
**Regulatory Analysis for Proposed Rule -
Transportation of Spent Nuclear Fuel in 10 CFR Part 73**

**U.S. Nuclear Regulatory Commission
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EXECUTIVE SUMMARY

The U. S. Nuclear Regulatory Commission (NRC) is proposing to amend its security regulations pertaining to the transport of irradiated reactor fuel (for purposes of this rulemaking, the terms “irradiated reactor fuel” and “spent nuclear fuel” are used interchangeably). This proposed rulemaking would: (1) establish generically applicable security requirements similar to those previously imposed by Commission orders issued after the terrorist attacks of September 11, 2001; (2) establish the acceptable performance standards and objectives for the protection of spent nuclear fuel (SNF) shipments from theft, diversion, or radiological sabotage; (3) ensure that the acceptable performance standards and objectives for SNF shipments apply to all licensees authorized to possess or transport SNF; and (4) address, in part, the requests for NRC rulemaking raised by Nevada petition PRM-73-10.

The analysis presented in this document examines the benefits and costs of the proposed security requirements. The key findings of the analysis are as follows:

- *Total Cost to Industry.* The proposed rule would result in negligible additional total costs. The rule would put into effect for licensees authorized to possess or transport SNF generically applicable security requirements similar to those previously imposed by Commission orders issued after the terrorist attacks of September 11, 2001, along with additional security requirements resulting from insights gained while implementing the security orders. The total cost of implementation of the rule would be slightly higher than the cost of the implementation of the orders. The total annual cost for the rule is \$967,726. The new requirements that resulted from insights gained while implementing the security orders make up \$84,000 of the \$967,726 annual costs. The total present value of the costs is estimated at \$6.8 million (using a 7-percent discount rate) and \$8.3 million (using a 3-percent discount rate) over the next 10 years.
- *Annual Impact to the Economy.* Under the Congressional Review Act of 1996 and as a result of consultations with the Office of Information and Regulatory Affairs of the Office of Management and Budget (OMB), the NRC has determined that this action is a non-major rule. This determination is based on the estimated one-time costs (expected to occur within the first year) of implementing this action for the total industry is not to exceed \$1.05 million.
- *Value of Benefits Not Reflected Above.* With the exception of some of the direct monetary savings to industry, the cost figures shown above do not reflect the value of the benefits of the proposed rule. These benefits are evaluated qualitatively in Section 3.1. This regulatory analysis concluded the costs of the rule are justified in view of the qualitative benefits.
- *Costs to NRC.* The annual cost of the rule to the NRC is negligible. The rule would put into effect for licensees authorized to possess or transport SNF generically applicable security requirements similar to those previously imposed by Commission orders issued after the terrorist attacks of September 11, 2001, along with additional security requirements resulting from insights gained while implementing the security orders. As such, the rule development requires no additional cost. The total annual costs are approximately \$4,000. NRC is not expected to incur any one-time costs as a result of the rule.

- *Decision Rationale.* Although the NRC did not quantify the benefits of this rule, the staff did qualitatively examine benefits and concluded that the rule would provide safety and security-related benefits. The sum total of the requirements in the proposed rule would be to establish the acceptable performance standards and objectives for the protection SNF shipments from theft, diversion, or radiological sabotage. Specifically, the proposed rule would require the following: (1) armed guards throughout the rail and road route; (2) procedures for normal and contingency responses; (3) the training of personnel; (4) continuous and active monitoring of the SNF shipment by a movement control center; (5) shipment preplanning and coordination with States; (6) constant visual surveillance by armed escort; (7) 2-way redundant communication capabilities; (8) a minimum of 2 weapons for armed guards; (9) additional NRC notifications; (10) armed escort instructions on the use of deadly force; and (11) background investigations of individuals granted unescorted access to SNF. The additional security requirements in the proposed rulemaking provide a substantial increase in the protection of the common defense and security and the public health and safety from SNF in transit. The costs of the proposed rulemaking are justified based on the qualitative benefits.

The proposed amendments would affect NRC licensees who transport, or deliver to a carrier for transport, in a single shipment, a quantity of irradiated reactor fuel in excess of 100 grams (0.22 lbs) in net weight exclusive of cladding or other material, which has a total radiation level in excess of 1 Sv (100 rems) per hour at a distance of .91 meters (3 feet) from any accessible surface without regard to any intervening shielding.

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ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CoC	Certificate of Compliance
COMSECY	A paper originating from a Commissioner who wants to bring an item to the attention of his or her fellow Commissioners, or a paper that originates from the NRC Executive Director for Operations (EDO), the Chief Financial Officer (CFO), or other Commission-level office seeking guidance from the Commission.
FR	Federal Register
INL	Idaho National Laboratory
ISFSI	Independent Spent Fuel Storage Installation
LLEA	Local Law Enforcement Agency
NRC	U. S. Nuclear Regulatory Commission
NUREG	NRC Nuclear Regulation
NUREG/BR	NRC Nuclear Regulation/Brochure
SAR	Safety Analysis Report
SECY	A paper addressing policy, rulemaking, or adjudicatory matters submitted to the Commission for consideration in a document style and format established specifically for the purpose.
SER	Safety Evaluation Report
SIG	Safeguard Information
SNF	Spent Nuclear Fuel
SOC	Statements of Consideration

1. Introduction

The NRC is proposing to amend 10 CFR Part 73 to specify additional security requirements for licensees who transport SNF.

