
**Draft Regulatory Analysis for Proposed Rule:
Access Authorization and Physical Protection during
Nuclear Power Plant Construction
(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 add access authorization and physical protection requirements during new nuclear power plant construction to the existing requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 73, “Physical Protection of Plants and Materials.” The proposed rulemaking codifies access authorization controls; physical inspections; lockdown measures and procedures for securing the security- and safety-related structures, systems, and components; and the performance of high-quality security sweeps before the nuclear power plant transitions to its operational phase.

The regulatory analysis examines the benefits and costs of the proposed access authorization and physical protection requirements during nuclear power plant construction relative to the baseline of current regulations and voluntary actions on the part of industry. The analysis makes the following key findings:

- **Total Cost to Industry, Including Backfits.** The proposed rule would result in a total one-time cost to all nuclear power plant construction sites of approximately \$7.1 million followed by total annual costs of approximately \$29 million during the construction period. The analysis estimates the total present value of these costs at \$109.2 million (using a 7-percent discount rate) and at \$118.88 million (using a 3-percent discount rate) over the 4-year construction period. Of the estimated costs to industry, fourteen percent qualify as backfits (see Section 4.2).
- **Average Cost per Construction Site for Power Reactors.** The average nuclear power plant construction site, which may include multiple units, would incur a one-time cost of approximately \$504,000 followed by annual costs during construction of approximately \$2.1 million.
- **Value of Benefits Not Reflected Quantitatively.** With the exception of some direct monetary savings to industry, the cost figures shown above do not reflect the value of the benefits of the proposed rule. Section 4.1 qualitatively evaluates these benefits.
- **Costs to the NRC.** The rule would result in a one-time cost to the NRC of approximately \$2.6 million, followed by annual costs of approximately \$400,000. The analysis estimates the total present value of these NRC costs at \$4 million (using a 7-percent discount rate) and at \$4.1 million (using a 3-percent discount rate).
- **Decision Rationale.** The NRC believes that the rule is cost-justified because the proposed regulatory initiatives for increased and consistent access authorization and physical protection measures during nuclear power plant construction would deter and detect malicious acts that could compromise the safe construction and subsequent operation of new nuclear power plants. This deterrence and detection of malicious activities will increase public health and safety, promote the common defense and security, and protect the environment.

The proposed rule would apply to any new nuclear power reactor construction after the effective date of the final rule, including those referenced in both construction permit and combined license applications that the NRC has received to date. Because access authorization and

physical protection costs are primarily a function of the site rather than the reactor design, the regulatory and backfit analyses reflect costs associated with construction permits in deferred status, and those units covered by new combined license applications. This analysis estimates that one-time and annual costs to implement the proposed access authorization and physical protection measures will be approximately equal for new power reactors constructed at Greenfield sites with those co-located with currently operating nuclear power plants (i.e., because the development of construction security plans for the new sites will require similar development and implementation efforts). In addition, the quantitative results do not reflect any incremental cost difference between the construction permit and combined license plants because of the uncertainty associated with the duration of the construction period and with when these facilities will be licensed and operated.

Acronyms

ADAMS	Agencywide Documents Access and Management System
CFR	<i>Code of Federal Regulations</i>
COL	combined license
CP	construction permit
NEI	Nuclear Energy Institute
NRC	U.S. Nuclear Regulatory Commission
SSC	structure, system, and component

1. Introduction

The U.S. Nuclear Regulatory Commission (Commission or NRC) is proposing to add requirements for access authorization and physical protection during new nuclear power plant construction to the existing requirements in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 73, "Physical Protection of Plants and Materials." Specifically, the proposed rule would require licensees to implement physical protection measures during the reactor construction phase. These would include access authorization controls; physical inspections; lockdown measures and procedures for securing the security- and safety-related structures, systems, and components (SSCs); and the performance of high-quality security sweeps before the nuclear power plant transitions to its operational phase.

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

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

1.1 Statement of the Problem and Objective of the Rulemaking

Current NRC regulations do not include requirements for access authorization or physical protection at nuclear power plant construction sites before the receipt of nuclear fuel. Although licensees may provide industrial or commercial security during construction to reduce commercial risk, the lack of required security measures before receipt of fuel is inconsistent with the potential security risk stemming from malicious activities that could occur during the construction of new nuclear power plants. This omission could result in an inadequate level of assurance of a licensee's ability during construction to deter or detect malicious activities that could adversely affect the safe construction and subsequent operation of security- and safety-related systems and components at NRC-regulated commercial nuclear power plants.

The objective for this rulemaking is to substantially enhance security at nuclear power plant construction sites by providing mechanisms to deter and detect malicious acts during construction that could later be used to cause or facilitate a radiological sabotage event during plant operation.

1.2 Background

The requirements for the physical protection measures and the access authorization program for granting individuals unescorted access to protected areas of operating nuclear power plants appear in 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors against Radiological Sabotage." These regulations apply upon the receipt of nuclear fuel onsite within the protected area.

Discussions with terrorist experts confirmed that both domestic and international terrorist groups have targeted, or have expressed the intent to target, nuclear facilities in the United States. These terrorist groups have demonstrated the capacity to perform acts of sabotage and

violence capable of destroying property. Some groups are on record as strongly opposing the expansion of the nuclear power industry in the United States.

