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RULEMAKING ISSUE
(Notation Vote)

March 1, 2023 SECY-23-0021

FOR: The Commissioners

FROM: Daniel H. Dorman
Executive Director for Operations

SUBJECT: PROPOSED RULE: RISK-INFORMED, TECHNOLOGY-INCLUSIVE REGULATORY FRAMEWORK FOR ADVANCED REACTORS (RIN 3150-AK31)

PURPOSE:

The purpose of this paper is to obtain Commission approval to publish, in the *Federal Register*, the enclosed draft proposed rule (Enclosure 1) that would amend regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) to establish a voluntary risk-informed, performance-based, and technology-inclusive regulatory framework for commercial nuclear plants.

SUMMARY:

The U.S. Nuclear Regulatory Commission (NRC) staff is recommending the addition of Part 53, "Risk-Informed, Technology-Inclusive Regulatory Framework for Commercial Nuclear Plants," (Part 53) 10 CFR. The draft proposed rule offers a voluntary, performance-based alternative regulatory framework for licensing future commercial nuclear plants. In the context of this proposed rulemaking, future commercial nuclear plants, including non-light-water reactors (non-LWRs) and LWRs, would have the option to be licensed under Part 53. Applicants for these facilities would continue to have the option to be licensed under the existing requirements

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in 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” or 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants.” In addition to providing a new Part 53, the draft proposed rule includes revisions to 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 plants. The draft proposed rule also includes conforming changes to other parts such as 10 CFR Parts 2, “Agency Rules of Practice and Procedure”; 20, “Standards for Protection Against Radiation”; 21, “Reporting of Defects and Noncompliance”; 50, and 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions”; among others.

BACKGROUND:

On January 14, 2019, the President signed the Nuclear Energy Innovation and Modernization Act (NEIMA) into law (Public Law 115-439). NEIMA requires the NRC to prepare the regulatory infrastructure to support the development and commercialization of advanced nuclear reactors. Specifically, NEIMA section 103(a)(4) directs the NRC to “complete a rulemaking to establish a technology-inclusive, regulatory framework for optional use by commercial advanced nuclear reactor applicants for new reactor license applications” by December 31, 2027. The current regulations for nuclear reactor licensing are in 10 CFR Part 50 and 10 CFR Part 52. This draft proposed rule, if approved, would create 10 CFR Part 53, in keeping with the statutory provisions in NEIMA section 103(a)(4).

Consistent with NEIMA, the NRC staff provided a proposed approach to the Commission 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 (Agencywide Documents Access and Management System Accession No. ML19340A056). On October 2, 2020, the Commission issued Staff Requirements Memorandum (SRM)-SECY-20-0032 (ML20276A293), in which it approved the NRC staff’s overall approach and directed that the staff prepare a schedule with milestones and resource requirements to achieve publication of the final rule by October 2024. The Commission further directed the NRC staff to prepare and release preliminary draft rule language, followed by public outreach and dialogue, and then to further revise the language until the NRC staff has established the rudiments of its proposed rule for Commission consideration. The NRC staff followed the Commission’s direction and issued several iterations of preliminary proposed rule language and had numerous interactions with stakeholders and the Advisory Committee on Reactor Safeguards (ACRS). The NRC staff considered the feedback resulting from these interactions.

DISCUSSION:

This proposed rulemaking defines a set of technology-inclusive, performance-based requirements for commercial nuclear plants. The staff focused the rulemaking on technology-inclusive and risk-informed functional requirements that build on existing NRC regulations, Commission policy statements, and recent activities undertaken to implement the NRC’s vision and strategy for non-LWRs. This approach is consistent with the rulemaking plan described in SECY-20-0032 and the related SRM as well as the Commission’s direction in SRM-SECY-10-0121, “Staff Requirements—SECY-10-0121—Modifying the Risk-Informed Regulatory Guidance for New Reactors,” dated March 2, 2011 (ML110610166). The Commission found in SRM-SECY-10-0121 that “the existing safety goals, safety performance expectations, subsidiary risk goals and associated risk guidance…, key principles and quantitative metrics for implementing risk-informed decision making, are sufficient for new plants….”