A statement of the problem, background on the proposed rule, and regulatory objectives are discussed in the following sections. Section 2 identifies the alternatives evaluated in this rulemaking. Section 3 describes the analysis method and input assumptions. Section 4 describes the Results. Section 5 discusses the Decision Rationale and Implementation of the preferred alternative, and Section 6 lists the References used in this Regulatory Analysis.

1.1 Statement of the Problem and Reasons for Rulemaking

The current 10 CFR 73.37 has changed little since its promulgation in 1980. However, there have been significant changes in the threat environment. After the terrorist attacks of September 11, 2001, the NRC issued a series of security-related orders to specific licensees. In the area of SNF transit security, the orders were issued to licensees who ship or receive SNF and those planning to ship or receive SNF. The orders were issued as immediately effective under NRC's authority to protect the common defense and security under the Atomic Energy Act of 1954, as amended. The requirements put in place by the orders supplement the existing regulatory requirements. These additional security requirements are primarily intended to provide reasonable assurance of preventing the theft, diversion, or sabotage of SNF in transit.

This proposed rulemaking would establish generically applicable security requirements similar to those previously imposed by Commission orders issued after the terrorist attacks of September 11, 2001. The proposed rulemaking would establish the acceptable performance standards and objectives for the protection of SNF shipments from theft, diversion, or radiological sabotage. The proposed amendments would apply to those licensees authorized to possess or transport SNF. The proposed rulemaking would also add several new requirements not derived directly from the security order requirements, but developed as a result of insights gained by performing security assessments of potential security vulnerabilities associated with SNF transportation.

In addition, the proposed rulemaking would consider the State of Nevada June 22, 1999, petition for rulemaking (PRM-73-10). The petition requested that the NRC initiate rulemaking to strengthen its regulations governing the physical protection of SNF shipments against sabotage and terrorism. The proposed rulemaking would address, in part, the requests for NRC rulemaking raised by PRM-73-10.

1.2 Background

1.2.1 Current Regulatory Framework

On June 15, 1979, the NRC published in the *Federal Register* (44 FR 34466) an interim final rule that established its first requirements for the physical protection of SNF in transit. The interim final rule added 10 CFR 73.37, "Requirements for Physical Protection of Irradiated Reactor Fuel in Transit" to 10 CFR Part 73. After considering public comments, the Commission affirmed the interim final rule on June 3, 1980 (45 FR 37399).

The current 10 CFR 73.37 has changed little since its promulgation in 1980. These regulations require licensees to put in place a physical protection system for SNF shipments that meets the following objectives: (1) minimize the possibilities for radiological sabotage of SNF shipments, especially within heavily populated areas and (2) facilitate the location and recovery of SNF shipments that may have come under the control of unauthorized persons. The regulation also provides for: (1) the early detection and assessment of attempts to gain unauthorized access to or control over SNF shipments, (2) the notification to the appropriate response forces of any sabotage events, and (3) the impeding of attempts at radiological sabotage of SNF shipments in heavily populated areas or attempts to illicitly move such shipments into heavily populated areas.

1.2.2 NRC Orders

The NRC issued EA -02-109, "Issuance of Order for Interim Safeguards and Security Compensatory Measures for the Transportation of SNF Greater than 100 Grams" on October 3, 2002. The orders were issued to licensees who had shipped or received SNF within 3 years and who planned to ship or receive SNF in the foreseeable future. The specifics of the orders are protected as SGI, as such; their details cannot be discussed in this document. In general, the security requirements resulted in enhancements in the following areas: preplanning and coordination with States and LLEA; improved communications among movement control personnel; the development of normal and contingency procedures; a minimum number of weapons for escorts and more thorough background investigations of individuals associated with the SNF shipment.

1.3 Regulatory Objectives

The NRC's objectives for the proposed rulemaking are to: (1) establish generically applicable security requirements similar to those previously imposed by Commission orders issued after the terrorist attacks of September 11, 2001; (2) establish the acceptable performance standards and objectives for the protection of SNF shipments from theft, diversion, or radiological sabotage; (3) ensure that the acceptable performance standards and objectives for SNF shipments apply to all licensees authorized to possess or transport SNF; and (4) address, in part, the requests for NRC rulemaking raised by Nevada petition PRM-73-10.

2. IDENTIFICATION OF ALTERNATIVE APPROACHES

The NRC considered 2 alternatives for the proposed rule, described below.

2.1 Alternative 1: No-Action

Alternative 1 is the No-Action Alternative. Under the No-Action Alternative, the NRC would make no changes to the current regulations. Licensees who are subject to the NRC security orders would continue to comply with these orders. This alternative would not reflect the several new requirements not derived directly from the security order requirements, but developed as a result of insights gained by performing security assessments of potential security vulnerabilities associated with SNF transportation, and from implementation of the security orders. Thus, this alternative would be inconsistent with the requirements the NRC has determined are needed to establish the acceptable performance standards and objectives for the protection of SNF shipments from theft, diversion, or radiological sabotage.

In addition, this alternative would place an administrative burden on the NRC. Unlike the requirements of a rule, the orders apply only to the licensees named on the document and would not apply to new licensees. The NRC would be required to issue orders to each new licensee seeking to transport SNF and would be required to issue new orders to licensees receiving the initial order to address the new requirements not derived from the orders. Thus, this alternative is less efficient and effective than the development of the proposed regulation. As such, the No-Action Alternative would be inconsistent with NRC's organizational excellence objectives of ensuring that its actions are efficient, effective, realistic, and timely.

The No-Action Alternative would also be inconsistent with NRC's openness strategy. This alternative would not allow for the accurate and timely sharing of information with the public about NRC's regulatory activities relative to SNF shipment security. Nor would this alternative provide for fair, timely, and meaningful stakeholder involvement in NRC's development of SNF transit requirements.

