
Draft Regulatory Analysis for Proposed Rule: Amendments to Material Control and Accounting Regulations (10 CFR Part 74)

U.S. Nuclear Regulatory Commission

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Executive Summary

The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend the Title 10 of the *Code of Federal Regulations* (10 CFR) Part 74 material control and accounting (MC&A) regulations applicable to special nuclear material (SNM) and some source material. This rulemaking would consolidate the MC&A requirements currently in 10 CFR Part 72 for independent spent fuel storage installations (ISFSIs) in 10 CFR Part 74. Also, 10 CFR 150.17 (applicable to licensees located in Agreement States) would be changed to conform to 10 CFR 74.13. Part 74 of 10 CFR would also be revised to include a “two-person” rule to strengthen requirements for tamper-safing, performing physical inventories, transferring SNM, or any handling of SNM that is not under an active control measure or monitoring or surveillance condition. Other miscellaneous changes would also be made to 10 CFR Part 74 requirements for Category III, II, and I facilities respectively in Subparts C, D, and E. Plain language revisions would also be made to 10 CFR Part 74. Existing NUREG guidance documents would be revised to reflect these changes and a NUREG previously un-issued guidance document for Category II facilities would also be updated and included. References to due dates and reporting frequencies would be made more uniform by expressing such times in terms of calendar days. Section 74.4 would be amended by adding, removing, and modifying certain defined terms that are used throughout 10 CFR Part 74.

The regulatory analysis examines the benefits and costs of the proposed changes to the requirements for general performance objectives; recordkeeping and submitting reports; written MC&A procedures; completing physical inventories, item controls; tamper-safing operations; two-person rule for tamper-safing, performing physical inventories, handling nuclear materials, and for transferring nuclear materials; and designating material balance areas and item control areas and custodial responsibilities for these areas. The analysis makes the following key findings:

- **Total Cost to Industry.** The proposed rule would result in a total one-time cost to licensees of approximately \$646,000 followed by total annual costs of approximately \$1.1 million. The analysis estimates the total present value of these costs at \$8.1 million (using a 7-percent discount rate) and at \$9.7 million (using a 3-percent discount rate) over the 10-year analysis period.
- **Costs to the NRC.** The rule would result in a one-time cost to the NRC of approximately \$259,000, followed by no annual costs.

Decision Rationale. The NRC believes that the rule is cost-justified because the proposed regulatory initiatives would update, clarify, and strengthen the existing requirements, and thereby, promote the common defense and security.

Acronyms

ADAMS	Agencywide Documents Access and Management System
10 CFR	Title 10 of the <i>Code of Federal Regulations</i>
FNMC	Fundamental Nuclear Material Control
IAEA	International Atomic Energy Agency
NRC	U.S. Nuclear Regulatory Commission
SNM	Special Nuclear Material
ISFSI	Independent Spent Fuel Storage Installation
MC&A	Material Control and Accounting
NMMSS	Nuclear Materials Management and Safeguards System
NUREG	Nuclear Regulatory Publication

1. Introduction

The NRC is proposing to amend the 10 CFR Part 74 MC&A regulations applicable to SNM. This rulemaking would consolidate the MC&A requirements currently in 10 CFR Part 72 for ISFSIs in 10 CFR Part 74. Also, 10 CFR 150.17 (applicable to licensees located in Agreement States) would be changed to conform to 10 CFR 74.13. No substantive changes would be involved. References to due dates and reporting frequencies would be made more uniform by expressing such times in terms of calendar days. Section 74.4 would be amended by adding, removing, and modifying certain defined terms that are used throughout 10 CFR Part 74.

This analysis presents background material, rulemaking objectives, alternatives, and input assumptions, and it describes the consequences of the rule language and alternative approaches necessary to accomplish the regulatory objectives.

The remainder of this introduction is divided into two sections. Section 1.1 states the problem and the objective of the rulemaking. Section 1.2 provides background information.

1.1 Statement of the Problem and Objective of the Rulemaking

The Commission has directed the staff to revise and consolidate requirements for MC&A in 10 CFR Part 74. The MC&A requirements for an ISFSI that are currently located in 10 CFR Part 72 would be relocated in 10 CFR Part 74. In addition, 10 CFR Part 74 would be revised to make it clear what requirements apply to different types of facilities. The general provisions would be revised to include general performance objectives for the MC&A program that would apply to licensees authorized to possess SNM in a quantity greater than 350 grams. Some current exemptions in the regulations would be deleted or modified. Part 74 of 10 CFR would be revised to include definitions for some new terms and to clarify the definitions of some terms. Part 74 of 10 CFR would also be revised to include a “two-person” rule to strengthen requirements for tamper-safing, performing physical inventories, transferring SNM, or any handling of SNM that is not under an active control measure or monitoring or surveillance condition. Other miscellaneous changes would also be made to 10 CFR Part 74 requirements for Category III, II, and I facilities respectively in Subparts C, D, and E. Plain language revisions would also be made to 10 CFR Part 74. Existing NUREG guidance documents would be revised to reflect these changes and a NUREG guidance document for Category II facilities would be developed.

