

Material Balance Reports (MBR)

Instructors:

- Alexandra Zeigler
- Mitch Hembree
- Brandon Zack
- John Cettin
- Brian Horn



Topics

1 What is a Material Balance Reports?

Alexandra Zeigler

- Purpose
- Regulatory Framework
- DOE/NRC Form 742C

2 How to complete and submit a Material Balance Reports.

Brian Horn | John Cettin

- Required MC&A Data
- Submittal Methods
- Quality Control and Validation process applied by NMMSS.

3 Case Study

Mitch Hembree | Brandon Zack

- Power Reactor

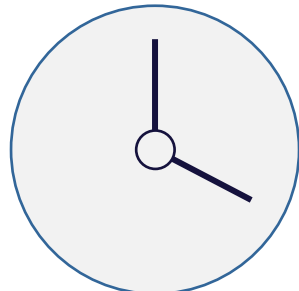


What is a Material Balance Reports?

Topic

1

Material Balance Report



Material Balance Report describes a facility's inventory status for a specified time period

Material Balance Report is used as part of the reconciliation process to compare how reported transactions during the time period affect projected nuclear material balances



Facilities

Reported as part of their material status report (MSR) or generated from the site's previous ending balance with transactions applied for the reported period

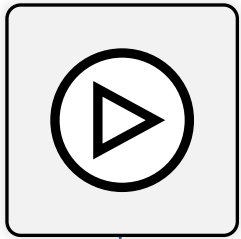


Facilities

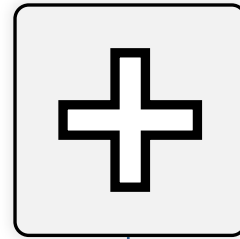
Reported as part of their material status report (MSR)

Material Balance Report *(Continued)*

For each Material Type, the Material Balance Report describes the following:



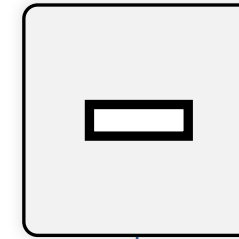
The **beginning** balance for the reporting period



Additions to the material balance during the reporting period

Examples:

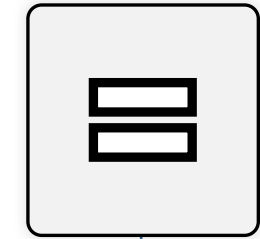
Production, Material Received



Subtractions from the material balance during the reporting period

Examples:

Decay, Material Shipped



The **ending balance** on the last day of the reporting period

When to Report



Facilities

Annually, for all facilities and additionally as directed by the DOE/NNSA or NRC.

As specified in facility attachments or TFA for DOE/NNSA facilities selected under the provisions of the U.S.-IAEA Safeguards Agreement.



Licensees

Licensees who possess less than 350 grams of SNM are required to report their physical inventory on the calendar year, reporting to NMMSS between January 1 and March 31 of each year

Licensees possessing 350 grams or more of SNM must report a physical inventory to NMMSS a minimum of once a year.

DOE/NRC Form 742: Material Balance Report

DOE/NRC FORM 742 (05-2021) MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-61	U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY MOMB: NO. 3150-0004 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 license process and fed back to industry. Send comments regarding burden estimate to the FOIA, Library, or Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; or by e-mail to infocollections@nrc.gov , and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0004). Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: ora_submission@omb.eop.gov . T. NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.
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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	

NRC FORM 742 (05-2021)

DOE/NRC FORM 742 <small>(05-2021)</small>				U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION	
<small>10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91</small>					
MATERIAL BALANCE REPORT (Continued)					
SECTION A (Continued)		MATERIAL ACCOUNTABILITY			
PC	SEQ		A. ELEMENT WEIGHT	B. ISOTOPE WEIGHT	
	54.	SHIPMENTS -- MISC			
	58.	DONATED MATERIAL -- TO U.S. GOVT BY OTHERS			
	59.	DONATED MATERIAL -- TO OTHERS BY U.S. GOVT			
	65.	ROUNDING ADJUSTMENT			
	71.	DEGRADATION TO OTHER MATERIALS a. ICT			
		b. ICT			
	72.	DECAY			
	73.	FISSION AND TRANSMUTATION			
	74.	NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS			
	75.	ACCIDENTAL LOSSES			
	76.	APPROVED WRITE-OFFS			
	77.	INVENTORY DIFFERENCE			
	80.	ENDING INVENTORY -- U.S. GOVT OWNED			
	81.	ENDING INVENTORY -- NOT U.S. GOVT OWNED			
	82.	TOTAL (Lines 41-81)			
	83.	BIAS ADJUSTMENT			
SECTION B		FOREIGN OBLIGATIONS			
PC	SEQ	1. COUNTRY OF OBLIGATION	2. ELEMENT WEIGHT	3. ISOTOPE WEIGHT	
4. TOTAL WEIGHT					
SECTION C		CERTIFICATION			
To the best of my knowledge and belief, the information given above and in any attached schedules is true, complete, and correct.					
SIGNATURE (See instructions for provisions on confidentiality)		TITLE		DATE	
WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL, AND/OR CRIMINAL PENALTIES. NRC REGULATION REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.					