The proposed *Federal Register* notice contains detailed discussions of the two licensing frameworks in the proposed Part 53. The following text summarizes the frameworks and their specific subparts in proposed Part 53 and the accompanying proposed revisions to 10 CFR Part 26 and 10 CFR Part 73.

Overview of Proposed Changes to NRC Regulations

10 CFR Part 53 Frameworks

The proposed Part 53 consists of two independent frameworks to support either (1) a top-down approach based on an integrated decision-making process and associated performance standards (Framework A) or (2) a bottom-up approach based on adapting established design criteria and analysis approaches to accommodate a wider range of reactor technologies (Framework B). As described below, the NRC staff proposes to specify the requirements for Framework A in Subpart A, Subparts B through K, and Subpart X and the requirements for Framework B in Subpart A, Subparts N through U, and Subpart X. Both frameworks are organized in terms of the life cycle for a commercial nuclear plant with specified subparts and sections for plant-level safety criteria and associated requirements for design and analysis, siting, construction and manufacturing, operations, and decommissioning. Proposed Subpart A, "General Provisions," is common to both Frameworks A and B and includes an introduction section, general requirements, and definitions. In addition, several subparts in Frameworks A and B are essentially the same but are repeated within each subpart for ease of use due to framework-specific internal references and terminology. Proposed Subpart X, "Enforcement," is also common to both Frameworks A and B and would address certain violations and penalties associated with violations of Part 53 regulations.

In creating this proposed Part 53, the staff has attempted to take a comprehensive look at existing requirements, incorporate risk insights, and thoughtfully discern efficiencies and opportunities for streamlining. The staff has also developed transformative regulations for a new licensing process, highlighting the role of probabilistic risk assessment (PRA) in risk-informed and performance-based approaches to identifying enhanced safety margins that can be used to justify operational flexibilities. The staff's proposed approach endeavors to reflect a sound balance between:

- flexibility and innovation (where appropriate to account for experience, new risk insights, an emphasis on performance-based standards, and the wide diversity in potential designs);
- structural clarity (having each framework be self-contained to the greatest possible extent rather than relying on complex cross-references), and
- consistency in baseline safety standards (the fundamental acknowledgment that there are many requirements that remain applicable to all reactor facilities to ensure safety, security, and effective regulatory oversight).

Framework A

The organization of proposed Framework A begins by specifying high-level safety criteria in proposed Subpart B, "Technology-Inclusive Safety Requirements," that would be met through a combination of plant design features, human actions, and programmatic controls. The proposed safety criteria support meeting the objectives of limiting the possibility of an immediate threat to public health and safety and implementing additional measures that may be appropriate when

considering other potential risks to public health and safety. The requirements in Framework A support an integrated decision-making process that provides flexibility to plant designers and plant operators to determine how the safety criteria would be met for any commercial nuclear plant. The requirements in Subpart B address safety criteria for the analyses of design-basis accidents and licensing-basis events other than design-basis accidents and the need to define safety functions, provide defense in depth, and protect the public and plant workers during normal operations. The collective or integrated consideration of an applicant's compliance with the various performance standards, safety criteria, and related requirements in Subpart B and other subparts would enable the NRC to make its required findings related to ensuring that the licensed activity will provide reasonable assurance of adequate protection under the Atomic Energy Act of 1954, as amended (AEA). Enclosure 4 includes additional discussion on several of the proposed safety criteria, including consideration of the NRC's safety goal policy statement and measures to keep doses to the public and plant workers as low as reasonably achievable.

Proposed Subpart C, "Design and Analysis Requirements," reflects the overall hierarchy throughout Framework A, which would cover (1) plant-level safety criteria, (2) safety functions needed to meet the safety criteria, (3) design features, human actions, and programmatic controls needed to fulfill the safety functions, and (4) functional design criteria that must be defined for each design feature relied on to demonstrate that the safety functions and safety criteria are met. Subpart C includes specific design requirements to capture foundational concepts and important provisions from existing regulations. Examples include the need to (1) demonstrate the abilities of design features to fulfill their safety function by a combination of analyses, test programs, prototype testing, and operating experience, (2) use generally accepted consensus codes and standards, where applicable, and (3) address the possible impact of a large commercial aircraft. In addition to design requirements, Subpart C also specifies analysis requirements to demonstrate that the safety criteria and event-specific evaluation criteria are met for a spectrum of licensing-basis events. The proposed approach to identifying licensing-basis events and determining appropriate special treatment for design features (i.e., structures, systems, and components (SSCs)) includes requirements to undertake PRAs and consider the insights from such PRAs, as well as requirements for analyzing design-basis accidents using a largely deterministic approach similar to that required under 10 CFR Part 50 and 10 CFR Part 52. The reliance on PRAs to help establish elements of the licensing basis for commercial nuclear plants would be a logical evolutionary step in the NRC's development and use of risk-informed, performance-based approaches to regulating radioactive materials.