1.2 Background

Many of the current MC&A requirements were developed over 20 years ago and have been considered over the past several years during self-assessment and operating experience activities completed by the NRC. A more risk-informed and performance-based approach is being considered for the requirements in 10 CFR Part 74. The previous amendments to 10 CFR Part 74 consolidated the MC&A requirements from 10 CFR Part 70. All that remains to be moved are the requirements in 10 CFR Part 72 that apply to a licensee operating an ISFSI. There are reporting requirements for the Nuclear Materials Management and Safeguards System (NMMSS) that are located in 10 CFR Part 40 for source material. These requirements would not be moved as they are not applicable for SNM. There are also NMMSS reporting requirements in 10 CFR Part 150 that apply to Agreement State licensees. These requirements

would not be relocated to 10 CFR Part 74. This rulemaking would complete the relocation process by including ISFSIs in the scope of 10 CFR Part 74 and in the requirements for submitting material status reports and nuclear material transaction reports to the NRC via the NMMSS. Comporting changes would remove the requirements from 10 CFR Part 72 and refer to the MC&A requirements in 10 CFR Part 74. The proposed reporting requirements for a licensee under 10 CFR Part 72 would be essentially unchanged except that the requirements would be located in 10 CFR Part 74.

Currently there are no general performance objective requirements for NRC-licensed facilities which are authorized to possess more than 350 grams of SNM, but which are not Category I, II, or III facilities. This rulemaking would revise Subpart A of 10 CFR Part 74 to enlarge the set of NRC licensees who are subject to General Performance Objective (GPO) requirements.

This rulemaking would add defined terms to 10 CFR Part 74, modify some existing terms, and remove one defined term. Newly defined terms include: *accounting*, *custodian*, *item control system* and *item control area*, *material balance area*, *material control and accounting*, and *two person rule*. Modified terms include, *formula quantity*, *special nuclear material of moderate strategic significance*, and *special nuclear material of low strategic significance*. For these classes of materials, 10 CFR Part 74 would be revised to improve clarity of the requirements that apply to different types of facilities. These classes of materials would be designated respectively as a Category I quantity, a Category II quantity, and a Category III quantity. Also, a new appendix would be added to 10 CFR Part 74: Appendix A, Categories of Special Nuclear Material, that includes a table showing the quantities for each category, the reference corresponding to the subpart in 10 CFR Part 74 for each category, and formulae to calculate any combination of SNM in a quantity for a category. The term *Effective kilograms of special nuclear material* would be removed from 10 CFR Part 74 and the requirements would simply refer to gram quantities. *Effective kilograms of special nuclear material* would remain as a defined term in 10 CFR Parts 40, 70, 75, 76, and 110, to ensure the continued effective implementation of the US/International Atomic Energy Agency Safeguards Agreement.

Many of the references to due dates and reporting frequencies would be changed to calendar days, to make 10 CFR Part 74 more uniform in this regard. Using calendar days avoids the existing uncertainty over whether weekends and holidays are counted in determining whether or not a licensee has taken timely action.

A new item control requirement would be added to Subpart B of 10 CFR Part 74. Subparts C and D would be revised to remove some exemptions or modify requirements for item control of smaller quantities of SNM. Subparts C, D, and E would be revised to require at least two, qualified and authorized individuals to complete and observe certain operations and to require certain procedures to be established for tamper-safing containers or locations and to require designation of material balance areas or item control areas. Plain language revisions would clarify an MC&A program and various systems that comprise the MC&A program. The term, MC&A plan would replace the term, Fundamental Nuclear Material Control (FNMC) plan. Conforming changes would be completed for associated guidance documents that are used by licensees and the NRC and interested members of the public.

2. Identification and Preliminary Analysis of Alternative Approaches

The following sections describe the two regulatory options that the NRC is considering in order to meet the rulemaking objective identified in the previous section. Section 3 presents a detailed analysis.

2.1 Option 1: No Action

Under Option 1, the no-action alternative, the NRC would not amend the current regulations at 10 CFR Part 74. Current NRC regulations do not include GPO requirements for licensees authorized to possess more than 350 grams of SNM, but which are not Category I, II, or III facilities. Licensees under Subpart B are required to establish and follow written MC&A procedures but are not required to implement item controls. Licensees under Subparts C and D (Category III and II facilities, respectively) are now exempt from certain item controls involving kilogram amounts of SNM. There is no tamper-safing requirement in Subparts C or D and licensees under Subpart E (Category I facilities) are not required to control access to unused tamper seals or account for seals. Licensees under Subparts C, D, and E are not required to designate material balance areas, item control areas, or custodians for these areas. There is no direct requirement for the two-person rule. Any future irradiated fuel reprocessing plant would currently be exempt from the Subpart E requirements.

