

Instructions for the Preparation and Distribution of Material Status Reports

(DOE/NRC Forms 742 and 742C)

Draft Report for Comment

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Instructions for the Preparation and Distribution of Material Status Reports

(DOE/NRC Forms 742 and 742C)

Draft Report for Comment

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Office of Nuclear Material Safety and Safeguards

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ABSTRACT

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

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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

1		
2		
3	A	addition to inventory
4		
5	BI	beginning inventory
6		
7	CFR	<i>Code of Federal Regulations</i>
8		
9	DOD	U.S. Department of Defense
10	DOE	U.S. Department of Energy
11		
12	EI	ending inventory
13	EURATOM	European Atomic Energy Community
14		
15	FA	facility attachment
16		
17	IAEA	International Atomic Energy Agency
18	ICT	inventory change type
19	I.D.	identification
20	ID	inventory difference
21		
22	LES	Louisiana Energy Services
23		
24	NMMSS	Nuclear Materials Management and Safeguards System
25	NRC	U.S. Nuclear Regulatory Commission
26		
27	Pu	plutonium
28		
29	OMB	Office of Management and Budget
30		
31	R	removal from inventory
32	RIS	reporting identification symbol
33		
34	SAMS	Safeguards Management Software
35	SNM	special nuclear material
36		
37	TFA	transitional facility attachment
38		
39	U	uranium

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

4
5 **U.S. DEPARTMENT OF ENERGY/U.S. NUCLEAR**
6 **REGULATORY COMMISSION FORMS 742 AND 742C**

7
8
9 **1 INTRODUCTION**

10
11 The U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE)
12 jointly sponsor the Nuclear Materials Management and Safeguards System (NMMSS). This
13 system is the U.S. Government’s national database used by DOE and the NRC for tracking
14 certain nuclear material.

15
16 Common reporting forms and formats are used to minimize the reporting burden on licensees¹
17 that are required to provide nuclear material data to one or both agencies in accordance with
18 current regulations or contractual obligations. In this manner, licensees can file one report to
19 meet the reporting requirements of both the NRC and DOE. Compliance with specific reporting
20 requirements is monitored by the agency that requires the specific data. NRC regulations
21 require licensees to submit the reports in computer-readable form.

22
23 In addition to the physical inventory reporting requirements in Title 10 of the *Code of Federal*
24 *Regulations* (CFR) Part 74, “Material Control and Accounting of Special Nuclear Material,” as
25 discussed in Section 1.2, licensees may also be required to report to NMMSS all receipts,
26 transfers, and inventory adjustments of U.S. Government-owned, -loaned, or -leased material in
27 their possession that they obtained from DOE. In such cases, licensees shall file DOE/NRC
28 Form 742, “Material Balance Report,” and DOE/NRC Form 742C, “Physical Inventory Listing,” to
29 report quantities of 0.5 or greater of the reporting unit specified in DOE Series 470 orders (DOE
30 Order 470.4, “Safeguards and Security Program,” and DOE Order 474.2, “Nuclear Material
31 Control and Accountability”).

32
33 **1.1 Material Status Reports**

34
35 DOE/NRC Forms 742 and 742C are the means for submitting reports of material balance and
36 physical inventory listing data to NMMSS. The information must be completed in accordance
37 with the instructions in this NUREG and must be submitted in computer-readable format.
38 NMMSS Report D-24, “Personal Computer Data Input for NRC Licensees,” issued January 1,
39 2012, provides the instructions for creating the computer-readable submittal.

40
41 Licensees use DOE/NRC Form 742 to report a summary of activity for a specified material
42 within a material balance reporting period, as specified in 10 CFR 74.13, “Material Status

¹ The term “licensee” here denotes an NRC or Agreement State licensee or an NRC certificate holder or possessor.

1 Reports.” The report conveys beginning and ending inventory balances; activities such
2 shipments and receipts involving other facilities; and decay, transmutation, and production
3 calculations. This information is useful for validating a facility’s ending book inventory.
4 Licensees that neither received nor transferred source or special nuclear material (SNM) within
5 a reporting period should still refer to instructions in NUREG/BR-0006, “Instructions for
6 Completing Nuclear Material Transaction Reports,” to submit a DOE/NRC Form 741, “Nuclear
7 Materials Transaction Report,” to NMMSS to report other transactions that would otherwise
8 change the inventory balance within the material balance period.
9

10 Licensees use DOE/NRC Form 742C to report a facility’s physical inventory listing as of a
11 specified date. For each material type category, the report lists the amount of material in the
12 facility’s possession at the time of the inventory process. The form can show each individual
13 batch or summarize totals of “like” batches. The totals for each material type category must
14 match the ending balance in the corresponding material balance report (DOE/NRC Form 742).
15

16 NMMSS relies heavily on the quality of the data reported by the facilities involved in nuclear
17 activities. The data submitted to NMMSS are subject to evaluation according to the restrictions
18 placed on nuclear activity by the policies of various governing agencies of the United States.
19 NMMSS receives the data after they are verified by “edit checks” as acceptable within the
20 restrictions of the system.
21

22 **1.2 Regulations**

23
24 NRC regulations in 10 CFR Part 74.13 requires each licensee who possessed special nuclear
25 material during a material balance reporting period in a quantity totaling 1 gram or more of
26 contained uranium (U)-235, U-233, or plutonium (Pu) to prepare and submit in computer-
27 readable format Material Balance Reports (DOE/NRC Forms 742 and 742C) concerning SNM
28 received, produced, possessed, transferred, consumed, disposed of, or lost. Reporting periods
29 are determined by the quantity of material possessed by the facility. Specifically,

- 30 • Licensees subject to the requirements of 10 CFR 74.51 shall compile a report as of
31 March 31 and September 30 of each year, and file the report within 30 days after the
32 end of the period covered by the report.
- 33 • Licensees subject to the requirements of 10 CFR Parts 74.19(c)(5), 74.33(c)(4), or
34 74.43(c)(6) shall submit a report within 60 calendar days of the beginning of the physical
35 inventory.
- 36 • Licensees reporting pursuant to 10 CFR 75.35 shall prepare and submit material status
37 reports as described in Section 3.2 of this NUREG.
- 38 • All other licensees, including those subject to 10 CFR 150.17 shall submit a report no
39 later than March 31 of each year.
40

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

1 In addition, NRC regulations in 10 CFR 40.64 require each licensee that possesses, or that had
2 possessed in the previous reporting period, 1 kilogram or more of uranium or 1 kilogram or more
3 of thorium source material pursuant to the operation of enrichment services, downblending
4 uranium that has an initial enrichment of the U-235 isotope of 10 percent or more, or the
5 fabrication of mixed-oxide fuels shall complete and submit DOE/NRC Forms 742 and 742C for
6 all activities involving the source material.
7

8 Furthermore, NRC regulations in 10 CFR 40.64(b)(1) require each Federal or State licensee
9 that possessed during a reporting period 1 kilogram or more of foreign obligated source material
10 (material types 10, 81, and 88) to must submit a statement of foreign obligated source material
11 inventory to the NRC. The regulation allows DOE/NRC Form 742 to be used. The reporting
12 period is October 1 to September 30 of each year (unless the NRC authorizes an alternate
13 period).
14

15 Each licensee required to report material balance, inventory, and/or foreign obligation
16 information, as detailed in this part, shall resolve any discrepancies identified during the report
17 review and reconciliation process within 30 calendar days of notification of a discrepancy
18 identified by the NRC. See section 1.5 of this NUREG for additional instructions on
19 reconciliation.
20

21 Possessor of DOE-owned material shall refer to DOE Order 470.4B and DOE Order 474.2 for
22 additional information about reporting inventories.
23

24 **1.3 Preparation and Submission of DOE/NRC Forms 742 and 742C in** 25 **Computer-Readable Format** 26

27 NMMSS Report D-24 provides instructions for preparing DOE/NRC Forms 742 and 742C in
28 computer-readable format as required for submittal. The Safeguards Management Software
29 (SAMS) program is a facsimile of NMMSS that allows the user to import and export data; do
30 "edit checks" to complete a quality review; generate various reports; and create material
31 balance, inventory, and transaction data. It has the capability to export data into the required
32 NMMSS predefined computer-readable format outlined in NMMSS Report D-24. The SAMS
33 program may be obtained from NMMSS staff free of charge.
34

35 Licensees can submit data to NMMSS through the following two methods:
36

37 (1) Electronic Data Submission 38

39 Licensees should submit DOE/NRC Forms 742 and 742C in computer-readable format
40 unless reporting under 10 CFR 40.64(b). NMMSS Report D-24 provides instructions on
41 packaging, data format requirements, acceptable media types, and the mailing address
42 for the submittal of data on computer media.
43

44 Licensees can request a copy of the fillable forms installer kit by e-mailing NMMSS at
45 nmmss@nnsa.doe.gov. These forms can be completed, saved at the licensee site, and
46 submitted to NMMSS at the aforementioned e-mail address. Licensees may also

1 contact the NRC program manager for questions about fillable forms and electronic data
2 submission by e-mailing the NRC e-mail resource at nmmss.resource@nrc.gov.

