Regulatory Analysis for the Final Rule: Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors

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ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC) is amending its regulations by adding a new Part 53, “Risk-Informed, Technology-Inclusive Regulatory Framework for Commercial Nuclear Plants” (Part 53), to Title 10 of the *Code of Federal Regulations* (10 CFR) and revising existing regulations at 10 CFR Part 26, “Fitness for Duty Programs,” and 10 CFR Part 73, “Physical Protection of Plants and Materials,” to address the possible attributes of future commercial nuclear power plants. The current application and licensing requirements were primarily developed for large light-water and nonpower reactors as outlined in 10 CFR Parts 26, 50, 52, 55, 73, and 100 and therefore may not fully consider the variety of designs for advanced nuclear reactors.

This document presents a regulatory analysis of the finalized amendments, including new 10 CFR Part 53 requirements and revisions to 10 CFR Part 26 and 10 CFR Part 73 and the associated regulatory guidance documents, relative to the baseline case (i.e., the no-action alternative).

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ABBREVIATIONS

ADVANCE Act	Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2024
BLS	Bureau of Labor Statistics (U.S. Department of Labor)
CFR	*Code of Federal Regulations*
COL	combined license
CP	construction permit
CRGR	Committee to Review Generic Requirements
DC	design certification
ESP	early site permit
EO	Executive Order
FFD	fitness for duty
FR	*Federal Register*
FSAR	final safety analysis report
FY	fiscal year
GLRO	generally licensed reactor operator
LMP	Licensing Modernization Project
LWR	light-water reactor
ML	manufacturing license
MRO	medical review officer
NEIMA	Nuclear Energy Innovation and Modernization Act
non-LWR	non-light-water reactor (a nuclear power reactor using a coolant other than water)
NPV	net present value
NRC	U.S. Nuclear Regulatory Commission
NUREG	an NRC technical report designation
OL	operating license
OMB	U.S. Office of Management and Budget
PERT	program evaluation and review technique
PRA	probabilistic risk assessment
RG	regulatory guide
ROCIS	Regulatory Information Service Center/Office of Information and Regulatory Affairs Consolidated Information System
SDA	standard design approval
SECY	Secretary of the Commission
SOC	standard occupational classification (code)
SRM	staff requirements memorandum
SSC	structure, system, and component
TS	technical specification(s)
U.S.C.	United States Code

EXECUTIVE SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) is amending its regulations by adding a new Part 53, "Risk-Informed, Technology-Inclusive Regulatory Framework for Commercial Nuclear Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) for the licensing, operation, and decommissioning of new commercial nuclear power plants. In the staff requirements memorandum for SECY-20-0032, "Staff Requirements—SECY-20-0032—Rulemaking Plan on 'Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors' (RIN 3150-AK31; NRC-2019-0062)," dated October 2, 2020 (NRC, 2020c), the Commission directed the NRC staff to proceed with "a rulemaking to develop the regulatory infrastructure to support the licensing of advanced nuclear reactors."

The NRC's goal in promulgating these regulations is to establish a technology-inclusive regulatory framework for optional use by applicants for new commercial nuclear plants. The regulatory requirements developed in this rulemaking used methods of evaluation, including risk-informed and performance-based methods, that are flexible and practicable for application to a variety of reactor technologies, including advanced nuclear reactors.

The NRC used information on anticipated future applications under this final rule to determine the number and types of applicants included in this regulatory analysis. The regulatory analysis, using a 66-year analysis period, indicates that the final rule is cost beneficial and is expected to result in net cost savings to industry and the NRC of approximately $152 million using a 7 percent discount rate and $203 million using a 3 percent discount rate, in 2024 dollars. The annualized costs are approximately $1.17 million per year at a 7 percent discount rate, and $1.37 million per year at a 3 percent discount rate. The annualized cost savings are approximately $11.9 million per year at a 7 percent discount rate, and $8.46 million per year at a 3 percent discount rate. Therefore, the annualized net cost savings are estimated at $10.7 million per year at a 7 percent discount rate and $7.09 million per year at a 3 percent discount rate. The number of future applicants was chosen conservatively; with each additional applicant beyond those included in the regulatory analysis, the final rule becomes even more cost beneficial.

In addition to these quantified net averted costs, this final rule will have the qualitative benefits of Improvements in Knowledge, due to the advances in PRA and other new analyses enabled by the rule; Regulatory Efficiency, due to the codification of requirements based on current guidance and technical specifications and to reducing the need to rely on exemption requests; and Increased Public Confidence by being responsive to statutory requirements and improving the licensing pathway for new and emerging nuclear power reactor technologies.

Following publication of the proposed rule, the President signed Executive Order (EO) 14154, "Unleashing American Energy" (90 FR 8353; January 29, 2025) and EO 14300, "Ordering the Reform of the Nuclear Regulatory Commission" (90 FR 22587; May 29, 2025). The NRC has examined this final rule and determined that it is consistent with the policies and directives outlined in EO 14154 and EO 14300. The NRC recognizes the additional rulemaking activities undertaken pursuant to those EOs and understands that those rulemaking activities may yield further cost savings beyond those accounted for in this regulatory analysis.

Table ES-*1* Total Costs and Cost Savings of Final Rule, Alternative 2

Attribute	Costs		
	Undiscounted	7% net present value (NPV)	3% NPV
Industry Total:	$63,823,000	$11,078,000	$25,492,000
NRC Total:	$35,942,000	$5,499,000	$13,630,000
Net:	$99,765,000	$16,577,000	$39,122,000
	Annualized:	$1,174,000	$1,368,000
	Cost Savings		
	Undiscounted	7% NPV	3% NPV
Industry Total:	($346,524,000)	($139,576,000)	($203,353,000)
NRC Total:	($55,609,000)	($28,685,000)	($38,582,000)
Net:	($402,133,000)	($168,261,000)	($241,935,000)
	Annualized:	($11,915,000)	($8,461,000)
	Net Cost Savings		
	Undiscounted	7% NPV	3% NPV
Industry Net:	($282,700,000)	($128,500,000)	($177,860,000)
NRC Net:	($19,670,000)	($23,190,000)	($24,950,000)
Net:	($302,370,000)	($151,690,000)	($202,810,000)
	Annualized:	($10,741,000)	($7,093,000)
Qualitative Benefits:	Improvements in Knowledge, Regulatory Efficiency, and Increased Public Confidence		

Note: Globally, there may be differences among tables due to rounding. This analysis uses a 66-year time horizon, and 2024 dollars.

Need for the Rule

The NRC was created by Congress in 1974 to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment. The NRC protects public health and safety and advances the nation's common defense and security by enabling the safe and secure use and deployment of civilian nuclear energy technologies and radioactive materials through efficient and reliable licensing, oversight, and regulation for the benefit of society and the environment. From an economic perspective, common defense and national security are public goods for which the markets cannot maximize net benefits, and markets alone can sometimes create unintended impacts to public health and safety. Consistent with its statutory authority, NRC provides reasonable assurance of adequate protection of public health and safety.

On January 14, 2019, the President signed the Nuclear Energy Innovation and Modernization Act (NEIMA) into law (Pub. L. 115-439). NEIMA directed the NRC to undertake a rulemaking to establish a technology-inclusive regulatory framework for optional use by applicants for new commercial advanced nuclear reactor licenses. In addition, on July 9, 2024, the President signed into law the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2024, also referred to as the ADVANCE Act. The NRC has evaluated the ADVANCE Act,

including how NRC regulations, such as 10 CFR Part 53 or future revisions to it, could be used to address provisions in the ADVANCE Act. The ADVANCE Act contains provisions on a variety of nuclear-related topics, such as microreactors, nuclear reactor license application reviews, and nuclear fuel. Finally, in 2025, the President signed EO 14300, “Ordering the Reform of the Nuclear Regulatory Commission,” which builds on the provisions in the ADVANCE Act. EO 14300 will complement this rulemaking by providing additional mechanisms for streamlining the agency’s efforts to provide an efficient licensing pathway for advanced reactors.

This final rule responds to NEIMA by creating an alternative, technology-inclusive regulatory framework to accommodate licensing of future commercial nuclear plants, including advanced reactor designs that may not employ light-water technology. The requirements in 10 CFR Part 53 support a wide variety of potential commercial nuclear reactor technologies, consistent with NEIMA, the ADVANCE Act, and EO 14300.

1. Identification and Preliminary Analysis of Alternative Approaches

This section analyzes the alternatives that the U.S. Nuclear Regulatory Commission (NRC) considered for meeting the objective of creating a technology-inclusive, risk-informed regulatory framework for applicants and licensees for commercial nuclear plants during the development of this regulatory analysis in support of the final rule. The NRC identified and analyzed two alternatives in the final rule stage of the rulemaking. In the proposed rule stage, the NRC drafted and evaluated a more prescriptive, deterministic framework referred to as "Framework B" as an alternative but ultimately did not include it in the proposed rule, which resulted in an overall simplification of the structure of the rule. Similarly, the NRC included provisions in the draft proposed rule for specific comprehensive risk metrics and associated risk performance objectives, and a facility safety program. The NRC determined that the less stringent alternative of not including those requirements and programs in the proposed rule was the preferred path forward as it would lead to a reduction in cost while maintaining public health and safety.

1.1 Alternative 1: No Action

Under the no-action alternative, the NRC would not publish Title 10 of the *Code of Federal Regulations* (10 CFR) Part 53, "Risk-Informed, Technology-Inclusive Regulatory Framework for Commercial Nuclear Plants" (Part 53), or modify 10 CFR Part 26, "Fitness for Duty Programs," and 10 CFR Part 73, "Physical Protection of Plants and Materials," which constitute the new regulatory framework for advanced nuclear reactors. This alternative would be inconsistent with the Nuclear Energy Innovation and Modernization Act (NEIMA) and the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act of 2024. Future reactor applicants would apply under either 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," or 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." These applicants would not be able to benefit from the more technology-inclusive, risk-informed, and performance-based regulation of the final rule. In many areas, applicants would need to submit exemption requests to avoid requirements not developed for non-light-water reactor (non-LWR) technology or not applicable to their commercial nuclear plants.

1.2 Alternative 2—Establish a Technology-Inclusive, Performance-Based Framework

In this rulemaking alternative, the NRC is amending the regulations by creating an alternative regulatory framework for licensing advanced nuclear reactors. The new 10 CFR Part 53, along with the modifications to 10 CFR Part 26 and 10 CFR Part 73, would provide a technology-inclusive, risk-informed, performance-based framework for advanced nuclear reactor applicants (meeting the requirements of NEIMA and the ADVANCE Act). This framework would give applicants and licensees increased flexibility throughout the entire life cycle of a nuclear power plant: design, licensing, operation, and decommissioning.

2. Estimation and Evaluation of Costs and Benefits

This section presents the staff's process for evaluating the expected costs and benefits of each alternative relative to the regulatory baseline (Alternative 1). All costs and benefits are monetized, when possible. The total costs and benefits are then summed to determine whether

they constitute a positive benefit. In some cases, costs and benefits are not monetized because meaningful quantification is not possible.

1.3 Identification of Affected Attributes

This section identifies the components of the public and private sectors, commonly referred to as attributes, that are expected to be affected by Alternative 2. This alternative will apply to commercial nuclear plant licensees and applicants. The NRC staff believes that future licensees would be the primary beneficiaries. The staff developed an inventory of the affected attributes using the list in Chapter 5, "Details of a Cost-Benefit Analysis," of NUREG/BR-0058, Revision 5, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," issued January 2020 (NRC, 2020a).

The rule would affect five attributes:

(1) Industry Operation. This attribute accounts for the projected net economic effect on all affected entities of routine and recurring activities required by the alternative. In addition to activities required to meet the new regulations in this final rule, this attribute includes the reduction of exemption requests from applicants and licensees and the reduction of license amendment requests from the licensees.

(2) NRC Operation. This attribute accounts for the projected net economic effect on the NRC caused by routine and recurring activities required by the alternative after implementation of the final rule. In addition to review activities under the new regulations in this final rule, this attribute includes the reduction in NRC reviews of exemption requests and license amendment requests.

(3) Regulatory Efficiency. This attribute accounts for regulatory and compliance improvements resulting from the implementation of Alternative 2 relative to the regulatory baseline. Alternative 2 will continue the best practice of regulation through rulemaking instead of exemption requests, where practical. This rulemaking will reduce the effort that industry would expend generating exemption requests and considering alternative means to accomplish the goals of current regulation. This rulemaking will also reduce the effort that the NRC would expend processing those requests and adding necessary requirements to technical specifications (TS) instead of those requirements existing in NRC regulations.

(4) Improvements in Knowledge. This attribute accounts for increases in knowledge due to advances in reactor design and technology, probabilistic risk assessment (PRA), and other risk-informed analytical techniques.

(5) Public Confidence. This attribute accounts for the confidence the public has in the NRC's ability to effectively regulate applicants and licensees, including appropriate responses to statutory requirements (e.g., NEIMA, ADVANCE Act) and continuing to innovate and assess future designs and needs.

Attributes that are not expected to be affected under either of the alternatives include public health (routine), occupational health (accident), occupational health (routine), offsite property, onsite property, industry implementation, NRC implementation (sunk cost), other government

entities, general public, safeguards and security considerations, and environmental considerations.

1.4 Analytical Methodology

This section describes the process used to evaluate costs and benefits associated with the alternatives. The benefits would include any desirable changes in affected attributes (e.g., monetary savings, improved safety, improved security). The costs would include any undesirable changes in affected attributes (e.g., monetary costs, increased exposures).

Of the five affected attributes, the analysis evaluates two attributes—industry operation and NRC operation—on a quantitative basis. Quantitative analysis requires a baseline characterization of the affected society, including factors such as the number of affected entities, the nature of the activities currently performed, and the types of systems and procedures that applicants or licensees would consider or would no longer implement because of the alternatives. Where possible, the NRC calculated costs for these attributes using three-point estimates to quantify the uncertainty. Appendix B includes the detailed cost tables that the NRC used in this regulatory analysis. The NRC evaluated the remaining attributes on a qualitative basis because the benefits are not quantifiable or because the data necessary to quantify and monetize the impacts are not available. For example, section 3 qualitatively discusses, on a case-by-case basis, the final rule language for a factory fuel-loaded, manufactured reactor because the activities associated with this type of reactor are novel and also because the same activities—and more—would occur without the final rule.

The NRC documents its assumptions throughout this regulatory analysis. Appendix A to this regulatory analysis summarizes the key assumptions and inputs. Appendix C presents a qualitative analysis of each new or revised final rule requirement.

1.4.1 Regulatory Baseline

This regulatory analysis provides the incremental impacts of the final rule relative to a baseline that reflects anticipated behavior if the NRC does not take regulatory action. The regulatory baseline assumes full compliance with existing NRC requirements, including current regulations and relevant orders. Many aspects of reactor licensing, construction, and operation have different costs depending on the characteristics of the reactor, the staff size, and other factors. Therefore, when considering the incremental costs and benefits of this final rule compared to the regulatory baseline, it is important to consider the costs of the baseline to the specific reactor in question, not to historical costs of the operating fleet. For example, the reduced staff size at a smaller reactor would already have lower training costs relative to a large light-water reactor (LWR), and it is important to the accuracy of this regulatory analysis to ensure that this is considered before incremental costs and benefits are estimated.

As part of the regulatory baseline, this regulatory analysis also includes a few NRC rules that are not yet issued but are expected to be issued either before this Part 53 rule or in a similar timeframe. The NRC is considering the proposed rule “Reporting Requirements for Nonemergency Events at Nuclear Power Plants” (NRC, 2022) as part of the baseline in 10 CFR 50.72, “Immediate notification requirements for operating nuclear power reactors,” and therefore, the consistent changes made to the Part 53 final rule at 10 CFR 53.1630, “Immediate notification requirements for operating commercial nuclear plants,” are considered to have no incremental costs or benefits. The NRC is also considering the current microreactor proposed

rule, “Licensing Requirements for Microreactors and Other Low Consequence Reactors,” on an accelerated schedule, to be part of the regulatory baseline, and therefore, microreactors would be addressed by that rule and not by Part 53 (NRC, 2025a). This means that no microreactors were considered as potential applicants for this final rule. Finally, the NRC is considering the “Direct Final Rule: Revising the Duration of Design Certifications,” effective September 15, 2025 (NRC, 2025b), as part of the regulatory baseline. As a result, the changes in this Part 53 rule to give all future design certifications (DCs) a duration of 40 years do not result in incremental costs or benefits.

Section 3 of this regulatory analysis presents the estimated costs and benefits of Alternative 2 relative to this baseline.

1.4.2 Affected Entities

The NRC staff is aware of several applicants that may engage with the agency over the next several years and of varied reactor designs, including small modular reactors, non-LWRs, microreactors, and others. This analysis leverages the latest information the NRC has received on expected future applicants, including early site permits (ESPs), standard design approvals (SDAs), DCs, manufacturing licenses (MLs), construction permits (CPs), operating licenses (OLs), and combined licenses (COLs). Because the agency is pursuing a microreactor rulemaking on an expedited timeframe, as previously discussed, this regulatory analysis assumes that microreactors will apply under that final rule as opposed to this Part 53 final rule and did not include any known microreactor applicants. Appendix A includes a count of the number of applications of each type used in the regulatory analysis; however, to protect proprietary information, it does not give the names of applicants.

The NRC assumed that approximately 50 percent of applicants would qualify to use generally licensed reactor operators (GLROs) based on anticipated characteristics of the various expected applications. The NRC based this assumption on a comparison of known design features, as available, of the expected applications against the self-reliant mitigation facility criteria which uses GLROs and on an extrapolation of the result to expected applications for which no design information was available.

1.4.3 Base Year

All monetized costs are expressed in 2024 dollars, matching the last full year of Bureau of Labor Statistics (BLS) labor rate data available at the time of this analysis. The analysis assumes that ongoing costs of operation related to the alternative being analyzed will begin no earlier than 30 days after publication of the final rule unless otherwise stated. The analysis assumes that the final rule will be published in early 2027.

The applicants’ one-time and periodic and recurring annual operating expenses are estimated. The values for annual operating expenses are modeled as a constant expense for each year of the analysis horizon. The NRC performed a discounted cash flow calculation to discount these expenses to 2024-dollar values.

1.4.4 Discount Rates

In accordance with NUREG/BR-0058, net present value (NPV) calculations are used to determine how much society will need to invest today to ensure that the designated dollar

amount is available in a given year in the future. Use of NPVs allows costs and benefits to be valued to a reference year for comparison, regardless of when the cost or benefit is incurred. The choice of a discount rate and its associated conceptual basis is a topic of ongoing discussion within the Federal Government. Based on U.S. Office of Management and Budget (OMB) Circular A-4, "Regulatory Analysis," dated September 17, 2003 (OMB, 2003), and consistent with NRC past practice and guidance, present-worth calculations in this analysis use 3 percent and 7 percent real discount rates. A 3 percent discount rate approximates the real rate of return on long-term Government debt, which serves as a proxy for the real rate of return on savings to reflect reliance on a social rate of time preference discounting concept.[1] A 7 percent discount rate approximates the marginal pretax real rate of return on an average investment in the private sector and is the appropriate discount rate whenever the main effect of a regulation is to displace or alter the use of capital in the private sector. A 7 percent rate is consistent with an opportunity cost[2] of capital concept to reflect the time value of resources directed to meet regulatory requirements.

