

## **Draft Regulatory Analysis**

### **Proposed Rulemaking: Geologic Repository Operations Area Security and Material Control and Accounting Requirements (10 CFR Parts 60, 63, 73, and 74)**

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**U.S. Nuclear Regulatory Commission**  
Office of Federal and State Materials and Environmental Management Programs



## Table of Contents

1.	Introduction	1
1.1	Statement of the Problem and Reasons for the Rulemaking	1
1.2	Background	3
1.2.1	Current Regulations Governing GROA Security (10 CFR Part 73) and MC&A (10 CFR Part 74)	3
1.2.2	Commission Orders	4
1.3	Regulatory Objectives	5
2.	Identification and Preliminary Analysis of Alternative Approaches	5
2.1	Option 1: No Action	5
2.2	Option 2: Issue an Order to Enhance GROA Security and MC&A	5
2.3	Option 3: Amend Regulations to Enhance GROA Security and MC&A Operations	5
3.	Evaluation of Benefits and Costs	6
3.1	Identification of Affected Attributes	6
3.2	Analytical Methodology	7
3.2.1	Data	8
3.2.2	Assumptions	9
4.	Results	9
4.1	Benefits and Costs	9
5.	Decision Rationale	15
6.	Implementation	16
6.1	Schedule	16
6.2	Impacts on Other Requirements	16

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## **1. Introduction**

This document presents a draft regulatory analysis of proposed revisions to the geologic repository operations area (GROA) security and material control and accounting (MC&A) requirements as set forth by the U.S. Nuclear Regulatory Commission (NRC) in Title 10, Parts 73 and 74, of the Code of Federal Regulations, with conforming changes in Parts 60 and 63. This introduction is divided into three sections. Section 1.1 states the problem and the reasons for the proposed rulemaking, Section 1.2 provides background information on the rulemaking, and Section 1.3 discusses regulatory objectives related to adoption of the proposed revisions to the rule.

### **1.1 Statement of the Problem and Reasons for the Rulemaking**

On November 2, 2001 (66 FR 55732), NRC published its final rule governing disposal of high-level radioactive waste (HLW) in a potential geologic repository at Yucca Mountain in Nevada. The U.S. Department of Energy (DOE) must comply with these regulations for NRC to authorize construction and license operation of a potential repository at Yucca Mountain in Nevada. The security requirements applicable to a GROA were developed prior to September 11, 2001, under a previous and very different threat environment. Currently, there is no distinction between the security and MC&A requirements for independent spent fuel storage installations (ISFSIs) and the requirements for larger, more complicated geologic repositories for permanent disposal of HLW. At the time the security provisions were established, the NRC used the same regulatory approach for protecting a GROA as that for protecting spent nuclear fuel storage facilities licensed under 10 CFR Part 72. GROA operations, at least those conducted in surface facilities, seemed vulnerable to the same kinds of potential threats that were characteristic of the storage of spent nuclear fuel (SNF). The same level of protection was deemed sufficient to protect against acts that might be inimical to the common defense and security. The same reasoning applies to the MC&A requirements.

The NRC's regulatory approach was predicated on maintaining the physical integrity of the SNF rods. In the event the physical integrity of the SNF rods could not be maintained, the staff planned to address the additional security measures that would be necessary by incorporating conditions into the license.

Potential surface operations at a GROA have become more complex over the years. For example, DOE has indicated that it now plans to include SNF handling operations within a spent fuel pool to transfer SNF from a non-TAD (transfer, aging, disposal) canister to a TAD canister, which would then be utilized for emplacement and permanent disposal of the SNF in the Yucca Mountain repository.

Because both the threat environment and the plans for surface operations at a GROA have changed, the NRC now believes that a separate regulatory approach for protecting and safeguarding a GROA is necessary. DOE has not set forth a final concept of operations for the GROA. Therefore, it is not clear what types of facilities would be part of the surface operations or what type of handling of the HLW within the surface facilities may occur.

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While it is expected that the primary waste to be handled at a GROA is irradiated reactor fuel, it is possible that DOE may propose the storage of other types of radioactive waste. Therefore, the new security and MC&A requirements should be broad enough and sufficiently flexible to cover a range of possible types of non-HLW radioactive materials without the need for additional rulemaking. DOE, in its Final Environmental Impact Statement (FEIS) for a geologic repository at Yucca Mountain, considered the possibility that radioactive waste types other than SNF and HLW, such as Greater-Than-Class-C low-level radioactive waste (LLW) and Special-Performance-Assessment-Required LLW might be disposed of in a geologic repository. See Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, February 2002, Vol. II, A-1, A-57 - A-64. Disposal of such non-HLW could require new legislation or a determination by NRC that these wastes require permanent isolation. NRC is not making such a determination in this rulemaking. However, the security and MC&A requirements being proposed for a GROA take account of the possibility that the geologic repository might be used for the disposal of radioactive materials which are not SNF or HLW.

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## 1.2 Background

### 1.2.1 Current Regulations Governing GROA Security (10 CFR Part 73) and MC&A (10 CFR Part 74)

NRC's regulatory requirements for MC&A for a GROA are contained in 10 CFR Part 72. MC&A requirements for the majority of facilities are contained in 10 CFR Part 74. Requirements vary depending on the type and quantity of special nuclear material (SNM) possessed by a facility. The MC&A requirements for a GROA focus on inventory, record, and reporting requirements.

In §§ 72.72, 72.74, 72.76, and 72.78, the regulation establishes minimal records and reports-oriented requirements addressing the following aspects of an MC&A program:

- Recordkeeping showing receipt, inventory, disposal, acquisition, and transfer of SNM;
- Physical inventory frequency;
- Procedures;
- Material status reports;
- Nuclear material transfer reports; and
- Reporting loss of SNM

There is no requirement to develop an MC&A plan or to submit the plan for NRC approval. Section 63.21(b)(4) only requires submittal of a description of the MC&A program.

