MATERIAL CONTROL AND ACCOUNTING OF SPECIAL NUCLEAR MATERIAL
May 2011—Preliminary Draft Rule Language

Subpart A—General Provisions

§ 74.2 Scope.

(a) * * * The general reporting and recordkeeping requirements of subpart B of this part also apply to licensees who possess spent nuclear fuel at independent spent fuel storage installations.

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§ 74.3 General performance objectives.

In addition to any other requirements in this part, each licensee who is authorized to possess or use special nuclear material (SNM) at a fixed site shall implement and maintain a material control and accounting program that enables the licensee to achieve the following general performance objectives in a timely manner:

(a) Maintain accurate, current, and reliable information on, and confirm the quantities and locations of SNM in its possession;

(b) Detect, respond to, and resolve any anomaly indicating a possible loss, theft, diversion, or misuse of SNM;

(c) Permit rapid determination of whether an actual loss, theft, diversion, or misuse of SNM has occurred;

(d) Provide information to aid in the investigation and recovery of missing SNM in the event of an actual loss, theft, diversion, or other misuse; and

(e) Control access to MC&A information that might assist adversaries to carry out acts of theft, diversion, misuse, or radiological sabotage involving SNM.

§ 74.4 Definitions.

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Accounting means a system which documents the quantities of special nuclear material held on current inventory by the licensee, and includes tracking of receipts, shipments, and measured discards; and transfers of special nuclear material into, out of, and within the controlled access area.

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Custodian means an individual authorized and qualified by the licensee who maintains the accounting system, and who is responsible for controlling the movement of all special nuclear material into, out of, and within the material balance area.

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Formula quantity means strategic special nuclear material in any combination in a quantity of 5,000 grams or more computed by the formula, grams = (grams contained U-235) + 2.5 (grams U-233 + grams plutonium). This class of material is also referred to as a Category I quantity of material as shown in Appendix A to this part.

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Item control area (ICA) means a designated administrative area within the controlled access area, in which special nuclear material is maintained in such a way that, at any time, a count of the items and the related material quantities can be obtained using the accounting system. Control of items moving into, out of, and within an ICA is by the identity of an item and its assigned material quantity.

Item control system means a system tracking the creation, identity, element and isotopic content, location, and disposition of all items, which enables the licensee to maintain current knowledge of each item.

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Material balance area (MBA) means a designated administrative area within the material access area, in which the control of special nuclear material is such that the quantity of material being moved into, out of, and within the MBA is an assigned value based on measurements of both the element content and the isotopic content.

Material control and accounting (MC&A) means a program to control and account for certain types of nuclear material used at a licensed facility, including special nuclear material and source material, and which controls and accounts for equipment capable of producing enriched uranium. The purpose of an MC&A program is to prevent and detect any loss, theft, diversion, or unauthorized production of nuclear material.

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Special nuclear material of low strategic significance means:

(1)(i) Less than an amount of special nuclear material of moderate strategic significance, but more than 15 grams of uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope) or 15 grams of uranium-233 or 15 grams of plutonium or the combination of 15 grams when computed by the equation, grams = grams contained U-235 + grams plutonium + grams U-233; or

(ii) Less than 10,000 grams but more than 1,000 grams of uranium-235 (contained in uranium enriched to 10 percent or more, but less than 20 percent in the U-235 isotope); or

(iii) 10,000 grams or more of uranium-235 contained in uranium enriched above natural, but less than 10 percent in the U-235 isotope.

(2) This class of material is also referred to as a Category III quantity of material as shown in Appendix A to this part.

Special nuclear material of moderate strategic significance means:

(1) (i) Less than a formula quantity of strategic special nuclear material but more than 1,000 grams of uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope) or more than 500 grams of uranium-233 or plutonium or in a combined quantity of more than 1,000 grams when computed by the equation, grams=(grams contained U-235)+2 (grams U-233+grams plutonium); or

(ii) 10,000 grams or more or uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope).

(2) This class of material is also referred to as a Category II quantity of material as shown in Appendix A to this part.