3
4 Licensees should adhere to their facility's encryption policy for transmitting electronic
5 data to NMMSS.

6
7 Licensees may also download data onto electronic media and mail the data to NMMSS.
8 Contact NMMSS staff to confirm the mailing address before submitting mail.

9
10 (2) New or Modified Methods of Transferring Electronic Data

11
12 The NRC may authorize new or modified methods of transferring electronic DOE/NRC
13 Form 742 and 742C data to NMMSS. Licensees may confirm authorization to use
14 additional methods for the transfer of these data by contacting NMMSS staff.

15
16 **1.4 Documentation and Distribution**

17
18 Licensees must submit the completed DOE/NRC Forms 742 and 742C to NMMSS in a timely
19 manner. Before licensees submit any data, they should determine whether their submission
20 contains classified information because the specific documentation and distribution instructions
21 depend on whether the completed DOE/NRC Form 742 or 742C contains classified or
22 unclassified information.

23
24 Any DOE/NRC Form 742 or 742C that is classified must be documented and handled in
25 accordance with all pertinent security requirements. All other submissions that are not classified
26 are considered to be proprietary material control and accounting information, and licensees may
27 request that such information be withheld as defined by 10 CFR 2.390, "Public Inspections,
28 Exemptions, Requests for Withholding." Each person who is to receive a copy of the report
29 must be verified as a qualified recipient before distribution. Licensees should confirm the
30 address before sending documents to NMMSS or other recipients. In addition, they should
31 formally provide classification guidance to NMMSS after making a decision to classify or
32 declassify a submission or to change previously submitted guidance. When submitting
33 safeguards information, licensees should also submit DOE/NRC Form 740M, "Concise Note,"
34 and state that the submission is safeguards information and should be handled in accordance
35 with 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

36
37 Licensees should do the following when distributing the completed report:

- 38
39 • Submit one copy of the completed report and all supporting subschedules and lists to
40 NMMSS. All RIS holders are encouraged to review their RIS point-of-contact
41 information yearly and notify NMMSS that the data are correct or make changes.
42
43 • Retain one copy for licensee files.

44
45 **1.5 Reconciliation**

46
47 At the end of every material balance reporting period, a reconciliation shall be performed
48 between reports submitted by the licensee to NMMSS and the projected book inventory that

1 NMMSS has calculated. This process shall be considered complete when the licensee resolves
2 any differences between the reported and projected balances, including those listed for
3 foreign-obligated materials.² The reconciliation should be completed within 30 calendar days of
4 when the licensee was notified of the discrepancy, and it should include all accounts, including
5 holding accounts, held by the licensee.
6

7 Facilities should ensure that their reported weight totals in DOE/NRC Form 742C equal the
8 weight totals in DOE/NRC Form 742 for each material type. The totals in DOE/NRC Form 742C
9 should be an arithmetic sum of the weights listed on the batch data lines of DOE/NRC
10 Form 742C. The totals on DOE/NRC Forms 742 and 742C should agree with the values
11 maintained and used at the site. However, if reported DOE/NRC Form 742 and 742C values
12 differ from site-maintained values because of issues such as rounding, the site should submit a
13 concise note (DOE/NRC Form 740M) explaining the difference.
14

² Commercial practices allow a facility to conduct an obligations exchange to meet a contractual requirement. 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 obligations balance. NMMSS may report a negative obligations balance for a facility at any given reporting date because of the time delay in reporting shipments versus receipt; however, 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 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:

<u>CODE</u>	<u>DESCRIPTION</u>
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.

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.

³ Report the material type as Pu-238 if the contained Pu-238 is greater than 10 percent of the total plutonium by weight; otherwise, report it as plutonium.

1 **2.1 Section A, “Material Accountability”**
2

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

- 6 • “A” refers to the initial entry of data.
7
- 8 • “C” refers to the replacement of data. Data may be replaced at any time before the
9 close of the processing period in which the initial entry was made.
10
- 11 • “D” refers to the deletion of data. Data may be deleted at any time before the close of
12 the processing period in which the initial entry was made.
13

14 Reported material balance reports may be modified for the current processing periods. Use
15 process code C for replacement and D for deletion, as follows:
16

- 17 • Submit a form with the RIS, report period, material type, sequence number, and process
18 code C with the unique identifier for the line to be replaced.
19
- 20 • Submit a form with the RIS, report period, material type, sequence number, and process
21 code D with the unique identifier for the line to be deleted.
22
- 23 • Submit a form with the RIS, report period, material type with no sequence number, and
24 process code D to delete all matching records.
25
- 26 • Submit a form with the RIS, report period, and process code D to delete the entire
27 material balance within the reporting dates.
28

29 SEQUENCE NUMBER—All detail lines that contain data must have a sequence number. Enter
30 a numerical value in sequential order beginning with 1. Do not repeat or skip numbers.
31

32 Use columns A and B to enter all numeric data by element and isotope weight.⁵
33

34 **COLUMN A—ELEMENT WEIGHT⁴**
35

36 Enter the total element weight of the SNM or source material being reported. If the material is
37 Pu-238, report it to the nearest gram or 0.1 gram. Report all other SNM to the nearest gram
38 and all other source material to the nearest kilogram.
39

40 **COLUMN B—ISOTOPE WEIGHT³**
41

42 In the case of enriched uranium or U-233, enter the weight of the isotope U-235 or U-233 as
43 appropriate; in the case of plutonium, enter the weight of the isotopes Pu-239 and Pu-241; and
44 in the case of Pu-238, enter the weight of the isotope Pu-238. If the material is Pu-238, report it
45 to the nearest gram or 0.1 of a gram. If the material is depleted uranium, enter the weight of the
46 isotope U-235 to the nearest kilogram. Do not make an entry for other source materials.

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.

1 Note that, for facilities reporting under 10 CFR Part 75, the FA or TFA may require different
2 reporting units for element and isotope weight (i.e., the element weight in kilograms and the
3 isotope weight in grams). For this reason, the facility should report to NMMSS as required in its
4 FA or TFA and should contact NMMSS staff with any questions.
5

6 8. BEGINNING INVENTORY—U.S. GOVT-OWNED—Enter the inventory of DOE-owned
7 SNM or source material as of the beginning of business on the first day of the period
8 covered by the report. The quantities reported on line 8 (columns A and B) must agree
9 with the reconciled quantities on line 80 of the report submitted for the previous reporting
10 period. Although the data field is titled “U.S. Govt-Owned,” enter only DOE-owned
11 material in this field.
12

13 9. BEGINNING INVENTORY—NOT U.S. GOVT-OWNED—Enter the inventory of SNM or
14 source material that is not DOE owned as of the beginning of business on the first day of
15 the period covered by the report. The quantities reported on line 9 (columns A and B)
16 must agree with the reconciled quantities on line 81 of the report submitted for the
17 previous reporting period.
18

19 RECEIPTS

20
21 11. PROCUREMENT FROM DOE—Enter quantities of SNM (or source material) that have
22 been purchased from DOE during the reporting period and reported to the NRC on
23 DOE/NRC Form 741. This may be done by listing individual receipts for each individual
24 RIS as reported on DOE/NRC Form 741 or a total of receipts for each individual RIS
25 during the reporting period. SNM or source material quantities entered on line 11 are
26 not entered on line 30.
27

28 13. PROCUREMENT FOR THE ACCOUNT OF DOE—Enter quantities of SNM (or source
29 material) that have been purchased for the account of DOE during the reporting period
30 and reported to the NRC on DOE/NRC Form 741. This may be done by listing individual
31 receipts for each individual RIS as reported on DOE/NRC Form 741 or a total of receipts
32 for each individual RIS during the reporting period. SNM or source material quantities
33 entered on line 13 are not entered on line 30.
34

35 14. DOD RETURNS—USE A—Leave blank.
36

37 15. DOD RETURNS—USE B—Leave blank.
38

39 16. DOD RETURNS—OTHER USES—Leave blank.
40

41 21. PRODUCTION—Enter the calculated net quantity of plutonium or U-233 produced in the
42 fuel or blanket material of a reactor during the reporting period. For licensees reporting
43 under 10 CFR Part 75, if the fuel from which the plutonium or U-233 was produced was
44 removed or discharged from the reactor during this reporting period, enter the
45 discharged quantity on line 21 directly after the word “Production.”
46