1.4.5 Labor Rates

For the purposes of this regulatory analysis, the staff applied strict incremental cost principles to develop labor rates that include only labor and material costs directly related to the implementation, operation, and maintenance of the final rule requirements. This approach is consistent with the guidance in NUREG/CR-3568, "A Handbook for Value-Impact Assessment," issued December 1983 (NRC, 1983), and with general cost-benefit methodology. The NRC's incremental labor rate for 2025 analyses is $158 per hour.[3]

The staff used the 2024 BLS Occupational Employment and Wages data (www.bls.gov), which provide labor categories and the mean hourly wage rate by job type. The labor rates used in the analysis reflect total hourly compensation, which includes wages and nonwage benefits (using a burden factor of 2.4, which is applicable for contract labor and conservative for regular utility employees). The staff used the BLS data tables to select appropriate hourly labor rates for the estimated procedural, licensing, and utility-related work necessary during and after implementation of the proposed alternative. These labor rates include wages paid to the individuals performing the work plus the associated fringe benefit component of labor costs (i.e., the time for plant management exceeding the time directly expensed), which are considered incremental expenses. Table summarizes the BLS labor categories the staff used to estimate industry labor costs for this final rule, and appendix A lists the industry labor rates used in the analysis. The staff also performed an uncertainty analysis, which is discussed in section 3.7.

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1 The "social rate of time preference discounting concept" refers to the rate at which society is willing to postpone a marginal unit of current consumption in exchange for more future consumption.

2 "Opportunity cost" represents what is foregone by undertaking a given action. If the applicant or licensee personnel were not engaged in producing exemption requests, they would be engaged in other work activities. Throughout the analysis, the NRC estimates the opportunity cost of performing these incremental tasks as the industry personnel's pay for the designated unit of time.

3 The NRC labor rates presented here differ from those developed under the NRC's license fee recovery program (10 CFR Part 170, "Fees for Facilities, Materials, Import and Export Licenses, and Other Regulatory Services under the Atomic Energy Act of 1954, as Amended"). NRC labor rates for fee recovery purposes are designed for full-cost recovery of the services rendered and thus include nonincremental costs (e.g., overhead, administrative, and logistical support costs).

Table 1 Position Titles and Occupations

Position Title (in This Regulatory Analysis)	Standard Occupational Classification
Managers	General and Operations Managers (111021)
	Industrial Production Managers (113051)
	First-Line Supervisors of Mechanics, Installers, and Repairers (491011)
	First-Line Supervisors of Production and Operating Workers (511011)
Technical Staff	Nuclear Engineers (172161)
	Physicists (192012)
	Nuclear Technicians (194051)
	Industrial Machinery Mechanics (499041)
	Nuclear Power Reactor Operators (518011)
Administrative Staff	Office and Administrative Support Occupations (430000)
	First-Line Supervisors of Office and Administrative Support Workers (431011)
	Office Clerks, General (439061)
Licensing Staff	Lawyers (231011)
	Paralegals and Legal Assistants (232011)

Source: BLS, "May 2024 National Industry-Specific Occupational Employment and Wage Estimates; NAICS 221113 —Nuclear Electric Power Generation" (BLS, 2024).

1.4.6 Sign Conventions

In this analysis (excluding the executive summary), all favorable consequences for the alternative are positive (benefits/averted costs/cost savings), and all adverse consequences for the alternative are negative. Negative values are shown using parentheses (e.g., negative $500 is displayed as ($500)).

1.4.7 Analysis Horizon

The NRC assumed that each reactor applicant receives the original 40-year OL and then applies for and receives a 20-year license extension for a total of 60 years. The operating costs of each reactor are estimated individually, based on the anticipated first year of operation.

1.4.8 Cost Estimation

To estimate the costs associated with the evaluated alternatives, the NRC used an engineering-buildup estimating method to deconstruct each requirement down to its mandated activities. For each required activity, the NRC further subdivided the work across labor categories (i.e., managers, technical staff, administrative staff, and licensing staff). The NRC estimated the required level of effort for each activity and used a blended labor rate to develop bottom-up cost estimates.

The NRC gathered data from several sources and consulted working group members to develop level of effort and unit cost estimates. The NRC applied several cost estimation methods in this analysis. Additionally, the agency used its collective professional knowledge and judgment to estimate many of the costs and benefits. For example, to calculate the estimated averted costs of exemption requests, the NRC used analogous data from previous exemption

request submittals to determine the labor categories of the staff who would perform the work and to estimate the amount of time required under each category to complete the work. If data were not available, the agency used the level-of-effort method to estimate future costs based on similar steps in the process for which data were available. Additionally, the NRC used the expert-opinion method to fill data gaps when one or more experts were the only available sources of information. Appendix A contains further detail on the assumptions and input data used in this analysis.

To evaluate the effect of uncertainty in the model, the NRC used a Monte Carlo simulation, which is an approach to uncertainty analysis that expresses input variables as distributions. Section 3.7 describes the Monte Carlo simulation methods in more detail and presents the results.

1.5 Data

To collect data for this analysis, the NRC used input from subject-matter experts, knowledge gained from past rulemakings, the documented burdens associated with existing regulations, and information obtained during public meetings and from correspondence. The NRC considered the potential differences between the new requirements and the current requirements and incorporated the incremental changes into this regulatory analysis. For more details, see Appendix A.

3. Results

This section presents the quantitative and qualitative results by attribute for Alternative 2 relative to the regulatory baseline (Alternative 1). As described in the previous sections, costs and benefits are quantified where possible and are shown to be either positive or negative, depending on whether the alternative has a favorable or adverse effect relative to the regulatory baseline. Those attributes that are not easily represented in monetary values are discussed in qualitative terms. This "ex ante cost-benefit analysis"[4] provides helpful information that the NRC can use to decide whether to select an alternative. The potential benefits and costs of the alternatives are analyzed for (1) applicants and licensees and (2) the NRC.[5] The analyses in this section are based on the NRC's assessment and input from stakeholders.

The NRC considered the exemption and guidance alternative (i.e., Alternative 1) to a rulemaking action. The final rule would establish a comprehensive regulatory framework that will enhance regulatory stability, predictability, and clarity in the licensing process and provide an opportunity for stakeholder input on the regulatory framework. This is also in keeping with the implementation of the Commission's approved rulemaking plan in SECY-20-0032, "Rulemaking Plan on 'Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (RIN-3150-AK31; NRC-2019-0062),'" dated April 13, 2020 (NRC, 2020b); the Commission's direction in Staff Requirements Memorandum (SRM)-SECY-20-0032, dated October 2, 2020 (NRC, 2020c); SRM-SECY-23-0021, "Staff Requirements—SECY-23-0021—Proposed Rule: Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (RIN 3150-AK31)," dated March 4, 2024 (NRC, 2024), and the intent of NEIMA and the ADVANCE Act.

4 An "ex ante cost-benefit analysis" is prepared before the implementation of a policy, program, or alternative and can assist in deciding whether to allocate resources to that alternative.

5 The NRC considered the incremental impact of the rule for other entities, including Tribal, State, and local government organizations, but it does not expect such entities to experience incremental costs or averted costs compared to the regulatory baseline.

This section presents the incremental benefits and costs that the NRC, applicants, and licensees will incur from the final rule. Incremental benefits and costs are calculated values and impacts that are above the baseline condition. The baseline condition for this rulemaking action includes the benefits and costs to comply with the current licensing requirements in 10 CFR Part 50 or 10 CFR Part 52.

To streamline this regulatory analysis, the appendices contain several key parts. Appendix A contains tables with all the inputs to the cost model for this regulatory analysis. Appendix B contains tables with cost estimates of all the final rule requirements with incremental costs or benefits relative to the regulatory baseline. Appendix C presents all the regulatory language in the final rule that includes new or modified requirements compared to the existing NRC regulations. The table identifies in which section the regulatory language resides, briefly describes the requirement, lists whether the staff expects it to result in incremental costs or benefits, and provides justification for the staff expectations. Later parts of this section of the regulatory analysis discuss regulatory changes that the staff expects to result in significant incremental costs or benefits. The tables in appendices B and C serve as the complete discussion in this regulatory analysis of other changes that the staff expects to result in minor, or no, incremental costs or benefits.

A significant new set of requirements would be issued under the final rule in 10 CFR Part 53 for ML applicants and holders, and this aspect of the rulemaking is discussed here because the regulatory analysis assesses it qualitatively. These new requirements are outlined in 10 CFR 53.620(d) and the associated licensing provisions in Subpart H, “Licenses, Certifications, and Approvals,” of 10 CFR Part 53. These provisions would allow the loading of fuel into a manufactured reactor at the manufacturing site for subsequent transport to a commercial nuclear facility that will operate pursuant to a COL or for export in accordance with 10 CFR Part 110, “Export and Import of Nuclear Equipment and Material.”

The final rule requirements at 10 CFR 53.620(d)(1) would limit when an ML would authorize possession of a manufactured reactor into which fuel had been loaded at the factory in accordance with a license under 10 CFR Part 70, “Domestic Licensing of Special Nuclear Material.” This would require the manufactured reactor to include features to prevent criticality. The requirements in 10 CFR 53.620(d)(1) further state that, once the fueled manufactured reactor is installed in its place of operation, and the Commission has found that the acceptance criteria in the inspections, tests, analyses, and acceptance criteria are met under 10 CFR 53.1452(g), the features to prevent criticality may be removed. Upon initiating the removal of the features to prevent criticality, the fueled manufactured reactor will be considered to have commenced operation.

The final rule requirements at 10 CFR 53.620(d)(2) would require holders of 10 CFR Part 70 licenses authorizing the possession and loading of fresh fuel into manufactured reactors to comply with the requirements of 10 CFR Part 70, including its Subpart H, “Additional Requirements for Certain Licensees Authorized to Possess a Critical Mass of Special Nuclear Material,” for the facilities and activities related to the storage, movement, and loading of fresh fuel in the manufactured reactor. The final rule also requires that all procedures, equipment, and personnel required by the 10 CFR Part 70 license be in place before the receipt of special nuclear material at the manufacturing facility. In addition, this provision would require that security programs for any ML that authorizes possession of a manufactured reactor into which the licensee has loaded fuel at the factory meet the performance objectives of 10 CFR 73.67, “Licensee fixed site and in-transit requirements for the physical protection of special nuclear

material of moderate and low strategic significance," with some additions and exceptions. These additions and exceptions include requirements for a physical security plan, a cybersecurity plan, and programs and screening of individuals for unescorted access to special nuclear material.

Finally, 10 CFR 53.620(d)(3) would require the loading or unloading of fresh fuel into or from a manufactured reactor, or any changes to the configuration of reactivity control and prevention systems, to be performed by a certified fuel handler meeting the requirements in Subpart F, "Requirements for Operation," of 10 CFR Part 53.

Corresponding provisions are in 10 CFR 53.1279(d) for application content for applicants seeking an ML for manufactured reactors that will be fueled at the factory under a 10 CFR Part 70 license, consistent with the requirements in 10 CFR 53.620(d). These provisions would require the application to include information related to loading fuel and the required features to prevent criticality and to otherwise ensure that the fueled manufactured reactor can be successfully transported, installed, and operated at a site for which the Commission has issued a COL that authorizes construction and operation of a commercial nuclear plant using the manufactured reactor.

The final rule provisions being included in 10 CFR 53.620(d) and 10 CFR 53.1279(d) are intended to cover a factory fabrication model that has been suggested for some microreactor designs. However, the provisions are not limited to any size or type of reactor. Because the existing requirements governing MLs in 10 CFR Part 52 do not include provisions for loading fuel into the manufactured reactor and the historical NRC position that the act of fuel loading is the point at which a reactor commences operation, an applicant would have to obtain both an ML and a COL under 10 CFR Part 52 to load fuel into a manufactured reactor. There are significantly more requirements for obtaining a COL, and many would go far beyond those needed to safely load fresh fuel into a manufactured reactor at the manufacturing facility. Therefore, it is likely that an applicant choosing to do so under the current regulations and the historical NRC position would seek exemptions from a significant portion of the requirements for COL applicants. Because of this, the NRC deemed it prudent to include requirements specific to this deployment model in 10 CFR Part 53 to ensure that these activities would be appropriately regulated from a safety standpoint but without undue burden on potential applicants wishing to load fuel into manufactured reactors under an ML.

Including specific provisions for factory fuel loading in 10 CFR Part 53 will also benefit the NRC because they would relieve the agency from the burden of processing a large number of exemption requests for applicants seeking to perform such activities in a manufacturing facility under the historical NRC position. In addition, dealing with this deployment model through rulemaking allows the NRC to address the technical and policy issues generically and relieves the agency from having to address these matters on a case-by-case basis. Addressing the issue of factory fuel loading through rulemaking also increases transparency for external stakeholders and allows for greater opportunities for public participation in the formulation of the requirements.

These new requirements also entail considerable costs associated with factory fuel loading and transportation, but these costs are associated with an activity that was not addressed under existing regulations for MLs. The NRC expects that approving such activities on a case-by-case basis would result in requirements similar to those in this rule, but with fewer of the aforementioned benefits, and generated the requirements in part by considering what a case-by-case process would entail. For this reason, the regulatory analysis does not provide estimated quantitative costs or benefits for this approach, given that the regulatory baseline

costs would be roughly similar, if not greater. The regulatory analysis concludes that the benefits of these provisions in 10 CFR Part 53 exceed the benefits of the case-by-case baseline, and therefore the inclusion of these provisions is a net benefit to applicants and the NRC and is not discussed further in this document.

1.6 Industry Operation

This attribute accounts for the projected net economic effect of routine and recurring activities required by the alternative for all affected licensees and applicants. There are several significant industry cost and averted cost drivers in Alternative 2, discussed below.

Significant Industry Cost Drivers

The radiation protection process control program is a new program to be maintained throughout operations. Under existing regulations, this program is traditionally required as a condition in NRC licenses instead of a program required by regulation. The program results in costs to industry (based on the expected applications) of approximately ($7.80 million) using a 7 percent NPV and ($19.9 million) using a 3 percent NPV. The integrity assessment program is another new program resulting in costs of approximately ($1.64 million) using a 7 percent NPV and ($3.46 million) using a 3 percent NPV. Both of these programs are described further in the *Federal Register* notice of this final rule and appendix C to this regulatory analysis and reflect the performance-based nature of the rule as opposed to more deterministic approaches in the existing regulatory framework.

Significant Industry Averted Cost Drivers

The final rule significantly reduces costs associated with the technical information content of all application types, because of both the streamlining of the application processes and the removal of entire sections from applications. In undertaking this analysis, the NRC considered projected applications through the year 2031 as shown in Appendix A. The NRC estimates that the various applications used in this regulatory analysis have averted costs (cost savings) to industry as follows:

- Early Site Permits: $1.61 million (7 percent NPV) and $1.80 million (3 percent NPV)
- Standard Design Approvals: $1.92 million (7 percent NPV) and $2.36 million (3 percent NPV)
- Design Certifications: $15.9 million per DC, but none are expected in the analysis horizon; therefore, the regulatory analysis includes no averted costs
- Manufacturing Licenses: $3.68 million per ML, but none are expected in the analysis horizon; therefore, the regulatory analysis includes no averted costs
- Construction Permits: $16.6 million (7 percent NPV) and $18.7 million (3 percent NPV)
- Operating Licenses: $6.77 (7 percent NPV) and $8.25 million (3 percent NPV)
- Combined Licenses: $8.70 million (7 percent NPV) and $10.1 million (3 percent NPV)

These averted costs were applied in the cost estimate to the appropriate years when the NRC expects each type of application, and appendices A and B provide further details. Reflected in the cost estimate of the final rule is the deletion of the proposed rule requirement for aircraft impact assessment (formerly at 10 CFR 53.440(j)), which resulted in an estimated additional reduction in hours of effort for DC, CP, OL, and COL applicants of approximately 1,000 hours per application.

The new earthquake engineering requirements provide flexibility in allowing an applicant to use a risk-informed seismic approach that would not require an exemption from Appendix S, "Earthquake Engineering Criteria for Nuclear Power Plants," to 10 CFR Part 50. Additional savings should result from the guidance currently under development to support this approach, which leverages the work done with the PRA to inform other aspects of the application. This guidance is assumed to be available by the time the final rule is effective. The staff estimates incremental averted costs to industry of approximately $30.7 million (7 percent NPV) and $34.6 million (3 percent NPV) resulting from these new regulations and guidance.

The final rule also provides greater flexibility in the use of PRA at 10 CFR 53.450(a) by allowing applicants to use other systematic risk evaluations "to identify potential failures, susceptibility to internal and external hazards, and other contributing factors to event sequences." The NRC did not estimate incremental benefits associated with this flexibility because justification of the non-PRA approach might require additional effort such that applicants would need to make a business case decision about whether to use a PRA, other systematic risk evaluation, or a combination of the two.

The cybersecurity requirements for the protection of digital assets would result in licensees having to protect hundreds fewer assets, resulting in estimated averted costs of $30.4 million (7 percent NPV) and $35.6 million (3 percent NPV). Additionally, the NRC anticipates that licensees would incur significantly reduced costs from Alternative 2 relative to the regulatory baseline in the training, examination, and proficiency programs for operators, whether a licensee qualifies to use GLROs or not. For future licensees able to meet the requirements to use GLROs, the staff estimates averted costs to industry of approximately $15.6 million (7 percent NPV) and $38.0 million (3 percent NPV) due to the simplified requirements. For licensees that cannot use GLROs, the staff estimates averted costs to industry of approximately $3.42 million (7 percent NPV) and $8.05 million (3 percent NPV) due to the scalable training program requirements. In this regulatory analysis, the staff assumed half of the licensees would not qualify for GLROs but would benefit from the scalable training program requirements. As previously discussed in the Regulatory Baseline section of this regulatory analysis, these averted costs are over and above the reduction in costs a reactor with reduced staff size would experience compared to a large LWR. This regulatory analysis must discuss the incremental costs and benefits of the final rule language compared to what would be the case under the regulatory baseline for the specific entity in question and therefore considers these averted costs related to staffing size as a part of the baseline.

The new fitness-for-duty (FFD) requirements are expected to avert a significant number of exemption requests that future applicants would otherwise submit to simplify and scale their FFD programs, as appropriate, to the new technology, smaller staff size, and greater safety margins of future designs. The NRC estimates that approximately 10 exemption requests for FFD would be submitted per applicant if this final rule is not issued. This is estimated to result in averted costs to industry of approximately $1.75 million (7 percent NPV) and $2.07 million (3 percent NPV). Finally, the NRC is relaxing the FFD training and behavioral observation training requirements to 2-year intervals (as opposed to annually). Combined, these relaxations

result in estimated averted costs to industry of $11.2 million (7 percent NPV) and $17.9 million (3 percent NPV).

1.7 Total Industry Costs

Table 2 shows the industry totals for the expected applicants during the analysis horizon, which add up to averted costs of approximately $129 million at a 7 percent NPV and $178 million at a 3 percent NPV.

Table 2 Total Industry Costs

Attribute	Total Industry Averted Costs (Costs)		
	Undiscounted	**7% NPV**	**3% NPV**
Implementation Totals:	$0	$0	$0
Operation Totals:	$282,700,000	$128,500,000	$177,860,000
Industry Totals:	**$282,700,000**	**$128,500,000**	**$177,860,000**

Note: Totals may differ within and between tables due to rounding.