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Two-person rule means a requirement that at least two authorized and qualified persons be present whenever a task covered by the rule is performed. An authorized person under this rule is one who has been given authority to perform the task, and a qualified person is one who has sufficient knowledge to determine if the proper procedure is being followed, meets any formal qualification requirements established by the licensee for performing the task, and is capable of attesting to the accuracy of the task being performed. Such persons must maintain line of sight on each other and the task being performed, and must be able to verify both that the task was completed in accordance with the proper procedures, and that the information recorded about the task is accurate.

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Subpart B--General Reporting and Recordkeeping Requirements

§ 74.11 Reports of loss or theft or attempted theft or unauthorized production of special nuclear material.

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(b) Each licensee shall make the notifications required by paragraph (a) of this section to the NRC Headquarters Operations Center via any available telephone system to ensure that a report is received within one hour.

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§ 74.13 Material balance reports and physical inventory listing reports.

(a) All licensees who possess or who had possessed in the previous reporting period one gram or more of irradiated or non-irradiated special nuclear material are required to submit both a Material Balance Report and a Physical Inventory Listing Report of these materials to the Nuclear Materials Management and Safeguards System (NMMSS) in accordance with the instructions in paragraph (b) of this section and according to the following schedule:

(1) Commercial power reactor licensees, authorized under part 50 or part 52 of this chapter shall submit both reports within 60 calendar days of the start of the inventory covered by the reports;

(2) Research and test reactors, authorized under part 50 of this chapter shall submit both reports within 60 calendar days of the start of the inventory covered by the reports;

(3) Independent spent fuel storage installation (ISFSI) licensees, authorized under part 50 or part 72 of this chapter shall submit both reports within 60 calendar days of the start of the inventory covered by the reports.

(4) Licensees subject to § 74.31 shall submit both reports within 60 calendar days of the start of the inventory covered by the reports;

(5) Licensees operating uranium enrichment facilities shall submit both reports within 60 calendar days of the start of the inventory providing a total plant material balance as described in § 74.33(c)(4)(i).

(6) Licensees subject to subpart D of this part shall submit both reports within 60 calendar days of the start of the inventory covered by the reports;

(7) Licensees subject to subpart E of this part shall submit both reports within 30 calendar days of the start of the inventory covered by the reports;

(8) All other licensees who possess, or had possessed in the previous reporting period, one gram or more of irradiated or non-irradiated special nuclear material shall submit both reports between January 1 and March 31 of each year.

(b) Each licensee shall prepare and submit the reports described in paragraph (a) of this section as follows:

(1) Reports must be submitted for each Reporting Identification Symbol (RIS) account, including all holding accounts, concerning special nuclear material that the licensee has received, produced, possessed, transferred, consumed, disposed, or lost.

(2) Each licensee shall prepare and submit the reports described in this section as specified in the instructions in both NUREG/BR–0007 and NMMSS Report D–24 ‘‘Personal Computer Data Input for NRC Licensees.’’

(i) This prescribed computer-readable report replaces the DOE/NRC Form 742, Material Balance Report, and DOE/NRC Form 742C, Physical Inventory Listing Report, which have been previously submitted in paper form.

(ii) Copies of these instructions may be obtained from the U.S. Nuclear Regulatory Commission, Division of Fuel Cycle Safety and Safeguards, Washington, DC 20555–0001 or by e-mail to RidsNmssFcss.Resource@nrc.gov.

(c) The Commission may permit a licensee to submit the reports at other times for good cause. Such requests must be submitted in writing to Chief, Material Control and Accounting Branch, Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555. The licensee must continue to report as required until such request is granted.

(d) Any licensee who is required to submit routine Material Status Reports under § 75.35 of this chapter (pertaining to implementation of the US/IAEA Safeguards Agreement) shall prepare and submit these reports only as provided in that section (instead of as provided in paragraphs (a) through (b) of this section).

(e) Each licensee subject to the requirements of this section shall resolve any discrepancies identified during the report review and reconciliation process within 30 calendar days of notification of a discrepancy identified by NRC.

§ 74.15 Nuclear material transaction reports.