Proposed Subpart D, "Siting Requirements," states requirements for the siting of commercial nuclear plants and would serve the role provided by 10 CFR Part 100, "Reactor Site Criteria," for nuclear reactors licensed under 10 CFR Part 50 and 10 CFR Part 52. The staff is proposing to include the siting requirements in this subpart consistent with the overall organization of Part 53 by the phases of a plant's life cycle. The reason for establishing siting requirements is to ensure that licensees and applicants assess the impact the site environs may have on a commercial nuclear plant (e.g., external hazards) and, conversely, the potential adverse health and safety impacts a commercial nuclear plant may have on nearby populations. Both Subparts C and D reflect the historical importance of assessing seismic events as risks to commercial nuclear plants and the associated development of risk-informed approaches to address such events. Framework A would be flexible in terms of supporting approaches to earthquake engineering similar to those currently in 10 CFR Part 50 and 10 CFR Part 52 as well as more probabilistic approaches that exist now or may be developed and incorporated into consensus codes and standards in the future, provided the NRC approves those approaches. In this regard, Framework A proposes to permit the use of multiple design-basis ground motions in

lieu of the single safe-shutdown earthquake ground motion and minimum peak ground acceleration currently required by 10 CFR Part 50, Appendix S, “Earthquake Engineering Criteria for Nuclear Power Plants.” Subpart D proposes to use existing requirements in 10 CFR Part 100 for establishing an exclusion area, low-population zone, and population center distance. Subpart D also supports revisions to guidance related to population densities surrounding a commercial nuclear plant to reflect Commission direction in SRM-SECY-20-0045, “Staff Requirements—SECY-20-0045—Population-Related Siting Considerations for Advanced Reactors,” dated July 13, 2022 (ML22194A885).

Proposed Subpart F, “Requirements for Operation,” provides requirements governing the operation of commercial nuclear plants. The subpart is organized into sections related to design features, staffing and requirements relevant to operators, and plant programs. The sections governing design features address matters such as configuration control and maintenance of safety-related and non-safety-related but safety-significant SSCs. The sections on plant programs include provisions similar to existing requirements in areas such as radiation protection, emergency preparedness, and quality assurance. In addition, Subpart F provides a new security framework based on potential consequences resulting from an event initiated by a design-basis threat. The staff has also included a proposed new requirement for a facility safety program that would involve periodically assessing possible changes in plant risks, including risks from external events, and, when appropriate, considering risk-reduction measures. The program is designed to provide significant operational flexibility in how licensees manage facility risk. Enclosure 4 contains additional discussion on this proposed program.

Much of the proposed Subpart F provides a structure to address staffing, training, operator licensing, and human factors engineering in a manner that is risk-informed, technology-inclusive, performance-based, and flexible in nature. These proposed requirements are structured to be common to both Frameworks A and B. Included within Subpart F is a licensing approach for reactor operators and senior reactor operators that is distinct from that of 10 CFR Part 55, “Operators’ Licenses,” and incorporates new flexibilities and a performance-based focus. Furthermore, a new proposal would provide for generally licensed reactor operators for plant designs meeting stringent criteria governing the role of human actions in preventing or mitigating unplanned events. Enclosure 4 includes additional discussion on the proposed requirement for generally licensed reactor operators.