2.2 Alternative 2: Rulemaking to Amend Regulations to Enhance SNF Transit Security

Under Alternative 2: Rulemaking, NRC would conduct a rulemaking to enhance the physical security of SNF shipments. These changes would include revisions to 10 CFR 73.37, minor revisions to 10 CFR 73.72, and the creation of a new 10 CFR 73.38. Through a comprehensive rulemaking, the NRC would: (1) establish generically applicable security requirements similar to those previously imposed by Commission orders issued after the terrorist attacks of September 11, 2001; (2) establish the acceptable performance standards and objectives for the protection of SNF shipments from theft, diversion, or radiological sabotage; (3) ensure that the acceptable performance standards and objectives for SNF shipments apply to all licensees authorized to possess or transport SNF; and (4) address, in part, the requests for NRC rulemaking raised by Nevada petition PRM-73-10.

This alternative would be consistent with NRC's organizational excellence objectives of ensuring that its actions are efficient, effective, realistic, and timely. The rulemaking alternative is more efficient and effective than the continued issuance and re-issuance of orders. It would also be consistent with NRC's openness strategy. This alternative, through the rulemaking process, would provide for fair, timely and meaningful stakeholder involvement in NRC's development of SNF transit requirements.

The NRC has estimated the benefits and costs of this alternative, as described in Section 3 and 4 of this regulatory analysis. The NRC has pursued Alternative 2: Rulemaking for the reasons discussed in Section 5.

The following cross reference table outlines the rule changes.

CROSS-REFERENCE TABLE 2.1

Cross Reference of Proposed Regulations with Existing Regulations

PROPOSED REGULATION	EXISTING REGULATION
73.37 (a)(1)	73.37 (a)(1)
73.37 (a)(2)	73.37 (a)(2)
73.37 (b)(1)(i)-(iv)	New (no existing equivalent)
73.37 (b)(1)(v)(A)	73.37(b)(8)
73.37 (b)(1)(v)(B)	73.37(b)(6)
73.37 (b)(1)(v)(C)	New (no existing equivalent)
73.37 (b)(1)(v)(D)	New (no existing equivalent)
73.37 (b)(1)(vi)	73.37(b)(6)
73.37 (b)(1)(vii)	73.37(b)(7)
73.37 (b)(1)(vii)(A)	New (no existing equivalent)
73.37 (b)(1)(vii)(B)	73.37(b)(7)
73.37 (b)(1)(vii)(C)	73.37(b)(7)
73.37 (b)(1)(viii)	New (no existing equivalent)
73.37 (b)(1)(ix)	New – incorporates 73.21&73.22 Revisions
73.37 (b)(2)	73.37 (b)(1) & 73.37(f)
73.37 (b)(2)(i)	73.37 (b)(1)
73.37 (b)(2)(ii)	73.37(f)
73.37 (b)(2)(iii)	73.37(f)(4)
73.37 (b)(2)(iv)	73.37(f)(4)
73.37 (b)(2)(v)	73.70
73.37 (b)(3)(i)	New (no existing equivalent)
73.37 (b)(3)(ii)	73.37(b)(4)
73.37 (b)(3)(iii)	73.37(b)(4)
73.37 (b)(3)(iv)	73.37(b)(5)
73.37 (b)(3)(v)	New (no existing equivalent)
73.37 (b)(3)(vi)	73.37(b)(3)
73.37 (b)(3)(vii)(A)	73.37(b)(10)
73.37 (b)(3)(vii)(B)	73.37(b)(11)
73.37 (b)(3)(vii)(C)	73.37(b)(9)
73.37 (b)(3)(viii)	73.37(b)(3)
73.37 (b)(3)(xi)	New – incorporates 73.21&73.22 Revisions
73.37 (b)(4)(i)	73.37(b)(2)
73.37 (b)(4)(ii)	73.37(b)(2)
73.37(b)(4)(iii)	73.37(b)(2)
73.37(b)(4)(iv)	73.37(b)(3)
73.37(b)(4)(v)	New – incorporates 73.21&73.22 Revisions
73.37(c)	73.37(c)
73.37(c)(1)	73.37(c)(1)
----- (none-paragraph deleted from existing)	73.37(c)(2)
73.37(c)(2)	New – replaces 73.37(c)(3)
73.37(c)(3)	73.37(c)(4)

PROPOSED REGULATION	EXISTING REGULATION
73.37(c)(4)	73.37(c)(5)
73.37(c)(5)	New (no existing equivalent)
73.37(c)(6)	New – incorporates 73.21&73.22 Revisions
73.37(d)	73.37(d)
73.37(d)(1)	73.37(d)(1)
----- (none-paragraph deleted from existing)	73.37(d)(2)
73.37(d)(2)	New – replaces 73.37(d)(3)
73.37(d)(3)	New (no existing equivalent)
73.37(d)(4)	New – incorporates 73.21&73.22 Revisions
73.37(e)(1)	73.37(e)(1)
73.37(e)(2)	73.37(e)(2)
73.37(e)(3)	New – replaces 73.37(e)(3)
73.37(e)(4)	New – incorporates 73.21&73.22 Revisions
	73.37(f) moved to 73.37 (b)(2)(ii)-(iv)
73.37(f)(1)	New – incorporates 73.71 reporting provisions
73.37(f)(2)	New – incorporates 73.21&73.22 Revisions
73.37(g)	73.37(g) & incorporates 73.21&73.22 Revision
73.38	New-incorporates background investigations
73.72(a)(1)	73.72(a)(1)
73.72(a)(4)(i)-(iii)	73.72(a)(4)
73.72(a)(5)	73.72(a)(5)
----- (none-exemption deleted from existing)	73.72(b)
73.72(b)	New (no existing equivalent-new exemption)

3. ANALYSIS OF VALUES AND IMPACTS

The 2 subsections below describe the analysis conducted to identify and evaluate the values and impacts resulting from the proposed rule. The main analysis is presented in Subsection 3.1. and a second analysis called the pre-order analysis is presented in Subsection 3.2.