The licensees would continue to comply with existing regulations. They may choose to voluntarily implement these practices that have been encouraged within the industry for many years. There are currently no facilities that are licensed to operate under Subpart D of 10 CFR Part 74. The licensees operating under Subparts C and E have already implemented best practices which are similar to the proposed changes. Option 1 would avoid costs that the proposed rule would impose; however, the existing requirements would not be updated, clarified, or consolidated to improve security issues for facilities authorized to possess and use SNM that the NRC considers necessary to assure the common defense and security. Option 1, which is the no-action alternative, is the baseline for this regulatory analysis.

2.2 Option 2: Amend 10 CFR Part 74

The changes listed below are consistent with Option 2 to revise and consolidate MC&A requirements in 10 CFR Part 74.

- Relocate to 10 CFR Part 74 the NMMSS-related reporting requirements for ISFSIs that currently exist in 10 CFR Part 72. These requirements in 10 CFR Part 72 duplicate requirements in existing Subpart B of 10 CFR Part 74. In this regard, revisions are proposed to 10 CFR 72.72 and 72.74; 10 CFR 72.76 and 72.78 would be removed.
- Revise 10 CFR Part 74 to make it clear what requirements apply to different types of facilities because although the Subpart B general provisions apply to almost all facilities that are authorized to possess and use SNM, some licensees and NRC staff have expressed confusion as to what requirements apply to a particular facility. To address this matter, the staff proposes to modify the 10 CFR Part 74 definitions for *formula quantity*, *special nuclear material of moderate strategic significance*, and *SNM of low strategic significance* by conforming them to the existing definitions in 10 CFR Parts 70 and 73, which clarify these

classes of SNM respectively as Category I, II, and III quantities of strategic SNM. Licensees authorized to possess Category I material are subject to the requirements in 10 CFR Part 74, Subpart E, while licensees authorized to possess Category II or III material are subject to the requirements in Subpart D or C, respectively. To further clarify these divisions, the staff proposes to add Appendix A to 10 CFR Part 74 – a table listing the Category I, II, and III quantities of strategic SNM, and the formulae used to calculate these quantities.

- Include general performance objectives that would apply to licensees authorized to possess more than 350 grams of SNM but which are not licensees authorized to possess Category I, II, and III quantities of material. Examples of general performance objectives include the need to confirm the presence of SNM and to resolve indications of missing material. The general performance objectives that would apply to all NRC licensees authorized to possess SNM in a quantity greater than 350 grams are stated in proposed 10 CFR 74.3.
- Add item control requirements in proposed 10 CFR 74.19(c)(1) that would apply to licensees authorized to possess more than 350 grams of SNM but which are not Category I, II, and III quantities of material. Item control exemptions would be removed from 10 CFR 74.31(c)(6), 10 CFR 74.33(c)(6), and 10 CFR 74.43(b)(6).
- Move the exemptions for sealed sources in 10 CFR 74.31(a)(1) and 10 CFR 74.41(a)(1). These exemptions exclude sealed sources from being used in calculating whether or not a facility possesses SNM of low strategic significance or SNM of moderate strategic significance, respectively. To clarify this point, these exemptions would be moved to Appendix A.
- Remove the existing exemption in 10 CFR 74.51(a) for an irradiated fuel reprocessing plant.
- Include definitions for some new terms and to clarify the definitions of some terms. In this regard, the staff proposes to add defined terms for *accounting*, *custodian*, *item control area*, *item control system*, *material balance area*, *material control and accounting*, and *two-person rule*.
- Add requirements related to the two-person rule. Current requirements for checks and balances use the two-person rule concept for the MC&A program capabilities and for the quality assurance and accounting requirements in Subpart E at 10 CFR 74.51(b)(1) and 10 CFR 74.59 (b)(1) and (h)(3). The staff proposed to include the two-person rule in 10 CFR 74.31(c)(10), 74.33(c)(10), 74.43(c)(9), and 74.59(h)(6).
- Strengthen requirements related to tamper-indicating device programs. Having a tamper-safing program is already required in Subparts D and E at 10 CFR 74.43(c)(3) and 74.59(f)(2), respectively, and similar tamper-safing requirements would be added to Subpart C in proposed 10 CFR 74.31(c)(9) for fuel fabrication facilities using SNM of low strategic significance and 10 CFR 74.33(c)(9) for uranium enrichment facilities.

Other miscellaneous changes would be made, including plain language revisions. Such changes and revisions would replace the existing references to the FNMC Plan with references to an MC&A Plan. The staff's view is that FNMC is an outdated term and does not explicitly

refer to “accounting.” Thus, it does not fully describe the accounting aspects of the MC&A program.

The NUREG guidance documents listed below would be updated. A previously un-issued guidance document for a Category II facility would be updated and included with the guidance documents listed below.