Proposed Subpart H, “Licenses, Certifications, and Approvals,” provides the licensing provisions for Framework A and includes requirements comparable to those for licenses, certifications, and approvals from both 10 CFR Part 50 and 10 CFR Part 52. To streamline Subpart H, the staff proposes to use the content of application requirements for early site permits as a baseline for site-related information needs. Likewise, the staff proposes to use the content of application requirements for design certifications as the baseline for reactor design information needs. The content for other types of applications refers to the early site permit or design certification sections, as necessary, and provides applicable clarifications for each type of application. Many of the sections governing licensing processes and relationships among licenses, certifications, and approvals are equivalent to those provided in 10 CFR Part 50 and 10 CFR Part 52.

Framework B

Framework B would largely replicate the existing licensing approach in 10 CFR Part 50 and 10 CFR Part 52 but would modify it to be technology neutral. Framework B would not require applicants to use a PRA to the extent proposed in Framework A. Instead, Framework B would

require applicants to use risk insights from a PRA, or an alternative evaluation for risk insights (AERI), in a confirmatory role to the largely deterministic safety analysis in Framework B and as a possible tool to identify safety margins to justify operational flexibilities. This approach is consistent with how 10 CFR Part 52 currently uses risk insights. Additionally, the approach to licensing in Framework B, which would require applicants to develop and use principal design criteria similar to the criteria in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, would coincide with existing international standards for designing and licensing advanced reactors and would provide technology neutral approaches to the existing prescriptive requirements developed for LWRs.

Proposed Subpart N, "Siting Requirements," provides the siting requirements for Framework B commercial nuclear plants. Many of the requirements and related definitions in the proposed Subpart N are taken from 10 CFR Part 100 requirements on siting factors and non-seismic siting criteria. A proposed change from 10 CFR Part 100 in Subpart N is the inclusion of provisions for developing ground motion response spectra that would enable the use of an alternative, risk-informed, performance-based approach to seismic design under proposed Part 53, Subpart R, "Licenses, Certifications, and Approvals."

Proposed Subpart P, "Requirements for Operation," provides requirements that connect plant systems personnel and programmatic controls, including those associated with maintenance effectiveness. The proposed requirements are similar to Subpart F in Framework A but reflect the differences in how safety requirements are determined and described within each framework. An example is the use of the phrase "important to safety" in Subpart R, which is consistent with current requirements but different from Framework A. Some proposed requirements, such as those for technical specifications, are adapted from the associated requirements in 10 CFR Part 50 and 10 CFR Part 52 by making them applicable to a variety of reactor technologies. The staffing, training, personnel qualifications, and human factors requirements in Part 53, Framework B, are grouped with those in Part 53, Framework A, Subpart F. The proposed requirements for operational programs generally mirror those in Subpart F but reflect the differences in internal references and terminology and address certain operational requirements that parallel those currently found under 10 CFR Part 50 and 10 CFR Part 52.

Proposed Subpart R closely aligns with the proposed structure and requirements in Subpart H and covers all the licenses, certifications, and approvals currently covered by 10 CFR Part 50 and 10 CFR Part 52. Subpart R provides general technical requirements in a dedicated section, proposed 10 CFR 53.4730, and then other sections related to the content of applications for each type of license, certification, or approval refer to the applicable technical requirements in the dedicated section. Most of the proposed technical and content of application requirements were derived from the current requirements in 10 CFR 52.79, "Contents of applications; technical information in final safety analysis report," for combined licenses. Under Framework B, because the collective regulations follow the longstanding deterministic structure in 10 CFR Part 50 and 10 CFR Part 52, they are supported by the Commission's established conclusion that those regulations presumptively provide reasonable assurance of adequate protection of public health and safety. A significant element of proposed Subpart R involves providing technology-inclusive requirements in place of the existing LWR requirements in 10 CFR Part 50 and 10 CFR Part 52. The proposed technology-inclusive requirements in Framework B would provide flexibility in how safety analyses could be performed while maintaining the general construct of 10 CFR Part 50 and 10 CFR Part 52 that involve deterministic analyses and the use of principal design criteria, as well as consideration of risk insights and Commission policy statements.

Subpart R requires a risk evaluation that could be based on a PRA or, if specified entry conditions are met, on an AERI. Enclosure 4 further discusses the AERI proposal. Subpart R also includes alternatives that allow applicants and licensees to use risk insights to grade the requirements for seismic design and special treatment through a risk-informed SSC classification construct. The risk-informed alternatives for SSC classification parallel the existing alternatives under 10 CFR 50.69, “Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors.” The seismic design alternatives are similar to the flexibilities proposed under Framework A for permitting the use of multiple design-basis ground motions in lieu of the current requirements for a single safe-shutdown earthquake ground motion and minimum peak ground acceleration.