3.1 Main Analysis

The main analysis measures the incremental values and impacts of the proposed rule alternative relative to the No-Action Alternative.

3.1.1 Baseline for the Main Analysis

The baseline used in the main analysis is the No-Action Alternative, which would not involve any rulemaking and would keep the current regime of security orders in place. This baseline assumes full compliance with existing NRC requirements, including current regulations and orders. This is consistent with NUREG/BR-0058, “Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission,” Rev. 4, which states that, “in evaluating a new requirement..., the staff should assume that all existing NRC requirements have been implemented.” An additional assumption of the baseline for this analysis is that the Commission would issue new orders to licensees who plan to ship SNF in the future and did not receive the initial orders, and the Commission would issue new orders to licensees receiving the initial order to address the new requirements not derived from the orders.

3.1.2 Assumptions

The analysis assumes that any one-time implementation costs already occurred when the orders were issued. The rulemaking and the No-Action Alternative assume that one-time costs have already occurred and are not factored into the analysis. Ongoing costs of operation related to the rule are assumed to begin in 2010, and are modeled on an annual cost basis. Ongoing costs related to the No-Action Alternative are assumed to be ongoing and begin in 2010 and are modeled on an annual cost basis. The analysis calculated cost and savings over a 10-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, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Rev. 4.

For the analysis, the NRC assumed that 20 shipments a year would be affected by the regulation under both the No-Action Alternative and the Rulemaking Alternative. The 20 shipments would break down to 10 shipments via highway and 10 railways. The NRC does not anticipate any shipments via waterways. The NRC estimates that the shipments would pass through or crosses on average of 5 States per shipment. The NRC estimates that 5 shipments annually would originate in ports due to international shipment. These shipments would be shipped from port via highway or railway depending on the licensee's need. The NRC anticipates 5 shipments annually would incur some issue(s) which would require revisions to the schedule. In addition, 1 shipment would be canceled over a 3-year period. The 20 shipments would impact 18 licensees on average annually as 2 licensees would ship twice. Also, the NRC estimates that 1 shipment in a 3-year period would incur an "event" which would require reporting and investigation.

3.1.3 Identification of Affected Attributes

The attributes were identified using the list of potential attributes provided in Chapter 5 of NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook." Each attribute listed in Chapter 5 was evaluated. The baseline for this analysis assumes full compliance with existing requirements and any future orders the Commission may issue. The following attributes would be affected by the proposed rule:

- *Regulatory Efficiency* – The proposed rule would enhance regulatory efficiency by placing in the regulations generically applicable security requirements similar to those previously imposed by Commission orders.
- *Safeguards and Security Considerations* – The proposed rule would establish the acceptable performance standards and objectives for the protection of SNF in transit that would provide high assurance that the transport of SNF is not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.
- *Public Health (Accident)* – The proposed rule would reduce the risk that public health would be affected by radiological releases resulting from radiological sabotage.
- *Occupational Health (Accident)* – The proposed rule would reduce the risk that occupational health would be affected by radiological releases resulting from radiological sabotage.

- *Industry Implementation* – The proposed rule would require licensees to make revision to their Transportation Physical Security Plans, Safeguards Contingency Plans, and Training and Qualification Plans, among other implementation activities.
- *Industry Operation* – The proposed rule would require licensees to implement additional security activities beyond those currently required.
- *NRC Implementation* – The proposed rule would require the NRC to revise guidance and inspection procedures.
- *NRC Operation* – The proposed rule would require the NRC Operations Center to receive additional notifications.
- *Off-Site Property* – The proposed rule would reduce the risk that off-site property would be affected by radiological releases resulting from radiological sabotage.
- *Other Government* – The proposed rule would require additional State and LLEAs interaction with licensees and the NRC.
- *Improvements in Knowledge* – The proposed rule would result in an increase in the information relative to the SNF shipments.
- *Environmental Considerations* – The proposed rule would result in a decrease of the potential risk of environmental contamination that could result from theft, diversion or radiological sabotage of SNF shipments.

Relative to the main analysis baseline, the proposed rule would *not* be expected to affect the following attributes:

- *Public Health (Routine)*
- *Occupational Health (Routine)*
- *General Public*
- *Antitrust Considerations*

3.1.4 Analytic Methodology

This subsection describes the process used to evaluate the incremental values (benefits) and impacts (costs) associated with the proposed rule relative to the baseline described in 3.1.1 (above). The benefits include desirable changes in affected attributes, *e.g.*, monetary savings and improved safety. The costs include undesirable changes in affected attributes, *e.g.*, increased monetary costs and radiation exposure levels.

Industry implementation and operation and NRC implementation and operation are quantitatively evaluated. Quantitative analysis requires a baseline characterization. This analysis includes: (1) the average number of shipments affected, (2) the nature of current activities conducted, (3) the types of new or modified systems and procedures to be implemented, or would no longer be implemented, (4) and the number of hours and costs entailed in carrying each procedure out.