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(b) * * *

(2) Perform independent tests to assure the accurate identification and measurement of the material received, including its weight and enrichment; except that a licensee authorized under parts 50 or 52 of this chapter receiving unirradiated fuel rods or unirradiated fuel assemblies or a licensee authorized under part 70 of this chapter receiving special nuclear material contained in a sealed source that will not be opened need not perform such tests; and

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§74.19 Recordkeeping, written material control and accounting procedures, item controls, and physical inventories

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(b) Each licensee authorized to possess special nuclear material, at any one time and site location, in a quantity of 350 grams or more of contained uranium-235, uranium-233, or plutonium, or any combination thereof, shall:

(1) Establish, maintain, and follow written material control and accounting procedures that are sufficient to enable the licensee to account for the special nuclear material in its possession under the license;

(2) Retain these procedures until the Commission terminates the license that authorizes possession of the special nuclear material; and

(3) Retain any superseded portion of the procedures for 3 years after the portion is superseded.

(c) Licensees subject to the requirements of §§ 74.31, 74.33, 74.41, or 74.51 are exempt from the requirements of paragraphs (c)(1) through (3) of this section. Otherwise, each licensee who is authorized to possess, at any one time and site location, any quantity of contained uranium-235, uranium-233, or plutonium, or any combination thereof, shall:

(1) Establish, document, implement, and maintain an item control system as defined in § 74.4. Exempted from this requirement are items in solution with a concentration of less than 5 grams of uranium-235 per liter and items of waste destined for burial or incineration;

(2) Conduct a physical inventory of all special nuclear material in its possession under the license at intervals not to exceed 370 calendar days; and

(3) Retain the records associated with each physical inventory until the Commission terminates the license that authorized the possession of special nuclear material. The records of the physical inventories need not be submitted to the Commission.

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Subpart C--Special Nuclear Material of Low Strategic Significance

§ 74.31 Nuclear material control and accounting for special nuclear material of low strategic significance.

(a) *General performance objectives.* (1) Each licensee who is authorized to possess and use 350 grams or more of contained uranium-235 or special nuclear material of low strategic significance (as defined in § 74.4 and shown in Appendix A to this part) at any site or contiguous sites subject to control by the licensee is subject to the performance objective requirements stated in § 74.3.

(2) Production or utilization facilities licensed under part 50 or 52 of this chapter; independent spent fuel storage installations licensed under part 50 or 72 of this chapter; and any licensee operations involving waste disposal, are not subject to the requirements of subpart C of this part.

(b) *Implementation.* Each applicant for a license, and each licensee that, upon application for modification of its license, would become newly subject to paragraph (a) of this section shall submit for approval a material control and accounting (MC&A) plan describing how the performance objectives of § 74.3 and the requirements of paragraph (c) of this section will be met. The MC&A plan shall be implemented when a license is issued or modified to authorize the activities being addressed in paragraph (a) of this section, or by the date specified in a license condition.

(c) *Program capabilities.* To achieve the § 74.3 performance objectives, the MC&A plan must include the capabilities described in paragraphs (c)(1) through (11) of this section, and require the licensee to:

(1) Establish, document, and maintain a management structure which assures clear overall responsibility for material control and accounting functions, independence from production responsibilities, separation of key responsibilities, and adequate review and use of critical material control and accounting procedures;

(2) Establish and maintain a measurement system which assures that all quantities in the material accounting records are based on measured values;

(3) Follow a measurement control program which assures that measurement bias is estimated and significant biases are eliminated from inventory difference values of record;

(4) In each inventory period, control total material control and accounting measurement uncertainty so that twice its standard error of the inventory difference (SEID) is less than the

greater of 9,000 grams of U-235 or 0.25 percent of the active inventory, and assure that any measurement performed under contract is controlled so that the licensee can satisfy this requirement;

(5) Unless otherwise required to satisfy part 75 of this chapter, perform a physical inventory at intervals not to exceed 370 calendar days and, within 60 calendar days after the start of the inventory, reconcile and adjust the book inventory to the results of the physical inventory, and resolve, or report an inability to resolve, any inventory difference which is rejected by a statistical test which has a 90 percent power of detecting a discrepancy of a quantity of uranium-235 established by NRC on a site-specific basis;

(6) Establish, document, implement, and maintain an item control system as defined in § 74.4. Store and handle or subsequently measure items in a manner such that unauthorized removals of individual items or any quantity of material (as defined in § 74.4) from items will be detected. Exempted from this requirement are items in solution with a concentration of less than 5 grams of uranium-235 per liter and items of waste destined for burial or incineration;

(7) Conduct and document shipper-receiver difference comparisons for all SNM receipts, on a total shipment basis and on an individual batch basis when required by part 75 of this chapter, and ensure that any shipper-receiver difference that is statistically significant and exceeds twice the estimated standard deviation of the difference estimator and 500 grams of uranium-235 is investigated and resolved;

(8) Independently assess the effectiveness of the MC&A program at least every 24 months, and document management's action on prior assessment recommendations.