Common and Similar Subparts

Proposed Subpart A includes the general provisions pertaining to all applicants and licensees under either of the optional frameworks (Framework A or Framework B). The provisions of Subpart A relate to the purpose and scope of Part 53, including definitions, written communications, employee protections, completeness and accuracy of information, exemptions, standards for review, jurisdictional limits, consideration of attacks and destructive acts by enemies of the United States, and information collection requirements. Many of these general requirements are equivalent to those in 10 CFR Part 50. The definition sections in Subpart A are especially important in that they explain the terminology that is common throughout Part 53, as well as definitions that are specific to either Framework A or B. For example, "commercial nuclear plant" is a common term used to avoid the ambiguity that may result from such terms as "advanced nuclear reactor." A separate section is proposed for definitions unique to Framework A and addresses the terms used to categorize licensing-basis events, equipment classification, and framework-specific performance metrics. Another section likewise provides definitions supporting Framework B by addressing the event categories used in that framework and terms such as “functional containment” that are needed to allow technology-inclusive approaches to safety analyses.

The proposed Part 53 addresses construction and manufacturing requirements in Subparts E and O, “Construction and Manufacturing Requirements,” for Framework A and B, respectively. The two subparts are essentially the same but are included separately within the frameworks to enhance clarity and ease of use due to the differences in the internal references between Framework A and Framework B. The proposed language for construction-related activities largely reflects current requirements in 10 CFR Part 50 without fundamental changes. The proposed requirements for manufacturing activities largely mirror those for construction-related activities and are largely equivalent to those in 10 CFR Part 52. Although the staff made minor updates to the requirements for manufacturing licenses, the staff is not yet proposing significant changes in this area. For example, some stakeholders suggested including provisions for loading of fuel into manufactured reactor modules at the manufacturing facility to support deployment models being contemplated for microreactors. The staff is still exploring this approach and other issues related to manufacturing licenses. To support future development of provisions related to manufacturing licenses, the staff is recommending that the Commission approve publication of a *Federal Register* notice for the proposed rule that includes questions concerning different deployment models contemplated for microreactors. Enclosure 4 includes additional discussion related to manufacturing licenses.

The proposed Subpart G, “Decommissioning Requirements,” and Subpart Q, “Decommissioning,” in Frameworks A and B, respectively, provide the regulatory requirements for the decommissioning phase of the life cycle of a future commercial nuclear plant. The only

variations between Subpart G in Framework A and Subpart Q in Framework B are the internal references to various sections in each framework. The staff has adapted the proposed requirements in Subparts G and Q for decommissioning a commercial nuclear plant from the current regulations in 10 CFR 50.75, “Reporting and recordkeeping for decommissioning planning,” and 10 CFR 50.82, “Termination of license.” Although the staff has copied the requirements from those sections of 10 CFR Part 50 into Subparts G and Q with relatively few changes, the requirements are reorganized to fit within the Part 53 structure. The few changes the staff is proposing were primarily to make the requirements more technology inclusive by adding alternatives, because analogous requirements in 10 CFR Part 50 were developed specifically for LWRs. On March 3, 2022, the NRC published for public comment the proposed rule, “Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning” (87 FR 12254). As that rulemaking progresses, the NRC staff will consider revisions to Part 53 to align the two rulemaking efforts in the Part 53 draft final rule.

