United States Nuclear Regulatory Commission

Protecting People and the Environment

NUREG/BR-0007
Revision 8

Instructions for the Preparation and Distribution of Material Status Reports

(DOE/NRC Forms 742 and 742C)

Final Report

Office of Nuclear Material Safety and Safeguards

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Instructions for the Preparation and Distribution of Material Status Reports

(DOE/NRC Forms 742 and 742C)

Final Report

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ABSTRACT

U.S. Nuclear Regulatory Commission (NRC) regulations require each licensee that is authorized to possess special nuclear material or foreign obligated source material to prepare and submit, in computer-readable format, reports concerning special nuclear material that it received, produced, possessed, transferred, consumed, disposed of, or lost. This NUREG contains instructions for preparing these forms.

Paperwork Reduction Act Statement

U.S. Department of Energy (DOE)/NRC Form 742, "Material Balance Report," and DOE/NRC Form 742C, "Physical Inventory Listing," cover the information collections in NUREG/BR-0007. The Office of Management and Budget (OMB) approved DOE/NRC Forms 742 and 742C under approval numbers 3150-0004 and 3150-0058. The estimated burden per response to comply with this mandatory collection request is 2 hours for small licensees and 5 hours for large licensees to complete DOE/NRC Form 742 and 2 hours for small licensees and 6 hours for large licensees to complete DOE/NRC Form 742C. The NRC requires the information to fulfill its safeguards responsibilities, bilateral agreements, and responsibilities as a participant in the U.S./International Atomic Energy Agency Safeguards Agreement. Send comments on burden estimates to the Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or through e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0004, 3150-0058), Office of Management and Budget, Washington, DC 20503.

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ACRONYMS AND ABBREVIATIONS

A	addition to inventory
BI	beginning inventory
CFR	*Code of Federal Regulations*
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
EI	ending inventory
EURATOM	European Atomic Energy Community
FA	facility attachment
IAEA	International Atomic Energy Agency
ICT	inventory change type
I.D.	identification
ID	inventory difference
IDC	identification code
LES	Louisiana Energy Services
MBA	material balance area
NMIS	Nuclear Material Information System
NMMSS	Nuclear Materials Management and Safeguards System
NRC	U.S. Nuclear Regulatory Commission
OMB	Office of Management and Budget
Pu	plutonium
R	removal from inventory
RIS	reporting identification symbol
SAMS	Safeguards Management Software
SNM	special nuclear material
TFA	transitional facility attachment
U	uranium

U.S. NUCLEAR REGULATORY COMMISSION INSTRUCTIONS FOR THE PREPARATION AND DISTRIBUTION OF MATERIAL STATUS REPORTS

U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR REGULATORY COMMISSION FORMS 742 AND 742C

1 INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) jointly sponsor the Nuclear Materials Management and Safeguards System (NMMSS). This system is the U.S. Government's national database used by the DOE and the NRC for tracking certain nuclear material.

Common reporting forms and formats are used to minimize the reporting burden on licensees[1] that are required to provide nuclear material data to one or both agencies in accordance with current regulations or contractual obligations. In this manner, licensees can file one report to meet the reporting requirements of both the NRC and DOE. The agency that requires the specific data monitors compliance with specific reporting requirements. NRC regulations require licensees to submit the reports in computer-readable form.

In addition to the physical inventory reporting requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 74, "Material Control and Accounting of Special Nuclear Material," as discussed in Section 1.2, licensees may also be required to report to the NMMSS all receipts, transfers, and inventory adjustments of DOE-owned, -loaned, or -leased material in their possession that they obtained from the DOE. In such cases, licensees shall file DOE/NRC Form 742, "Material Balance Report," and DOE/NRC Form 742C, "Physical Inventory Listing," to report quantities of 0.5 or greater of the reporting unit specified in DOE Series 470 orders (DOE Order 470.4, "Safeguards and Security Program," and DOE Order 474.2, "Nuclear Material Control and Accountability").

1.1 Material Status Reports

DOE/NRC Forms 742 and 742C are the means for submitting reports of material balance and physical inventory listing data to the NMMSS. The information must be completed in accordance with the instructions in this NUREG and must be submitted in computer-readable format. NMMSS Report D-24, "Personal Computer Data Input for Nuclear Regulatory Commission Licensees," dated January 1, 2012, provides the instructions for creating the computer-readable submittal.

Licensees use DOE/NRC Form 742 to report a summary of activity for a specified material within a material balance reporting period, as specified in 10 CFR 74.13, "Material Status Reports." The report conveys beginning and ending inventory balances; activities such as shipments and receipts involving other facilities; and decay, transmutation, and production

[1] The term "licensee" here denotes an NRC or Agreement State licensee or an NRC certificate holder or possessor.

calculations. This information is useful for validating a facility's ending book inventory. Licensees that neither received nor transferred source or special nuclear material (SNM) within a reporting period should still refer to instructions in NUREG/BR-0006, "Instructions for Completing Nuclear Material Transaction Reports," to submit a DOE/NRC Form 741, "Nuclear Material Transaction Report," to the NMMSS to report other transactions that would otherwise change the inventory balance within the material balance period.

Licensees use DOE/NRC Form 742C to report a facility's physical inventory listing as of a specified date. For each material type category, the report lists the amount of material in the facility's possession at the time of the inventory. The form can show each individual batch or summarize totals of "like" batches. The totals for each material type category must match the ending balance in the corresponding material balance report (DOE/NRC Form 742).

The NMMSS relies heavily on the quality of the data reported by the facilities involved in nuclear activities. The data submitted to the NMMSS are subject to evaluation according to the restrictions placed on nuclear activity by the policies of various governing agencies of the United States. The NMMSS receives the data after they are verified by "edit checks" as acceptable within the restrictions of the system.

1.2 Regulations

NRC regulations in 10 CFR 74.13 require each licensee that possessed SNM during a material balance reporting period in a quantity totaling 1 gram or more of contained uranium (U)-235, U-233, or plutonium (Pu) to prepare and submit in computer-readable format DOE/NRC Forms 742 and 742C concerning SNM received, produced, possessed, transferred, consumed, disposed of, or lost. Reporting periods are determined by the quantity of material possessed by the facility, specifically as follows:

- Licensees subject to the requirements of 10 CFR 74.51, "Nuclear Material Control and Accounting for Strategic Special Nuclear Material," shall compile a report as of March 31 and September 30 of each year and file the report within 30 days after the end of the period covered by the report.

- Licensees subject to the requirements of 10 CFR 74.19(c), 10 CFR 74.31(c)(5), 10 CFR 74.33(c)(4), or 10 CFR 74.43(c)(6) shall submit a report within 60 calendar days of the beginning of the physical inventory.

- Licensees reporting pursuant to 10 CFR 75.35, "Material Status Reports," shall prepare and submit material status reports as described in Section 3.2 of this NUREG.

- All other licensees, including those subject to 10 CFR 150.17, "Submission to Commission of Nuclear Material Status Reports," shall submit a report no later than March 31 of each year.

Licensees shall complete a separate DOE/NRC Form 742 and 742C for each material type of SNM and source material for which a reportable quantity is possessed or a reportable inventory change has occurred during the material balance period. For SNM, reportable quantities are defined as 1 gram or more; for source material, the reportable quantity is 1 kilogram or more. For reporting purposes, quantities of 0.5 or more are to be rounded up to the next whole unit. Section 2 of this NUREG provides a complete listing of material types.

In addition, NRC regulations in 10 CFR 40.64, “Reports,” require each licensee that possesses, or that had possessed in the previous reporting period, 1 kilogram or more of uranium or 1 kilogram or more of thorium source material pursuant to the operation of enrichment services, the downblending of uranium that has an initial enrichment of the U-235 isotope of 10 percent or more, or the fabrication of mixed-oxide fuels to complete and submit DOE/NRC Forms 742 and 742C for all activities involving the source material.

Furthermore, NRC regulations in 10 CFR 40.64(b)(1) require each Federal or State licensee that possessed 1 kilogram or more of foreign obligated source material (material types 10, 81, and 88) during a reporting period to submit a statement of foreign obligated source material inventory to the NRC. The regulation allows the use of DOE/NRC Form 742. The reporting period is October 1 to September 30 of each year (unless the NRC authorizes an alternate period).

Each licensee required to report material balance, inventory, and/or foreign obligation information, as detailed in this part, shall resolve any discrepancies identified during the report review and reconciliation process within 30 calendar days of notification of a discrepancy identified by the NRC. Section 1.5 of this NUREG contains additional instructions on reconciliation.

Possessors of DOE-owned material should refer to DOE Order 470.4B and DOE Order 474.2 for additional information on reporting inventories.

1.3 Preparation and Submission of DOE/NRC Forms 742 and 742C in Computer-Readable Format

NMMSS Report D-24 provides instructions for preparing DOE/NRC Forms 742 and 742C in computer-readable format as required for submittal. The Safeguards Management Software (SAMS) program is a facsimile of the NMMSS that allows the user to import and export data; do “edit checks” to complete a quality review; generate various reports; and create material balance, inventory, and transaction data. It has the capability to export data into the required NMMSS predefined computer-readable format outlined in NMMSS Report D-24. The SAMS program may be obtained from the NMMSS staff free of charge.

Licensees can submit data to the NMMSS through the following two methods:

(1) Electronic Data Submission

Licensees should submit DOE/NRC Forms 742 and 742C in computer-readable format unless reporting under 10 CFR 40.64(b). NMMSS Report D-24 provides instructions on packaging, data format requirements, acceptable media types, and the mailing address for the submittal of data on computer media.

Licensees can request a copy of the fillable forms installer kit by e-mailing the NMMSS staff at nmmss@nnsa.doe.gov. These forms can be completed, saved at the licensee site, and submitted to the NMMSS at this e-mail address. Licensees may also contact the NRC program manager for questions about fillable forms and electronic data submission by e-mailing the NRC at nmmss.resource@nrc.gov.

Licensees should adhere to their facility's encryption policy for transmitting electronic data to the NMMSS.

Licensees may also download data onto electronic media and mail the data to the NMMSS. Contact the NMMSS staff to confirm the mailing address before sending mail.

(2) New or Modified Methods of Transferring Electronic Data

The NRC may authorize new or modified methods of transferring electronic DOE/NRC Form 742 and 742C data to the NMMSS. Licensees may confirm authorization to use additional methods for the transfer of these data by contacting the NMMSS staff.

1.4 Documentation and Distribution

Licensees must submit the completed DOE/NRC Forms 742 and 742C to the NMMSS in a timely manner, consistent with their possession license requirements. Before licensees submit any data, they should determine whether their submission contains classified information because the specific documentation and distribution instructions depend on whether the completed DOE/NRC Form 742 or 742C contains classified or unclassified information.