NRC's regulatory requirements for physical protection are contained in 10 CFR Part 73. Part 73 distinguishes between requirements applicable to power reactors and to special nuclear material at fixed sites and in transit. Requirements for fixed sites vary depending on the type of site and the relevant "design basis threat" (DBT) as described in § 73.1(a). The physical protection requirements for a GROA are contained in § 73.51 and focus on general performance capabilities.

To protect a GROA, the requirements in § 73.51 begin by establishing the following general performance objective (§ 73.51(b)):

Each licensee subject to this section shall establish and maintain a physical protection system with the objective of providing high assurance that activities involving spent nuclear fuel and high level radioactive waste do not constitute an unreasonable risk to public health and safety.

In §§ 73.51(b) and (d), the regulation establishes general requirements addressing the following aspects of a GROA physical protection system:

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- Physical security organizations,
- Physical barriers,
- Access requirements,
- Detection systems, and
- Communications.

As currently worded in § 63.21(b)(3), there is some uncertainty over whether there is a need to submit the security plan for NRC review and approval. In the same paragraph, a description is asked for and then goes on to state what the plan should contain. However, NRC staff's view is that only a description of the detailed security measures is required to be submitted with the application under Part 63.

### **1.2.2 Commission Orders**

Following the terrorist attacks on September 11, 2001, the NRC conducted a thorough review of security to ensure that the protection of SNM at fixed sites and in transit continued to have effective security measures in place given the changing threat environment. Through a series of security orders issued to certain licensees, the Commission specified changes to the DBT, enhanced requirements for specific training, access authorization, defensive strategies, and security. Through generic communications, the Commission also specified expectations about enhanced notifications to the NRC for certain security events or suspicious activities. In general, the enhancements resulted in some NRC licensees having to revise their physical security plans, security personnel training and qualification plans, and safeguards contingency plans, to defend against the supplemental DBT requirements. These security orders specifically required some licensees to: (1) increase patrols, (2) augment the security force capabilities and security posts, (3) add and modify existing physical security barriers, (4) move vehicle check points to a greater standoff distance, (5) enhance coordination with local law enforcement agency and military authorities, (6) augment their security and emergency response training, equipment and communications, and (7) strengthen off-site access controls including additional background and screening checks of employees. These enhancements have not been previously addressed for possible inclusion in the security requirements for a GROA.

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### **1.3 Regulatory Objectives**

The goal of this rulemaking is to ensure that effective security measures are in place for the protection of HLW and other radioactive materials at a GROA given the post-September 11, 2001, threat environment. Also, requirements for specific training enhancements, improved access authorization, and enhancements to defensive strategies would be incorporated. The proposed rule would also establish general performance objectives and corresponding systems capabilities for the GROA MC&A program, with a focus on strengthening, streamlining, and consolidating into 10 CFR Part 74 all MC&A regulations specific to GROA.

## **2. Identification and Preliminary Analysis of Alternative Approaches**

This section presents preliminary analysis of the alternatives that the staff considered to meet the regulatory goals identified in the previous section. (Section 4 presents a more detailed analysis of the proposed rule option.) The staff considered two alternatives for revising Part 73's GROA security provisions as discussed below.

### **2.1 Option 1: No Action**

Under Option 1, the no-action alternative, NRC would not amend the current regulations regarding GROA security and MC&A. DOE would comply with the current regulations. This option would avoid certain costs that the proposed rule would impose. However, taking no action would not improve security and MC&A measures.

### **2.2 Option 2: Issue an Order to Enhance GROA Security and MC&A**

Under Option 2, NRC would issue an order to DOE upon issuance of a construction authorization. The order would contain the same requirements as the proposed rule plus some requirements that are considered safeguards information. This option would avoid certain costs that the proposed rule would impose, however, issuance of an order would not involve public participation. In addition, issuance of an order would not inform the public of the requirements the NRC is using because the security requirements contained in orders are typically considered to be safeguards information.

### **2.3 Option 3: Amend Regulations to Enhance GROA Security and MC&A Operations**

Under Option 3, NRC would conduct a rulemaking to address changes in several sections of 10 CFR Parts 73 and 74, with additional changes to Parts 60 and 63, to enhance security and MC&A operations at a GROA. A rulemaking provides the benefits of public notice and comment on the proposed requirements. These changes entail: (1) adding §§ 73.53, 73.56a, and 73.71a; (2) revising §§ 73.2, 73.50, 73.51, 73.57, 73.70, Appendix B, Appendix C, and Appendix G to Part 73; (3) adding Subpart F to Part 74; (4) revising §§ 60.21, 60.24, 60.78, 63.21, 63.24, 63.78, and 63.161; and (4) revising §§ 74.1, 74.2, 74.13, 74.17, and 74.19.

A comprehensive rulemaking would provide a means of addressing the identified issues and

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concerns with respect to Parts 73 and 74. Through a comprehensive revision, the NRC could (1) establish enhanced security requirements for a GROA and (2) establish enhanced MC&A requirements for a GROA.

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 3 for the reasons discussed in Section 5.

### **3. Evaluation of Benefits and Costs**

This section examines the benefits (values) and costs (impacts or burdens) expected to result from this rulemaking, and is presented in two subsections. Section 3.1 identifies attributes that are expected to be affected by the rulemaking. Section 3.2 describes how benefits and costs have been analyzed.

#### **3.1 Identification of Affected Attributes**

This section identifies the factors within the public and private sectors that the regulatory alternatives (discussed in Section 2) are expected to affect. These factors are classified as "attributes" using the list of potential attributes provided by NRC in Chapter 5 of its *Regulatory Analysis Technical Evaluation Handbook*.<sup>1</sup> Affected attributes include the following:

- **Safeguards and Security Considerations** – The proposed actions are intended to establish requirements that would provide high assurance that activities involving HLW and other radioactive materials at a GROA are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.
- **Industry Implementation** – The proposed action would modify the security and MC&A requirements for a GROA. DOE, as the potential licensee of a GROA, would have to prepare a Physical Security Plan, Safeguards Contingency Plan, Training and Qualification Plan, and MC&A Plan, among other implementation activities.
- **Industry Operation** – The proposed action would require DOE to conduct security activities beyond those currently required. For example, DOE would need to provide on-the-job training for security personnel, including an additional 40 hours of on-the-job-training for personnel involved with contingency response.

