



DRAFT
Regulatory
Standard

S-336

CNSC Safeguards and Nuclear Non- Proliferation Reporting Requirements

Issued for External Stakeholder Consultation
September 2006

TYPES OF REGULATORY DOCUMENTS

Regulatory documents support the Canadian Nuclear Safety Commission (CNSC) regulatory framework. By expanding on expectations set out in general terms in the *Nuclear Safety and Control Act* and associated regulations, regulatory documents provide one of the core management tools upon which the CNSC relies to fulfill its legislated obligations.

The regulatory documents most commonly published by the CNSC are *regulatory policies*, *regulatory standards*, and *regulatory guides*. At the highest level, regulatory policies provide the direction for regulatory standards and guides, which serve as the policy “instruments.” A fourth type of regulatory document, the *regulatory notice*, is issued when warranted. Because the information in a *regulatory notice* must be conveyed with relative urgency, the development process is faster than that applied to the other documents.

Regulatory Policy (P): The regulatory policy describes the philosophy, principles or fundamental factors on which the regulatory activities associated with a particular topic or area of concern are based. It describes why a regulatory activity is warranted, and therefore promotes consistency in the interpretation of regulatory requirements.

Regulatory Standard (S): The regulatory standard clarifies CNSC expectations of what the licensee should do, and becomes a legal requirement when it is referenced in a licence or other legally enforceable instrument. The regulatory standard provides detailed explanation of the outcomes the CNSC expects the licensee to achieve.

Regulatory Guide (G): The regulatory guide informs licensees about how they can meet CNSC expectations and requirements. It provides licensees with a recommended approach for meeting particular aspects of the requirements and expectations associated with their respective licensed activities.

Regulatory Notice (N): The regulatory notice notifies licensees and other stakeholders about significant matters that warrant timely action.

Draft Regulatory Standard

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CNSC SAFEGUARDS AND NUCLEAR NON-PROLIFERATION REPORTING REQUIREMENTS

September 2006

About this Document

This draft regulatory standard sets the requirements for accurate and efficient accountancy of nuclear substances, equipment and information. It describes the reporting requirements to attain licensee uniformity in accounting records and reports of controlled nuclear substances, including special fissionable and source material, equipment and information.

Comments

The CNSC invites interested persons to assist in the further development of this draft regulatory document by commenting in writing on its content and potential usefulness. Please respond by December 29, 2006. Direct your comments to the postal or e-mail address provided below, referencing file 1-8-8-336.

The CNSC will take the comments received on this draft into account when developing it further. Any comments submitted including names and affiliations, may be made public.

Document availability

This document is available in English or French on the CNSC website at www.nuclearsafety.gc.ca. A paper copy of the document in either official language can be ordered from:

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Draft Regulatory Standard

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**CNSC SAFEGUARDS AND NUCLEAR NON-PROLIFERATION
REPORTING REQUIREMENTS**

Issued for External Stakeholder Consultation by the
Canadian Nuclear Safety Commission
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CNSC SAFEGUARDS AND NUCLEAR NON-PROLIFERATION REPORTING REQUIREMENTS

1.0 PURPOSE

The purpose of this regulatory standard, when incorporated into a licence or other legally enforceable instrument, is to provide requirements for the recording and reporting of accountancy data related to controlled nuclear substances, including special fissionable and source material, controlled nuclear equipment and controlled nuclear information. This document replaces AECB-1049, *Reporting Requirements for Fissionable and Fertile Substances*.

2.0 SCOPE

This regulatory standard sets the requirements for accurate and efficient accountancy of nuclear substances, equipment and information. It establishes the reporting requirements to attain licensee uniformity in accounting records and reports of controlled nuclear substances, including special fissionable and source material, controlled nuclear equipment and controlled nuclear information.

3.0 RELEVANT LEGISLATION

The following provisions of the *Nuclear Safety and Control Act* (NSCA) and regulations made under the NSCA are relevant to this regulatory standard:

1. Under section 3, the purpose of the NSCA is to provide for the limitation of the risks to national security, the health and safety of persons and the environment that are associated with the development, production and use of nuclear energy. The NSCA also provides for the implementation of measures to which Canada has agreed respecting international control of nuclear energy, including the non-proliferation of nuclear weapons and nuclear explosive devices;
2. Section 9 of the NSCA states that the objects of the Commission are to regulate the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information in order to achieve conformity with measures of control and international obligations to which Canada has agreed;
3. Paragraph 24(4)(b) of the NSCA stipulates that no licence may be issued, renewed, amended or replaced unless, in the opinion of the Commission, the applicant will make adequate provision for, among other things, the maintenance of national security and measures required to implement international obligations to which Canada has agreed;
4. Section 24(5) of the NSCA states that a licence may contain any term or condition that the Commission considers necessary;

5. Section 14 of the Class I Nuclear Facilities Regulations stipulates that records must be kept and retained by every licensee who operates a Class I nuclear facility;
6. Schedule, parts A and B of the Nuclear Non-Proliferation Import and Export Control Regulations lists controlled nuclear substance, controlled nuclear equipment and controlled nuclear information and these terms have the same meaning in this regulatory standard.

4.0 RELEVANT INTERNATIONAL OBLIGATIONS

Canada has agreed obligations and measures of control with international organizations. Treaties and Agreements relevant to this regulatory standard include:

1. The Treaty on the Non-Proliferation of Nuclear Weapons (NPT);
2. IAEA 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;
3. IAEA INFCIRC/164/Add 1, 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;
4. Subsidiary arrangements and facility attachments to INFCIRC/164 and 164/Add 1, and
5. Bilateral Nuclear Cooperation Agreements (NCAs) between Canada and potential nuclear trading partner countries and entities.

5.0 DEFINITIONS

The Glossary at the end of the document defines the special terms used in this regulatory standard.

6.0 GENERAL REQUIREMENTS

The CNSC requires all persons licensed pursuant to Section 26 of the NSCA to carry on activities involving nuclear materials, obligated equipment or obligated information to submit to the CNSC, reports of such movements and possession as stipulated in this regulatory standard unless otherwise required by the terms of the licence or agreed by the CNSC. Licensees shall report to the CNSC their inventory and inventory changes in accordance with the requirements of Section 8, below

Reporting requirements for nuclear materials differ according to the group and element category of nuclear material involved.

This standard is based on the IAEA reporting requirements for the CNSC. A copy of these requirements is provided in Appendix J, IAEA Model Code 10.

7.0 GROUPS OF NUCLEAR MATERIALS

Group 1 nuclear materials include natural and depleted uranium and thorium connected with the nuclear fuel cycle or in any unfinished form. This group includes uranium enriched in uranium-235, uranium enriched in uranium-233 and plutonium.

Group 2 nuclear materials include natural and depleted uranium and thorium not connected with the nuclear fuel cycle and in a finished form. This group includes counterweights, other cast, machined or clad forms, pottery pigments, alloys and incandescent mantles.

8.0 REPORTS TO BE SUBMITTED TO THE CNSC

Reports to be submitted by licensees to the CNSC are as follows:

1. Inventory Change Document (Appendix A);
2. General Ledger (Appendix B);
3. Summary of Inventory Change Report (Appendix C);
4. List of Inventory Items (Appendix D); and
5. Reconciliation Statement (Appendix E).

In addition, licensees must complete the following forms and inventory tags and submit them to the CNSC:

1. Request for Exemption Form (Appendix F);
2. Request for De-exemption Form (Appendix G);
3. Inventory Tag.

Each item or batch of nuclear material in the inventory to be verified by safeguards inspectors and contained in the List of Inventory Items must have an inventory tag attached to it. The information on each tag is used to construct the List of Inventory Items. The tags must remain until the Physical Inventory Verification has been completed, if applicable.

9.0 PRECISION

Records and reports for nuclear material quantities shall be maintained at one place to the right of the decimal point in grams for uranium enriched in uranium-233 or uranium-235 or plutonium, and at one place to the right of the decimal point in kilograms for natural uranium, depleted uranium or thorium, unless otherwise agreed by the CNSC.

The licensee shall maintain all accounting reports, as defined in the Glossary, at the same place of decimal to minimise differences due to rounding.

10.0 REPORTING OF FOREIGN OBLIGATIONS

Canada has established a number of bilateral Nuclear Cooperation Agreements with potential nuclear trading partners. The NCAs typically prescribe reciprocal conditions on the use of nuclear materials, equipment and information that are assumed by the importing government. Such conditions can include the tracking and periodic reporting on nuclear materials, equipment and information that are subject to the NCAs.

Items or quantities of materials that are transferred subject to an NCA are identified as such solely by way of government-to-government communications and agreement. In cases where nuclear material, equipment and information transferred to Canada is made subject to a bilateral NCA, the material is identified to the importer by the CNSC as “obligated” and must be tracked and reported by the licensee as being obligated to the country or entity that has requested the obligation.

Where a receiver is notified by the shipper in a transfer that nuclear material, controlled nuclear equipment or controlled nuclear information is obligated, the receiver is required to assume responsibility for tracking and reporting on that obligation to the CNSC.

Licensees are required to track and report on foreign obligations associated with inventory and category changes. Inventory changes involving Receipt Foreign (RF), Receipt Domestic (RD), Receipt at Starting Point (RS), Nuclear Production (NP), Shipment Foreign (SF), Shipment Domestic (SD), Nuclear Loss (NL), must be reported to the CNSC. Category changes must also be tracked by licensees and reported to the CNSC. Categories include ED, NE, DE, EN, ND, and DN, where the first letter denotes the original category, and the second letter is the resulting category: (E = enriched, N = natural, D = depleted uranium).

11.0 INVENTORY AND CHANGES TO INVENTORY

The licensee shall maintain an account of each element category of nuclear material in each Material Balance Area at the licensee’s facility. All changes to the Material Balance Area inventories shall be reported by the licensee to the CNSC on the Inventory Change Document, General Ledger and Summary of Inventory Change Report.

The batches, or preferably the items, of nuclear material under IAEA safeguards present during the licensee’s Physical Inventory Taking and present during the verification of the inventory by the IAEA or the CNSC shall be listed on the List of Inventory Items.

During Physical Inventory Verification by the IAEA or CNSC, an Inventory Tag shall be affixed to each batch or item in inventory by the licensee.

12.0 PHYSICAL INVENTORY REPORTS

The licensee is required to determine and report to the CNSC in accordance with Section 13, below, on the physical inventory of nuclear material in its possession and on a frequency stipulated by the CNSC or stipulated in the relevant facility attachment. A facility attachment is prepared for each facility subject to IAEA safeguards in Canada. It describes the IAEA safeguards arrangements specific for each facility.

The licensee is required to provide to the safeguards inspectors the List of Inventory Items for each category of nuclear material being verified at the commencement of the Physical Inventory Verification for that category. The format for the list of inventory items is given in Appendix D.

13.0 PHYSICAL INVENTORY TAKING, PREPARATION OF THE LIST OF INVENTORY ITEMS, AND THE RECONCILIATION STATEMENT

13.1 General Physical Inventory Taking Procedures

The licensee is required to perform a Physical Inventory Taking at a frequency stipulated by the CNSC staff or as outlined in the relevant facility attachment. The IAEA and CNSC safeguards inspectors verify the Physical Inventory Taking which has been completed by the licensee. The verification of the Physical Inventory Taking by safeguards inspectors is referred to as the Physical Inventory Verification.

13.2 Actions Taken Prior to the Physical Inventory Taking

13.2.1 Notification of the CNSC

The licensee must notify the CNSC at least 30 days in advance of the date of the Physical Inventory Taking and provide the CNSC with a written procedure outlining the steps to be taken by the licensee to perform the Physical Inventory Taking. CNSC staff may make arrangements for the licensee to provide additional personnel or equipment for the Physical Inventory Verification.

13.2.2 Tagging of Batches*

All items or batches in the inventory shall be tagged by the licensee with consecutively numbered inventory tags. The most convenient form of inventory tag is one which produces multiple copies of the information entered on the tag. One copy is collected and sorted by the licensee to compile the List of Inventory Items. The stub remains with the batch for identification and verification by the safeguards inspectors.

* A batch is homogeneous. For example, it is not permitted to group finished pellets, green pellets, a drum of ceramic uranium dioxide powder and a drum of scrap under one inventory tag. This would constitute four batches and require four separate inventory tags. Furthermore, all items in a batch must be physically grouped in the same location.

Enter the data on the inventory tags as follows:

1. Inventory tag number,
2. Batch identification,
3. Number of items in a batch,
4. Material description,
5. Gross weight,
6. Tare weight,
7. Net weight,
8. Conversion factor,
9. Enrichment (if applicable),
10. Element weight,
11. Uranium-235 weight and uranium-233 weight (if applicable), and
12. Key measurement point.

13.2.3 Prior to the Arrival of the Inspection Team

Immediately prior to the arrival of the inspection team, the licensee shall compile the List of Inventory Items for each category of nuclear material from inventory tag data sorted by physical inventory key measurement point and stratum in a consecutively numbered sequence to avoid double counting or omissions. The licensee provides copies of the List of Inventory Items to the safeguards inspectors for their use during the Physical Inventory Verification.

The licensee shall bring the facility General Ledger, for each category of nuclear material, up to date to the day of the Physical Inventory Verification. It is recommended that the facility stop the flow of material during the Physical Inventory Taking and Physical Inventory Verification. If material flow is not stopped during the Physical Inventory Taking and Physical Inventory Verification, then arrangements must be made to insure an accurate estimate of the material in-process; last minute adjustments to the List of Inventory Items and the licensee's accounts may be required.

The licensee shall prepare a Reconciliation Statement (see Appendix E) indicating, for each category of nuclear material, the adjusted book ending, the physical ending and the material unaccounted for. The material unaccounted for shall also be reported to the CNSC on an Inventory Change Document.

13.3 Physical Inventory Verification

13.3.1 Notification by the CNSC

Verification of the physical inventory follows the completion of the Physical Inventory Taking by the licensee. The CNSC provides the licensee with the names of the inspectors and the expected date of their arrival at the facility at least a week in advance of the Physical Inventory Verification, unless arrangements for unannounced or short notice inspections of the facility have been planned.

13.3.2 Audit of the Accounts

An audit of the accounts is performed and the licensee's adjusted book ending inventory is agreed to by the IAEA, the CNSC and the facility and recorded on the reconciliation statement. Any agreed changes to the reconciliation statement will be recorded as a revision to the reconciliation statement.

13.3.3 Verification of Inventory Items

The inspection team selects items from the list of inventory items to be verified. Verification varies from simply observing the presence of an item to a complete measurement involving weighing, sampling and analysis. If numerous or large discrepancies are found, the number of items verified is increased accordingly.

Notes indicating such things as discrepancies in quantity and other observations are entered on the facility, IAEA and CNSC list of inventory items sheets.

The licensee recalculates, if necessary, the physical endings and the material unaccounted for taking into account any adjustments made to the List of Inventory Items or General Ledger during the Physical Inventory Verification.

The agreed to reconciliation statement is signed by a representative of the licensee, the IAEA, and the CNSC.

The difference between the licensee's adjusted book ending and the physical ending is reported as material unaccounted for on the reconciliation statement and on the inventory change document before the safeguards inspectors leave.

13.4 Following the Physical Inventory Verification

13.4.1 Submission to the CNSC

If CNSC inspectors did not attend the Physical Inventory Verification, the licensee must forward to the CNSC, no later than the day following the completion of the Physical Inventory Verification, the List of Inventory Items, the Reconciliation Statement, and for each category of nuclear material, an Inventory Change Document to report the quantity of nuclear material unaccounted for, and a general ledger for the period from the previous month end to the date of the Physical Inventory Verification. The ending balance of the general ledger must be the same as the physical ending reported on the Reconciliation Statement.

Within seven days of end of the month following the completion of the Physical Inventory Verification, the licensee shall forward to the CNSC, for each category of nuclear material, a general ledger for the period from the day following the Physical Inventory Verification to the end of the month. The starting balance of the general ledger must be the same as the physical ending reported on the Reconciliation Statement.

14.0 CHANGES TO THE INVENTORY OF NUCLEAR MATERIALS

All inventory changes of Group 1 nuclear material must be reported to the CNSC by the licensee on the Inventory Change Document. In addition, a General Ledger and a Summary of Inventory Changes report shall also be submitted to the CNSC by the licensee in accordance with Section 18, below.

14.1 Irradiated Group 1 Research Reactor Fuel

In addition to the requirements of Section 14.0, above, the shipper must provide for each transfer of irradiated Group 1 research reactor fuel, on an Inventory Change Document, the following information to the CNSC:

1. The number of fuel items;
2. The total initial weight of source material and fissile isotope in the batch of fuel items, based on the fabricator's data;
3. The total final weight of source material and fissile isotope in the batch of fuel items, as of the day of discharge from the reactor;
4. If required by the facility attachment, the total nuclear loss and nuclear production weight of source material and fissile isotope in the batch of fuel items, as of the day of discharge from the reactor; and,
5. If required by the facility attachment, for shipments for reprocessing the total plutonium-241 decay during storage, per fuel bundle or per batch, is calculated as of the date stipulated in the facility attachment.

Note: Nuclear loss and nuclear production, as a consequence of irradiation, is calculated using data in 14.1 (2) and (3).

The above data is required to be submitted to the CNSC for used fuel that is permanently discharged but not for used fuel that is temporarily discharged for shuffling or recycling back into the reactor. The licensee may choose the method of calculating the final amount of fissile isotope but it must first be approved by the CNSC.

14.2 International Transfers of Nuclear Materials

See also Section 10.0, above, which deals with the reporting of foreign obligations.

14.2.1 Export of Nuclear Materials

An Inventory Change Document shall be submitted to the CNSC by the shipper as per sections 14.0 or 14.1.

14.2.2 Import of Nuclear Materials

An Inventory Change Document shall be submitted to the CNSC by the receiver as per section 14.0. The transfer shall have a transfer number assigned from the receiver's report numbering series.