Any DOE/NRC Form 742 or 742C that is classified must be documented and handled in accordance with all pertinent security requirements. All other submissions that are not classified are considered to be proprietary material control and accounting information, and licensees may request that such information be withheld as defined by 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding." Each person who is to receive a copy of the report must be verified as a qualified recipient before distribution. Licensees should confirm the address before sending documents to the NMMSS or other recipients. In addition, they should formally provide classification guidance to the NMMSS after deciding to classify or declassify a submission or to change previously submitted guidance. When submitting safeguards information, licensees should also submit DOE/NRC Form 740M, "Concise Note," and state that the submission is safeguards information and should be handled in accordance with 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Licensees should do the following when distributing the completed report:

- Submit one copy of the completed report and all supporting subschedules and lists to the NMMSS. All reporting identification symbol (RIS) holders are encouraged to review their RIS point-of-contact information yearly and notify the NMMSS staff that the data are correct or make changes.

- Retain one copy for licensee files.

1.5 Reconciliation

At the end of every material balance reporting period, a reconciliation shall be performed between reports submitted by the licensee to the NMMSS and the projected book inventory that the NMMSS has calculated. This process shall be considered complete when the licensee resolves any differences between the reported and projected balances, including those listed for

foreign obligated materials.[2] The reconciliation should be completed within 30 calendar days of when the licensee was notified of the discrepancy, and it should include all accounts, including holding accounts, held by the licensee.

Facilities should ensure that their reported weight totals on DOE/NRC Form 742C equal the weight totals on DOE/NRC Form 742 for each material type. The totals in DOE/NRC Form 742C should be an arithmetic sum of the weights listed on the batch data lines of DOE/NRC Form 742C. The totals on DOE/NRC Forms 742 and 742C should agree with the values maintained and used at the site. However, if reported DOE/NRC Form 742 and 742C values differ from site-maintained values because of issues such as rounding, the site should submit a concise note (DOE/NRC Form 740M) explaining the difference.

[2] Commercial practices allow a facility to conduct a foreign obligations exchange to meet a contractual requirement. Foreign obligation exchanges are not meant to circumvent U.S. international agreements for peaceful use and nuclear cooperation with trading partners. Facilities should use special care to avoid a negative foreign obligations balance. The NMMSS may report a negative foreign obligations balance for a facility at any given reporting date because of the time delay in reporting shipments versus receipt; however, the NMMSS cannot reconcile a facility for a material balance period until the foreign obligations at the facility are balanced.

2 INSTRUCTIONS FOR COMPLETING DOE/NRC FORM 742 REPORTS

Licensees should complete DOE/NRC Form 742 in accordance with the instructions in this NUREG and in NMMSS Report D-24, as appropriate. NMMSS Report D-24 provides instructions and examples for the preparation of required electronic submittals to the NMMSS.

The following numbered instructions correspond to the numbered blocks and lines on DOE/NRC Form 742 that licensees must complete:

1. NAME AND ADDRESS—Leave blank.

2. LICENSE NUMBER(S)—Leave blank.

3. REPORTING IDENTIFICATION SYMBOL (RIS)—Enter the RIS that has been assigned and under which the source material or SNM being reported is or was held. Submit a separate report for each RIS and any holding account.

4. REPORT PERIOD (MM/DD/YYYY)—Enter the inclusive dates. The beginning date for the reporting period must be the next consecutive date after the ending date of the previous report.

5. MATERIAL TYPE—Enter the appropriate material type code for the material being reported, as follows:

CODE	DESCRIPTION
10	depleted uranium
E1	uranium enriched greater than normal but less than 5 percent
E2	uranium in enrichment of 5 percent or more but less than 20 percent
E3	uranium in enrichment of 20 percent or more but less than 80 percent
E4	uranium in enrichment of 80 percent or more
50	plutonium
70	U-233
81	normal uranium
83[3]	Pu-238
88	thorium
89	uranium in cascades

Complete a separate DOE/NRC Form 742 for each SNM or source material type even for cases in which two or more types are combined.

[3] Report the material type as Pu-238 if the contained Pu-238 is greater than 10 percent of the total plutonium by weight (material type 83); otherwise, report it as plutonium (material type 50). The element Pu-238 was 1 of the 12 material types originally reported in the electronic Nuclear Material Information System (NMIS), which predated the NMMSS database. Pu-238 was primarily possessed by nuclear power and research reactors that were government (DOE) owned and followed the convention for reporting at the 0.1-gram level. When the NRC was formed in 1974, the NRC licensees possessing DOE-owned Pu-238 continued reporting at the 0.1-gram level in accordance with DOE guidance. This reporting trend continued in practice even as nuclear material became privately owned. DOE guidance continues to require sites to report transfers and holdings of Pu-238 to the 0.1-gram level, if it is 10 percent or more Pu-238 (material type 83). NRC regulations do not distinguish between plutonium isotopes. Licensees are required to report transactions and holdings of plutonium (material type 50) to the nearest gram. The NRC accepts reporting of Pu-238 to the nearest gram, reported as 0.1-gram units.

When U-235 and U-233 are mixed, report the total element weight of the mixture in the element weight column of both the U-235 report and the U-233 report and reflect this fact in a concise note (DOE/NRC Form 740M) for each report.

2.1 Section A, "Material Accountability"

PC [process code]—Enter one of the following process codes (A, C, or D); use process codes C and D only to modify the report data for only the current processing period:

- "A" refers to the initial entry of data.
- "C" refers to the replacement of data. Data may be replaced at any time before the close of the processing period in which the initial entry was made.
- "D" refers to the deletion of data. Data may be deleted at any time before the close of the processing period in which the initial entry was made.

Reported material balance reports may be modified for the current processing periods. Use process code C for replacement and D for deletion, as follows:

- Submit a form with the RIS, report period, material type, sequence number, and process code C with the unique identifier for the line to be replaced.
- Submit a form with the RIS, report period, material type, sequence number, and process code D with the unique identifier for the line to be deleted.
- Submit a form with the RIS, report period, material type with no sequence number, and process code D to delete all matching records.
- Submit a form with the RIS, report period, and process code D to delete the entire material balance within the reporting dates.

SEQ [sequence number]—All detail lines that contain data must have a sequence number. Enter a numerical value in sequential order beginning with 1. Do not repeat or skip numbers.

Use columns A and B to enter all numeric data by element and isotope weight.[4]

COLUMN A—ELEMENT WEIGHT[4]

Enter the total element weight of the SNM or source material being reported. If the material is Pu-238, reported as material type 83, report it to the nearest 0.1 gram. Report all other SNM to the nearest gram and all other source material to the nearest kilogram.

COLUMN B—ISOTOPE WEIGHT[3]

In the case of enriched uranium or U-233, enter the weight of the isotope U-235 or U-233 as appropriate; in the case of plutonium, enter the weight of the isotopes Pu-239 and Pu-241 to the

[4] Round up fractions of 0.5 or greater. If the quantity to be entered is less than 0.5 of the reporting unit, round down to the next whole reporting unit.

nearest gram; and in the case of Pu-238 (material type 83), enter the weight of the isotope Pu-238 to the nearest 0.1 gram. If the material is depleted uranium, enter the weight of the isotope U-235 to the nearest kilogram. Do not make an entry for other source materials.

Note that, for facilities reporting under 10 CFR Part 75, "Safeguards on Nuclear Material—Implementation of Safeguards Agreements between the United States and the International Atomic Energy Agency," the facility attachment (FA) or transitional facility attachment (TFA) may require different reporting units for element and isotope weight (i.e., the element weight in kilograms and the isotope weight in grams). For this reason, the facility should report to the NMMSS as required in its FA or TFA and should contact the NMMSS staff with any questions.

8. BEGINNING INVENTORY—U.S. GOVT-OWNED—Enter the inventory of DOE-owned SNM or source material as of the beginning of business on the first day of the period covered by the report. The quantities reported on line 8 (columns A and B) must agree with the reconciled quantities on line 80 of the report submitted for the previous reporting period. Although the data field is titled "U.S. Govt-Owned," enter only DOE-owned material in this field.

9. BEGINNING INVENTORY—NOT U.S. GOVT-OWNED—Enter the inventory of SNM or source material that is not DOE-owned as of the beginning of business on the first day of the period covered by the report. The quantities reported on line 9 (columns A and B) must agree with the reconciled quantities on line 81 of the report submitted for the previous reporting period.

RECEIPTS

11. PROCUREMENT FROM DOE—Enter quantities of SNM (or source material) that have been purchased from DOE during the reporting period and reported to the NRC on DOE/NRC Form 741. This may be done by listing individual receipts for each individual RIS as reported on DOE/NRC Form 741 or a total of receipts for each individual RIS during the reporting period. SNM or source material quantities entered on line 11 are not entered on line 30.

13. PROCUREMENT—FOR THE ACCOUNT OF DOE—Enter quantities of SNM (or source material) that have been purchased for the account of DOE during the reporting period and reported to the NRC on DOE/NRC Form 741. This may be done by listing individual receipts for each individual RIS as reported on DOE/NRC Form 741 or a total of receipts for each individual RIS during the reporting period. SNM or source material quantities entered on line 13 are not entered on line 30.

14. DOD RETURNS—USE A—Leave blank.

15. DOD RETURNS—USE B—Leave blank.

16. DOD RETURNS—OTHER USES—Leave blank.

21. PRODUCTION—Enter the calculated net quantity of plutonium or U-233 produced in the fuel or blanket material of a reactor during the reporting period. For licensees reporting under 10 CFR Part 75, if the fuel from which the plutonium or U-233 was produced was removed or discharged from the reactor during this reporting period, enter the discharged quantity on line 21 directly after the word "Production."

Uranium mines and mills should account for foreign obligated uranium milled as production for the reporting period.

22. FROM OTHER MATERIALS—Enter increases resulting from the introduction of another material into the material balance being reported. If the added quantity is the result of blending, burnup, or enrichment, identify the process by which the material was added by entering the appropriate inventory change type (ICT) code from the following list:

CODE	DESCRIPTION
EN	enriched to normal
ED	enriched to depleted
NE	normal to enriched
ND	normal to depleted
DE	depleted to enriched
DN	depleted to normal
EE	enriched (low/high) to enriched (high/low)

"EE" can refer to a change from low enrichment to high, or from high enrichment to low (i.e., any combination of the E1 through E4 material type codes).