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<sup>1</sup> *Regulatory Analysis Technical Evaluation Handbook, Final Report*, NUREG/BR-0184, Office of Nuclear Regulatory Research, January 1997.

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- NRC Implementation – Under the proposed action, NRC would develop or revise guidance and review the DOE MC&A and security plans based on the new requirements.
- NRC Operation – The proposed action would require the NRC Operations Center to answer calls from DOE when it discovers an imminent or actual threat against the facility, and to answer calls regarding suspicious activity and tampering.
- Regulatory Efficiency – The proposed action would result in enhanced regulatory efficiency through regulatory and compliance improvements.
- Public Health (Accident) – The proposed action would reduce the risk that public health would be affected by radiological releases resulting from radiological sabotage.
- Occupational Health (Accident) – The proposed action would reduce the risk that occupational health would be affected by radiological releases resulting from radiological sabotage.
- Off-Site Property – The proposed action would reduce the risk that off-site property would be affected by radiological releases resulting from radiological sabotage.
- On-Site Property – The proposed action would reduce the risk that on-site property would be affected by radiological releases resulting from radiological sabotage.

Attributes that are *not* expected to be affected under any of the rulemaking options include the following: occupational health (routine); public health (routine); environmental considerations; other government; general public; improvements in knowledge; and antitrust considerations.

### **3.2 Analytical Methodology**

This section describes the process used to evaluate benefits and costs associated with the various regulatory options. The *benefits* (values) of the rule include any desirable changes in affected attributes (e.g., monetary savings, improved safety resulting from new requirements) while the *costs* (impacts or burdens) include any undesirable changes in affected attributes (e.g., monetary costs, increased exposures). As described in Section 3.1, the attributes expected to be affected include Safeguards and Security Considerations, Industry Implementation, Industry Operation, NRC Implementation, NRC Operation, Regulatory Efficiency, Public Health (Accident), Occupational Health (Accident), Offsite Property, and Onsite Property.

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Ideally, a benefit-cost analysis quantifies the overall benefits and costs of the regulatory options relative to each of these attributes. This analysis relies on a qualitative evaluation of several of the affected attributes (safeguards and security considerations, public health, occupational health, offsite property, and onsite property) due to the difficulty in quantifying the impact of the current rulemaking.<sup>2</sup> These attributes would be affected by the regulatory options through the associated reduction in the risks of radiological sabotage damage to the high-level radioactive waste. Quantification of any of these attributes would require estimation of factors such as (1) the frequency of attempted radiological sabotage, (2) the frequency with which radiological sabotage attempts are (i.e., pre-rule) and will be (i.e., post-rule) successful, and (3) the impacts associated with successful radiological sabotage attempts.

The remaining attributes (industry implementation, industry operation, NRC implementation, NRC operation) are evaluated quantitatively. Quantitative analysis requires a baseline characterization of the universe, typically including factors such as the number of licensees affected, the nature of the security activities currently being conducted, and the types of new or modified systems and procedures that licensees would implement, or would no longer implement, as a result of the rule. DOE may respond to the rule in different ways depending on its final concept of operations and its approach toward meeting performance-based criteria. Because DOE has not finalized its concept of operations, it is not possible to know exactly what facilities and materials would be at a GROA. Nevertheless, the analysis proceeds quantitatively for these attributes by making generalizing assumptions (see Section 3.2.2).

### 3.2.1 Data

To the extent practical, quantitative information (e.g., costs and savings) and qualitative information (e.g., the nature and magnitude of safeguards and security impacts) on attributes affected by the rule has been obtained from, or developed in consultation with, NRC staff. In some cases the staff used costs that were estimated for power reactors. NRC staff discussed its understanding of the potential differences between the proposed new requirements and the current requirements and has incorporated available, non-safeguards, information into this draft regulatory analysis. The NRC is seeking additional insights from stakeholders on implementing costs and related issues. Additionally, in developing the final rule the NRC will consider the need for flexibility by the NRC in implementing a final rule, so as to not impose an unreasonable burden on DOE.

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<sup>2</sup> The regulatory efficiency attribute also is evaluated qualitatively, by definition. See NRC's *Regulatory Analysis Technical Evaluation Handbook*, Section 5.5.14.

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### **3.2.2 Assumptions**

The analysis assumes the rule would become effective in December 2008, and that one-time implementation costs are incurred in 2010 or 2016, depending on the specific cost. Ongoing costs of operation are assumed to begin in 2017, and are modeled on an annual cost basis. The analysis calculated the operating life for a GROA as 30 years. Therefore, costs and savings are estimated for a GROA over a 30 year period, with each year's costs or savings discounted back at a 7-percent and 3-percent discount rate, in accordance with NUREG/BR-0058, Rev. 4, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission." (See Section 4.1 for these results.) Costs and savings are expressed in 2007 dollars.

## **4. Results**

This section presents the analytical results. Section 4.1 presents findings on the overall benefits and costs of the proposed rule under the main analysis.

### **4.1 Benefits and Costs**

This section summarizes the values (benefits) and impacts (costs) estimated for the regulatory options. 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 results of the value-impact analysis are summarized in Exhibits 4-1 and 4-2. Relative to the no-action alternative (Option 1), Option 2 would result in a net quantitative impact estimated between \$18.0 million and \$34.1 million (7-percent and 3-percent discount rate, respectively), and Option 3 would result in a net quantitative impact estimated between \$18.0 million and \$34.1 million (7-percent and 3-percent discount rate, respectively). The majority of the costs associated with Options 2 and 3 will be incurred by DOE (\$17.6 million - \$33.6.0 million, 7-percent and 3-percent discount rate, respectively).

The analysis estimates that Options 2 and 3 would result in qualitative benefits in the following attributes: safeguards and security, public health (accident), occupational health (accident), off-site property, and on-site property. In addition, options 2 and 3 would result in an increased level of assurance that a GROA can defend against radiological sabotage. There would also be a reduced risk that public health and occupational health would be affected by radiological releases resulting from radiological sabotage. Options 2 and 3 would also reduce the risk that off-site and on-site property would be affected by radiological releases resulting from radiological sabotage and would reduce the threat of theft and diversion. Option 3 would also result in improved regulatory efficiency. Specifically, the benefits would include enhanced regulatory efficiency through regulatory and compliance improvements, including changes in DOE's planning efforts and in NRC's review efforts.