15.0 OTHER REPORTS

Licensees receiving Group 1 nuclear material and converting to Group 2 nuclear material shall acknowledge receipt on the Inventory Change Document and submit an annual report to the CNSC showing receipts, quantities of Group 1 nuclear material converted to Group 2 nuclear material and subsequent shipments of Group 2 nuclear material.

Unless stipulated by the CNSC, licensees receiving only Group 2 nuclear material are required to submit reports to the CNSC.

16.0 REPORTING INVENTORY CHANGES

All inventory changes (see Glossary) of nuclear materials are to be reported using specified data elements and the Inventory Change Document format (see Section 17 and Appendix A, below).

16.1 Initiation, Distribution and Acknowledgement of Inventory Change Documents

16.1.1 Domestic Transfers of Nuclear Material

An Inventory Change Document shall be initiated by the shipper on the day of shipment and submitted to the CNSC and the receiver on the same day. The receiver shall acknowledge receipt of the material by completing and signing the Inventory Change Document and submitting copies to the CNSC and the shipper no later than the close of business on the same day of receipt.

16.1.2 Receiver of Nuclear Material

The receiver shall complete, on the copy of the Inventory Change Document that the receiver receives from the shipper, the following boxes:

1. Box 412, enter the date the material was received in the Receiver Data section;
2. Box 407, enter the flow key measurement point;
3. Box 411, enter the inventory change code "RD" for domestic receipt, or "RF" for foreign receipt (import);
4. Box 469, enter the appropriate measurement identification code;
5. Receiver signature.

The receiver shall sign the Inventory Change Document in the receiver's signature box.

The receiver's completed and signed copy of the Inventory Change Document should be sent to the shipper and to the CNSC to report that the nuclear material has been received. Each receiver of reportable quantities of nuclear material must submit an Inventory Change Document no later than the close of business on the same day of receipt.

16.1.3 Exports of Nuclear Material

The procedure for domestic transfers is recommended to be used for all exports of nuclear materials. If this procedure cannot be completely followed, the shipper shall initiate the Inventory Change Document and submit it to the CNSC no later than the close of business on the same day of shipment. Copies of the Inventory Change Document may be submitted to the foreign receiver at the shipper's discretion.

The shipper shall submit to the CNSC whatever acknowledgement of receipt is obtained from the foreign receiver no later than the close of business on the same day of receipt of the acknowledgement.

16.1.4 Imports of Nuclear Material

The Canadian receiver shall complete the Inventory Change Document and submit it to the CNSC no later than the close of business on the same day of receipt.

17.0 INVENTORY CHANGE DOCUMENT

Refer to Appendix A for detailed instructions for completing the Inventory Change Document.

An Inventory Change Document must be submitted to the CNSC. The Inventory Change Document may be prepared in the labelled format (see Appendix L), written to a digital or optical medium and transmitted in electronic form to the CNSC, in near real time, as instructed by the CNSC. The printed information must be complete and decipherable.

Two brief examples follow.

Example 1

In Box 1020, IAEA Safeguarded, enter “NO” if the material is known to be exempted, terminated or if the material is known to be in a non-safeguarded form.

Example 2

Reporting Foreign Obligation(s) and Origin of Nuclear Material Subject to the Transfer: In Box 2004, identify any foreign obligation associated with the item or quantity of material that is being imported, exported or transferred domestically. The foreign obligation is to be identified using the codes identified in the Reporting Identification Symbols Directory found in Appendix J.

In Box 2003, identify the country of origin associated with the item or quantity of material that is being imported, exported or transferred domestically. The country of origin is to be identified using the Reporting Identification Symbols Directory found in Appendix J.

Where only a portion of an item or quantity of material has foreign obligations attached to it, separate line items are needed for Box 2004 to identify the portions associated with each obligation. The CNSC accepts the use of a proportional approach in associating foreign obligations to specific portions of an item or material. Where more than one foreign obligation has been placed on the same item or quantity of material, that item or quantity of material is deemed to be obligated to each of the countries or entities simultaneously.

Clarification: Where a given quantity of material is identified as being obligated to both country X and country Y, this results in the given quantity of material being obligated to both countries simultaneously. This does not result in half the material being obligated to country X and the resultant half being obligated to country Y.

The country of origin and any foreign obligations must be recorded and tracked by each licensee possessing the item or quantity of material.

Example: If a given quantity of material is identified as being of country X origin and of country Y obligation, these two attributes must be retained in the records maintained by the licensee possessing the material. The attributed foreign obligation cannot be transferred to material identified as having a different country of origin.

Note: There are boxes on the Inventory Change Document that are to be completed only by the CNSC.

18.0 GENERAL LEDGER AND SUMMARY OF INVENTORY CHANGE

18.1 Reportable Quantities

Transfers of Group 1 materials shall be reported regardless of quantity on a monthly basis via a General Ledger and the Summary of Inventory Change. The General Ledger and the Summary of Inventory Change must be submitted to the CNSC by the seventh day of the following month. An example of the format and the details for completing the General Ledger are included in Appendix B.

18.2 Group 2 Material Production Reports

Licensees converting Group 1 nuclear material to Group 2 nuclear material must submit an annual General Ledger. If material is transferred from a facility in both Group 1 and Group 2 form, a clear distinction in the General Ledger must be made between the two groups of material.

18.3 Computer Printed Ledgers

Reports may be prepared in a labelled format, written to a digital or optical medium or transmitted to the CNSC in near real time by a method as instructed by the CNSC. The labelled formats are found in Appendix L.

19.0 ACCOUNT AUDITS

Licensees of nuclear material and facilities are subject to account audits by CNSC staff or IAEA. These audits take place during physical inventory verifications, interim inventory verifications and unannounced or short notice inspections.

During an account audit, safeguards inspectors examine the licensee's reports, records, and source documents for correctness, completeness, and internal consistency. The inspectors also compare, for consistency, the licensee's accounts with the CNSC State Reports. These activities are also referred to as a book audit.

19.1 Licensee Responsibilities

The licensee must assist the CNSC or IAEA during account audits by providing access to records, reports and source documents and by providing explanations with regard to the accounts when requested.

20.0 NUCLEAR MATERIAL ACCOUNTING REPORTS

20.1 Data Elements

Each piece of information (data element) in an accounting report is associated with a three or four digit numeric label (number) that identifies the information. Three digit labels are for information that is required for safeguards. Four digit labels are for information that the CNSC requires for purposes other than IAEA safeguards. The labelled formats are found in Appendix L.

20.2 Labels

Licensees shall use the labels (numbers) in Appendix H to identify the information (data elements) in accounting reports.

20.3 Material Balance Area

The Material Balance Area is the basic reporting unit. For every such Material Balance Area, the nuclear material is accounted for and reported in Inventory Change Documents and List of Inventory Items by batch.

20.4 Report Entries

Nuclear material accounting reports are made up of labelled data elements. A set of data elements logically connected to each other comprises a report entry (record), a set of which (pertaining to the same Material Balance Area) is considered to be a report.

GLOSSARY

Account audit

An examination by the IAEA or CNSC safeguards 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 Material Balance Area:

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.

Adjusted book 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.

Agency

The International Atomic Energy Agency is referred to as “the Agency” in the safeguards agreement.

Agreement

IAEA 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*

Batch

A portion of nuclear material handled as a unit for accounting purposes at a key measurement point and for which the composition and quantity are defined by a single set of specifications or measurements. The nuclear material may be in bulk form or contained in a number of separate items.

Batch data

The total weight of each element of nuclear material and, in the case of plutonium and uranium, the isotopic composition when appropriate. The units of account shall be as follows:

1. Grams of contained plutonium;
2. Grams of total uranium and grams of contained uranium-235 plus uranium-233 for uranium enriched in these isotopes; and
3. Kilograms of contained thorium, natural uranium or depleted uranium.

For reporting purposes, the weights of individual items in the batch shall be added together before rounding to the nearest unit. Although the facilities are left to use the precision and accuracy they normally employ for contract purposes, they must adhere to the units of account.

Book inventory

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

Burn-up

See definition for “nuclear loss” below.

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.

Data element

Information in a report, it consists of a unique three or four digit numeric label, a value, and delimiters. A set of data elements logically connected to each other comprises a report entry (record), a set of records (pertaining to the same Material Balance Area) is a considered a report.

Discrepancy

An inconsistency found in the facility operator’s records, or between facility records and State reports or between these records and inspector observations or indications resulting from containment and surveillance measures. Discrepancies that cannot be resolved (i.e. ascribed to innocent causes or otherwise satisfactorily explained) may lead to the determination that declared nuclear material is unaccountably missing. A discrepancy involving 1 significant quantity or more of nuclear material is classified as a possible anomaly.

Effective kilogram

A special unit used in safeguarding nuclear material. The quantity in effective kilograms is obtained by taking:

1. For plutonium, its weight in kilograms;
2. For uranium with an enrichment of 0.01 (1%) and above, its weight in kilograms multiplied by the square of its enrichment;
3. For uranium with an enrichment below 0.01 (1%) and above 0.005 (0.5%), its weight in kilograms multiplied by 0.0001; and
4. For depleted uranium with an enrichment of 0.005 (0.5%) or below, and for thorium, its weight in kilograms multiplied by 0.00005.

Element categories of nuclear material

Depleted uranium, natural uranium, enriched uranium, plutonium and thorium

Entity

A multi-national group of countries to which foreign obligations may apply.

Facility

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

Facility attachment

Part of the subsidiary arrangements to the *Agreement between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards Pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons*. The facility attachment specifies how the safeguards procedures laid down in this Agreement are to be applied at the facility.

Facility inventory change document report numbering series

An integer numbering sequence that a licensee uses to assign batch names to Inventory Change Documents. The first number in the sequence is 1, with each consecutive Inventory Change Document issued the next number in the series.

Facility safeguards approach

The approach selected for safeguards implementation at a specific facility, developed by adapting the model approach (where such exists) to account for actual conditions at the facility as compared with the reference plant. The provisions for implementing the facility safeguards approach are incorporated in the subsidiary arrangements.

Fertile material

Nuclear material that can be converted into a special fissionable material through 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, but not uranium-235 present in natural or depleted uranium.

Foreign obligation

A condition or set of conditions on the use of nuclear material, controlled nuclear equipment or controlled nuclear information that are assumed by the importing government in accordance with the non-proliferation policy requirements of the supplying party. Such foreign obligations can include the tracking and periodic reporting on nuclear material, controlled nuclear equipment or controlled nuclear information that are subject to Nuclear Cooperation Agreements (NCAs). In cases where nuclear material, controlled nuclear equipment or controlled nuclear information transferred to Canada is made subject to a bilateral NCA, it is identified to the importer by the CNSC as “obligated” and must be tracked and reported by the licensee as being obligated to the country, countries or entity that made the request.

For clarity, the country, countries or entity of foreign obligation are not necessarily the country(ies) of origin or the country(ies) of supply. The country, countries or entity of obligation, origin and supply may all be different. The country of origin is identified as the jurisdiction within which that the nuclear material, controlled nuclear equipment or controlled nuclear information was manufactured, mined or developed. In the case of nuclear material, processing in another jurisdiction does not alter the country of origin.

Nuclear material, controlled nuclear equipment or controlled nuclear information that is transferred subject to an NCA is identified as such solely by way of government-to-government communications and agreement. Those identified by the CNSC as being subject to an NCA are said to be obligated and must be tracked and periodically reported to ensure that bilateral requirements are met. For a given quantity of nuclear material, controlled nuclear equipment or controlled nuclear information, there may be a single country of obligation, multiple countries of obligation, or no foreign obligations at all. Where an item or a quantity of material has not been identified by the CNSC as being foreign obligated, it is said to have no obligations or is unobligated.

The licensee in possession of the nuclear material, controlled nuclear equipment or controlled nuclear information will be notified in writing by the CNSC when a foreign obligation is attributed to it. This is typically done at the time of issuance of an import licence by the CNSC, but may occur at some other time. Where there has been no such notification by the CNSC, the item or material in question may be considered unobligated.

Gross weight

The total weight of a batch of nuclear material.

IAEA interim inventory verification

An inspection activity that does not coincide with the ending date of a material balance period and does not necessarily have to include all nuclear material present in the Material Balance Area. Verification of nuclear material is made for purpose of the timely detection of the diversion of nuclear material or, for example, the re-establishment of the nuclear material inventory within an area covered by surveillance after a failure of surveillance.

Identity data

Those data needed to uniquely characterize an item, batch or stratum. Examples are a material balance area, nuclear material category, batch identification, material description, and type and date of an inventory change.

Integrated safeguards

The optimum combination of all safeguards measures available to the IAEA under comprehensive safeguards agreements and additional protocols to achieve maximum effectiveness and efficiency in meeting the IAEA's safeguards commitments within available resources. Integrated safeguards are implemented in a State only when the IAEA has drawn a conclusion of the absence of undeclared nuclear material and activities in that State. Under integrated safeguards, measures may be applied at reduced levels at certain facilities, compared with the measures that would have been applied without this conclusion.

Inventory change

An increase or decrease of nuclear material, in terms of batches, in a material balance area. A complete list of inventory changes is given in Appendix A.2, paragraph 27, including the following examples:

1. Increases
 - a) Import;
 - b) Domestic receipt: receipts from other material balance areas, receipts from a non-safeguarded (non-peaceful) activity or receipts at the starting point of safeguards;
 - c) Nuclear production: production of special fissionable material in a reactor; and
 - d) De-exemption: re-application of safeguards on nuclear material previously exempted due to its use or quantity.
2. Decreases
 - a) Export;
 - b) Domestic shipment: shipments to other material balance areas or shipments for a non-safeguarded (non-peaceful) activity;
 - c) Nuclear loss: loss of nuclear material due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions;
 - d) Measured discard: nuclear material which has been measured, or estimated on the basis of measurements, and disposed of in such a way that it is not suitable for further nuclear use;

- e) Retained waste: nuclear material generated from processing or from an operational accident, which is deemed to be unrecoverable for the time being but which is stored;
- f) Exemption: exemption of nuclear material from safeguards on account of its use or quantity; and
- g) Other loss: for example, accidental loss (that is irretrievable and inadvertent loss of nuclear material as the result of an operational accident) or theft.
- h) Inventory changes are reported by the licensee to the CNSC in the inventory change document and by the CNSC to the IAEA in the inventory change report.

Key measurement point

A location where nuclear material appears in such a form that it may be measured to determine material flow or inventory. Key measurement points include, but are not limited to, the inputs and outputs (including measured discards) and storages in material balance areas. Flow key measurement points are places in the material balance area where the flow of nuclear material is determined. Physical inventory key measurement points are places in the Material Balance Area where the physical inventory of nuclear material is determined.

Labels

Three or four digit numbers used to unambiguously identify information in accounts.

Location outside facilities

Any installation or location, which is not a facility, where nuclear material is customarily used in amounts of one effective kilogram or less.

Low enriched uranium

Enriched uranium containing less than 20% of the isotope uranium-235. Low enriched uranium is considered a special fissionable material and an indirect use material.

Material balance area

An area in and outside of a facility such that:

- a) The quantity of nuclear material in each transfer into and out of the area can be determined; and
- b) The physical inventory of nuclear material in each Material Balance Area can be determined when necessary, in accordance with specified procedures, in order that the material balance for IAEA safeguards purposes can be established.

Material balance period

The term used to refer to the time between two consecutive Physical Inventory Takings.

Material unaccounted for

The difference between book inventory and physical inventory. See Appendix E.1, Definition/Explanation.

Net weight

The weight of the contents of a container. Gross weight minus the tare weight equals the net weight.

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 (e.g. of plutonium-241) during storage.

Nuclear material

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

Nuclear production

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

Operating records

A set of data kept at each facility on the operation of the facility in connection with the use or handling of nuclear material. The operating records of a reactor show, for example, the integrated thermal power produced by the reactor for a given period and the associated data of the reactor operation for that period as needed to determine the nuclear production and nuclear loss, and the location of each fuel element at any time.

Operator

The person or organization responsible for the nuclear material inventory.

Physical inventory

The sum of all the measured or derived estimates of batch quantities of nuclear material on hand at a given time within a material balance area obtained in accordance with specified procedures.

Physical inventory verification

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

Rebatching

Accounting for changes in the inventory of an individual batch of nuclear material.

Reporting identification symbol

A unique combination of letters and numbers that is assigned to shippers and receivers of nuclear material.

Safeguards approach

A set of measures chosen for the implementation of safeguards in a given situation in order to meet the applicable objectives. The safeguards approach takes into account the specific features of the safeguards agreement and, where applicable, whether the IAEA has drawn a conclusion of the absence of undeclared nuclear material and activities in the State. Safeguards approaches are developed for each facility under safeguards. In addition, safeguards approaches may be developed for generic facility types and, mainly under integrated safeguards, for the State as a whole.

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 Material Balance Area.

Source material

Uranium containing the mixture of isotopes occurring in nature; uranium depleted in the isotope 235; thorium; any of the foregoing in the form of metal, alloy, chemical compound, or concentrate. The term source material shall not be interpreted as applying to ore or ore residue. Ore concentrate is considered to be source material.

Special fissionable material

Plutonium-239; uranium-233; uranium enriched in the isotopes 235 or 233; any material containing one or more of the foregoing. The term 'special fissionable material' does not include source material.

State level safeguards approach

A safeguards approach developed for a specific State, encompassing all nuclear material, nuclear installations and nuclear fuel cycle related activities in that State. A State level safeguards approach defines the application of safeguards measures at each facility and location outside facilities in the State and, where an additional protocol is in force, the safeguards measures that would enable the IAEA to draw and maintain a conclusion of the absence of undeclared nuclear material and activities in that State.

Supporting document

A record containing identity data, source data and batch data for each accounting transaction, such as shipping documents, weight (volume) records, laboratory records, charge/discharge records and power production records.

Source document

A supporting document that is the source of the information on a related report or record.

State reports

Accounting reports that the CNSC is required to submit to the IAEA in accordance with the safeguards agreement. During IAEA account audits, state reports for a facility are compared with the facility accounting reports and records.