1.8 NRC Operation

This attribute accounts for the projected net economic effect on the NRC of routine and recurring activities required by the alternative.

There are several significant NRC cost drivers and averted cost drivers in the final rule, discussed below.

Significant NRC Cost Drivers

The process control program for radiation protection is required by regulation, instead of by conditions on NRC licenses. The NRC will periodically review this program, resulting in estimated costs to the agency of approximately ($3.98 million) using a 7 percent NPV and ($10.6 million) using a 3 percent NPV, for the expected licensees in the analysis period. Similarly, reviewing the integrity assessment programs results in estimated costs to the NRC of approximately ($1.08 million) using a 7 percent NPV and ($2.52 million) using a 3 percent NPV.

Significant NRC Averted Cost Drivers

Similar to the industry averted costs, the final rule simplifies and reduces the technical information content of all types of applications, resulting in averted costs to the NRC as follows:

- Early Site Permits: $994,000 (7 percent NPV) and $1.16 million (3 percent NPV).
- Standard Design Approvals: $1.29 million (7 percent NPV) and $1.64 million (3 percent NPV).
- Design Certifications: $8.12 million per DC, but none are expected in the analysis horizon; therefore, the regulatory analysis includes no averted costs.
- Manufacturing Licenses: $4.00 million per ML, but none are expected in the analysis horizon; therefore, the regulatory analysis includes no averted costs.

- Construction Permits: $7.86 million (7 percent NPV) and $9.22 million (3 percent NPV).
- Operating Licenses: $7.06 million (7 percent NPV) and $8.94 million (3 percent NPV).
- Combined Licenses: $6.07 million (7 percent NPV) and $7.33 million (3 percent NPV).

These averted costs were applied in the cost estimate to the appropriate years when the NRC expects each type of application, and appendices A and B provide further details. Reflected in the cost estimate of the final rule is the deletion of the proposed rule requirement for aircraft impact assessment (formerly at 10 CFR 53.440(j)), which resulted in an estimated additional reduction in hours of effort for DC, CP, OL, and COL applicants of approximately 1,000 hours per application.

The averted exemption requests from the new FFD requirements are estimated to result in averted costs to the NRC of approximately $1.82 million (7 percent NPV) and $2.22 million (3 percent NPV). The greater flexibilities in operator licensing requirements (for licensees not using GLROs), expected to apply to applicants but included as a common requirement, are estimated to result in averted costs to the NRC of approximately $541,000 (7 percent NPV) and $1.36 million (3 percent NPV). The GLRO program, for licensees that can use it, is estimated to result in averted costs to the NRC of approximately $1.66 million (7 percent NPV) and $4.20 million (3 percent NPV).

1.9 Total NRC Costs

Table 3 shows the total NRC implementation and operation costs for the final rule. The total averted costs for the NRC are estimated to range from $23.2 million (7 percent NPV) to $25.0 million (3 percent NPV).

Table 3 Total NRC Costs

Attribute	Total NRC Averted Costs (Costs)		
	Undiscounted	**7% NPV**	**3% NPV**
Implementation Totals:	$0	$0	$0
Operation Totals:	$19,670,000	$23,190,000	$24,950,000
NRC Totals:	**$19,670,000**	**$23,190,000**	**$24,950,000**

Note: Totals may differ within and between tables due to rounding.

1.10 Total Costs

Table 4 shows the total implementation and operation costs for industry and the NRC from the final rule. These total averted costs are estimated to range from $152 million (7 percent NPV) to $203 million (3 percent NPV). The annualized averted costs at a 7 percent discount rate are approximately $1.64 million per year to the NRC and $9.1 million per year to industry, or net annualized averted costs of approximately $10.7 million over the 66-year analysis period.

Table 4 Combined Total Costs (Alternative 2)

Attribute	Total Averted Costs (Costs)		
	Undiscounted	**7% NPV**	**3% NPV**
Industry Implementation:	$0	$0	$0
Industry Operation:	$282,700,000	$128,500,000	$177,860,000
Industry Totals:	*$282,700,000*	*$128,500,000*	*$177,860,000*
NRC Implementation:	$0	$0	$0
NRC Operation:	$19,670,000	$23,190,000	$24,950,000
NRC Totals:	*$19,670,000*	*$23,190,000*	*$24,950,000*
Net:	***$302,370,000***	***$151,680,000***	***$202,810,000***

Note: Totals may differ within and between tables due to rounding.

1.11 Potential Effect on Offsite Governmental Organizations

Offsite governmental organizations would incur the same costs under all alternatives.

1.12 Uncertainty Analysis

The NRC completed a Monte Carlo uncertainty analysis for this regulatory analysis using the specialty software @Risk.[6] The Monte Carlo approach answers the question, "What distribution of net benefits and costs results from multiple draws of the probability distribution assigned to key variables?"

1.12.1 Uncertainty Analysis Assumptions

Because this regulatory analysis is based on estimates of values that are sensitive to plant-specific cost drivers and plant dissimilarities, the NRC provides the following analysis of the variables that have the greatest uncertainty. As noted above, the NRC performed this analysis with a Monte Carlo simulation analysis using the @Risk software program.

Monte Carlo simulations involve introducing uncertainty into the analysis by replacing the point estimates of the variables used to estimate base-case costs and benefits with probability distributions. By defining input variables as probability distributions instead of point estimates, the influence of uncertainty on the results of the analysis (i.e., the net benefits) can be effectively modeled.

The probability distributions chosen to represent the different variables in the analysis were bounded by the range-referenced input and the NRC staff's professional judgment. When defining the probability distributions for use in a Monte Carlo simulation, summary statistics are needed to characterize the distributions. These summary statistics include (1) the minimum, most likely, and maximum values of a program evaluation and review technique (PERT) distribution,[7] (2) the minimum and maximum values of a uniform distribution, and (3) the

6 Information about the @Risk software is available at http://www.palisade.com.

specified integer values of a discrete population. The NRC used the PERT distribution to reflect the relative spread and skewness of the distribution defined by the three estimates.

Appendix A contains a table that identifies the data elements and the distribution of the inputs used in the uncertainty analysis.

1.12.2 Uncertainty Analysis Results

The NRC performed the Monte Carlo simulation by repeatedly recalculating the results 10,000 times. For each iteration, the agency chose the values identified in the table randomly from the probability distributions that define the input variables. The NRC recorded the values of the output variables for each iteration and used these values to define the resultant probability distribution.

For the analysis shown in each figure below, the NRC ran 10,000 simulations in which it changed the key variables to assess the resulting effect on costs and benefits. Figure 1, Figure 2, Figure 3, and Figure 4 analyze the incremental costs and benefits from the regulatory baseline for Alternative 2. The analysis shows that both industry and the NRC will benefit in terms of cost savings (positive averted costs) if this rule is issued.

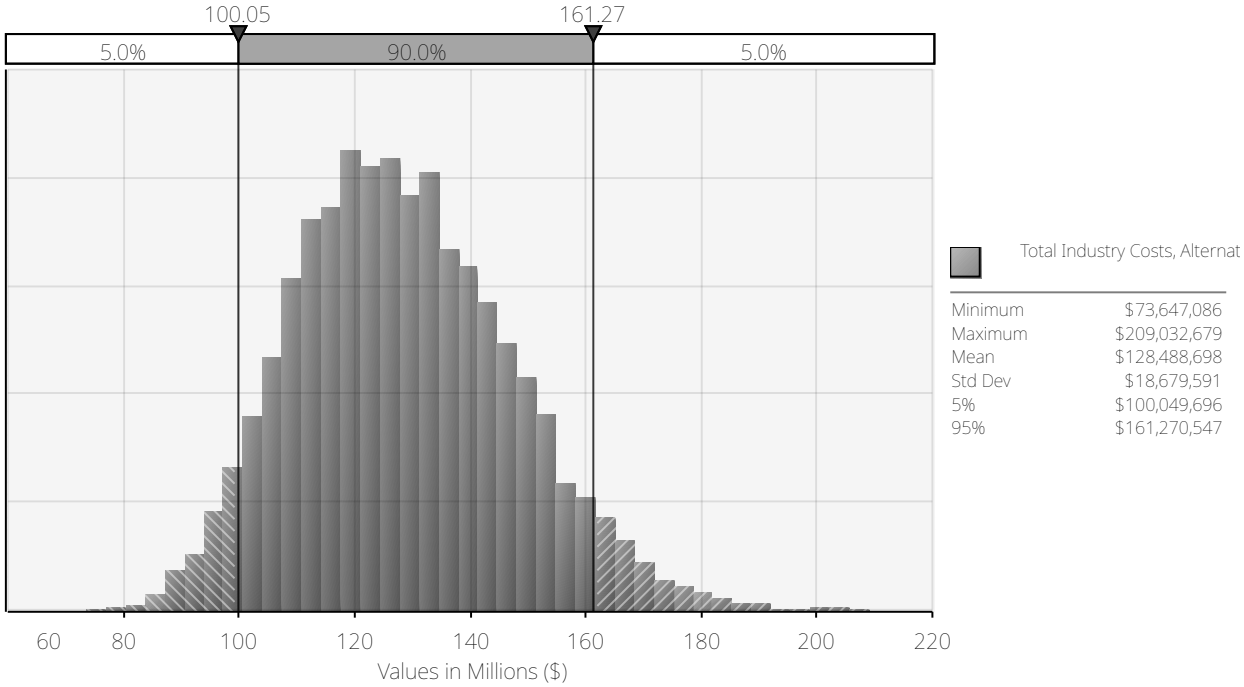

Figure 1 Total Industry Costs, Alternative 2, 7 Percent NPV

7 A PERT distribution is a special form of the beta distribution with specified minimum and maximum values. The shape parameter is calculated from the defined "most likely" value. The PERT distribution is similar to a triangular distribution in that it has the same set of three parameters. Technically, it is a special case of a scaled beta (or beta general) distribution. The PERT distribution is generally considered superior to the triangular distribution when the parameters result in a skewed distribution because the smooth shape of the curve places less emphasis in the direction of skew. Similar to the triangular distribution, the PERT distribution is bounded on both sides and, therefore, may not be adequate for some modeling purposes if the capture of tail or extreme events is desired.

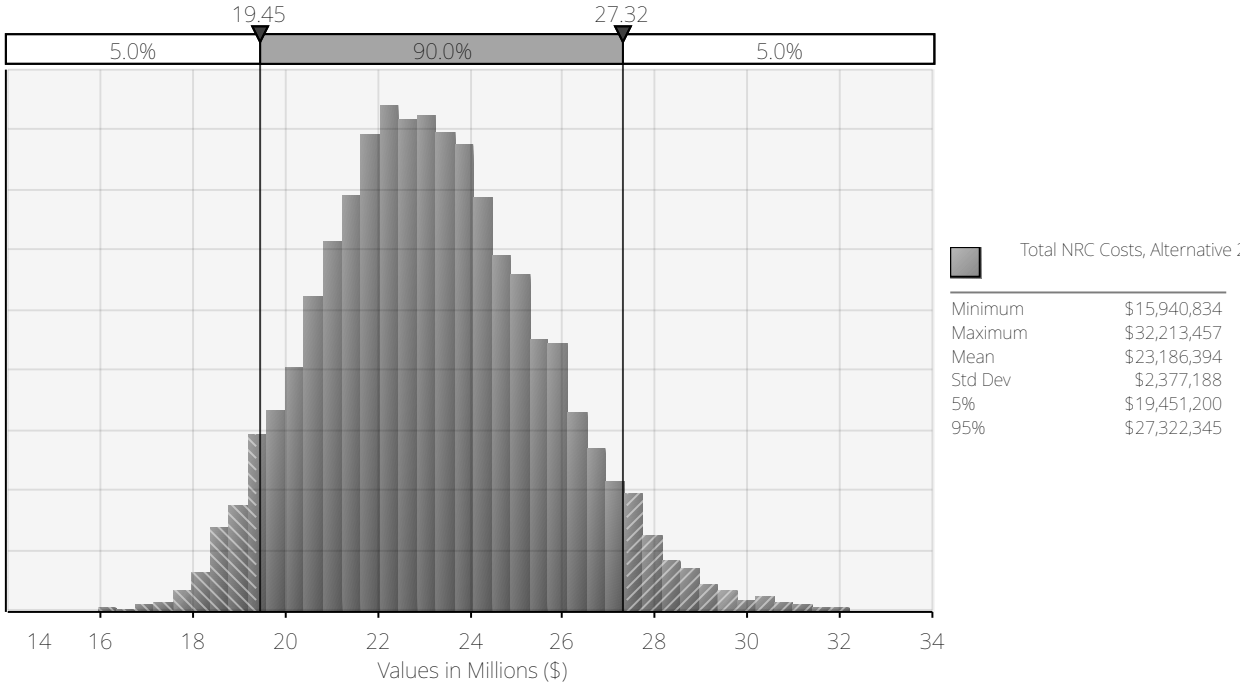

Figure 2 Total NRC Costs, Alternative 2, 7 Percent NPV

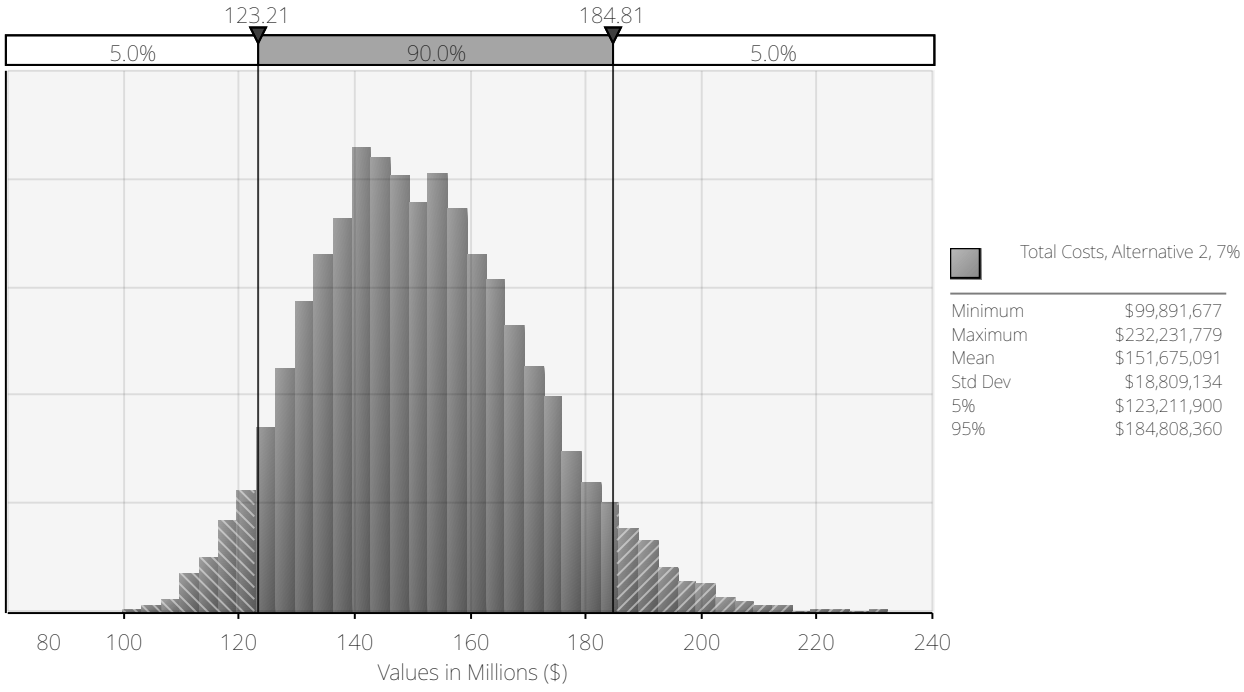

Figure 3 Total Costs, Alternative 2, 7 Percent NPV

Table 5 presents descriptive statistics for the uncertainty analysis. In particular, the table shows the ranges of the output distributions, which give a clearer picture of the potential incremental costs and benefits of the rule. The 5 percent and 95 percent values shown (rounded) in

TableTable 5 also appear as numerical values in Figure 1, Figure 2, and Figure 3, above the vertical lines marking the endpoints of the 90 percent confidence interval.

Table 5 Descriptive Statistics for Uncertainty Results (7 Percent NPV)

Uncertainty results	Incremental cost-benefit (2024 dollars, millions)					
	Min	Mean	Std dev	Max	5%	95%
Total industry cost	$73.6	$128	$18.7	$209	$100	$161
Total NRC cost	$15.9	$23.2	$2.38	$32.2	$19.5	$27.3
Total cost	$99.9	$152	$18.8	$232	$123	$185

Figure 4 shows a tornado diagram that identifies the cost drivers with the greatest impact for the final rule. The figure ranks the top 10 cost drivers based on their contribution to the uncertainty in cost. The largest cost drivers are the reduction in digital assets needing protection, the industry labor rate, and the industry labor hours for earthquake engineering analysis, meaning that the uncertainty in these quantities generates the largest variation in the total costs.

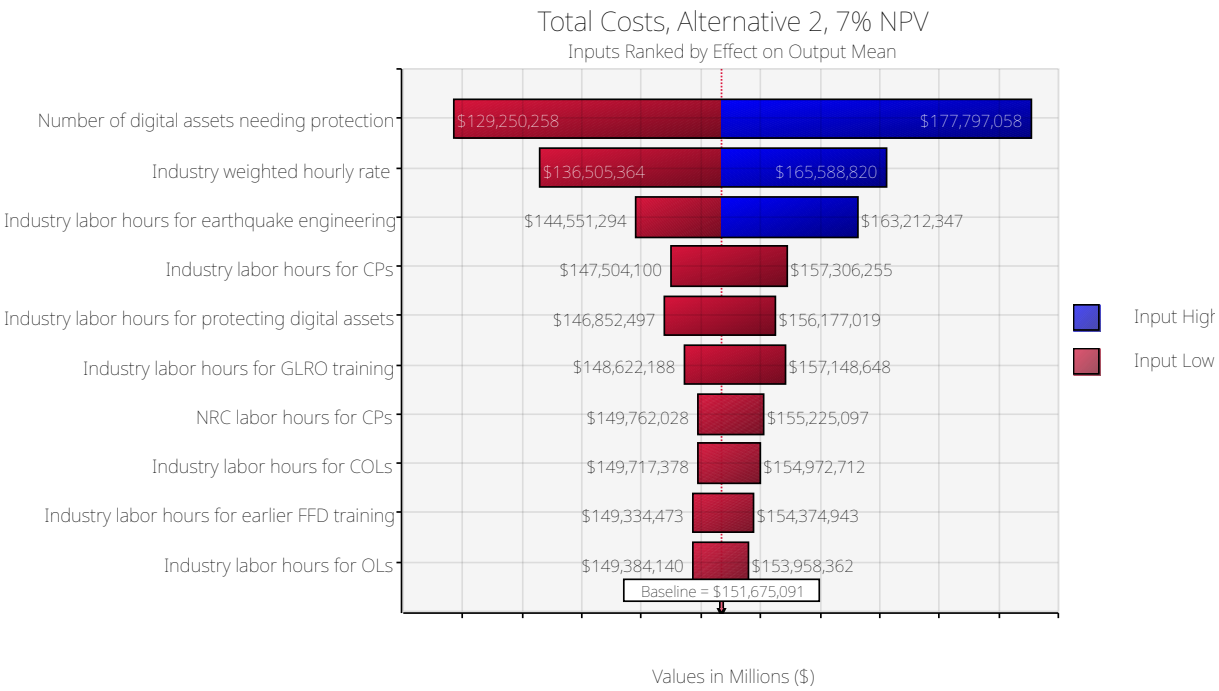

Figure 4 Sensitivity Analysis, Total Costs, Alternative 2, 7% NPV

Summary of Uncertainty Analysis Results

The uncertainty analysis shows that the estimated mean averted costs for Alternative 2 are $152 million (7 percent NPV), and that there is a greater than 99 percent confidence that the final rule is cost beneficial. It is reasonable to infer that issuing the rule represents an efficient use of resources and averted costs for the NRC and industry. The rule would also be cost beneficial to industry and to the NRC when the two are considered separately.