30. RECEIPTS REPORTED TO DOE/NRC ON DOE/NRC 741 (not listed elsewhere)—Enter the SNM or source material received from others and reported on DOE/NRC Form 741 but not listed elsewhere on this form. This may be done by listing individual receipts by RIS as reported on DOE/NRC Form 741 or a total of receipts from each individual RIS during the report period.

34. RECEIPTS—MISC—Enter the total quantity of material added to the inventory through miscellaneous receipt transactions (ICT 34). This requirement includes nuclear material removed from inventory and then returned to inventory, if not accounted for elsewhere on this form.

37. PROCUREMENT BY OTHERS—Leave blank.

38. DONATED MATERIAL—FROM U.S. GOVT TO OTHERS—Enter the amount of DOE-owned material donated and now non-DOE-owned.

39. DONATED MATERIAL—FROM OTHERS TO U.S. GOVT—Enter the amount of non-DOE-owned material donated that is now DOE-owned.

40. TOTAL—Enter the sums of columns A and B (lines 8 through 39).

REMOVALS

41. EXPENDED IN SPACE PROGRAMS—Leave blank.

42. SALES TO U.S. GOVT—Enter quantities of non-DOE-owned SNM or source material that have been sold and converted to DOE-owned during the reporting period and that have been reported to the NRC on DOE/NRC Form 741. This may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during the reporting period. (Do not enter SNM or source material quantities on line 51 that have already been entered on line 42.)

43. SALES TO OTHERS FOR THE ACCOUNT OF U.S. GOVT—Enter quantities of DOE-owned SNM or source material that have been sold and converted to non-DOE-owned during the reporting period and that have been reported to the NRC on DOE/NRC Form 741. This may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during the reporting period. (Do not enter SNM or source material quantities on line 51 that have already been entered on line 43.)

44. DOD—USE A—Leave blank.

45. DOD—USE B—Leave blank.

46. DOD—OTHER USES—Leave blank.

47. EXPENDED IN U.S. GOVT TESTS—Leave blank.

48. ROUTINE TESTS—Leave blank.

49. SHIPPER—RECEIVER DIFFERENCE—Leave blank.

51. SHIPMENTS REPORTED TO NRC/DOE ON NRC/DOE 741 (not listed elsewhere)—Enter the quantities of SNM or source material shipped to others and reported to the NRC on DOE/NRC Form 741 but not listed elsewhere on this form. This may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during the reporting period.

54. SHIPMENTS—MISC—Enter the total quantity of material removed from inventory through miscellaneous shipment transactions during the reporting period.

58. DONATED MATERIAL—TO U.S. GOVT BY OTHERS—Enter the amount of non-DOE-owned nuclear material donated that is now DOE-owned.

59. DONATED MATERIAL—TO OTHERS BY U.S. GOVT—Enter the amount of DOE-owned nuclear material donated that is now non-DOE-owned.

65. ROUNDING ADJUSTMENT—Enter the quantity of nuclear material that is removed (as a positive number) or added (as a negative number) to the inventory as a result of rounding.

71. DEGRADATION TO OTHER MATERIALS—Enter decreases resulting from the introduction of other material into the material balance being reported. If the decreased quantity is the result of blending, burnup, or enrichment, identify the process by which the material was removed by entering the appropriate code from the list in line 22 above.

72. DECAY[5]—Enter the amount of radioactive decay that occurred during the reporting period for plutonium (material type 50) and Pu-238 (material type 83). If the SNM being reported is material type 50, enter the amount of radioactive decay of the isotope Pu-241 if the decay is 1 gram or more. If the SNM being reported is material type 83, enter the amount of radioactive decay of the isotope Pu-238 to the nearest 0.1 gram.[6]

73. FISSION AND TRANSMUTATION—Enter the calculated net quantities of SNM lost by fission and transmutation in a reactor.

74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS—Normal operational losses and measured discards are materials that have been discarded, whether in the form of solids, liquids, or gases, as determined by measurement or by estimate on the basis of measurement.

All material that leaves the inventory through the process of normal operational losses/measured discards shall be accounted for on a DOE/NRC Form 741. If the licensee has not previously reported the transaction in the period covered by this material balance period, it shall submit DOE/NRC Form 741 and DOE/NRC Form 742 to facilitate reconciliation with the NMMSS.

75. ACCIDENTAL LOSSES—Accidental loss is the irretrievable and inadvertent loss of a known quantity of SNM or source material as the result of an operational accident, as determined by measurement or by estimate on the basis of measurement.

76. APPROVED WRITE-OFFS—Leave blank.

77. INVENTORY DIFFERENCE—Inventory difference is the difference between physical inventory and book inventory after the book has been adjusted for all receipts and removals. A negative entry reports a gain. A positive entry reports a loss.

Reactors should not report an inventory difference to the NMMSS. At the time of physical inventory, the value assigned to an SNM item (e.g., assembly, rod, fragment, sealed container) should be recorded identically on both the book inventory and the physical inventory. At a reactor, unlike at facilities that process SNM for some end use, adjustments to the values assigned to items (representing factors such as nuclear loss, decay, and production rounding) can be explained and should be reported as such.

80. ENDING INVENTORY—U.S. GOVT OWNED—Enter the ending DOE-owned inventory as of the end of the last day of the period covered by this report.

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5 Round up fractions of 0.5 or greater. If the quantity to be entered is less than 0.5 of the reporting unit, round down to the next whole reporting unit.

6. The element Pu-238 was 1 of the 12 material types originally reported in the electronic NMIS, which predated the NMMSS database. Pu-238 was primarily possessed by nuclear power and research reactors that were government (DOE) owned and followed the convention for reporting at the 0.1-gram unit. When the NRC was formed in 1974, the NRC licensees possessing DOE-owned Pu-238 continued reporting to the 0.1-gram level in accordance with DOE guidance. This reporting trend continued in practice even as nuclear material became privately owned. DOE guidance continues to require sites to report transfers and holding of Pu-238 to the 0.1-gram level, if it is 10 percent or more Pu-238 (material type 83). NRC regulations do not distinguish between plutonium isotopes. Licensees are required to report transactions and holdings of plutonium (material type 50) to the nearest gram. The NRC accepts Pu-238 reported as material type 83, to the nearest 0.1 gram.

81. ENDING INVENTORY—NOT U.S. GOVT OWNED—Enter the ending non-DOE-owned inventory as of the last day of the period covered by this report.

82. TOTAL—Enter the sums of lines 41 through 81. The totals reported on this line must agree with those on line 40.

83. BIAS ADJUSTMENT—Leave blank.

2.2 Section B, "Foreign Obligations"

The total amount of foreign obligated nuclear material in a facility's inventory as of the end of the reporting period must be accounted for by material type. It may not exceed the total amount of physical inventory (i.e., a "negative foreign obligations balance"). The NMMSS staff can provide facilities with reports that calculate a foreign obligations balance for an RIS code based on the balance of transactions reported since the last reconciliation date. The NMMSS-calculated report may indicate a negative foreign obligations balance for a facility as a result of the delay in reporting shipments versus receipts; however, the NMMSS is not authorized to reconcile a facility for a material balance period until the foreign obligations at the facility are balanced.

The following column entries are required:

1. COUNTRY OF OBLIGATION—Enter the unique foreign obligation code for each category of nuclear material. Appendix C to this NUREG lists the codes available as of the date of this NUREG publication. The current list of codes can be obtained from the NMMSS staff by sending a request to nmmss@nnsa.doe.gov.

2. ELEMENT WEIGHT—Enter the element weight (plutonium, uranium, or thorium) of the foreign obligated SNM or source material in the reporting units specified for column A of Section A of the form (see Section 2.1 of this NUREG).

3. ISOTOPE WEIGHT—Enter the appropriate isotope weight. For enriched uranium or U-233, enter the weight to the nearest gram of U-235 or U-233, as appropriate. No entry is necessary for plutonium, depleted uranium, natural uranium, or thorium unless the licensee's TFA requires such an entry.

4. TOTAL WEIGHT—Enter the totals for columns 2 and 3. These totals represent the total foreign obligated material at the facility. The total weight of foreign obligated nuclear material may not exceed the total element and isotope weight reported on line 82.

2.3 Section C, "Certification"

SIGNATURE, TITLE, AND DATE—An authorized representative of the licensee shall sign the report if the licensee submits it as a hard copy. If the licensee submits it electronically, the licensee must establish internal procedures to ensure that the information in the report is accurate and that only authorized licensee personnel prepare and issue the report.

3 INSTRUCTIONS FOR COMPLETING DOE/NRC FORM 742C

DOE/NRC Form 742C describes the status of the nuclear material reported on lines 80 and 81 of DOE/NRC Form 742 as of the end of the reporting period. There are two separate sets of procedures for filing DOE/NRC Form 742C: (1) one for licensees required to report under 10 CFR 74.13 or 10 CFR 150.17 and (2) one for licensees required to report under 10 CFR Part 75.

The instructions for completing the form are presented separately for the two categories of licensees.

3.1 Licensees Reporting under 10 CFR 74.13 or 10 CFR 150.17

The following numbered instructions correspond to the numbered blocks or lines on DOE/NRC Form 742C that licensees are to complete. Source material that has no foreign obligation and that is not used in the operation of enrichment services (i.e., downblending of uranium that has an initial enrichment of U-235 of 10 percent or more) or in the fabrication of mixed-oxide fuels is exempt from this requirement.

1. NAME AND ADDRESS—Leave blank.

2 REPORTING IDENTIFICATION SYMBOL (RIS)—Enter the RIS of the reporting facility.

3. INVENTORY DATE—Enter the ending date of the reporting period for the material balance report.

4. LICENSE NUMBER(S)—Leave blank.

5. BATCH DATA—The basic reporting unit is the batch, 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.

   A batch may have only one value for the following:

   - batch name
   - number of items
   - composition/facility code
   - scrap program
   - owner code

   In general, enter all of the data for one batch on one line of block 5 of DOE/NRC Form 742C. An exception is when a single item contains more than one material (e.g., irradiated fuel containing both uranium and plutonium). In this case, use a separate line for the data for each material, and enter all data common to all materials in the batch on the first line.