DOE/NRC Form 742: Material Balance Report

Sections

Header Information

Section A

Material Accountability

Developed by: **LIN**
Tech

DOE/NRC FORM 742 (05-2021) MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30.40, 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 <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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to infocollections.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0004), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.</small>
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MATERIAL BALANCE REPORT

1. NAME AND ADDRESS <div style="height: 100px;"></div>	2. LICENSE NUMBER(S) <div style="height: 100px;"></div>	3. REPORTING IDENTIFICATION SYMBOL (RIS) <div style="height: 100px;"></div>				
	4. REPORT PERIOD (MM/DD/YYYY) <table style="width: 100%; border: none;"> <tr> <td style="border-bottom: 1px solid black; width: 50%;"></td> <td style="border-bottom: 1px solid black; width: 50%;"></td> </tr> <tr> <td style="font-size: small;">FROM</td> <td style="font-size: small;">TO</td> </tr> </table>			FROM	TO	5. MATERIAL TYPE (Submit separate report for each type)
FROM	TO					

SECTION A MATERIAL ACCOUNTABILITY

PC	SEQ	DESCRIPTION	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		

Sections

Section A

Material Accountability

Section B

Foreign Obligations

Section C

Certification

[illegible]

DOE/NRC Form 742: Material Balance Report

DOE/NRC FORM 742
(05-2021)
MANDATORY DATA
COLLECTION
AUTHORIZED BY
10 CFR 30, 40, 50, 70, 72,
74, 75, 150, Public Laws
83-703, 93-438, 95-91

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

MATERIAL BALANCE REPORT

APPROVED BY OMB: NO. 3150-0004

EXPIRES: 02/29/2024

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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0004), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oir_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

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)

Header
Information

Developed by:  LINK Technologies

NMMSS - Material Balance Reports (MBR) | 9

DOE/NRC Form 742: Material Balance Report

SECTION A		MATERIAL ACCOUNTABILITY	
PC	SEQ		
		8. BEGINNING INVENTORY -- U.S. GOV'T-OWNED	A. ELEMENT WEIGHT
		9. BEGINNING INVENTORY -- NOT U.S. GOV'T-OWNED	B. ISOTOPE WEIGHT
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:	
		34. RECEIPTS -- MISC	
		37. PROCUREMENT BY OTHERS	
		38. DONATED MATERIAL -- FROM U.S. GOV'T TO OTHERS	
		39. DONATED MATERIAL -- FROM OTHERS TO U.S. GOV'T	
		40. TOTAL (Lines 8-39)	

Section A
Receipts

DOE/NRC Form 742: Material Balance Report

DOE/NRC FORM 742
(05-2021)
MANDATORY DATA
COLLECTION
AUTHORIZED BY
10 CFR 32.42, 35.75, 75.75
24.75, 102, Public Law
92-705, 92-435, 92-91

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

APPROVED BY OMB: NO. 3150-0094
EXPIRES: 02/28/2024

Estimated burden per response to comply with this mandatory collection request: 5 hours for small businesses and 5 hours for large businesses. Reported burden is based on the following process and fed back to industry. Send comments regarding burden estimate to the OMB, Library, and Information Collection Branch (330-A100), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to informationcollection@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0094), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: omb-information@omb.eop.gov. The OMB may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

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)

6. DATE AND TIME

7. A. ELEMENT WEIGHT B. ISOTOPE WEIGHT

SECTION A

PC SEQ

8. BEGIN

9. BEGIN

10. RECEIPTS

11. PROCUREMENT FROM DOE RIS

12. FROM

13. PROCUREMENT -- FOR THE ACCOUNT OF DOE

14. DOD RETURNS -- USE A

Section A
Removals

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

NRC FORM 742 (05-2021)

Page 1

DOE/NRC FORM 742
(05-2021)
MANDATORY DATA
COLLECTION
AUTHORIZED BY
10 CFR 32.42, 35.75, 75.75
24.75, 102, Public Law
92-705, 92-435, 92-91

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

APPROVED BY OMB: NO. 3150-0094
EXPIRES: 02/28/2024

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MATERIAL BALANCE REPORT (Continued)

SECTION A (Continued)

MATERIAL ACCOUNTABILITY

PC SEQ

A. ELEMENT WEIGHT B. ISOTOPE WEIGHT

SECTION A (Continued)