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

1 22. FROM OTHER MATERIALS—Enter increases resulting from the introduction of another
2 material into the material balance being reported. If the added quantity is the result of
3 blending, burnup, or enrichment, identify the process by which the material was added
4 by entering the appropriate inventory change type (ICT) code from the following list:
5

<u>CODE</u>	<u>DESCRIPTION</u>
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)

14
15 “EE” can refer to a change from low enrichment to high, or from high enrichment to low
16 (i.e., any combination of the E1 through E4 material type codes).
17

18 30. RECEIPTS REPORTED TO NRC ON DOE/NRC 741 (NOT LISTED ELSEWHERE)—
19 Enter the SNM or source material received from others and reported on DOE/NRC
20 Form 741 but not listed elsewhere on this form. This may be done by listing individual
21 receipts by RIS as reported on DOE/NRC Form 741 or a total of receipts from each
22 individual RIS during the report period.
23

24 34. RECEIPTS—MISC—Enter the total quantity of material added to the inventory through
25 miscellaneous receipt transactions (ICT 34). This requirement includes nuclear material
26 removed from inventory and then returned to inventory, if not accounted for elsewhere
27 on this form.
28

29 37. PROCUREMENT BY OTHERS—Leave blank.
30

31 38. DONATED MATERIAL—FROM U.S. GOVT TO OTHERS—Enter the amount of
32 DOE-owned material donated and now non-DOE owned.
33

34 39. DONATED MATERIAL—FROM OTHERS TO U.S. GOVT—Enter the amount of
35 non-DOE-owned material donated and now DOE owned.
36

37 40. TOTAL—Enter the sums of columns A and B (lines 8 through 39).
38

39 REMOVALS

40
41 41. EXPENDED IN SPACE PROGRAMS—Leave blank.
42

43 42. SALES TO U.S. GOVT—Enter quantities of non-DOE-owned SNM or source material
44 that have been sold and converted to DOE owned during the reporting period and that
45 have been reported to the NRC on DOE/NRC Form 741. This may be done by listing
46 individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments
47 to each individual RIS during the reporting period. (Do not enter SNM or source material
48 quantities on line 51 that have already been entered on line 42.)
49

50 43. SALES TO OTHERS FOR THE ACCOUNT OF U.S. GOVT—Enter quantities of
51 DOE-owned SNM or source material that have been sold and converted to non-DOE

1 owned during the reporting period and that have been reported to the NRC on
2 DOE/NRC Form 741. This may be done by listing individual shipments by RIS as
3 reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during
4 the reporting period. (Do not enter SNM or source material quantities on line 51 that
5 have already been entered on line 43.)

6
7 44. DOD—USE A—Leave blank.

8
9 45. DOD—USE B—Leave blank.

10
11 46. DOD—OTHER USES—Leave blank.

12
13 47. EXPENDED IN U.S. GOVT TESTS—Leave blank.

14
15 48. ROUTINE TESTS—Leave blank.

16
17 49. SHIPPER—RECEIVER DIFFERENCE—Leave blank.

18
19 51. SHIPMENTS REPORTED TO NRC/DOE ON DOE/NRC 741 (NOT LISTED
20 ELSEWHERE)—Enter the quantities of SNM or source material shipped to others and
21 reported to the NRC on DOE/NRC Form 741 but not listed elsewhere on this form. This
22 may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741
23 or a total of shipments to each individual RIS during the reporting period.

24
25 54. SHIPMENTS—MISC— Enter the total quantity of material removed from inventory
26 through miscellaneous shipment transactions during the reporting period.

27
28 58. DONATED MATERIAL—TO U.S. GOVT BY OTHERS—Enter the amount of
29 non-DOE-owned nuclear material donated and now DOE owned.

30
31 59. DONATED MATERIAL—TO OTHERS BY U.S. GOVT—Enter the amount of
32 DOE-owned nuclear material donated and now non-DOE owned.

33
34 65. ROUNDING ADJUSTMENT—Enter the quantity of nuclear material that is removed (as
35 a positive number) or added (as a negative number) to the inventory as a result of
36 rounding activities encountered by the licensee.

37
38 71. DEGRADATION TO OTHER MATERIALS—Enter decreases resulting from the
39 introduction of other material into the material balance being reported. If the decreased
40 quantity is the result of blending, burnup, or enrichment, identify the process by which
41 the material was removed by entering the appropriate code from the list in line 22 above.

42
43 72. DECAY⁵—Enter the amount of radioactive decay that occurred during the reporting
44 period for plutonium and Pu-238. If the SNM being reported is plutonium (material
45 type 50), enter the amount of radioactive decay of the isotope Pu-241 if the decay is
46 1 gram or more.

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.

1 If the SNM being reported is Pu-238 (material type 83), enter the amount of radioactive
2 decay of the isotope Pu-238 to the nearest gram or 0.1 gram. Reporting regulations in
3 10 CFR 74.13 require licensees in possession of 1 gram or more of SNM to complete
4 material status reports; however, NMMSS accepts units reported to 0.1 gram for this
5 material type.
6

7 73. FISSION AND TRANSMUTATION—Enter the calculated net quantities of SNM lost by
8 fission and transmutation in a reactor.
9

10 74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS—Normal operational
11 losses and measured discards are materials that have been discarded, whether in the
12 form of solids, liquids, or gases, as determined by measurement or by estimate on the
13 basis of measurement.
14

15 All material that leaves the inventory through the process of normal operational
16 losses/measured discards shall be accounted for on a DOE/NRC Form 741. If the
17 licensee has not previously reported the transaction in the period covered by this
18 material balance period, it shall submit DOE/NRC Form 741 and DOE/NRC Form 742 to
19 facilitate reconciliation with NMMSS.
20

21 75. ACCIDENTAL LOSSES—Accidental loss is the irretrievable and inadvertent loss of a
22 known quantity of SNM or source material as the result of an operational accident, as
23 determined by measurement or by estimate on the basis of measurement.
24

25 76. APPROVED WRITE-OFFS—Leave blank.
26

27 77. INVENTORY DIFFERENCE—Inventory difference is the difference between physical
28 inventory and book inventory after the book has been adjusted for all receipts and
29 removals. A negative entry reports a gain. A positive entry reports a loss.
30

31 Reactors should not report an inventory difference to NMMSS. At the time of physical
32 inventory, the value assigned to an SNM item (e.g., assembly, rod, fragment, sealed
33 container) should be recorded identically on both the book inventory and the physical
34 inventory. At a reactor, unlike at facilities that process SNM for some end use,
35 adjustments to the values assigned to items (representing factors such as nuclear loss,
36 decay, and production rounding) can be explained and should be reported as such.
37

38 80. ENDING INVENTORY—U.S. GOVT-OWNED—Enter the ending DOE-owned inventory
39 as of the end of the last day of the period covered by this report.
40

41 81. ENDING INVENTORY—NOT U.S. GOVT-OWNED—Enter the ending non-DOE-owned
42 inventory as of the last day of the period covered by this report.
43

44 82. TOTAL—Enter the sums of lines 41 through 81. The totals reported on this line must
45 agree with those on line 40.
46

47 83. BIAS ADJUSTMENT—Leave blank.

1 **2.2 Section B, “Foreign Obligations”**
2

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

11 The following column entries are required:
12

- 13
- 14 1. COUNTRY OF OBLIGATION—Enter the unique obligation code for each category of
15 nuclear material. Appendix C to this NUREG lists the codes. The current list of codes
16 can be obtained from NMMSS staff by sending a request to nmmss@nnsa.doe.gov.
17
 - 18 2. ELEMENT WEIGHT—Enter the element weight (plutonium, uranium, or thorium) of the
19 obligated SNM or source material in the reporting units specified for column A of
20 Section A of the form (see Section 2.1 of this NUREG).
21
 - 22 3. ISOTOPE WEIGHT—Enter the appropriate isotope weight. For enriched uranium or
23 U-233, enter the weight to the nearest gram of U-235 or U-233, as appropriate. No entry
24 is necessary for plutonium, depleted uranium, natural uranium, or thorium unless the
25 licensee’s TFA requires such an entry.
26
 - 27 4. TOTAL WEIGHT—Enter the totals for columns 2 and 3. These totals represent the total
28 obligated material at the facility. The total weight of obligated nuclear material may not
29 exceed the total element and isotope weight reported on line 82.
30

31 **2.3 Section C, “Certification”**
32

33 SIGNATURE, TITLE, AND DATE—An authorized representative of the licensee shall sign the
34 report if the licensee submits it as a hard copy. If the licensee submits it electronically, it must
35 establish internal procedures to ensure that the information provided in the report is accurate
36 and that only authorized licensee personnel prepare and issue the report.
37

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, "Submission to the Commission of Nuclear Material Status Reports," 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 follows:

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.