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The new requirements in the rule are expected to result in specific qualitative benefits listed below:

- The security plan that would be required by the proposed rule would lead to the implementation of enhanced security practices that would protect against radiological sabotage and theft or diversion.
- The MC&A plan that would be required by the proposed rule would lead to the implementation of enhanced MC&A practices, particularly a theft/diversion detection and response systems capability.
- The proposed rule would ensure that escorts are trained and knowledgeable about their duties while accompanying visitors. This proposed requirement would reduce the risk of a security incident initiated by a visitor since escorts would be better informed regarding visitor's authorized activities.
- The proposed rule would require DOE to implement protective measures such that a single act would not disable the intrusion detection, assessment, and communications capabilities of both the central alarm station and secondary alarm station. This proposed requirement would ensure continuity of response operations during a security event by ensuring that the detection, assessment, and communications functions required to effectively implement the DOE's protective strategy are maintained despite the loss of one or the other alarm station.

The NRC has concluded that protecting the alarm stations such that a single act does not disable the key functions would provide an enhanced level of assurance that DOE can maintain detection, assessment and communications capabilities required to protect the facility against the threat of radiological sabotage.

- Uninterruptible back-up power would provide an enhanced level of assurance that DOE can maintain detection, assessment and communication capabilities required to defend the facility against the various threats. This new requirement would reduce the risk of losing detection, assessment, and communication capabilities during a loss of the normal power supply.
  - Advanced video technology would provide an enhanced level of assurance that DOE can assess the cause of an alarm annunciation and initiate a timely response capable of defending the facility against the threat up to and including the design basis threat.
  - The proposed safety-security interface requirements would reduce the risk of adverse safety-security interactions. These requirements would enhance the communication among facility staff in order to avoid adverse safety or security effects.
  - These proposed requirements would assure that personnel performing security functions whether, armed or unarmed, meet appropriate age, vision, hearing and psychological requirements commensurate with their assigned security duties.
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- The proposed training requirements would provide DOE with the assurance that security personnel are prepared to assume their security duties upon assignment, and that they remain skilled in the weaponry that is available onsite. These new requirements would enhance the effectiveness of the security personnel in responding to security events.
  - The proposed rule would require DOE to have an access authorization program and address the integration of the access authorization requirements and security program requirements.
  - The proposed rule contains new reporting provisions. It would require DOE to notify the NRC Operations Center no later than 15 minutes after discovery of an actual or imminent threat against the facility including a requirement to follow this report with a written report within 60 days. Additionally, the proposed rule would require DOE to report within 4 hours to NRC incidents of suspicious activity. These proposed requirements enable NRC to quickly obtain information and support the NRC effort to assess the current threat environment.
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**Exhibit 4-1**  
Summary of Benefits/Savings and Costs/Burdens

Net Monetary Savings (or Costs) - Total Present Value	Non-Monetary Benefits/Costs
<p><b>Option 1: No Action</b></p> <p>\$0</p>	<p><u>Qualitative Benefits:</u></p> <p>None</p> <p><u>Qualitative Costs:</u></p> <p>Safeguards and Security: Decreased level of assurance that a GROA is adequately safeguarded.</p>
<p><b>Option 2: Issue Order</b></p> <p><b>DOE:</b> (\$9.5 million) using a 7% discount rate (\$19.3 million) using a 3% discount rate</p> <p><b>NRC:</b> (\$0.46 million) using a 7% discount rate (\$0.53 million) using a 3% discount rate</p>	<p><u>Qualitative Benefits:</u></p> <p>Safeguards and Security: Increased level of assurance that a GROA is safeguarded.</p> <p>Public Health (Accident): Reduced risk that public health would be affected by radiological releases resulting from radiological sabotage.</p> <p>Occupational Health (Accident): Reduced risk that occupational health would be affected by radiological releases resulting from radiological sabotage.</p> <p>Off-Site Property: Reduced risk that off-site property would be affected by radiological releases resulting from radiological sabotage.</p> <p>On-Site Property: Reduced risk that on-site property would be affected by radiological releases resulting from radiological sabotage.</p> <p><u>Qualitative Costs:</u></p> <p>None.</p>
<p><b>Option 3: Proposed Action</b></p> <p><b>DOE:</b> (\$9.5 million) using a 7% discount rate (\$19.3 million) using a 3% discount rate</p> <p><b>NRC:</b> (\$0.46 million) using a 7% discount rate (\$0.53 million) using a 3% discount rate</p>	<p><u>Qualitative Benefits:</u></p> <p>Safeguards and Security: Increased level of assurance that a GROA is safeguarded.</p> <p>Regulatory Efficiency: Enhanced regulatory efficiency through regulatory and compliance improvements, including changes in DOE's planning efforts and in NRC's review and inspection efforts.</p> <p>Public Health (Accident): Reduced risk that public health would be affected by radiological releases resulting from radiological sabotage.</p> <p>Occupational Health (Accident): Reduced risk that occupational health would be affected by radiological releases resulting from radiological sabotage.</p> <p>Off-Site Property: Reduced risk that off-site property would be affected by radiological releases resulting from radiological sabotage.</p> <p>On-Site Property: Reduced risk that on-site property would be affected by radiological releases resulting from radiological sabotage.</p> <p><u>Qualitative Costs:</u> None</p>