1. NUREG-1280, Rev. 1 (1995), “Standard Format and Content Acceptance Criteria for the Material Control and Accounting (MC&A) Reform Amendment,”
2. NUREG-1065, Rev. 2 (1995), “Acceptable Standard Format and Content for the Fundamental Nuclear Material Control (FNMC) Plan Required for Low-Enriched Uranium Facilities,”
3. NUREG/CR-5734 (1991), “Recommendations to the NRC on Acceptable Standard Format and Content for the Fundamental Nuclear Material Control (FNMC) Plan Required for Low-Enriched Uranium Enrichment Facilities,”
4. NUREG/BR-0096(1992), “Instructions and Guidance for Completing Physical Inventory Summary Report.”

The NRC has estimated the benefits and costs of this option, as described in Sections 3 and 4 of this regulatory analysis, and has pursued Option 2 for the reasons discussed in Section 5.

3. Estimation and Evaluation of Values and Impacts

This section describes the analysis that the NRC conducted to identify and evaluate the benefits (values) and costs (impacts) of the two regulatory options. Section 3.1 identifies the attributes that the staff expects the proposed rulemaking to affect. Section 3.2 describes how the values and impacts have been analyzed. Finally, Section 3.3 presents the detailed results of the projected impacts.

3.1 Identification of Affected Attributes

This section identifies the factors within the public and private sectors that the final rule is expected to affect, using the list of potential attributes in Chapter 5 of NUREG/BR-0184, “Regulatory Analysis Technical Evaluation Handbook,” issued January 1997, and in Chapter 4 of NUREG/BR-0058, “Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission,” Revision 4, issued September 2004. The evaluation considered each attribute listed in Chapter 5 of NUREG/BR-0184. The basis for selecting those attributes is presented below.

Affected attributes include the following:

- Industry Implementation. The proposed changes would require certain licensees to implement general performance objectives, establish and follow written MC&A procedures, implement an item control system, implement a two-person rule for certain operations such as tamper-safing of containers or vaults, and designate material

balance areas and/or item control areas and custodial responsibilities for these areas. Certain items currently exempted from an item control program would be subject to item controls. An irradiated fuel reprocessing plant would no longer be exempted from the requirements for a Category I facility in 10 CFR Part 74, Subpart E.

- **NRC Implementation.** Under the proposed action, the NRC would develop the proposed rule package to be published by the Office of the *Federal Register* and prepare the final rule package that responds to comments from stakeholders and sets forth the final rule text for publication by the Office of the *Federal Register*. The NRC would revise guidance and inspection procedures to accommodate the requirements that would be added or modified by the rulemaking process.
- **Industry Operations.** The proposed changes to 10 CFR 74.19(c) would require reactor licensees and certain materials licensees to establish item control systems. Licensees would maintain the two-person rule by ensuring that individuals are qualified and authorized to perform and observe certain MC&A operations. Licensees would maintain material balance areas and/or item control areas and ensure custodial responsibilities are assigned to these areas. Certain items currently exempted from item control requirements would be tracked to maintain current knowledge of each item.
- **NRC Operations.** The proposed changes would include inspection and enforcement of requirements for certain licensees to adequately assure common defense and security of workers and members of the public from lost, missing, stolen, or diverted SNM. Inspectors would assess licensee implementation of the requirements noted above and operational activities noted above to maintain the MC&A program at licensee facilities. The NRC does not estimate any additional operating cost due to the proposed regulations because the routine inspection program is reviewed and updated at 3-year intervals and the proposed changes would be incorporated without increasing cost to the NRC to update procedures. The NRC inspection activities at a facility would include the proposed changes without increasing inspection effort.
- **Security Considerations.** The regulatory basis for 10 CFR Part 74 is security and the information and data and the activities to manage the information and data ensure that an adequate level of safety and security over SNM is maintained.

Attributes that the rulemaking options would *not* affect include the following: occupational health (routine), occupational health (accidents), public health (routine), public health (accidents), regulatory efficiency, environmental considerations, general public, improvements in knowledge, offsite property, onsite property, antitrust considerations, and other Government regulations.

3.2 Analytical Methodology

This section describes the methodology used to analyze the consequences associated with the proposed rule. The values (benefits) include any desirable changes in the affected attributes. The impacts (costs) include any undesirable changes in the affected attributes.

As described in Section 3.1, the attributes expected to be affected include the following:

- Industry implementation
- Industry operation
- NRC implementation
- NRC operations
- Safeguards and security considerations

This analysis relies on a qualitative evaluation of one of the affected attributes (safeguards and security considerations) due to the difficulty in quantifying the impact of the current rulemaking. This attribute would be affected by the regulatory options through the associated reduction in the risks of damage from malevolent use of SNM. Quantification would require estimation of factors such as: (1) the frequency of attempted theft or diversion, (2) the frequency with which theft or diversion attempts are (i.e., pre-rule) and will be (i.e., post-rule) successful, and (3) the impacts associated with successful theft or diversion attempts.

The NRC collected input assumptions using data and information from NRC workgroups and staff experience and NRC databases to estimate the costs associated with implementation and costs associated with annual operations of industry and the NRC.