1 5a. MATERIAL TYPE—Enter the appropriate SNM type code, as follows:
2

3	<u>CODE</u>	<u>DESCRIPTION</u>
4	10	depleted uranium
5	E1	uranium enriched greater than normal but less than 5 percent
6	E2	uranium in enrichment of 5 percent or more but less than 20 percent
7	E3	uranium in enrichment of 20 percent or more but less than 80 percent
8	E4	uranium in enrichment of 80 percent or more
9	20	enriched uranium ⁶
10	50	plutonium
11	70	U-233
12	81	normal uranium
13	83	Pu-238
14	88	thorium
15	89	uranium in cascade

16
17 5b. COMPOSITION/FACILITY (COMP/FAC) CODE—Enter the appropriate code, as follows:
18

19	<u>CODE</u> ⁷	<u>DESCRIPTION</u>
20	860	in reactors and critical assemblies
21	861	in cooling basins
22	862	in conversion and fabrication processes
23	863	in recovery processes
24	864	material not in process
25	865	unirradiated scrap awaiting recovery
26	866	unirradiated scrap awaiting disposal
27	899	inventory total line

28
29 5c. ELEMENT WEIGHT—Enter the element weight as instructed for columns A and B of
30 Section A of DOE/NRC Form 742 (see Section 2.1 of this NUREG).
31

32 5d. ISOTOPE WEIGHT—Enter the isotope weights as instructed for columns A and B of
33 Section A of DOE/NRC Form 742 (see Section 2.1 of this NUREG).
34

35 5e. DOE PROJECT NO.—Leave blank unless DOE-owned material is being reported. See
36 DOE Series 470 orders for guidance.
37

38 5f. SCRAP PROGRAM—Leave blank.
39

40 5g. WEIGHT PERCENT ISOTOPE—Leave blank.
41

42 5h. OWNER CODE—This code describes the ownership of the material at the time of the
43 physical inventory taking. Enter the appropriate code (G or J), as follows:
44

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

⁶ This code is used when totaling all E1–E4 values reported by the facility in the inventory total for line 899.

⁷ Appendix A to this NUREG provides more detailed code instructions.

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

3
4 5i. SEQUENCE NUMBER—Enter the line number. Number lines consecutively beginning
5 with 1. Do not repeat or skip numbers.

6
7 5j. BATCH NAME—Leave blank.

8
9 5k. NO. OF ITEMS—Leave blank.

10
11 5l. KEY MEASUREMENT POINT—Leave blank.

12
13 5m. MEASUREMENT I.D.—Leave blank.

14
15 5n. ENTRY STATUS—Leave blank.

16
17 5o. MBA (Material Balance Area)—Leave blank.

18
19 5p. SITE IDC (Identification Code)—Leave blank.

20
21 5q. PROCESS CODE—Enter one of the following process codes (A, C, or D); use process
22 codes C and D to modify report data for only the current processing period:

- 23
24
- “A” refers to the initial entry of data.
 - “C” refers to the replacement of data. Data may be replaced at any time before
27 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
30 close of the processing period in which the initial entry was made.
- 31

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

- 34
- Submit a form with the RIS, report period, material type, sequence number, and
36 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
38 process code D with the unique identifier for the line to be deleted.
- 39

- 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 provided 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 Order 470.4, “Safeguards and Security Program,” and DOE Order 474.2, “Nuclear Material Control and Accountability”) 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 75⁸

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./IAEA Safeguards Agreement. Facilities that are required to submit initial inventory 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, 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 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.

⁸ Possessors of nuclear material outside facilities, reporting inventories of source 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.

1 After the licensee completes DOE/NRC Form 742C, it should follow the instructions in
2 Section 1.3 to prepare the submittal in computer-readable format.

3
4 The following numbered instructions correspond to the numbered blocks or columns that
5 licensees are to complete on the physical inventory listing:

- 6
7 1. NAME AND ADDRESS—Leave blank.
- 8
9 2. REPORTING IDENTIFICATION SYMBOL—Enter the RIS of the reporting facility.
- 10
11 3. INVENTORY DATE—Enter the ending date for the period covered by the material
12 balance report.
- 13
14 4. LICENSE NUMBER(S)—Leave blank.
- 15
16 5. BATCH DATA—The basic reporting unit is the batch, defined as follows:

17
18 A portion of nuclear material handled as a unit for accounting purposes at
19 a key measurement point and for which the composition and quantity are
20 defined by a single set of specifications or measurements. The nuclear
21 material may be in bulk form or contained in a number of separate items.

22
23 A batch may have only one value for the following:

- 24 • batch name
- 25 • number of items
- 26 • composition/facility code
- 27 • key measurement point
- 28 • measurement basis
- 29 • owner code

30
31 In general, enter all of the data for one batch on one line of block 5 of DOE/NRC
32 Form 742C. One exception is when a single discrete item contains more than one
33 material (e.g., irradiated fuel containing both uranium and plutonium). In such a case,
34 use a separate line for the data for each material, and enter all data common to all
35 materials in the batch on the first line.

- 36
37 5a. MATERIAL TYPE—Enter the appropriate material type code, as follows:

<u>CODE</u>	<u>DESCRIPTION</u>
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

- 1 5b. COMPOSITION/FACILITY (COMP/FAC) CODE—Enter the appropriate code from the
2 list developed during the formulation and negotiation of the FA or TFA.
3
- 4 5c. ELEMENT WEIGHT—Enter the weight of the contained SNM or source material in the
5 same units as specified for Section A of DOE/NRC Form 742 (see Section 2.1 of this
6 NUREG).
7
- 8 5d. ISOTOPE WEIGHT—Enter the isotope weight according to the requirements of the
9 facility’s FA or TFA.
10
- 11 5e. DOE PROJECT NO.—Leave blank unless DOE-owned material is being reported. See
12 DOE Series 470 orders for guidance.
13
- 14 5f. SCRAP PROGRAM—Leave blank.
15
- 16 5g. WEIGHT PERCENT ISOTOPE—Enter the weight percent of the isotope U-235
17 contained in either enriched or depleted uranium. Leave this field blank for U-235
18 contained in natural uranium unless the facility’s FA or TFA requires the information. For
19 plutonium, enter the weight percent of the isotope Pu-240. For Pu-238, enter the weight
20 percent of the isotope Pu-238. Report weight percent to at least two, but not more than
21 four, decimal places depending on the accuracy of the measurement method
22 (e.g., XX.XXXX%). For U-233, enter the parts per million of U-232. This column does
23 not apply for normal uranium or thorium. Use separate lines to report material of
24 different enrichments.
25
- 26 5h. OWNER CODE—This code describes the ownership of the material at the time it was in
27 the shipper’s possession. Enter the appropriate code (G or J), as follows:
28
- 29 • “G” refers to DOE-owned material.
 - 30 • “J” refers to non-DOE-owned material.
- 31
- 32 Refer to the glossary in Appendix D to this NUREG for further description of DOE-owned
33 material.
34
- 35 5i. SEQUENCE NUMBER—Enter the line number. Use consecutive numbers beginning
36 with 1. Do not repeat or skip numbers.
37
- 38 5j. BATCH NAME—Enter a unique identifier for the batch as defined in block 5. If the batch
39 is a discrete item with a unique identifying serial number or name (e.g., a fuel assembly,
40 sealed source, or uranium hexafluoride cylinder), enter the identification number of the
41 batch name. Note that the same batch name should not appear twice in the same report
42 for the same material type.
43
- 44 5k. NO. OF ITEMS—If the batch is composed of a number of discrete items, enter the
45 number of items. If the batch is bulk material or if the number of items is not meaningful,
46 enter 1. If more than one line is used to report data on the batch, enter the number of
47 data items on each line.
48
- 49 5l. KEY MEASUREMENT POINT—Enter the code for the appropriate inventory key
50 measurement point, as specified in the FA or TFA.