Licensees may, however, respond differently to the rule. Their responses are dependent on site-specific characteristics, such as: (1) site physicality; (2) current contingency, security, training and qualification plan contents; and (3) the operations' organizational and management structure. It is also dependent upon the number of shipments anticipated and the number of States each shipment would pass through, which would require additional efforts in terms of planning and coordination. Because individual licensee information, in a large part, is considered "safeguards information" (under § 73.21), this analysis only examines licensees in the aggregate. Nevertheless, the analysis proceeds quantitatively for these attributes by making generalizing assumptions.

Due to the difficulty in quantifying the impact of this proposed rule, the analysis primarily relies upon a qualitative evaluation. Quantification of any of these attributes would require estimation of the frequency rate of attempted radiological sabotage and the impact of those attempts.

In accordance with OMB guidance and NUREG/BR-0058, Rev. 4, the results of the analysis are presented using both 3 percent and 7 percent real discount rates. The NRC seeks public comments on the accuracy of this regulatory analysis' assumptions and on the validity of the proposed rules' value and impact estimation methods.

3.1.5 Analysis of Values

The proposed rule would have a significant qualitative value or benefit associated with improving regulatory efficiency and increasing public confidence.

3.1.6 Analysis of Impact

There would be no impacts or costs associated with the proposed rule because of the full compliance baseline assumption. In other words, all costs would have been incurred under the baseline condition, so no costs are associated with the proposed rule.

3.1.7 Preferred Alternative

The proposed rule would have positive qualitative benefits and no costs. As such, it is the preferred alternative.

3.2 Pre-Order Analysis

The pre-order analysis measures the incremental costs and savings of the proposed rule relative to a baseline prior to the issuance of Commission orders regarding protection of SNF. This analysis accounts for incremental costs and savings associated with the Commission orders. It is presented here to give the reader an idea of the costs and savings that have already been incurred or would be incurred absent the proposed rule as a result of Commission orders.

3.2.1 Baseline for the Pre-Order Analysis

The pre-order analysis is based upon the regulatory requirements placed upon SNF in transit pre-9/11. As such, this analysis is based upon the existing requirements in §§ 73.37 and 73.72.

3.2.2 Identification of Affected Attributes in the Pre-Order Analysis

Using the list of potential attributes provided in Chapter 5 of NUREG/BR-0184, “Regulatory Analysis Technical Evaluation Handbook,” this subsection identifies the attributes that the proposed rule could affect. Relative to the pre-order baseline, the proposed rule would be expected to affect the following attributes:

Table 3-1: Listing of Expected Affected Attributes by the Proposed Rule Relative to the Pre-Order Baseline

Attribute	Expected Change
<i>Industry Implementation</i>	Licensees would need to make revisions to Transportation Physical Security Procedures, Training and Qualification Plans, among other implementation activities.
<i>Industry Operation</i>	Licensees would need to conduct additional security activities beyond those currently required.
<i>NRC Implementation</i>	The NRC would develop or revise guidance and inspection procedures and review changes to licensee security plans.
<i>NRC Operation</i>	The NRC Operations Center would answer calls from licensees prior to the shipment of SNF and when the shipment arrives at its destination.
<i>Regulatory Efficiency</i>	The proposed regulations would enhance regulatory efficiency vis-à-vis regulatory and compliance improvements.
<i>Safeguards and Security</i>	Increased safeguards and security would provide high assurance that the SNF activities do not constitute an unreasonable risk to the common defense and security as well as public health and safety and the environment.
<i>Public Health</i>	The risk of radiological sabotage, which would affect the public health and the environment, would be reduced.
<i>Occupational Health</i>	The risk of radiological sabotage, which would affect the occupational health, would be reduced.
<i>Other Government</i>	State and LLEAs interaction with licensees and the NRC would increase.
<i>Offsite Property</i>	The risk that off-site property would be affected by radiological releases resulting from radiological sabotage would be reduced.
<i>Improvements in Knowledge</i>	The level of knowledge on shipments of SNF would be increased.
<i>Environmental Considerations</i>	The risk of environmental contamination that could result from malevolent use of lost, stolen or diverted radioactive material would decrease.
<i>Other considerations</i>	Public confidence in the NRC would increase by providing accurate and timely information to the public about the NRC’s security activities and by providing fair, timely and meaningful stakeholder involvement in the NRC decision-making process through rulemaking process.

Relative to the pre-order baseline, the proposed rule would *not* be expected to affect the following attributes:

- *Public Health (Routine)*
- *Occupational Health (Routine)*
- General Public
- *Antitrust Considerations*

3.2.3 Methodology of the Pre-Order Analysis

This subsection describes the methodology used to analyze the incremental values and impacts associated with the proposed rule relative to the pre-order baseline described in 3.2.1 above. The values (savings) include any desirable changes in the affected attribute, while the impacts (costs) include any undesirable changes in the affected attribute. This analysis relies on both quantitative and qualitative analyses of the affected attributes. The quantitative analysis involves the assessment of costs and savings associated with the proposed rule. The qualitative analysis involves a discussion of those attributes that the NRC was not able to quantify.

In accordance with OMB guidance and NUREG/BR0058, Rev. 4, the results of the analysis are presented using both 3 percent and 7 percent real discount rates.

3.2.4 Affected Universe of the Pre-Order Analysis

The orders were issued to licensees who had shipped or received SNF during 1999 through 2002, and who expected to ship or receive SNF by June 2004. Since 2002, orders have been issued only to licensees that have given NRC advance notification of a SNF shipment. The licensees that would be affected by the proposed rule relative to the pre-order baseline are the commercial power reactor sites, decommissioning reactor sites, research and test reactors and ISFSI and a limited number of Part 70 licensees. For the pre-order analysis, it is assumed that only the 25 licensees that were issued SNF transportation security orders have incurred costs. However, even the licensees that have received the SNF transportation orders would incur costs in the pre-order analysis because the proposed rule adds new requirements that resulted from insights gained while implementing the security orders.