**Exhibit 4-2**  
DOE Savings and Costs

Item	One-Time Saving (Cost)	Annual Saving (Cost)	NPV (7 percent)	NPV (3 percent)
<b>Part 73</b>				
<b>Section 73.53</b>				
Prepare Security Plans	(\$151,200)	---	(\$115,350)	(\$134,339)
Procedure Development	(\$96,200)	(\$9,620)	(\$117,259)	(\$218,242)
Training on Security	(\$700,000)	(\$700,000)	(\$5,105,541)	(\$11,051,966)
Performance Evaluation Program	---	(\$100,000)	(\$674,970)	(\$1,502,211)
Records	(\$103,500)	(\$3,500)	(\$79,921)	(\$131,902)
Maintenance and Calibration Program	---	(\$36,500)	(\$246,364)	(\$548,307)
Security Assessment	(\$500,000)	---	(\$408,149)	(\$457,571)
Video Capture - Install real-time and play-back/recorded video capabilities to the CAS & SAS	(\$140,000)	---	(\$76,151)	(\$107,298)
Uninterrupted Power - Install uninterrupted power to intrusion detection and assessment system	(\$300,000)	---	(\$163,180)	(\$229,925)

Item	One-Time Saving (Cost)	Annual Saving (Cost)	NPV (7 percent)	NPV (3 percent)
Cyber Security	(\$375,000)	(\$75,000)	(\$710,202)	(\$1,414,064)
<i>Subtotal for Section 73.53</i>	<i>(\$2,365,900)</i>	<i>(\$924,620)</i>	<i>(\$7,697,086)</i>	<i>(\$15,795,825)</i>
<b>Section 73.56</b>				
Access Authorization Program	(\$100,000)	(\$1,500)	(\$64,518)	(\$99,175)
<i>Subtotal for Section 73.56</i>	<i>(\$100,000)</i>	<i>(\$1,500)</i>	<i>(\$64,518)</i>	<i>(\$99,175)</i>
<b>Section 73.71a</b>				
Safeguards Notification		(\$1640)	(\$11,070)	(\$24,636)
<i>Subtotal for Section 73.71a</i>		<i>(\$1640)</i>	<i>(\$11,070)</i>	<i>(\$24,636)</i>
<b>Part 73, Appendix B</b>				
Physical/Medical Examinations for Security Personnel - Vision, hearing, medical, and physical fitness qualifications for unarmed security personnel	(\$8,800)	(\$2,200)	(\$19,636)	(\$39,793)
Physical Requirements for Security Organization Personnel - Unarmed security personnel must meet physical requirements annually	---	(\$3,400)	(\$22,949)	(\$51,075)
On-the-Job Training - On- the-job training & documentation and certification	(\$206,000)	(\$37,000)	(\$361,789)	(\$713,700)
Qualification of Security Instructors	(\$6,000)	(\$1,000)	(\$10,013)	(\$19,621)
Armorer Certification	(\$6,400)	(\$2,133)	(\$17,878)	(\$36,947)
<i>Subtotal for Appendix B</i>	<i>(\$227,200)</i>	<i>(\$45,733)</i>	<i>(\$432,266)</i>	<i>(\$861,136)</i>
<b>Part 73, Appendix C</b>				
Drill Exercise	---	(\$20,000)	(\$134,994)	(\$300,442)
<i>Subtotal for Appendix C</i>	<i>---</i>	<i>(\$20,000)</i>	<i>(\$134,994)</i>	<i>(\$300,442)</i>



Item	One-Time Saving (Cost)	Annual Saving (Cost)	NPV (7 percent)	NPV (3 percent)
<b>Subtotal for Part 73</b>	<b>(\$2,693,100)</b>	<b>(\$993,493)</b>	<b>(\$8,339,933)</b>	<b>(\$17,071,213)</b>
<b>Part 74</b>				
<b>Subpart F</b>				
Develop MC&A Plan	(\$50,400)	---	(\$38,450)	(\$44,780)
Develop Procedures	(\$47,900)	---	(\$26,054)	(\$36,711)
Program Review and Assessment	---	(\$100,000)	(\$674,970)	(\$1,502,211)
Training	(\$7,000)	(\$7,000)	(\$51,055)	(\$110,520)
Anomaly, Detection, and Response Program	(\$7,750)	(\$3,875)	(\$30,371)	(\$64,150)
Quality Assurance Capabilities	(\$507,750)	(\$3,875)	(\$302,337)	(\$447,359)
<b>Subtotal for Subpart F</b>	<b>(\$620,800)</b>	<b>(\$114,750)</b>	<b>(\$1,123,237)</b>	<b>(\$2,205,731)</b>
<b>74.17</b>				
Inventory Summary Report	---	(\$190)	(\$1,282)	(\$2,854)
<b>Subtotal for 74.17</b>	<b>---</b>	<b>(\$190)</b>	<b>(\$1,282)</b>	<b>(\$2,854)</b>
<b>Subtotal for Part 74</b>	<b>(\$620,800)</b>	<b>(\$114,940)</b>	<b>(\$1,124,520)</b>	<b>(\$2,208,585)</b>
<b>Total</b>	<b>(\$3,313,900)</b>	<b>(\$1,108,433)</b>	<b>(\$9,464,453)</b>	<b>(\$19,289,798)</b>

## 5. Decision Rationale

### 5.1 Regulatory Analysis

Relative to the “no-action” alternative, options 2 and 3 would result in a net cost estimated as approximately \$9.9 million (total present value over a 30-year period), assuming a 7-percent discount rate, or approximately \$19.8 million assuming a 3-percent discount rate. All of this cost would accrue to DOE, except for approximately \$0.46 million (7 percent) or \$0.53 million (3 percent) that would accrue to the NRC. Options 2 and 3 would result in one-time DOE costs of approximately \$3.3 million. Options 2 and 3 would generate annual DOE costs of about \$1.1 million. Offsetting this net cost, the NRC believes that options 2 and 3 would result in substantial non-quantified benefits related to safety and security. The proposed rule (option 3) would also result in enhanced regulatory efficiency and effectiveness, and would provide an opportunity for public involvement. The analysis presents these benefits in Section 4.1 of this document. Based on the NRC’s assessment of the costs and benefits of the proposed rule on a GROA, the agency has concluded that the proposed rule provisions would be justified.

## **6. Implementation**

This section identifies how and when the proposed action would be implemented, the required NRC actions to ensure implementation, and the impact on NRC resources.