1.13 Disaggregation

To comply with guidance in Section 4.3.2, “Criteria for the Treatment of Individual Requirements,” of NUREG/BR-0058, Revision 5 (NRC, 2020a), the NRC conducted a screening review to ensure that the aggregate analysis did not mask the inclusion of individual rule provisions that would not be cost-beneficial when considered individually and are not necessary to meet the goals of the rule revisions. Consistent with the regulatory analysis guidelines in NUREG/BR-0058, the NRC evaluated, on a disaggregated basis, each new regulatory provision expected to result in an incremental cost. All provisions in the final rule that result in incremental costs and benefits are provided separately in appendix B, along with their cost bases. Provisions resulting in significant incremental costs are identified and described in sections 3.1 and 3.3 and appendix C. Each of the provisions in this final rule that result in incremental costs is needed to ensure a complete framework and enable the relaxations in this framework that result in the net averted costs to licensees and the NRC. The provisions with significant incremental costs are justified below.

The radiation protection process control program is a new program to be maintained throughout operations. Under existing regulations, this program is traditionally required as a condition in specific NRC licenses instead of a program required by regulation. The program results in costs to industry (based on the expected applications) of approximately ($7.80 million) using a 7 percent NPV and ($19.9 million) using a 3 percent NPV. Additionally, the process control program will result in estimated costs to the NRC of approximately ($3.98 million) using a 7 percent NPV and ($10.6 million) using a 3 percent NPV. This program has previously been included in the TS issued as part of each NRC license, and as such, this cost is a formality of the regulatory analysis process (i.e., the NRC estimates costs for new regulations even if the same or similar actions were being taken through other means in the past) as opposed to being an actual new cost to licensees. Including the program in Part 53 is more efficient and sets clearer expectations than the current process of adding it to the TS; therefore, the NRC considers this incremental cost to be justified.

The integrity assessment program is another new program resulting in costs of approximately ($1.64 million) using a 7 percent NPV and ($3.46 million) using a 3 percent NPV. Reviewing the integrity assessment programs results in estimated costs to the NRC of approximately ($1.08 million) using a 7 percent NPV and ($2.52 million) using a 3 percent NPV. The inclusion of this program enables many of the relaxations in this final rule because it reflects a performance-based approach for the introduction of new materials and operating conditions that allows for the subsequent consideration of operating experience and appropriate corrective actions or allowable relaxations for ensuring that design features comply with the required functional design criteria. It also enables more allowable combinations of design features, operating experience, testing, and monitoring during operations beneficial to the licensing of new technologies. Those licensees using consensus codes and standards such as American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 2, “Reliability and Integrity Management (RIM),” would largely fulfill the requirements for an integrity assessment program and thereby incur lower additional costs.

1.14 Summary

This regulatory analysis identified both quantifiable and nonquantifiable costs and benefits that will result from issuing the final rule to address risk-informed, technology-inclusive requirements for commercial nuclear plants. Although quantifiable costs and benefits appear more tangible,

the staff urges decision-makers not to discount costs and benefits that cannot be quantified or monetized, as the latter may be of equal or greater importance. Based on this regulatory analysis, Alternative 2 is cost beneficial to industry and the NRC.

1.14.1 Quantified Net Benefit

As shown in Table 4, the estimated incremental averted costs for Alternative 2 over the 60-year analysis horizon, relative to the regulatory baseline (Alternative 1), range from approximately $152 million (7 percent NPV) to $203 million (3 percent NPV).

1.14.2 Nonquantified Benefits

In addition to the quantified costs discussed in this regulatory analysis, the final rule would lead to several nonquantified benefits for the general public, industry, and the NRC in relation to regulatory efficiency, improvements in knowledge, and increased public confidence. One stated purpose of NEIMA is to provide a regulatory program "to develop the expertise and regulatory processes necessary to allow innovation and the commercialization of advanced nuclear reactors." This final rule responds to this direction in NEIMA by creating an alternative, technology-inclusive regulatory framework to accommodate licensing of future commercial nuclear plants, including advanced reactor designs. While identified nonquantified benefits of the rulemaking are summarized in greater detail below, the magnitude of the effects of this rulemaking are uncertain.

Additionally, this regulatory analysis does not estimate the number of exemption requests a future applicant might submit for many provisions in 10 CFR Part 50, 10 CFR Part 52, and 10 CFR Part 55, "Operators' Licenses," that would not be necessary for a future reactor design and would result in excessive costs to the applicant. This was not quantified because of the significant uncertainty in the extent of potential exemption requests, and because Alternative 2 has significant net averted costs without these requests being quantified. While it is important to acknowledge these averted costs, it is not necessary to quantify them, especially in view of the high levels of uncertainty in the data.

Improvements in Knowledge

Compared to the regulatory baseline (Alternative 1), Alternative 2 would increase the knowledge of industry and the NRC staff by enabling licensees to justify operational flexibilities using advances in PRA and other risk-informed analyses in a technology-inclusive framework with performance-based requirements. Industry and the NRC would thereby develop greater knowledge and common understanding of these advanced techniques through application and experience.

Regulatory Efficiency

Compared to the regulatory baseline, Alternative 2 would increase regulatory efficiency because the final rule codifies regulatory enhancements that exist currently in regulatory guides (RGs), such as the Licensing Modernization Project (LMP) methodology, and because of the other risk-informed alternatives for licensees to use without the need for exemption requests, such as the revised 10 CFR Part 26 requirements and the seismic analyses alternatives. This would give licensees flexibility and decrease their uncertainty when applying to the NRC and during operations. As noted above, Alternative 2 would also include provisions allowing factory fuel

loading for manufacturing licensees. While the NRC has not attempted to quantify the benefits from these provisions, the agency expects that the additional flexibility from these provisions could yield significant efficiencies for future applications. As noted by EO 14300, streamlined nuclear reactor licensing will also enhance national security. Finally, several requirements in this rule (such as the radiation protection process control program) are similar to those included in the TS for each currently operating reactor, and therefore codifying these requirements increases regulatory efficiency compared to the past practice of adding them to the TS for each licensee.

Increased Public Confidence

Under Alternative 2, the NRC is meeting its statutory requirements by responding to NEIMA and the ADVANCE Act, demonstrating its role as an effective regulator. This alternative would allow licensees to use risk-informed, performance-based approaches and the latest methods and technology to design, construct, operate, examine, and test nuclear power plant components while maintaining NRC oversight of these activities, which would increase public confidence.

1.15 Safety Goal Evaluation

Safety goal evaluations apply only to regulatory initiatives considered to be generic safety enhancement backfits subject to the substantial additional protection standard at 10 CFR 50.109(a)(3) or the issue finality provisions in 10 CFR Part 52. The staff expects that a plant licensed under 10 CFR Part 53 will have the same or a greater level of safety as a plant licensed under 10 CFR Part 50 or 10 CFR Part 52, and will meet the Commission's safety goals. A more dominant effect of this rule is to reduce costs for the regulated entities and the NRC, resulting in cost savings for both.

1.16 Results for the Committee to Review Generic Requirements

This section addresses regulatory analysis information requirements for rulemaking actions or staff positions subject to review by the Committee to Review Generic Requirements (CRGR). This regulatory analysis or the *Federal Register* notice for the final rule presents all information called for by the CRGR procedures (NRC, 2018b). Table 6 cross-references the relevant information to its location in this document or the *Federal Register* notice. However, the CRGR did not review this rule package. In SRM-SECY-20-0032 (NRC, 2020c), the Commission approved the staff's recommendation that the CRGR does not need to review this rule. In addition, the Committee declined to review the backfitting and issue finality assessment for this rule.

Table 6 Specific CRGR Regulatory Analysis Information Requirements

CRGR Procedures Citation (NRC, 2018b)	Information Item to Be Included in a Regulatory Analysis Prepared for CRGR Review	Where Item Is Discussed
Appendix B, (i)	The new or revised generic requirement or staff position in the final rule	Final rule text in *Federal Register* notice
Appendix B, (ii)	Draft papers or other documents supporting the requirements or staff positions	*Federal Register* notice for the final rule

CRGR Procedures Citation (NRC, 2018b)	Information Item to Be Included in a Regulatory Analysis Prepared for CRGR Review	Where Item Is Discussed
Appendix B, (iii)	The sponsoring office's position on whether each requirement or staff position would modify, implement, relax, or reduce existing requirements or staff positions	Regulatory analysis, section 3, and Section IX, "Backfitting and Issue Finality," of *Federal Register* notice for the final rule
Appendix B, (iv)	The method of implementation	Regulatory analysis, section 6
Appendix B, (vi)	The category of power reactors, new reactors, or nuclear materials facilities or activities to which the generic requirement or staff position applies	Regulatory analysis, section 2.2.2
Appendix B, (vii)–(viii)	The items required at 10 CFR 50.109(c) and the required rationale at 10 CFR 50.109(a)(3) if the action involves a power reactor backfit and the exceptions at 10 CFR 50.109(a)(4) do not apply	Section IX of *Federal Register* notice for the final rule
Appendix B, (xvi)	An assessment of how the action relates to the Commission's Safety Goal Policy Statement	Regulatory analysis, section 3.10

4. Decision Rationale

Table 7 provides the quantified and qualified costs and benefits for Alternatives 1 and 2. The quantitative analysis uses mean values.

Table 7 Summary of Totals

Net Monetary Savings or (Costs)—Total Present Value	Nonquantified Benefits or (Costs)
Alternative 1: No action $0	None
Alternative 2: Issuing the 10 CFR Part 53 final rule Industry: $128 million using 7% NPV $178 million using 3% NPV NRC: $23.2 million using 7% NPV $25.0 million using 3% NPV Net benefit (cost): $152 million using 7% NPV $203 million using 3% NPV	Benefits: • Fulfills the statutory requirements of NEIMA to establish a technology-inclusive regulatory framework for optional use by commercial nuclear plant applicants by December 31, 2027, and the ADVANCE Act for efficient licensing of nuclear reactors. • **Regulatory Efficiency:** Increases regulatory efficiency by codifying regulatory enhancements that exist currently in RGs, such as the LMP program, and risk-informed and other alternatives that licensees can use

Net Monetary Savings or (Costs)—Total Present Value	Nonquantified Benefits or (Costs)
	without the need for exemption requests, such as the revised 10 CFR Part 26 requirements, the seismic analyses alternatives, and provisions for factory fuel loading for manufacturing licensees. Gives licensees flexibility and decreases their uncertainty when applying to the NRC and during operations. Establishing a more efficient regulatory process also furthers national security. • **Improvements in Knowledge:** Increases the knowledge of industry and the NRC staff by enabling licensees to use advances in PRA and other risk-informed analyses in a technology-inclusive framework with performance-based requirements. • **Public Confidence:** The NRC is meeting its statutory requirements by responding to NEIMA ahead of schedule, demonstrating its role as an effective regulator, as well as complying with the ADVANCE Act. Enabling the latest methods and technology to design, construct, operate, examine, and test nuclear power plant components while maintaining NRC oversight of these activities increases public confidence.

Industry and the NRC would benefit from Alternative 2, because of several major averted cost drivers discussed above. As previously stated, this regulatory analysis estimated costs and benefits based on the current expectations of future applicants; each additional applicant beyond those the NRC has been informed of would result in further averted costs.

Based solely on quantified costs and benefits, the regulatory analysis shows that the rulemaking is justified because the total quantified benefits of the final rule would exceed the costs, for all discount rates up to 7 percent. The identified qualitative benefits further justify issuing the final rule. The uncertainty analysis shows a net benefit (averted cost) for all simulations with a range of averted costs from $99.9 million to $232 million (at a 7 percent NPV).

Therefore, after integrating both quantified and qualitative costs and benefits, the benefits of the final rule outweigh the costs associated with the rule.

5. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA), as amended at 5 U.S.C. 601 et seq., requires that agencies consider the impact of their rulemakings on small entities and, consistent with applicable statutes, consider alternatives to minimize these impacts on the businesses, organizations, and government jurisdictions to which they apply.

In accordance with the Small Business Administration's (SBA's) regulation at 13 CFR 121.903(c), the NRC has developed its own size standards for performing an RFA analysis and has verified with the SBA Office of Advocacy that its size standards are appropriate for NRC analyses. The NRC size standards at 10 CFR 2.810, “NRC size standards,” are used to determine whether an applicant or licensee qualifies as a small entity in the NRC's regulatory programs. The NRC is currently not aware of any known small entities as defined in 10 CFR 2.810 that are planning to apply for a commercial nuclear plant ESP, CP, OL, ML, or COL under Part 53 that would be impacted by this final rule. Based on this finding, the NRC has determined that the final rule does not have a significant economic impact on a substantial number of small entities.

Although the NRC is not aware of any small entities that are affected by the final rule, there is a possibility that future applications for a commercial nuclear plant permit or license could be submitted by small entities. Commercial nuclear plants of a size operated by a small entity would most likely be used to support electrical demand for military bases or small remote towns and would provide process heat, so they would not directly compete with a larger commercial nuclear plant that would typically produce electricity for the grid. As a result of these differing purposes, the NRC would expect that small and large entities would not be in direct competition with each other.

The Small Business Regulatory Enforcement Fairness Act requires that the NRC prepare a written compliance guide to assist small entities in complying with each rule for which a regulatory flexibility analysis is prepared. Since the NRC is not aware of any small entities that would be affected by this rule, the agency did not prepare this guide for the 10 CFR Part 53 final rule.

5.1 Impact on Small Entities

The NRC’s 10 CFR Part 53 rule will result in reduced costs to those individuals, organizations, and companies licensed by the agency that choose to apply under the new regulatory framework for commercial nuclear plants. The staff anticipates that a licensee could possibly qualify as a small entity if such an enterprise were for a commercial nuclear plant rated 8 megawatts electric or less. This qualification depends on the structure of the ownership and operating responsibilities for such an enterprise.

On January 14, 2019, the President signed NEIMA into law (Public Law 115-439). NEIMA directs the NRC to develop the regulatory infrastructure to support the development and commercialization of advanced nuclear reactors. This rulemaking establishes an alternative technology-inclusive regulatory framework for optional use by applicants for new commercial advanced nuclear reactors. The regulatory requirements developed in this rulemaking would use methods of evaluation, including risk-informed and performance-based methods, that are flexible and practicable for application to a variety of advanced reactor technologies.

Before NEIMA, the NRC described its efforts to prepare for the licensing of advanced reactors in documents such as “NRC Vision and Strategy: Safely Achieving Effective and Efficient Non-Light Water Reactor Mission Readiness,” issued December 2016 (NRC, 2016), and SECY-14-0095, “Status of the Office of New Reactors Readiness to Review Small Modular Reactor Applications,” dated August 28, 2014 (NRC, 2014).

Through this rulemaking, the NRC is amending its regulations by creating an alternative regulatory framework for licensing advanced nuclear reactors. The new alternative requirements and implementing guidance would adopt technology-inclusive approaches and include the appropriate use of risk-informed and performance-based techniques, to provide the necessary flexibility for licensing and regulating a variety of advanced nuclear reactor technologies and designs.

The final rule’s objectives are to (1) continue to provide reasonable assurance of adequate protection of public health and safety and the common defense and security at reactor sites where advanced nuclear reactor designs are deployed to at least the same degree of protection as required for current-generation LWRs, (2) protect health and minimize danger to life or property to at least the same degree of protection as required for current-generation LWRs, (3) provide greater operational flexibilities where supported by enhanced margins of safety that may be provided in advanced nuclear designs, (4) promote regulatory stability, predictability, and clarity, and (5) reduce requests for exemptions from the current requirements in 10 CFR Part 50 and 10 CFR Part 52.

5.2 Summary

The NRC has determined that the 10 CFR Part 53 final rule would not have a significant impact on a substantial number of small entities. Some advanced reactor licensees may qualify as small entities, but most would not. For those qualifying as small entities, the averted costs of the rule would constitute a significant positive impact. The final rule saves significant costs in the areas of applications (technical details), operator licensing, and PRA, compared to 10 CFR Parts 50, 52, and 55, which would otherwise apply to these advanced reactors. This regulatory analysis demonstrates that industry would experience estimated averted costs of approximately $128 million. Based on its regulatory flexibility analysis, the NRC concludes that the 10 CFR Part 53 final rule meets the objectives of NEIMA and would not impose unnecessary burdens on small entities, in keeping with the Regulatory Flexibility Act.

6. Implementation Schedule

The NRC assumes that the final rule will become effective 30 days after its publication in the *Federal Register* in 2027.

7. References

10 CFR Part 2. *U.S. Code of Federal Regulations*, “Agency Rules of Practice and Procedure,” Part 2, Chapter I, Title 10, “Energy.”

10 CFR Part 26. *U.S. Code of Federal Regulations*, “Fitness for Duty Programs,” Part 26, Chapter I, Title 10, “Energy.”

10 CFR Part 50. *U.S. Code of Federal Regulations*, “Domestic Licensing of Production and Utilization Facilities,” Part 50, Chapter I, Title 10, “Energy.”

10 CFR Part 52. *U.S. Code of Federal Regulations*, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” Part 52, Chapter I, Title 10, “Energy.”

10 CFR Part 55. *U.S. Code of Federal Regulations*, “Operators’ Licenses,” Part 55, Chapter I, Title 10, “Energy.”

10 CFR Part 70. *U.S. Code of Federal Regulations*, “Domestic Licensing of Special Nuclear Material,” Part 70, Chapter I, Title 10, “Energy.”

10 CFR Part 73. *U.S. Code of Federal Regulations*, “Physical Protection of Plants and Materials,” Part 73, Chapter I, Title 10, “Energy.”

10 CFR Part 100. *U.S. Code of Federal Regulations*, “Reactor Site Criteria,” Part 100, Chapter I, Title 10, “Energy.”

10 CFR Part 110. *U.S. Code of Federal Regulations*, “Export and Import of Nuclear Equipment and Material,” Part 110, Chapter I, Title 10, “Energy.”

10 CFR Part 170. *U.S. Code of Federal Regulations*, “Fees for Facilities, Materials, Import and Export Licenses, and Other Regulatory Services under the Atomic Energy Act of 1954, as Amended,” Part 170, Chapter I, Title 10, “Energy.”

American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 2, “Reliability and Integrity Management (RIM).”

Atomic Energy Act of 1954, as amended. Public Law 83-703, 42 U.S.C. 2011 et seq.

BLS, 2024. “May 2024 National Industry-Specific Occupational Employment and Wage Estimates,” U.S. Department of Labor, Bureau of Labor Statistics, May 2024. Available at https://www.bls.gov/oes/tables.htm; last accessed April 2, 2025.