The primary concern relative to terrorist-related activities during the new reactor construction period is the ability of potential adversaries to introduce undetected defects into security- or safety-related SSCs or to pre-position construction site restricted items (e.g., unauthorized firearms, explosives, or incendiary devices) that could be used for malicious purposes after the plant is operational.

On September 7, 2006, the NRC staff provided the Commission with an information paper that describes the agency's plans to work with the nuclear power reactor industry to develop appropriate access authorization and physical protection measures for nuclear power plants under construction. These plans included the development of measures designed to deter or prevent potential adversaries from gaining site-specific information and to deter malevolent acts of terrorism or other activities that could compromise the safe construction or subsequent operation of security- or safety-related SSCs.

As a result of the September 7, 2006, memorandum, the NRC staff held working-level meetings with the industry's New Plants Security Task Force and discussed numerous issues associated with security at new reactor construction sites. These meetings culminated in the development of Revision 2 to Appendix F, "Security Measures during New Reactor Construction," to Nuclear Energy Institute (NEI) 03-12, "Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan" (NEI's template for a generic power reactor security plan), issued September 2007. Appendix F outlines security measures for the construction phase of a new nuclear power plant, independent of whether the plant is to be constructed within an existing owner-controlled area or on an undeveloped or greenfield site. Applicants may voluntarily choose to incorporate the security measures that appear in Appendix F into their security plans.

On November 30, 2007, the NRC staff requested in an information paper that the Commission approve the establishment of construction site personnel access authorization and physical protection requirements for holders of combined licenses (COLs), construction permits (CPs), or limited work authorizations.

On January 23, 2008, the Commission issued a staff requirements memorandum in response to SECY-07-0211, approving the NRC staff proposal to establish access authorization and physical protection requirements for new nuclear power reactor sites under construction, consistent with Appendix F to NEI 03-12. In addition, the Commission authorized the NRC staff to continue to work with industry to develop alternative measures in lieu of fingerprint submission and to resolve open items related to physical protection. The Commission also stated that the NRC staff should leave the option of fingerprinting open as a last resort if alternative measures could not be developed and should request public comment on this issue. The Commission also authorized the NRC staff to pursue access authorization and physical protection rulemaking that would apply to nuclear power plant construction sites.

On March 16, 2010, the staff released "Draft Rule Language—Access Authorization and Physical Security for Nuclear Power Plant Construction" (ADAMS Accession No. ML100750461). After its release, the staff held a public meeting with stakeholders on March 31, 2010, to exchange views and information on the goals and objectives contained in

the proposed rule text. Feedback received during the March 31, 2010, public meeting included the need to focus the proposed rule on performance-based versus specific requirements and to simplify the rule text with clear objectives and framework. A summary of the public meeting is available in ADAMS under Accession No. ML101090147. On August 27, 2010, the staff held a second public workshop to discuss the status and schedule of the proposed rulemaking. The workshop objective was to facilitate improved stakeholder understanding of the proposed rule so that stakeholders could provide informed comments on the proposed rule during the public comment period. A summary of the public meeting is available in ADAMS under Accession No. ML102440075.

The NRC believes that this proposed rulemaking would substantially enhance security at nuclear power plant construction sites by providing mechanisms to deter and detect malicious acts during construction that could have a latent or delayed effect and could later be used to cause or facilitate a radiological sabotage event during plant operation.

2. Identification and Preliminary Analysis of Alternative Approaches

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

2.1 Option 1: No Action

Under Option 1, the no-action alternative, the NRC would not amend the current regulations at 10 CFR Part 73 on access authorization and physical protection for nuclear power plant construction. Current NRC regulations do not include requirements for access authorization or physical protection at nuclear power plant construction sites before the receipt of nuclear fuel. Holders of CPs and COLs would continue to comply with existing regulations. They may also choose to voluntarily implement a construction-related, industrial security program predicated on such drivers as insurance, banking, safety, and common risk, asset protection and loss prevention policies common in the course of conducting business. Option 1 would avoid costs that the proposed rule would impose; however, it would leave the existing security issues during nuclear power plant construction unresolved and would not reflect the requirements that the NRC considers necessary to assure the adequate protection of public health and safety and the common defense and security. Option 1, which is the no-action alternative, is the baseline for this regulatory analysis.

2.2 Option 2: Amend Regulations To Provide for Access Authorization and Physical Protection Requirements during Nuclear Power Plant Construction

Under this option, the NRC would require licensees to implement physical protection measures, access authorization controls, physical inspections, the performance of high-quality security sweeps, and lockdown measures and procedures for securing the security- and safety-related SSCs before the nuclear power plant transitions to its operational phase. The rule would require licensees to implement access authorization and physical security measures before the scheduled onsite in-place setting, installation, or erection of security- or safety-related SSCs in the areas in which they will be permanently operated.

The rule would also require licensees to perform the following security inspection activities before implementing the required lockdown procedures:

- Conduct lockdown measures and procedures for securing the security- and safety-related SSCs before the plant enters its operational phase.
- Perform high-quality security sweeps before the licensed material arrives and the nuclear power plant transitions to its operational phase.