In accordance with guidance from the Office of Management and Budget and NUREG/BR-0058, Revision 4, this regulatory analysis presents the results of the analysis using both 3-percent and 7-percent real discount rates. The NRC seeks public comments on the accuracy of these regulatory analysis assumptions and on the validity of the proposed rule's value and impact estimation methods.

3.2.1 Data and Assumptions

The analysis assumes that one-time implementation costs will be incurred in calendar year 2013. The analysis assumes that ongoing costs to revise and consolidate requirements for MC&A in 10 CFR Part 74 related to the proposed rule will begin in 2013 and will be modeled on an annual cost basis. The analysis calculated cost and savings over a 10-year time horizon with each year's costs or savings discounted back at a 7-percent and 3-percent discount rate in accordance with NUREG/BR-0058, Revision 4. Costs and savings are expressed in 2011 dollars.

Data/Affected Entities

The analysis assumes that licensees of the following existing facilities will be affected by this rule:

- Reactor facilities licensed under 10 CFR Part 50
- Industrial, academic, and research facilities licensed under 10 CFR Part 70
- Category III- Enrichment Facilities licensed under 10 CFR Part 70
- Category III- Fuel Fabrication Facilities licensed under 10 CFR Part 70
- Category I- Fuel Fabrication Facilities licensed under 10 CFR Part 70
- ISFSIs licensed under 10 CFR Part 72.

Applications for reactor facility licenses under 10 CFR Part 52 are pending. Any holders of Part 52 licenses would also be affected by this rule. Within the next 10 years, the NRC expects to receive and review an application for a medical isotope production facility. Such a facility, if licensed, would likely be a Category II facility that would be affected by this rule.

Other Data and Assumptions

The analysis makes the following other assumptions:

- The analysis assumes that the labor rate for the NRC staff is \$119 per hour.
- The analysis assumes a \$100 per hour labor rate for licensee nonsecurity-related personnel.
- The analysis assumes that the final rule will be published in December 2012 and would be effective in mid-2013.
- The analysis calculated cost over a 10-year timeframe with each year's costs or savings discounted back at a 7-percent and 3-percent discount rate, in accordance with NUREG/BR-0058, Revision 4.
- To the extent practical, quantitative information (e.g., costs and savings) and qualitative information (e.g., the nature and magnitude of impacts) on attributes affected by the rule were obtained from, or developed in consultation with, the NRC staff.

3.3 Detailed Results

This section presents a detailed estimate of the impacts for the proposed rulemaking (Option 2). Some values and impacts are addressed qualitatively for reasons discussed in Section 3.2. Exhibits 3-1 and 3-2 summarize these results.

Option 1: No Action

By definition, this option does not result in any values or impacts.

Option 2: Amend Regulations to Revise and Consolidate Requirements for MC&A of SNM in 10 CFR Part 74

Industry Implementation

Impact: Establish, Maintain Written MC&A Procedures

The proposed changes to 10 CFR 74.19(b)(1) would require each licensee authorized to possess SNM, at any one time and site location, in a quantity greater than 350 grams of contained uranium-235, uranium-233, or plutonium, or any combination thereof, to establish, maintain, and follow written MC&A procedures that are sufficient to enable the licensee to account for the SNM in its possession under the license. It is estimated by the NRC that the changes would not impact any additional licensees. The NRC staff compared the current

number of licensees subject to the current requirement with the number of licensees that would be subject to the proposed requirement which would reduce the threshold possession limit from one effective kilogram of SNM to a quantity greater than 350 grams of contained uranium-235, uranium-233, or plutonium, or any combination thereof and determined that no additional licensees would be affected by proposed 10 CFR 74.19(b)(1).

Impact: Item Control System

The proposed changes to 10 CFR 74.19(c)(1) would require each licensee authorized to possess SNM, at any one time and site location, in a quantity greater than 350 grams of contained uranium-235, uranium-233, or plutonium, or any combination thereof, to establish, document, implement, and maintain an item control system as defined in § 74.4. These item controls would be applicable to reactor licensees and to two materials facilities licensed by the NRC that are authorized to hold more than 350 grams of SNM, but which are not Category III, II, or I facilities. The reactor licensees have already implemented item controls (i.e., controlling and accounting for discrete items) and thus would not be impacted by the proposed requirement. The two materials facilities would be impacted by the proposed requirement. The staff estimated about 5 labor hours would be needed for each of the two material licensees to establish an item control system. The labor rate is \$100 per hour. The onetime cost per licensee would be \$500 and the total onetime cost to the industry would be \$1,000.