- 1 5m. MEASUREMENT I.D.—Fill in the three sections of this data field as described below.
2
3 5m1. MEASUREMENT BASIS—Enter the pertinent code for the measurement basis as
4 specified in the FA or TFA.
5
6 5m2. OTHER MEASUREMENT POINT—Leave this field blank unless the FA or TFA requires
7 the information.
8
9 5m3. MEASUREMENT METHOD—In some cases, the FA or TFA may provide codes for
10 identifying the measurement method used. In such cases, enter the appropriate code.
11
12 5n. ENTRY STATUS—Enter N for “new entry.”
13
14 5o. MATERIAL BALANCE AREA—Leave blank.
15
16 5p. SITE IDC—Leave blank.
17
18 5q. PROCESS CODE—Enter one of the following process codes (A, C, or D); use process
19 codes C and D to modify report data for only the current processing period:
20
21 • “A” refers to the initial entry of data.
22
23 • “C” refers to the replacement of data. Data may be replaced at any time before
24 the close of the processing period in which the initial entry was made.
25
26 • “D” refers to the deletion of data. Data may be deleted at any time before the
27 close of the processing period in which the initial entry was made.
28
29 Reported inventories may be modified for the current processing periods. Use process
30 code C for replacement and D for deletion, as follows:
31
32 • Submit a form with the RIS, report period, material type, sequence number, and
33 process code C with the unique identifier for the line to be replaced.
34
35 • Submit a form with the RIS, report period, material type, sequence number, and
36 process code D with the unique identifier for the line to be deleted.
37
38 • Submit a form with the RIS, report period, material type with no sequence
39 number, and process code D to delete all matching records.
40
41 • Submit a form with the RIS, report period, and process code D to delete the
42 entire material balance within the reporting dates.
43
44 6. TOTALS—Enter the total inventory reported in the above categories for element weight
45 (5c), isotope weight (5d), and the next sequence number. This total must agree with the
46 sum of the quantities entered on lines 80 and 81 on DOE/NRC Form 742.
47
48 7. SIGNATURE—An authorized representative of the licensee must sign the form, if the
49 licensee submits it as hard copy; otherwise, each licensee must establish internal

1 procedures to ensure that the information provided in the report is accurate and that only
2 authorized licensee personnel prepare and issue the reports.

3
4 8. TITLE—Enter the title of the person who signed the report (required only for paper
5 submission).

6
7 9. DATE—Enter the date the report was signed (required only for paper submission).
8

1

APPENDIX A

2

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 change 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 in 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

1 generic material types. For all enriched uranium entries (E1, E2, E3, and E4), sum the weights
2 together and report this value on the line 899.

1 **APPENDIX B**

2 **DOE/NRC FORM 742, "MATERIAL BALANCE REPORT" (BLANK), AND**

3 **DOE/NRC FORM 742C, "PHYSICAL INVENTORY LISTING" (BLANK)**

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

DOE/NRC FORM 742 <small>(09-2014)</small> MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 33, 40, 50, 70, 72, 74, 75, 150, Public Laws 93-703, 93-438, 95-91	 U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0004 EXPIRES: 08/31/2017 <small>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 FOIA, Privacy, and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollct.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOS-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.</small>
MATERIAL BALANCE REPORT		
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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APPENDIX C

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OBLIGATION CODES

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OBLIGATION CODES

Material Balance Code	Obligation Entity
85	Australia
86	Canada
87	European Atomic Energy Community (EURATOM) ⁹
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

3

⁹ 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.

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

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

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APPENDIX D

2

GLOSSARY

GLOSSARY

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

7
8 **Agreement State**—A State that has signed an agreement with the U.S. Nuclear Regulatory
9 Commission (NRC) under which the State regulates the use of byproduct, source, and small
10 quantities of SNM in that State.

11
12 **Book inventory**—The algebraic sum of the most recent physical inventory of the material
13 balance area and of all inventory changes that have occurred since the physical inventory was
14 taken.

15
16 **Concise Note**—U.S. Department of Energy (DOE)/NRC Form 740M, “Concise Note,” which is
17 used to provide additional information concerning nuclear material transaction, material balance,
18 or inventory data supplied by facilities engaged in the import or export of nuclear materials, by
19 facilities selected under the provisions of the agreement between the United States and the
20 International Atomic Energy Agency for the application of safeguards in the United States, or by
21 any facility that would like to transmit any additional explanatory nuclear material information.

22
23 **DOE-owned material**—Nuclear material that, although a licensee uses such material as part of
24 its activities, is actually a DOE-owned asset. These materials may be bulk materials, discrete
25 radiation sources, or finished products. Such materials may represent a lease or loan
26 arrangement with DOE and are represented by an owner code of G on shipping information
27 (i.e., DOE/NRC Form 741, “Nuclear Materials Transaction Report”) and inventory
28 documentation (i.e., DOE/NRC Form 742, “Material Balance Report,” and DOE/NRC
29 Form 742C, “Physical Inventory Listing”). A licensee can determine whether nuclear material in
30 its possession is DOE owned by reviewing its DOE/NRC Form 741 documentation, which lists
31 the original receipt of the material. If DOE owns such material, the licensee’s portion of the form
32 will have the owner code G.

33
34 **European Atomic Energy Community**—As of January 2019, an organization consisting of the
35 following member countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic,
36 Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania,
37 Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain,
38 Sweden, and the United Kingdom.

39
40 **Foreign-obligated nuclear material**—Source material or SNM that is subject to the terms and
41 conditions of a peaceful use agreement under Section 123 of the Atomic Energy Act of 1954, as
42 amended, that the U.S. Government has entered into with another government or group of
43 governments.

44
45 **Highly enriched uranium**—Uranium enriched to 20 percent or greater in the isotope uranium
46 (U)-235.

47
48 **Holding account**—Typically identified by an NRC-assigned four-character reporting
49 identification symbol (RIS) that ends in the letter H. These accounts usually acquired inventory

1 material from the primary RIS in use at the licensee's facility. Typically, a small number of
2 licensees have used these accounts for nuclear materials not expected to be immediately
3 processed, reprocessed, or disposed. However, the licensed nuclear materials in holding
4 accounts are still in the licensee's possession and must be included in inventories reported to
5 the Nuclear Materials Management and Safeguards System.
6

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

$$ID = (BI + A - R) - EI,$$

12
13
14 where (BI + A - R) is the book inventory.
15
16

17 **Inventory reconciliation**—The adjustment of the book record quantity of elements and fissile
18 isotope weights to reflect the results of a physical inventory taking. In a broad sense, inventory
19 reconciliation involves the activities of calculating (1) the ID for the material balance period in
20 question, (2) the uncertainty value associated with the ID, (3) the active inventory for the period,
21 and (4) any bias adjustment or prior period adjustment associated with the ID value.
22

23 **Low-enriched uranium**—Uranium enriched below 20 percent in the isotope U-235.
24

25 **Material balance period**—The time span to which a material or physical inventory pertains.
26

27 **Nuclear Materials Management and Safeguards System**—The national database and
28 information system for select nuclear materials controlled by the U.S. Government. This system
29 was created to support national safeguards and management objectives in domestic and
30 international programs. The system stores data on nuclear material transactions and
31 inventories and produces a wide range of printed reports for use by DOE and the NRC and by
32 those licensees that they regulate. The system is used to satisfy the nuclear materials
33 information requirements of agreements between the United States and foreign entities. In
34 addition, the system provides the reporting interface between facilities selected under the
35 provisions of the U.S./International Atomic Energy Agency Safeguards Agreement.
36

37 **Nuclear material outside facilities**—The nuclear material that is not in a facility and is
38 customarily used in amounts of 1 effective kilogram or less.
39

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

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

4
5 **Reporting identification symbol**—A unique combination of three or four characters that the
6 NRC assigns to each reporting organization for the purpose of identification in the Nuclear
7 Materials Management and Safeguards System database.

8
9 **Shipper-receiver difference**—The weight difference for a shipment between the shipper and
10 receiver values based on measurements.

11
12 **Source material**—Uranium or thorium, or any combination thereof, in any physical or chemical
13 form or ores that contain by weight 0.05 percent or more of uranium, thorium, or any
14 combination thereof. Source material does not include SNM.

15
16 **Special nuclear material**—Plutonium, U-233, and uranium enriched in the isotope U-233 or
17 U-235.