Once this rule becomes effective, each CP holder or each combined licensee that has not received a 10 CFR 52.103(g) finding that the acceptance criteria in the combined license are met would be required to submit a construction security plan and the proposed schedule for implementing the construction security program for NRC review and approval. To allow for the planning of NRC inspections, licensees would need to notify the agency by letter at least 60 days before implementing the physical protection measures identified in 10 CFR 73.52(f).

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

3. Estimation and Evaluation of Values and Impacts

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

3.1 Identification of Affected Attributes

This section identifies the factors within the public and private sectors that the final rule is expected to affect, using the list of potential attributes in Chapter 5 of NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook," issued January 1997 (Ref. 1), and in Chapter 4 of NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Revision 4, issued September 2004 (Ref. 3). The evaluation considered each attribute listed in Chapter 5 of NUREG/BR-0184. The basis for selecting those attributes is presented below.

Affected attributes include the following:

- Occupational Health (Accidents). The action would reduce the risk that occupational health could be affected by radiological releases resulting from radiological sabotage.
- Industry Implementation. The action would require licensees to implement physical protection measures during new nuclear power plant construction and to prepare and implement a construction security plan.
- Industry Operation. The proposed action would require licensees to conduct additional security activities beyond those currently being conducted voluntarily. Specifically, the

rule would require access authorization controls, physical inspections, lockdown measures and procedures for securing the SSCs, and the performance of high-quality security sweeps before the plant transitions to its operational phase. The regulatory action would also require licensees to retain records.

- **NRC Implementation.** Under the proposed action, the NRC would develop or revise guidance and inspection procedures and review and approve licensee construction security plans as a result of the new requirements.
- **Public Health (Accidents).** The proposed action would reduce the risk that public health could be affected by radiological releases resulting from radiological sabotage.
- **Offsite Property.** The proposed action would reduce the risk that offsite property could be affected by radiological releases resulting from radiological sabotage.
- **Onsite Property.** The proposed action would reduce the risk that onsite property could be affected by radiological releases resulting from radiological sabotage.
- **NRC Operations.** The proposed action would require the NRC to conduct periodic inspections during nuclear power plant construction related to the new requirements. In addition, the proposed action would require licensees to submit reports to the NRC for review.

Attributes that the rulemaking options should *not* affect include the following: (1) occupational health (routine), (2) public health (routine), (3) regulatory efficiency, (4) environmental considerations, (5) general public, (6) safeguards and security considerations, (7) improvements in knowledge, and (8) antitrust considerations and other Government regulations.

3.2 Analytical Methodology

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

The NRC collected input assumptions using data and information from NRC workgroups and staff experience and NRC databases.

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

- industry implementation
- industry operation
- public health (accidents)
- occupational health (accidents)
- NRC implementation
- offsite property
- onsite property
- NRC operations

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

3.2.1 Model Design

This section describes the cost model and the data sources used to calculate the values and impacts for the attributes affected by the proposed rule.

3.2.2 Data and Assumptions

The main analysis assumes that one-time implementation costs will be incurred in calendar year 2011. The analysis assumes that ongoing costs of implementing access authorization and physical security measures during plant construction related to the rule will begin in 2011 and will be modeled on an annual cost basis. The analysis calculated cost and savings over a 20-year time horizon with each year's costs or savings discounted back at a 7-percent and 3-percent discount rate in accordance with NUREG/BR-0058, Revision 4. Costs and savings are expressed in 2010 dollars.

3.2.2.1 Data/Affected Entities

The analysis makes the following assumptions regarding the entities affected (licensees):

- The NRC is estimating 14 total reactor construction sites for this review, including the 13 COL applications currently under review by the NRC and 1 construction permit in deferred status. The NRC does not expect to receive any additional COL applications until fiscal year 2012. However, the licensing and construction of these new nuclear power plants may become the impetus for new COL applications.
- The analysis assumes that each construction site will employ approximately 4,000 workers.

3.2.2.2 Other Data and Assumptions

The analysis makes the following other assumptions:

- The analysis assumes that the labor rate for the NRC staff is \$119 per hour.
- The analysis assumes a \$100 per hour labor rate for licensee nonsecurity-related personnel.
- The analysis assumes a \$30 per hour labor rate for licensee security personnel and a \$35 per hour labor rate for licensee reviewing officials.

- The analysis assumes that the final rule will become effective in December 2011.
- The analysis assumes that the ongoing costs of construction security related to the rule begin in 2011 and are modeled on an annual cost basis. Ongoing costs related to the no-action alternative are zero because current NRC regulations do not include requirements for access authorization or physical protection at nuclear power plant construction sites before the receipt of nuclear fuel.
- For the analysis, the NRC assumed that all COL applications currently under active review would be approved and issued on their current published schedules. The NRC assumed that two CP holders would request the reinstatement of their CP for facilities in either a deferred or terminated plant status. In addition, the NRC assumed that each COL applicant who receives their combined license would begin construction upon issuance of the COL and that construction would span a period of 4 years.
- The NRC assumed that any one-time implementation costs would be incurred during the first year following the reactivation of their CP or the scheduled receipt of their COL. One-time costs for the second unit of a two-unit construction site would be incurred 4 years after receipt of the COL for that site.
- The analysis calculated cost and savings over a 4-year construction timeframe and a 3-year postconstruction recordkeeping 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, Revision 4.
- To the extent practical, quantitative information (e.g., costs and savings) and qualitative information (e.g., the nature and magnitude of impacts) on attributes affected by the rule were obtained from, or developed in consultation with, the NRC staff.