Impact: Item Control Exemptions for Category III and II Facilities

The proposed changes to 10 CFR 74.31(c)(6) would require each Category III fuel fabrication facility to include currently exempted items in their item control system. The currently exempted items that a licensee would be required to track include items that exist for 14 days or less and individual items containing less than 500 grams of uranium-235 up to a total of 50 kilograms of uranium-235. It is estimated by the NRC that the changes would impact the three licensees that are currently operating Category III fuel fabrication facilities. The implementation time would be 250 hours at \$100 per hour. The one-time cost per licensee would be \$25,000 and the total one-time cost to the industry would be \$75,000.

The proposed changes to 10 CFR 74.33(c)(6)(ii) would require each Category III enrichment facility to include currently exempted items in their item control system. The currently exempted items that a licensee would be required to track include items that exist for less than 14 days and individual items containing less than 500 grams uranium-235 up to a cumulative total of 50 kilograms of uranium-235. It is estimated by the NRC that the changes would impact two licensees that are operating enrichment facilities and two potential licensees that are constructing enrichment facilities that will be licensed to operate in the future. The implementation time would be 250 hours at \$100 per hour. The one-time cost per licensee would be \$25,000 and the total one-time cost to the industry would be \$100,000.

The proposed changes to 10 CFR 74.43(b)(6) would require any future Category II facility to include currently exempted items in their item control system. The currently exempted items include items that exist for less than 14 calendar days and individual items containing less than 200 grams of plutonium or uranium-233 or 300 grams or more of uranium-235 up to a total of one formula of kilogram of strategic SNM or 17 kilograms of uranium-235 contained in uranium enriched to 10.00 percent or more but less than 20.00 percent in the uranium-235 isotope. It is

estimated by the NRC that the changes would impact one potential licensee (e.g., a medical isotope production facility could be operating within 10 years) and the implementation time would be 250 hours at \$100 per hour. The total one-time cost to the licensee and the industry would be at \$25,000.

Impact: Two- Person Rule

The proposed changes to 10 CFR 74.31(c)(10) would require each Category III fuel fabrication licensee to use the two-person rule (as defined in § 74.4) for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. It is estimated by the NRC that the changes would impact the three licensees that are currently operating these Category III facilities. The implementation time would be 500 hours to train the workers. The one-time cost of training at \$100 per hour would be \$50,000 per licensee and the total one-time cost to the industry would be \$150,000.

The proposed changes to 10 CFR 74.33(c)(10) would require each uranium enrichment licensee to use the two-person rule (as defined in § 74.4) for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. It is estimated by the NRC that the changes would impact two licensees that are operating enrichment facilities and two potential licensees that are constructing enrichment facilities that will be licensed to operate within 10 years. The implementation time to train the workers would be 500 hours. The one-time cost at \$100 per hour would be \$50,000 per licensee and the total one-time cost to the industry would be \$200,000.

The proposed changes to 10 CFR 74.43(c)(9) would require any future Category II licensee to use the two-person rule (as defined in § 74.4) for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. It is estimated by the NRC that the changes would impact one potential licensee and the implementation time would be 500 hours to train the workers. The one-time cost to the licensee and the industry would be \$50,000.

The proposed changes to 10 CFR 74.59(h)(6) would require each Category I fuel cycle licensee to use the two-person rule (as defined in § 74.4) for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. It is estimated by the NRC that the changes would impact the two licensees that are currently operating the Category I facilities and the potential licensee that would operate the mixed oxide (MOX) facility. The implementation time would be 150 hours to train the workers. The training time would be less than a Category III or II facility because many operations in a Category I facility are already performed under a two-person rule concept that is similar to the proposed two-person rule. The one-time cost at \$100 per hour would be \$15,000 per licensee and the total one-time cost for the industry would be \$45,000.

NRC Implementation

Impact: Develop Rule Package and Revise Guidance Documents

The NRC staff would develop the rule package and revise guidance and inspection procedures to accommodate the requirements that would be added or modified by the rulemaking process. This is an estimated \$259,420 one-time cost to the NRC. This effort will require one-half of a full-time equivalent position (FTE) for participating in the rulemaking activities and one-half FTE to revise and update the guidance documents.

Industry Operation

Impact: Item Control System

The proposed changes to 10 CFR 74.19(c)(1) would require each licensee authorized to possess SNM, at any one time and site location, in a quantity greater than 350 grams of contained uranium-235, uranium-233, or plutonium, or any combination thereof, to establish, document, implement, and maintain an item control system as defined in § 74.4. The NRC estimated the proposed change to include item controls would be applicable to reactor licensees and to two materials facilities licensed by the NRC who are authorized to hold more than 350 grams of SNM, but which are not Category III, II, or I facilities. The reactor licensees have already implemented item control systems and would not be impacted by the proposed requirement. The two materials facilities would be impacted by the proposed requirement. Because the number of items they possess is small and the number of transactions for their inventory is also small and they do not currently have an item control system, the annual time to perform these actions would be 3 hours per materials licensee. The annual cost at \$100 per hour would be \$300 per licensee and the total annual cost to the industry would be \$600.