Stratum

A grouping of items and/or batches having similar physical and chemical characteristics (e.g. isotopic composition) made for the purpose of facilitating statistical sampling. The desired end result of stratification is that the items in a particular stratum are more like one another with respect to certain characteristics relevant for verification measurement and safeguards data analysis purposes than they are like the items in the other strata. In practice, a stratum may contain dissimilar materials as long as the facility operator used one method for measurement and the inspector used one method for verification (not necessarily the same). Stratification simplifies verification, making it possible to formulate the sampling plans needed to verify a material balance and to calculate its uncertainty. The operator and the IAEA should cooperate in defining strata so that the purposes of stratification are met.

Tare weight

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

Unannounced inspection

An inspection performed at a facility or a location outside facilities for which no advance notice is provided by the IAEA to the State before the arrival of IAEA inspectors.

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. The material balance area and the CNSC must account for and report grams of total uranium and grams of contained uranium-235, plus uranium-233, regardless of the enrichment for the batch of nuclear material. The use of a unified uranium account is a point of negotiation in the subsidiary arrangements. Currently unified uranium is not used in Canada.

Weight data

The numeric label and the element or isotope weight of an item or batch of nuclear material. The meanings of the individual numeric labels for this data element are:

600	unified uranium	weight of element
610	natural uranium	weight of element
620	depleted uranium	weight of element
630	enriched uranium	weight of element
640	enriched/unified uranium-233 content	weight of isotope
650	enriched/unified uranium-234 content	weight of isotope
660	enriched/unified uranium-233 + uranium-235 content	weight of isotopes
670	enriched/unified uranium-235 content	weight of isotope
680	enriched /unified uranium-236 content	weight of isotope
690	enriched /unified uranium-238 content	weight of isotope
700	plutonium	weight of element
710	plutonium-238 content	weight of isotope
720	plutonium-239 content	weight of isotope
730	plutonium-240 content	weight of isotope
740	plutonium -241 content	weight of isotope
750	plutonium -242 content	weight of isotope
760	plutonium -239 + plutonium-241 content	weight of isotopes
770	natural uranium fissile content	weight of isotope
780	depleted uranium fissile content	weight of isotope
800	thorium	weight of element

ABBREVIATIONS

BA	adjusted book ending
BE	book ending
CNSC	Canadian Nuclear Safety Commission
Code 10	Chapter 10 of the subsidiary arrangements of the Canada/IAEA safeguards agreement
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	depleted uranium or de-exemption use
E	element code for enriched uranium
ekg	effective kilograms
ED	enriched uranium to depleted uranium category change
EN	enriched uranium to natural uranium category change
EQ	exemption, quantity
EU	exemption, use
FA	facility attachment
FW	retransfer from retained waste
g	grams
G	isotope code for uranium enriched in uranium-235
GA	accidental gain
GL	general ledger
HEU	high enriched uranium
IAEA	International Atomic Energy Agency
ICD	inventory change document
IIV	interim inventory verification
IT	inventory tag
J	isotope code for uranium enriched in uranium-235 and uranium-233
K	isotope code for uranium enriched in uranium-233
kg	kilograms
KMP	key measurement point
L	measurement identification code for batch data are based on measurements made at another material balance area which has been reported for the present material balance area in a preceding ICD or list of inventory items

LA	accidental loss
LD	measured discard
LEU	low enriched uranium
LII	list of inventory items
LOF	location outside facilities
LN	nuclear loss
M	measurement identification code for batch data based on fresh measurements made at the material balance area
MBA	material balance area
MDC	material description code
MF	material unaccounted for
MUF	material unaccounted for
N	element code for natural uranium
N	measurement identification code for batch data are based on measurements made at another MBA
ND	natural uranium to depleted uranium category change
NE	natural uranium to enriched uranium category change
NP	nuclear production
NRT	near real time
NSCA	Nuclear Safety and Control Act
P	element code for plutonium
PE	physical ending
PIT	physical inventory taking
PIV	physical inventory verification
Pu	plutonium
RCS	reconciliation statement
RD	receipt, domestic
RF	receipt foreign
RFD	request for de-exemption
RFE	request for exemption
RIS	reporting identification symbol
RM	decrease in batch content
RN	receipt from non-safeguarded activity
RP	increase in batch content
RS	receipt at starting points
SA	subsidiary arrangement to the safeguards agreement
SD	shipment, domestic
SF	shipment, foreign
SIC	summary of inventory change report
SN	shipment to non-safeguarded activity

T	thorium
T	measurement identification code for batch data based on measurements made at the present MBA that has been reported in a preceding ICD or LII; measurements have not been repeated
Th	thorium
TU	termination from safeguards
TW	transfer to retained waste
U	uranium
UI	unannounced inspection

APPENDIX A INVENTORY CHANGE DOCUMENT



Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Inventory Change Document

IAEA SAFEGUARDED YES <input type="checkbox"/> NO <input type="checkbox"/>		ENTRY STATUS		FROM (MSA)		TO (MSA)		SHIPPED (DD/MM/YY) <input type="checkbox"/>		RECEIVED (DD/MM/YY) <input type="checkbox"/>	
1020		309		370		372		2001		2002	
BATCH NAME				SHIPPER'S BATCH NAME		REVISION		EXPORT LICENCE NUMBER		IMPORT LICENCE NUMBER	
446				447		1021		2001		2002	
SHIPPER/RECEIVER DATA											
NUMBER OF ITEMS	MATERIAL DESCRIPTION CODE(S)	OPERATOR'S MATERIAL DESCRIPTION CODE(S)	ELEMENT CODE	NET WEIGHT	ELEMENT WEIGHT	UNIT (KG/G)	ISOTOPE WEIGHT	ISOTOPE CODE	UNIQUE IDENTIFIER	COUNTRY OF ORIGIN	FOREIGN OBLIGATION CODE
470	430	435	1006	1013	600,610,620,630,700,800	1023	640-90,710-90	1024		1025	2003
REMARKS/COMMENTS 1004											
SHIPPER (NAME AND ADDRESS)						RECEIVER (NAME AND ADDRESS)			CHEMICAL AND PHYSICAL DESCRIPTION		
1027						1028			436		
KEY MEASUREMENT CODE			INVENTORY CHANGE TYPE			MEASUREMENT IDENTIFICATION CODE			OWNER		
407			411			469			1029		
SIGNATURE						SIGNATURE			COUNTRY OF INTENDED END-USE		
2005						2005			2005		
SIGNATURE						SIGNATURE			HOLDING ACCOUNT CODE		
2006						2006			2006		
CNSC OFFICE USE ONLY									CONTRACT NUMBER		
COPY(S) FORWARDED TO ASSIGNED COUNTRY OFFICER(S)						DATA ENTERED BY					
2007						2007			2007		

BATCH NAME 446

A.1 Instructions for Completing the Inventory Change Document

Inventory changes of nuclear material are reported on the inventory change document. The instructions below explain the data required for each box on the form. The box number is the same as the label number for that information.

There can be no more than one batch per inventory change. A 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 material balance area to another material balance area, this would be one transfer of nuclear material but two inventory changes because the nuclear material transferred has two different physical forms and therefore constitutes two batches of nuclear material.

1) Box 1020 IAEA Safeguards Status

This box is used to report if the nuclear material is subject to IAEA safeguards. For most cases, the response should be “Yes” in Box 1020. Enter “No” if the material is known to be exempted, or terminated from safeguards, or if the material is known to be in a non-safeguarded form.

If the material is known to be exempted from safeguards enter “exempted, use”, “exempted, quantity”, or “termination” in the Remarks, Box 1004, as appropriate.

2) Box 309 Entry Status

This box indicates whether the entry is new, to be ignored, a correction, an addition or a deletion.

- a) Enter “N”, for a new entry,
- b) Enter “U”, for an entry to be ignored by the IAEA,
- c) Enter “C”, for an entry serving as correction/revision to an earlier one,
- d) Enter “D”, for an entry deleting the one referenced by this entry, or
- e) Enter “A”, for an entry to be added to a previous report.

3) Box 370 Shipper of Nuclear Material

This box identifies the shipper of nuclear material. Enter the appropriate reporting identification symbol code as per Appendix J.

For imports (RFs) enter the country code, facility code or MBA code of the foreign shipper. For domestic receipts (RDs), enter the reporting identification symbol code of the shipper. For all other inventory changes, enter the reporting identification symbol code of the reporting facility.

4) Box 372 Receiver of Nuclear Material

This box identifies the receiver of nuclear material. Enter the appropriate reporting identification symbol code as per Appendix J.

For exports (SFs), enter the country code, facility code or MBA code of the foreign receiver. For domestic shipments (SDs), enter the reporting identification symbol code of the receiver. For all other inventory changes, enter the reporting identification symbol code of the reporting facility.

5) Box 412 Date of Inventory Change

Enter the date on which the change in inventory occurred or was established.

6) Box 446 Batch Name

Enter the batch name of the nuclear material being reported. In particular, for inventory change document entries reporting a receipt, the batch name may be one assigned by the reporting material balance area or may be the same one used by the shipper as reported in Box 447, Shipper's Batch Name.

It is mandatory that the batch name reported in Box 446 be unique to the reporting material balance area for any inventory change on a single date. A maximum of 16 characters may be entered.

The facility originating the inventory change document should assign a batch number from the facility's inventory change document report numbering sequence.

If the inventory change code in Box 411 is "DI" (shipper/receiver difference), the batch name in Box 446 must be the same as the batch name of the receipt domestic (RD) or receipt foreign (RF) to which the DI pertains.

Each category of nuclear material in a batch should be reported on a separate line in the shipper's data section of the inventory change document. For example, two lines in the shipper's data section would be required to report a batch of spent fuel containing natural uranium and plutonium.

7) Box 447 Shipper's Batch Name

This box is used only for reporting a receipt. It is the batch name used by the shipper. If this batch name is unknown, then the keyword "unknown" is entered in Box 447. A maximum of 16 characters may be entered.

8) Box 1021 Correction Number

Enter the number of times the inventory change has been revised.

If the entry status in Box 309 is "N", then correction number must be "0" (zero) to indicate this is the original inventory change document for the inventory change. If the entry status in Box 309 is "C" the correction number must be greater than 0 (zero).

9) Box 2001 Export Licence Number

The export licence number should be entered, if applicable. If "SF" (shipment foreign) is entered in Box 411, the export licence number must be provided.

10) Box 2002 Import Licence Number

The import licence number should be entered if applicable. If "RF" (receipt foreign) is entered in Box 411, the import licence number must be provided.

11) Box 2003 Country of Origin

This box is used to identify the country of origin of nuclear material that has been imported into Canada. Enter the appropriate country code as per Appendix J.

12) Box 2004 Foreign Obligation Code

This box is used to report the country or entity of obligation. Enter the appropriate country code as per Appendix J.

13) Box 470 Numbers of Items in Batch

Enter the number of items in the batch. This number must be an integer. In the case of bulk material, and generally when the number would not be meaningful, the number "0" (zero) should be placed in this box.

14) Box 430 Material Description Code

This box consists of a four-character code indicating the physical and chemical form and irradiation status of the nuclear material in the batch. The domestic shipment of a given batch from one material balance area and its receipt in another material balance area must be reported with the same material description code.

Physical and Chemical Form

First keyword	Second keyword	First two characters
solution	nitrate fluorides other	L N L F L O
powder	homogeneous heterogeneous	P H P N
ceramics	pellets spheres other	C P C S C O
metal	pure alloys	M P M A
fuel	rods, pins plates bundles assemblies other	E R E P E B E A E O
sealed sources small quantities, samples scrap	- - homogeneous heterogeneous (cleanouts, clinkers, sludges, fines, other)	Q S S S S H S N
solid waste	hulls mixed (plastics, gloves, papers, etc.) contaminated equipment other	A H A M A C A O
liquid waste	low active medium active high active	W L W M W H

Type of container (items)

Keyword	Third Character
cylinder	C
pack	P
drum	D
discrete fuel units (for fuel only)	S
bird cage	B
bottle	F
other	O

Further Characterisation of the Material

Keyword	Fourth Character
fresh nuclear material	F
irradiated nuclear material	I
retained waste	W
irrecoverable material	N
recoverable material	R

15) Box 435 Operator's Material Description Code

If the facility's material description code differs from the material description code in Box 430; the operator's material description code should be given. A maximum of 12 characters may be entered.

16) Box 1006 Element Code

Enter the element category or categories of the nuclear material. Enter the appropriate element code from the following table:

Element Code	Element	Units	IAEA Safeguarded	Label
C	Natural uranium concentrate	kg	No	1032
U	Unified Uranium	g	Yes	600
N	Natural Uranium	kg	Yes	610
D	Depleted Uranium	kg	Yes	620
E	Enriched Uranium	g	Yes	630
P	Plutonium	g	Yes	700
T	Thorium	kg	Yes	800

17) Box 1013 Net Weight

This box is used for reporting the net weight of each category of nuclear material in the batch.

18) Box 600, 610, 620, 630, 700, 800 Element Weight

This box is used for reporting the element weight of each category of nuclear material in the batch. The element weights are to be expressed in the following units:

- a) grams for plutonium, grams of the total uranium for enriched uranium,
- b) grams for unified uranium,
- c) kilograms for natural uranium, depleted uranium and thorium.

The meanings of the individual numeric labels for this data element are:

Label	Element Category	Units
600	Unified uranium	g
610	Natural uranium	kg
620	Depleted uranium	kg
630	Enriched uranium	g
700	Plutonium	g
800	Thorium	kg

If agreed by the CNSC, the data may be rounded off, but not beyond the nearest integer of the unit used. If the batch data (element weights) are rounded, this rounding should be done by first adding the weights of the individual items comprising the batch, then rounding their sum. If the quantity is equal to or greater than 0.5 of the reporting unit, the quantity should be rounded up to the next whole reporting unit. If the quantity entered is less than 0.5 of the reporting unit, the quantity should be rounded down to the next whole reporting unit. It is recommended that data be reported in un-rounded figures.

A weight data label (600 to 800) may be reported only once per inventory change. For example, it is not permissible to report label 630 (enriched uranium) and label 640 (uranium-233) along with label 630 (enriched uranium) and label 670 (uranium-235) on a single inventory change document.

If the entry is a correction, then the difference between the element weight of the previous correction and the current correction must be reported.

19) Box 1023 Units

This box is used for reporting units as follows:

Label	Element Category	Units
600	Unified uranium	g
630	Enriched uranium	g
700	Plutonium	g
610	Natural uranium	kg
620	Depleted uranium	kg
800	Thorium	kg

20) Box 640-690, 710-780 Isotope Weight

This box is for reporting the isotope weight of each category of nuclear material in the batch. The isotope weights are to be expressed in the following units:

- a) grams for plutonium,
- b) grams for the uranium isotopes of enriched uranium, and
- c) kilograms of natural uranium, depleted uranium and thorium.

The category of unified uranium shall be reported in grams.

The meanings of the individual numeric labels for this data element are:

Label	Isotope	Units
640	enriched/unified uranium-233 content	g
650	enriched /unified uranium-234 content	g
660	enriched /unified uranium-233 + uranium-235 content	g
670	enriched /unified uranium uranium-235 content	g
680	enriched /unified uranium uranium-236 content	g
690	enriched /unified uranium uranium-238 content	g
710	plutonium-238 content	g
720	plutonium-239 content	g
730	plutonium-240 content	g
740	plutonium-241 content	g
750	plutonium-242 content	g
760	plutonium-239 + plutonium-241 content	g
770	natural uranium fissile content	kg
780	depleted uranium fissile content	kg

If agreed to by the CNSC, the data may be rounded off, but not beyond the nearest integer of the unit used. If the batch data (element weights) are rounded, this rounding should be done by first adding the weights of the individual items comprising the batch, then rounding their sum. If the quantity is equal to or greater than 0.5 of the reporting unit, the quantity should be rounded up to the next whole reporting unit. If the quantity entered is less than 0.5 of the reporting unit, the quantity should be rounded down to the next whole reporting unit. It is recommended that data be reported in un-rounded figures.

A weight data label (600 to 800) may be reported only once per inventory change. For example, it is not permissible to report label 630 (enriched uranium) and label 640 (uranium-233) along with label 630 (enriched uranium) and label 670 (uranium-235) on a single inventory change document.

If the entry is a correction, then the difference between the isotope weight of the previous correction and the current correction must be reported.

21) Box 1024 Isotope Code for Uranium

Enter one of the isotope codes below.

Isotope Code	Isotope
K	enriched/unified uranium-233 content
J	enriched /unified uranium-233 + uranium-235 content
G	enriched /unified uranium-235 content

22) Box 1025 Unique Identifier

Enter any unique batch identification such as the lot number or cylinder number.

23) Box 1004 Comments/Remarks

Enter any additional information.

- 24) Box 1027 Name and Address of the Shipper

Enter the name and address of the shipper.

- 25) Box 1028 Name and Address of the Receiver

Enter the name and address of the receiver.

- 26) Box 407 Key Measurement Point

Enter the flow key measurement point code specified in the facility attachment.

- 27) Box 411 Type of Inventory Change

Enter the appropriate code from the following:

Keyword	Code	Explanation
Receipt foreign	RF	Import of nuclear material into Canada.
Receipt domestic	RD	Domestic receipt of nuclear material from another material balance area.
Receipt at starting point	RS	Domestic receipt of nuclear material at starting point of safeguards. RS is used to report the production of uranium dioxide, uranium hexafluoride and uranium metal.
Receipt from non-safeguarded activity	RN	Domestic receipt of nuclear material from non-safeguarded (permitted military) activity. RN is not currently used in Canada.
Nuclear production	NP	Production of fissionable material in a reactor (plutonium, uranium-233). Nuclear production of plutonium is generally reported monthly.
De-exemption, use	DU	Reapplication of safeguards on nuclear material previously exempted on the basis of use. A DU should not be reported until the facility receives confirmation that the request for exemption has been approved by the CNSC/IAEA.
De-exemption, quantity	DQ	Reapplication of safeguards on nuclear material previously exempted on the basis of quantity. A DQ should not be reported until the facility receives confirmation that the request for de-exemption has been approved by the CNSC/IAEA.
Shipment, foreign	SF	Export of nuclear material out of Canada.
Shipment, domestic	SD	Domestic transfer of nuclear material to another material balance area.
Shipment to non-safeguarded activity	SN	Domestic transfer of nuclear material to non-safeguarded (permitted military) activity.
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 loss is generally reported monthly.