3.2.5 Analysis of Values in the Pre-Order Analysis

There are no *quantifiable* values (i.e. benefits) associated with the proposed rule. The qualitative values of the proposed rule are associated with safeguard and security considerations or the decreased risk of a security-related event, such as an act of sabotage or a terrorist attack. Increasing the security of SNF decreases this risk and increases the common defense and security of the nation. Other qualitative values that are positively affected by the decreased risk of a security-related event include public and occupational health due to an accident or event and the risk of damage to offsite property. Finally, public confidence in the NRC and its licensees could increase because the proposed rule would establish in the regulations the minimum performance standards and objectives for the protection of SNF shipments from theft, diversion, or radiological sabotage.

3.2.6 Analysis of Impacts in the Pre-Order Analysis

The assumptions used in analyzing the quantifiable impacts (costs) associated with the proposed rule are discussed in this subsection. The hourly rate applied to labor hours is \$100 (NRC) and \$100 (industry). These are NRC's incremental labor rate which includes only those variable costs associated with implementation and operation costs of the orders and the proposed rule. Use of this labor rate is consistent with Section 5.2 of NUREG/CR-4627, Generic Cost Estimates. It is assumed that licensees, applicants, and State contacts would have a similar labor rate.

3.2.6.1 Licensee Costs

Licensees would bear the largest share of this rule's costs with implementation. The costs are estimated to be \$968,726 for the first year. These costs include establishing a communication program (which includes maintaining 2 distinct means of communication), an armed transit personnel program, and a video surveillance program for equipping various modes of SNF transit.

3.2.6.2 NRC Costs

NRC costs annually would be minimal. The costs are estimated to be \$4,000. Costs would be bore from advance notifications and potential theft investigations.

3.2.6.3 State Government Costs

State Government costs annually would be minimal. The costs are also estimated to be \$4,000. Costs would be bore from advance notifications and potential theft investigations.

3.2.7 Results of the Pre-Order Analysis

The total annual costs associated with the proposed rule relative to the pre-order baseline over 10 years at a 7 percent discount rate are estimated to be \$6.80 million. Of this amount, shipping costs account for \$542,056 annually and the other costs for non-LLEA armed response, preplanning and coordination activities, documentation, advance notification and cancellations, recordkeeping, background checks, and investigations account for \$362,361 annually. At a 3 percent discount rate the total estimated annual operation costs of the proposed rule over 10 years would be \$8.25 million. Of this amount, shipping costs account for \$563,107 annually and the other costs for non-LLEA armed response, preplanning and coordination activities, documentation, advance notification and cancellations, recordkeeping, background checks, and investigations account for \$376,433 annually.

Although there are no quantitative benefits under the proposed rule alternative, the expected qualitative values contribute significantly to the benefits of the proposed rule relative to the pre-order baseline. These qualitative values include (1) a positive effect on public and occupational health, (2) increased protection of onsite and offsite property, (3) increased protection of the common defense and security of the nation, and (4) increased public confidence in the NRC and licensees.

4. Results

This section presents results of values and impacts (i.e., costs) that are expected to be derived from the proposed rule. To the extent that the affected attributes could be analyzed quantitatively, the net effect of each alternative 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 Tables 4-1 and 4-2. Table 4-3 provides the cost comparison for the 2 alternatives. The Rulemaking Alternative would result in no additional costs when compared to No-Action Alternative. The quantitative impact estimated for the Rulemaking Alternative is similar in size as the No-Action Alternative. Both are estimated to cost between \$6.80 million and \$8.25 million (7-percent and 3-percent discount rate, respectively). The majority of the costs would be incurred by industry.

There are no quantifiable values (i.e. benefits) associated with the rule. The qualitative values of the rule are associated with safeguard and security considerations or the decreased risk of a security-related event, such as theft, diversion, or radiological sabotage of SNF and subsequent use for malevolent purposes. Increasing the transportation security of SNF, the risk is decreased and the common defense and security of the nation is increased. Other qualitative values that are positively affected by the decreased risk of a security-related event include public and occupational health due to an accident or event and the risk of damage to on-site and off-site property. In addition, regulatory efficiency is enhanced by the rule.

TABLE 4-1

Summary of Benefits/Savings and Costs/Burdens for Main Analysis

Net Monetary Savings (or Costs) – Total Present Value in millions	Non-Monetary Benefits/Costs
<p>Alternative 1: No Action</p> <p>Industry: \$0</p> <p>NRC: (\$.13) using a 7% discount rate (\$.16) using a 3% discount rate</p>	<p><u>Qualitative Benefits:</u></p> <p>Safeguards and Security: Increased level of assurance that SNF shipments are safeguarded.</p> <p>Public Health (Accident): Reduced risk that public health would be affected by radiological releases from malevolent use of radioactive material.</p> <p>Occupational Health (Accident): Reduced risk that occupational health would be affected by radiological releases from malevolent use of radioactive material.</p> <p>Off-site Property: Reduced risk that off-site property would be affected by radiological releases from malevolent use of radioactive material.</p>