5a. MATERIAL TYPE—Enter the appropriate SNM type code, as follows:

CODE	DESCRIPTION
10	depleted uranium
E1	uranium enriched greater than normal but less than 5 percent
E2	uranium in enrichment of 5 percent or more but less than 20 percent
E3	uranium in enrichment of 20 percent or more but less than 80 percent
E4	uranium in enrichment of 80 percent or more
20	enriched uranium[7]
50	plutonium
70	U-233
81	normal uranium
83	Pu-238
88	thorium
89	uranium in cascade

5b. COMP/FAC [COMPOSITION/FACILITY] CODE—Enter the appropriate code, as follows:

CODE[8]	DESCRIPTION
860	in reactors and critical assemblies
861	in cooling basins
862	in conversion and fabrication processes
863	in recovery processes
864	material not in process
865	unirradiated scrap awaiting recovery
866	unirradiated scrap awaiting disposal
899	inventory total line

5c. ELEMENT WEIGHT—Enter the element weight as instructed for columns A and B of Section A of DOE/NRC Form 742 (see Section 2.1 of this NUREG).

5d. ISOTOPE WEIGHT—Enter the isotope weights as instructed for columns A and B of Section A of DOE/NRC Form 742 (see Section 2.1 of this NUREG).

5e. DOE PROJECT NO.—Leave blank unless DOE-owned material is being reported. See DOE Series 470 orders for guidance.

5f. SCRAP PROGRAM—Leave blank.

5g. WEIGHT PERCENT ISOTOPE—Leave blank.

5h. OWNER CODE—This code describes the ownership of the material at the time of the physical inventory taking. Enter the appropriate code (G or J), as follows:

- “G” refers to DOE-owned material.
- “J” refers to non-DOE-owned material.

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7. This code is used when totaling all E1–E4 values reported by the facility in the inventory total for line 899.

8. Appendix A to this NUREG provides more detailed code instructions.

Refer to the glossary in Appendix D to this NUREG for further description of DOE-owned material.

5i. SEQUENCE NUMBER—Enter the line number. Number lines consecutively beginning with 1. Do not repeat or skip numbers.

5j. BATCH NAME—No entry is required, except as described in Section 3.2 and Appendix E of this NUREG. A RIS may choose to batch like items to facilitate inventory-taking. Entries in this field should be limited to 16 alpha-numeric characters only.

5k. NO. OF ITEMS—No entry is required, except as described in Section 3.2 and Appendix E of this NUREG. A RIS may choose to batch like items to facilitate inventory-taking.

5l. KEY MEASURE POINT—Leave blank.

5m. MEASUREMENT I.D.—Leave blank.

5n. ENTRY STATUS—Leave blank.

5o. MBA [material balance area]—Leave blank.

5p. SITE IDC [identification code]—Leave blank.

5q. PROCESS CODE—Enter one of the following process codes (A, C, or D); use process codes C and D to modify report data for only the current processing period:

- "A" refers to the initial entry of data.
- "C" refers to the replacement of data. Data may be replaced at any time before the close of the processing period in which the initial entry was made.
- "D" refers to the deletion of data. Data may be deleted at any time before the close of the processing period in which the initial entry was made.

Reported inventories may be modified for the current processing periods. Use process code C for replacement and D for deletion, as follows:

- Submit a form with the RIS, report period, material type, sequence number, and process code C with the unique identifier for the line to be replaced.
- Submit a form with the RIS, report period, material type, sequence number, and process code D with the unique identifier for the line to be deleted.
- Submit a form with the RIS, report period, material type with no sequence number, and process code D to delete all matching records.
- Submit a form with the RIS, report period, and process code D to delete the entire inventory within the reporting dates

6. TOTALS—Enter the total inventory reported in the above categories for element weight (5c), isotope weight (5d), and the next sequence number. These total elemental and isotopic weights must agree with the sum of the quantities entered on lines 80 and 81 on DOE/NRC Form 742 for each individual material type being reported.

7. SIGNATURE—An authorized representative of the licensee shall sign the report if the licensee submits it as a hard copy; otherwise, each licensee must establish internal procedures to ensure that the information in the report is accurate and that only authorized licensee personnel prepare and issue the reports.

8. TITLE—Enter the title of the person submitting the report (required only for paper submission).

9. DATE—Enter the date the report was submitted (required only for paper submission).

Submit the data as specified in Section 1.3 of this NUREG.

Refer to DOE Series 470 orders (DOE Orders 470.4 and 474.2) for DOE-owned material holdings. In addition, reporting data for DOE-owned inventory in an expanded level of detail to comply with DOE reporting requirements meets the NRC's inventory reporting requirements. The total of DOE-owned inventory on which inventory data are reported must agree with the quantity entered on line 80 on DOE/NRC Form 742.

3.2 Licensees Reporting under 10 CFR Part 75[9]

The instructions in this section apply only to facilities that the NRC has notified by letter, as provided in 10 CFR 75.10, "Facilities," that they have been identified under the U.S./International Atomic Energy Agency (IAEA) Safeguards Agreement. Facilities that are required to submit reports under 10 CFR 75.32, "Initial Inventory Report," and facilities for which a physical inventory is not performed shall prepare DOE/NRC Form 742 according to the instructions in Section 2.1 of this NUREG, completing lines 2, 3, 4, 80, 81, and 82. The licensee may base the information in the initial inventory report on its book record. Facilities reporting under this section must file subsequent material balance reports based on a physical inventory and submit DOE/NRC Form 742C. Such reports are required for each physical inventory taken as part of the material control and accounting procedures under 10 CFR 75.21, "General Requirements." Unless license conditions specify otherwise, such reports shall be dispatched as soon as possible and, in any event, within 30 days after the start of the physical inventory. After the licensee completes DOE/NRC Form 742C, it should follow the instructions in Section 1.3 of this NUREG to prepare the submittal in computer-readable format.

The following numbered instructions correspond to the numbered blocks or columns that licensees are to complete on DOE/NRC Form 742C:

1. NAME AND ADDRESS—Leave blank.

2. REPORTING IDENTIFICATION SYMBOL (RIS)—Enter the RIS of the reporting facility.

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9 Possessors of nuclear material outside facilities and reporting inventories of source material and SNM under the U.S./IAEA Caribbean Territories Safeguards Agreement Modified Small Quantities Protocol (INFCIRC/366) should follow the supplemental instructions in Appendix E to this NUREG.

3. INVENTORY DATE—Enter the ending date for the period covered by the material balance report.

4. LICENSE NUMBER(S)—Leave blank.

5. BATCH DATA—The basic reporting unit is the batch, 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.

A batch may have only one value for the following:

- batch name
- number of items
- composition/facility code
- key measurement point
- measurement basis
- owner code

In general, enter all of the data for one batch on one line of block 5 of DOE/NRC Form 742C. One exception is when a single discrete item contains more than one material (e.g., irradiated fuel containing both uranium and plutonium). In such a case, use a separate line for the data for each material, and enter all data common to all materials in the batch on the first line.

5a. MATERIAL TYPE—Enter the appropriate material type code, as follows:

CODE	DESCRIPTION
10	depleted uranium
E1	uranium enriched greater than normal but less than 5 percent
E2	uranium in enrichment of 5 percent or more but less than 20 percent
E3	uranium in enrichment of 20 percent or more but less than 80 percent
E4	uranium in enrichment of 80 percent or more
50	plutonium
70	U-233
81	normal uranium
83	Pu-238
88	thorium
89	uranium in cascades

5b. COMP/FAC [composition/facility] CODE—Enter the appropriate code from the list developed during the formulation and negotiation of the FA or TFA.

5c. ELEMENT WEIGHT—Enter the weight of the contained SNM or source material in the same units as specified for Section A of DOE/NRC Form 742 (see Section 2.1 of this NUREG).

5d. ISOTOPE WEIGHT—Enter the isotope weight according to the requirements of the facility's FA or TFA.

5e. DOE PROJECT NO.—Leave blank unless DOE-owned material is being reported. See DOE Series 470 orders for guidance.

5f. SCRAP PROGRAM—Leave blank.

5g. WEIGHT PERCENT ISOTOPE—Enter the weight percent of the isotope U-235 contained in either enriched or depleted uranium. Leave this field blank for U-235 contained in natural uranium unless the facility's FA or TFA requires the information. For plutonium, enter the weight percent of the isotope Pu-240. For Pu-238 (material type 83), enter the weight percent of the isotope Pu-238. Report weight percent to at least two, but not more than four, decimal places depending on the accuracy of the measurement method (e.g., XX.XXXX%). For U-233, enter the parts per million of U-232. This column does not apply for normal uranium or thorium. Use separate lines to report material of different enrichments.

5h. OWNER CODE—This code describes the ownership of the material at the time it was in the shipper's possession. Enter the appropriate code (G or J), as follows:

- "G" refers to DOE-owned material.
- "J" refers to non-DOE-owned material.

Refer to the glossary in Appendix D to this NUREG for further description of DOE-owned material.

5i. SEQUENCE NUMBER—Enter the line number. Use consecutive numbers beginning with 1. Do not repeat or skip numbers.

5j. BATCH NAME—Enter a unique identifier for the batch as defined in block 5. If the batch is a discrete item with a unique identifying serial number or name (e.g., a fuel assembly, sealed source, or uranium hexafluoride cylinder), enter the identification number of the batch name. Note that the same batch name should not appear twice in the same report for the same material type.

5k . NO. OF ITEMS—If the batch is composed of a number of discrete items, enter the number of items. If the batch is bulk material or if the number of items is not meaningful, enter 1. If more than one line is used to report data on the batch, enter the number of data items on each line.

5l. KEY MEASURE POINT—Enter the code for the appropriate inventory key measurement point, as specified in the FA or TFA.

5m. MEASUREMENT I.D.—Fill in the three sections of this data field as described below.

5m1. MEAS. BASIS—Enter the pertinent code for the measurement basis as specified in the FA or TFA.

5m2. OTHER MEAS. POINT—Leave this field blank unless the FA or TFA requires the information.

5m3. MEAS. METHOD—In some cases, the FA or TFA may provide codes for identifying the measurement method used. In such cases, enter the appropriate code.

5n. ENTRY STATUS—Enter N for “new entry.”

5o. MBA [material balance area]—Leave blank.

5p. SITE IDC—Leave blank.

5q. PROCESS CODE—Enter one of the following process codes (A, C, or D); use process codes C and D to modify report data for only the current processing period:

- “A” refers to the initial entry of data.
- “C” refers to the replacement of data. Data may be replaced at any time before the close of the processing period in which the initial entry was made.
- “D” refers to the deletion of data. Data may be deleted at any time before the close of the processing period in which the initial entry was made.

Reported inventories may be modified for the current processing periods. Use process code C for replacement and D for deletion, as follows:

- Submit a form with the RIS, report period, material type, sequence number, and process code C with the unique identifier for the line to be replaced.
- Submit a form with the RIS, report period, material type, sequence number, and process code D with the unique identifier for the line to be deleted.
- Submit a form with the RIS, report period, material type with no sequence number, and process code D to delete all matching records.
- Submit a form with the RIS, report period, and process code D to delete the entire material balance within the reporting dates.