### **6.1 Schedule**

The action would be enacted through a proposed rule, resolution of public comments, and a final rule, with promulgation of the final rule within 90 days from the date of publication. The staff has not identified any impediments to implementing the recommended alternative.

### **6.2 Impacts on Other Requirements**

As discussed in Section 4.1, DOE would experience most of the impact of the revisions to 10 CFR Parts 73 and 74 . The NRC expects the rulemaking would have a substantial impact on one-time expenditures of agency resources. The impact results from NRC's need to review DOE's security and MC&A plans. The NRC estimates that it would require approximately 2 full-time equivalents to review the security plans and the MC&A plan for a GROA. In addition, the NRC estimates that it would require 2 full-time equivalents to revise implementation guidelines. These activities would result in a one-time cost of approximately \$0.59 million. The NRC does not expect that the rulemaking subsequently would result in a substantial increase in annual expenditures of agency resources.

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Appendix A:

DOE ACTIVITIES AND COST EQUATIONS FOR  
THE PROPOSED RULE

## A.1 ONE-TIME COSTS FOR DOE

### Develop Plans

DOE submits Physical Security, Training and Qualification, and Safeguards Contingency Plans no later than 180 days after issuance of the construction authorization.

Note: This calculation accounts for the additional provisions that will need to be addressed in the Plans required by the rule.

Hours of senior manager time per set of plans	300
Wage of senior manager per hour	x \$100
	-----
Cost of senior manager time per set of plans	\$30,000
Hours of manager time per set of plans	300
Wage of manager per hour	x \$50
	-----
<i>Cost of manager time per set of plans</i>	\$15,000
Hours of staff time per set of plans	3000
Wage of staff per hour	x \$35
	-----
<i>Cost of staff time per set of plans</i>	\$105,000
Hours of clerical time per set of plans	60
Wage of clerical worker per hour	x \$20
	-----
<i>Cost of clerical worker time for security plans</i>	\$1,200
<b>Total for security plans</b>	<b>\$151,200</b>

DOE submits Material Control and Accounting (MC&A) Plan no later than 180 days after issuance of the construction authorization.

Hours of senior manager time for MC&A plan	100
Wage of senior manager per hour	x \$100
	-----
<i>Cost of senior manager time for MC&amp;A plan</i>	\$10,000
Hours of manager time for MC&A plan	100
Wage of manager per hour	x \$50
	-----
<i>Cost of manager time for MC&amp;A plan</i>	\$5,000
Hours of staff time for MC&A plan	1000
Wage of staff per hour	x \$35
	-----
<i>Cost of staff time for MC&amp;A plan</i>	\$35,000
Hours of clerical time for MC&A plan	20
Wage of clerical worker per hour	x \$20
	-----
<i>Cost of clerical worker time for MC&amp;A plan</i>	\$400

<b>Total Cost for MC&amp;A plan</b>	<b>\$50,400</b>
<b>Total Cost for Plan Development</b>	<b>\$201,600</b>

### Procedure Development

Procedures will be necessary to implement the additional requirements for the security program.

Hours of manager time for procedures	500
Wage of manager per hour	x \$50
	-----
<i>Cost of manager time for procedures</i>	\$25,000
Hours of staff time for procedures	2000
Wage of staff per hour	x \$35
	-----
<i>Cost of staff time per set of procedures</i>	\$70,000
Hours of clerical time for procedures	60
Wage of clerical worker per hour	x \$20
	-----
<i>Cost of clerical time for procedures</i>	\$1,200
<b>Total Cost for security procedures</b>	<b>\$96,200</b>

Procedures will be necessary to implement the additional requirements for the MC&A program.

Hours of manager time for procedures	250
Wage of manager per hour	x \$50
	-----
<i>Cost of manager time for procedures</i>	\$12,500
Hours of staff time for procedures	1000
Wage of staff per hour	x \$35
	-----
<i>Cost of staff time per set of procedures</i>	\$35,000
Hours of clerical time for procedures	20
Wage of clerical worker per hour	x \$20
	-----
<i>Cost of clerical time for procedures</i>	\$400
<b>Total Cost for MC&amp;A procedures</b>	<b>\$47,900</b>

### Training

Training on Security Related Aspects:

Hours of staff time	40
Wage of staff per hour	\$35
Number of people requiring training	x 500
	-----

*Cost of training* \$700,000

Training on MC&A Related Aspects:

Hours of staff time 20  
Wage of staff per hour \$35  
Number of people requiring training x 10

*Cost of training* \$7,000

### **Security Assessment**

DOE must conduct an initial security assessment to determine target sets, risk, sabotage consequences, etc.

*Cost of initial security assessment* \$500,000

### **Video Capture**

The Isolation Zone video surveillance and assessment equipment must be designed to provide real-time and play-back/recorded video images in conjunction with an alarm annunciation in a manner that allows timely assessment of activities prior to and after the alarm annunciation.

Note: This calculation accounts for the video technology requirements in.

*Cost to install real-time and play-back/recorded video images in conjunction with alarm annunciation capabilities to the CAS and SAS* \$140,000

### **Uninterrupted Power**

DOE must install uninterrupted power to the entire intrusion detection and assessment system.

*Cost to install uninterrupted power* \$300,000

### **Cyber Security**

DOE must establish cyber security programs to protect important computer systems.

Equipment and Installation:

*Cost of equipment and installation* \$375,000

### **Records**

DOE must retain additional records based on the new requirements

Hours of manager time 50  
Wage of manager per hour x \$50  
*Cost of manager time* \$2,500

Hours of clerical time for records		50
Wage of clerical worker per hour	x	\$20
		-----
<i>Cost of clerical time for records</i>		\$1,000
<i>Cost of additional file cabinets, safes, etc.</i>		\$100,000
<b>Total Cost</b>		<b>\$103,500</b>

### Access Authorization Program

DOE is required to meet the requirements in § 73.56a for an access authorization program that go beyond current requirements.

<i>Cost for additional requirements for access authorization</i>		\$100,000
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### Physical/Medical Examinations for Security Personnel - Appendix B

DOE must ensure that all security personnel who are assigned duties and responsibilities associated with detection, assessment, and response to unauthorized activities (not just the armed personnel) meet minimum vision, hearing, medical, and physical fitness qualifications.