(9) Maintain and follow procedures for tamper-safing (as defined in § 74.4) of containers or vaults (as defined in § 74.4) containing SNM, which include control of access to, and distribution of, unused seals and records;

(10) Use the two-person rule (as defined in § 74.4) for tamper-safing, for any handling of nuclear materials, performing physical inventories, or for transferring nuclear materials; and

(11) .Designate material balance areas and item control areas and assign custodial responsibility for each of these areas in a manner that ensures that such responsibility can be effectively executed for all SNM possessed under license.

§ 74.33 Nuclear material control and accounting for uranium enrichment facilities authorized to produce special nuclear material of low strategic significance.

(a) *General performance objectives.* Each licensee who is authorized to possess equipment capable of enriching uranium or operate an enrichment facility, and produce, possess, or use 350 grams or more of contained uranium-235 or special nuclear material of low strategic significance (as defined in § 74.4 and shown in Appendix A to this part) at any site or contiguous sites, subject to control by the licensee, is subject to the performance objective requirements stated in § 74.3 and to the following performance objectives:

(1) Maintain accurate, current, and reliable information on, and confirm the quantities and locations of source material (SM) in its possession;

(2) Detect, respond to, and resolve any anomaly indicating a possible loss, theft, diversion, or misuse of SM;

(3) Permit rapid determination of whether an actual loss, theft, diversion, or misuse of SM has occurred;

(4) Provide information to aid in the investigation and recovery of missing SM in the event of an actual loss, theft, diversion, or other misuse; and

(5) Provide information to aid in the investigation of any unauthorized production of uranium, including unauthorized production of uranium enriched to 10% or more in the isotope U-235. (For centrifuge enrichment facilities, this requirement does not apply to each cascade during its start-up process, not to exceed the first 24 hours.)

(b) *Implementation*. Each applicant for a license who would, upon issuance of a license under any part of this chapter, be subject to the requirements of paragraph (a) of this section shall:

(1) Submit for approval a material control and accounting (MC&A) plan describing how the performance objectives of §§ 74.3 and 74.33(a), the program capabilities of § 74.33(c), and the recordkeeping requirements of § 74.33(d) will be met; and

(2) Implement the NRC-approved MC&A plan submitted under paragraph (b)(1) of this section prior to:

(i) The cumulative receipt of 5,000 grams of U-235 contained in any combination of natural, depleted, or enriched uranium; or

(ii) NRC's issuance of a license to test or operate the enrichment facility, whichever occurs first.

(c) *Program capabilities.* To achieve the general performance objectives stated and referenced in paragraph (a) of this section, the MC&A plan must include the capabilities described in paragraphs (c) (1) through (11) of this section. The licensee shall establish, document, implement and maintain:

(1) A management structure that ensures:

(i) Clear overall responsibility for MC&A functions;

(ii) Independence of MC&A management from production responsibilities;

(iii) Separation of key MC&A responsibilities from each other; and

(iv) Use of approved written MC&A procedures and periodic review of those procedures;

(2) A measurement program that ensures that all quantities of source material and special nuclear material in the accounting records are based on measured values;

(3) A measurement control program that ensures that:

(i) Measurement bias is estimated and minimized through the measurement control program, and any significant biases are eliminated from inventory difference values of record;

(ii) All MC&A measurement systems are controlled so that twice the standard error of the inventory difference (SEID), based on all measurement error contributions, is less than the greater of 5,000 grams of U-235 or 0.25 percent of the U-235 of the active inventory for each total plant material balance; and

(iii) Any measurements performed under contract are controlled so that the licensee can satisfy the requirements of paragraphs (c)(3) (i) and (ii) of this section;

(4) A physical inventory program that provides for:

(i) Performing, unless otherwise required to satisfy part 75 of this chapter, a dynamic (nonshutdown) physical inventory of in-process (e.g., in the enrichment equipment) uranium and U^{235} at least every 65 calendar days, and performing a static physical inventory of all other uranium and total U-235 contained in natural, depleted, and enriched uranium located outside of the enrichment processing equipment at least every 370 calendar days, with static physical inventories being conducted in conjunction with a dynamic physical inventory of in-process uranium and U-235 so as to provide a total plant material balance at least every 370 calendar days; and

(ii) Reconciling and adjusting the book inventory to the results of the static physical inventory and resolving, or reporting an inability to resolve, any inventory difference that is rejected by a statistical test which has a 90 percent power of detecting a discrepancy of a quantity of U-235, established by NRC on a site-specific basis, within 60 calendar days after the start of each static physical inventory;

(5) A detection program, independent of production, that provides high assurance of detecting and resolving:

(i) Production of uranium enriched to 10 percent or more in the U-235 isotope, to the extent that SNM of moderate strategic significance (as defined in § 74.4) could be produced within any 370 calendar day period;

(ii) Production of uranium enriched to 20 percent or more in the U-235 isotope; and

(iii) Unauthorized production of uranium of low strategic significance (as defined in § 74.4);

(6) An item control system (as defined in § 74.4). The system must ensure that items are stored and handled or subsequently measured in a manner such that unauthorized removal of any quantity of U-235, as individual items or as uranium contained in items, will be detected. Exempted from this requirement are items in solution with a concentration of less than 5 grams of uranium-235 per liter and items of waste destined for burial or incineration;

(7) A system for conducting and documenting shipper-receiver difference comparisons for all source material and special nuclear material receipts on a total shipment basis and on an individual batch basis when required by part 75 of this chapter to ensure that any shipper-receiver difference that is statistically significant and exceeds twice the estimated standard

deviation of the difference estimator and 500 grams of uranium-235 is investigated and resolved;

(8) An assessment program that:

(i) Independently assesses the effectiveness of the MC&A program at least every 24 months;

(ii) Documents the results of the above assessment;

(iii) Documents management's findings on whether the MC&A program is currently effective; and

(iv) Documents any actions taken on recommendations from prior assessments;

(9) Procedures for tamper-safing (as defined in § 74.4) of containers or vaults (as defined in § 74.4) containing SNM, which include control of access to, and distribution of, unused seals and records;

(10) The two-person rule (as defined in § 74.4) for tamper-safing, for any handling of nuclear materials, performing physical inventories, or for transferring nuclear materials; and

(11) Material balance areas, item control areas, and shall assign custodial responsibility for each of these areas in a manner that ensures that such responsibility can be effectively executed for all SM and SNM possessed under license.

(d) *Recordkeeping.*

(1) Each licensee shall establish records that will demonstrate that the performance objectives stated and referenced in paragraph (a) of this section and the program capabilities of paragraph (c) of this section have been met and maintain these records in an auditable form, available for inspection, for at least 3 years, unless a longer retention time is required by part 75 of this chapter.

(2) Records that must be maintained pursuant to this part may be the original or a reproduced copy or a microform if such reproduced copy or microform is duly authenticated by authorized personnel and the microform is capable of producing a clear and legible copy after storage for the period specified by Commission regulations. The record may also be stored in electronic media with the capability for producing, on demand, legible, accurate, and complete records during the required retention period. Records such as letters, drawings, and specifications must include all pertinent information such as stamps, initials, and signatures.

(3) The licensee shall maintain adequate safeguards against tampering with and loss of records.

Subpart D--Special Nuclear Material of Moderate Strategic Significance

§ 74.41 Nuclear material control and accounting for special nuclear material of moderate strategic significance.

(a) *General performance objectives.* (1) Each licensee who is authorized to possess and use special nuclear material of moderate strategic significance (as defined in §74.4 and shown in Appendix A of this part) or 1 kilogram or more of strategic special nuclear material (as defined in § 74.4 and shown in Appendix A to this part) in irradiated fuel reprocessing operations at any site or contiguous sites subject to control by the licensee, is subject to the performance objective requirements stated in § 74.3.