Keyword	Code	Explanation
Measured discard	LD	Operational loss, i.e., loss of a measured or estimated (on the basis of measurement) quantity of nuclear material from processing which has been disposed of in such a way that it is not suitable for further nuclear use.
Transfer to retained waste	TW	Transfer to the retained waste category of measured nuclear material which is deemed to be irrecoverable, to be stored at the material balance area and to be deleted from the inventory of the material balance area.
Retransfer from retained waste	FW	Retransfer of material which had been stored at the material balance area 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 material balance area or for transfer from the material balance area subject to IAEA safeguards.
Exemption, use	EU	Exemption of nuclear material from safeguards on the basis of the use of the material. An EU should not be reported until the facility receives confirmation that the request for exemption has been approved by the CNSC/IAEA.
Exemption, quantity	EQ	Exemption of nuclear material from safeguards on the basis of quantity. An EQ should not be reported until the facility receives confirmation that the request for exemption has been approved by the CNSC/IAEA.
Termination	TU	Termination of safeguards on nuclear material. A TU must not be reported without the approval of the CNSC.
Accidental loss	LA	Irretrievable and inadvertent loss of a known quantity of nuclear material as the result of an operational accident.
Accidental gain	GA	Nuclear material unexpectedly found to be present in the material balance area, except when detected in the course of a physical inventory taking.
Category change (with the appropriate code as shown). This procedure is not applicable in material balance area which report in terms of 'unified uranium'.	EN ED NE ND DE DN	<p>The quantity of uranium which 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).</p> <p>The material description codes (labels 430 and if appropriate 435) should be those for the resulting material. The weight data (in labels 610, 620, 630, 640, 660, 670, 770, 780 as appropriate) should be provided both for the originating and for the resulting category. These entries should be consolidated into the material balances for both categories.</p>

In addition to the inventory changes described above, the inventory may be adjusted in accordance with the results of measurements performed in the material balance area on nuclear material previously recorded and reported on shipper's data. The keyword and the code are as follows:

Keyword	Code	Explanation
Shipper-receiver difference	DI	<p>The 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 material balance area.</p> <p>DIs can be reported for foreign receipts (RF) and as well as for domestic receipts (RD)</p> <p>DI applies only to weights (not to the number of items)</p> <p>DI = shipper's weight minus receiver's weight</p> <p>If the receiver's element weight is greater than the shipper's element weight, the element weight reported for the DI should be reported with a negative sign.</p> <p>If the receiver's isotope weight is greater than the shipper's isotope weight, the isotope weight reported for the DI should be reported with a negative sign.</p> <p>A positive DI decreases the balance of nuclear material a material balance area; a negative DI (one with a negative sign preceding the weight) increases the balance.</p> <p>It is possible to have a shipper/receiver difference for the element weight and not the isotope weight and visa versa.</p> <p>A DI should not be reported if shipper's element weight, minus receiver's element weight, is zero and shipper's isotope weight, minus receiver's isotope weight, is zero.</p> <p>The DI has to be directly linked by the batch name (label 446) to the domestic or foreign receipt to which it pertains.</p> <p>The batch name for a DI must be the same as the batch name of the domestic or foreign receipt to which the DI pertains.</p> <p>A DI has to relate to only one domestic or foreign receipt.</p> <p>There can not be a single DI for several RDs or for several RFs.</p> <p>The measurement identification code (label 469) for the receipt, domestic (RD) or receipt, foreign (RF) associated with the DI must be "N" (batch data are based on measurements made at another material balance area). The measurement identification code (label 469) for the DI must be "M" (batch data are based on fresh measurements made at the material balance area).</p>
The following, which are not inventory changes, are for reporting changes in batch identification or content.		
Decrease in batch content	RM	The quantity by which the batch mentioned in the entry is diminished due to rebatching.

Increase in batch content	RP	The quantity of material added to the batch mentioned in the entry from another batch due to rebatching.
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The batch decreases (RM) and increases (RP) involved in rebatching should be reported simultaneously in separate entries. In any given inventory change document the sum of entries with the code RM should be equal to the sum of entries with the code RP. Since these entries do not change the total inventory, they should be ignored during the calculation of the balance of the general ledger.

Prior authorization is required from the CNSC to report an inventory change code which is not identified in the facility attachment.

28) Box 469 Measurement Identification Code

Enter the appropriate letter to indicate the measurement identification code.

- a) Enter “N”, if batch data are based on measurements made at another material balance area;
- b) Enter “L”, if batch data are based on measurements made at another material balance area and have been reported for the present material balance area in a preceding inventory change document or list of inventory items;
- c) Enter “M”, if the batch data are based on fresh measurements made at the material balance area; or
- d) Enter “T”, if the batch data are based on measurements made at the present material balance area and have been reported in a preceding inventory change document or list of inventory items; the measurements have not been repeated.

29) Box 436 Chemical and Physical Description

Enter a textual description of the batch. A maximum of 100 characters may be used.

30) Box 1029 Owner

Enter the owner of the material.

31) Box 2005 Country of Intended End Use

Enter the country of intended end use for the material.

32) Box 2006 Holding Account Code

Enter the holding account code to identify material going to a holding location before proceeding directly to a country – refer to the reporting identification symbol as per Appendix J.

33) Box 2007 Contract Number

Enter the contract number associated to this transfer, if applicable.

34) Signature

If submitted on paper, the inventory change document must be signed by an authorized representative of the licensee. Each licensee must establish internal procedures to ensure that the information provided in the report is accurate and that the report has been prepared and issued only by authorized licensee personnel.

An authorized representative of the licensee issuing the inventory change document for all types of inventory changes, except domestic and foreign receipts, should sign the inventory change document in this area.

35) Receiver Signature

This area on the receiver's copy of the inventory change document should be signed by the Canadian receiver of the nuclear material.

B.1 Instructions for Completing the General Ledger

The General Ledger consists of the following:

- a) a heading;
- b) a starting balance for the period;
- c) a running balance;
- d) a closing balance for the period; and
- e) inventory changes that occurred or were established during the period.

A General Ledger must be maintained for each element category of nuclear material in the material balance area.

The information for an inventory change recorded on the General Ledger must be consistent with information on the inventory change document for that inventory change.

The starting balance must be equal to the ending balance of the previous General Ledger and be to the same decimal place.

1. Box 207 Facility Code

Enter the appropriate code for the facility from Appendix J.

2. Box 307 Material Balance Area Code

Enter the appropriate code for the material balance area from Appendix J.

3. Box 1006 Element Code

Enter the appropriate element code from the following list:

Element Code	Element	Units
N	Natural uranium	kg
D	Depleted uranium	kg
E	Enriched uranium	g
P	Plutonium	g
T	Thorium	kg

4. Box 1024 Isotope Code

Enter the appropriate isotope code from the following list:

Isotope Code	Isotope
K	Enriched/unified uranium-233 content
J	Enriched/unified uranium-233 + uranium-235 content
G	Enriched/unified uranium-235 content

5. **Box 015 Reporting Period**

Enter the beginning and ending dates of the period covered by the report in the form YYYY/MM/DD.

The reporting period should encompass the dates of all the inventory changes in the report. The start date of the period should be the date of the earliest inventory change. The end date of the period should be the date of the latest inventory change.
6. **Signature**

The General Ledger must be signed by an authorized representative of the licensee. Each licensee must establish internal procedures to ensure that the information provided in the General Ledger is accurate and that it has been prepared and issued only by authorized licensee personnel.
7. **Page**

Enter the current page number.
8. **Total Pages**

Enter the total number of pages in the summary of inventory change report.
9. **Column 1000 Line Number**

Each line entry must be consecutively numbered with an integer.
The first line number is "0".
The starting balance is reported on line "0".
The ending balance is reported on the line of the last inventory change in the report.
The first inventory change is reported in the ledger on line "1", the second on line "2", and so on.
10. **Column 412 Date of Inventory Change**

Enter the date on which the inventory change occurred or was established in the format YYYY/MM/DD. If the entry is a correction, enter the date the correction was made.
11. **Column 446 Batch Name**

Enter the name of the batch involved in the inventory change. A maximum of 16 characters may be reported.
12. **Column 370 Shipper of Nuclear Material**

Enter the shipper of the nuclear material. Enter the appropriate reporting identification symbol code as per Appendix J.
For imports (RFs) enter the country code, facility code or material balance area code of the shipper. For domestic receipts (RDs), enter the reporting identification symbol code of the shipper. For all other inventory changes, enter the reporting identification symbol code of the reporting facility.
13. **Column 372 Receiver of Nuclear Material**

Enter the receiver of the nuclear material. Enter the appropriate reporting identification symbol code as per Appendix J.

For exports (SFs) enter the country code, facility code or material balance area code of the receiver. For domestic shipments (SDs), enter the reporting identification symbol code of the receiver. For all other inventory changes, enter the reporting identification symbol code of the reporting facility.

14. Column 407 Key Measurement Point

Enter flow key measurement point code specified in the facility attachment.

15. Column 411 Type of Inventory Change

Enter the appropriate inventory change code from the table below.

Keyword	Code	Explanation
Receipt, foreign	RF	Import of nuclear material into Canada.
Receipt, domestic	RD	Domestic receipt of nuclear material from another material balance area.
Receipt at starting point	RS	Domestic receipt of nuclear material at starting point of safeguards.
Receipt from non-safeguarded activity	RN	Domestic receipt of nuclear material from non- safeguarded (permitted military) activity.
Nuclear production	NP	Production of fissionable material in a reactor (plutonium, uranium-233).
De-exemption, use	DU	Reapplication of safeguards on nuclear material previously exempted.
De-exemption, quantity	DQ	Reapplication of safeguards on nuclear material previously exempted.
Shipment foreign	SF	Export of nuclear material out of Canada.
Shipment domestic	SD	Domestic transfer of nuclear material to another material balance area.
Shipment to non-safeguarded activity	SN	Domestic transfer of nuclear material to non-safeguarded (permitted military) activity.
Nuclear loss	LN	Consumption of nuclear material due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions.
Measured discard	LD	Operational loss, i.e., loss of a measured or estimated (on the basis of measurement) quantity of nuclear material from processing which has been disposed of in such a way that it is not suitable for further nuclear use.
Transfer to retained waste	TW	Transfer to the retained waste category of measured nuclear material which is deemed to be irrecoverable, to be stored at the material balance area and to be deleted from the inventory of the material balance area.

Keyword	Code	Explanation
Retransfer from retained waste	FW	Retransfer of material which had been stored at the material balance area 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 material balance area or for transfer from the material balance area.
Exemption, use	EU	Exemption of nuclear material from safeguards.
Exemption, quantity	EQ	Exemption of nuclear material from safeguards.
Termination	TU	Termination of safeguards on nuclear material.
Accidental loss	LA	Irretrievable and inadvertent loss of a known quantity of nuclear material as the result of an operational accident.
Accidental gain	GA	Nuclear material unexpectedly found to be present in the material balance area, except when detected in the course of a physical inventory taking
Category change (with the appropriate code as shown). This procedure is not applicable in material balance areas that report in terms of unified uranium.	EN ED NE ND DE DN	The quantity of uranium which 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). The material description codes (labels 430 and if appropriate 435) should be those for the resulting material. The weight data (in labels 610, 620, 630, 640, 660, 670, 770, 780 as appropriate) should be provided both for the originating and for the resulting category. These entries should be consolidated into the material balances for both categories.
In addition to the inventory changes described above, the inventory may be adjusted in accordance with the results of measurements performed in the material balance area on nuclear material previously recorded and reported on shipper's data. The keyword and the code are as follows:		
Keyword	Code	Explanation
Shipper-receiver difference	DI	The 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 material balance area.
The following, which are not inventory changes, are for reporting changes in batch identification and content.		
Decrease in batch content	RM	The quantity by which the batch mentioned in the entry is diminished due to rebatching.
Increase in batch content	RP	The quantity of material added to the batch mentioned in the entry from another batch due to rebatching.

16. Column 1001 Batch/Item Identification

Enter identification name or number of the item or batch.

17. Column 470 Number of Items in Batch
Enter the number of items in the batch
18. Increases
Box A Element Weight
Enter the element weight of the increase.
Box B Isotope Weight
Enter the isotope weight of the increase.
19. Decreases
Box C Element Weight
Enter the element weight of the decrease.
Box D Isotope Weight
Enter the isotope weight of the decrease.
20. Balance
Column 1030 Element Weight
Enter the running element weight balance.
Column 1031 Isotope Weight
Enter the running isotope weight balance.
21. Corrections
Column 1002 Previous Date
Enter the date of the previous revision to this inventory change.
Column 1003 Previous Line number
Enter the of the line number of General Ledger on which the previous revision to this inventory change was reported.
22. Column 1004 Remarks
Enter any other appropriate information.

C.1 Instructions for Completing the Summary of Inventory Change

For each General Ledger submitted to the CNSC, a corresponding summary of inventory change report should also be submitted. The summary of inventory change report consists of the following:

- a) A heading;
- b) The starting balance for the period;
- c) A running balance;
- d) The closing balance for the period; and
- e) The total element weight and isotope weight for each type of inventory change that occurred or was established during the period.

C.2 Recorded Information

The information for an inventory change recorded on the summary of inventory change report must be consistent with the information reported on the corresponding General Ledger for the same period.

- a) The starting balance of the summary of inventory change report must be equal to the ending balance of the previous accounting period and to the same decimal place.
 - b) The starting balance of the summary of inventory change must be equal to and to the same decimal place as the starting balance of the General Ledger for the same period.
 - c) The ending balance of the summary of inventory change must be equal to and to the same decimal place as the ending balance of the general for the same period.
 - d) A summary of inventory change report must be submitted to the CNSC for each element category of nuclear material in the material balance area.
 - e) The weights reported on the summary of inventory change report must be to the same place of decimals as the weights reported in the corresponding general ledger.
1. Box 207 Facility Code
Enter the appropriate code for the facility as per Appendix J.
 2. Box 307 Material Balance Area Code
Enter the appropriate code for the material balance area as per Appendix J.
 3. Box 1006 Element Code
Enter the appropriate element code.
 4. Box 1024 Isotope Code For Uranium
Enter the appropriate isotope code.

5. Box 1023 Units
Enter the units of account.
“kg”: for natural and depleted uranium and thorium and
“g”: for enriched uranium and plutonium
6. Box 015 Reporting Period
Enter the beginning and ending dates of the period covered by the report in the form YYYY/MM/DD.
The reporting period must encompass the dates of all the inventory changes in the report. The start date of the period should be the date of the earliest inventory change. The end date of the period should be the date of the latest inventory change. The start and end dates of the summary of inventory change report must be the same as the start and end dates of the corresponding general ledger.
7. Column 1000 Line Number
 - a) Each line entry must be consecutively numbered with an integer.
 - b) The first line number is “0”.
 - c) The starting balance is reported on line “0”
 - d) The ending balance is reported on the last line of the summary of inventory change report.
 - e) The sub-totals for each type of inventory change that occurred or was established during the period are reported on the lines between “0” and the last line.
8. Column 411 Type of Inventory Change
Enter the code for each type of inventory change that occurred or was established during the period.
9. Column 1026 Number of Inventory Changes
For each type of inventory change that occurred or was established during the reporting period, enter the number of the inventory changes of that type.
10. Columns A, B, C, D Increases/Decreases
For each type of inventory change that occurred or was established during the reporting period, enter in columns A, B, C, or D as appropriate the element weight and isotope weight sub-totals of the inventory changes of that type.
11. Column 1030 Balance - Element Weight
 - a) On line “0”, enter the element weight of the starting balance.
 - b) On the last line, enter the element weight of the ending balance
 - c) On lines between lines “0” and the last line, enter the running element weight balance.
12. Column 1031 Balance -Isotope Weight
 - a) On line “0”, enter the isotope weight of the starting balance.
 - b) On the last line, enter the isotope weight of the ending balance
 - c) On lines between lines 0 and the last line, enter the running isotope weight balance.

D.1 Instructions for Completing the List of Inventory Items

The List of Inventory Items includes nuclear material items or batches present in the inventory of a material balance area at the time of the physical inventory taking. These items or batches are subject to physical inventory verification by the CNSC and IAEA.

- a) Besides being an accounting record/report, the List of Inventory Items is also a working paper for the CNSC and IAEA inspectors during the physical inventory verification. The List of Inventory Items must be provided to the CNSC and IAEA at the start of the physical inventory verification or at a time agreed to by the CNSC.
- b) Code 3.1.3 of the facility attachment specifies the frequency of Physical Inventory Taking.
- c) Code 4.2 of the facility attachment describes the source data that are to be recorded in the List of Inventory Items.
- d) If CNSC inspectors are not present for the Physical Inventory Verification, the List of Inventory Items must be submitted to the CNSC no later than the close of business on the same day of the Physical Inventory Verification.
- e) The List of Inventory Items includes individual items rather than batches. However, if the number of items in inventory is too large to list individually, permission to batch the items on the List of Inventory Items shall be obtained from CNSC staff.
- f) Items on the List of Inventory Items should be sorted by element category, physical inventory key measurement point, stratum and the inventory tag number.
- g) Licensees must produce a List of Inventory Items in a format similar to the model format (see Appendix D, above). Deviations must be approved by the CNSC.
- h) The item or batch quantities recorded on the List of Inventory Items must be reported to the same decimal place as they are recorded on the Inventory Change Document and General Ledger.