MATERIAL ACCOUNTABILITY

PC SEQ

A. ELEMENT WEIGHT B. ISOTOPE WEIGHT

54. SHIPMENTS -- MISC

58. DONATED MATERIAL -- TO U.S. GOVT BY OTHERS

59. DONATED MATERIAL -- TO OTHERS BY U.S. GOVT

65. ROUNDING ADJUSTMENT

71. DEGRADATION TO OTHER MATERIALS a. ICT

b. ICT

72. DECAY

73. FISSION AND TRANSMUTATION

74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS

75. ACCIDENTAL LOSSES

76. APPROVED WRITE-OFFS

77. INVENTORY DIFFERENCE

80. ENDING INVENTORY -- U.S. GOVT OWNED

81. ENDING INVENTORY -- NOT U.S. GOVT OWNED

82. TOTAL (Lines 41-81)

83. BIAS ADJUSTMENT

Page 2

SECTION C

CERTIFICATION

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

SIGNATURE (See instructions for provisions on confidentiality) TITLE DATE

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

NRC FORM 742 (05-2021)

Page 3

DOE/NRC Form 742: Material Balance Report

DOE/NRC FORM 742
REV-2023
MANDATORY DATA
COLLECTION
AUTHORIZED BY:
10 CFR 90.40, 90.70, 92,
74, 76, 100, Public Laws
92-105, 95-435, 95-61

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

MATERIAL BALANCE REPORT

APPROVED BY CNRS NO. 3150-0084 EXPIRES: 6/30/2024

Estimated burden per response to comply with this mandatory collection request: 2 hours for small licensees and 6 hours for large licensees. Reported burdens listed are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FDA, Library, and Information Collection Branch (7-8-1006), U.S. Nuclear Regulatory Commission, Washington, DC 20545-0001, or by email to informationcollection@nrc.gov, and the OMB Review at: OMB Office of Information and Regulatory Affairs (3150-0047). Also: "Don't Ask Me" for the Nuclear Regulatory Commission, 325 17th Street NW, Washington, DC 20003; e-mail: info@nrc.nv.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or imposing the collection displays a correctly valid OMB control number.

DOE/NRC FORM 742
REV-2023
10 CFR 90.40, 90.70, 92,
74, 76, 100, Public Laws
92-105, 95-435, 95-61

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

MATERIAL BALANCE REPORT (Continued)

SECTION A (Continued)

PC SEQ

54 SHIPMENTS – MISC

55 DONATED MATERIAL – TO U.S. GOV'T BY OTHERS

56 ROUNDING ADJUSTMENT

MATERIAL ACCOUNTABILITY

A. ELEMENT WEIGHT B. ISOTOPE WEIGHT

SECTION B

FOREIGN OBLIGATIONS

SEQ

1. COUNTRY OF OBLIGATION

2. ELEMENT WEIGHT

3. ISOTOPE WEIGHT

4. TOTAL WEIGHT

57. PROCUREMENT BY OTHERS

58. DONATED MATERIAL – FROM OTHERS TO U.S. GOV'T

59. TOTAL (Lines 57-58)

REMOVALS

60. EXPENDED IN SPACE PROGRAMS

61. SALES TO U.S. GOV'T RIS TO:

TO:

62. SALES TO OTHERS FOR THE ACCOUNT OF U.S. GOV'T RIS TO:

TO:

63. DOD – USE A

64. DOD – USE B

65. DOD – OTHER USES

66. EXPENDED IN U.S. GOV'T TESTS

67. ROUTINE TESTS

68. SHIPPER – RECEIVER DIFFERENCE

SHIPMENTS REPORTED TO NRC/DGE ON NRC/DOE 741 (not listed elsewhere)

TO:

RIS

SIGNATURE (See instructions for procedure in performance) TITLE DATE

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

Section B

Foreign Obligations

NMSS Technologies

NMMSS - Material Balance Reports

DOE/NRC Form 742: Material Balance Report

DOE/NRC FORM 742
(05-2021)
MANDATORY DATA
COLLECTION
AUTHORIZED BY
10 CFR 32.45, 35.75, 75.75,
74.75, 102, Public Law
92-705, 92-435, 92-91

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

APPROVED BY OMB: NO. 3150-0004
EXPIRES: 02/28/2024

Estimated burden per response to comply with this mandatory collection request: 5 hours for small
business and 5 hours for large business. Reported burden is based on information in the following
process and fed back to industry. Send comments regarding burden estimate to the OMB, Library, and
Information Collection Branch (0304-0188), U.S. Nuclear Regulatory Commission, Washington, DC
20555-0001, or by email to informationcollection@nrc.gov and the OMB reviewer at: OMB Office of
Information and Regulatory Affairs, (3150-0004) OMB Desk Officer for the Nuclear Regulatory
Commission, 725 17th Street NW, Washington, DC 20503; email: omb-nrc@omb.eop.gov. The
NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information
unless it displays this notice. Send comments regarding this notice to omb-nrc@omb.eop.gov.