U.S. Congress, 2019. “S. 512—Nuclear Energy Innovation and Modernization Act,” U.S. Congress, January 2019. Available at https://www.congress.gov/bill/115th-congress/senate-bill/512?q=%7B%22search%22%3A%5B%22cite%3APL115-439%22%5D%7D&s=1&r=1.

NRC, 1983. “A Handbook for Value-Impact Assessment,” NUREG/CR-3568, U.S. Nuclear Regulatory Commission, December 1983. (Agencywide Documents Access and Management System Accession No. ML062830096)

NRC, 1986. “Safety Goals for the Operations of Nuclear Power Plants; Policy Statement; Republication,” 51 FR 28044, U.S. Nuclear Regulatory Commission, August 21, 1986.

NRC, 2014. “Status of the Office of New Reactors Readiness to Review Small Modular Reactor Applications,” SECY-14-0095, U.S. Nuclear Regulatory Commission, August 28, 2014. (ML14073A710)

NRC, 2016. “NRC Vision and Strategy: Safely Achieving Effective and Efficient Non-Light Water Reactor Mission Readiness,” U.S. Nuclear Regulatory Commission, December 2016. (ML16356A670)

NRC, 2018a. “Proposed Rule: Financial Qualifications Requirements for Reactor Licensing (RIN 3150-AJ43),” SECY-18-0026, U.S. Nuclear Regulatory Commission, February 26, 2018. (ML17172A565)

NRC, 2018b. “Committee to Review Generic Requirements Procedures and Internal Administrative Process,” June 2018. (ML17355A533)

NRC, 2020a. “Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission,” NUREG/BR-0058, Revision 5, U.S. Nuclear Regulatory Commission, January 2020. (ML19261A278)

NRC, 2020b. “Rulemaking Plan on ‘Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (RIN-3150-AK31; NRC-2019-0062),’” SECY-20-0032, U.S. Nuclear Regulatory Commission, April 13, 2020. (ML19340A056)

NRC, 2020c. “Staff Requirements—SECY-20-0032—Rulemaking Plan on ‘Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (RIN-3150-AK31; NRC-2019-0062),’” SRM-SECY-20-0032, U.S. Nuclear Regulatory Commission, October 2, 2020. (ML20276A293)

NRC, 2022. “Regulatory Basis: Reporting Requirements for Nonemergency Events at Nuclear Power Plants,” 87 *Federal Register* (FR) 67571, U.S. Nuclear Regulatory Commission, November 9, 2022. (87 FR 67571)

NRC, 2023. “Proposed Rule: Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (RIN 3150-AK31),” SECY-23-0021, U.S. Nuclear Regulatory Commission, March 1, 2023. (ML21162A093)

NRC, 2024. “Staff Requirements—SECY-23-0021—Proposed Rule: Risk-Informed, Technology-Inclusive Regulatory Framework for Advanced Reactors (RIN 3150-AK31),” SRM-SECY-23-0021, U.S. Nuclear Regulatory Commission, March 4, 2024. (ML24064A047)

NRC, 2025a. “Staff Requirements—SECY-24-0008—Micro-Reactor Licensing and Deployment Considerations: Fuel Loading and Operational Testing at a Factory,” U.S. Nuclear Regulatory Commission, June 17, 2025. (ML25168A133)

NRC, 2025b. “Direct Final Rule: Revising the Duration of Design Certifications,” 90 FR 28869, U.S. Nuclear Regulatory Commission, July 2, 2025.

OMB, 2003. “Regulatory Analysis,” Circular A-4, Office of Management and Budget, September 17, 2003. Available at https://www.whitehouse.gov/wp-content/uploads/2025/08/CircularA-4.pdf.

Regulatory Flexibility Act. Public Law 96-354, 5 U.S.C. 601 et seq.

Small Business Regulatory Enforcement Fairness Act. Public Law 104-121, 15 U.S.C. 657 and 5 U.S.C. 601 note.

APPENDIX A
MAJOR ASSUMPTIONS AND INPUT DATA

The estimates in this table, when not otherwise described (e.g., “NRC Estimate”), are based on burden data previously developed by the NRC as part of its submissions to the Office of Management and Budget (OMB) under the Paperwork Reduction Act (PRA). Specifically, these estimates are based on information provided in NRC’s OMB clearance requests, which quantify the paperwork burdens associated with various regulatory requirements. These data are publicly accessible through the Regulatory Information Service Center/Office of Information and Regulatory Affairs Consolidated Information System (ROCIS) under the “Information Collection Review” section of www.reginfo.gov. The U.S. Nuclear Regulatory Commission (NRC) considered the extent of changes to these requirements in this final rule and determined the best estimates of the incremental burden of these changes based on the magnitude of differences between this final rule and those existing regulations. For example, for a paragraph in this final rule containing regulatory language similar to existing language in 10 CFR Part 50, if the existing annual burden for Part 50 was listed as 200 hours, the NRC would evaluate the differences between Part 53 and Part 50 and estimate what, if any, reduction in burden there was (for example, a 25% reduction in burden based on fewer required reports). In this example, the regulatory analysis would then estimate that this regulatory paragraph reduced the annual burden for Part 53 relative to the baseline by 50 hours. The low and high estimates were then based on NRC experience with the range of burden associated with each activity.

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
General						
Base Year	2024					
Applications in 2027	6	PERT	3	6	5	Proprietary NRC information on future applicants
Applications in 2028	2	PERT	5	2	9	
Applications in 2029	5	PERT	4	5	6	
Applications in 2030	1	PERT	3	1	5	
Applications in 2031	1	PERT	2	1	4	
CP Applications in 2027	4					
CP Applications in 2028	1					
CP Applications in 2029	0					
CP Applications in 2030	0					
CP Applications in 2031	0					
OL Applications in 2027	0					
OL Applications in 2028	0					
OL Applications in 2029	4					

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
OL Applications in 2030	1					
OL Applications in 2031	0					
COL Applications in 2027	1					
COL Applications in 2028	0					
COL Applications in 2029	1					
COL Applications in 2030	0					
COL Applications in 2031	0					
ESP Applications in 2027	1					
ESP Applications in 2028	0					
ESP Applications in 2029	0					
ESP Applications in 2030	0					
ESP Applications in 2031	0					
ML Applications in 2027	0					
ML Applications in 2028	0					
ML Applications in 2029	0					
ML Applications in 2030	0					
ML Applications in 2031	0					
SDA Applications in 2027	0					
SDA Applications in 2028	1					
SDA Applications in 2029	0					
SDA Applications in 2030	0					
SDA Applications in 2031	1					
DC Applications in 2027	0					
DC Applications in 2028	0					
DC Applications in 2029	0					
DC Applications in 2030	0					
DC Applications in 2031	0					
GLRO Applicants in 2027	1					NRC assumption
GLRO Applicants in 2028	0					
GLRO Applicants in 2029	3					

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
GLRO Applicants in 2030	0					
GLRO Applicants in 2031	0					
Reactor Life	60 years					NRC expectation based on current trends and existing fleet operating experience
NRC Labor Rate	$158					Calculated value based on fiscal year (FY) 2024 actuals
Industry Weighted Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Managers	$198					The labor rates used are from the dataset “SOC Code: Standard Occupational Classification Code” (2024 values). The NRC then applied a multiplier of 2.4, which includes fringe and indirect management costs, resulting in the displayed labor rates.
Administrative Staff	$109					
Licensing Staff	$178					
Nuclear Engineer	$159					
Primary Discount Rate	7%					OMB
Alternative Discount Rate	3%					OMB
NRC Rulemaking						
Final Rule Preparation Begins	2025					

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
Final Rule Completed	2026					
10 CFR Part 26 Changes						
Exemption requests for 10 CFR Part 26 sections						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Number of Exemption Requests Submitted	9.5	PERT	5	10	12	NRC estimate based on number of regulatory requirements
Labor Hours	230	PERT	120	230	340	NRC estimate
Review exemption requests for approval						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Number of Exemption Requests Reviewed	9.5	PERT	5	10	12	NRC estimate based on number of regulatory requirements
Labor Hours	115	PERT	60	115	170	Half of the time to prepare and submit
Develop license conditions and inspect after implementation						
NRC Labor Rate	$158					Calculated value based on FY2024 actuals
Number of License Conditions	2					
Labor Hours per Condition	13.6	PERT	9.6	12	24	NRC estimate
Inspection Hours	22.7	PERT	16.0	20.0	40.0	
26.608 Licensees implement initial FFD training in construction year instead of operating year, which results in costs being incurred 1 year earlier and more personnel trained						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	680	PERT	480	600	1,200	NRC estimate, 2 hours of training, 300 personnel
Cost	($105,006)					
1 Year 7% NPV Factor	0.93					

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
Cost to Conduct a Year Earlier	($7,904)					
Number of Trainees	340	PERT	240	300	600	NRC estimate, 2 hours of training, 150 personnel
Cost to Train Additional Personnel	(52,503)					
26.607(m)(2) Medical review officer requalification training/exam at 5-year intervals						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	8	PERT	7	8	9	NRC estimate
Periodicity (years)	5					Rule language
26.608(b) FFD training at 2-year intervals						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	2	PERT	1	1.5	2	NRC estimate
Periodicity (years)	2					Rule language
26.608(b) Behavioral observation retraining at 2-year intervals						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	2	PERT	1	1.5	2	NRC estimate
Periodicity (years)	2					Rule language
Licensee writes change control procedure						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	136.0	PERT	96	120	240	NRC estimate
Licensee evaluates and justifies FFD changes						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	2.3	PERT	1.6	2	4	NRC estimate
Licensee ensures randomization in testing						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	4.5	PERT	3.2	4	8	NRC estimate
Licensee establishes dilute testing and conducts initial testing						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
Labor Hours	5.1	PERT	3.6	4.5	9	NRC estimate
Licensee conducts dilute testing						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	1.1	PERT	0.8	1	2	NRC estimate
Licensee contracts with backup lab						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	109	PERT	77	96	192	NRC estimate
10 CFR Part 73 Changes						
Licensee performs analyses in support of cybersecurity plan (73.110)—occurs with licensing						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	211.3	PERT	150	212	270	NRC estimate of differences based on data for comparable regulations
Licensee reports annually to the NRC (73.110)—annual once operating						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	0.3	PERT	0.2	0.3	0.4	NRC estimate of differences based on data for comparable regulations
Licensee implements cybersecurity controls and procedures to protect digital assets in support of cybersecurity plan (73.110)—occurs during construction						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Digital Assets Needing Protection	388.7	PERT	0	333	1,000	NRC estimate of differences based on data for comparable regulations
Labor Hours per Digital Asset	96.3	PERT	72	97	118	NRC estimate of differences based on data for comparable

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
						regulations
10 CFR Part 53 Changes						
53.440(f) Design requirements—safety and security interface—incremental costs in application year, requires considering safety and security together, NRC policy but not a current requirement						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	113.3	PERT	80	100	200	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2023 actuals
Labor Hours	113.3	PERT	80	100	200	NRC estimate of differences based on data for comparable regulations
53.480 Earthquake engineering—incremental savings in application year, greater flexibility with RG and risk-informed seismic approach						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	35,133	PERT	24,800	31,000	62,000	NRC estimate of differences based on data for comparable regulations
53.1146 Contents of applications for early site permits; technical information—incremental savings in application year due to simplified application requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
Labor Hours	12,750	PERT	9,000	11,250	22,500	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	8,246	PERT	5,821	7,276	14,552	NRC estimate of differences based on data for comparable regulations
53.1209 Contents of applications for standard design approvals; technical information—incremental savings in application year due to simplified application requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	8,976	PERT	6,336	7,920	15,840	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	6,283	PERT	4,435	5,544	11,088	NRC estimate of differences based on data for comparable regulations
53.1239 Contents of applications for standard design certifications; technical information—incremental savings in application year due to simplified application requirements						
Industry Activity						

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	102,791	PERT	72,558	90,698	181,396	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	51,396	PERT	36,279	45,349	90,698	NRC estimate of differences based on data for comparable regulations
53.1279 Contents of applications for manufacturing licenses; technical information—incremental savings in application year due to simplified application requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	23,800	PERT	16,800	21,000	42,000	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	25,290	PERT	17,852	22,315	44,630	NRC estimate of differences based on data for comparable regulations
53.1309 Contents of applications for construction permits; technical information—incremental savings in application year due to simplified application requirements						

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	26,633	PERT	18,800	23,500	47,000	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	13,208	PERT	9,323	11,654	23,308	NRC estimate of differences based on data for comparable regulations
53.1369 Contents of applications for operating licenses; technical information—incremental savings in application year due to simplified application requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	12,467	PERT	8,800	11,000	22,000	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	13,591	PERT	9,593	11,992	23,983	NRC estimate of differences based on data for comparable regulations
53.1416 Contents of applications for combined licenses; technical information—incremental savings in application year						

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
due to simplified application requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	36,842	PERT	26,006	32,508	65,016	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	26,891	PERT	18,982	23,727	47,454	NRC estimate of differences based on data for comparable regulations
53.1540 Updating licensing-basis information and determining the need for NRC approval—annual savings due to enhanced use of PRA to assess changes						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables.
Labor Hours	479	PERT	338	423	846	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	18	PERT	13	16	32	NRC estimate of differences based on data for comparable regulations

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
53.1550(a) Evaluating changes to facility as described in Final Safety Analysis Reports—savings treated annually due to PRA providing specific metrics for NRC approval instead of the need to make a determination						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	66	PERT	46	58	116	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	44	PERT	31	39	78	NRC estimate of differences based on data for comparable regulations
53.780 Training, examination, and proficiency program—periodic training treated annually, incremental savings due to simplified and streamlined requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	805.8	PERT	569	711	1,422	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	124.7	PERT	88	110	220	NRC estimate of differences based on data for comparable

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
						regulations
53.805 Facility licensee requirements related to generally licensed reactor operators—annual costs due to new requirement to report information on all GLROs						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	7	PERT	5	6	12	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	1.1	PERT	0.8	1	2	NRC estimate of differences based on data for comparable regulations
53.810 Generally licensed reactor operators—periodic training treated annually, incremental savings due to simplified and streamlined requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	28.3	PERT	20	25	50	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	5.7	PERT	4	5	10	NRC estimate of differences based on data for

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
						comparable regulations
53.815 Generally licensed reactor operator training, examination, and proficiency programs—periodic training treated annually, incremental savings due to simplified and streamlined requirements						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	2,578	PERT	1,820	2,275	4,550	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	284	PERT	201	251	502	NRC estimate of differences based on data for comparable regulations
53.850(b) Radiation protection—monthly savings treated annually; no requirement for effluent-related technical specification						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	231	PERT	163	204	408	NRC estimate of differences based on data for comparable regulations
53.850(c) Radiation protection—monthly costs treated annually; requirement for process control program						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	816	PERT	576	720	1,440	NRC estimate of differences based on data for

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
						comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	435	PERT	307	384	768	NRC estimate of differences based on data for comparable regulations
53.860 Security programs—incremental savings in application year, allows use of 10 CFR 73.100 to implement the physical protection program, which provides a graded approach to security, including the potential for being exempt from protecting against the design-basis threat						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	385	PERT	272	340	680	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	193	PERT	136	170	340	NRC estimate of differences based on data for comparable regulations
53.870 Integrity assessment programs—incremental costs in construction year due to new program						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	764	PERT	539	674	1,348	NRC estimate of differences based

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
						on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	340	PERT	240	300	600	NRC estimate of differences based on data for comparable regulations
53.870 Integrity assessment programs—annual costs starting in operation year due to new program						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	113	PERT	80	100	200	NRC estimate
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	91	PERT	64	80	160	NRC estimate (Office of Nuclear Reactor Regulation)
53.440(k) Initiating events and accident analysis—chemical hazards—incremental costs in construction year when licensees would potentially need to research and test materials and coolants that have limited operating experience						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	1,360	PERT	960	1,200	2,400	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
						actuals
Labor Hours	453	PERT	320	400	800	NRC estimate of differences based on data for comparable regulations
53.1545(a) Updating Final Safety Analysis Reports (FSARs)—incremental savings every 2 years; simplified FSAR means less information to be updated, and change is estimated to reduce recurring annual costs by half						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	113.3	PERT	80	100	200	NRC estimate of differences based on data for comparable regulations
53.1306, 53.1366, 53.1413 Contents of applications (financial qualification requirements)—incremental savings due to reduced requirements matching those proposed in SECY-18-0026						
Industry Activity						
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	1360.0	PERT	960	1200	2400	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	680	PERT	480	600	1200	NRC estimate of differences based on data for comparable regulations
Removal of 53.1680 Annual Financial Reports—incremental savings each year due to removal of reporting requirement						
Industry Activity						

Activity	Mean Estimate	Distribution	Low Estimate	Best Estimate	High Estimate	Source or Basis of Estimate
Industry Labor Rate	$154	PERT	$127	$155	$180	BLS.gov tables
Labor Hours	1.1	PERT	0.8	1	2	NRC estimate of differences based on data for comparable regulations
NRC Activity						
NRC Labor Rate	$158					Calculated value based on FY 2024 actuals
Labor Hours	0.6	PERT	0.4	0.5	1	NRC estimate of differences based on data for comparable regulations

APPENDIX B
DETAILED COST TABLES

Industry Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
53.440(f) Design requirements—safety and security interface							
2027	Provide Safety and Security Design Information	6	113	$154	($105,000)	($86,000)	($96,000)
2028	Provide Safety and Security Design Information	1	113	$154	($18,000)	($13,000)	($16,000)
2029	Provide Safety and Security Design Information	0	113	$154	$0	$0	$0
2030	Provide Safety and Security Design Information	0	113	$154	$0	$0	$0
2031	Provide Safety and Security Design Information	0	113	$154	$0	$0	$0
				Net Benefit (Cost) Total	**($123,000)**	**($99,000)**	**($112,000)**
53.480 Earthquake engineering							
2027	Flexibilities in Earthquake Engineering Specifications	6	35,133	$154	$32,552,000	$26,572,000	$29,790,000
2028	Flexibilities in Earthquake Engineering Specifications	1	35,133	$154	$5,425,000	$4,139,000	$4,820,000
2029	Flexibilities in Earthquake Engineering Specifications	0	35,133	$154	$0	$0	$0
2030	Flexibilities in Earthquake Engineering Specifications	0	35,133	$154	$0	$0	$0
2031	Flexibilities in Earthquake Engineering Specifications	0	35,133	$154	$0	$0	$0
				Net Benefit (Cost) Total	**$37,977,000**	**$30,711,000**	**$34,610,000**
53.1146 Contents of applications for early site permits; technical information							
2027	Simplified ESP Application Technical Information	1	12,750	$154	$1,969,000	$1,607,000	$1,802,000
2028	Simplified ESP Application Technical Information	0	12,750	$154	$0	$0	$0