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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

1 **SUPPLEMENTAL INSTRUCTIONS FOR POSSESSORS OF NUCLEAR**
2 **MATERIAL OUTSIDE FACILITIES THAT REPORT UNDER THE**
3 **U.S./INTERNATIONAL ATOMIC ENERGY AGENCY CARIBBEAN**
4 **TERRITORIES SAFEGUARDS AGREEMENT MODIFIED SMALL**
5 **QUANTITIES PROTOCOL (INFCIRC/366) ON U.S. DEPARTMENT OF**
6 **ENERGY/U.S. NUCLEAR REGULATORY COMMISSION FORMS 742**
7 **AND 742C**
8

9 **E-1. Introduction**

10
11 INFCIRC/366, "U.S.-IAEA Caribbean Territories Safeguards Agreement," is an agreement
12 between the U.S. Government and the International Atomic Energy Agency (IAEA) for the
13 application of safeguards in connection with the Treaty for the Prohibition of Nuclear Weapons
14 in Latin America (Tlatelolco Treaty), brought into force on July 3, 2018. Under Article 60 of
15 INFCIRC/366, the United States is obligated to submit an initial inventory report on all nuclear
16 material in its Caribbean territories to IAEA. By IAEA definition, nuclear material includes all
17 uranium, plutonium, and thorium holdings in the relevant territories in any chemical or physical
18 form. U.S. Caribbean territories include Puerto Rico and the U.S. Virgin Islands, as defined in
19 Title 10 of the *Code of Federal Regulations* (10 CFR) 75.4, "Definitions." The United States
20 fulfills this reporting commitment through the collection of information in accordance with
21 10 CFR Part 75, "Safeguards on Nuclear Material—Implementation of Safeguards Agreements
22 between the United States and the International Atomic Energy Agency." This appendix
23 provides instruction for licensees reporting inventory under 10 CFR 75.32, "Initial Inventory
24 Report," and 10 CFR 75.35, "Material Status Reports," in accordance with INFCIRC/366.
25

26 **E-2. General Instructions**

27
28 The instructions in this appendix apply only to possessors of nuclear material outside facilities
29 (possessors), as defined in 10 CFR 75.4. Possessors are required to submit initial inventory
30 under 10 CFR 75.32 by preparing U.S. Department of Energy (DOE)/U.S. Nuclear Regulatory
31 Commission (NRC) Form 742C, "Physical Inventory Listing," in accordance with the instructions
32 in Section E-2.1 of this appendix. The information in the initial inventory report may be based
33 on the licensee's book record. Possessors reporting under this section must file subsequent
34 material balance reports based on a physical inventory and are required to attach a completed
35 DOE/NRC Form 742, "Material Balance Report," in accordance with the instructions in
36 Section E-2.2 of this appendix. Such reports are required with respect to each physical
37 inventory taken as part of the material control and accounting procedures under 10 CFR 75.21,
38 "General Requirements." Unless otherwise specified by license conditions, such reports shall
39 be dispatched as soon as possible and, in any event, within 30 days after the start of the
40 physical inventory. The reports must be filed as specified in the facility attachment for
41 possessors of nuclear material outside facilities, which the NRC will provide to applicable
42 licensees required to report under 10 CFR Part 75.
43

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

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

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

- 4
- 5 1. NAME AND ADDRESS—Leave blank.
- 6
- 7 2. REPORTING IDENTIFICATION SYMBOL (RIS)—Enter the RIS of the possessor of
8 nuclear material outside facilities that is reporting inventory.
- 9
- 10 3. INVENTORY DATE—Enter the ending date for the period covered by the material
11 balance report.
- 12 4. LICENSE NUMBER(S)—Leave blank.
- 13 5. BATCH DATA—The basic reporting unit is the batch, defined as follows:

14
15 A portion of nuclear material handled as a unit for accounting purposes at
16 a key measurement point and for which the composition and quantity are
17 defined by a single set of specifications or measurements. The nuclear
18 material may be in bulk form or contained in a number of separate items.

19
20 A batch may have only one value for the following:

- 21
- 22 • batch name
 - 23 • number of items
 - 24 • composition/facility code
 - 25 • key measurement point
 - 26 • measurement basis
 - 27 • owner code
- 28

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

1 5a. MATERIAL TYPE—Enter the appropriate special nuclear material (SNM) type
2 code, as follows:

<u>CODE</u>	<u>DESCRIPTION</u>
10	depleted uranium
20 ¹⁰	enriched uranium
50	plutonium
70	U-233
81	normal uranium
83	Pu-238
88	thorium
89	uranium in cascade

14 5b. COMPOSITION/FACILITY (COMP/FAC) CODE—Enter the appropriate code that
15 describes the physical form (e.g., unencapsulated or encapsulated) and the chemical
16 form of the material from the list provided in Code 4 of the Locations Outside Facility
17 Attachment. In addition, Composition Code 899 applies to the inventory total line. Enter
18 the cumulative total reported for a given material type.

20 5c. ELEMENT WEIGHT—Enter the weight of the contained SNM or source material in the
21 same units as specified for Section A of DOE/NRC Form 742 (see Section E-2.2 of this
22 appendix).

23 If the quantity to be entered is equal to or greater than 0.5 of the reporting unit, the
24 quantity should be rounded up to the next whole reporting unit. If the quantity to be
25 entered is less than 0.5 of the reporting unit, the quantity should be rounded down to the
26 next whole reporting unit.

27
28 For processors with greater than 0.0 kilograms but less than 0.5 kilograms of source
29 material and greater than 0.0 grams but less than 0.5 grams of SNM, which are rounded
30 to a zero value when reported, processors are to provide DOE/NRC Form 740M, which
31 will define the actual weights.

32 5d. ISOTOPE WEIGHT—Enter the isotope weight. For enriched uranium or uranium
33 (U)-233, enter the weight to the nearest gram of U-235 or U-233, as appropriate. For
34 plutonium (material type 50), enter the sum of plutonium (Pu)-239 and Pu-241 to the
35 nearest gram. For Pu-238 (material type 83), enter the weight of the isotope Pu-238 to
36 the nearest gram or 0.1 gram. For natural and depleted uranium, enter the weight of the
37 U-235 isotope to the nearest gram and report to three decimal places. Do not make an
38 entry for thorium.

¹⁰ If reporting enriched uranium (material type 20), enter the appropriate enrichment level code in lieu of material type 20, as follows:

<u>CODE</u>	<u>DESCRIPTION</u>
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

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

3
4 5e. DOE PROJECT NO.—Do not make an entry unless reporting DOE-owned material.
5 See DOE Series 470 orders for guidance.

6
7 5f. SCRAP PROGRAM—Do not make an entry unless reporting DOE-owned material. See
8 DOE Series 470 orders for guidance.

9
10 5g. WEIGHT PERCENT ISOTOPE—Enter the weight percent of the isotope U-235 if the
11 material is uranium enriched or depleted in U-235. Do not make an entry for U-235 in
12 natural uranium. For plutonium, enter the weight percent of the isotope Pu-240. For
13 Pu-238, enter the weight percent of the isotope Pu-238. Report weight percent to at
14 least two, but not more than four, decimal places depending on the accuracy of the
15 measurement method (e.g., XX.XXXX%). For U-233, enter the parts per million of
16 uranium-232. For depleted uranium with an enrichment of 0.5 percent or less, enter
17 “0.3%” if the enrichment is unknown. This column does not apply for normal uranium or
18 thorium. Use separate lines to report material of different enrichments.

19
20 5h. OWNER CODE—This code describes the ownership of the material at the time it was in
21 the shipper’s possession. Enter the appropriate code (G or J), as follows:

- 22
- 23 • “G” refers to DOE-owned material.
- 24 • “J” refers to non-DOE-owned material.
- 25

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

28
29 5i. SEQUENCE NUMBER—Enter the line number. Use consecutive numbers beginning
30 with 1. Do not repeat or skip numbers.

31
32 5j. BATCH NAME—Enter a unique identifier for the batch as defined in block 5. If the batch
33 is a discrete item with a unique identifying serial number or name (e.g., industrial
34 radiography cameras, medical isotope generators), enter the identification number of the
35 batch name. Note that the same batch name must not appear twice in the same report
36 for the same material type, must not include special characters (e.g., ;, /), and must not
37 exceed 16 characters.

38
39 5k. NO. OF ITEMS—If the batch is composed of a number of discrete items, enter the
40 number of items. If the batch is bulk material or if the number of items is not meaningful,
41 enter 1. If more than one line is used to report data on the batch, enter the number of
42 data items on each line.

43
44 5l. KEY MEASUREMENT POINT—Enter the appropriate code from the list provided in
45 Code 4 of the Locations Outside Facility Attachment.

46
47 5m. MEASUREMENT I.D.— Leave blank.

48
49 5m1. MEASUREMENT BASIS—Enter the appropriate code from the list provided in Code 4 of
50 the Locations Outside Facility Attachment.