Cost per physical and medical examination		\$400
Number of unarmed members of the security organization hired per year per site	x	20
		-----
<i>Cost of physical and medical examinations per year</i>		\$8,000
Hours of clerical time		40
Cost of clerical time per hour	x	\$20
		-----
<i>Cost of clerical time</i>		\$800
<b>Total Cost</b>		<b>\$8,800</b>

### On-The-Job Training

DOE must provide 40 hours of on-the-job training to each member of the armed and unarmed security organization. In addition, training managers must document and certify on-the-job training.

Number of armed and unarmed security officers		100
Number of on-the-job training hours per person		40
Wage of armed and unarmed security organization member per hour	x	\$25
		-----
<i>Cost of on-the-job training for currently employed security members</i>		\$100,000
Number of contingency response personnel		100
Number of additional on-the-job training hours		40
Wage of contingency response personnel	x	\$25

<i>Cost of on-the-job training for contingency response personnel</i>		----- \$100,000
Number of hours for a training manager to document and certify all on-the-job training per year		120
Wage of training manager	x	\$50
		-----
Cost for on-the-job training documentation and certification		\$6,000
<b>Total Cost</b>		<b>\$106,000</b>

### Qualification of Security Instructors

DOE must ensure that all security instructors receive required training to qualify them for their duties.

Cost of training per instructor		\$1,500
Number of instructors	x	4
		-----
<i>Cost of training</i>		\$6,000

### Armorer Certification

Cost of training per staff person		\$3,200
Number of staff requiring training	x	2
		-----
<i>Cost of training</i>		\$6,400

### Anomaly, Detection, and Response Program

DOE is required to have a program to address anomalies, including a collusion protection aspect.

Hours of manager time for program development		50
Wage of manager per hour	x	\$50
		-----
<i>Cost of manager time program development</i>		\$2,500
Hours of staff time for program development		150
Wage of staff per hour	x	\$35
		-----
<i>Cost of staff time for program development</i>		\$5,250
<b>Total Cost</b>		<b>\$7,750</b>

### Quality Assurance Capabilities

DOE is required to have a measurements and measurement control program.



Hours of manager time for program development	50
Wage of manager per hour	x \$50
	-----
<i>Cost of manager time program development</i>	\$2,500
Hours of staff time for program development	150
Wage of staff per hour	x \$35
	-----
<i>Cost of staff time for program development</i>	\$5,250
 <i>Cost of MC&amp;A measurement equipment</i>	 \$500,000
 <b>Total Cost</b>	 <b>\$507,750</b>

## A.2 ANNUAL COSTS FOR DOE

### Program Assessment

DOE must conduct a performance evaluation of the security program.

*Cost of the security evaluation on an annual basis.* \$100,000

DOE must conduct an independent assessment of the MC&A program every 2 years.

*Cost of the MC&A assessment on an annual basis.* \$100,000

### Training on Security Related Aspects

DOE will need to conduct ongoing training.

Hours of staff time	40
Wage of staff per hour	\$35
Number of people requiring training	x 500
	-----
<i>Cost of training</i>	\$700,000

### Training on MC&A Related Aspects

DOE will need to conduct ongoing training.

Hours of staff time	20
Wage of staff per hour	\$35
Number of people requiring training	x 10
	-----
<i>Cost of training</i>	\$7,000

### Procedure Development

The additional procedures will need to be periodically updated.

Hours of manager time for procedures	50
Wage of manager per hour	x \$50
	-----
<i>Cost of manager time for procedures</i>	\$2,500

Hours of staff time for procedures	200
Wage of staff per hour	x \$35
	-----
<i>Cost of staff time per set of procedures</i>	\$7,000

Hours of clerical time for procedures	6
Wage of clerical worker per hour	x \$20
	-----
<i>Cost of clerical time for procedures</i>	\$120

**Total Cost for security procedures**

**\$9,620**

**Maintenance and Calibration Program**

Additional equipment will need to come under the maintenance and calibration program.

Hours of manager time		100
Wage of manager per hour	x	\$50
		-----
<i>Cost of manager time</i>		\$5,000
Hours of staff time		900
Cost of staff per hour		\$35
		-----
<i>Cost of staff time</i>		\$31,500
<b>Total cost for maintenance and calibration</b>		<b>\$36,500</b>

**Records**

DOE must retain additional records based on the new requirements.

Hours of manager time		50
Wage of manager per hour	x	\$50
		-----
<i>Cost of manager time</i>		\$2,500
Hours of clerical time for records		50
Wage of clerical worker per hour	x	\$20
		-----
<i>Cost of clerical time for records</i>		\$1,000
<b>Total Cost</b>		<b>\$3,500</b>

**Cyber Security**

DOE must establish cyber security programs to protect important computer systems. This requirement will result in equipment maintenance costs.

<i>Cost of cyber security equipment maintenance</i>	\$75,000
-----------------------------------------------------	----------

**Individuals are subject to an authorization program**

Any newly hired individual whose assigned duties and responsibilities permit the individual to take actions by electronic means, either on site or remotely, that could adversely impact operational safety, security, or emergency response capabilities are subject to an authorization program, and must receive a background check.

Number of new hires needing background checks	5
Number of hours to conduct a background check	6

Wage of manager per hour	x	\$50
		-----
<i>Cost of background check</i>		\$1,500

### Safeguards Notifications

DOE must notify the NRC Operations Center as soon as possible, but not later than 15 minutes after discovery of an imminent or actual threat against the GROA and must notify the NRC Operations Center of suspicious activity with 4 hours.

Hours of manager time per call		0.08
Cost of manager's time per hour		\$50
Number of calls per year	x	10
		-----
<i>Cost of threat notifications per year</i>		\$40

DOE must provide a written follow-up report for threat notifications.