3.3 Detailed Results

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

Option 1: No Action

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

Option 2: Amend Regulations To Provide for Access Authorization and Physical Protection Requirements during Nuclear Power Plant Construction

Industry Implementation

Impact: Written Construction Security Plan

- The regulation at 10 CFR 52.79, “Contents of Applications; Technical Information in Final Safety Analysis Report,” requires CP applicants, COL applicants, and applicants that request the reinstatement of a CP for facilities in either a deferred or terminated plant status to submit the written construction security plan with the proposed implementation schedule and proposed milestones for NRC review. The NRC estimates that each construction site will require 800 hours to prepare and approve a construction security plan with an implementing schedule for submittal to the NRC. This is an \$80,000 one-time cost to each licensee.

Impact: Detailed Site-Specific Security Procedures

- The regulation at 10 CFR 50.54(ii)(3) requires CP holders and combined licensees to maintain the construction security plan and to annually review all plan elements. The NRC estimates that each construction site will require 320 hours to prepare and approve procedures for developing and maintaining its construction security plan and its detailed construction security procedures. This is a \$32,000 one-time cost to each licensee.

Impact: Badge Program – The Initial Setup Cost for the Badge Machine and the Initial Issuance of Badges for Construction Personnel

- The regulation at 10 CFR 73.52(d) requires CP holders and combined licensees to establish, implement, and provide a badge program. Identification badges with photographs shall be required to gain access to the areas with security- and safety-related SSCs. This is a one-time cost of \$12,000 per licensee that includes \$8,000 for the purchase and setup of the badge machine and a cost of \$1 per badge.

Impact: Barrier

- The regulation at 10 CFR 73.53(d) requires CP holders and combined licensees to install a barrier to implement the access control requirements. This is a one-time cost of \$175,000 per licensee for a 5,000-linear-foot barrier at an installation cost of \$35 per foot.

Impact: One-time Equipment Cost

- The regulation at 10 CFR 73.52(d) requires each CP holder and combined licensee to meet specific security requirements. To fulfill these requirements, the NRC estimates that the licensees would obtain equipment, including a trailer, computer, safe, cabinets, patrol vehicles, radios, flashlights, uniforms, mirrors, hand-held metal detectors, and lockers. This is a one-time cost of \$197,150 per licensee.

Impact: Letter Notifying the NRC of Onsite Work on Security- and Safety-Related SSCs

- The regulation at 10 CFR 73.52(f) requires the licensee to report to the NRC the scheduled onsite in-place setting, installation, or erection of security- and safety-related SSCs in the areas in which they will be operated. This is a one-time cost of \$4,000 per licensee. This effort will require 40 labor hours to complete.

Impact: Letter Notifying the NRC of the Scheduled Implementation of Lockdown Procedures

- The regulation at 10 CFR 73.52(f) requires the licensee to report to the NRC the scheduled implementation of lockdown procedures, including the commencement of security sweeps. This is a one-time cost of \$4,000 per licensee. This effort will require 40 labor hours to complete.

NRC Implementation

Impact: Review of the Licensee Written Construction Security Plan

- This is a \$168,980 one-time cost to the NRC per licensee. This effort will require 1,420 labor hours per construction security plan to complete the review. The effort will require the development of a template for the construction security safety evaluation report (80 hours), a written construction security standard review plan (80 hours), security plan reviews (700 hours), and the development of the safety evaluation report (560 hours).

Impact: Review of the Licensee Letter Notifying the NRC of Onsite Work on Security- and Safety-Related SSCs

- This is a \$9,520 one-time cost to the NRC per licensee. This effort will require 80 labor hours per letter to complete.

Impact: Review of the Licensee Letter Notifying the NRC of the Implementation of Lockdown Procedures

- This is a \$9,520 one-time cost to the NRC per licensee. This effort will require 80 labor hours per letter to complete.

Industry Operation

Impact: Report Changes to the Construction Security Plan

- The regulation at 10 CFR 50.54(ii)(2) allows the licensee to make changes to its construction security plan without prior Commission approval if the changes do not decrease the effectiveness of the plan. The licensee shall maintain records of construction security plan changes made without prior Commission approval and shall submit a report containing a description of each change within 60 calendar days after the change is made. The NRC estimates that each licensee will submit one report annually. This is an \$8,000 annual cost per licensee.