MATERIAL BALANCE REPORT

DOE/NRC FORM 742
(05-2021)
MANDATORY DATA
COLLECTION
AUTHORIZED BY
10 CFR 32.45, 35.75, 75.75,
74.75, 102, Public Law
92-705, 92-435, 92-91

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

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20555-0001, or by email to informationcollection@nrc.gov and the OMB reviewer at: OMB Office of
Information and Regulatory Affairs, (3150-0004) OMB Desk Officer for the Nuclear Regulatory
Commission, 725 17th Street NW, Washington, DC 20503; email: omb-nrc@omb.eop.gov. The
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MATERIAL BALANCE REPORT (Continued)

SECTION C

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TITLE

DATE

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NRC FORM 742 (05-2021)

Page 2

Section C
Certification



How to complete and submit a Material Balance Reports.

Topic

2

DOE/NRC Form 742: Material Balance Report

Fields to be Completed in the Header Section

The diagram shows the DOE/NRC Form 742 with four specific fields highlighted by blue boxes and labeled with callouts:

- Box 1:** Site Name (located in the '1. NAME AND ADDRESS' field)
- Box 3:** Reporting Identification Symbol (RIS) (located in the '3. REPORTING IDENTIFICATION SYMBOL (RIS)' field)
- Box 4:** Report Period (MM/DD/YYYY) From/To (located in the '4. REPORT PERIOD (MM/DD/YYYY)' field, which is split into 'FROM' and 'TO' sub-fields)
- Box 5:** Material Type (located in the '5. MATERIAL TYPE (Submit separate report for each type)' field)

Report Period (MM/DD/YYYY) From/To

Note: The from date for the reporting period must be the next consecutive date after the ending date of the previous report.



Reporting Units for DOE/NRC Form 742

Nuclear Material	Material Type	Units
Depleted Uranium	10	Whole Kilogram
Enriched Uranium	20	Whole Gram
Plutonium	50	Whole Gram
Uranium-233	70	Whole Gram
Normal Uranium	81	Whole Kilogram
Plutonium-238	83	Tenth of Gram
Thorium	88	Whole Kilogram
Uranium in Cascades	89	Whole Gram



Reporting Units for DOE/NRC Form 742

Enriched Uranium



Reporting of Enriched Uranium

E-1

Greater than **0.711%** but less than **5.00%**

E-2

5.00% or more, but less than **20.00%**

E-3

20.00% or more, but less than **80.00%**

E-4

80.00% or more



Reporting Units for DOE/NRC Form 742

Type	Nuclear Material	Dom. MT Code	Intl. MT Code	DOE	NRC	IAEA
Special	Uranium in Cascade	89		X	X	
	Enriched Uranium	20	EG	X	X	X
	Plutonium-242	40		X		
	Plutonium	50	P	X	X	X
	Uranium-233	70	EK	X	X	X
	Plutonium-238	83		X	X	
Source	Depleted Uranium	10	D	X	X	X
	Natural Uranium	81	N	X	X	X
	Thorium	88	T	X	X	X
Other	Americum-241	44		X		
	Americum-243	45		X		
	Curium	46		X		
	Californium-252	48		X		
	Enriched Lithium	60		X		
	Neptunium-237	82		X		
	Deuterium	86		X		
	Tritium	87		X		

DOE/NRC Form 742: Material Balance Report | Section A – Material Accountability

Line 8

Beginning Inventory
U.S. DOE-owned

Line 9

Beginning Inventory
Non DOE-owned

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: 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		

Lines 11-39

Receipts

Note: Additions to Inventory during the Reporting Period

Lines 41-77

Removals

Note: Reductions to inventory during the reporting period

Section A

Material Accountability

Section A (Continued)

MATERIAL ACCOUNTABILITY

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

Section B

FOREIGN OBLIGATIONS

PC	SEQ	1. COUNTRY OF OBLIGATION	2. ELEMENT WEIGHT	3. ISOTOPE WEIGHT
	Line 80			
	Line 81			

Section C

ENDING INVENTORY

PC	SEQ	ENDING INVENTORY
	Line 80	Ending Inventory DOE-owned
	Line 81	Ending Inventory Non DOE-owned

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

Material Balance Form Sections

Section A – Receipts

Type of Inventory Change/Use Codes	
Procurement from DOE	11
Procurement For Account of DOE	13
Production	21
From Other Materials	22
Receipts reported to DOE/NRC on Form 741	30
Receipts – Miscellaneous	34
Procurement from others	37
Donated material to others from DOE	38
Donated material to DOE from others	39

Material Balance Form Sections

Section A – Category Changes

NRC Use Codes	
DE	Depleted to enriched
DN	Depleted to normal
ED	Enriched to depleted
EE	Enriched to enriched
EN	Enriched to normal
EQ	Approved write offs
GA	Accidental gains
LA	Accidental losses

NRC Use Codes	
LD	Normal operation losses/measured discards
LN	Fission and transmutation
MF	Inventory difference
ND	Normal to depleted
NE	Normal to enriched
NP	Production
TN	Decay

- DE, DN, ED, EN, EE, NE, and ND – category change – the quantity of uranium which has changed category as a result of blending, enrichment, depletion, or burn up.