- 1 5m2. OTHER MEASUREMENT POINT— Leave blank.
2
3 5m3. MEASUREMENT METHOD— Leave blank.
4
5 5n. ENTRY STATUS—Enter N for “new entry.”
6
7 5o. MATERIAL BALANCE AREA—Leave blank.
8
9 5p. SITE IDC—Leave blank.
10
11 5q. PROCESS CODE—Enter one of the following process codes (A, C, or D); use process
12 codes C and D to modify report data for only the current processing period:
13

- 14 • “A” refers to the initial entry of data.
15
- 16 • “C” refers to the replacement of data. Data may be replaced at any time before
17 the close of the processing period in which the initial entry was made.
18
- 19 • “D” refers to the deletion of data. Data may be deleted at any time before the
20 close of the processing period in which the initial entry was made.
21

22 Reported material balance reports may be modified for the current processing periods.
23 Use process code C for replacement and D for deletion, as follows:
24

- 25 • Submit a form with the RIS, report period, material type, sequence number, and
26 process code C with the unique identifier for the line to be replaced.
27
- 28 • Submit a form with the RIS, report period, material type, sequence number, and
29 process code D with the unique identifier for the line to be deleted.
30
- 31 • Submit a form with the RIS, report period, material type with no sequence
32 number, and process code D to delete all matching records.
33
- 34 • Submit a form with the RIS, report period, and process code D to delete the
35 entire material balance within the reporting dates.
36

- 37 6. TOTALS—If all lines being reported have the same material type, enter the total
38 inventory reported in the above categories for element weight (5c), isotope weight (5d),
39 and the next sequence number. This total must agree with the sum of the quantities
40 entered on lines 80 and 81 on DOE/NRC Form 742.
41

42 If multiple material types are being reported on a DOE/NRC Form 742C, the “Totals”
43 field will not be filled, and a line with the Composition Code 899 will display the
44 “Inventory Total Line” where the cumulative total is reported for a given material type.
45 This code must be reported for all generic material types. There should only be one
46 code per generic material type. For all enriched uranium entries (E1, E2, E3, and E4),
47 sum the weights together, and report this value on line 899.
48

- 49 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 provided 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).

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:

<u>CODE</u>	<u>DESCRIPTION</u>
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 ¹¹	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.

¹¹ Report the material as Pu-238 if the contained Pu-238 is greater than 10 percent of total plutonium by weight; otherwise, report it as plutonium.

1 **Section A, "Material Accountability"**

2
3 **PROCESS CODE**—Enter one of the following process codes (A, C, or D); use process codes C
4 and D to modify report data for only the current processing period:

- 5
6 • "A" refers to the initial entry of data.
7
8 • "C" refers to the replacement of data. Data may be replaced at any time before the
9 close of the processing period in which the initial entry was made.
10
11 • "D" refers to the deletion of data. Data may be deleted at any time before the close of
12 the processing period in which the initial entry was made. Reported material balance
13 reports may be modified for the current processing periods. Use process code C for
14 replacement and D for deletion, as follows:
15
16 • Submit a form with the RIS, report period, material type, sequence number, and process
17 code C with the unique identifier for the line to be replaced.
18
19 • Submit a form with the RIS, report period, material type, sequence number, and process
20 code D with the unique identifier for the line to be deleted.
21
22 • Submit a form with the RIS, report period, material type with no sequence number, and
23 process code D to delete all matching records.
24
25 • Submit a form with the RIS, report period, and process code D to delete the entire
26 material balance within the reporting dates.
27

28 **SEQUENCE NUMBER**—All detail lines that contain data must have a sequence number. Enter
29 a numerical value in sequential order beginning with 1. Do not repeat or skip numbers.

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

31
32
33 **COLUMN A—ELEMENT WEIGHT¹²**

34
35 Enter the total element weight of the SNM or source material being reported. For Pu-238, report
36 to the nearest gram or 0.1 gram. Report all other SNM to the nearest gram and all other source
37 material to the nearest kilogram.

38
39 **COLUMN B—ISOTOPE WEIGHT¹³**

40
41 In the case of enriched uranium or U-233, enter the weight of the isotope U-235 or U-233 to the
42 nearest whole gram. In the case of plutonium, enter the weight of the isotopes Pu-239 and
43 Pu-241, and in the case of Pu-238, enter the weight of the isotope Pu-238. For Pu-238, report
44 to the nearest 0.1 of a gram. For natural or depleted uranium, enter the weight of the isotope
45 U-235 to the nearest gram. Do not make an entry for thorium.

¹² 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.

¹³ 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.

- 1 8. BEGINNING INVENTORY—U.S. GOVT-OWNED—Enter the inventory of DOE-owned
2 SNM or source material as of the beginning of business on the first day of the period
3 covered by the report. The quantities reported on line 8 (columns A and B) must agree
4 with the reconciled quantities on line 80 of the report submitted for the previous reporting
5 period.
6
- 7 9. BEGINNING INVENTORY—NOT U.S. GOVT-OWNED—Enter the inventory of
8 non-DOE-owned SNM or source material as of the beginning of business on the first day
9 of the period covered by the report. The quantities reported on line 9 (columns A and B)
10 must agree with the reconciled quantities on line 81 of the report submitted for the
11 previous reporting period.
12

13 RECEIPTS

- 14
- 15 11. PROCUREMENT FROM DOE—Enter quantities of SNM (or source material) that have
16 been purchased from DOE during the reporting period and reported to the NRC on
17 DOE/NRC Form 741, “Nuclear Materials Transaction Report.” This may be done by
18 listing individual receipts for each individual RIS as reported on DOE/NRC Form 741 or a
19 total of receipts for each individual RIS during the reporting period. SNM or source
20 material quantities entered on line 11 are not entered on line 30.
21
- 22 13. PROCUREMENT FOR THE ACCOUNT OF DOE—Enter quantities of SNM (or source
23 material) that have been purchased for the account of DOE during the reporting period
24 and reported to the NRC on DOE/NRC Form 741. This may be done by listing individual
25 receipts for each individual RIS as reported on DOE/NRC Form 741 or a total of receipts
26 for each individual RIS during the reporting period. SNM or source material quantities
27 entered on line 13 are not entered on line 30.
28
- 29 14. DOD RETURNS—USE A—Leave blank.
30
- 31 15. DOD RETURNS—USE B—Leave blank.
32
- 33 16. DOD RETURNS—OTHER USES—Leave blank.
34
- 35 21. PRODUCTION—Leave blank.
36
- 37 22. FROM OTHER MATERIALS—Leave blank.
38
- 39 30. RECEIPTS REPORTED TO NRC ON DOE/NRC 741 (NOT LISTED ELSEWHERE)—
40 Enter the SNM or source material received from others and reported on DOE/NRC
41 Form 741 but not listed elsewhere on this form. This may be done by listing individual
42 receipts by RIS as reported on DOE/NRC Form 741 or a total of receipts from each
43 individual RIS during the report period.
44
- 45 34. RECEIPTS—MISC—Complete DOE/NRC Form 741 and report the cumulative
46 miscellaneous receipts (Inventory Change Type (ICT) 34). This requirement includes
47 nuclear material removed from inventory and then returned to inventory, if not accounted
48 for elsewhere on this form.
49
- 50 37. PROCUREMENT BY OTHERS—Leave blank.

- 1 38. DONATED MATERIAL—FROM U.S. GOVT TO OTHERS—Enter the amount of
2 DOE-owned material donated and now non-DOE owned.
3
- 4 39. DONATED MATERIAL—FROM OTHERS TO U.S. GOVT—Enter the amount of
5 non-DOE-owned material donated and now DOE owned.
6
- 7 40. TOTAL—Enter the sums of columns A and B (lines 8 through 39).
8
- 9 REMOVALS
- 10
- 11 41. EXPENDED IN SPACE PROGRAMS—Leave blank.
12
- 13 42. SALES TO U.S. GOVT—Enter quantities of non-DOE-owned SNM or source material
14 that have been sold and converted to DOE owned during the reporting period and that
15 have been reported to the NRC on DOE/NRC Form 741. This may be done by listing
16 individual shipments by RIS as reported on DOE/NRC Form 741 or a total of shipments
17 to each individual RIS during the reporting period. (Do not enter SNM or source material
18 quantities on line 51 that have already been entered on line 42.)
19
- 20 43. SALES TO OTHERS FOR THE ACCOUNT OF U.S. GOVT—Enter quantities of
21 DOE-owned SNM or source material that have been sold and converted to non-DOE
22 owned during the reporting period and that have been reported to the NRC on
23 DOE/NRC Form 741. This may be done by listing individual shipments by RIS as
24 reported on DOE/NRC Form 741 or a total of shipments to each individual RIS during
25 the reporting period. (Do not enter SNM or source material quantities on line 51 that
26 have already been entered on line 43.)
27
- 28 44. DOD—USE A—Leave blank.
29
- 30 45. DOD—USE B—Leave blank.
31
- 32 46. DOD—OTHER USES—Leave blank.
33
- 34 47. EXPENDED IN U.S. GOVT TESTS—Leave blank.
35
- 36 48. ROUTINE TESTS—Leave blank.
37
- 38 49. SHIPPER—RECEIVER DIFFERENCE—Leave blank.
39
- 40 51. SHIPMENTS REPORTED TO NRC/DOE ON DOE/NRC 741 (NOT LISTED
41 ELSEWHERE)—Enter the quantities of SNM or source material shipped to others and
42 reported to the NRC on DOE/NRC Form 741 but not listed elsewhere on this form. This
43 may be done by listing individual shipments by RIS as reported on DOE/NRC Form 741
44 or a total of shipments to each individual RIS during the reporting period.
45
- 46 54. SHIPMENTS—MISC—Complete DOE/NRC Form 741 and report the cumulative
47 miscellaneous shipments (ICT 54). Possessors reporting under 10 CFR Part 75 should
48 also include transfers to burials on this line rather than on line 74.
49
- 50 58. DONATED MATERIAL—TO U.S. GOVT BY OTHERS—Enter the amount of
51 non-DOE-owned nuclear material donated and now non-DOE owned.