Impact: Annual Independent Review of Construction Security Plan and Findings Report

- The regulation at 10 CFR 50.54(ii)(3) requires the licensee to provide for the development, revision, implementation, and maintenance of its written construction security plan. The licensee shall ensure that all plan elements are reviewed by individuals independent of both security plant management and personnel who have direct responsibility for implementation of the construction security plan at intervals not to exceed 12 months. These reports must be maintained in an auditable form and made available for inspection. This is a \$4,200 annual cost per licensee. This effort will require 42 labor hours per licensee to review all plan elements, consider management's findings on the effectiveness of the plan, assess actions taken from prior plan reviews, document the results, and report the findings.

Impact: Corrective Action Program

- The regulation at 10 CFR 50.54(ii)(5) requires licensees to track, trend, and document the actions taken to correct and prevent the recurrence of failures and deficiencies in the construction access authorization and physical protection program. This is a \$4,000 annual cost per licensee. This effort will require 40 labor hours per review.

Impact: Construction Access Program

- The regulation at 10 CFR 73.52(d)(1)(ii)(A)(1)(i) requires licensees constructing nuclear power plants to collect and review construction worker demographic data as a precondition for initial access to construction areas with security- and safety-related SSCs. Collected demographic information must be electronically submitted to the NRC, and the results must be reviewed. The NRC estimates that the maximum construction workforce is 4,000 workers per construction site and that it would take 2 hours to collect, review, process each worker, and transmit the data file to the NRC. This is a \$280,000 annual cost per licensee to support the reviewing officials who will oversee and perform many of the functions required by the site access authorization requirements during nuclear power plant construction.

Impact: Badge Program

- The regulation at 10 CFR 73.52(d) requires the licensee to establish, implement, and provide a badge program. Identification badges with photographs would be required to gain access to the areas with security- and safety-related SSCs. This is a \$5,500 annual cost per licensee that includes an estimated 45 hours of labor for badge issuance and \$1,000 for badge maintenance per year.

Impact: Site Physical Security Requirements

- The regulation at 10 CFR 73.52(d) requires the licensee to implement physical security requirements for the deterrence of malicious acts, including onsite surveillance at the nuclear reactor construction site, assessment and reporting procedures for incidences of malicious acts during construction, and a construction site security force composed of personnel to implement measures in accordance with the construction security plan. The licensee shall have physical security measures in place to control access and channel personnel, vehicles, and materials to planned access portals into the controlled construction access area. The licensee would establish a personnel, vehicle, and material search and inspection process to deter the introduction of unauthorized firearms, explosives, and incendiary devices. This is an annual cost of \$1,747,200 per licensee. The labor cost for this effort is associated with a physical security workforce on duty 24 hours per day. The NRC estimates that the costs associated with attrition and training will add an additional 12.5 percent.

Impact: Demonstration of a Site's Ability To Meet Security Requirements

- The regulation at 10 CFR 73.52(b)(3) requires the licensee constructing a nuclear power plant to demonstrate, upon the request of an authorized NRC representative, its ability to meet NRC requirements through the implementation of the construction security plan, including the ability of personnel to perform the assigned duties and responsibilities required by the construction security plan and licensee procedures. This is an annual cost of \$8,000 per licensee. The NRC estimates that each construction site will require 80 hours to prepare, demonstrate, and follow up on inquiries from the NRC. The NRC assumes that this request will occur once a year at each construction site.

Impact: Recordkeeping

- This is a \$12,000 annual cost per licensee. This effort will require 120 hours of effort annually. The NRC estimates that this effort will require 10 hours per month for the 4 years of construction and an additional 3 years after the site becomes operational.

NRC Operation

Impact: Review of Reports on Changes to the Construction Security Plan

- This is a \$9,520 annual cost to the NRC per licensee. This effort will require 80 labor hours per report. The NRC estimates that each licensee will submit an average of two reports annually.

Impact: Review of Demographic Data Check Reports

- This is a \$9,520 annual cost to the NRC per licensee. This effort will require 80 labor hours per report. The NRC estimates that each licensee will submit an average of two reports annually.

Impact: Inspection To Verify the Licensee's Ability To Demonstrate Its Ability To Meet Security Requirements

- This is a \$9,520 annual cost to the NRC per licensee. This effort will require 80 labor hours per licensee. The NRC estimates that it will inspect each licensee an average of once a year.

Exhibit 3-1
Quantitative Results
(Total Present Value for the Cost Associated
with the Project Life of One Plant)
 Value (+) or Impact (-)

	One-time Startup Costs	Total Startup Costs	Annual Operating Cost	*Total Project Cost with 3% Discount Rate	*Total Project Cost with 7% Discount Rate
Industry	\$504,150	\$504,150	\$2,068,900	\$8,194,455	\$7,511,951
NRC	\$188,020	\$188,020	\$188,020	\$886,909	\$824,883
Total	\$692,170	\$692,170	\$2,256,920	\$9,081,364	\$8,336,834

* The total project equals a 4-year construction timeframe.

Exhibit 3-2
Quantitative Results
(Total Present Value for the Cost Associated
with the Project Life of All Plants)
 Value (+) or Impact (-)

	One-time Startup Costs	Total Startup Costs	Annual Operating Cost	Total Annual Operating Cost	*Total Project Cost with 3% Discount Rate	*Total Project Cost with 7% Discount Rate
Industry	\$504,150	\$7,058,100	\$2,068,900	\$28,964,600	\$114,722,368	\$105,167,319
NRC	\$188,020	\$2,632,280	\$28,560	\$399,840	\$4,118,525	\$3,986,623
Total	\$692,170	\$9,690,380	\$2,097,460	\$29,364,440	\$118,840,893	\$109,153,942

* The total project equals a 4-year construction timeframe.