Hours of staff time per written report		20
Wage of staff per hour		\$35
Number of written reports per year	x	2
		-----
<i>Cost of staff time for written reports</i>		\$1400

Hours of manager time per written report		2
Cost of manager's time per hour		\$50
Number of written reports per year	x	2
		-----
<i>Cost of manager time for written reports</i>		\$200

**Total Cost** **\$1640**

### Physical/Medical Examinations for Security Personnel - Appendix B

DOE must ensure that all newly hired security personnel who are assigned duties and responsibilities associated with detection, assessment, and response to unauthorized activities (not just the armed personnel) meet minimum vision, hearing, medical, and physical fitness qualifications.

Cost per physical and medical examination		\$400
Number of unarmed members of the security organization hired per year	x	5
		-----
<i>Cost of physical and medical examinations per year</i>		\$2,000

Hours of clerical time		10
Cost of clerical time per hour	x	\$20
		-----
<i>Cost of clerical time</i>		\$200

**Total Cost** **\$2,200**

## Physical Requirements for Security Organization Personnel - Appendix B

DOE must ensure that armed and unarmed members of the security organization must meet physical requirements annually.

Cost of updating physical examination per person	\$150
Number of armed and unarmed members of the security organization	x 20
	-----
<i>Cost of updating physical examination for armed and unarmed members of the security organization</i>	\$3,000
Hours of clerical time	20
Cost of clerical time per hour	\$20
	-----
<i>Cost of clerical time</i>	\$400
<b>Total Cost</b>	<b>\$3,400</b>

## On-the-Job Training - Appendix B

DOE must provide 40 hours of on-the-job training to each new member of the armed and unarmed security organization prior to his or her assignment. In addition, training managers must document and certify on-the-job training.

Number of newly hired armed and unarmed members of the security organization per year	20
Number of on-the-job training hours per person	40
Wage of armed and unarmed security organization member per hour	x \$25
	-----
<i>Cost of newly hired armed and unarmed security organization members</i>	\$20,000
Number of armed and unarmed security organization trainers	20
Number of additional on-the-job training hours per person	20
Wage of armed and unarmed security organization trainers per hour	x \$40
	-----
<i>Cost of armed and unarmed security organization trainers</i>	\$16,000
Number of hours for a training manager to document and certify all on-the-job training per year	20
Wage of training manager	x \$50
	-----
<i>Cost for on-the-job training documentation and certification</i>	\$1,000
<b>Total Cost</b>	<b>\$37,000</b>

## Qualification of Security Instructors - Appendix B

DOE must ensure that all security instructors receive requalification training every three years. For the purposes of this analysis it is assumed that instructors attend a three-day requalification

training every three years. To estimate the annual cost, this analysis assumes there is one day of requalification training each year.

Cost of training per instructor per year		\$250
Number of instructors	x	4
		-----
<i>Cost of training per year</i>		\$1,000

**Armorer Certification - Appendix B**

Cost of training per staff member per year		\$1,067
Number of staff requiring training	x	2
		-----
<i>Cost of training per year</i>		\$2,133

**Drill Exercise - Appendix C**

DOE must train staff in accordance with the drill exercise requirements.

Cost of training per person		\$500
Number of staff requiring training	x	40
		-----
<i>Cost of training</i>		\$20,000

**Anomaly, Detection, and Response Program**

DOE is required to have a program to address anomalies, including a collusion protection aspect

Hours of manager time for program development		25
Wage of manager per hour	x	\$50
		-----
<i>Cost of manager time program development</i>		\$1,250
Hours of staff time for program development		75
Wage of staff per hour	x	\$35
		-----
<i>Cost of staff time for program development</i>		\$2,625
<b>Total Cost</b>		<b>\$3,875</b>

**Measurements and Measurement Control Program**

Hours of manager time for program development		25
Wage of manager per hour	x	\$50
		-----
<i>Cost of manager time program development</i>		\$1,250
Hours of staff time for program development		75
Wage of staff per hour	x	\$35

*Cost of staff time for program development*

-----  
\$2,625

**Total Cost**

**\$3,875**

**Inventory Summary Report**

DOE must submit an inventory summary report.

*Cost of submitting an inventory summary report*

\$190

Appendix B:

NRC ACTIVITIES AND COST EQUATIONS FOR  
THE PROPOSED RULE



## B.1 ONE-TIME COSTS FOR NRC

### Review Plans

NRC reviews and approves Physical Security, Training and Qualification, and Safeguards Contingency Plans.

Note: Previously there was no provision for DOE to submit the full plans for NRC approval.

Hours of NRC staff time per set of plans	500
Wage of NRC staff per hour	x \$107
	-----
<i>Cost of NRC staff time per set of plans</i>	<i>\$53,500</i>

Hours of NRC clerical time per set of plans	6
Wage of NRC clerical worker per hour	x \$40
	-----
<i>Cost of NRC clerical worker time per set of plans</i>	<i>\$240</i>

*Subtotal cost for security plans* *\$53,740*

NRC reviews and approves Material Control and Accounting Plan.

Note: Previously there was no requirement for DOE to develop and submit a plan for NRC approval.

Hours of NRC staff time for plan	2500
Wage of NRC staff per hour	x \$107
	-----
<i>Cost of NRC staff time for plan</i>	<i>\$267,500</i>

Hours of NRC clerical time per plan	6
Wage of NRC clerical worker per hour	x \$40
	-----
<i>Cost of NRC clerical worker time per plan</i>	<i>\$240</i>

*Subtotal cost for MC&A plan* *\$267,740*

**Total Cost** **(\$321,480)**

### Implementation Guidelines

NRC revises/develops implementation guidelines for onsite physical protection systems and material control and accounting.

1.0 full time equivalent (FTE) (@ \$133,000/FTE) NRC

staff time for security guidance	\$133,000
1.0 FTE NRC staff time for MC&A guidance	\$133,000
<b>Total costs</b>	<b>(\$266,000)</b>

## B.2 ANNUAL COSTS FOR NRC

### Safeguards Notifications

NRC will answer calls from DOE regarding the discovery of an imminent or actual threat against the GROA or suspicious activity at the facility..

Hours of NRC staff time per call	0.08
Cost of NRC staff time per call	\$107
Number of calls per year	x 10
<i>Cost of NRC staff time per year</i>	<b>\$86</b>