- 1 59. DONATED MATERIAL—TO OTHERS BY THE U.S. GOVT—Enter the amount of
2 nuclear material removed from a U.S. Government account by donation to others.
3
- 4 65. ROUNDING ADJUSTMENT—Enter the quantity of nuclear material that is removed (as
5 a positive number) or added (as a negative number) to the inventory as a result of
6 rounding activities encountered by the licensee.
7
- 8 71. DEGRADATION TO OTHER MATERIALS—Enter decreases resulting from the
9 introduction of other material into the material balance being reported. If the decreased
10 quantity is the result of blending, burnup, or enrichment, identify the balance losing the
11 material by entering the appropriate code from the list in line 22 above.
12
- 13 72. DECAY⁴—Enter the amount of radioactive decay that occurred during the reporting
14 period for plutonium and Pu-238. If the SNM being reported is plutonium (material
15 type 50), enter the amount of radioactive decay of the isotope Pu-241 if the decay is
16 1 gram or more.
17
- 18 If the SNM being reported is Pu-238 (material type 83), enter the amount of radioactive
19 decay of the isotope Pu-238 to the nearest gram or 0.1 gram.
- 20 73. FISSION AND TRANSMUTATION—Enter the calculated quantities of SNM lost by
21 fission and transmutation in a reactor.
22
- 23 74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS—Normal operational
24 losses and measured discards are materials that have been discarded, whether in the
25 form of solids, liquids, or gases, as determined by measurement or by estimate on the
26 basis of measurement.
27
- 28 DOE/NRC Form 741 must account for all materials that leave the inventory through the
29 process of normal operational losses/measured discards, if not previously reported in the
30 period covered by this report. To account for these discards, use the established RIS
31 types described below.
32
- 33 If the material is discarded to a lagoon or pond, append an L to the receiver's RIS.
34 Measured discards to the atmosphere or ground should be documented as an onsite
35 transfer with the licensee's RIS as shipper and receiver. If the material goes off the
36 inventory into a holding area (refer to the term "holding account" in the glossary in
37 Appendix D) for later removal to a burial site, append an H to the receiver's RIS. When
38 the material is eventually shipped to a burial site, the transfer series on DOE/NRC
39 Form 741 will show the shipper's RIS with an appended H and the appropriate V-series
40 RIS in the receiver's block. Alternatively, the licensee may return the material from the
41 holding account to the primary RIS and then ship the material from the primary RIS.
42 Such activities must also be documented on DOE/NRC Form 741. Remove discards
43 from inventory only when the material has been disposed of by (1) transfer to an
44 authorized recipient or holding area in accordance with 10 CFR Part 40, "Domestic
45 Licensing of Source Material," or 10 CFR Part 74, "Material Control and Accounting of
46 Special Nuclear Material," (2) authorization under 10 CFR 20.2002, "Method for

¹⁴ 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.

1 Obtaining Approval of Proposed Disposal Procedures,” (3) under the requirements in
2 10 CFR 20.2003, “Disposal by Release into Sanitary Sewerage”; 10 CFR 20.2004,
3 “Treatment or Disposal by Incineration”; or 10 CFR 20.1302, “Compliance with Dose
4 Limits for Individual Members of the Public” (related to concentrations in effluents to
5 unrestricted areas), or (4) under the requirements in corresponding Agreement State
6 regulations. Note that the establishment of L or H accounts requires prior NRC
7 approval.
8

9 75. ACCIDENTAL LOSSES—Accidental loss is the irretrievable and inadvertent loss of a
10 known quantity of SNM or source material as the result of an operational accident, as
11 determined by measurement or by estimate on the basis of measurement.
12

13 76. APPROVED WRITE-OFFS—Leave blank.
14

15 77. INVENTORY DIFFERENCE—Inventory difference (ID) is the difference between
16 physical inventory and book inventory after the book has been adjusted for all receipts
17 and removals. A negative entry reports a gain. A positive entry reports a loss.
18

19 80. ENDING INVENTORY—U.S. GOVT-OWNED—Enter the ending DOE-owned inventory
20 as of the end of the last day of the period covered by this report.
21

22 81. ENDING INVENTORY—NOT U.S. GOVT-OWNED—Enter the ending non-DOE-owned
23 inventory as of the last day of the period covered by this report.
24

25 82. TOTAL—Enter the sums of lines 41 through 81. The totals reported on this line must
26 agree with those on line 40.
27

E-10

28 83. BIAS ADJUSTMENT—The ID bias adjustment is that quantity of material that should be
29 added to or subtracted from the ID quantity on line 77 to produce the best estimate of an
30 unbiased ID. The adjustment represents the algebraic summation of the impact of
31 measurement system biases on each component of the measured plant material
32 balance. Include the sum of the bias adjustments for the ID for the current period on this
33 line. This line should also include any prior period adjustments. Do not include bias
34 adjustments that have already been applied to the source data in the material balance
35 equation.
36

37 Note that the total ending inventories must match the total inventory reported on DOE/NRC
38 Form 742C for a material type.
39

40 **Section B, “Foreign Obligations”**

41
42 This section only applies to licensees that possess obligated nuclear material in their inventory
43 within a reporting period. It does not apply to licensees that have not possessed or transferred
44 (received or shipped) foreign-obligated material within a reporting period.
45

46 The total amount of obligated nuclear material in inventory as of the end of the reporting period
47 must be accounted for by material type. It may not exceed the total amount of physical
48 inventory for a given material type (i.e., a “negative obligations balance”). Facilities should use
49 special care to avoid a negative obligations balance at the time of facility reconciliation.
50 NMMSS may show a negative obligations balance for a facility at any given time within a
51 material balance period as a result of the delay in reporting shipments versus receipts; however,

1 NMMSS will not be able to reconcile a facility for a material balance period until the foreign
2 obligations at the facility are balanced.

3
4 The following column entries are required:

- 5
6 1. COUNTRY OF OBLIGATION—Enter the unique obligated code for each category of
7 nuclear material. Appendix C to this NUREG lists the codes. NMMSS staff can provide
8 an up-to-date listing.
9
- 10 2. ELEMENT WEIGHT—Enter the element weight (plutonium, uranium, or thorium) of the
11 obligated SNM or source material in the reporting units specified for column A of
12 Section A of the form (see Section E-2.2 of this appendix).
13
- 14 3. ISOTOPE WEIGHT—Enter the appropriate isotope weight. For enriched uranium or
15 U-233, enter the weight to the nearest gram of U-235 or U-233, as appropriate. Do not
16 make an entry for plutonium.
17
- 18 4. TOTAL WEIGHT—Enter the totals for columns 2 and 3. These totals represent the total
19 obligated material at the facility. The total weight of obligated nuclear material may not
20 exceed the total element and isotope weight reported on line 82.
21

22 **Section C, “Certification”**

23
24 SIGNATURE, TITLE, AND DATE—An authorized representative of the licensee shall sign the
25 report if the licensee submits it as a hard copy. If the licensee submits it electronically, it must
26 establish internal procedures to ensure that the information provided in the report is accurate
27 and that only the authorized licensee personnel have prepared and issued the report.

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11. ABSTRACT (200 words or less)

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

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

Nuclear Materials Management and Safeguards System (NMMSS)

material balance report

physical inventory listing

material status reports

Form 742

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