Material Balance Form Sections

Section A – Removals

Type of Inventory Change/Use Codes	
Expended in space programs	41
Sales to DOE	42
Sales to others for the account of DOE	43
Expended in DOE tests	47
Routing tests	48
Shipments reported to DOE/NRC on form 741	51
Shipments – miscellaneous	54
Shipment to 91C involving U ENR	55
Donated material to DOE by others	58

Type of Inventory Change/Use Codes	
Donated material to others by DOE	59
Rounding Bias	65
Degradation to other materials	71
Decay	72
Fission and transmutation	73
Normal operational losses/measured discards	74
Accidental losses	75
Approved write-offs	76
Inventory differences	77

- DE, DN, ED, EN, EE, NE, and ND – category change – the quantity of uranium which has changed category as a result of blending, enrichment, depletion, or burn up.

Material Balance Form Sections

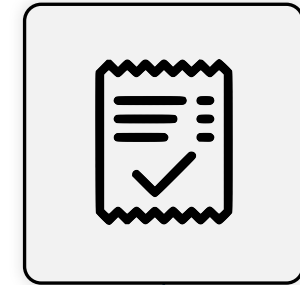
Section B – Foreign Obligations



On **October 1, 2003**, baseline obligation balances were established by agreement between each facility and DOE/NNSA.



These amounts were used to create the initial Foreign Obligation Report **Balances**.



Subsequent **receipts and removals** applied to the initial balances result in the cumulative balances shown at the time of reconciliation.

Material Balance Form Sections

Section B – Foreign Obligations

(Continued)

Section B Foreign Obligations

SECTION B		FOREIGN OBLIGATIONS			
PC	SEQ	1. COUNTRY OF OBLIGATION		2. ELEMENT WEIGHT	3. ISOTOPE WEIGHT
4. TOTAL WEIGHT					

For each "detail" line Complete the Following:

**Country
of Obligation***

Box
1

**Element
weight**

Box
2

**Isotope
weight**
(MT 20 and 70)

Box
3

List the Foreign
Obligations applied to
this Material Type



Facilities

Section B data is reconciled with
the NMMSS Obligation Summary
Report.



Facilities

Section B data is reconciled with
the NMMSS Negative Obligation
Balances Report.

Material Balance Form Sections

Section C – Certification

Section C Certification

SECTION C CERTIFICATION		
To the best of my knowledge and belief, the information given above and in any attached schedules is true, complete, and correct.		
SIGNATURE (See instructions for provisions on confidentiality)	TITLE	DATE
<p>WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL, AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.</p>		

NRC FORM 742 (05-2021) Page 2

Sign and **Date** to Signify Approval in this Section.

When submitting the form electronically, the “**Signature**” is implied by the submission.

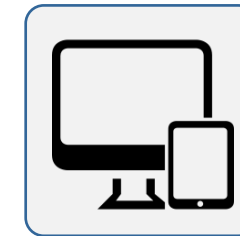
Letter that Accompanies CD

Signature on Email

Material Balance Report Submittal



Sites/Facilities should assess whether their forms contain **classified information** because the specific documentation and distribution instructions depend on whether the completed DOE/NRC Form 742 contains classified or unclassified information.

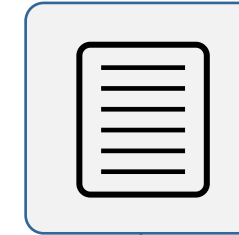


Computer-readable format is recommended for Submittal

Material Balance Report Submittal *(Continued)*



Do not send a copy of DOE/NRC Form 742 data to NMMSS if arrangements have been made to receive a NMMSS-generated MBR or if reporting electronically.



If DOE/NRC Form 742 is prepared in paper form, copies should be distributed to NMMSS and to other recipients, if any, in accordance with instructions provided by DOE/NNSA.