6. TOTALS—Enter the total inventory reported in the above categories for element weight (5c), isotope weight (5d), and the next sequence number. This total must agree with the sum of the quantities entered on lines 80 and 81 on DOE/NRC Form 742.

7. SIGNATURE—An authorized representative of the licensee must sign the form, if the licensee submits it as hard copy; otherwise, each licensee must establish internal procedures to ensure that the information in the report is accurate and that only authorized licensee personnel prepare and issue the reports.

8. TITLE—Enter the title of the person who signed the report (required only for paper submission).

9. DATE—Enter the date the report was signed (required only for paper submission).

APPENDIX A

COMPOSITION CODE INSTRUCTIONS

COMPOSITION CODE INSTRUCTIONS

860 In Reactors and Critical Assemblies

Enter this code for special nuclear material (SNM) or source material in reactors, test piles, and critical assemblies and for SNM being used for radiation studies. Do not use this code to report excess, spare, or transiently used fuel elements. Reactors use this code to indicate fuel in core.

861 In Cooling Basins

Enter this code for irradiated SNM or source material in cooling basins held for future recovery or disposal (including reactor-produced SNM). Use this code for spent fuel in dry storage as well. Reactors use this code to indicate fuel discharged in wet or dry storage.

862 In Conversion and Fabrication Processes

Enter this code for SNM or source material in conversion or fabrication processes that changes its chemical or physical form. Sealed sources, unopened receipts, and ultimate products maintained under tamper-safe conditions are not considered to be “in process.” Use this code to reflect uranium within an enrichment plant (i.e., cascade) as well. This code does not apply to reactors.

863 In Recovery Processes

Enter this code for SNM or source material in a recovery process (i.e., nuclear material in the process of being separated from original fuel and other reactor products and nuclear material in the process of being removed from undesired materials and converted to usable forms). This code does not apply to reactors.

864 Materials Not in Process

Enter this code for SNM or source material in all unopened receipts, sealed sources, and ultimate products maintained under tamper-safe conditions. Use this code to report excess, spare, or transiently used fuel elements. Reactors use this code to indicate storage of fresh fuel not in process.

865 Unirradiated Scrap Awaiting Recovery

Enter this code for SNM or source material in unirradiated scrap material that is awaiting in-house or offsite recovery. Reactors would use this code to indicate fission chambers, containers, or loose pellets not reported by code 861.

866 Unirradiated Scrap Awaiting Disposal

Enter this code for SNM or source material in unirradiated scrap material that is awaiting transfer to an authorized disposal facility. This code does not apply to reactors.

899 Inventory Total Line

Enter the cumulative total reported for a given material type. This code shall be reported for all generic material types. For all enriched uranium entries (E1, E2, E3, and E4), sum the weights together and report this value on the line 899.

APPENDIX B

DOE/NRC FORM 742, “MATERIAL BALANCE REPORT” (BLANK), AND

DOE/NRC FORM 742C, “PHYSICAL INVENTORY LISTING” (BLANK)

DOE/NRC Form 742, "Material Balance Report" (Blank), and DOE/NRC Form 742C, "Physical Inventory Listing" (Blank)

DOE/NRC FORM 742
(04-2018)
MANDATORY DATA COLLECTION
AUTHORIZED BY
10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91

U.S. DEPARTMENT OF ENERGY
AND
U.S. NUCLEAR REGULATORY COMMISSION

MATERIAL BALANCE REPORT

APPROVED BY OMB: NO. 3150-0004 **EXPIRES: 04/30/2021**

Estimated burden per response to comply with this mandatory collection request: 2 hours for small licensees and 5 hours for large licensees. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0004), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. NAME AND ADDRESS	2. LICENSE NUMBER(S)	3. REPORTING IDENTIFICATION SYMBOL (RIS)
	4. REPORT PERIOD (MM/DD/YYYY) FROM / TO	5. MATERIAL TYPE (Submit separate report for each type)

SECTION A **MATERIAL ACCOUNTABILITY**

PC	SEQ		A. ELEMENT WEIGHT	B. ISOTOPE WEIGHT
		8. BEGINNING INVENTORY -- U.S. GOVT-OWNED		
		9. BEGINNING INVENTORY -- NOT U.S. GOVT-OWNED		
		RECEIPTS		
		11. PROCUREMENT FROM DOE RIS		
		FROM:		
		13. PROCUREMENT -- FOR THE ACCOUNT OF DOE		
		14. DOD RETURNS -- USE A		
		15. DOD RETURNS -- USE B		
		16. DOD RETURNS -- OTHER USES		
		21. PRODUCTION		
		22. FROM OTHER MATERIALS a. ICT		
		b. ICT		
		c. ICT		
		30. RECEIPTS REPORTED TO DOE/NRC ON DOE/NRC 741 (not listed elsewhere)		
		FROM: RIS		
		34. RECEIPTS -- MISC		
		37. PROCUREMENT BY OTHERS		
		38. DONATED MATERIAL -- FROM U.S. GOVT TO OTHERS		
		39. DONATED MATERIAL -- FROM OTHERS TO U.S. GOVT		
		40. TOTAL (Lines 8-39)		
		REMOVALS		
		41. EXPENDED IN SPACE PROGRAMS		
		42. SALES TO U.S. GOVT RIS TO: RIS		
		TO:		
		43. SALES TO OTHERS FOR THE ACCOUNT OF U.S. GOVT RIS		
		TO:		
		44. DOD -- USE A		
		45. DOD -- USE B		
		46. DOD -- OTHER USES		
		47. EXPENDED IN U.S. GOVT TESTS		
		48. ROUTINE TESTS		
		49. SHIPPER -- RECEIVER DIFFERENCE		
		51. SHIPMENTS REPORTED TO NRC/DOE ON NRC/DOE 741 *(not listed elsewhere)*		
		TO: RIS		

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DOE/NRC FORM 742
(04-2018)
10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91

U.S. DEPARTMENT OF ENERGY
AND
U.S. NUCLEAR REGULATORY COMMISSION

MATERIAL BALANCE REPORT (Continued)

SECTION A (Continued) MATERIAL ACCOUNTABILITY

PC	SEQ		A. ELEMENT WEIGHT	B. ISOTOPE WEIGHT
		54. SHIPMENTS -- MISC		
		58. DONATED MATERIAL -- TO U.S. GOVT BY OTHERS		
		59. DONATED MATERIAL -- TO OTHERS BY U.S. GOVT		
		65. ROUNDING ADJUSTMENT		
		71. DEGRADATION TO OTHER MATERIALS a. ICT		
		b. ICT		
		72. DECAY		
		73. FISSION AND TRANSMUTATION		
		74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS		
		75. ACCIDENTAL LOSSES		
		76. APPROVED WRITE-OFFS		
		77. INVENTORY DIFFERENCE		
		80. ENDING INVENTORY -- U.S. GOVT OWNED		
		81. ENDING INVENTORY -- NOT U.S. GOVT OWNED		
		82. TOTAL (Lines 41-81)		
		83. BIAS ADJUSTMENT		

SECTION B FOREIGN OBLIGATIONS

PC	SEQ	1. COUNTRY OF OBLIGATION	2. ELEMENT WEIGHT	3. ISOTOPE WEIGHT
		4. TOTAL WEIGHT		

SECTION C CERTIFICATION

To the best of my knowledge and belief, the information given above and in any attached schedules is true, complete, and correct.

SIGNATURE (See instructions for provisions on confidentially)	TITLE	DATE

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL, AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

NRC FORM 742C
(04-2018)
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70,72, 74, 75, 150,
Public Laws 83-703, 93-438, 95-91

U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION

PHYSICAL INVENTORY LISTING

APPROVED BY OMB: NO. 3150-0058 **EXPIRES: 04/30/2021**

Estimated burden per response to comply with this mandatory collection request: 2 hours for small licensees and 6 hours for large licensees. This information is required by NRC to fulfill its safeguards responsibilities, bilateral agreements, and responsibilities as a participant in the US/IAEA Safeguards Agreement. Send comments regarding burden estimate to the Information Services Branch (T-2 F43), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0058), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. NAME AND ADDRESS				2. REPORTING IDENTIFICATION SYMBOL (RIS)
STREET ADDRESS				
CITY	STATE	ZIP CODE	3. INVENTORY DATE	4. LICENSE NUMBER(S)

5. BATCH DATA

a. MATERIAL TYPE	b. COMP/FAC CODE	c. ELEMENT WEIGHT	d. ISOTOPE WEIGHT	e. DOE PROJECT NO.	f. SCRAP PROGRAM	g. WEIGHT PER-CENT ISOTOPE	h. OWNER CODE	i. SEQUENCE NUMBER	j. BATCH NAME	k. NO. OF ITEMS	l. KEY MEASURE POINT	m. MEASUREMENT I.D.			n. ENTRY STATUS	o. MBA	p. SITE IDC	q. PROCESS CODE
												MEAS. BASIS	OTHER MEAS. POINT	MEAS. METHOD				
6. TOTALS																		

7. SIGNATURE	8. TITLE	9. DATE

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

NRC FORM 742C (04-2018) To the best of my knowledge and belief, the information given above and in any attached schedules is true, complete, and correct.

APPENDIX C

FOREIGN OBLIGATION CODES

Material Balance Code	Foreign Obligation Entity
85	Australia
86	Canada
87	European Atomic Energy Community (EURATOM)[1]
88	Japan
89	People's Republic of China
C1	Russia
A8	Switzerland
A1	Argentina
A2	Brazil
A3	Chile
D1	India
D2	Republic of Korea
D3	Taiwan
D4	Socialist Republic of Vietnam
C4	Japan/Russia
C5	EURATOM/Russia
C6	Australia/Japan/Russia
C7	Canada/Japan/Russia
C8	EURATOM/Japan/Russia
B1	Louisiana Energy Services (LES) Centrifuge Enrichment/Japan
B2	Australia/Japan/LES Centrifuge Enrichment
B3	Canada/Japan/LES Centrifuge Enrichment
B4	EURATOM/Japan/LES Centrifuge Enrichment
B5	Australia/EURATOM/Japan/LES Centrifuge Enrichment
B6	Canada/EURATOM/Japan/LES Centrifuge Enrichment
B7	China/Japan/LES Centrifuge Enrichment
A9	Australia/Canada/EURATOM/Japan/LES Centrifuge Enrichment
94	Australia/Japan
95	Canada/Japan
96	EURATOM/Japan
97	Australia/EURATOM/Japan
98	Canada/EURATOM/Japan
99	China/Japan
I1	Australia/Canada

[1] EURATOM comprises 28 member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

Material Balance Code	Foreign Obligation Entity (cont.)
I2	Australia/Canada/EURATOM
A4	LES Centrifuge Enrichment
91	Australia/EURATOM
92	Canada/EURATOM
A5	LES Centrifuge Enrichment/Australia
A6	LES Centrifuge Enrichment/Canada
A7	LES Centrifuge Enrichment/EURATOM
C2	Australia/Russia
C3	Canada/Russia
93	Former Soviet Union Weapons

Note: The Nuclear Materials Management and Safeguards System staff will provide updated information on valid foreign obligation codes.