The following data elements for a List of Inventory Items may be required depending on the specific inventory:

Label	Data Element	Mandatory or Optional
015	Date of the physical inventory taking	mandatory
207	Facility code	mandatory
307	Material balance area	mandatory
407	KMP/area identification	mandatory
430	Material description code	mandatory
446	Batch identification	mandatory

Label	Data Element	Mandatory or Optional
469	Measurement identification code	mandatory
600-630, 700, 800	Element weight	mandatory
640-690, 710-780	Isotope weight (for enriched uranium or plutonium only)	mandatory
1001	Item identification	mandatory
1004	Remark (i.e. measure basis, method, instrument used, or accessibility)	optional
1005	Stratum identification	mandatory
1006	Element code	mandatory
1007	Irradiation status	optional
1008	Inventory tag number	mandatory
1009	Seal number	optional
1010	Item description (drum, tray, rod, bundle)/ Material description (uranium dioxide, sintered, alloyed)	optional
1011	Gross weight	optional
1012	Tare weight	optional
1013	Net weight	optional
1014	Element concentration factor (indicate whether nominal, calculated, or measured)	optional
1015	Isotope enrichment factor (indicate whether nominal, calculated, or measured) poison material (weight %)	optional
1016	Volume	optional
1017	Density	optional
1018	Cooling time of irradiated fuel	optional
1019	Burn-up of irradiated fuel	optional
1024	Isotope code	mandatory

The data elements used must be appropriate for the inventory being reported.

D.2 Contents of the List of Inventory Items

1. Box 207 Facility Code
Enter the reporting identification symbol for the facility from Appendix J.
2. Box 307 Material Balance Area Code
Enter the reporting identification symbol for the material balance area from Appendix J.
3. Box 015 Reporting Period
Enter the date of the physical inventory verification using YYYY/MM/DD.

4. Box 1006 Element Code
Enter an element code from the following:
 - a) "E", for enriched uranium;
 - b) "N", for natural uranium;
 - c) "D", for depleted uranium;
 - d) "T", for thorium;
 - e) "P", for plutonium.
5. Box 1024 Isotope Code For Uranium
Enter the isotope code:
 - a) "G", for uranium enriched in uranium-235;
 - b) "K", for uranium enriched in uranium-233;
 - c) "J", for uranium enriched in uranium-235 and uranium-233.
6. Column 1023 Units
Enter the units:
 - a) "g" (grams), for enriched uranium and plutonium;
 - b) "kg" (kilograms), for depleted uranium, natural uranium and thorium.
7. Signature

If submitted on paper, the list of inventory items must be signed by an authorized representative of the facility. Each licensee must establish internal procedures to ensure that the information provided in the report is accurate and that the report has been prepared and issued only by the authorized licensee personnel.

An authorized representative of the facility issuing the list of inventory items document should sign the summary of inventory change report in this box.
8. Page
Enter the current page number.
9. Total Pages
Enter the total number of pages in the summary of inventory change report.
10. Column 1007 Irradiation Status
Enter:
 - a) "F", for un-irradiated;
 - b) "I", for irradiated.
11. Column 407 Key Measurement Point or Area Identification
Enter the physical inventory key measurement point code specified in the facility attachment and the area identification
12. Column 1005 Stratum Identification
Enter the batch or items stratum code.

13. Column 1008 Inventory Tag Number
Enter the inventory tag number.
14. Column 446 Batch Name
Enter the batch name of the nuclear material being reported. A maximum of 16 characters may be used.
15. Column 1001 Item Identification
Enter the identification number or item name. For example, bundle serial number; drum number, uranium hexafluoride cylinder number.
16. Box 600, 610, 620, 630, 700, 800 Element Weight
Enter the element weight of the nuclear material in the item or batch. Express the element weight in the following units:
- grams of plutonium;
 - grams of total uranium for enriched uranium;
 - kilograms of natural uranium, depleted uranium and thorium;
 - report the category of unified uranium in grams;
 - the individual numeric labels for this data element include:

Label	Element Category	Units
600	'Unified' uranium	g
610	Natural uranium	kg
620	Depleted uranium	kg
630	Enriched uranium	g
700	Plutonium	g
800	Thorium	kg

It is recommended that data be reported in un-rounded figures. However, if the CNSC staff approves, the data may be rounded off, but not beyond the nearest integer of the unit used. If the batch data (element weights) are rounded, this rounding should be done by first adding the weights of the individual items comprising the batch, then rounding their sum. If the quantity is equal to or greater than 0.5 of the reporting unit, the quantity should be rounded up to the next whole reporting unit. If the quantity entered is less than 0.5 of the reporting unit, the quantity should be rounded down to the next whole reporting unit.

A weight data label (600 to 800) should not be entered more than once per inventory item or batch.

17. Box 640-90, 710-80 Isotope Weight
Enter the isotope weight of the nuclear material in the batch. Express the isotope weight in the following units:
- grams of plutonium,
 - grams of total uranium isotopes for enriched uranium,
 - kilograms of natural uranium, depleted uranium and thorium.

Report the category of unified uranium in grams.

The meanings of the individual numeric labels for this data element are:

Label	Isotope Category	Units
640	Enriched/unified uranium-233 content	kg
650	Enriched/unified uranium-234 content	kg
660	Enriched/unified uranium-233 + uranium-235 content	kg
670	Enriched/unified uranium-235 content	kg
680	Enriched/unified uranium-236 content	kg
690	Enriched/unified uranium-238 content	kg
710	Plutonium-238 content	kg
720	Plutonium-239 content	kg
730	Plutonium-240 content	kg
740	Plutonium-241 content	kg
750	Plutonium-242 content	kg
760	Plutonium-239 + Plutonium-241 content	kg
770	Natural uranium fissile content	kg
780	Depleted uranium fissile content	kg

It is recommended that data be reported in un-rounded figures. However, if the CNSC staff approves, the data may be rounded off, but not beyond the nearest integer of the unit used. If the batch data (element weights) are rounded, this rounding should be done by first adding the weights of the individual items comprising the batch, then rounding their sum. If the quantity is equal to or greater than 0.5 of the reporting unit, the quantity should be rounded up to the next whole reporting unit. If the quantity entered is less than 0.5 of the reporting unit, the quantity should be rounded down to the next whole reporting unit.

18. **Box 469 Measurement Identification Code**

Enter the appropriate letter to indicate the measurement identification code.

- a) Enter "N", if batch data are based on measurements made at another material balance area;
- b) Enter "L", if batch data are based on measurements made at another material balance area and have been reported for the present material balance area in a preceding inventory change document or list of inventory items;
- c) Enter "M", if the batch data are based on fresh measurements made at the material balance area; or
- d) Enter "T", if the batch data are based on measurements made at the present material balance area and have been reported in a preceding inventory change document or list of inventory items; the measurements have not been repeated.

APPENDIX E RECONCILIATION STATEMENT

RECONCILIATION STATEMENT									
FACILITY CODE	MATERIAL BALANCE AREA CODE	REPORTING PERIOD					PAGE		
207	307	015							
		FROM			TO		TOTAL PAGES		
		Enriched Uranium		Enriched Uranium		Natural Uranium Total (kg)	Depleted Uranium Total (kg)	Plutonium Total (g)	Thorium Total (kg)
		Total Uranium (g)	Uranium-235 (g)	Total Uranium (g)	Uranium-233 (g)				
		630	670	630	640	610	620	700	800
Adjusted Book Ending (BA)									
Physical Ending (PE)									
Material Unaccounted For (MF)									
SIGNATURE BLOCK									
ORGANIZATION		SIGNATURE						DATE	
Operator									
CNSC									
IAEA									

E.1 Instructions for Completing the Reconciliation Statement

Immediately following the physical inventory taking, but before the physical inventory verification, the licensee shall prepare a reconciliation statement indicating, for each category of nuclear material in inventory, the adjusted book ending, the physical ending, and the material unaccounted for. The definitions of these terms are as follows:

Term	Code	Definition/Explanation
Adjusted ending book inventory	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 in the General Ledger as of the effective date of the physical inventory verification.
Ending physical inventory	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.
Material unaccounted for	MF	This should be calculated as the difference between the BA and the PE, i.e. $MF=BA-PE$.

The reconciliation statement shall be provided to the safeguards inspectors at the start of the physical inventory verification unless otherwise agreed by the CNSC.

For each category of nuclear material in the inventory, the material unaccounted for shall be entered on an inventory change document before the completion of the physical inventory verification.

Licensees must produce their statements in a format similar to the model format (see Appendix E.1, above). Deviations must be approved by the CNSC.

APPENDIX F

REQUEST FOR EXEMPTION FROM SAFEGUARDS ON NUCLEAR MATERIAL

F.1 Exemption Request Process

Nuclear material which is subject to IAEA safeguards may be exempted from IAEA safeguards. Under article 36 of the Safeguards Agreement, nuclear material may be exempted on the basis of its non-nuclear use (EU). Under article 37 of the Agreement, nuclear material may be exempted on the basis of quantity (EQ).

1. Licensees may request an exemption by completing the *Exemption Request Form* (see section F.2, below) and submitting it to the CNSC. If the CNSC staff determines that the nuclear material qualifies for exemption, it will make a request for exemption to the IAEA on the licensee's behalf and will inform the licensee when the IAEA grants or denies the exemption.
2. If the CNSC informs a licensee that an exemption on the basis of non-nuclear use has been granted, the licensee shall report the exemption, use (EU) on the inventory change document and post the "EU" entry in the general ledger.
3. If the CNSC informs a licensee that an exemption on the basis of quantity has been granted, the licensee shall report the exemption, quantity (EQ) on the inventory change document and post the "EQ" in the general ledger.
4. If the request is denied, the nuclear material must remain subject to IAEA safeguards.
5. Nuclear material for which an exemption has been granted must not be reported on the list of inventory items or stored or processed together with nuclear material that is under safeguards.
6. Facilities must maintain a separate account of net-quantities of exempted nuclear material and inform the CNSC by completing an inventory change document if the exempted nuclear material is shipped off site or is otherwise disposed of.

F.3 Instructions for Completing the Exemption Request Form

Licensees may request an exemption by completing the *Exemption Request Form* and submitting it to the CNSC (see Appendix F.2, above). Explanations are provided here, relating to each item number on the form. Terms used in the form are defined in the Glossary section of this S-336 standard.

1. “Article” under which the Exemption is requested refers to the article number in the Safeguards Agreement INFCIRC 164; exemption may be granted only under one of the following, based on either ‘Use’ (article 36a, 36b, or 36c), or ‘Quantity’ (article 37).
2. Give a brief explanation for why exemption for the material is being requested.
3. Give a brief explanation of the intended use of the exempted material (if known).
4. The safeguarded nuclear material to be exempted must be one of the following elements: natural Uranium, depleted Uranium, enriched Uranium (U233, U235), Thorium or Plutonium.
5. Provide the Element weight in the required units (grams or kilograms) and, for enriched U, the Isotope weight in grams.
6. Describe the present physical and chemical form of the material to be exempted, and give the Material Description Label 430 code (see S-336, Appendix J).
7. Describe the physical form and chemical form of the material, and give the Material Description code (Label 430), as it will be in its intended exempted form.
8. Give the approximate or estimated date the ledger book inventory of the material will be adjusted (accounted) for the Material Balance Area. If the material will be physically moved out of the Material Balance Area site, then also provide this date.
9. Provide the company or organization name and address, and Material Balance Area code (if applicable), where the exempted material will be transferred.

F.4 Exemptions from Safeguards

For easy reference, the relevant provisions (articles) of the Safeguards Agreement (INFCIRC/164) and Additional Protocol (INFCIRC 164/Addendum 1) are provided below

IAEA INFCIRC/164, Article 13, Provisions relating to nuclear material to be used in non-nuclear activities

Where nuclear material subject to safeguards under this Agreement is to be used in non-nuclear activities, such as the production of alloys or ceramics, the Government of Canada shall agree with the Agency, before the material is so used, on the circumstances under which the safeguards on such material may be terminated.

INFCIRC/164, Article 36

At the request of the Government of Canada, the Agency shall exempt nuclear material from safeguards, as follows:

- a) special fissionable material, when it is used in gram quantities or less as a sensing component in instruments;
- b) nuclear material, when it is used in non-nuclear activities in accordance with Article 13, if such nuclear material is recoverable; and
- c) plutonium with an isotopic concentration of plutonium-238 exceeding 80%.

INFCIRC/164, Article 37

At the request of the Government of Canada, the Agency shall exempt from safeguards nuclear material that would otherwise be subject to safeguards, provided that the total quantity of nuclear material which has been exempted in Canada in accordance with this Article may not at any time exceed:

- a) one kilogram in total of special fissionable material, which may consist of one or more of the following:
 - (i) plutonium;
 - (ii) uranium with an enrichment of 0.2 (20%) and above, taken account of by multiplying its weight by its enrichment; and
 - (iii) uranium with an enrichment below 0.2 (20%) and above that of natural uranium., taken account of by multiplying its weight by five times the square of its enrichment;
- b) ten metric tons in total of natural uranium and depleted uranium with an enrichment above 0.005 (0.5%);
- c) twenty metric tons of depleted uranium with an enrichment of 0.005 (0.5%) or below; and

d) twenty metric tons of thorium;

Or such greater amounts as may be specified by the Board of Governors for uniform application.

F.5 Provision of Information

IAEA INFCIRC/164/Add.1 Additional Protocol, Article 2

Pursuant to paragraph (vii), Canada shall provide the Agency with a declaration containing:

- a) information regarding the quantities, uses and locations of nuclear material exempted from safeguards pursuant to Article 37 of the Safeguards Agreement; and
- b) information regarding the quantities (which may be in the form of estimates) and uses at each location, of nuclear material exempted from safeguards pursuant to Article 36(b) of the Safeguards Agreement but not yet in a non-nuclear end-use form, in quantities exceeding those set out in Article 37 of the Safeguards Agreement. The provision of this information does not require detailed nuclear material accountancy.

APPENDIX G

REQUEST FOR SAFEGUARDS FOR PREVIOUSLY EXEMPTED NUCLEAR MATERIAL

G.1 De-exemption Request Process

Nuclear material, for which an exemption has been granted, must be de-exempted (brought back onto safeguards) before it can be exported. It must also be brought back onto safeguards if it is stored or processed together with nuclear material that is subject to safeguards, or before it is to be terminated from safeguards.

1. Licensees may request a de-exemption by completing the *De-exemption Request Form* and submitting it to the CNSC (see Appendix G.2 below).
2. If the request for de-exemption is denied, the nuclear material must not be exported or stored, or processed together with nuclear material that is subject to safeguards.
3. If above applies, facilities shall request the re-application of safeguards on nuclear material previously exempted, by completing the *De-exemption Request Form* and submitting it to the CNSC.
4. If CNSC staff determines that the nuclear material should be de-exempted, it will make a request for de-exemption to the IAEA on the licensee's behalf and inform the licensee if the IAEA grants or denies the request.
5. If CNSC staff informs a licensee that a de-exemption on the basis of non-nuclear use has been granted, the licensee shall report a de-exemption, use (DU) on the Inventory Change Document and post the DU in the General Ledger.
6. If CNSC staff informs a licensee that a de-exemption on the basis of a quantity has been granted, the licensee shall report a de-exemption, quantity (DQ) on the Inventory Change Document and post the DQ in the General Ledger.
7. Nuclear material, for which a de-exemption has been granted, must be reported on the List of Inventory Items and should be stored together with nuclear material that is under safeguards.

G.3 Instructions for Completing the De-exemption Request Form

Licensees may request a de-exemption by completing the *De-exemption Request Form* and submitting it to the CNSC (see section G.2, above). Terms used in the form are defined in the Glossary section of this S-336 standard.

1. “Article” under which the original exemption was granted refers to the article number in the Safeguards Agreement INFCIRC 164; exemption may be granted under one of only the following, based on either ‘Use’ (article 36a, 36b, or 36c), or ‘Quantity’ (article 37). Therefore, de-exemption must be applied using the same article under which the original exemption was approved (Use or Quantity).
2. State the Batch Name of the material as identified on the original Inventory Change Document. A copy of the Inventory Change Document or Transfer form should be attached to this form, if available.
3. State the Exemption Request Identifier (if known)
4. State the licensee name and/or Material Balance Area code, and the address of where the exempted nuclear material came from.
5. Give a brief explanation for why de-exemption for the material is being requested; i.e. for export, the exempted material is to be processed or stored with other material subject to safeguards (Article 38 applies), or state other reason(s).
6. The safeguarded nuclear material to be de-exempted must be one of the following elements: natural Uranium, depleted Uranium, enriched Uranium (U233, U235), Thorium or Plutonium.
7. Provide the Element weight of the material in the required units (grams or kg) and, for enriched U, the Isotope weight in grams.
8. Describe the present physical and chemical form of the material to be de-exempted, and give the Material Description Label 430 code (see S-336, Appendix J).
9. Give the approximate or estimated date when safeguards will be re-applied for the material, at the Material Balance Area.

G.4 Relevant Provisions of the Safeguards Agreement

IAEA INFCIRC/164, Article 36

At the request of the Government of Canada, the Agency shall exempt nuclear material from safeguards, as follows:

- a) Special fissionable material, when it is used in gram quantities or less as a sensing component in instruments;
- b) Nuclear material, when it is used in non-nuclear activities in accordance with Article 13, if such nuclear material is recoverable; and
- c) Plutonium with an isotopic concentration of plutonium-238 exceeding 80%.

IAEA INFCIRC/164, Article 37

At the request of the Government of Canada, the Agency shall exempt from safeguards nuclear material that would otherwise be subject to safeguards, provided that the total quantity of nuclear material which has been exempted in Canada in accordance with this Article may not at any time exceed:

- a) one kilogram in total of special fissionable material, which may consist of one or more of the following:
 - (i) plutonium;
 - (ii) uranium with an enrichment of 0.2 (20%) and above, taken account of by multiplying its weight by its enrichment; and
 - (iii) uranium with an enrichment below 0.2 (20%) and above that of natural uranium., taken account of by multiplying its weight by five times the square of its enrichment;
- b) ten metric tons in total of natural uranium and depleted uranium with an enrichment above 0.005 (0.5%);
- c) twenty metric tons of depleted uranium with an enrichment of 0.005 (0.5%) or below; and
- d) twenty metric tons of thorium; or
- e) such greater amounts as may be specified by the Board of Governors for uniform application.