4. Presentation of Results

4.1 Values and Impacts

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

Exhibit 4-1 summarizes the results of the value-impact analysis. Relative to the no-action alternative (Option 1), Option 2 would result in a net quantitative impact estimation of \$118,840,893 over a 4-year period at a 3-percent discount rate and \$109,153,942 over a 4-year period at a 7-percent discount rate.

Exhibit 4-1
Summary of Values and Impacts at a Discount Rate of 3 Percent

Regulatory Option	Net Value (+) or Impact (-) (Total Present Value)	Qualitative Values/Impacts
Option 1: No Action	\$0	Not Applicable
Option 2: Proposed Action	<u>Industry:</u> \$114,722,368 <u>NRC:</u> \$4,118,525	<u>Values:</u> <i>Occupational Health (Accidents)</i> —The action would reduce the risk that occupational health will be affected by radiological releases resulting from radiological sabotage. <i>Public Health (Accidents)</i> —The proposed action would reduce the risk that public health will be affected by radiological releases resulting from radiological sabotage. <i>Offsite Property</i> —The proposed action would reduce the risk that offsite property will be affected by radiological releases resulting from radiological sabotage. <i>Onsite Property</i> —The proposed action would reduce the risk that onsite property will be affected by radiological releases. <u>Impacts:</u> None

4.2 Backfit Analysis

The NRC has determined that, except for possibly 2 cases, the backfit rule, 10 CFR 50.109, and comparable provisions in 10 CFR part 52, do not apply to this proposed rule and, therefore, a backfit analysis is not required, because the proposed rule does not contain any provisions which either impose backfitting as defined in the backfit rule or is otherwise inconsistent with any of the comparable backfitting and finality provisions in part 52. The proposed access authorization and physical protection requirements apply only to nuclear power plant construction performed under a construction permits or a combined license. The backfitting issues for construction permits and combined licenses are discussed below.

The access authorization and physical protection during nuclear power plant construction rule applies to construction permits issued after the effective date of the rule. To the extent that the access authorization and physical protection during nuclear power plant construction rule revises the requirements for future construction permits, the requirements do not constitute backfitting, because the requirements in the proposed access authorization and physical protection during nuclear power plant construction rule are prospective in nature and effect. The backfit rule was not intended to apply to every NRC action which substantially changes the expectations of future applicants under 10 CFR part 50. There are no current holders of construction permits or any expected to be issued before the effective date of the final rule or for several years thereafter. There are two plant sites who have begun construction under construction permits but whose construction permits were placed in deferred status at the permit holder's request. Although the NRC does not expect either of these deferred construction permits to apply for reactivation before the effective date of the final rule should this possibility occur, the proposed rule would apply. One of these sites is in discussion with the NRC regarding activities necessary to reactivate its construction permit. However, this partially constructed nuclear power plant site is located within an existing protected area of a nuclear power facility subject to the requirements of 10 CFR 73.55. If the NRC approves the reactivation of this plant's construction permit before the effective date of the final rule, the construction site already meets the requirements of the proposed rule under proposed § 73.52(a)(3) and therefore the requirements of the proposed rule do not constitute backfitting. The NRC has not been notified that the second plant with a construction permit in deferred status plans to reactivate its construction permit. This situation would raise backfit concerns should it occur and is addressed below.

The NRC is reviewing 13 COL applications with the first combined license scheduled to be issued after the scheduled effective date of the final rule. Therefore there is no backfitting of current or expected future holders of combined licenses. The NRC does recognize, however, that these schedule dates could change. If the first COL is issued before the effective date of the final rule, this situation would raise a backfit concern, which is addressed below.

Although neither situation is anticipated to occur, the NRC assumed for this backfit analysis that one CP holder would request the reinstatement of their CP for their facility in a deferred plant status that is not located within an existing protected area of a nuclear power facility and one combined license applicant would receive their COL before the final rule becomes effective.

This new proposed rule to address the requirements for access authorization and physical protection during nuclear power plant construction is based both on enhanced public health and enhanced safety and common defense and security but is not necessary for adequate protection. Rather, it would be to enhance the facility's inherent robustness. The NRC also evaluated the aggregated set of requirements that constitute backfits in accordance with 10 CFR 50.109 to determine if the costs of implementing the rule would be justified by a substantial increase in public health and safety or the common defense and security. In performing this analysis, the NRC considered the quantitative and qualitative costs and benefits of the rule, as discussed below.