(2) Production or utilization facilities licensed under part 50 or 52 of this chapter; licensees using reactor irradiated fuels involved in research, development, and evaluation programs in facilities other than irradiated fuel reprocessing plants; and any licensee operations involving waste disposal, are not subject to the requirements of subpart D of this part.

(b) *Implementation.* Each applicant for a license, and each licensee that, upon application for modification of its license, would become newly subject to paragraph (a) of this section shall submit for approval a material control and accounting (MC&A) plan describing how the performance objectives of § 74.3 and the requirements of paragraph (c) of this section will be met. The MC&A plan shall be implemented when a license is issued or modified to authorize the activities being addressed in paragraph (a) of this section, or by the date specified in a license condition.

(c) *Program capabilities.* To achieve the § 74.3 performance objectives, the MC&A plan must include the capabilities described in §§ 74.43 and 74.45, and must incorporate checks and balances that are sufficient to detect falsification of data and reports that could conceal diversion of SNM by:

(1) A single individual, including an employee in any position; or

(2) Collusion between two individuals, one or both of whom have authorized access to SNM.

§ 74.43 Internal controls, inventory, and records.

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(b) * * *

(3) The licensee shall provide for the adequate review, approval, and use of written MC&A procedures that are identified in the approved MC&A plan as being critical to the effectiveness of the described system.

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(5) The licensee shall establish, document, implement, and maintain an item control system as defined in § 74.4. The system must ensure that items are stored and handled or subsequently measured in a manner such that unauthorized removals of individual items or any quantity of material (as defined in § 74.4) from items will be detected.

(6) Exempted from the requirements of paragraph (b)(5) of this section are items in solution with a concentration of less than 5 grams of U-235 per liter, and items of waste destined for burial or incineration.

(7) Conduct and document shipper-receiver difference comparisons for all SNM receipts,

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(c) * * *

(3) Maintain and follow procedures for tamper-safing (as defined in § 74.4) of containers or vaults (as defined in § 74.4) containing SNM which include control of access to, and distribution of, unused seals and records;

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(7) Conduct physical inventories of all possessed SNM for each plant at intervals not to exceed 270 calendar days; and * * *

(8) * * *

(iii) Investigate and report to the Director, Office of Nuclear Material Safety and Safeguards, any occurrence of SEID exceeding 0.125 percent of active inventory, and any occurrence of ID exceeding both three times SEID and 200 grams of plutonium or uranium-233 or 300 grams of uranium-235 contained in high enriched uranium, or 9000 grams of uranium-235 contained in low enriched uranium. The report shall include a statement of the probable reasons for the excessive inventory difference and the corrective actions taken or planned;

(9) Use the two-person rule (as defined in § 74.4) for tamper-safing (as defined in § 74.4), for any handling of nuclear materials, performing physical inventories, or for transfer of nuclear materials; and

(10) Designate material balance areas and item control areas, and assign custodial responsibility for each of these areas in a manner that ensures that such responsibility can be effectively executed for all SNM and SSNM possessed under license.

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§ 74.45 Measurements and measurement control.

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(c) * * *

(4) Establish and maintain a measurement control program so that for each inventory period the standard error of the inventory difference (SEID) is less than 0.125 percent of the active inventory, and assure that any MC&A measurements performed under contract are controlled so that the licensee can satisfy this requirement.

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Subpart E--Formula Quantities of Strategic Special Nuclear Material

§ 74.51 Nuclear material control and accounting for strategic special nuclear material.

(a) *General performance objectives.* (1) Each licensee who is authorized to possess and use five or more formula kilograms of strategic special nuclear material (SSNM) (as defined in § 74.4 and shown in Appendix A to this part) at any site or contiguous sites subject to control by the licensee, is subject to the performance objective requirements stated in § 74.3, and to the following performance objectives:

(i) Ongoing confirmation of the presence of SSNM in assigned locations;

(ii) Timely detection of the possible abrupt loss of five or more formula kilograms of SSNM from an individual unit process; and

(iii) Rapid determination of whether an actual loss of five or more formula kilograms of SSNM occurred.

(2) Production or utilization facilities licensed under part 50 or 52 of this chapter; independent spent fuel storage facilities licensed under part 50 or part 72 of this chapter; and any licensee operations involving waste disposal, are not subject to the requirements of subpart E of this part.