APPENDIX D

GLOSSARY

GLOSSARY

Accountability—In U.S. Department of Energy (DOE) terminology, the determination and current record maintenance of special nuclear material (SNM) and source material quantities associated with transfers, measured discards, inventories, and inventory differences (IDs) that might result from theft, diversion, or other unidentified loss mechanisms.

Agreement State—A State that has signed an agreement with the U.S. Nuclear Regulatory Commission (NRC) under which the State regulates the use of byproduct, source, and small quantities of SNM in that State.

Book inventory—The algebraic sum of the most recent physical inventory of the material balance area and of all inventory changes that have occurred since the physical inventory was taken.

Concise Note—DOE/NRC Form 740M, "Concise Note," which is used to provide additional information concerning nuclear material transaction, material balance, or inventory data supplied by facilities engaged in the import or export of nuclear materials, by facilities selected under the provisions of the agreement between the United States and the International Atomic Energy Agency for the application of safeguards in the United States, or by any facility that would like to transmit any additional explanatory information on nuclear material.

DOE-owned material—Nuclear material that, although used as part of a licensee's activities, is actually a DOE-owned asset. These materials may be bulk materials, discrete radiation sources, or finished products. Such materials may represent a lease or loan arrangement with the DOE and are represented by an owner code of G on shipping information (i.e., DOE/NRC Form 741, "Nuclear Material Transaction Report") and inventory documentation (i.e., DOE/NRC Form 742, "Material Balance Report," and DOE/NRC Form 742C, "Physical Inventory Listing"). A licensee can determine whether nuclear material in its possession is DOE-owned by reviewing its DOE/NRC Form 741 documentation, which lists the original receipt of the material. If DOE owns such material, the licensee's portion of the form will show the owner code G.

European Atomic Energy Community—As of January 2019, an organization consisting of the following member countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

Foreign obligated nuclear material—Source material or SNM that is subject to the terms and conditions of a peaceful use agreement under Section 123 of the Atomic Energy Act of 1954, as amended, that the U.S. Government has entered into with another government or group of governments.

Highly enriched uranium—Uranium enriched to 20 percent or greater in the isotope uranium (U)-235.

Holding account—Typically identified by an NRC-assigned four-character reporting identification symbol (RIS) that ends in the letter H. These accounts usually acquired inventory

material from the primary RIS in use at the licensee's facility. Typically, a few licensees have used these accounts for nuclear materials not expected to be immediately processed, reprocessed, or disposed. However, the licensed nuclear materials in holding accounts are still in the licensee's possession and must be included in inventories reported to the Nuclear Materials Management and Safeguards System.

Inventory difference—The arithmetic difference between a book inventory and the corresponding physical inventory that closes the material balance period. It is calculated by subtracting the ending inventory (EI) and removals from inventory (R) from the beginning inventory (BI) and additions to inventory (A) during the period between physical inventories. Mathematically, ID can be expressed as follows:

$$ID = (BI + A - R) – EI,$$

where (BI + A - R) is the book inventory.

Inventory reconciliation—The adjustment of the book record quantity of elements and fissile isotope weights to reflect the results of a physical inventory. In a broad sense, inventory reconciliation involves the activities of calculating (1) the ID for the material balance period in question, (2) the uncertainty value associated with the ID, (3) the active inventory for the period, and (4) any bias adjustment or prior period adjustment associated with the ID value.

Low-enriched uranium—Uranium enriched below 20 percent in the isotope U-235.

Material balance period—The time span to which a material or physical inventory pertains.

Nuclear Materials Management and Safeguards System—The national database and information system for select nuclear materials controlled by the U.S. Government. This system was created to support national safeguards and management objectives in domestic and international programs. The system stores data on nuclear material transactions and inventories and produces a wide range of printed reports for use by the DOE and NRC and by those licensees that they regulate. The system is used to satisfy the nuclear materials information requirements of agreements between the United States and foreign entities. In addition, the system provides the reporting interface between facilities selected under the provisions of the U.S./International Atomic Energy Agency Safeguards Agreement.

Nuclear material outside facilities—The nuclear material that is not in a facility and is customarily used in amounts of 1 effective kilogram or less.

Physical inventory—A physical determination of the quantity of nuclear material on hand at a given time. The methods of physical inventory and the associated measurements vary depending on the material to be inventoried and the process involved. A book inventory between physical inventory takings can be calculated based on the physical inventory quantity from the prior period together with all subsequent inventory changes associated with the determination of that book inventory. The primary purpose of a physical inventory is to confirm the absence of (or to detect) a loss, theft, or diversion of SNM.

Reporting period—The period that includes defined dates (e.g., October 1, 2005, through September 30, 2006). Each reporting period must begin the day after the previous reporting period ended.

Reporting identification symbol—A unique combination of three or four characters that the NRC assigns to each reporting organization for the purpose of identification in the Nuclear Materials Management and Safeguards System database.

Shipper-receiver difference—The weight difference for a shipment between the shipper and receiver values based on measurements.

Source material—Uranium or thorium, or any combination thereof, in any physical or chemical form or ores that contain by weight 0.05 percent or more of uranium, thorium, or any combination thereof. Source material does not include SNM.

Special nuclear material—Plutonium, uranium-233, and uranium enriched in the isotope U-233 or U-235.

APPENDIX E

SUPPLEMENTAL INSTRUCTIONS FOR POSSESSORS OF NUCLEAR MATERIAL OUTSIDE FACILITIES THAT REPORT UNDER THE U.S./INTERNATIONAL ATOMIC ENERGY AGENCY CARIBBEAN TERRITORIES SAFEGUARDS AGREEMENT MODIFIED SMALL QUANTITIES PROTOCOL (INFCIRC/366) ON U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR REGULATORY COMMISSION FORMS 742 AND 742C

SUPPLEMENTAL INSTRUCTIONS FOR POSSESSORS OF NUCLEAR MATERIAL OUTSIDE FACILITIES THAT REPORT UNDER THE U.S./INTERNATIONAL ATOMIC ENERGY AGENCY CARIBBEAN TERRITORIES SAFEGUARDS AGREEMENT MODIFIED SMALL QUANTITIES PROTOCOL (INFCIRC/366) ON U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR REGULATORY COMMISSION FORMS 742 AND 742C

E.1 Introduction

INFCIRC/366, "U.S.-IAEA Caribbean Territories Safeguards Agreement," is an agreement between the U.S. Government and the International Atomic Energy Agency (IAEA) for the application of safeguards in connection with the Treaty for the Prohibition of Nuclear Weapons in Latin America (Tlatelolco Treaty), brought into force on July 3, 2018. Under Article 60 of INFCIRC/366, the United States is obligated to submit an initial inventory report on all nuclear material in its Caribbean territories to the IAEA. By IAEA definition, nuclear material includes all uranium, plutonium, and thorium holdings in the relevant territories in any chemical or physical form. U.S. Caribbean territories include Puerto Rico and the U.S. Virgin Islands, as defined in Title 10 of the *Code of Federal Regulations* (10 CFR) 75.4, "Definitions." The United States fulfills this reporting commitment through the collection of information in accordance with 10 CFR Part 75, ''Safeguards on Nuclear Material—Implementation of Safeguards Agreements between the United States and the International Atomic Energy Agency." This appendix provides instructions for licensees reporting inventory under 10 CFR 75.32, "Initial Inventory Report," and 10 CFR 75.35, "Material Status Reports," in accordance with INFCIRC/366.

E.2 General Instructions

The instructions in this appendix apply only to possessors of nuclear material outside facilities (possessors), as defined in 10 CFR 75.4. Possessors are required to submit initial inventory under 10 CFR 75.32 by preparing U.S. Department of Energy (DOE)/U.S. Nuclear Regulatory Commission (NRC) Form 742C, "Physical Inventory Listing," in accordance with the instructions in Section E-2.1 of this appendix. The information in the initial inventory report may be based on the licensee's book record. Possessors reporting under this section must file subsequent material balance reports based on a physical inventory and are required to attach a completed DOE/NRC Form 742, "Material Balance Report," in accordance with the instructions in Section E-2.2 of this appendix. Such reports are required with respect to each physical inventory taken as part of the material control and accounting procedures under 10 CFR 75.21, "General Requirements." Unless otherwise specified by license conditions, such reports shall be dispatched as soon as possible and, in any event, within 30 days after the start of the physical inventory. The reports must be filed as specified in the facility attachment for possessors of nuclear material outside facilities, which the NRC will provide to applicable licensees required to report under 10 CFR Part 75.

Nuclear Materials Management and Safeguards System (NMMSS) Report D-24, "Personal Computer Data Input for Nuclear Regulatory Commission Licensees," provides instructions and examples for the preparation of required electronic submittals to the NMMSS.

E.2.1 Instructions for Completing DOE/NRC Form 742C

The following numbered instructions correspond to the numbered blocks or columns that possessors are to complete on the physical inventory listing:

1. NAME AND ADDRESS—Leave blank.

2. REPORTING IDENTIFICATION SYMBOL (RIS)—Enter the RIS of the possessor of nuclear material outside facilities that is reporting inventory.

3. INVENTORY DATE—Enter the ending date for the period covered by the material balance report.

4. LICENSE NUMBER(S)—Leave blank.

5. BATCH DATA—The basic reporting unit is the batch, 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.

   A batch may have only one value for the following:

   - batch name
   - number of items
   - composition/facility code
   - key measurement point
   - measurement basis
   - owner code

In general, enter all of the data for one batch on one line of block 5 of DOE/NRC Form 742C. The licensee shall report all batches that contain a known weight of nuclear material, even if the element or isotope weight rounds to zero reportable units. In addition, the licensee shall submit DOE/NRC Form 740M, “Concise Note,” to provide the actual measurement for any batch that rounds to zero reportable units.