For the two nuclear power plant construction site that were postulated to have backfit issues, these backfits would mean an initial one-time cost of approximately \$500,000 for each site followed by annual costs of about \$2.1 million per site. The NRC estimates that the backfits would result in a total cost of approximately \$1 million in one-time costs and about \$4.2 million in annual costs. The NRC considered access authorization and physical protection benefits in quantitative terms during nuclear power plant construction afforded by the proposed rule's provisions, as documented in Section 4.1 of the regulatory analysis. The NRC also qualitatively determined whether the costs of the rule would be justified in light of the construction security benefits. In contrast, the NRC evaluated costs in quantitative terms, as documented in Section 4.1 to the regulatory analysis. In performing this analysis, the NRC considered the following nine factors in 10 CFR 50.109:

(1) Statement of the Specific Objectives That the Proposed Backfit Is Designed To Achieve

This proposed rulemaking aims to introduce access authorization and physical protection regulations pertaining to nuclear power reactors under construction.

The objectives of the proposed rule are as follows:

- Deter malicious acts to security- and safety-related SSCs during nuclear power plant construction. These actions would substantially enhance security at nuclear power plant construction sites by providing mechanisms to deter and detect malicious acts during construction that could later be used to cause or facilitate a radiological sabotage event during plant operation.
- Detect malicious acts to security- and safety-related SSCs after the implementation of lockdown procedures. These actions would substantially enhance security at nuclear power plant construction sites by providing mechanisms to deter and detect malicious acts during construction that could later be used to cause or facilitate a radiological sabotage event during plant operation.
- Enhance nuclear plant construction security by codifying improvements to requirements in the following areas:
 - physical protection measures
 - access authorization controls

- physical inspections
- security sweeps
- lockdown measures and procedures for securing the security- and safety-related SSCs

(2) General Description of the Activity That Would Be Required by the Licensee or Applicant To Complete the Backfit

In general terms, the proposed rule would ensure that the CP holder who reactivated its construction permit and the combined licensee who received its combined license before the effective date of the final rule consistently implement new access authorization and physical protection measures during the construction of nuclear power plants. Section 3.3 of this regulatory analysis presents a detailed analysis of the activities and procedural changes required by the proposed rule. Each of the following backfits generally described below would potentially affect only these two construction sites:

- Written Construction Security Plan

The proposed rule language would require CP holders and combined licensees to submit and maintain a written construction security plan with the proposed implementation schedule and proposed milestones for NRC review and approval.

- Detailed Site-Specific Security Procedures

The proposed rule language would require CP holders and combined licensees to develop, approve, and maintain procedures, training, and guidance for implementing the construction security plan to ensure that plant construction security is clear and conveys the construction protective measures deemed appropriate.

- Construction Site Badge Program

The new measures would require CP holders and combined licensees to establish a construction site badge program to provide the appropriate identification of personnel who are granted construction site access or those in visitor status who are authorized to be in the area.

- Construction Site Barrier

The proposed rule would require CP holders and combined licensees to establish and place a site barrier(s) to maintain a clear separation of the controlled access construction area occupied by security- and safety-related SSCs from the surrounding area and to facilitate the conduct of access controls. Licensees and CP holders may already have a construction site barrier(s) via a voluntary initiative that accomplishes the intent of the proposed rule. Licensees, however,

would need to review and confirm or (if necessary) revise the existing site barrier to reflect the revised rule.

- Annual Independent Review of the Construction Security Plan

The proposed rule would require CP holders and combined licensees to review the effectiveness of the construction security plan using independent personnel who are not regularly associated with the management and day-to-day implementation of the construction security plan. The proposed rule would also require licensees to implement and compile a report of the results, inform the licensee corporate management of those results, and keep the annual effectiveness evaluation in a form that is available for subsequent inspection by the NRC.

- Corrective Action Program

The proposed rule would require CP holders and combined licensees to identify and correct failures and deficiencies discovered in the construction security plan using the corrective action operational program.

- Construction Access Program

The proposed rule would require CP holders and combined licensees to establish a construction access program, procedures, and training to certify, grant, deny, unfavorably terminate, or maintain a construction worker's access to the construction site.

- Demographic Data Checks

The proposed rule would require CP holders and combined licensees to verify a construction worker's identity before granting him or her access to the controlled access construction areas following the issuance of the construction security plan. At a minimum, CP holders and combined licensees must validate the individual's identity by evaluating an accumulation of information developed from other background investigation sources (e.g., previous employment records and personal references). The CP holders and combined licensees must also conduct a semiannual NRC demographic data check for all personnel that had access to areas with security and safety-related SSCs within the last 365 days. Licensees and CP holders must electronically submit demographic data compiled for initial construction site access and for semiannual data checks to the NRC within 10 days.

- Site Physical Security Requirements

The proposed rule would require CP holders and combined licensees to establish and maintain a construction security force that is staffed, trained, and equipped to implement the construction security plan. CP holders and combined licensees may already have a construction security force via a voluntary initiative that

accomplishes the intent of the proposed rule. CP holders and combined licensees, however, would need to review and confirm whether the existing construction site security force is sufficient to implement the intent of the proposed rule.

(3) Potential Change in the Risk to the Public from the Accidental Offsite Release of Radioactive Material

This rulemaking would enhance the construction sites' security robustness which would reduce the likelihood of core damage or spent fuel damage resulting from malicious acts. The rulemaking will provide added assurance that the risk resulting from malicious acts during construction remains acceptably low by providing mechanisms to detect and deter malicious acts during construction that could have a latent or delayed effect and could potentially cause a radiological sabotage event during plant operation.

