ore processing activities.

Stratum
A grouping of items and/or batches having similar physical and chemical characteristics. For example, items maybe grouped according to isotopic composition in order to facilitate statistical sampling.

Tare weight
The weight of a container and/or packing material without the weight of the material it contains.

Transfers
Any movement of nuclear material, both domestic (between Canadian MBAs) and foreign (imports and exports).

Unified uranium
A category of uranium, used for nuclear material accounting and reporting purposes under the safeguards agreement, where all uranium (natural, depleted and enriched) is included in a single (unified) account.

Weight data
The numeric label and the element or isotope weight of an item or batch of nuclear material.

Additional Information

The following documents contain additional information that may be of interest to persons to which this document applies.

1. International Atomic Energy Agency, *Agreement between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*; IAEA INFCIRC/164, 1972.
2. International Atomic Energy Agency, *IAEA Guidelines for State System of Accounting for and Control of Nuclear Materials*. International Nuclear Verification Series; INFCIRC/2 1980, 2006.
3. International Atomic Energy Agency, *IAEA Safeguards Glossary*; 2001 Edition, International Nuclear Verification Series 3, 2001.
4. International Atomic Energy Agency, *Nuclear Material Handbook*; Services Series 15, 2008.
5. International Atomic Energy Agency, Protocol Additional to the *Agreement between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*; IAEA INFCIRC/164/Add 1, 2000.