5a. MATERIAL TYPE—Enter the appropriate special nuclear material (SNM) type code, as follows:

CODE	DESCRIPTION
10	depleted uranium
20[1]	enriched uranium
50	plutonium
70	U-233
81	normal uranium
83	Pu-238
88	thorium
89	uranium in cascade

5b. COMP/FAC [composition/facility] CODE—Enter the appropriate code that describes the physical form (e.g., unencapsulated or encapsulated) and the chemical form of the material from the list provided in Code 4 of the Locations Outside Facility Attachment. In addition, Composition Code 899 applies to the inventory total line. Enter the cumulative total reported for a given material type.

5c. ELEMENT WEIGHT—Enter the weight of the contained SNM or source material in the same units as specified for Section A of DOE/NRC Form 742 (see Section E-2.2 of this appendix).

If the quantity to be entered 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 to be entered is less than 0.5 of the reporting unit, the quantity should be rounded down to the next whole reporting unit.

For processors with greater than 0.0 kilograms but less than 0.5 kilograms of source material and greater than 0.0 grams but less than 0.5 grams of SNM, which are rounded to a zero value when reported, processors are to provide DOE/NRC Form 740M, which will define the actual weights.

5d. ISOTOPE WEIGHT—Enter the isotope weight. For enriched uranium or uranium (U)-233, enter the weight to the nearest gram of U-235 or U-233, as appropriate. For plutonium (material type 50), enter the sum of plutonium (Pu)-239 and Pu-241 to the nearest gram. For Pu-238 (material type 83), enter the weight of the isotope Pu-238 to the nearest 0.1 gram. For natural and depleted uranium, enter the weight of the U-235 isotope to the nearest gram and report to three decimal places. Do not make an entry for thorium.

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1. If reporting enriched uranium (material type 20), enter the appropriate enrichment level code in lieu of material type 20, as follows:

CODE	DESCRIPTION
E1	greater than normal but less than 5 percent
E2	5 percent or more but less than 20 percent
E3	20 percent or more but less than 80 percent
E4	80 percent or more

Processors who have rounded are to provide DOE/NRC Form 740M, which will define the actual weights.

5e. DOE PROJECT NO.—Do not make an entry unless reporting DOE-owned material. See DOE Series 470 orders for guidance.

5f. SCRAP PROGRAM—Do not make an entry unless reporting DOE-owned material. See DOE Series 470 orders for guidance.

5g. WEIGHT PERCENT ISOTOPE—Enter the weight percent of the isotope U-235 if the material is uranium enriched or depleted in U-235. Do not make an entry for U-235 in natural uranium. For plutonium (material type 50), enter the weight percent of the isotope Pu-240. For Pu-238 (material type 83), enter the weight percent of the isotope Pu-238. Report weight percent to at least two, but not more than four, decimal places depending on the accuracy of the measurement method (e.g., XX.XXXX%). For U-233, enter the parts per million of U-232. For depleted uranium with an enrichment of 0.5 percent or less, enter "0.3%" if the enrichment is unknown. This column does not apply for normal uranium or thorium. Use separate lines to report material of different enrichments.

5h. OWNER CODE—This code describes the ownership of the material at the time it was in the shipper's possession. Enter the appropriate code (G or J), as follows:

- "G" refers to DOE-owned material.
- "J" refers to non-DOE-owned material.

Refer to the glossary in Appendix D to this NUREG for further description of DOE-owned material.

5i. SEQUENCE NUMBER—Enter the line number. Use consecutive numbers beginning with 1. Do not repeat or skip numbers.

5j. BATCH NAME—Enter a unique identifier for the batch as defined in block 5. If the batch is a discrete item with a unique identifying serial number or name (e.g., industrial radiography cameras, medical isotope generators), enter the identification number of the batch name. Note that the same batch name must not appear twice in the same report for the same material type, must not include special characters (e.g., :, /), and must not exceed 16 characters.

5k. NO. OF ITEMS—If the batch is composed of a number of discrete items, enter the number of items. If the batch is bulk material or if the number of items is not meaningful, enter 1. If more than one line is used to report data on the batch, enter the number of data items on each line.

5l. KEY MEASURE POINT—Enter the appropriate code from the list provided in Code 4 of the Locations Outside Facility Attachment.

5m. MEASUREMENT I.D.—Leave blank.

5m1. MEAS. BASIS—Enter the appropriate code from the list provided in Code 4 of the Locations Outside Facility Attachment.

5m2. OTHER MEAS. POINT—Leave blank.

5m3. MEAS. METHOD—Leave blank.

5n. ENTRY STATUS—Enter N for "new entry."

5o. MBA [material balance area]—Leave blank.

5p. SITE IDC [identification code]—Leave blank.

5q. PROCESS CODE—Enter one of the following process codes (A, C, or D); use process codes C and D to modify report data for only the current processing period:

- "A" refers to the initial entry of data.
- "C" refers to the replacement of data. Data may be replaced at any time before the close of the processing period in which the initial entry was made.
- "D" refers to the deletion of data. Data may be deleted at any time before the close of the processing period in which the initial entry was made.

Reported material balance reports may be modified for the current processing periods. Use process code C for replacement and D for deletion, as follows:

- Submit a form with the RIS, report period, material type, sequence number, and process code C with the unique identifier for the line to be replaced.
- Submit a form with the RIS, report period, material type, sequence number, and process code D with the unique identifier for the line to be deleted.
- Submit a form with the RIS, report period, material type with no sequence number, and process code D to delete all matching records.
- Submit a form with the RIS, report period, and process code D to delete the entire material balance within the reporting dates.

6. TOTALS—If all lines being reported have the same material type, enter the total inventory reported in the above categories for element weight (5c), isotope weight (5d), and the next sequence number. This total must agree with the sum of the quantities entered on lines 80 and 81 on DOE/NRC Form 742.

If multiple material types are being reported on DOE/NRC Form 742C, the "Totals" field will not be filled, and a line with the Composition Code 899 will display the "Inventory Total Line" where the cumulative total is reported for a given material type. This code must be reported for all generic material types. There should be only one code per generic material type. For all enriched uranium entries (E1, E2, E3, and E4), sum the weights together, and report this value on line 899.

7. SIGNATURE—An authorized representative of the licensee must sign the form if the licensee submits a hard copy; otherwise, each licensee must establish internal

procedures to ensure that the information in the report is accurate and that only authorized licensee personnel have prepared and issued the report.

8. TITLE—Enter the title of the person who signed the report (required only for paper submission).

9. DATE—Enter the date the report was signed (required only for paper submission).

E.2.2 Instructions for Completing DOE/NRC Form 742

The following numbered instructions correspond to the numbered blocks and lines on DOE/NRC Form 742 that licensees must complete:

1. NAME AND ADDRESS—Leave blank.

2. LICENSE NUMBER(S)—Leave blank.

3. REPORTING IDENTIFICATION SYMBOL (RIS)—Enter the RIS that has been assigned and under which the source material or SNM being reported is or was held. Submit a separate report for each RIS and any holding account.

4. REPORT PERIOD (MM/DD/YYYY)—Enter the inclusive dates. The beginning date for the reporting period must be the next consecutive date after the ending date of the previous report.

5. MATERIAL TYPE—Enter the appropriate code for the material being reported, as follows:

CODE	DESCRIPTION
10	depleted uranium
E1	uranium enriched greater than normal but less than 5 percent
E2	uranium in enrichment of 5 percent or more but less than 20 percent
E3	uranium in enrichment of 20 percent or more but less than 80 percent
E4	uranium in enrichment of 80 percent or more
50	plutonium
70	U-233
81	normal uranium
83[2]	Pu-238
88	thorium
89	uranium in cascade

Complete a separate DOE/NRC Form 742 for each SNM or source material type even in cases in which two or more types are combined.

When U-235 and U-233 are mixed, report the total element weight of the mixture in the element weight column of both the U-235 report and the U-233 report, and reflect this fact in a concise note (DOE/NRC Form 740M) for each report.

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2. Report the material as Pu-238 if the contained Pu-238 is greater than 10 percent of total plutonium by weight (material type 83); otherwise, report it as plutonium (material type 50).

Section A, "Material Accountability"

PC [process code]—Enter one of the following process codes (A, C, or D); use process codes C and D to modify report data for only the current processing period:

- "A" refers to the initial entry of data.
- "C" refers to the replacement of data. Data may be replaced at any time before the close of the processing period in which the initial entry was made.
- "D" refers to the deletion of data. Data may be deleted at any time before the close of the processing period in which the initial entry was made.

Reported material balance reports may be modified for the current processing periods. Use process code C for replacement and D for deletion, as follows:

- Submit a form with the RIS, report period, material type, sequence number, and process code C with the unique identifier for the line to be replaced.
- Submit a form with the RIS, report period, material type, sequence number, and process code D with the unique identifier for the line to be deleted.
- Submit a form with the RIS, report period, material type with no sequence number, and process code D to delete all matching records.
- Submit a form with the RIS, report period, and process code D to delete the entire material balance within the reporting dates.

SEQ [sequence number]—All detail lines that contain data must have a sequence number. Enter a numerical value in sequential order beginning with 1. Do not repeat or skip numbers.

Use columns A and B to enter all numeric data by element and isotope weight.[3]

COLUMN A—ELEMENT WEIGHT[3]

Enter the total element weight of the SNM or source material being reported. For Pu-238 (material type 83), report to the nearest 0.1 gram. Report all other SNM to the nearest gram and all other source material to the nearest kilogram.

COLUMN B—ISOTOPE WEIGHT[3]

In the case of enriched uranium or U-233, enter the weight of the isotope U-235 or U-233 to the nearest whole gram. In the case of plutonium (material type 50), enter the weight of the isotopes Pu-239 and Pu-241, and in the case of Pu-238 (material type 83), enter the weight of the isotope Pu-238. For Pu-238, report to the nearest 0.1 gram. For natural or depleted

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3. Round up fractions of 0.5 or greater. If the quantity to be entered is less than 0.5 of the reporting unit, round down to the next whole reporting unit.

uranium, enter the weight of the isotope U-235 to the nearest gram. Do not make an entry for thorium.

8. BEGINNING INVENTORY—U.S. GOVT-OWNED—Enter the inventory of DOE-owned SNM or source material as of the beginning of business on the first day of the period covered by the report. The quantities reported on line 8 (columns A and B) must agree with the reconciled quantities on line 80 of the report submitted for the previous reporting period.

9. BEGINNING INVENTORY—NOT U.S. GOVT-OWNED—Enter the inventory of non-DOE-owned SNM or source material as of the beginning of business on the first day of the period covered by the report. The quantities reported on line 9 (columns A and B) must agree with the reconciled quantities on line 81 of the report submitted for the previous reporting period.