(b) *Implementation.* Each applicant for a license, and each licensee that, upon application for modification of its license, would become newly subject to paragraph (a) of this section shall submit for approval a material control and accounting (MC&A) plan describing how the performance objectives of § 74.3 and paragraph (a) of this section will be achieved, and how the requirements of paragraph (c) of this section will be met. The MC&A plan shall be implemented when a license is issued or modified to authorize the activities being addressed in paragraph (a) of this section, or by the date specified in a license condition.

(c) *Program capabilities.* To achieve the general performance objectives specified in § 74.3 and paragraph (a) of this section, the MC&A plan must provide the capabilities described in §§ 74.53, 74.55, 74.57 and 74.59 and must incorporate checks and balances that are sufficient to detect falsification of data and reports that could conceal diversion of SNM or SSNM by:

(1) A single individual, including an employee in any position; or

(2) Collusion between two individuals, one or both of whom have authorized access to SNM or SSNM.

(d) *Inventories.* Notwithstanding § 74.59(f)(1), licensees shall perform at least three physical inventories at intervals not to exceed 65 calendar days after implementation of the NRC-approved MC&A plan and shall continue to perform such inventories at intervals not to exceed 65 calendar days until performance acceptable to the NRC has been demonstrated and the Commission has issued formal approval to perform physical inventories at intervals not to exceed 180 calendar days. Licensees who have prior experience with process monitoring and/or can demonstrate acceptable performance against all MC&A plan commitments may request authorization to perform inventories at intervals not to exceed 180 calendar days at an earlier date.

§ 74.53 Process monitoring.

(a) Licensees subject to § 74.51 shall monitor internal transfers, storage, and processing of SSNM. The process monitoring must achieve the detection capabilities described in paragraph (b) of this section for all SSNM except:

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(3) SSNM with an estimated measurement standard deviation greater than five percent that is either input or output material associated with a unit that processes less than five formula kilograms over a period of 90 calendar days; and

(4) SSNM involved in research and development operations that process less than five formula kilograms during a period of 7 calendar days.

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(c) * * *

(1) Perform material balance tests on a lot or a batch basis, as appropriate, or at intervals not to exceed 30 calendar days, whichever is sooner, and investigate any difference greater than 200 grams of plutonium or U-233 or 300 grams of U-235 that exceeds three times the estimated standard error of the inventory difference estimator;

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§ 74.59 Quality assurance and accounting requirements.

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(e) * * *

(7) Investigate and take corrective action, as appropriate, to identify and reduce associated measurement biases when, for like material types (i.e., measured by the same measurement system), the net cumulative shipper/receiver differences accumulated over a period not to exceed 180 calendar days results in a value greater than one formula kilogram or 0.1 percent of the total amount received.

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(f) * * *

(1) Except as required by part 75 of this Chapter, perform a physical inventory at intervals not to exceed 180 calendar days and within 45 calendar days after the start of the ending inventory:

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(2) * * *

(i) Development of procedures for tamper-safing of containers or vaults containing SSNM not in process that include adequate controls to assure the validity of assigned SSNM values and which include control of access to, and distribution of, unused seals and records;

* * * * *

(h) * * *:

(2) * * *

(ii) Any scrap measured with a standard deviation greater than five percent of the measured amount is recovered so that the results are segregated by inventory period and recovered within 180 calendar days of the end of the inventory period in which the scrap was generated except where it can be demonstrated that the scrap measurement uncertainty will not cause noncompliance with § 74.59(e)(5).

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(5) Designate material balance areas and item control areas and assign custodial responsibility for each of these areas in a manner that ensures that such responsibility can be effectively executed for all SSNM possessed under license.

(6) Use the two-person rule (as defined in § 74.4) for tamper-safing (as defined in § 74.4), for any handling of nuclear materials, performing physical inventories, or for transferring nuclear materials.

Appendix A to Part 74—Categories of Special Nuclear Material

Notes:

1. Sealed sources as defined in § 74.4 are excluded from the quantities in the table.

2. Irradiated fuel which by virtue of its original fissile material content is included as Category I or II before irradiation is reduced one category level, during the period of time that the radiation level from the fuel exceeds 1 Sv per hour (100 rads per hour) at 1 meter, unshielded.