(4) Potential Impact on Radiological Exposure of Facility Employees

This rulemaking would enhance the construction sites' security robustness which would reduce the likelihood of core damage or spent fuel damage. The rulemaking will provide added assurance that the risk resulting from malicious acts during construction remains acceptably low by providing mechanisms to detect and deter malicious acts during construction that could have a latent or delayed effect and could potentially cause a radiological sabotage event during plant operation.

(5) Installation and Continuing Costs Associated with the Backfit, Including the Cost of Facility Downtime or the Cost of Construction Delay

The backfit analysis for the proposed rule provides the NRC's estimate of the initial costs for implementing the major elements of the proposed rule during nuclear power plant construction. The estimated one-time industry net cost associated with the backfits for the two postulated sites would be approximately \$1.0 million (or approximately \$500,000 for each site), and the recurring annual cost during construction would be approximately \$4.2 million (or approximately \$2.1 million for each site). Combining these initial and annual costs, this analysis estimates that the backfits associated with the proposed rule would cost industry approximately \$15.6 million (present value, assuming a 7-percent discount rate) or \$17.0 million (present value, assuming a 3-percent discount rate).

(6) Potential Safety Impact of Changes in Plant or Operational Complexity, Including the Relationship to Proposed and Existing Regulatory Requirements

The proposed rule is not expected to require changes with respect to the design of a nuclear power plant. This rule is not expected to have a significant effect on operational complexity because all features required by the rule occur during plant construction.

(7) Estimated Resource Burden on the NRC Associated with the Proposed Backfit and the Availability of Such Resources

The majority of the one-time costs incurred by the NRC are to review the construction security plans and construction personnel demographic data submitted by the CP holder and the combined licensee and to perform inspections of the reactivated CP holder and the combined licensee site. The NRC will incur additional costs for reviewing and approving construction security plans, processing and reviewing submitted licensee demographic data for initial construction site badging, and developing inspection procedures and inspecting the implementation of construction security plans. These activities would result in one-time costs of approximately \$33,000. The NRC will incur annual operation costs for reviewing semiannual demographic submittals and construction security plan updates, evaluating changes that a licensee makes to its emergency plan that may decrease its effectiveness, and performing site inspections to assess construction security plan implementation. These activities would result in annual costs of approximately \$19,000.

(8) Potential Impact of Differences in the Facility Type, Design, or Age on the Relevancy and Practicality of the Proposed Backfit

For nuclear power reactor CP holders and combined licensees, the construction security requirements in the proposed rule would not directly relate to the facility type, design, or age. Benefits and costs attributable to the proposed rule may vary for a variety of site-specific reasons and are based on the percentage of construction completed when the construction security plan is implemented. The NRC does not believe the benefits and costs will vary significantly based on the facility type, design, or age of the nuclear power reactor.

(9) Whether the Proposed Backfit Is Interim or Final and, If It Is Interim, the Justification for Imposing the Proposed Backfit on an Interim Basis

The proposed backfit would be final when it is implemented at the final rule stage.

In light of the substantial benefits of the proposed rule as summarized in Section 4.1, the NRC finds that the backfits contained in the proposed rule, when considered in the aggregate, would constitute a substantial increase in public health and safety, in promoting the common defense and security, and in protecting the environment

5. Decision Rationale

The decision rationale is based on the main analysis. Relative to the no-action alternative, Option 2 would result in a net cost estimated at approximately \$106,157,327 (total present value over the 4-year construction period) assuming a 7-percent discount rate, or approximately \$115,763,363 assuming a 3-percent discount rate. Offsetting the net cost, the NRC believes that Option 2 would result in substantial nonquantified benefits related to safety and security. Although significant costs are incurred as a result of the rule, the qualitative benefits associated with the rule outweigh its cost. The NRC believes that the rule is cost-justified because the proposed regulatory initiatives for increased and consistent access authorization and physical protection measures during nuclear power plant construction would deter and detect malicious activities that could compromise the safe construction and subsequent operation of facilities and would therefore increase public health and safety, promote the common defense and security,

and protect the environment. If the proposed regulations were not enforced, the NRC could be unaware, for extended periods of time, of whether the construction security plans and their implementation are adequate to protect public health and safety, promote the common defense and security, and protect the environment. Without a timely review of information, changes to personnel, procedures, equipment, and facilities or a failure to maintain and implement an effective construction security plan could adversely affect the CP holder's or combined licensee's ability to deter and detect malicious activities during nuclear power plant construction.

6. Implementation

The staff proposes to make the final rule effective 30 days after its publication in the *Federal Register*. For this analysis, the final rule effective date is December 2011. Applicants for a COL who have a docketed application and COL holders before the effective date of the final rule would be permitted to defer implementation of the final rule until 6 months after the effective date of the final rule.

7. References

1. NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook, Final Report," U.S. Nuclear Regulatory Commission, Washington, DC, January 1997.
2. NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Revision 4, U.S. Nuclear Regulatory Commission, Washington, DC, September 2004.