RECEIPTS

11. PROCUREMENT FROM DOE—Enter quantities of SNM (or source material) that have been purchased from the DOE during the reporting period and reported to the NRC on DOE/NRC Form 741, "Nuclear Material Transaction Report." This may be done by listing individual receipts for each individual RIS as reported on DOE/NRC Form 741 or a total of receipts for each individual RIS during the reporting period. SNM or source material quantities entered on line 11 are not entered on line 30.

13. PROCUREMENT—FOR THE ACCOUNT OF DOE—Enter quantities of SNM (or source material) that have been purchased for the account of DOE during the reporting period and reported to the NRC on DOE/NRC Form 741. This may be done by listing individual receipts for each individual RIS as reported on DOE/NRC Form 741 or a total of receipts for each individual RIS during the reporting period. SNM or source material quantities entered on line 13 are not entered on line 30.

14. DOD RETURNS—USE A—Leave blank.

15. DOD RETURNS—USE B—Leave blank.

16. DOD RETURNS—OTHER USES—Leave blank.

21. PRODUCTION—Leave blank.

22. FROM OTHER MATERIALS—Leave blank.

30. RECEIPTS REPORTED TO DOE/NRC ON DOE/NRC 741 (not listed elsewhere)—Enter the SNM or source material received from others and reported on DOE/NRC Form 741 but not listed elsewhere on this form. This may be done by listing individual receipts by RIS as reported on DOE/NRC Form 741 or a total of receipts from each individual RIS during the report period.

34. RECEIPTS—MISC—Complete DOE/NRC Form 741 and report the cumulative miscellaneous receipts (Inventory Change Type (ICT) 34). This requirement includes nuclear material removed from inventory and then returned to inventory, if not accounted for elsewhere on this form.

37. PROCUREMENT BY OTHERS—Leave blank.

38. DONATED MATERIAL—FROM U.S. GOVT TO OTHERS—Enter the amount of DOE-owned material received by donation.

39. DONATED MATERIAL—FROM OTHERS TO U.S. GOVT—For NRC licensees, leave blank.

40. TOTAL—Enter the sums of columns A and B (lines 8 through 39).

REMOVALS

41. EXPENDED IN SPACE PROGRAMS—Leave blank.

42. SALES TO U.S. GOVT—Enter quantities of non-DOE-owned SNM or source material that have been sold and converted to DOE-owned during the reporting period and that have been reported to the NRC on DOE/NRC Form 741. This may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during the reporting period. (Do not enter SNM or source material quantities on line 51 that have already been entered on line 42.)

43. SALES TO OTHERS FOR THE ACCOUNT OF U.S. GOVT—Enter quantities of DOE-owned SNM or source material that have been sold and converted to non-DOE-owned during the reporting period and that have been reported to the NRC on DOE/NRC Form 741. This may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during the reporting period. (Do not enter SNM or source material quantities on line 51 that have already been entered on line 43.)

44. DOD—USE A—Leave blank.

45. DOD—USE B—Leave blank.

46. DOD—OTHER USES—Leave blank.

47. EXPENDED IN U.S. GOVT TESTS—Leave blank.

48. ROUTINE TESTS—Leave blank.

49. SHIPPER—RECEIVER DIFFERENCE—Leave blank.

51. SHIPMENTS REPORTED TO NRC/DOE ON NRC/DOE 741 (not listed elsewhere)—Enter the quantities of SNM or source material shipped to others and reported to the NRC on DOE/NRC Form 741 but not listed elsewhere on this form. This may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during the reporting period.

54. SHIPMENTS—MISC—Complete DOE/NRC Form 741 and report the cumulative miscellaneous shipments (ICT 54). Possessors reporting under 10 CFR Part 75 should also include transfers to burials on this line rather than on line 74.

58. DONATED MATERIAL—TO U.S. GOVT BY OTHERS—Enter the amount of non-DOE-owned nuclear material that is donated to the U.S. Government and thereby will become DOE-owned.

59. DONATED MATERIAL—TO OTHERS BY U.S. GOVT— For NRC Licensees, leave blank.

65. ROUNDING ADJUSTMENT—Enter the quantity of nuclear material that is removed (as a positive number) or added (as a negative number) to the inventory as a result of rounding.

71. DEGRADATION TO OTHER MATERIALS—Enter decreases resulting from the introduction of other material into the material balance being reported. If the decreased quantity is the result of blending, burnup, or enrichment, identify the balance losing the material by entering the appropriate code from the list in line 22 above.

72. DECAY[4]—Enter the amount of radioactive decay that occurred during the reporting period for plutonium (material type 50) and Pu-238 (material type 83). If the SNM being reported is plutonium (material type 50), enter the amount of radioactive decay of the isotope Pu-241 if the decay is 1 gram or more.

    If the SNM being reported is Pu-238 (material type 83), enter the amount of radioactive decay of the isotope Pu-238 to the nearest 0.1 gram.

73. FISSION AND TRANSMUTATION—Enter the calculated quantities of SNM lost by fission and transmutation in a reactor.

74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS—Normal operational losses and measured discards are materials that have been discarded, whether in the form of solids, liquids, or gases, as determined by measurement or by estimate on the basis of measurement.

    DOE/NRC Form 741 must account for all materials that leave the inventory through the process of normal operational losses and measured discards, if not previously reported in the period covered by this report. To account for these discards, use the established RIS types described below.

    If the material is discarded to a lagoon or pond, append an L to the receiver's RIS. Measured discards to the atmosphere or ground should be documented as an onsite transfer with the licensee's RIS as shipper and receiver. If the material goes off the inventory into a holding area (refer to the term "holding account" in the glossary in Appendix D) for later removal to a burial site, append an H to the receiver's RIS. When the material is eventually shipped to a burial site, the transfer series on DOE/NRC Form 741 will show the shipper's RIS with an appended H and the appropriate V-series RIS in the receiver's block. Alternatively, the licensee may return the material from the holding account to the primary RIS and then ship the material from the primary RIS.

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[4] Round up fractions of 0.5 or greater. If the quantity to be entered is less than 0.5 of the reporting unit, round down to the next whole reporting unit.

Such activities must also be documented on DOE/NRC Form 741. Remove discards from inventory only when the material has been disposed of by (1) transfer to an authorized recipient or holding area in accordance with 10 CFR Part 40, "Domestic Licensing of Source Material," or 10 CFR Part 74, "Material Control and Accounting of Special Nuclear Material," (2) authorization under 10 CFR 20.2002, "Method for Obtaining Approval of Proposed Disposal Procedures," (3) under the requirements in 10 CFR 20.2003, "Disposal by Release into Sanitary Sewerage"; 10 CFR 20.2004, "Treatment or Disposal by Incineration"; or 10 CFR 20.1302, "Compliance with Dose Limits for Individual Members of the Public" (related to concentrations in effluents to unrestricted areas), or (4) under the requirements in corresponding Agreement State regulations. Note that the establishment of L or H accounts requires prior NRC approval.

75. ACCIDENTAL LOSSES—Accidental loss is the irretrievable and inadvertent loss of a known quantity of SNM or source material as the result of an operational accident, as determined by measurement or by estimate on the basis of measurement.

76. APPROVED WRITE-OFFS—Leave blank.

77. INVENTORY DIFFERENCE—Inventory difference (ID) is the difference between physical inventory and book inventory after the book has been adjusted for all receipts and removals. A negative entry reports a gain. A positive entry reports a loss.

80. ENDING INVENTORY—U.S. GOVT OWNED—Enter the ending DOE-owned inventory as of the end of the last day of the period covered by this report.

81. ENDING INVENTORY—NOT U.S. GOVT OWNED—Enter the ending non-DOE-owned inventory as of the last day of the period covered by this report.

82. TOTAL—Enter the sums of lines 41 through 81. The totals reported on this line must agree with those on line 40.

83. BIAS ADJUSTMENT—Leave blank.

Note that the total ending inventories must match the total inventory reported on DOE/NRC Form 742C for a material type.

Section B, "Foreign Obligations"

This section applies only to licensees that possess foreign obligated nuclear material in their inventory within a reporting period. It does not apply to licensees that have not possessed or transferred (received or shipped) foreign obligated material within a reporting period.

The total amount of foreign obligated nuclear material in inventory as of the end of the reporting period must be accounted for by material type. It may not exceed the total amount of physical inventory for a given material type (i.e., a "negative foreign obligations balance"). Facilities should use special care to avoid a negative foreign obligations balance at the time of facility reconciliation. The NMMSS may show a negative foreign obligations balance for a facility at any given time within a material balance period as a result of the delay in reporting shipments versus receipts; however, the NMMSS will not be able to reconcile a facility for a material balance period until the foreign obligations at the facility are balanced.

The following column entries are required:

1. COUNTRY OF OBLIGATION—Enter the unique foreign obligated code for each category of nuclear material. Appendix C to this NUREG lists the codes. The NMMSS staff can provide an up-to-date listing.

2. ELEMENT WEIGHT—Enter the element weight (plutonium, uranium, or thorium) of the foreign obligated SNM or source material in the reporting units specified for column A of Section A of the form (see Section E-2.2 of this appendix).

3. ISOTOPE WEIGHT—Enter the appropriate isotope weight. For enriched uranium or U-233, enter the weight to the nearest gram of U-235 or U-233, as appropriate. Do not make an entry for plutonium.

4. TOTAL WEIGHT—Enter the totals for columns 2 and 3. These totals represent the total foreign obligated material at the facility. The total weight of foreign obligated nuclear material may not exceed the total element and isotope weight reported on line 82.

Section C, "Certification"

SIGNATURE, TITLE, AND DATE—An authorized representative of the licensee shall sign the report if the licensee submits it as a hard copy. If the licensee submits the report electronically, it must establish internal procedures to ensure that the information in the report is accurate and that only the authorized licensee personnel have prepared and issued the report.

NRC FORM 335
(12-2010)
NRCMD 3.7

U.S. NUCLEAR REGULATORY COMMISSION

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Washington, DC 20555-0001

9. SPONSORING ORGANIZATION - NAME AND ADDRESS (If NRC, type "Same as above", if contractor, provide NRC Division, Office or Region, U. S. Nuclear Regulatory Commission, and mailing address.)

Same as above.

10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

U.S. Nuclear Regulatory Commission (NRC) regulations require each licensee who is authorized to possess special nuclear material (SNM) or obligated source material to prepare and submit, in computer-readable format, reports concerning SNM received, produced, possessed, transferred, consumed, disposed of, or lost. This NUREG contains the reporting instructions for licensees to follow in making these reports.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

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Nuclear Materials Management and Safeguards System (NMMSS)
Form 742
Form 742C
Material Balance Reports

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