Impact: Item Control Exemptions for Category III and II Facilities

The proposed changes to 10 CFR 74.31(c)(6) would require each Category III fuel fabrication facility to include currently exempted items in their item control system. The currently exempted items that a licensee would be required to track include items that exist for 14 days or less and individual items containing less than 500 grams of uranium-235 up to a total of 50 kilograms of uranium-235. It is estimated by the NRC that the changes would impact these three licensees that are currently operating the Category III facilities. The annual time would be 100 hours. The annual cost at \$100 per hour would be \$10,000 per licensee and the total annual cost to the industry would be \$30,000.

The proposed changes to 10 CFR 74.33(c)(6)(ii) would require each Category III enrichment facility to include currently exempted items in their item control system. The currently exempted items that a licensee would be required to track include items that exist for less than 14 days and individual items containing less than 500 grams uranium-235 up to a cumulative total of 50 kilograms of uranium-235. It is estimated by the NRC that the changes would impact two licensees that are operating enrichment facilities and two potential licensees that are constructing enrichment facilities that will be licensed to operate in the future. The annual time would be 100 hours at \$100 per hour. The annual cost per licensee would be \$10,000 and the total annual cost to the industry would be \$40,000.

The proposed changes to 10 CFR 74.43(b)(6) would require any future Category II facility to include currently exempted items in their item control system. The currently exempted items include items that exist for less than 14 calendar days and individual items containing less than

200 grams of plutonium or uranium-233 or 300 grams or more of uranium-235 up to a total of one kilogram of strategic SNM or 17 kilograms of uranium-235 contained in uranium enriched to 10 percent or more but less than 20 percent in the uranium-235 isotope. It is estimated by the NRC that the changes would impact one potential licensee and the annual time would be 100 hours at \$100 per hour. The annual cost to the licensee and the industry would be \$10,000.

Impact: Two-Person Rule

The proposed changes to 10 CFR 74.31(c)(10) would require each Category III fuel fabrication licensee to use the two-person rule (as defined in § 74.4) for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. It is estimated by the NRC that the changes would impact the three licensees that are currently operating the Category III facilities. The annual time would be 1,500 labor hours each to assign at least two qualified and authorized individuals to prevent collusion and ensure that correct procedures are used, the operations are completed correctly, and that information about the operation is accurately documented. The annual cost at \$100 per hour would be \$150,000 per licensee and the total annual cost to the industry would be \$450,000.

The proposed changes to 10 CFR 74.33(c)(10) would require each uranium enrichment licensee to use the two-person rule (as defined in § 74.4) for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. It is estimated by the NRC that the changes would impact two licensees that are operating enrichment facilities and two potential licensees that are constructing enrichment facilities that will be licensed to operate within 10 years at 500 labor hours each to assign at least two qualified and authorized individuals to prevent collusion and ensure that correct procedures are used, the operations are completed correctly, and that information about the operation is accurately documented. The annual cost at \$100 per hour would be \$50,000 per licensee and the total annual cost to the industry would be \$200,000.

The proposed changes to 10 CFR 74.43(c)(9) would require any future Category II licensee to use the two-person rule (as defined in § 74.4) for tamper-safing operations, for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. The NRC estimates this will impact one potential licensee at 1,000 labor hours to assign at least two qualified and authorized individuals to prevent collusion and ensure that correct procedures are used, the operations are completed correctly, and that information about the operation is accurately documented. The annual cost at \$100 per hour would be \$100,000 for the licensee and the annual cost to the industry would be \$100,000.

The proposed changes to 10 CFR 74.59(h)(6) would require each Category I fuel cycle licensee to use the two-person rule (as defined in § 74.4) for tamper-safing operations, for conducting tamper-safing operations, physical inventories, transfer of SNM, and for any handling of SNM that is not under an active control measure or monitoring or surveillance condition. It is estimated by the NRC that the changes would impact the two licensees that are currently operating the Category I facilities and the potential licensee that would operate the MOX facility.

The annual time would be 750 labor hours for each licensee to assign at least two qualified and authorized individuals to prevent collusion and ensure that correct procedures are used, the operations are completed correctly, and that information about the operation is accurately documented. The annual cost at \$100 per hour would be \$75,000 per licensee and the total annual cost to the industry would be \$225,000.

Impact: Removal of exemption in 10 CFR 74.51(a) for an irradiated fuel reprocessing plant

This proposed change would impact no licensees, because there are currently no operating irradiated fuel reprocessing plants.

NRC Operation

Impact: The amount of NRC inspection effort would not change. Inspectors would evaluate licensee implementation of the changes within the scope of the routine inspection program elements. The inspection procedures would be updated within the normal review and revision cycle at 3-year intervals. The procedures were revised in December 2010 and would be reviewed and updated in 2013 which would coincide with the issuance of the final rule.