Net Monetary Savings (or Costs) – Total Present Value in millions	Non-Monetary Benefits/Costs
<p>Alternative 2: Rulemaking</p> <p>Industry: (\$6.67) using a 7% discount rate (\$8.09) using a 3% discount rate</p> <p>NRC: (\$.13) using a 7% discount rate (\$.16) using a 3% discount rate</p>	<p>On-site Property: Reduced risk that on-site property would be affected by radiological releases from malevolent use of radioactive material.</p> <p><u>Qualitative Costs:</u></p> <p>Regulatory Efficiency: Regulatory efficiency would be reduced by the need to issue security Orders to new licensees.</p> <p><u>Qualitative Benefits:</u></p> <p>Safeguards and Security: Increased level of assurance that SNF shipments are safeguarded.</p> <p>Public Health (Accident): Reduced risk that public health would be affected by radiological releases from malevolent use of radioactive material.</p> <p>Occupational Health (Accident): Reduced risk that occupational health would be affected by radiological releases from malevolent use of radioactive material.</p> <p>Off-site Property: Reduced risk that off-site property would be affected by radiological releases from malevolent use of radioactive material.</p> <p>On-site Property: Reduced risk that on-site property would be affected by radiological releases from malevolent use of radioactive material.</p> <p>Regulatory Efficiency: Enhanced regulatory efficiency through regulatory and compliance improvements.</p> <p><u>Qualitative Costs:</u></p> <p>None.</p>

4.1 Summary of Results

Table 4-2 presents the net impact of the rule. A positive value below is a cost. A number in parentheses is a negative cost, or a savings.

Table 4-2: Net Impact of Alternatives 1 and 2

Regulatory Alternative	10-year total at 3% discount rate (\$)	10-year total 7% discount rate (\$)
1. No-Action	\$0	\$0
2. Rulemaking	\$8,254,895	\$6,796,899

There are no “new” substantial costs to industry associated with the No-Action Alternative. No changes would be made to the regulation. The Part 73 licensees would continue to operate under the Orders. Costs have already been incurred for carrying out the Orders, which would have to be issued to new licensees.

There are no major contributing savings under the Alternative 2: Rulemaking, other than the decreased risks in theft, diversion, or radiological sabotage of radioactive materials. The NRC would realize savings from not issuing new and updating Orders to new and existing licensees.

- The risk of environmental contamination from radioactive materials would decrease.
- The risk of the affected off-site property would decrease.
- The risk of public health placed in grave danger would decrease.

Table 4-3 shows the estimated costs, by attribute, over the 10-year analysis period.

Table 4-3: Estimated Values and Impacts by Attribute

Attribute	Alternative 2: Rulemaking 10-Year Total Cost (million \$)	
	3% Discount	7% Discount
Industry Implementation*	0	0
Industry Operation	(8.09)	(6.67)
NRC Implementation	0	0
NRC Operation	(.16)	(.13)
Total	(8.25)	(6.80)

Note: Total may differ from sum of values due to rounding.

*Industry utilizes standing SNF transit infrastructure

5. DECISION RATIONALE AND IMPLEMENTATION

Two alternatives were evaluated in this Regulatory Analysis. The Alternative 1: No-Action Alternative would maintain the regulations as currently written and continue to retain requirements in orders and to issue new orders and re-issue existing orders as needed.

The Alternative 2: Rulemaking would amend NRC regulations to: (1) establish generically applicable security requirements similar to those previously imposed by Commission orders issued after the terrorist attacks of September 11, 2001; (2) establish the acceptable performance standards and objectives for the protection of SNF shipments from theft, diversion, or radiological sabotage; (3) ensure that the acceptable performance standards and objectives for SNF shipments apply to all licensees authorized to possess or transport SNF; and (4) address, in part, the requests for NRC rulemaking raised by Nevada petition PRM-73-10. Specifically, the rule would require the following: (1) armed guards throughout the rail and road route; (2) procedures for normal and contingency responses; (3) the training of personnel; (4) continuous and active monitoring of the SNF shipment by movement control center; (5) shipment preplanning and coordination with States; (6) constant visual surveillance by armed escort; (7) 2-way redundant communication capabilities; (8) a minimum of 2 weapons for armed guards; (9) additional NRC notifications; (10) armed escort instructions on the use of deadly force; and (11) background investigations for individuals granted unescorted access to SNF shipments.

The Alternative 2: Rulemaking would reduce the risk of radiological sabotage damage from SNF shipments, which could have grave consequences to the environment, off-site property, and public health. Therefore, the Rulemaking Alternative is the preferred approach. The proposed rule is planned for publication in the *Federal Register* in 2010.

6. References

NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Rev. 4.

NUREG 0725, "Public Information Circular for Shipments of Irradiated Reactor Fuel," Rev. 14.

NUREG 0561, "Physical Protection of Shipments of Irradiated Reactor Fuel," Rev. 1.

NUREG/BR-0184 "Regulatory Analysis Technical Evaluation Handbook, Final Report," Office of Nuclear regulatory Research, January 1997.

Appendix

73.37 (b)(1)(ii)-Non-LLEA Armed Escort Deadly Force Instruction.

The licensee or the licensee's agent shall ensure that each Non-LLEA armed escort prevent or impede attempted acts of radiological sabotage by using force sufficient to counter the force directed at that person, including the use of deadly force when there is a reasonable belief that the use of deadly force is necessary in self-defense or in the defense of others, or any other circumstances as authorized by applicable State or Federal law. Licensees have normally relied upon LLEA to escort SNF. In the past 30 years, the NRC is aware of one instance in which a Non-LLEA armed escort, which translates to 1 in 1285 shipments. There is no data to determine whether there would be any increase in the future.