Validating Material Balance Data

Validation of Material Balance Data is part of the **NMMSS Daily Run Process**



The Validation Process is **Repeated** until **all Errors** are **Resolved**

Validating Material Balance Data *(Continued)*

Example Material Balance Validation Errors:

Invalid **RIS**

Invalid **Material Type Code**

- Both the element and isotope weights can not be 0
- Material balance category can not be blank
- The From Date must be one day after the last reported To Date
- The total amount of obligated material cannot exceed the ending material balance for the given material type
- The To Date must be greater than the From Date
- The isotope and element weights cannot be negative



Case Study

Topic

3

Case Study

1

NRC facility Acme Energy (**RIS YYO**) is preparing their material balance forms for the period: **6/16/2019** through **6/17/2020**. All material is non-DOE-owned. The facility has the following material at the beginning of the material balance period:

Type of Material	Element Weight	Isotope Weight
Depleted Uranium	145,667	911
Enriched Uranium (E1)	1,137,821,594	13,164,413
Enriched Uranium (E4)	52	47
Plutonium	16,985,562	11,796,428

Case Study

1

(Continued)

Acme Energy had the following material **additions** for the material balance period:

Type of Material	Category	Additional Information	Element Weight	Isotope Weight
Depleted Uranium	22. From Other Materials	ICT=ED	7,332	48
Enriched Uranium (E1)	30. Receipts Reported on Form DOE/NRC-741	RIS=YDD	72,428,676	3,143,163
Enriched Uranium (E4)	30. Receipts Reported on Form DOE/NRC-741	RIS=XYW	8	7
Plutonium	21. Production		506,564	316,620

Case Study

1

(Continued)

Acme Energy had the following material **reductions** for the material balance period:

Type of Material	Category	Additional Information	Element Weight	Isotope Weight
Depleted Uranium	65. Rounding Bias		-1	-1
Enriched Uranium (E1)	71. Degradation to Other Materials	ICT=ED	7,332,096	48,128
Enriched Uranium (E1)	73. Fission and Transmutation		2,918,173	1,531,449
Plutonium	65. Rounding Bias		1	1
Plutonium	72. Decay		62,034	62,034
Plutonium	73. Fission and Transmutation		91	91

Case Study

1

(Continued)

Acme Energy had the following **cumulative foreign obligation balances** as of the end of the material balance period:

Type of Material	Category	Element Weight	Isotope Weight
Depleted Uranium	85. Australia Obligations (31)	400	
Depleted Uranium	86. Canada Obligations (32)	35,000	
Enriched Uranium (E1)	85. Australia Obligations (31)	8,000,000	80,000
Enriched Uranium (E1)	86. Canada Obligations (32)	330,000,000	4,000,000
Plutonium	85. Australia Obligations (31)	79,000	
Plutonium	86. Canada Obligations (32)	3,500,000	

Prepare the material balance report (MBR), DOE/NRC Form 742, for Acme Energy.

Case Study

1A

Prepare MBR for Depleted Uranium. Enter MBR Header Information.

Depleted Uranium

DOE/NRC FORM 742 (05-2021) MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0004 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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov , and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0004), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov . The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.		EXPIRES: 02/29/2024	
MATERIAL BALANCE REPORT							
1. NAME AND ADDRESS				2. LICENSE NUMBER(S)		3. REPORTING IDENTIFICATION SYMBOL (RIS)	
						YYO	
				4. REPORT PERIOD (MM/DD/YYYY)		5. MATERIAL TYPE (Submit separate report for each type)	
				FROM 6/16/2019		TO 6/17/2020	
						10	

Box 3 Reporting Identification Symbol (RIS)

Box 4 Reporting Period (MM/DD/YYYY)

Box 5 Material Type

Case Study

1A

Enter MBR material accountability information: **Beginning Inventory** and **Additions**.

Depleted Uranium

Material Balance Category

Element and Isotope Weight

ICT or RIS

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	145667	911
		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 ED	7332	48
		b. ICT		
		c. ICT		
		30. RECEIPTS REPORTED TO DOE/NRC ON DOE/NRC 741 (not listed elsewhere)		
		FROM:		
		31. RECEIPTS MISC		

Case Study

1A

Enter MBR material accountability information: **Reductions, Ending Inventory** and **Foreign Obligations**.

Depleted Uranium

Material Balance Category

Element and Isotope Weight

DOE/NRC FORM 742 <small>(05-2021) 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91</small>		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION	
MATERIAL BALANCE REPORT (Continued)			
SECTION A (Continued)		MATERIAL ACCOUNTABILITY	
PC	SEQ		A. ELEMENT WEIGHT B. ISOTOPE WEIGHT
		54. SHIPMENTS -- MISC	
		58. DONATED MATERIAL -- TO U.S. GOV'T BY OTHERS	
		59. DONATED MATERIAL -- TO OTHERS BY U.S. GOV'T	
		65. ROUNDING ADJUSTMENT	-1 -1
		71. DEGRADATION TO OTHER MATERIALS a. ICT	
		b. ICT	
		72. DECAY	
		73. FISSION AND TRANSMUTATION	
		74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS	
		75. ACCIDENTAL LOSSES	
		76. APPROVED WRITE-OFFS	
		77. INVENTORY DIFFERENCE	
		80. ENDING INVENTORY -- U.S. GOV'T OWNED	
		81. ENDING INVENTORY -- NOT U.S. GOV'T OWNED	153000 960
		82. TOTAL (Lines 41-81)	
		83. BIAS ADJUSTMENT	
SECTION B		FOREIGN OBLIGATIONS	
PC	SEQ	1. COUNTRY OF OBLIGATION	2. ELEMENT WEIGHT 3. ISOTOPE WEIGHT
		85. Australia Obligations (31)	400
		86. Canada Obligations (32)	35,000