Exhibit 3-1
Quantitative Results
Total Present Value for the Cost

	One-Time Implementation Costs	Annual Operating Costs	Total Combined Implementation and Annual Cost for 10-year Period at 3% Discount Rate	Total Combined Implementation and Annual Cost for 10-year Period at 7% Discount Rate
Industry Costs	\$646,000	\$1,055,600	\$9,650,482	\$8,060,093
NRC Costs	\$259,420	\$0	\$259,420	\$259,420
Total	\$905,420	\$1,055,600	\$9,909,902	\$8,319,513

Exhibit 3-2
Detailed Quantitative Results: Licensee Costs

Citation	Description	Number of Licensees Affected	Labor Rate \$/hr	Annual Hours per Licensee	Annual Cost per Licensee	Total Annual Cost	One-Time Implementation Cost per Licensee	Total One-Time Implementation Cost
74.19(b)(1)	Written MC&A Procedures	0						
74.19(b)(2)	Recordkeeping	0						
74.19(b)(3)	Recordkeeping	0						
74.19(c)(1)	Item Control System	2	\$100	3	\$300	\$600	\$500	\$1,000
74.31(c)(6)	Item Control Exemptions	3	\$100	100	\$10,000	\$30,000	\$25,000	\$75,000
74.33(c)(6)(ii)	Item Control Exemptions	4	\$100	100	\$10,000	\$40,000	\$25,000	\$100,000
74.43(b)(6)	Item Control Exemptions	1	\$100	100	\$10,000	\$10,000	\$25,000	\$25,000
74.31(c)(10)	Two-Person Rule	3	\$100	1,500	\$150,000	\$450,000	\$50,000	\$150,000
74.33(c)(10)	Two-Person Rule	4	\$100	500	\$50,000	\$200,000	\$50,000	\$200,000
74.43(c)(9)	Two-Person Rule	1	\$100	1,000	\$100,000	\$100,000	\$50,000	\$50,000
74.59(h)(6)	Two-Person Rule	3	\$100	750	\$ 75,000	\$225,000	\$15,000	\$45,000
Total						\$1,055,600		\$646,000

4. Presentation of Results

4.1 Values and Impacts

This section summarizes the values (benefits) and impacts (costs) estimated for these regulatory options. (Section 3.3 presents a more detailed analysis.) To the extent that the affected attributes could be analyzed quantitatively, the net effect of each option has been calculated and is presented below. However, some values and impacts could be evaluated only on a qualitative basis.

The benefits of this proposed rule are associated with safeguards and security considerations and the decreased risk of a security-related event, such as theft, diversion, or radiological sabotage of SNM and subsequent use for malevolent purposes. The values and impacts of the proposed changes that are nonquantifiable would improve a licensee's capabilities to deter and detect any loss, theft, diversion, or misuse of SNM that could result in a malevolent event. The proposed changes would promote the common defense and security of SNM.

Exhibit 4-1 summarizes the results of the value-impact analysis. Relative to the no-action alternative (Option 1), Option 2 would result in a net quantitative impact estimation of approximately \$9,900,000 at a 3-percent discount rate and \$8,300,000 at a 7-percent discount rate.

Exhibit 4-1
Summary of Impacts at Discount Rates of 3 Percent and 10 Percent for a 10-Year Period

Attribute	One-time Implementation Costs	Annual Operating Costs	Total Combined Implementation and Annual Cost for 10-year Period at 3% Discount Rate	Total Combined Implementation and Annual Cost for 10-year Period at 7% Discount Rate
Industry Implementation	\$646,000		\$646,000	\$646,000
Industry Operation		\$1,055,600	\$9,004,482	\$7,414,093
Industry Total Costs			\$9,650,482	\$8,060,093
NRC Implementation	\$259,420		\$259,420	\$259,420
NRC Operation				
NRC Total Costs			\$259,420	\$259,420
Total	\$905,420	\$1,055,600	\$9,909,902	\$8,319,513

5. Decision Rationale

The changes in this rulemaking are intended to consolidate MC&A requirements in 10 CFR Part 74 and to clarify, revise, modify, and strengthen the existing requirements. The decision rationale is based on how the values and impacts have been analyzed. Relative to the no-action alternative, Option 2 would result in a net cost estimated at approximately \$8,300,000 assuming a 7-percent discount rate, or approximately \$9,900,000 assuming a 3-percent discount rate. Offsetting the net cost, the NRC believes that Option 2 would result in substantial non-quantifiable benefits related to safety and security. Although costs are incurred as a result of the rule, the qualitative benefits associated with the rule outweigh its cost. The NRC believes that the rule is cost-justified because the proposed regulatory initiatives would promote the common defense and security of SNM.

6. Implementation

The staff proposes to make the final rule effective 90 days after its publication in the FR. For this analysis, the final rule effective date is mid-2013.

7. References

- NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook, Final Report," U.S. Nuclear Regulatory Commission, Washington, DC, January 1997.
- NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Revision 4, U.S. Nuclear Regulatory Commission, Washington, DC, September 2004.
- SECY-08-0059, Rulemaking Plan: Part 74 - Material Control and Accounting of Special Nuclear Material, April 25, 2008.