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
2029	Simplified ESP Application Technical Information	0	12,750	$154	$0	$0	$0
2030	Simplified ESP Application Technical Information	0	12,750	$154	$0	$0	$0
2031	Simplified ESP Application Technical Information	0	12,750	$154	$0	$0	$0
Net Benefit (Cost) Total					**$1,969,000**	**$1,607,000**	**$1,802,000**
53.1209 Contents of applications for standard design approvals; technical information							
2027	Simplified SDA Technical Information	0	8,976	$154	$0	$0	$0
2028	Simplified SDA Technical Information	1	8,976	$154	$1,386,000	$1,057,000	$1,232,000
2029	Simplified SDA Technical Information	0	8,976	$154	$0	$0	$0
2030	Simplified SDA Technical Information	0	8,976	$154	$0	$0	$0
2031	Simplified SDA Technical Information	1	8,976	$154	$1,386,000	$863,000	$1,127,000
Net Benefit (Cost) Total					**$2,772,000**	**$1,920,000**	**$2,359,000**
53.1239 Contents of applications for standard design certifications; technical information							
2027	Simplified DC Application Technical Information	0	102,791	$154	$0	$0	$0
2028	Simplified DC Application Technical Information	0	102,791	$154	$0	$0	$0
2029	Simplified DC Application Technical Information	0	102,791	$154	$0	$0	$0
2030	Simplified DC Application Technical Information	0	102,791	$154	$0	$0	$0
2031	Simplified DC Application Technical Information	0	102,791	$154	$0	$0	$0
Net Benefit (Cost) Total					**$0**	**$0**	**$0**
53.1279 Contents of applications for manufacturing licenses; technical information							
2027	Simplified ML Application Technical Information	0	23,800	$154	$0	$0	$0

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
2028	Simplified ML Application Technical Information	0	23,800	$154	$0	$0	$0
2029	Simplified ML Application Technical Information	0	23,800	$154	$0	$0	$0
2030	Simplified ML Application Technical Information	0	23,800	$154	$0	$0	$0
2031	Simplified ML Application Technical Information	0	23,800	$154	$0	$0	$0
Net Benefit (Cost) Total					**$0**	**$0**	**$0**
53.1309 Contents of applications for construction permits; technical information							
2027	Simplified CP Application Technical Information	4	26,633	$154	$16,451,000	$13,429,000	$15,055,000
2028	Simplified CP Application Technical Information	1	26,633	$154	$4,113,000	$3,138,000	$3,654,000
2029	Simplified CP Application Technical Information	0	26,633	$154	$0	$0	$0
2030	Simplified CP Application Technical Information	0	26,633	$154	$0	$0	$0
2031	Simplified CP Application Technical Information	0	26,633	$154	$0	$0	$0
Net Benefit (Cost) Total					**$20,564,000**	**$16,567,000**	**$18,709,000**
53.1369 Contents of applications for operating licenses; technical information							
2027	Simplified OL Application Technical Information	0	12,467	$154	$0	$0	$0
2028	Simplified OL Application Technical Information	0	12,467	$154	$0	$0	$0
2029	Simplified OL Application Technical Information	4	12,467	$154	$7,700,000	$5,490,000	$6,642,000
2030	Simplified OL Application Technical Information	1	12,467	$154	$1,925,000	$1,283,000	$1,612,000
2031	Simplified OL Application Technical Information	0	12,467	$154	$0	$0	$0
Net Benefit (Cost) Total					**$9,625,000**	**$6,773,000**	**$8,254,000**
53.1416 Contents of applications for combined licenses; technical information							

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
2027	Simplified COL Application Technical Information	1	36,842	$154	$5,689,000	$4,644,000	$5,206,000
2028	Simplified COL Application Technical Information	0	36,842	$154	$0	$0	$0
2029	Simplified COL Application Technical Information	1	36,842	$154	$5,689,000	$4,056,000	$4,908,000
2030	Simplified COL Application Technical Information	0	36,842	$154	$0	$0	$0
2031	Simplified COL Application Technical Information	0	36,842	$154	$0	$0	$0
Net Benefit (Cost) Total					**$11,378,000**	**$8,700,000**	**$10,114,000**
53.1540 Updating licensing-basis information and determining the need for NRC approval							
2029–2088	Streamlined Updating of Licensing Basis	1	479	$154	$4,442,000	$741,000	$1,767,000
2030–2089	Streamlined Updating of Licensing Basis	0	479	$154	$0	$0	$0
2031–2090	Streamlined Updating of Licensing Basis	5	479	$154	$22,209,000	$3,236,000	$8,329,000
2032–2091	Streamlined Updating of Licensing Basis	1	479	$154	$4,442,000	$605,000	$1,617,000
2033–2092	Streamlined Updating of Licensing Basis	0	479	$154	$0	$0	$0
Net Benefit (Cost) Total					**$31,093,000**	**$4,582,000**	**$11,713,000**
53.1550(a) Evaluating changes to facility as described in Final Safety Analysis Reports							
2029–2088	Streamlined Change Evaluation Process	1	154	$154	$1,431,000	$239,000	$569,000
2030–2089	Streamlined Change Evaluation Process	0	154	$154	$0	$0	$0
2031–2090	Streamlined Change Evaluation Process	5	154	$154	$7,154,000	$1,042,000	$2,683,000
2032–2091	Streamlined Change Evaluation Process	1	154	$154	$1,431,000	$195,000	$521,000
2033–2092	Streamlined Change Evaluation Process	0	154	$154	$0	$0	$0
Net Benefit (Cost) Total					**$10,016,000**	**$1,476,000**	**$3,773,000**

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
73.110(a) through (e) Additional cybersecurity plan analysis							
2028	Additional Analyses in Development of Cyber Plan	6	211	$154	($196,000)	($149,000)	($174,000)
2029	Additional Analyses in Development of Cyber Plan	1	211	$154	($33,000)	($23,000)	($28,000)
2030	Additional Analyses in Development of Cyber Plan	0	211	$154	$0	$0	$0
2031	Additional Analyses in Development of Cyber Plan	0	211	$154	$0	$0	$0
2032	Additional Analyses in Development of Cyber Plan	0	211	$154	$0	$0	$0
				Net Benefit (Cost) Total	**($229,000)**	**($172,000)**	**($202,000)**
73.110(d)(1) and (e)(3) Protection of digital assets							
2028	Assets Not Required to Be Protected	2332	96	$154	$34,691,000	$26,465,000	$30,822,000
2029	Assets Not Required to Be Protected	389	96	$154	$5,782,000	$4,122,000	$4,987,000
2030	Assets Not Required to Be Protected	0	96	$154	$0	$0	$0
2031	Assets Not Required to Be Protected	0	96	$154	$0	$0	$0
2032	Assets Not Required to Be Protected	0	96	$154	$0	$0	$0
				Net Benefit (Cost) Total	**$40,473,000**	**$30,587,000**	**$35,809,000**
Exemption requests for 10 CFR Part 26 sections							
2028	Averted Exemption Requests	47.5	230	$154	$1,687,000	$1,287,000	$1,499,000
2029	Averted Exemption Requests	9.5	230	$154	$337,000	$241,000	$291,000
2030	Averted Exemption Requests	9.5	230	$154	$337,000	$225,000	$283,000
2031	Averted Exemption Requests	0	230	$154	$0	$0	$0
2032	Averted Exemption Requests	0	230	$154	$0	$0	$0
				Net Benefit (Cost) Total	**$2,361,000**	**$1,753,000**	**$2,073,000**
26.608 Licensees implement initial FFD training							

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
2028	Implement Training During Construction vs. Operation	5	($60,407)		($302,000)	($230,000)	($268,000)
2029	Implement Training During Construction vs. Operation	1	($60,407)		($60,000)	($43,000)	($52,000)
2030	Implement Training During Construction vs. Operation	1	($60,407)		($60,000)	($40,000)	($51,000)
2031	Implement Training During Construction vs. Operation	0	($60,407)		$0	$0	$0
2032	Implement Training During Construction vs. Operation	0	($60,407)		$0	$0	$0
Net Benefit (Cost) Total					**($422,000)**	**($313,000)**	**($371,000)**
26.607(m)(2) Medical review officer requalification training/exam at 5-year intervals							
2029–2088	MRO Requalification Training and Exam	5	8	$154	($74,000)	($24,000)	($40,000)
2030–2089	MRO Requalification Training and Exam	1	8	$154	($15,000)	($5,000)	($8,000)
2031–2090	MRO Requalification Training and Exam	1	8	$154	($15,000)	($6,000)	($8,000)
2032–2091	MRO Requalification Training and Exam	0	8	$154	$0	$0	$0
2033–2092	MRO Requalification Training and Exam	0	8	$154	$0	$0	$0
Net Benefit (Cost) Total					**($104,000)**	**($35,000)**	**($56,000)**
26.608(b) FFD training at 2-year intervals							
2029–2088	Biannual Training (Instead of Annual)	5	510	$154	$11,813,000	$3,877,000	$6,317,000
2030–2089	Biannual Training (Instead of Annual)	1	510	$154	$2,363,000	$830,000	$1,301,000
2031–2090	Biannual Training (Instead of Annual)	1	510	$154	$2,363,000	$888,000	$1,340,000
2032–2091	Biannual Training (Instead of Annual)	0	510	$154	$0	$0	$0
2033–2092	Biannual Training (Instead of Annual)	0	510	$154	$0	$0	$0
Net Benefit (Cost) Total					**$16,539,000**	**$5,595,000**	**$8,958,000**

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
26.608(b) Behavioral observation retraining at 2-year intervals							
2029–2088	Biannual Training (Instead of Annual)	5	510	$154	$11,813,000	$3,877,000	$6,317,000
2030–2089	Biannual Training (Instead of Annual)	1	510	$154	$2,363,000	$830,000	$1,301,000
2031–2090	Biannual Training (Instead of Annual)	1	510	$154	$2,363,000	$888,000	$1,340,000
2032–2091	Biannual Training (Instead of Annual)	0	510	$154	$0	$0	$0
2033–2092	Biannual Training (Instead of Annual)	0	510	$154	$0	$0	$0
				Net Benefit (Cost) Total	**$16,539,000**	**$5,595,000**	**$8,958,000**
26.603(e) Licensees write change control procedure							
2028	Licensees Write Procedure	5	136	$154	($105,000)	($80,000)	($93,000)
2029	Licensees Write Procedure	1	136	$154	($21,000)	($15,000)	($18,000)
2030	Licensees Write Procedure	1	136	$154	($21,000)	($14,000)	($18,000)
2031	Licensees Write Procedure	0	136	$154	$0	$0	$0
2032	Licensees Write Procedure	0	136	$154	$0	$0	$0
				Net Benefit (Cost) Total	**($147,000)**	**($109,000)**	**($129,000)**
26.603(e) Licensees evaluate and justify FFD changes							
2029–2088	Licensees Evaluate And Justify Changes	5	2	$154	($105,000)	($18,000)	($42,000)
2030–2089	Licensees Evaluate And Justify Changes	1	2	$154	($21,000)	($3,000)	($8,000)
2031–2090	Licensees Evaluate And Justify Changes	1	2	$154	($21,000)	($3,000)	($8,000)
2032–2091	Licensees Evaluate And Justify Changes	0	2	$154	$0	$0	$0
2033–2092	Licensees Evaluate And Justify Changes	0	2	$154	$0	$0	$0
				Net Benefit (Cost) Total	**($147,000)**	**($24,000)**	**($58,000)**
26.163 Licensees establish dilute testing and conduct testing							
2028	Licensees Establish Testing	5	5	$154	($4,000)	($3,000)	($3,000)

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
2029	Licensees Establish Testing	1	5	$154	($1,000)	($1,000)	($1,000)
2030	Licensees Establish Testing	1	5	$154	($1,000)	($1,000)	($1,000)
2031	Licensees Establish Testing	0	5	$154	$0	$0	$0
2032	Licensees Establish Testing	0	5	$154	$0	$0	$0
2028–2088	Licensees Annually Test Dilutes	5	1	$154	($53,000)	($9,000)	($22,000)
2029–2089	Licensees Annually Test Dilutes	1	1	$154	($11,000)	($2,000)	($4,000)
2030–2090	Licensee Annually Test Dilutes	1	1	$154	($11,000)	($2,000)	($4,000)
2031–2091	Licensee Annually Test Dilutes	0	1	$154	$0	$0	$0
2032–2092	Licensee Annually Test Dilutes	0	1	$154	$0	$0	$0
Net Benefit (Cost) Total					**($81,000)**	**($18,000)**	**($35,000)**
26.607(c)(4) Licensees contract with backup lab							
2028	Licensees Establish Contract	5	109	$154	($84,000)	($64,000)	($75,000)
2029	Licensees Establish Contract	1	109	$154	($17,000)	($12,000)	($14,000)
2030	Licensees Establish Contract	1	109	$154	($17,000)	($11,000)	($14,000)
2031	Licensees Establish Contract	0	109	$154	$0	$0	$0
2032	Licensees Establish Contract	0	109	$154	$0	$0	$0
Net Benefit (Cost) Total					**($118,000)**	**($87,000)**	**($103,000)**
53.780 Training, examination, and proficiency program							
2028–2088	Scalable Training Program Requirements	0	806	$154	$0	$0	$0
2029–2089	Scalable Training Program Requirements	0	806	$154	$0	$0	$0
2030–2090	Scalable Training Program Requirements	2	806	$154	$15,181,000	$2,331,000	$5,469,000
2031–2091	Scalable Training Program Requirements	1	806	$154	$7,590,000	$1,089,000	$2,578,000
2032–2092	Scalable Training Program Requirements	0	806	$154	$0	$0	$0
Net Benefit (Cost) Total					**$22,771,000**	**$3,420,000**	**$8,047,000**
53.805 Facility licensee requirements related to generally licensed reactor operators							
2029–2088	Reporting Names of GLROs	1	7	$154	($63,000)	($11,000)	($25,000)

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
2030–2089	Reporting Names of GLROs	0	7	$154	$0	$0	$0
2031–2090	Reporting Names of GLROs	3	7	$154	($189,000)	($28,000)	($71,000)
2032–2091	Reporting Names of GLROs	0	7	$154	$0	$0	$0
2033–2092	Reporting Names of GLROs	0	7	$154	$0	$0	$0
Net Benefit (Cost) Total					**($252,000)**	**($39,000)**	**($96,000)**
53.810 Generally licensed reactor operators							
2028–2088	Elimination of Specific Operator Licensing	1	28	$154	$267,000	$47,000	$108,000
2029–2089	Elimination of Specific Operator Licensing	0	28	$154	$0	$0	$0
2030–2090	Elimination of Specific Operator Licensing	3	28	$154	$801,000	$123,000	$306,000
2031–2091	Elimination of Specific Operator Licensing	0	28	$154	$0	$0	$0
2032–2092	Elimination of Specific Operator Licensing	0	28	$154	$0	$0	$0
Net Benefit (Cost) Total					**$1,068,000**	**$170,000**	**$414,000**
53.815 Generally licensed reactor operator training, examination, and proficiency programs							
2028–2088	Simplified Requirements for GLROs	1	2,578	$154	$24,287,000	$4,269,000	$9,849,000
2029–2089	Simplified Requirements for GLROs	0	2,578	$154	$0	$0	$0
2030–2090	Simplified Requirements for GLROs	3	2,578	$154	$72,861,000	$11,187,000	$27,850,000
2031–2091	Simplified Requirements for GLROs	0	2,578	$154	$0	$0	$0
2032–2092	Simplified Requirements for GLROs	0	2,578	$154	$0	$0	$0
Net Benefit (Cost) Total					**$97,148,000**	**$15,456,000**	**$37,699,000**
53.850(b) Radiation protection							
2029–2088	Removed Effluent-Related Tech Specs	1	231	$154	$2,142,000	$357,000	$852,000
2030–2089	Removed Effluent-Related	0	231	$154	$0	$0	$0

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
	Tech Specs						
2031–2090	Removed Effluent-Related Tech Specs	5	231	$154	$10,711,000	$1,561,000	$4,017,000
2032–2091	Removed Effluent-Related Tech Specs	1	231	$154	$2,142,000	$292,000	$780,000
2033–2092	Removed Effluent-Related Tech Specs	0	231	$154	$0	$0	$0
Net Benefit (Cost) Total					**$14,995,000**	**$2,210,000**	**$5,649,000**
53.850(c) Radiation protection							
2029–2088	Maintain Process Control Program	1	816	$154	($7,560,000)	($1,261,000)	($3,008,000)
2030–2089	Maintain Process Control Program	0	816	$154	$0	$0	$0
2031–2090	Maintain Process Control Program	5	816	$154	($37,802,000)	($5,508,000)	($14,178,000)
2032–2091	Maintain Process Control Program	1	816	$154	($7,560,000)	($1,030,000)	($2,753,000)
2033–2092	Maintain Process Control Program	0	816	$154	$0	$0	$0
Net Benefit (Cost) Total					**($52,922,000)**	**($7,799,000)**	**($19,939,000)**
53.860 Security programs							
2028	Averted Exemption Request	1	385	$154	$60,000	$45,000	$53,000
2029	Averted Exemption Request	0	385	$154	$0	$0	$0
2030	Averted Exemption Request	5	385	$154	$298,000	$198,000	$249,000
2031	Averted Exemption Request	1	385	$154	$60,000	$37,000	$48,000
2032	Averted Exemption Request	0	385	$154	$0	$0	$0
Net Benefit (Cost) Total					**$418,000**	**$280,000**	**$350,000**
53.870 Integrity assessment programs							
2028	Establish Integrity Assessment Program	1	764	$154	($118,000)	($90,000)	($105,000)
2029	Establish Integrity Assessment Program	0	764	$154	$0	$0	$0
2030	Establish Integrity Assessment	5	764	$154	($590,000)	($393,000)	($494,000)

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
	Program						
2031	Establish Integrity Assessment Program	1	764	$154	($118,000)	($73,000)	($96,000)
2032	Establish Integrity Assessment Program	0	764	$154	$0	$0	$0
Net Benefit (Cost) Total					**($826,000)**	**($556,000)**	**($695,000)**
2029–2088	Maintain Integrity Assessment Program	1	113	$154	($1,050,000)	($175,000)	($418,000)
2030–2089	Maintain Integrity Assessment Program	0	113	$154	$0	$0	$0
2031–2090	Maintain Integrity Assessment Program	5	113	$154	($5,250,000)	($765,000)	($1,969,000)
2032–2091	Maintain Integrity Assessment Program	1	113	$154	($1,050,000)	($143,000)	($382,000)
2033–2092	Maintain Integrity Assessment Program	0	113	$154	$0	$0	$0
Net Benefit (Cost) Total					**($7,350,000)**	**($1,083,000)**	**($2,769,000)**
53.440(k) Initiating events and accident analysis—chemical hazards							
2028	Chemical Hazard Analysis	1	1,020	$154	($158,000)	($120,000)	($140,000)
2029	Chemical Hazard Analysis	0	1,020	$154	$0	$0	$0
2030	Chemical Hazard Analysis	5	1,020	$154	($788,000)	($525,000)	($660,000)
2031	Chemical Hazard Analysis	1	1,020	$154	($158,000)	($98,000)	($128,000)
2032	Chemical Hazard Analysis	0	1,020	$154	$0	$0	$0
Net Benefit (Cost) Total					**($1,104,000)**	**($743,000)**	**($928,000)**
53.1545(a) Updating Final Safety Analysis Reports							
2029–2088	Simplified FSAR Update	1	113	$154	$1,050,000	$175,000	$418,000
2030–2089	Simplified FSAR Update	0	113	$154	$0	$0	$0
2031–2090	Simplified FSAR Update	5	113	$154	$5,250,000	$765,000	$1,969,000
2032–2091	Simplified FSAR Update	1	113	$154	$1,050,000	$143,000	$382,000
2033–2092	Simplified FSAR Update	0	113	$154	$0	$0	$0
Net Benefit (Cost) Total					**$7,350,000**	**$1,083,000**	**$2,769,000**