Case Study

1B

Prepare MBR for Enriched Uranium (E1). Enter MBR Header Information.

Enriched Uranium (E1)

DOE/NRC FORM 742 (05-2021) MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0004		EXPIRES: 02/29/2024			
MATERIAL BALANCE REPORT				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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov , and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0004), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov . The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.					
				1. NAME AND ADDRESS		2. LICENSE NUMBER(S)		3. REPORTING IDENTIFICATION SYMBOL (RIS)	
								YYO	
		4. REPORT PERIOD (MM/DD/YYYY)		5. MATERIAL TYPE (Submit separate report for each type)					
		FROM 6/16/2019		TO 6/17/2020		E1			

Box 3 Reporting Identification Symbol (RIS)

Box 4 Material Balance Period

Box 5 Material Type

Case Study

1B

Enter MBR material accountability information: **Beginning Inventory** and **Additions**.

Enriched Uranium (E1)

Material Balance Category

Element and Isotope Weight

ICT or RIS

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	1137821594	13164413
		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 YDD	72428676	3143163
		31. RECEIPTS MISC		

Case Study

1B

Enter MBR material accountability information: **Reductions, Ending Inventory and Foreign Obligations.**

Enriched Uranium (E1)

Material Balance Category

Element and Isotope Weight

ICT or RIS

DOE/NRC FORM 742
(05-2021)
10 CFR 30, 40, 50, 70, 72,
74, 75, 150, Public Laws
83-703, 93-438, 95-91

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

MATERIAL BALANCE REPORT (Continued)

SECTION A (Continued)		MATERIAL ACCOUNTABILITY	
PC	SEQ	A. ELEMENT WEIGHT	B. ISOTOPE WEIGHT
	54. SHIPMENTS -- MISC		
	58. DONATED MATERIAL -- TO U.S. GOVT BY OTHERS		
	59. DONATED MATERIAL -- TO OTHERS BY U.S. GOVT		
	65. ROUNDING ADJUSTMENT		
	71. DEGRADATION TO OTHER MATERIALS	a. ICT ED	7332096
		b. ICT	48128
	72. DECAY		
	73. FISSION AND TRANSMUTATION	2918174	1531448
	74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS		
	75. ACCIDENTAL LOSSES		
	76. APPROVED WRITE-OFFS		
	77. INVENTORY DIFFERENCE		
	80. ENDING INVENTORY -- U.S. GOVT OWNED		
	81. ENDING INVENTORY -- NOT U.S. GOVT OWNED	1200000000	14728000
	82. TOTAL (Lines 41-81)		
	83. BIAS ADJUSTMENT		

SECTION B

FOREIGN OBLIGATIONS

PC	SEQ	1. COUNTRY OF OBLIGATION	2. ELEMENT WEIGHT	3. ISOTOPE WEIGHT
	85.	Australia Obligations (31)	800000	80000
	86.	Canada Obligations (32)	3300000000	4000000

Case Study

1C

Prepare MBR for Enriched Uranium (E4). Enter MBR Header Information.

Enriched Uranium (E4)

DOE/NRC FORM 742 (05-2021) MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0004		EXPIRES: 02/29/2024	
MATERIAL BALANCE REPORT				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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov , and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0004), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov . The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.			
1. NAME AND ADDRESS				2. LICENSE NUMBER(S)		3. REPORTING IDENTIFICATION SYMBOL (RIS)	
						YYO	
				4. REPORT PERIOD (MM/DD/YYYY)		5. MATERIAL TYPE (Submit separate report for each type)	
				FROM 6/16/2019	TO 6/17/2020	E4	

Box 3 Reporting Identification Symbol (RIS)

Box 4 Material Balance Period

Box 5 Material Type

Case Study

1C

Enter MBR material accountability information: **Beginning Inventory** and **Additions**.