IAEA INFCIRC/164, Article 38

If exempted nuclear material is to be processed or stored together with nuclear material subject to safeguards under this Agreement, the Government of Canada and the Agency shall make arrangements for the reapplication of safeguards thereto.

APPENDIX H

REQUEST FOR TERMINATION OF SAFEGUARDS ON NUCLEAR MATERIAL

H.1 Termination Request Process

Nuclear material which has been consumed, or diluted in such a way that it is no longer usable for any nuclear activity, relevant to safeguards, or has become practically irrecoverable, shall be terminated (INFCIRC/164, Article 11 and Article 13). Licensees must submit information relating to nuclear material to be terminated from safeguards to the CNSC

1. Licensees may request termination of safeguards by completing the *Request for Termination of Safeguards on Nuclear Material Form* (see Appendix H.2 below) and submitting it to the CNSC for evaluation whether termination use (TU) is appropriate.
2. Nuclear material which is to be transferred out of Canada shall be terminated, once the recipient State has assumed responsibility (INFCIRC/164, Article 12).
3. Nuclear material, for which an exemption from safeguards has been granted, must be de-exempted (brought back onto safeguards) before it can be terminated. Facilities shall request the re-application of safeguards on nuclear material previously exempted, by completing the *De-exemption Request Form* (refer to G.2) and submitting it to the CNSC.
4. For nuclear material which is intended for further processing of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233, on which safeguards have been terminated pursuant to Article 11 of the Safeguards Agreement, facilities must provide to the CNSC information regarding the location and further processing activities. "Further processing" does not include repackaging of the waste or its further conditioning not involving the separation of elements, for storage or disposal (INFCIRC/164, Add.1, Article 2 (a) (viii)).
5. If CNSC staff determines that the nuclear material should be terminated, it will make a request for Termination to the IAEA on the licensee's behalf and inform the licensee if the IAEA grants or denies the request.
6. If CNSC staff informs a licensee that a termination of safeguards pursuant to Article 35 has been granted, the licensee shall report a termination (TU) on the Inventory Change Document and post the TU in the General Ledger.
7. Nuclear material, for which a termination has been granted, must be reported on the List of Inventory Items and should be stored together with nuclear material that is under safeguards.
8. If the request for termination is denied, the nuclear material must remain under safeguards, and is subject to the provisions for accounting for safeguarded nuclear materials.

H.3 Instructions for Completing the Request for Termination of Safeguards on Nuclear Materials Form

Licensees must submit information relating to nuclear material to be terminated from safeguards to the CNSC for evaluation whether termination use (TU) is appropriate. The *Request for Termination of Safeguards on Nuclear Material Form* (section H.2 above) must be submitted to the CNSC. Terms used in the forms are defined in the Glossary section of this S-336 standard.

1. “Article” under which Termination is requested refers to the article number in the Safeguards Agreement INFCIRC/164; termination may be granted only under one of the following articles 11, 13, or 35a or 35b.
2. Give a detailed explanation for why termination of safeguards for this material is requested; i.e. the material has been consumed, or diluted such that it is no longer usable for nuclear activities (articles 35 (a) and 11), the material is to be exported out of Canada (article 12), or the material is to be used for non-nuclear uses (articles 35 (b) and 13).
3. State the Batch Name of the material as identified on the original Inventory Change Document. A copy of the Inventory Change Document or the Transfer form should be attached to this form, if available.
4. The safeguarded nuclear material to be terminated must be one of the following elements: natural uranium, depleted uranium, enriched uranium (U233, U235), thorium or plutonium.
5. Provide the Element weight of the material in the required units (grams or kg) and, for enriched U, the Isotope weight in grams.
6. Describe the present physical and chemical form of the material to be terminated, and give the Material Description Label 430 code (see S-336, Appendix J).
7. State the present use of the material to be terminated, and describe the containment (Code 6.1), as appropriate.
8. Give the approximate or estimated date the ledger book inventory of the material will be adjusted (accounted) for the Material Balance Area. If the material will be physically moved out of the Material Balance Area site, then also provide this date.
9. Give the approximate or estimated date when the material will be transferred to non-nuclear use.
10. State what is the proposed use for the material, once terminated.
11. Explain why the nuclear material, once in terminated from safeguards, will be “practicably irrecoverable” (not reasonably possible to recover the material) for nuclear use.
12. Provide the company or organization name and address, and Material Balance Area code (if applicable), where the terminated material will be transferred (used).

H.4 Termination of Safeguards

For easy reference, the relevant provisions (articles) of the Safeguards Agreement (IAEA INFCIRC/164) and Additional Protocol (IAEA INFCIRC 164/Addendum 1) are provided below.

IAEA INFCIRC/164, Article 11, Consumption or dilution of nuclear material

Safeguards shall terminate on nuclear material upon determination by the Agency that the material has been consumed, or has been diluted in such a way that it is no longer usable for any nuclear activity relevant from the point of view of safeguards, or has become practically irrecoverable.

IAEA INFCIRC/164, Article 12, Transfer of nuclear material out of Canada

The Government of Canada shall give the Agency advance notification of intended transfers of nuclear material subject to safeguards under this Agreement out of Canada, in accordance with the provisions set out in Part II of this Agreement. The Agency shall terminate safeguards on nuclear material under this Agreement when the recipient State has assumed responsibility therefore, as provided for in Part II of this Agreement. The Agency shall maintain records indicating each transfer and, where applicable, the reallocation of safeguards to the transferred nuclear material.

IAEA INFCIRC/164, Article 13, Provisions relating to nuclear material to be used in non-nuclear activities

Where nuclear material subject to safeguards under this Agreement is to be used in non-nuclear activities, such as the production of alloys or ceramics, the Government of Canada shall agree with the Agency, before the material is so used, on the circumstances under which the safeguards on such material may be terminated.

IAEA INFCIRC/164, Article 35

Safeguards shall terminate on nuclear material subject to safeguards under this Agreement, under the conditions set forth in Article 11. Where the conditions of that Article are not met, but the Government of Canada considers that the recovery of safeguarded nuclear material from residues is not for the time being practicable or desirable, the Government of Canada and the Agency shall consult on the appropriate safeguards measures to be applied.

Safeguards shall terminate on nuclear material subject to safeguards under this Agreement, under the conditions set forth in Article 13, provided that the Government of Canada and the Agency agree that such nuclear material is practicably irrecoverable.

H.5 Provision of Information

IAEA INFCIRC/164/Add.1 Additional Protocol, Article 2

According to paragraph (a)(viii) of the above, Canada shall provide the Agency with a declaration containing “Information regarding the location or further processing of intermediate or high-level waste containing plutonium, high enriched uranium or uranium-233 on which safeguards have been terminated pursuant to Article 11 of the Safeguards Agreement. For the purpose of this paragraph, ‘further processing’ does not include repackaging of the waste or its further conditioning not involving the separation of elements, for storage or disposal.”

APPENDIX I LABELS AND DATA ELEMENTS

Label	Data Element	Report it is Applicable to:				
001	Reference number					
002	Entry number/Total Number of Entries					
003	Report Date					
006	Encoder's Name					
010	Report Type					
015	Reporting Period		GL	SIC	LII	RCS
099	Concise note reference					
207	Facility Code		GL	SIC	LII	RCS
307	MBA code		GL	SIC	LII	RCS
309	Entry Status and cross reference code	ICD				
310	State accounting system record identification					
370	Shipper of nuclear material	ICD	GL			
372	Receiver of nuclear material	ICD	GL			
390	Concise note indicator					
391	Concise note text					
407	Key measurement point	ICD	GL		LII	
411	Inventory change type	ICD	GL	SIC		
412	Date of Inventory change	ICD	GL			
430	IAEA material description code	ICD				
435	Operator's material description code	ICD				
436	Operator's material description text	ICD				
445	Non-Latin alphabet identification					
446	Batch Name/	ICD	GL		LII	
447	Shipper's batch name	ICD				
469	Measurement Identification Code	ICD			LII	
470	Number of Items in batch	ICD	GL			
600 to 800	Weight data	ICD	GL	SIC	LII	RCS
1000	Line no		GL	SIC		
1001	Item Identification		GL		LII	
1002	Correction - previous date		GL			
1003	Correction - line number (s)		GL			
1004	Remarks		GL			
1005	Stratum Code				LII	
1006	Element Code	ICD	GL	SIC	LII	
1007	Irradiation status				LII	
1008	Inventory tag number				LII	
1009	Seal number				LII	
1010	Item description				LII	
1011	Gross weight				LII	
1012	Tare weight				LII	

Label	Data Element	Report it is Applicable to:				
1013	Net weight	ICD			LII	
1014	Element concentration factor				LII	
1015	Isotope enrichment factor				LII	
1016	Volume				LII	
1017	Density				LII	
1018	Cooling time of irradiated fuel				LII	
1019	Burn-up of irradiated fuel				LII	
1020	Safeguards/non-safeguards	ICD				
1021	Inventory change document correction number	ICD				
1022	Correction Indicator			SIC		
1023	Units	ICD		SIC	LII	
1024	Isotope code	ICD	GL	SIC	LII	
1025	Unique identifier	ICD				
1026	Number of Inventory Changes			SIC		
1027	Shipper name and address	ICD				
1028	Receiver name and address	ICD				
1029	Owner of nuclear material	ICD				
1030	Balance - Element Weight		GL	SIC		
1031	Balance - Isotope Weight		GL	SIC		
1032	Element Weight of Concentrate	ICD	GL	SIC	LII	
2001	Export Licence Number	ICD				
2002	Import Licence Number	ICD				
2003	Country of Origin	ICD				
2004	Foreign Obligation Code	ICD				
2005	Country of intended end-use	ICD				
2006	Holding account code	ICD				
2007	Contract number	ICD				

ICD: Inventory Change Document

GL: General Ledger

SIC: Summary of Inventory Change

LII: List of Inventory Items

RCS: Reconciliation Statement

APPENDIX J

REPORTING IDENTIFICATION SYMBOLS DIRECTORY

Facility/Material Balance Area (MBA)	Facility Code	MBA Code
AECL Chalk River Laboratories, NMC	CNA-	CNA1
AECL Chalk River Laboratories, NMC	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 429B	CND-	CND1
AECL Chalk River Laboratories Metallurgy	CND-	CND2
AECL Chalk River Laboratories Isotope Processing	CND-	CND4
AECL Chalk River Laboratories Universal Cells 234	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 B	CNDD	CNDD
AECL Chalk River Laboratories Health Sciences	CNE-	CNE1
AECL Chalk River Laboratories Chemistry	CNE-	CNE2
AECL Chalk River Laboratories Reactor Physics	CNE-	CNE4
AECL Chalk River Laboratories Fuel Safety	CNE-	CNE5
AECL Chalk River Workshops	CNE-	CNE6
AECL Whiteshell Laboratories	CNP-	CN-P
OPG Western Used Fuel Dry Storage Facility	CNKS	CNKS
Bruce Power Bruce Generating Station 'A'	CNK-	CN-K
Bruce Power Bruce Generating Station 'B'	CNKB	CNKB
Cameco Blind River Refinery	CNBR	CNBR
Cameco Port Hope Conversion Facility	CNFN	CNFN
Dalhousie University Slowpoke	CNT-	CN-T
OPG Darlington Generating Station	CNAA	CNAA
AECL Douglas Point Waste Management	CNO-	CN-O
Ecole Polytechnique Slowpoke	CN6Y	CNY6
General Electric Canada, Peterborough	CNI-	CNI1
General Electric Canada, Toronto	CNH-	CNH1
AECL Gentilly-1 Waste Management	CNN-	CN-N
Hydro Quebec Centrale Nucleaire Gentilly-2	CNNB	CNBN
McMaster University	CNQ-	CN-Q
OPG Pickering Generating Stations A & B	CNM-	CN-M
OPG Pickering Used Fuel Dry Storage Facility	CNMS	CNMS
New Brunswick Power Point Lepreau Generating Station	CNNC	CNCN
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

Facility/Material Balance Area (MBA)	Facility Code	MBA Code
Zircotec Precision Industries Ltd.	CNG-	CNG1
OPG Darlington Used Fuel Dry Storage Facility (to be established)	CNAS	CNAS
Locations Outside Facilities (LOFs)	Facility Code	MBA Code
Stern Laboratories	CNZ-	CNZB
AECL Sheridan Park	CNZ-	CNZC
Kinectrics Inc.	CNZ-	CNZE
TRIUMF	CNZ-	CNZJ
MDS Nordion	CNS-	CN-S
Mississauga Metals & Alloys (to be established)	CNMM	CNMM
Mine/Mill Facilities	Code	
Cameco Corp. Key Lake	DKL	
Cameco Corp. Rabbit Lake	DGM	
Cogema Resources Inc. McArthur River	DMR	
Cogema Resources Inc. McClean Lake	DML	
Cameco Cigar Lake (not yet active)	N/A	
Cameco Midwest Project (not yet active)	N/A	

Country	Code	Country	Code	Country	Code
Afghanistan	AF	Columbia	CO	Holy See	HS
Albania	AL	Comoros	KM	Honduras	HO
Algeria	DZ	Congo, People's Republic of	CB	Hungary	HU
Andorra	AD	Cook Islands	KS	IAEA	IA
Antigua & Barbuda	AB	Costa Rica	CR	IAEA Japan Regional Office	IJ
Argentina	RA	Croatia	CT	IAEA Toronto RO	IC
Armenia	AM	Cuba	CU	Iceland	IS
Australia	AS	Cyprus	CY	India	IN
Austria	AU	Czechoslovakia, Republic of	CZ	Indonesia	RI
Azerbaijan	AR	Denmark	DK	Iran Islamic Republic of	IR
Bahamas	BA	Djibouti	DJ	Iraq	IQ
Bahrain	BH	Dominica	DM	Ireland	ID
Bangladesh	BD	Dominican Republic	DO	Israel	IL
Barbados	BB	Ecuador	EC	Italy	IT
Belgium	BL	Egypt	ET	Jamaica	AJ
Benin	BE	El Salvador	SV	Japan	J
Bhutan	BT	Equatorial Guinea	GE	Jordan	HJ
Bolivia	BO	Estonia	EA	Kazakhstan	KA
Bosniaherzegovin	HB	Ethiopia	EP	Kenya	KN
Botswana	RB	EURATOM	W	Korea, Dem. People's Republic of	KD
Brazil	BR	Fiji	IF	Korea, Republic of	KO
Brunei Darussala	BN	Finland	SF	Kuwait	KW
Bulgaria	BG	France	F	Kyrgyzstan	KY
Burkina Faso	HV	Gabon	GA	Lao People's Democratic Republic	LA
Burundi	RU	Gambia	GM	Latvia	LV
Cambodia	KR	Georgia	GO	Liberia	LB
Cameroon, Republic of	TC	Germany	DF	Libyan Arab Jamahiriya	LI
Canada	CN	Ghana	GH	Liechtenstein	LN
Cape Verde	CV	Grenada	GD	NIUE	NE
Central African Republic	CA	Guatemala	GT	Norway	NO
Chad	CD	Guinea	GN	Oman	AO
Chile	CE	Guinea-Bissau	GI	Lithuania	LT
China, People's Republic of	X	Guyana	GU	Luxembourg	LX
China, Republic of (Taiwan)	TW	Haiti	RH	Madagascar	RM

Country	Code	Country	Code	Country	Code
Malawi	MW	Peru	PE	Switzerland	CH
Malaysia	MY	Philippines	PI	Syrian Arab Republic	SR
Maldives	MD	Poland	PL	Taiwan	TW
Mali	ML	Portugal	PO	Tajikistan	TK
Malta	MT	Qatar	SQ	Tanzania, United Republic of	TA
Marshall Islands	MH	Romania	RO	Thailand	TH
Mauritania	MU	Rwanda	RW	Togo	TG
Mauritius	MS	Samoa	SS	Tonga	TO
Mexico	MX	San Marino	SM	Trinidad and Tobago	TT
Micronesia	MF	Sao Tome Principe	ST	Tunisia	TN
Moldova	MO	Saudi Arabia	SA	Turkey	TR
Monaco	MC	Senegal	SE	Turkmenistan	TM
Mongolia	MN	Seychelles	SY	Tuvalu	TU
Morocco	MA	Sierra Leone	SL	Uganda	EU
Mozambique	MB	Singapore	SG	Ukraine	UR
Myanmar	BU	Slovakia	SX	United Arab Emirates	AE
Namibia	NM	Slovenia	VE	United Kingdom	Q
Nauru	NU	Solomon Islands	SB	Uruguay	GY
Nepal	NP	Somalia	SO	USA	U
Netherlands	NL	South Africa	AZ	USSR	Z
Netherlands Antilles	NA	Spain	ES	Uzbekistan	KT
New Zealand	NZ	Sri Lanka	CL	Vanuatu	VU
Nicaragua	NI	St Kitts, Nevis	SK	Venezuela	NV
Niger	NG	St. Lucia	SC	Viet-Nam, Socialist Republic of	RV
Nigeria	NF	St Vincent Grenadines	VG	Yemen. Republic of	YE
Pakistan	PK	Sudan	SN	Yugoslavia	IU
Panama	PA	Surinam	SI	Zaire	CK
Papua New Guinea	PN	Swaziland	SD	Zimbabwe	MI
Paraguay	PY	Sweden	SW		
Holding Account	Code	Holding Account	Code	Holding Account	Code
Allied Signal – US	UUSCA	Comhurex – France	UFRCA	Urenco (Capehurst) – UK	UKHLD
BNFL – UK	CUKHD	Converdyne – US	CCCHD	Urenco (Gronau) - Germany	GEHLD
BNFL – UK	UUKCA	Eurodif - France	ELD8405	USEC – US	UNHLD
Comhurex	CFRHD	Urenco (Almelo) - Netherlands	NLHLD		

APPENDIX K

IAEA MODEL CODE 10

K.1 IAEA Model Code 10 (labelled format)

Appendix J is reproduced with some modifications from IAEA Model Code 10. The instructions in this regulatory standard are based on Code 10 of the subsidiary arrangements. Code 10 prescribes the data elements, keywords and codes used in the state reports that the CNSC submits to the IAEA.