Year	Activity	No. of Applicants/ Licensees/	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
53.1306, 53.1366. 53.1413 Contents of applications (financial qualification requirements)							
2028	Reduced Financial Qualification Reporting Requirements	5	1360	$154	$1,050,000	$801,000	$933,000
2029	Reduced Financial Qualification Reporting Requirements	1	1360	$154	$210,000	$150,000	$181,000
2030	Reduced Financial Qualification Reporting Requirements	1	1360	$154	$210,000	$140,000	$176,000
2031	Reduced Financial Qualification Reporting Requirements	0	1360	$154	$0	$0	$0
2032	Reduced Financial Qualification Reporting Requirements	0	1360	$154	$0	$0	$0
Net Benefit (Cost) Total					**$1,470,000**	**$1,091,000**	**$1,290,000**

NRC Operation

Year	Activity	No. of Applicants/ Licensees/ Actions	Labor Hours	Rate	Net Benefit (Cost) (2024$)		
					Undiscounted	7% NPV	3% NPV
53.440(f) Design requirements—safety and security interface							
2028	Review Safety and Security Design Information	6	113	$158	($107,000)	($82,000)	($95,000)
2029	Review Safety and Security Design Information	1	113	$158	($18,000)	($13,000)	($15,000)
2030	Review Safety and Security Design Information	0	113	$158	$0	$0	$0
2031	Review Safety and Security Design Information	0	113	$158	$0	$0	$0
2032	Review Safety and Security Design Information	0	113	$158	$0	$0	$0
Net Benefit (Cost) Total					**($125,000)**	**($95,000)**	**($110,000)**
53.1146 Contents of applications for early site permits; technical information							
2028	Review Simplified ESP Application Technical	1	8,246	$158	$1,303,000	$994,000	$1,158,000

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
	Information						
2029	Review Simplified ESP Application Technical Information	0	8,246	$158	$0	$0	$0
2030	Review Simplified ESP Application Technical Information	0	8,246	$158	$0	$0	$0
2031	Review Simplified ESP Application Technical Information	0	8,246	$158	$0	$0	$0
2032	Review Simplified ESP Application Technical Information	0	8,246	$158	$0	$0	$0
				Net Benefit (Cost) Total	**$1,303,000**	**$994,000**	**$1,158,000**
53.1209 Contents of applications for standard design approvals; technical information							
2028	Review Simplified SDA Technical Information	0	6,283	$158	$0	$0	$0
2029	Review Simplified SDA Technical Information	1	6,283	$158	$993,000	$708,000	$856,000
2030	Review Simplified SDA Technical Information	0	6,283	$158	$0	$0	$0
2031	Review Simplified SDA Technical Information	0	6,283	$158	$0	$0	$0
2032	Review Simplified SDA Technical Information	1	6,283	$158	$993,000	$578,000	$784,000
				Net Benefit (Cost) Total	**$1,986,000**	**$1,286,000**	**$1,640,000**
53.1239 Contents of applications for standard design certifications; technical information							
2028	Review Simplified DC Application Technical Information	0	51,396	$158	$0	$0	$0
2029	Review Simplified DC Application Technical	0	51,396	$158	$0	$0	$0

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
	Information						
2030	Review Simplified DC Application Technical Information	0	51,396	$158	$0	$0	$0
2031	Review Simplified DC Application Technical Information	0	51,396	$158	$0	$0	$0
2032	Review Simplified DC Application Technical Information	0	51,396	$158	$0	$0	$0
Net Benefit (Cost) Total					**$0**	**$0**	**$0**
53.1279 Contents of applications for manufacturing licenses; technical information							
2028	Review Simplified ML Application Technical Information	0	25,290	$158	$0	$0	$0
2029	Review Simplified ML Application Technical Information	0	25,290	$158	$0	$0	$0
2030	Review Simplified ML Application Technical Information	0	25,290	$158	$0	$0	$0
2031	Review Simplified ML Application Technical Information	0	25,290	$158	$0	$0	$0
2032	Review Simplified ML Application Technical Information	0	25,290	$158	$0	$0	$0
Net Benefit (Cost) Total					**$0**	**$0**	**$0**
53.1309 Contents of applications for construction permits; technical information							
2028	Review Simplified CP Application Technical Information	4	13,208	$158	$8,347,000	$6,368,000	$7,416,000

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
2029	Review Simplified CP Application Technical Information	1	13,208	$158	$2,087,000	$1,488,000	$1,800,000
2030	Review Simplified CP Application Technical Information	0	13,208	$158	$0	$0	$0
2031	Review Simplified CP Application Technical Information	0	13,208	$158	$0	$0	$0
2032	Review Simplified CP Application Technical Information	0	13,208	$158	$0	$0	$0
Net Benefit (Cost) Total					**$10,434,000**	**$7,856,000**	**$9,216,000**
53.1369 Contents of applications for operating licenses; technical information							
2028	Review Simplified OL Application Technical Information	0	13,591	$158	$0	$0	$0
2029	Review Simplified OL Application Technical Information	0	13,591	$158	$0	$0	$0
2030	Review Simplified OL Application Technical Information	4	13,591	$158	$8,589,000	$5,723,000	$7,193,000
2031	Review Simplified OL Application Technical Information	1	13,591	$158	$2,147,000	$1,337,000	$1,746,000
2032	Review Simplified OL Application Technical Information	0	13,591	$158	$0	$0	$0
Net Benefit (Cost) Total					**$10,736,000**	**$7,060,000**	**$8,939,000**
53.1416 Contents of applications for combined licenses; technical information							
2028	Review Simplified COL	1	26,891	$158	$4,249,000	$3,241,000	$3,775,000

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
	Application Technical Information						
2029	Review Simplified COL Application Technical Information	0	26,891	$158	$0	$0	$0
2030	Review Simplified COL Application Technical Information	1	26,891	$158	$4,249,000	$2,831,000	$3,558,000
2031	Review Simplified COL Application Technical Information	0	26,891	$158	$0	$0	$0
2032	Review Simplified COL Application Technical Information	0	26,891	$158	$0	$0	$0
Net Benefit (Cost) Total					**$8,498,000**	**$6,072,000**	**$7,333,000**
53.1540 Updating licensing-basis information and determining the need for NRC approval							
2029–2088	Review Streamlined Licensing-Basis Information	1	18	$158	$172,000	$27,000	$66,000
2030–2089	Review Streamlined Licensing-Basis Information	0	18	$158	$0	$0	$0
2031–2090	Review Streamlined Licensing-Basis Information	5	18	$158	$860,000	$117,000	$313,000
2032–2091	Review Streamlined Licensing-Basis Information	1	18	$158	$172,000	$22,000	$61,000
2033–2092	Review Streamlined Licensing-Basis Information	0	18	$158	$0	$0	$0
Net Benefit (Cost) Total					**$1,204,000**	**$166,000**	**$440,000**
53.1550(a) Evaluating changes to facility as described in Final Safety Analysis Reports							
2029–2088	Review Streamlined FSAR Changes	1	44	$158	$419,000	$65,000	$162,000
2030–2089	Review Streamlined FSAR Changes	0	44	$158	$0	$0	$0

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
2031–2090	Review Streamlined FSAR Changes	5	44	$158	$2,095,000	$285,000	$763,000
2032–2091	Review Streamlined FSAR Changes	1	44	$158	$419,000	$53,000	$148,000
2033–2092	Review Streamlined FSAR Changes	0	44	$158	$0	$0	$0
				Net Benefit (Cost) Total	**$2,933,000**	**$403,000**	**$1,073,000**
Review FFD exemption requests for approval							
2028	Averted Exemption Request Review	57	115	$158	$1,036,000	$790,000	$920,000
2029	Averted Exemption Request Review	19	115	$158	$345,000	$246,000	$298,000
2030	Averted Exemption Request Review	47.5	115	$158	$863,000	$575,000	$723,000
2031	Averted Exemption Request Review	9.5	115	$158	$173,000	$107,000	$140,000
2032	Averted Exemption Request Review	9.5	115	$158	$173,000	$100,000	$136,000
				Net Benefit (Cost) Total	**$2,590,000**	**$1,818,000**	**$2,217,000**
NRC staff develops FFD license conditions and inspects after implementation							
2028	Averted License Conditions and Inspection	12	36	$158	$69,000	$52,000	$61,000
2029	Averted License Conditions and Inspection	4	36	$158	$23,000	$16,000	$20,000
2030	Averted License Conditions and Inspection	10	36	$158	$57,000	$38,000	$48,000
2031	Averted License Conditions and Inspection	2	36	$158	$11,000	$7,000	$9,000
2032	Averted License Conditions and Inspection	2	36	$158	$11,000	$7,000	$9,000
				Net Benefit (Cost) Total	**$171,000**	**$120,000**	**$147,000**

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
53.780 Training, examination, and proficiency program							
2028–2088	Added Flexibilities in Operator Licensing Requirements	0	125	$158	$0	$0	$0
2029–2089	Added Flexibilities in Operator Licensing Requirements	0	125	$158	$0	$0	$0
2030–2090	Added Flexibilities in Operator Licensing Requirements	2	125	$158	$2,403,000	$369,000	$919,000
2031–2091	Added Flexibilities in Operator Licensing Requirements	1	125	$158	$1,202,000	$172,000	$446,000
2032–2092	Added Flexibilities in Operator Licensing Requirements	0	125	$158	$0	$0	$0
				Net Benefit (Cost) Total	**$3,605,000**	**$541,000**	**$1,365,000**
53.805 Facility licensee requirements related to generally licensed reactor operators							
2029–2088	Processing Report of GLRO Names	1	1	$158	($11,000)	($2,000)	($4,000)
2030–2089	Processing Report of GLRO Names	0	1	$158	$0	$0	$0
2031–2090	Processing Report of GLRO Names	3	1	$158	($32,000)	($5,000)	($12,000)
2032–2091	Processing Report of GLRO Names	0	1	$158	$0	$0	$0
2033–2092	Processing Report of GLRO Names	0	1	$158	$0	$0	$0
				Net Benefit (Cost) Total	**($43,000)**	**($7,000)**	**($16,000)**
53.810 Generally licensed reactor operators							
2028–2088	Elimination of Specific Operator Licensing	1	6	$158	$55,000	$9,000	$22,000
2029–2089	Elimination of Specific Operator Licensing	0	6	$158	$0	$0	$0
2030–2090	Elimination of Specific Operator Licensing	3	6	$158	$164,000	$24,000	$61,000
2031–2091	Elimination of Specific	0	6	$158	$0	$0	$0

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
	Operator Licensing						
2032–2092	Elimination of Specific Operator Licensing	0	6	$158	$0	$0	$0
				Net Benefit (Cost) Total	**$219,000**	**$33,000**	**$83,000**
53.815 Generally licensed reactor operator training, examination, and proficiency programs							
2028–2088	Review Simplified Programs for GLROs	1	284	$158	$2,742,000	$450,000	$1,079,000
2029–2089	Review Simplified Programs for GLROs	0	284	$158	$0	$0	$0
2030–2090	Review Simplified Programs for GLROs	3	284	$158	$8,225,000	$1,180,000	$3,052,000
2031–2091	Review Simplified Programs for GLROs	0	284	$158	$0	$0	$0
2032–2092	Review Simplified Programs for GLROs	0	284	$158	$0	$0	$0
				Net Benefit (Cost) Total	**$10,967,000**	**$1,630,000**	**$4,131,000**
53.850(c) Radiation protection							
2029–2088	Review Process Control Program	1	435	$158	($4,126,000)	($643,000)	($1,594,000)
2030–2089	Review Process Control Program	0	435	$158	$0	$0	$0
2031–2090	Review Process Control Program	5	435	$158	($20,628,000)	($2,809,000)	($7,511,000)
2032–2091	Review Process Control Program	1	435	$158	($4,126,000)	($525,000)	($1,459,000)
2033–2092	Review Process Control Program	0	435	$158	$0	$0	$0
				Net Benefit (Cost) Total	**($28,880,000)**	**($3,977,000)**	**($10,564,000)**
53.860 Security programs							
2028	Averted Exemption Request Review	1	193	$158	$30,000	$23,000	$27,000

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
2029	Averted Exemption Request Review	0	193	$158	$0	$0	$0
2030	Averted Exemption Request Review	5	193	$158	$152,000	$101,000	$127,000
2031	Averted Exemption Request Review	1	193	$158	$30,000	$19,000	$25,000
2032	Averted Exemption Request Review	0	193	$158	$0	$0	$0
				Net Benefit (Cost) Total	**$212,000**	**$143,000**	**$179,000**
53.870 Integrity assessment programs							
2028	Initial Review of Integrity Assessment Program	1	340	$158	($54,000)	($41,000)	($48,000)
2029	Initial Review of Integrity Assessment Program	0	340	$158	$0	$0	$0
2030	Initial Review of Integrity Assessment Program	5	340	$158	($269,000)	($179,000)	($225,000)
2031	Initial Review of Integrity Assessment Program	1	340	$158	($54,000)	($33,000)	($44,000)
2032	Initial Review of Integrity Assessment Program	0	340	$158	$0	$0	$0
				Net Benefit (Cost) Total	**($377,000)**	**($253,000)**	**($317,000)**
2029–2088	Review Integrity Assessment Program Annually	1	91	$158	($860,000)	($134,000)	($332,000)
2030–2089	Review Integrity Assessment Program Annually	0	91	$158	$0	$0	$0
2031–2090	Review Integrity Assessment Program Annually	5	91	$158	($4,298,000)	($585,000)	($1,565,000)
2032–2091	Review Integrity Assessment Program Annually	1	91	$158	($860,000)	($109,000)	($304,000)
2033–2092	Review Integrity Assessment Program Annually	0	91	$158	$0	$0	$0
				Net Benefit (Cost) Total	**($6,018,000)**	**($828,000)**	**($2,201,000)**

NRC Operation							
Year	**Activity**	**No. of Applicants/ Licensees/ Actions**	**Labor Hours**	**Rate**	**Net Benefit (Cost) (2024$)**		
					Undiscounted	**7% NPV**	**3% NPV**
53.440(k) Initiating events and accident analysis—chemical hazards							
2028	Review Chemical Hazard Analysis	1	453	$158	($72,000)	($55,000)	($64,000)
2029	Review Chemical Hazard Analysis	0	453	$158	$0	$0	$0
2030	Review Chemical Hazard Analysis	5	453	$158	($358,000)	($239,000)	($300,000)
2031	Review Chemical Hazard Analysis	1	453	$158	($72,000)	($45,000)	($58,000)
2032	Review Chemical Hazard Analysis	0	453	$158	$0	$0	$0
Net Benefit (Cost) Total					**($502,000)**	**($339,000)**	**($422,000)**
53.1306, 53.1366, 53.1413 Contents of applications (financial qualification requirements)							
2028	Review Reduced Financial Qualifications Requirements	5	680	$158	$537,000	$410,000	$477,000
2029	Review Reduced Financial Qualifications Requirements	1	680	$158	$107,000	$77,000	$93,000
2030	Review Reduced Financial Qualifications Requirements	1	680	$158	$107,000	$72,000	$90,000
2031	Review Reduced Financial Qualifications Requirements	0	680	$158	$0	$0	$0
2032	Review Reduced Financial Qualifications Requirements	0	680	$158	$0	$0	$0
Net Benefit (Cost) Total					**$751,000**	**$559,000**	**$660,000**

APPENDIX C
NEW AND MODIFIED REQUIREMENTS IN FINAL RULE LANGUAGE

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.3 Scope	Describes the NRC licensees subject to Part 26.	None	Applicability, equivalent to current requirements.
26.4 FFD program applicability to categories of individuals	Requires that individuals with certain duties, responsibilities, and access be subject to Part 26.	None	Applicability, matches existing requirements with editorial changes.
26.5 Definitions	Adds new and revised definitions of oral fluid testing.	None	Costs captured in procedure and training requirements.
26.21 Fitness-for-duty program	Describes the NRC licensees and individuals subject to Subpart B, "Program Elements," of Part 26.	None	Applicability, matches existing requirements.
26.51 Applicability	Describes the NRC licensees and individuals subject to Subpart C, "Granting and Maintaining Authorization," of Part 26.	None	Equivalent to current requirements.
26.53 General provisions	Makes provisions of Subpart C of Part 26 applicable to Part 53 licensees.	None	Equivalent to current requirements.
26.63 Suitable inquiry	Details requirements for a licensee's review of an	None	Equivalent to current requirements.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
	individual's background.		
26.73 Applicability	Describes the NRC licensees and individuals subject to Subpart D, "Management Actions and Sanctions to Be Imposed," of Part 26.	None	Applicability, matches existing requirements.
26.81 Purpose and applicability	Describes the NRC licensees and individuals subject to Subpart E, "Collecting Specimens for Testing," of Part 26.	None	Applicability, matches existing requirements.
26.97 Collecting oral fluid specimens for alcohol and drug testing	Allows use of virtual collection monitor	Reduced costs	Saves travel time for licensees that use 26.607(g)(2), qualitative benefit
26.201 Applicability	Describes the NRC licensees and individuals subject to Subpart I, "Managing Fatigue," of Part 26.	Reduced costs	Averted exemption request due to codifying revised requirement.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.202 General provisions for facilities licensed under Part 53	Delineates several general requirements for Part 53 licensees.	Reduced costs	Averted exemption request due to codifying revised requirement.
26.205 Work hours	Establishes limits on working hours for employees.	Reduced costs	Averted exemption request due to codifying revised requirement.
26.207 Waivers and exceptions	Establishes the process for requesting waivers and exceptions.	Reduced costs	Averted exemption request due to codifying revised requirement.
26.211 Fatigue assessments	Describes how to assess worker fatigue.	Reduced costs	Averted exemption request due to codifying revised requirement.
26.601 Applicability	Describes the applicability of Part 26, Subpart M, “Fitness for Duty Programs for Facilities Licensed Under 10 CFR Part 53,” which includes the options for licensee FFD programmatic requirements.	None	Applicability, not requirements.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.603(a) FFD program description	Describes the contents of the description of the FFD program.	None	Equivalent to 26.401(b).
26.603(b) FFD program implementation and availability	Describes how long to maintain the FFD program.	None	Equivalent to 26.3 and 26.401(a) and (b).
26.603(e) FFD program change control	Provides requirements for changing aspects of an FFD program.	None	Equivalent requirements to 50.54(p), 50.54(q), 26.137(f), 26.713(d), 26.713(g).
26.605(a)	FFD program requirements for an ML holder, a licensee of a commercial reactor constructing its facility, or a licensee that demonstrates compliance with 10 CFR 73.100(a)(1)(i) and elects to implement 26.605(a).	Decreased costs	Averted exemption request due to codifying revised requirement.
26.605(b)	FFD program requirements for an ML holder that loads fuel at the factory and certain other licensees before they begin operating a commercial nuclear reactor.	Decreased costs	Averted exemption request due to codifying revised requirement.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.606 Written policy and procedures	Requires written FFD policy and procedures for licensees using Part 53.	Decreased costs	Averted exemption request due to codifying revised requirement.
26.607 Drug and alcohol testing	Introductory paragraph to requirements.	None	Equivalent to 26.405.
26.607(a) Split specimens	Requires the use of split specimens	None	Equivalent to HHS Guidelines and DOT drug testing requirements
26.607(b)(1) Pre-access testing	Requires signed consent and pre-access drug and alcohol test within 14 days of authorization.	None	Equivalent to 26.405(c)(1).
26.607(b)(2)(v) Random testing	Requires random sampling equal to at least 50% of employees annually.	Small increase in costs	Additional costs from randomization of selection process.