Enriched Uranium (E4)

Material Balance Category

Element and Isotope Weight

ICT or RIS

SECTION A		MATERIAL ACCOUNTABILITY	
PC	SEQ		
		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 XYW	
		31. RECEIPTS MISC	

Case Study

1C

Enter MBR material accountability information: **Reductions, Ending Inventory and Foreign Obligations.**

Enriched Uranium (E4)

Material Balance Category

Element and Isotope Weight

DOE/NRC FORM 742 <small>(05-2021) 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91</small>		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION	
MATERIAL BALANCE REPORT (Continued)			
SECTION A (Continued)		MATERIAL ACCOUNTABILITY	
PC	SEQ		A. ELEMENT WEIGHT B. ISOTOPE WEIGHT
		54. SHIPMENTS -- MISC	
		58. DONATED MATERIAL -- TO U.S. GOVT BY OTHERS	
		59. DONATED MATERIAL -- TO OTHERS BY U.S. GOVT	
		65. ROUNDING ADJUSTMENT	
		71. DEGRADATION TO OTHER MATERIALS a. ICT	
		b. ICT	
		72. DECAY	
		73. FISSION AND TRANSMUTATION	
		74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS	
		75. ACCIDENTAL LOSSES	
		76. APPROVED WRITE-OFFS	
		77. INVENTORY DIFFERENCE	
		80. ENDING INVENTORY -- U.S. GOVT OWNED	
		81. ENDING INVENTORY -- NOT U.S. GOVT OWNED	60 54
		82. TOTAL (Lines 41-81)	
		83. BIAS ADJUSTMENT	
SECTION B		FOREIGN OBLIGATIONS	
PC	SEQ	1. COUNTRY OF OBLIGATION	2. ELEMENT WEIGHT 3. ISOTOPE WEIGHT

Case Study

1D

Prepare MBR for Plutonium. Enter MBR Header Information.

Plutonium

DOE/NRC FORM 742 (05-2021) MANDATORY DATA COLLECTION AUTHORIZED BY 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION		APPROVED BY OMB: NO. 3150-0004 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, Library, and Information Collections Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov , and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0004), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov . The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.		EXPIRES: 02/29/2024	
MATERIAL BALANCE REPORT							
1. NAME AND ADDRESS				2. LICENSE NUMBER(S)		3. REPORTING IDENTIFICATION SYMBOL (RIS)	
						YYO	
				4. REPORT PERIOD (MM/DD/YYYY)		5. MATERIAL TYPE (Submit separate report for each type)	
				FROM 6/16/2019	TO 6/17/2020	50	

Box 3 Reporting Identification Symbol (RIS)

Box 4 Material Balance Period

Box 5 Material Type

Case Study

1D

Enter MBR material accountability information: **Beginning Inventory** and **Additions**.

Plutonium

Material Balance Category

Element and Isotope Weight

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	16985562	11796428
		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	506564	316620
		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		
		31. RECEIPTS MISC		

Case Study

1D

Enter MBR material accountability information: **Reductions, Ending Inventory** and **Foreign Obligations**.

Plutonium

Material Balance Category

Element and Isotope Weight

DOE/NRC FORM 742 <small>(05-2021) 10 CFR 30, 40, 50, 70, 72, 74, 75, 150, Public Laws 83-703, 93-438, 95-91</small>		U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION	
MATERIAL BALANCE REPORT (Continued)			
SECTION A (Continued)		MATERIAL ACCOUNTABILITY	
PC	SEQ		A. ELEMENT WEIGHT B. ISOTOPE WEIGHT
		54. SHIPMENTS -- MISC	
		58. DONATED MATERIAL -- TO U.S. GOVT BY OTHERS	
		59. DONATED MATERIAL -- TO OTHERS BY U.S. GOVT	
		65. ROUNDING ADJUSTMENT	1 1
		71. DEGRADATION TO OTHER MATERIALS a. ICT	
		b. ICT	
		72. DECAY	62034 62034
		73. FISSION AND TRANSMUTATION	91 91
		74. NORMAL OPERATIONAL LOSSES/MEASURED DISCARDS	
		75. ACCIDENTAL LOSSES	
		76. APPROVED WRITE-OFFS	
		77. INVENTORY DIFFERENCE	
		80. ENDING INVENTORY -- U.S. GOVT OWNED	
		81. ENDING INVENTORY -- NOT U.S. GOVT OWNED	17430000 12050922
		82. TOTAL (Lines 41-81)	
		83. BIAS ADJUSTMENT	
SECTION B		FOREIGN OBLIGATIONS	
PC	SEQ	1. COUNTRY OF OBLIGATION	2. ELEMENT WEIGHT 3. ISOTOPE WEIGHT
		85. Australia Obligations (31)	79000
		86. Canada Obligations (32)	3500000

Summary

1 What is a Material Balance Reports?

- Purpose
- Regulatory Framework
- DOE/NRC Form 742C

2 How to complete and submit a Material Balance Reports.

- Required MC&A Data
- Submittal Methods
- Quality Control and Validation process applied by NMMSS.

3 Case Study

- Power Reactor

Questions