Material	Isotopic Composition	Category I (Subpart E)	Category II (Subpart D)	Category III (Subpart C)
Plutonium	All plutonium (element)	2,000 g or more	Less than 2,000 g, but more than 500 g	500 g or less, but more than 15 g
Uranium-233	All U-233 enrichments	2,000 g or more	Less than 2,000 g, but more than 500 g	500 g or less, but more than 15 g
Uranium-235	Uranium enriched to 20% or more in isotope U-235	5,000 g or more	Less than 5,000 g, but more than 1,000 g	1,000 g or less, but more than 15 g
	Uranium enriched to 10%, but less than 20%, in isotope U-235		10,000 g or more	Less than 10,000 g, but more than 1,000 g
	Uranium enriched above 0.711%, but less than 10%, in isotope U-235			10,000 g or more

The formulae to calculate a quantity of strategic special nuclear material (SSNM) as defined in § 74.4 are as follows:

- Category I, 5000 grams or more of SSNM
  - grams = grams contained U-235 + 2.5 (grams U-233 + grams Pu)

- Category II, less than 5000 grams but more than 1000 grams of SSNM
  - grams = grams contained U-235 + 2 (grams U-233 + grams Pu)

- Category III, less than 1000 grams but more than 15 grams of SSNM
  - grams = grams contained U-235 + grams U-233 + grams Pu

§ 72.72 Material control and accounting requirements for source material and special nuclear material.

(a) Each licensee shall follow the requirements of § 40.61 and § 40.64 of this chapter for source material.

(b) Each licensee shall follow the requirements of part 74 of this chapter for special nuclear material.

§ 72.74 Reports of accidental criticality.

(a) Each licensee shall notify the NRC Headquarters Operations Center within one hour of discovery of accidental criticality.

(b) Each licensee shall make the notifications required by paragraph (a) of this section to the NRC Headquarters Operations Center via any available telephone system. to ensure that a report is received within one hour.

(c) Reports required under § 73.71 of this chapter need not be duplicated under the requirements of this section.

§ 72.76 [Removed and Reserved]

§ 72.78 [Removed and Reserved]

§ 150.17 Submission to Commission of nuclear material status reports

(a) Except as specified in paragraph (d) of this section and § 150.17a, all licensees who possess or who had possessed in the previous reporting period one gram or more of irradiated or non-irradiated special nuclear material are required to submit both a Material Balance Report and a Physical Inventory Listing Report of these materials to the Nuclear Materials Management and Safeguards System (NMMSS) in accordance with the instructions in paragraph (b) of this section. Both reports shall be submitted between January 1 and March 31 of each year.

(1) Each licensee shall prepare and submit the reports described in this section as follows:

(i) Reports must be submitted for each Reporting Identification Symbol (RIS) account, including all special nuclear material that the licensee has received, produced, possessed, transferred, consumed, disposed, or lost.

(ii) Each licensee shall prepare and submit the reports described in this section as specified in the instructions in both NUREG/BR–0007 and NMMSS Report D–24 ‘‘Personal Computer Data Input for NRC Licensees.’’

(iii) This prescribed computer-readable report replaces the DOE/NRC Form 742 Material Balance Report and DOE/NRC Form 742C Physical Inventory Listing Report which have been previously submitted in paper form.

(iv) Copies of these instructions may be obtained from the U.S. Nuclear Regulatory Commission, Division of Fuel Cycle Safety and Safeguards, Washington, DC 20555–0001 or by e-mail to RidsNmssFcss.Resource@nrc.gov.

(2) The Commission may permit a licensee to submit the reports at other times for good cause. Such requests must be submitted in writing to Chief, Material Control and Accounting Branch, Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555. The licensee must continue to report as required until such request is granted.

(3) Any licensee who is required to submit routine Material Status Reports under § 75.35 of this chapter (pertaining to implementation of the US/IAEA Safeguards Agreement) shall prepare and submit these reports only as provided in that section (instead of as provided in paragraphs (a) through (b) of this section).

(4) Each licensee subject to the requirements of this section shall resolve any discrepancies identified during the report review and reconciliation process within 30 calendar days of notification of a discrepancy identified by NRC.