Regulatory Paragraph[(a)]	Description[(a)]	Incremen-tal Effect	Explanation[(a)]
26.607(b)(2)(vi)	Requires use of consortium /third party administrator for facilities with a small workforce.	None	Required to implement random testing in an unpredictable manner, which would otherwise not be possible for facilities with a small workforce.
26.607(c)(2)	Requires elements of urine testing.	None	Refers to multiple existing requirements elsewhere in Part 26.
26.607(c)(3)	Requires alcohol testing.	None	Refers to multiple existing requirements elsewhere in Part 26.
26.607(c)(4) Minimum requirements	Requires a primary and a backup laboratory certified by the U.S. Department of Health and Human Services.	Increased costs	Codifies requirement to contract with backup lab, leading to additional costs.
26.607(g) Oral fluid testing	Establishes requirements for oral fluid testing and forensic toxicologist review.	Decreased costs	Averted exemption request due to codifying revised requirement.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.607(i) Hair testing	Describes how to conduct drug testing of hair specimens.	None	Added regulatory flexibility.
26.607(j) Portal area screening	Describes how to conduct portal area drug and alcohol screening.	None	Added regulatory flexibility.
26.607(k) Blood testing	Describes how to test for drugs and alcohol with a blood sample.	None	Added regulatory flexibility.
26.607(l) Federal custody and control form	Requires a Federal custody and control form when performing drug testing.	Small increase in costs	Requirement for additional form increases costs.
26.607(m)(1) Medical review officer	Requires MRO to review positive, adulterated, substituted, and diluted samples.	None	Matches existing requirements.
26.607(m)(2) Medical review officer	Requirement for MRO initial training.	Slightly increased costs	Training requirement moved to construction instead of operation; very small impact, treated qualitatively.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.607(m)(3) Medical review officer	Requires MRO retraining every 5 years.	Increased costs	Existing requirements do not require retraining.
26.607(m)(4) Medical review officer	Clarifies that the MRO does not need to review any alcohol test results.	None.	Clarification on existing practice. MROs do not review alcohol test results.
26.608 FFD program training	Establishes FFD training requirements for Part 53 licensees.	Increased costs	New requirement for FFD training programs during construction instead of only at operation.
26.608(b)	Establishes FFD training and assessments.	Reduced costs	Existing requirement is annual; biannual is a relaxation.
26.609 Behavioral observation	Delineates behavioral observation program requirements.	None	Equivalent to 26.407 and 26.33.
26.609(c) Behavioral observation program requirement	Requires that behavioral observation be performed and allows audio/video technologies.	None	Equivalent to 73.55(e)(7)(i)(C).
26.609(d) Video and audio capture	Requirements for live video and audio streaming and capture.	Increased costs	New requirement.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.610 Sanctions	Requires sanctions for FFD policy violations.	None	Equivalent to 26.409 and 26.75.
26.611 Protection of information	Requires system to protect personal information and show signed consent to FFD program.	None	Equivalent to 26.411 and 26.37.
26.613 Appeals process	Requires procedure for appeals process for FFD determinations.	None	Equivalent to 26.39.
26.615 Audits	Requires audits of FFD program and frequency.	None	Equivalent to 26.415 and 26.41.
26.617 Recordkeeping, reporting, and FFD program performance	Requires recordkeeping and reporting to the NRC of program performance and individual violations.	None	Equivalent to 26.417 and Subpart N, “Recordkeeping and Reporting Requirements.”

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
26.619 Suitability and fitness determinations	Requires licensees to evaluate personnel for suitability to perform duties requiring them to be subject to FFD programs.	None	Equivalent to 26.419 and Subpart H, “Determining Fitness-for-Duty Policy Violations and Determining Fitness.”
26.709 Applicability	Requires Subpart N for licensees that do not implement Subpart M.	None	Equivalent to 26.3.
26.711 General provisions	Requires general provisions of Subpart N.	None	Equivalent to 26.3.
26.713 Recordkeeping requirements for licensees and other entities	Establishes recordkeeping requirements for licensees and other entities.	None	Equivalent to existing requirements.
26.825 Criminal penalties	States that the NRC may issue criminal penalties.	None	Equivalent to Subpart O, “Inspections, Violations, and Penalties.”
53.210 Safety criteria for design-basis accidents	Provides safety criteria for design basis accidents	None	Equivalent to existing requirements.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.220 Safety criteria for licensing-basis events other than design-basis accidents	Provides safety criteria for licensing-basis events other than design-basis accidents to address cumulative risk to individuals.	None	These requirements made available through LMP, RG 1.233.
53.230 Safety functions	Defines primary and additional safety functions needed to ensure safety criteria are met.	None	These requirements made available through LMP, RG 1.233.
53.240 Licensing-basis events	Provides requirements for identifying and addressing licensing-basis events.	None	These requirements made available through LMP, RG 1.233.
53.250 Defense in depth	Provides requirements for protection via defense in depth to address uncertainties.	None	These requirements made available through LMP, RG 1.233.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.400 Design features for licensing-basis events	Introductory paragraph explaining the goal of design features to address licensing-basis events.	None	These requirements made available through LMP, RG 1.233.
53.410 Functional design criteria for design-basis accidents	Provides requirements for design features, specifically for design-basis accidents.	None	These requirements made available through LMP, RG 1.233.
53.420 Functional design criteria for licensing-basis events other than design-basis accidents	Provides requirements for design features specifically for other licensing-basis events.	None	These requirements made available through LMP, RG 1.233.
53.425 Design features and functional design criteria for normal operations	Provides requirements to keep public doses in accordance with Part 20 during normal operations.	None	Equivalent requirements to Part 20, “Standards for Protection Against Radiation.”
53.430 Design features and functional design criteria for protection of plant workers	Provides requirements to keep plant worker doses in accordance with Part 20.	None	Equivalent requirements to Part 20.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.440(b) Design features classified as safety related	Must be designed using generally accepted consensus code standards.	None	Equivalent requirement to 50.55a.
53.440(c) Design requirements—materials qualification	Requires material qualification requirements for structures, systems, and components (SSCs).	None	Equivalent requirements to 50.49, 50.55a, and Appendix B to 10 CFR Part 50.
53.440(d) Design requirements—degradation mechanisms	Requires evaluation of possible degradation mechanisms of SSCs.	None	Equivalent requirements to 50.34(a) and (b), 52.17, 52.47, 52.79, 52.137, 52.157, and 50.55a.
53.440(e) Design requirements—fire protection	Requires that SSCs be designed and located to minimize the probability of fires and explosions.	None	Costs captured in content of application requirements.
53.440(f) Design requirements—safety and security interface	Requires that safety and security be considered together in the design process.	Increased costs	Not a current requirement, though it is NRC policy.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.440(i) Design requirements—radioactive material sources	Requires the consideration of all radioactive material sources in design.	None	These requirements made available through LMP, RG 1.233.
53.440(k) Initiating events and accident analysis—chemical hazards	Requires design, programmatic controls, or combination to achieve a low risk of permanent injury to the public from chemical hazards.	Increased costs	Licensees would potentially need to research and test materials and coolants that have limited operating experience.
53.440(m) Design requirements—criticality monitoring	Establishes requirements for providing means to detect criticality accidents.	None	Equivalent to 50.68.
53.440(n) Design requirements—human factors	Requires state-of-the-art human factors principles in design.	None	Equivalent to 50.34(f)(2)(iii).

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.450 Analysis requirements	Requires a PRA or other systematic risk evaluation in combination with other generally accepted approaches for the analysis of the plant.	None	These requirements made available through LMP, RG 1.233. Allowing other systematic risk evaluations provides more flexibility in analytical costs but justification might require additional effort. Applicants will make a business case decision, and therefore the NRC assumes no incremental cost or benefit.
53.460 Safety categorization and special treatments	Requires that SSCs be categorized according to safety significance and defines categories.	None	These requirements made available through LMP, RG 1.233.
53.480 Earthquake engineering	Requires that certain SSCs be able to withstand the effects of earthquakes without loss of safety function.	Reduced costs	Greater flexibility with a risk-informed seismic approach along with guidance.
53.510 External hazards	Provides requirements for withstanding natural phenomena and human-related hazards up to design-basis external hazard levels.	None	Costs captured in content of application requirements.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.530 Population-related considerations	Provides siting requirements related to population zones.	None	Applicant to consider the economics (business case) of its siting preference relative to the related requirements in these paragraphs, and therefore the NRC assumes no incremental cost or benefit.
53.600 Construction and manufacturing—scope and purpose	Establishes the overall construction and manufacturing requirements.	None	Does not contain requirements.
53.620(a) Manufacturing—management and control	Requires specific activities to manage and control manufacturing activities.	None	Equivalent to 52.157(a)(26) and (a)(29).
53.620(b) Manufacturing—manufacturing activities	Details requirements for executing manufacturing processes following receipt of ML.	None	Equivalent to 52.157(a)(17) and 52.158.
53.620(c) Control of radioactive materials	Establishes requirements for the control of radioactive materials for ML holders planning to possess and use such materials as part of the manufacturing process.	None	Equivalent to requirements in Parts 30, 40, and 70 for control of radioactive materials.
53.620(d) Fuel loading	Establishes requirements for fuel loading for manufactured reactors.	None	Benefits of these provisions equal to or exceed the costs of a case-by-case approval process that would be necessary under current regulations and historical position.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.620(e)(3) Manufacturing—transportation	Establishes procedure requirements for transportation of a manufactured reactor or major portions thereof.	None	Assumes that a procedure would have been developed, and this paragraph simply codifies that requirement.
53.620(f) Manufacturing—acceptance and installation at the site	Requires a verification process for a reactor to be installed at a site.	None	Reflects how the NRC staff expects the process would work under the current regulations.
53.700 Operational objectives	Provides overview of operational objectives.	None	Contains no requirements.
53.710 Maintaining capabilities and availability of SSCs	Requirements for safety-related and non-safety-related SSCs.	None	These requirements made available through LMP, RG 1.233.
53.715 Maintenance, repair, and inspection programs	Requires development and implementation of program for maintenance, repair, and inspection.	None	Equivalent to 50.65, with some conforming changes.
53.730 Defining, fulfilling, and maintaining the role of personnel in ensuring safe operations	Details requirements for personnel measures to enable safe operation of the plant.	Small increase in costs	Cost increase from proposing examination program and staffing plan; captured in content of applications costs.
53.740 Facility licensee requirements—general	Contains licensee requirements for plant operators and controls.	None	Equivalent to 50.54(i), 50.54(l), 50.54(j), 50.54(m)(2)(iv), 50.54(x), and 50.54(y).

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.780 Training, examination, and proficiency program	Details requirements for the program.	Reduced costs	Simplified and streamlined program requirements.
53.800 Facility licensees for self-reliant mitigation facilities	Provides alternative requirements for and defines a self-reliant mitigation class.	Increased costs	Additional requirements to be able to have GLROs; costs captured in contents of applications costs.
53.805 Facility licensee requirements related to GLROs	Provides requirements for facility licensees that have GLROs.	Small increase in costs	New annual reporting requirement of the names of all GLROs.
53.810 GLROs	Details requirements for a general license and GLROs.	Reduced costs	Simplified and eliminated requirements when creating GLRO.
53.815 GLRO training, examination, and proficiency programs	Describes the applicability and requirements of the GLRO program.	Reduced costs	Simplified and eliminated requirements when creating GLRO.
53.820 Cessation of individual applicability	Delineates when a general license expires.	None	No change in requirements.
53.845 Programs	General requirement for licensees to have various types of programs.	None	Specific requirements are elsewhere in Part 53.
53.850(a) Radiation protection	Requires OL and COL holders to establish a radiation protection program.	None	Equivalent to 20.1101.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
53.850(b) Radiation protection	Requires OL and COL holders to establish a program to control effluents and minimize public dose.	Reduced costs	Similar to 50.36a without requirement for effluent-related technical specifications.
53.850(c) Radiation protection	Requires OL and COL holders to establish a process control program.	Increased costs	Similar to 50.36a except adds requirements from standard technical specifications.
53.855 Emergency preparedness	Requires OL and COL holders to have an emergency response plan.	None	Equivalent to 50.47 and Appendix E to Part 50 or 50.160.
53.860 Security programs	Contains requirements for physical protection, FFD, access authorization, cybersecurity, and information security programs.	None	Points to applicable requirements in 10 CFR Parts 26 and Part 73.
53.865 Quality assurance	Requires a quality assurance program in accordance with Appendix B to Part 50.	None	Refers to Appendix B to Part 50.
53.870 Integrity assessment programs	Contains requirements for actively assessing possible degradation of SSCs from the effects of	Increased costs	New program requires assessing aging management of SSCs and corrective actions.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
	aging, fatigue, and environmental conditions.		
53.910 Procedures and guidelines	Details requirements for developing, implementing, and maintaining procedures and guidelines.	None	Equivalent to administrative controls section of Part 50 and Part 52 technical specifications.
53.1020 Cost estimates for decommissioning	Requires site-specific decommissioning fund cost estimates.	None	Equivalent to 50.75(c).
53.1146 Contents of applications for early site permits; technical information	Provides technical requirements for applications for ESPs.	Reduced costs	Use of PRA in leading role and reduction of FSAR information.
53.1209 Contents of applications for standard design approvals; technical information	Provides technical requirements for applications for SDAs.	Reduced costs	Use of PRA in leading role and reduction of FSAR information.
53.1239 Contents of applications for standard design certifications; technical information	Provides technical requirements for applications for DCs.	Reduced costs	Use of PRA in leading role and reduction of FSAR information.
53.1251 Duration of certification	Describes the period of validity for a standard DC under Part 53.	None	Duration of 40 years is consistent with the status quo of the DC Direct Final Rule expected in 2025.
53.1260 Duration of renewal	Describes the duration of a DC renewal.	None	Duration of 40 years is consistent with the status quo of the DC Direct Final Rule expected in 2025.
53.1279 Contents of	Provides technical	Reduced costs	Use of PRA in leading role and reduction of FSAR information.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
applications for manufacturing licenses; technical information	requirements for applications for MLs.		
53.1282 Contents of applications for manufacturing licenses; other application content	Contains additional requirements for ML applications.	None	Equivalent to 52.158.
53.1291 Duration of manufacturing licenses	Describes the period of validity for an ML under Part 53.	Reduced costs	A significant relaxation over existing regulations on the duration of MLs, but has no quantitative benefit in the regulatory analysis because no MLs are anticipated in the analysis period.
53.1306 Contents of applications for construction permits; technical information	Provides financial qualification requirements for CPs.	Reduced costs	Requirements relaxed compared to current financial qualification requirements; final rule financial qualification requirements match those proposed in SECY-18-0026.
53.1309 Contents of applications for construction permits; technical information	Provides technical requirements for applications for CPs.	Reduced costs	Use of PRA in leading role and reduction of FSAR information.
53.1348 Termination of construction permits	Requires notification within 30 days upon deciding to permanently cease construction.	None	Equivalent to 52.3(b)(8) and 52.110(a)(1).
53.1366 Contents of applications for operating licenses; general information	Provides financial qualification requirements for OLs.	Reduced costs	Requirements relaxed compared to current financial qualification requirements; final rule financial qualification requirements match those proposed in SECY-18-0026.
53.1369 Contents of applications for	Provides technical requirements	Reduced costs	Use of PRA in leading role and reduction of FSAR information.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
operating licenses; technical information	for applications for OLs.		
53.1413 Contents of applications for combined licenses; general information	Provides financial qualification requirements for COLs.	Reduced costs	Requirements relaxed compared to current financial qualification requirements; final rule financial qualification requirements match those proposed in SECY-18-0026.
53.1416 Contents of applications for combined licenses; technical information	Provides technical requirements for applications for COLs.	Reduced costs	Use of PRA in leading role and reduction of FSAR information.
53.1530 Revising design information within a Final Safety Analysis Report associated with a manufacturing license	Provides requirements for ML holder to evaluate and change an FSAR.	Reduced costs	Provides circumstances under which such applicants or licensees would not need to obtain a license amendment.
53.1535(b) Amendments during construction	Directs COL holders to regulations for requesting amendments within 45 days of beginning construction.	None	Equivalent to 50.35(b).
53.1540 Updating licensing-basis information and determining the need for NRC approval	Establishes requirements for updating licensing-basis information and determining the need for NRC approval.	Reduced costs	Enhanced use of PRA in assessing plant changes and circumstances under which such applicants or licensees would not need to obtain a license amendment.
53.1545(a) Updating Final Safety Analysis Reports	Provides requirements for updating FSARs,	None	Equivalent to 50.71(e).

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
	frequency, and inclusions.		
53.1550(a) Evaluating changes to facility as described in Final Safety Analysis Reports	Provides requirements under which a licensee may make changes without obtaining a license amendment.	Reduced costs	Use of PRA would provide specific metrics that lead to NRC approval as opposed to having to make a determination; also allows for systematic risk evaluation as a PRA alternative in cases where an applicant or licensee prefers that option.
53.1595 Renewal	Allows for renewal of licenses.	None	Provides more open-ended approach to license renewal, but NRC may amend it to be equivalent to Part 54 at some future point.
53.1630 Immediate notification requirements for operating commercial nuclear plants	Provides requirements for notification of the NRC Operating Center via the Emergency Notification System.	None	Equivalent to 50.72 as proposed in an ongoing Nonemergency Reporting Requirements Rulemaking.
53.1640 Licensee event report system	Defines reportable events and requires licensee event report submittal.	None	Equivalent to 50.73.
53.1720 Insurance required to stabilize and decontaminate plant following an accident	Delineates requirements for decontamination insurance.	None	Equivalent to 50.54(w).
73.100 Technology-inclusive requirements for physical protection of licensed activities at commercial nuclear plants	Requires security plans for licensees and details their elements.	None	Equivalent to 73.55.

Regulatory Paragraph[(a)]	Description[(a)]	Incremental Effect	Explanation[(a)]
against radiological sabotage			
73.100(a)(1)(i)	Details requirements for physical protection, FFD, access authorization.	Reduced costs	Removes need to use the exemption process to be exempt from requirement to protect against the design-basis threat and allows for a graded approach to FFD and access authorization programs.
73.100(a)(1) and 73.100(b)(5) Target sets	Part 53 licensees that choose to use 73.100 must perform a target set analysis	None	Similar to 73.55(f), supports the graded approach options in 73.100.
73.110 Technology-inclusive requirements for protection of digital computer and communication systems and networks	Requirements similar to 73.54 for a cybersecurity program to protect assets.	Decreased costs	Additional analyses during development of cybersecurity plan resulted in a significant reduction in number of assets to protect.
73.120 Access authorization program for commercial nuclear plants	Requires applicant to establish an access authorization program.	None	Equivalent to requirements for research and test reactors and Part 37.

(a) Paragraph references are all to Title 10 of the *Code of Federal Regulations* (10 CFR) (e.g., 73.120 means 10 CFR 73.120).