K.2 Accounting Reports

A system of records and reports is structured in such a way as to enable the CNSC to discharge its responsibilities efficiently and effectively. The data to be contained in reports submitted by licensees are specified so as to permit the CNSC to implement its procedures, including those for audit and verification of records on status and location of nuclear material, as well as for development of statistical sampling plans and meaningful error evaluation. Since the records kept at facilities and transmitted to the CNSC form the basis for the reports to be submitted to the IAEA, the specification of their basic elements must be closely linked.

The Material Balance Area (MBA) is the basic reporting entity. For every such MBA, the nuclear material is accounted for and reported in Inventory Change Reports (ICR) and Physical Inventory Listings (PIL) by batch, which is defined as a portion of nuclear material handled as a unit for accounting purposes at a key measurement point and for which the composition and quantity are defined by a single set of specifications or measurements. The nuclear material may be in bulk form or contained in a number of separate items.

An overview of the basic contents of ICRs, PILs, and Material Balance Reports (MBRs) follows:

- a) ICRs: each change in the inventory of nuclear material in an MBA; in specified cases also changes in batch composition;
- b) PILs: a listing of all batches of nuclear material, including names and identification of each batch; and
- c) MBRs: entries summarising (not broken down by batches), the components of the material balance.

Additionally, Concise Note entries or Textual Reports (TRs) providing additional explanation and clarification at the country, facility MBA, report or entry level may be submitted.

ICRs, PILs and MBRs dealt with under this Code 10 are designed to fulfil all requirements derived from the Agreement as well as from computerised data processing in Canada and at the IAEA, and from data transmission to the IAEA.

K.3 Data Elements

The following table lists the data elements that may appear in ICRs, MBRs, PILs and TRs. Every data element is briefly defined and each report in which it may appear is indicated.

DATA ELEMENT	REPORT
REFERENCE NUMBER: Uniquely defines a report for filing, processing, sorting and reference purposes	ICR, PIL, MBR, TR
ENTRY NUMBER / TOTAL NUMBER OF ENTRIES: Identifies the given entry and the total number of entries used for that specific report	ICR, PIL, MBR, TR
REPORT DATE: The date on which the report was produced	ICR, PIL, MBR, TR
ENCODER'S NAME: The name of the official responsible for the report	ICR, PIL, MBR
REPORT TYPE: Indicates the type of report	ICR, PIL, MBR, TR
REPORTING PERIOD: The period covered by the report; in a PIL the date as of which the physical inventory was taken	ICR, PIL, MBR
CONCISE NOTE REFERENCE: Provides the country, facility, MBA, report as a whole or entry to which the Concise Note refers	ICR, PIL, MBR, TR
FACILITY CODE: Identifies the reporting facility	ICR, PIL, MBR
MBA CODE: Identifies the reporting material balance area	ICR, PIL, MBR
ENTRY STATUS AND CROSS-REFERENCE CODE: Indicates whether the entry is new, invalid, a correction, addition, or deletion. In correction, addition or deletion entries, it also identifies the entry to be corrected, added or deleted	ICR, PIL, MBR
STATE ACCOUNTING SYSTEM RECORD IDENTIFICATION: Identifies the corresponding information in the State accounting system	ICR, PIL, MBR
SHIPPER OF NUCLEAR MATERIAL: Identifies the shipper of the nuclear material	ICR
RECEIVER OF NUCLEAR MATERIAL: Identifies the receiver of the nuclear material	ICR

DATA ELEMENT	REPORT
CONCISE NOTE INDICATOR: Calls attention to a Concise Note attached	ICR, PIL, MBR
TEXT OF CONCISE NOTE: Clarifications, amplifications and other unformatted information	ICR, PIL, MBR, TR
KEY MEASUREMENT POINT CODE: Identifies the flow or inventory key measurement code for the batch	ICR, PIL
TYPE OF INVENTORY CHANGE, TYPE OF ACCOUNTING ENTRY: Defines the type of transaction reported or a material balance item	ICR, MBR
DATE OF INVENTORY CHANGE: Date on which an inventory change occurred or was established	ICR
MATERIAL DESCRIPTION CODE: The set of Agency-defined codes that describe the physical and chemical form of a batch of material, its container and its quality	ICR, PIL
OPERATOR'S MATERIAL DESCRIPTION CODE: The code used by the operator to identify the type of nuclear material	ICR, PIL
OPERATOR'S MATERIAL DESCRIPTION (TEXT): Unformatted description of the batch in free text	ICR, PIL
NON-LATIN ALPHABET IDENTIFICATION: A code to indicate that a non-Latin alphabet was used in the report and to identify that alphabet	ICR, PIL, MBR
BATCH NAME: Uniquely identifies a portion of nuclear material handled as a unit for accounting purposes	ICR, PIL
SHIPPER'S BATCH NAME: Identifies the shipper's batch name in the reporting of a receipt	ICR
MEASUREMENT IDENTIFICATION CODE: Indicates when and where the batch was last measured	ICR, PIL
NUMBER OF ITEMS IN THE BATCH: The number of items comprising the batch	ICR, PIL
WEIGHT DATA: The quantity of nuclear material which is the subject of the entry in question, expressed by the weight of the chemical elements and, if appropriate, the corresponding fissile content. If required, isotopic composition is also to be provided	ICR, PIL, MBR

In the data element formats whose description follows below, clear distinction should be made between the letter O and the number 0. Henceforth in this Code, the letter is shaped as Ø and the number zero is shaped as 0.

K.4 Specification of Data Elements

1. A data element is identified by a unique three digit number called a label. Values which the data element may take on are set off from labels by delimiters. A label may identify a unique or composite data element. In the latter case, the components are internally separated by delimiters.
2. The following delimiters are used in this Code:
 - : to separate the label number and the content of a data element;
 - / to separate data items within a composite data element;
 - ; to separate data items within a composite data element; and
 - # to indicate the end of a data element.
3. The delimiters described above form an integral part of the data element and must be reproduced as such in the reports transmitted to the CNSC.
4. All data elements (items) are of variable length, unless the permitted or prescribed number of characters is specifically indicated.

K.5 Label, Format and Description

001 REFERENCE NUMBER

001: **/**,***...***#

This data element uniquely identifies a report for filing, processing, sorting and reference purposes.

- a) Code ØI for accounting entries, or code NC for Concise Note entries;
- b) Slash (/);
- c) Country code;
- d) Semicolon (;); and
- e) The numeric report number assigned by the reporting authority. The report number must be unique for any given MBA. All reports - whether they are ICRs, PILs, MBRs or TRs - are to be numbered consecutively with respect to each MBA, regardless of report type.

002 ENTRY NUMBER / TOTAL NUMBER OF ENTRIES

002: *** ... ***/*** ... ***#

This data element numbers the specific entry within the set of ØI or NC entries contained in the report:

- a) sequential number of the ØI or NC entry, (starting with 1 within each set of ØI and NC entries);
- b) slash (/); and
- c) total number of ØI or NC entries in the report (this may be omitted together with the preceding slash in all entries, except for the first ØI and NC entry of a report, where it is mandatory).

099 CONCISE NOTE REFERENCE

099:*/*** ... ***#

This data element is used only in Concise Note entries. It refers the entry (if appropriate) to the report as a whole or a specific accounting entry in the ØI report with the same report number.

- a) Letter E if it is related to a specific entry; in this case followed by:
 - (i) slash (/); and
 - (ii) the number of the entry in question or;
- b) Letter “R” if the Concise Note refers to the report as a whole.

207 FACILITY CODE

207:****#

The four-character identification code of the facility containing the reporting MBA as specified in the relevant Facility Attachment.

307 MBA CODE

307:****#

The four-character identification code of the MBA submitting the report as specified in the relevant Facility Attachment.

309 ENTRY STATUS AND CROSS REFERENCE CODE

309:*/**,* ** ... ***/** ... **# (309:*#)

This data element describes the status of the entry and, when necessary, provides a reference to a previously reported entry.

- a) One-character code to designate the status of the entry:
 - (i) “N” for new entries,
 - (ii) “U” for invalid entries to be ignored,
 - (iii) “C” for entries serving as corrections to earlier ones. The remainder of the entry should contain the same data elements and values of the referenced line entry except for those elements being corrected.
 - (iv) “D” for entries deleting the one referenced by this entry. The data elements for the remainder of the entry are optional.
 - (v) “A” for an entry to be added to a previous report.
- b) Slash (/); this and the following reference codes are mandatory if the entry status code is C, D, or A. For N, they are not applicable; for U, they are optional.
- c) Country code (the same as in label 001)
- d) Semicolon (;);
- e) The report number assigned by the reporting authority as specified in label 001 of the entry being referenced;

- f) Slash (/); and
- g) Entry number of the entry to be referenced (first subfield 002 of that entry), or in the case of an addition entry, the number of the entry as it is to appear in the report to which the entry is being added.

310 STATE ACCOUNTING SYSTEM RECORD IDENTIFICATION

310:***...***

This optional data element provides the identification in the State accounting system which uniquely refers to the data contained in the State report. A maximum of forty characters may be reported.

370 SHIPPER OF NUCLEAR MATERIAL

370:**/*****#

This data element identifies the shipper of nuclear material that has been received by the MBA indicated in label 307. It is mandatory when reporting domestic receipt of nuclear material from another MBA, or import of nuclear material; otherwise, it may be omitted. If an import is reported and the shipping MBA (or facility) code is unknown to the receiver, it is sufficient to report only the country code.

- a) Country code;
- b) Slash (/);
- c) MBA (or, for imports, facility or country) code.

372 RECEIVER OF NUCLEAR MATERIAL

372:**/*****#

This data element identifies the receiver of nuclear material that has been shipped by the MBA indicated in label 307. It is mandatory when reporting domestic transfer of nuclear material to another MBA or export of nuclear material; otherwise, it may be omitted. If an export is reported and the receiving MBA (or facility) code is unknown to the shipper, it is sufficient to report only the country code.

- a) Country code;
- b) Slash (/);
- c) MBA (or, for exports, facility or country) code.

390 CONCISE NOTE INDICATOR

390:*#

This optional data element serves to call attention to a Concise Note included in the report or otherwise attached to it.

Letter "Y" indicating the presence of a Concise Note.

391 TEXT OF CONCISE NOTE

391:*** ... ***#

The text of the Concise Note in free format, using only capital Latin letters, numerals and permitted special symbols to provide clarifications, amplifications and other unformatted information, such as relevant burn-up values, relevant aspects of the operational programme, etc. A maximum of 2000 characters may be reported in a single entry.

407 KEY MEASUREMENT POINT CODE

407:**#

The appropriate KMP code, as assigned in the facility attachment.

411 TYPE OF INVENTORY CHANGE, TYPE OF ACCOUNTING ENTRY

411:**# (411:****# for rounding adjustments)

In ICRs, inventory change codes consist of two alphabetic characters. The accounting entry type codes used in MBRs also consist of two letters, except for the codes indicating rounding adjustments. The inventory changes and other entry types are listed below. In ICRs, all transactions and operations are related to individual batches. In MBRs, the same codes denote consolidated entries, i.e., the sums of all individual operations with the same code over the material balance period. In addition, MBRs include entries related to inventories and adjustments not reported in ICRs.

Keyword	Code	Explanation
Receipt foreign	RF	Import of nuclear material into Canada
Receipt domestic	RD	Domestic receipt of nuclear material from another MBA
Receipt at starting point	RS	Domestic receipt of nuclear material at starting point of safeguards.
Receipt from non-safeguarded activity	RN	Domestic receipt of nuclear material from non-safeguarded (permitted military) activity
Nuclear production	NP	Production of fissionable material in a reactor (plutonium, uranium-233)
De-exemption, use	DU	Reapplication of safeguards on nuclear material previously exempted from safeguards.
De-exemption, quantity	DQ	Reapplication of safeguards on nuclear material previously exempted safeguards.
Shipment foreign	SF	Export of nuclear material out of Canada
Shipment domestic	SD	Domestic transfer of nuclear material to another MBA
Shipment to non-safeguarded activity	SN	Domestic transfer of nuclear material to non-safeguarded (permitted military) activity
Nuclear loss	LN	Consumption of nuclear material due to its transformation into other element(s) or isotope(s) as a result of nuclear reactions

Keyword	Code	Explanation
Measured discard	LD	Operational loss, i.e., loss of a measured or estimated (on the basis of measurement) quantity of nuclear material from processing which has been disposed of in such a way that it is not suitable for further nuclear use
Transfer to retained waste	TW	Transfer to the retained waste category of measured nuclear material which is deemed to be irrecoverable, to be stored at the MBA and to be deleted from the inventory of the MBA
Retransfer from retained waste	FW	Retransfer of material which 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
Exemption, use	EU	Exemption of nuclear material from safeguards.
Exemption, quantity	EQ	Exemption of nuclear material from safeguards.
Termination	TU	Termination of safeguards on nuclear material.
Accidental loss	LA	Irretrievable and inadvertent loss of a known quantity of nuclear material as the result of an operational accident
Accidental gain	GA	Nuclear material unexpectedly found to be present in the MBA, except when detected in the course of a physical inventory taking
Category change (with the appropriate code as shown) ¹⁵	EN ED NE ND DE DN	The quantity of uranium which 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). The material description codes (labels 430 and if appropriate 435) should be those for the resulting material. The weight data (in labels 610, 620, 630, 640, 660, 670, 770, 780 as appropriate) should be provided both for the originating and for the resulting category. These entries should be consolidated into the material balances for both categories.
In addition to the changes described above, the inventory may be adjusted in accordance with the results of measurements performed in the material balance area on nuclear material previously recorded and reported on shipper's data. The keyword and the code are as follows:		
Shipper-receiver difference	DI	The 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
The following, which are not inventory changes, are for reporting changes in batch identification and/or content.		

¹⁵ This procedure is not applicable in MBAs which report in terms of 'unified uranium'.

Keyword	Code	Explanation
Decrease in batch content ¹	RM	The quantity by which the batch mentioned in the entry is diminished due to rebatching
Increase in batch content ¹⁶	RP	The quantity of material added to the batch mentioned in the entry from another batch due to rebatching
The following entries appear only in Material Balance Reports:		
Beginning physical inventory	PB	Beginning physical inventory should be equal to the ending physical inventory of the previous MBR relating to the same category of material
Inventory changes		For each type of inventory change as applicable for the MBA in question, one consolidated entry should be made for the entire material balance period.
Ending book inventory ¹⁷	BE	The algebraic sum of the beginning physical inventory and the inventory changes, not including any rounding adjustments reported in the MBR.
Shipper/receiver difference	DI	One consolidated entry should be made for all shipper/receiver differences over the entire reporting period, if applicable
Adjusted ending book inventory	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
Ending physical inventory	PE	The sum of all measured and derived batch quantities of nuclear material on hand at the date of the physical inventory taking
MUF	MF	Material unaccounted for: this should be calculated as the difference between the adjusted ending book inventory and the ending physical inventory

¹⁶ The batch decreases and increases involved in rebatching should be reported simultaneously in separate entries. In any given ICR the sum of entries with the code RM should be equal to the sum of entries with the code RP. Since these entries do not change the total inventory, they should be ignored during the calculation of a material balance.

¹⁷ This entry is optional.

Keyword	Code	Explanation
Rounding adjustment to entry XX	RAX X	<p>The quantity to be added to the rounded sum to make it equal to the sum of the rounded terms. A rounding adjustment is made to an entry in the MBR on which the Agency has been informed differently through ICRs and PILs, in order to bring the MBR entry into agreement with the corresponding figures established on the basis of ICRs and PILs.</p> <p>The rounding adjustments should be coded RAXX where XX stands for the code of the entry to which the rounding adjustment pertains, e.g., RALN means a rounding adjustment to the consolidated entry on the nuclear loss</p> <p>In the case of a rounding adjustment to the ending book inventory, adjusted ending book inventory or MUF, the following formulae should be used respectively:</p> $\text{RABE} = \text{PB} + \text{IC}_{\text{MBR}} - \text{BE}$ $\text{RABA} = \text{PB} + \text{IC}_{\text{MBR}} - \text{DI} - \text{BA}$ $\text{RAMF} = \text{BA} - \text{PE} - \text{MF}$ <p>where IC_{MBR} represents the sum of the consolidated inventory changes as reported in the MBR, taken with the appropriate sign indicating increases or decreases.</p>

412 DATE OF INVENTORY CHANGE

412:[*****][*****]#

This data element indicates the date on which the change in inventory occurred or was established.

- a) eight numeric digits (as in label 003, above)

430 MATERIAL DESCRIPTION CODE

430:*/*/*/#

This data element consists of a four-character code indicating the physical and chemical form, the type of container and the irradiation status and quality of the nuclear material in the batch. The domestic shipment of a given batch from one MBA and its receipt in another MBA must be reported with the same material description code. Each of these codes corresponds also to a keyword combination for use in uncoded communication. If codes are used in hard-copy communications, the slashes may be omitted.