Hours of staff time	8
Wage of staff per hour	\$100
Number of people requiring instruction	2
Cost of instruction per licensee	\$1,600
Number of hours for a training manager to prepare, training and document training	12
Wage of training manager	\$100
Cost for training documentation	\$1,200
Subtotal	\$2,800
Percentage of shipments per year affected (1/1285)	x 0.000778
Total annual cost	(\$2.170)

73.37(b)(1)(vii)- Document the Preplanning and Coordination Activities

The current regulations do not require the coordination of law enforcement escorts, the sharing of movement control information, or the coordination of safe haven locations. The proposed revisions would require licensees to preplan and coordinate spent fuel shipment information with the States through and to document these activities.

Hours of staff time	40
Cost of staff time per hour	\$100
	\$4000
Number of shipments	X 20
Total annual cost	(\$80,000)

73.37(b)(2)(v)-Cancellation notice

Although the current regulations require the NRC and the State to receive advanced notifications of shipments, there is no provision requiring the notification of a cancellation of a previously approved advanced notification. This is a rare occurrence. It is assumed that one would occur per 10 annual shipments.

Hours of staff time per call	0.33
Cost of manager's time per hour	\$100
	\$33.00
Number of cancellations per year (1/10)	
Total annual cost	(\$33.00)

73.37(b)(2)(i-ii) - Written advance notices

The current regulations do not require the coordination of law enforcement escorts, the sharing of movement control information, or the coordination of safe haven locations. The proposed revisions would require licensees to preplan and coordinate spent fuel shipment information with the States through and to document these activities.

Because shipments pass through multiple States, the licensee must coordinate with all of them. For the purposes of the Regulatory Analysis, we are using 5 State average per trip. Thus, the 20 annual shipments would require 100 written advance notices to States and advance notices to the NRC.

Hours of staff time	0.50
Cost of staff time	\$100
Number of notifications	120
Total annual cost of advance notifications	(\$6,000)

73.37(b)(3)(v) – Procedures

The licensee shall develop, maintain, revise and implement written transportation physical protection procedures. This procedure is needed to protect SNF during transport and that an adequate response can be taken to emergencies affecting the shipment.

Preparation of security plan and procedures necessary to implement the security program.

Hours of staff time for plan	150
Wage of staff per hour	\$100
Impacted Licensees	18
Total annual cost of staff time for plan	(\$270,000)

73.37(b)(1)(vi), (2)(v), (3)(iv-vi), and (4)(iii) - Records

Although there are record requirements in § 73.70, the SNF regulations in § 73.37 are not included. As such, the proposed rulemaking would require include new recordkeeping requirements. These records would include a copy of the preplanning and coordination activities, advance notification, and any revision or cancellation notice. The record is to be maintained for 3 years in accordance with § 73.70.

One time cost of additional file cabinets etc.	\$1,000
Number of Shipments	20
Costs of staff (clerical) time	\$50
Hours of staff time to maintain records per shipment	3.275
Total Recordkeeping Cost	(\$4,275)

73.37 – Shipping Costs

Industry has averaged 20 shipments of SNF via road and rail (collectively) per year over the last 5 years. For purposes of the regulatory analysis, an assumption of 20 shipments per year is used. NRC regulations define the modes of transport to be by “road,” “rail,” and “sea.” Road and sea modes would incur equal costs; shipping by rail would be lower. Nevertheless for this regulatory analysis, zero shipments by sea are assumed.

Industry has indicated that it is more cost effective to hire contractors to ship SNF through. The below mentioned costs take into consideration all the internal costs that contractors incur to be compliant with NRC orders and proposed regulation.

Ship by Road

Number of shipments	10
Average Trip Transit costs, including rental	\$3,000
Average Trip communication Costs	\$2,000
Contractor cost	\$25,000
Total annual cost by road	\$300,000

Ship by Rail

Number of shipments	10A
Average Trip Transit costs, including rental	\$1,000
Average Trip communication Costs	\$2,000
Contractor cost	\$25,000
Total annual cost by rail	\$280,000

73.38(a) - Background Investigation

73.38(a) is being added to the CFR to implement an access authorization program that requires background investigations of individuals involved with the transportation of SNF.

Number of hours to conduct a background check	6
Wage of manager per hour	\$100
	<hr/>
	\$600
Cost of credit history	\$20
Cost of taking fingerprints	\$10
Cost for fingerprint submission	\$36
Cost of background check	\$666
Number of individuals needing background checks	36
Total annual cost of background checks	(\$23,976)

73.72 - Advance Notification

The current regulations in 10 CFR 73.72(a)(4) requires NRC notification, by phone, 2 days before the shipment commences. It does not require 2 hour notification before the shipment commences and notification before it reaches its final destination. The proposed rule would require 2 additional notifications of the NRC, 1 to be made 2 hours before the shipment commences, and the other to be made when the shipment reaches its final destination. These additional notifications allow the NRC to monitor SNF shipments and to maximize its readiness in case of a safeguards event. The NRC estimates each phone to take 18 minutes for a total of 54 minutes of notifications per shipment.

Staff time to phone in advance notification per shipment	9
Cost of staff time per hour	\$100
Number of shipments per year	20
Total annual cost of advance notifications	(\$1,800)

73.37(f)- Event Investigations

Although licenses are required by § 73.71 to notify the NRC of any safeguards events and to submit a report concerning the event, there is no specific requirement for an investigation. This requirement is being added to address this issue. It is assumed that any safeguard events would be rare. This is a rare occurrence. It is assumed that one would occur every 3 years or every 60 shipments

Hours of staff time per investigation	40
Hours of staff to write report	40
Wage of staff per hour	\$100
Number of investigations per year (1/10)	X _____ 0.33
Total annual event investigation costs	(\$2640)