Physical and Chemical Form

First Keyword	Second Keyword	First Two Characters
solution	nitrate fluorides other	LN LF LO
powder	homogeneous homogeneous	PH PN
ceramics	pellets spheres other	CP CS CO
metal	pure alloys	MP MA
fuel	rods, pins plates bundles assemblies other	ER EP EB EA EO
sealed sources small quantities, samples scrap	- - homogeneous heterogeneous (cleanouts, clinkers, sludges, fines, other)	QS SS SH SN
solid waste	hulls mixed (plastics, gloves, papers, etc.) contaminated equipment other	AH AM AC AO
liquid waste	low active medium active high active	WL WM WH

Type of Container (items)

Keyword	Third character
cylinder	C
pack	P
drum	D
discrete fuel units. (For fuel only.)	S
bird cage	B
bottle	F
other	O

Further Characterization of the Material

Keyword	Fourth character
fresh nuclear material	F
irradiated nuclear material	I
retained waste	W
irrecoverable material	N
recoverable material	R

435 OPERATOR'S MATERIAL DESCRIPTION CODE

435:*/*** ... ***#

This data element may be used to indicate that the operator's material description code is identical with the code used by the Agency; if they differ, the operator's own code may be shown.

letter Y indicates that the codes are identical, or a letter N which indicates that the operator's material description code follows;

slash (/), if operator's code follows; and

operator's material description code. A maximum of 12 characters may be reported.

436 OPERATOR'S MATERIAL DESCRIPTION (TEXT)

436:*** ... ***#

This data element permits the inclusion of a textual description of the batch if the operator so wishes or as otherwise agreed. The text should be composed of Latin capital letters, numerals and permitted special symbols. A maximum of one hundred characters may be reported.

445 NON-LATIN ALPHABET IDENTIFICATION

445:* #

If non-Latin letters are used in the entry (e.g., in the batch name or encoder's name), an agreed one letter code is to be placed in this data element. Otherwise this label should not be used.¹⁸

446 BATCH NAME

446:*** ... ***#

The batch name of the nuclear material being reported. In particular, for ICR entries reporting a receipt, the batch name may be one assigned by the reporting MBA or may be the same one used by the shipper as reported in label 447, SHIPPER'S BATCH NAME. It is mandatory that the batch name reported in label 446 be unique to the reporting MBA for any transaction on a single date. A maximum of sixteen characters may be reported.

¹⁸

The transcription tables for non-Latin alphabets should be agreed in advance; the code under this label should refer to the appropriate table.

447 SHIPPER'S BATCH NAME

447:*** ... ***# (447:UNKNOWN#)

This data element is only used in ICR entries reporting a receipt. It is the batch name used by the shipper in the ICR entry reporting the shipment. If the shipper's batch name is unknown, then the keyword UNKNOWN is to be reported. A maximum of sixteen characters may be reported.

469 MEASUREMENT IDENTIFICATION CODE

469:*/*** ... ***/*** ... ***#

This data element consists of three items, of which the first has to be provided for each batch. The second and third are to be given in specified cases only.

- a) Measurement basis code, consisting of one of the letters:
 - (i) "N" if batch data are based on measurements made at another MBA;
 - (ii) "L" if batch data are based on measurements made at another MBA and have been reported for the present MBA in a preceding ICR or PIL;
 - (iii) "M" if the batch data are based on fresh measurements made at the MBA; and
 - (iv) "T" if the batch data are based on measurements made at the present MBA and have been reported in a preceding ICR or PIL; the measurements have not been repeated;
- b) Slash (/) (if other data items follow);
- c) In cases denoted by "M" above, indicate the KMP where the measurement was made if it differs from the KMP named in the data element under label 407; otherwise not needed.
- d) Slash (/) (if other data item follows);
- e) In cases denoted by "M" or "T" above, indicate the method used for the measurement, if so provided in the Facility Attachment, using the agreed codes.

470 NUMBER OF ITEMS IN BATCH

470:*** ... ***#

The number of similar items of which the batch consists should be given. In the case of bulk material and generally when the number would not be meaningful, a numeric zero should be placed in this data element. This number must be an integer.

600-800 WEIGHT DATA

600:*** ... ***# 610:*** ... ***# 620:*** .. etc. .. 800:*** ... ***#

These data elements provide the quantities of the nuclear material in the batch represented by the entry (record). They are weight data related either to a specific chemical element or to its isotopes, as indicated in the table below.

These weight data are to be expressed in the following units:

- a) grams of plutonium (and its isotopes, if appropriate),
- b) grams of total uranium for enriched uranium,
- c) grams of isotopes of uranium, and
- d) kilograms of natural uranium, depleted uranium and thorium.

The category of unified uranium shall be reported in grams.

If desired, the data may be rounded, but not beyond the nearest integer of the unit used; this may necessitate the reporting of rounding adjustments in MBRs. If batch data are rounded, this rounding should be done by first adding the weights of the individual items comprising the batch and rounding their sum. It is recommended, though, that data be reported in unrounded figures.

The data element consists of a set of data items with the same format; each of these begins with its own numerical label, followed by a colon (:) and subsequently by the numerical expression of the weight of the element (isotope or their combination of isotopes), indicated by the label; and the letter “G”, if the weight is expressed in grams, or by the letter “K”, if the weight is given in kilograms. Weights reported to a higher precision than milligrams will be rounded to the nearest milligram.

The meaning of the individual numeric labels in this data element:

600	unified uranium	weight of element
610	natural uranium	weight of element
620	depleted uranium	weight of element
630	enriched uranium	weight of element
640	enriched/unified uranium-233 content	weight of isotope
650	enriched/unified uranium-234 content	weight of isotope
660	enriched/unified uranium-233 + uranium-235 content	weight of isotopes
670	enriched/unified uranium-235 content	weight of isotope
680	enriched/unified uranium-236 content	weight of isotope
690	enriched/unified uranium-238 content	weight of isotope
700	plutonium	weight of element
710	plutonium-238 content	weight of isotope
720	plutonium-239 content	weight of isotope
730	plutonium-240 content	weight of isotope
740	plutonium-241 content	weight of isotope
750	plutonium-242 content	weight of isotope
760	plutonium-239 + plutonium-241 content	weight of isotopes
770	natural uranium fissile content	weight of isotope
780	depleted uranium fissile content	weight of isotope
800	thorium	weight of element

K.6 Composition of Accounting Reports in Labelled Format

Each accounting report contains a number of labels with their associated data elements.

A set of data elements logically connected to each other comprises an entry (record), a set of which (pertaining to the same MBA) is considered as a report.

K.6.1 Physical Inventory Listing

Each Physical Inventory Listing (PIL) may consist of entries (records) of two types:

1. The first type of PIL entry (record) is used for the presentation of nuclear material batch data;
2. The second type of PIL entry (record) is used for Concise Notes giving additional textual information not accommodated in any of the data elements of the first type of PIL entries (records)

Each PIL must contain at least one entry (record) of the first type.

K.6.1.1 Specification of PIL entries (records)

K.6.1.2 The first type of PIL entry (record) includes the following data elements:

001, 002, 003, 006, 010, 015, 207, 307, 309,
310 – optional

390 - mandatory if this entry is referenced by a Concise Note submitted in the same report, 407, 430,

435 - optional, if the operator's material description code differs from the Agency code, represented by data with label 430,

436 - optional,

445 - mandatory if the batch name or encoder's name includes non-Latin letters, 446, 469, 470

and pertinent data with labels between 600-800 which describe the content of the batch and the weight of the nuclear materials; if label 600 or 630 is used, then label 640, 660 or 670 must also be reported. Data covered by labels 650, 680, 690, 710, 720, 730, 740, 750, 760, 770 and 780 are optional, if not required by the Facility Attachment.

K.6.1.3 Each PIL entry (record) of the second type includes the data elements with the following labels:

001, 002, 003, 099, 207, 307, 391 (of these, label 099 is optional).

If a second type entry (Concise Note) is made, the data recorded for labels 001, 207 and 307 must be the same as those recorded for the entry of the first type to which the Concise Note refers, with "NC" replacing ØI in label 001.

K.6.1.4 A PIL must be prepared even if there was no nuclear material in the MBA at the time of the physical inventory taking. Such a PIL should have a single entry including the following data elements:

001, 002, 003, 006, 010, 015, 207, 307, 309 - with a value of 'U', 310 optional.

K.6.2 Inventory Change Report

Each Inventory Change Report (ICR) may consist of entries (records) of two types.

1. The first type of ICR entry (record) is used for the indication of changes in the inventory of nuclear material;
2. The second type of ICR entry (record) is used for Concise Notes giving additional textual information not accommodated in any of the data elements of the first type of entries (records).

Each ICR must contain at least one entry (record) of the first type.

K.6.2.1 Specification of ICR entries (records)

K.6.2.2 The first type of ICR entry (record) includes the following data elements:

001, 002, 003, 006, 010, 015, 207, 307, 309, 310 – optional
370, 372 - mandatory for imports, exports and transfers between MBAs within the State,
390 - mandatory if this entry is referenced by a Concise Note submitted in the same
report, 407, 411, 412, 430,
435 - optional, if operator's material description code differs from the Agency code,
represented by label 430,
436 - optional,
445 - mandatory, if the batch name or encoder's name includes non-Latin letters, 446
447 - shipper's batch name or keyword UNKNOWN for ICRs reporting receipts 469, 470
and pertinent data with labels between 600-800 which describe the content of the batch
and the weight of the nuclear materials; if label 600 or 630 is used, then label 640, 660 or
670 must also be reported. Data covered by labels 650, 680, 690, 710, 720, 730, 740, 750,
760, 770 and 780 are optional, if not required by the Facility Attachment.

K.6.2.3 Each ICR entry (record) of the second type includes the data elements with the following labels:

001, 002, 003, 099, 207, 307, 391 (of these, label 099 is optional).
If a second type entry (Concise Note) is made, the data recorded for labels 001, 207 and
307 must be the same as those recorded for the entry of the first type to which the
Concise Note refers, with NC replacing ØI in label 001.

K.6.3 Material Balance Report

Each Material Balance Report (MBR) may consist of entries (records) of two types:

1. The first type of MBR entry (record) is used for the presentation of nuclear material balance data; and
2. The second type of MBR entry (record) is used for Concise Notes giving additional textual information not accommodated in any of the data elements of the first type of MBR entries (records).

Each MBR must consist of at least one entry (record) of the first type.

K.6.3.1 Specification of MBR entries (records)

K.6.3.2 The first type of MBR entries (records) includes the following data elements:

001, 002, 003, 006, 010, 015, 207, 307, 309, 310 – optional

390 – mandatory if this entry is referenced by a Concise Note submitted in the same report, 411

and pertinent data with labels between 600-800 which describe the content and weight of nuclear materials for which balances are to be reported. If label 600 or 630 is used, then label 640, 660 or 670 must also be reported. Data concerning labels 650, 680, 690, 710, 720, 730, 740, 750, 760, 770 and 780 are optional, if not required by the Facility Attachment.

K.6.3.3 MBR entries (records) of the second type include data elements with the following labels:

001, 002, 003, 099, 207, 307, 391 (of these, 099 is optional).

If an entry of the second type is made (Concise Note), the data recorded for labels 001, 207 and 307 must be the same as those recorded for entries of the first type in the same report, with NC replacing ØI in label 001.

K.6.3.4 An MBR must be prepared even if at the time of the physical inventory taking there was no nuclear material in the MBA and there were no transactions during the material balance period. Such an MBR should contain a single entry including the following data elements:

001, 002, 003, 006, 010, 015, 207, 307,
309 with a value of 'U' 310 - optional.

K.6.4 Composition of Plain Text Communications to be Transmitted on Magnetic Media

If so desired, freely formulated information not incorporated into formatted accounting reports may be reported as separate sets of records accumulated into any number of Textual Reports. Such reports should be formatted as free-standing Concise Notes.

Each such Textual Report must have a unique reference number. It must consist of at least one record. The length of any record in a Textual Report should not exceed a limit of 2000 characters. If the communication is longer than that, the Textual Report should be subdivided into an appropriate number of records.

Each Textual Report record must include the data elements with the following labels: 001, 002, 003, 391 (with the code NC in label 001).

If the text of the communication refers to a specific facility and/or Material Balance Area only, labels 207 and/or 307 may be used to indicate it. If a reference to a specific accounting report is desired, labels 010 and 099 may also be used. If used in this manner, label 099 should be completed as follows:

- a) 099:R/***...***#, or
- b) 099:E/***...***/**...***#

If the letter R is used, it should be followed by a slash and the report number to which the Concise Note refers. If the letter E is used, it should be followed by a slash, a report number, another slash and then the entry number within the report to which the Concise Note refers. (See description of element 099 in Section K.5, above).

APPENDIX L LABEL FORMATS

003	Report Date 003: *****#	436	Operator's Material Description (Text) 436:*** ... ***#
006	Encoder's Name 006: *** ... ***#	446	Batch Name 446:*** ... ***#
015	Reporting Period 015: [*****/****/****][*****/****/****]#	447	Shipper's Batch Name 447:*** ... ***# (447:UNKNOWN#)
207	Facility Code 207:*****#	469	Measurement Identification Code 469:*/*** ... ***/*** ... ***#
307	MBA Code 307:*****#	470	Number of Items in Batch 470:*** ... ***#
309	Entry Status and Cross Reference Code 309:*/**;* ... ***/*** ... ***# (309:*)#	600-800	Weight Data 600:*** ... ***# 610:*** ... ***# 620:*** .. etc. .. 800:*** ... ***#
370	Shipper of Nuclear Material 370:*/****#	1000	General Ledger Line Number 1000:*** ... ***#
372	Receiver of Nuclear Material 372:*/****#	1001	Item Identification 1001:*** ... ***# The identification number or name of the item. For example, bundle serial number, drum number, UF ₆ cylinder number, etc.
407	Key Measurement Point Code 407:**#	1002	General Ledger Correction Date 1002: *****#
411	Type of Inventory Change, Type of Accounting Entry 411:**# (411:*****# for rounding adjustments)	1003	General Ledger Correction Line Number 1003:*** ... ***# Line number of entry being corrected
412	Date of Inventory Change 412:[*****/****/****][*****/****/****]#		
430	Material Description Code 430:*/**/*#		
435	Operator's Material Description Code 435:*/*** ... ***#		

1004	Remarks/Comments 1004:***...***#	1018	Cooling time of irradiated fuel 1018:***.***/****#
1005	Stratum Code 1005:***...***#	1019	Burn-up of irradiated fuel 1019:***...*** #
1006	Element Code 1006:**#	1020	IAEA Safeguarded/Non-safeguarded 1020:*#
1007	Irradiation status 1007:*#	1021	ICD Revision Number 1021:***...***#
1008	Inventory tag number 1008:***...***#	1022	Correction indicator 1022:*#
1009	Seal number 1009:***.***#	1023	Units 1023:**#
1010	Item description 1010:***.***#	1024	Isotope Code to indicate the kind of fissile isotope of which the weight is given 1024:*#
1011	Gross weight 1011:***.***#	1025	Unique Identifier 1025:***...***#
1012	Tare weight 1012:***.***#	1027	Shipper (name and address) 1027:***...***/**...***/...#
1013	Net weight 1013:***.***#	1028	Receiver (name and address) 1028:***...***/**...***/...#
1014	Element concentration factor (indicate basis whether nominal, calculated or measured) 1014:***...****#	1029	Owner of the nuclear material 1029:***...***#
1015	Isotope enrichment factor (indicate basis whether nominal, calculated or measured) 1015:***...****#	2001	Export Licence Number 2001:***...***#
1016	Volume 1016:***...***#	2002	Import Licence Number 2002:***...***#
1017	Density 1017:***...***#	2003	Country of Origin Code 2003:****#

- 2004 Foreign Obligation Code
2004:****/****/****/****/...#
- 2005 Final Destination
2005:****#
- 2006 Country of Intended End Use
2006: ***...***#
- 2007 Holding Account Code
2007: ***...***#
- 2008 Contract Number indication the uranium export sales
contract number
2008: ***...***#
- 2009 Contract Balance (element weight)
2009:*** ... ***#
- 2010 Balance (isotope weight)
2010:*** ... ***#
- 2011 Number of inventory changes
2011:*** ... ***#

APPENDIX M SUPPLEMENTAL INSTRUCTIONS FOR SPECIAL ACCOUNTING SITUATIONS

M.1 Special Accounting Situations

M.1.1 Category Changes

Category change does not apply if the nuclear material accounts are maintained in terms of unified uranium.

The element categories for uranium are enriched, natural and depleted uranium.

In the course of processing or use, the enrichment of uranium may change and the nuclear material may therefore change from one element category to another. Blending different categories of uranium, enrichment, and depletion or burn-up are the ways in which category changes occur. When the element category for a batch changes, this is called a category change and is to be reported on an inventory change document and the General Ledger for each batch.

The inventory change codes for category changes are “ED”, “DE”, “ND”, “DN”, “NE”, “EN”, where the first character shows the previous element category and the second character the resulting element category. (e.g. for enrichment of natural uranium to enriched uranium, the inventory change code to report the change in category is NE, natural to enriched.)

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

M.1.2 Rebatching

In order to report changes in the contents of a batch or in the identity of a batch, the inventory change codes for rebatching are used.

The rebatching inventory change codes are “RM” (rebatching minus) and “RP” (rebatching plus). The RM entries report the previous status of a batch and the RP entries report the revised or new status of a batch.

If a batch is to be renamed, two line entries should be reported on the inventory change document and the general ledger. An RM entry is used to indicate the old batch name and an RP entry is used to report the new batch name.

If a quantity of nuclear material is removed from batch A and added to batch B, the decrease to batch A would be reported as an RM. The corresponding increase to batch B should be reported as an RP. The weights reported for the RM and the RP must be the same.

The inventory change codes RM and RP do not indicate real changes in inventory and therefore do not influence the adjusted book ending inventory. The sum of all RM entries for a batch must equal the sum of all RP entries for that batch.

M.1.3 Shipper-Receiver Differences

Receipts, foreign (RF) and domestic (RD), must be reported based in the inventory change document and the General Ledger on shipper values.

If the receiving material balance area measures the received batch and the measurement results are different from the shipper's weights, the General Ledger may be adjusted and the difference reported to the CNSC on the inventory change document and the General Ledger as a shipper-receiver difference using the inventory change code "DI".

The formula to calculate the shipper-receiver difference is:

$DI = \text{shipper's weight} - \text{receiver's weight}$.