The proposed Part 53 controls the maintenance of licensing-basis information through Subpart I in Framework A and Subpart S in Framework B, both titled “Maintaining and Revising Licensing Basis Information.” Both subparts are essentially the same as the corresponding sections of 10 CFR Part 50 and 10 CFR Part 52 that govern processes such as license amendments and updates to important documents such as safety analysis reports (SARs) and operational program documents. An area of ongoing discussion is the appropriate location of information from PRAs used to develop the licensing basis—whether it should be in SARs, other licensing basis documents, or in plant records available for inspection and audit. This topic is being addressed separately in the development of guidance for 10 CFR Part 50 or 10 CFR Part 52 applications that use the methodology endorsed by Regulatory Guide 1.233, Revision 0, “Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors,” issued June 2020 (ML20091L698). The development of this guidance could also inform the likely location of such information for Part 53, Framework A. In addition, the NRC is requesting stakeholder feedback on this issue as noted in Section VII, “Specific Requests for Comment,” of Enclosure 1. The NRC is seeking comment on the appropriate placement of PRA-related information among various licensing basis documents and plant records. The NRC is also seeking comment on the appropriate control of that information and on the routine submittal of updates to the NRC.

Both proposed Subparts I and S include sections that provide the equivalent of the requirements in 10 CFR 50.59, “Changes, tests, and experiments,” for evaluating changes to safety analysis reports and determining whether a license amendment is required to implement a change to a facility or procedures. The two frameworks differ in how safety analyses are performed and used to derive or confirm design requirements and related programmatic controls, and these differences are reflected in the proposed differences in the evaluation criteria used to determine whether an amendment is required. In addition, several matters in Part 53, including items in Subparts I and S, relate to issues being addressed in the draft proposed rulemaking on “Alignment of Licensing Processes and Lessons Learned from New Reactor Licensing” (ML21159A055). As that rulemaking progresses, the NRC staff will consider revisions to Part 53 to align the two rulemaking efforts in the Part 53 draft final rule. Proposed Subpart J, “Reporting and Other Administrative Requirements,” in Framework A, and proposed Subpart T, “Reporting and Other Administrative Requirements,” in Framework B address various reporting and administrative requirements. The two subparts are essentially the same and include sections to require unfettered facility access by NRC inspectors, maintenance of certain records and reporting of specified events or conditions, financial qualification of applicants and specified financial reports, and maintenance of financial protection to address potential accidents. The

various requirements in Part 53 were adapted from the equivalent requirements in 10 CFR Part 50 and 10 CFR Part 52 with only minor changes to make the requirements more technology inclusive.

The proposed Subparts K and U, “Quality Assurance Criteria for Commercial Nuclear Plants,” in Frameworks A and B, respectively, provide consolidated sets of quality assurance requirements for applicants and licensees implementing either framework. The two subparts are essentially the same with only minor differences resulting from framework-specific approaches and terminology related to SSC safety classification and supporting safety analyses. Both proposed subparts are equivalent to 10 CFR Part 50, Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.”

Proposed Subpart X would contain two provisions, 10 CFR 53.9000 and 10 CFR 53.9010, which are analogous to enforcement provisions contained in other parts of 10 CFR Chapter I imposing requirements on regulated entities. Section 53.9000 would provide notice of the Commission’s authority under the AEA to obtain injunctions or other court orders for the enumerated violations. Section 53.9010 would provide notice to all persons and entities subject to Part 53 that they are subject to criminal sanctions for willful violations, attempted violations, or conspiracy to violate certain regulations under Part 53.

10 CFR Part 26 Changes

The proposed revisions to 10 CFR Part 26 would establish a technology-inclusive, risk-informed, and performance-based approach for the application of drug and alcohol testing and fatigue management requirements for facilities licensed under Part 53. The proposed fitness-for-duty framework consists of a two-tiered graded approach similar to the current 10 CFR Part 26 requirements and an optional third tier for certain Part 53 licensees. The staff is proposing this graded approach to address expected variations in the potential radiological consequences presented by commercial nuclear plants, the number of staff at these plants, and the geographical conditions where these facilities are located.

10 CFR Part 73 Changes

The proposed revisions to 10 CFR Part 73 would establish a new voluntary, technology-inclusive, consequence-based approach for a range of security issues, including physical security, cybersecurity, and access authorization for future commercial nuclear plants licensed under either Framework A or B. Proposed 10 CFR 73.100, “Technology-inclusive requirements for physical protection of licensed activities at commercial nuclear plants against radiological sabotage,” provides a performance-based regulatory framework for the design, implementation, and maintenance of a physical protection program and security organization. The proposed physical protection program provides an optional pathway for licensees that elect not to demonstrate compliance with the more prescriptive provisions in 10 CFR 73.55, “Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage.” Proposed 10 CFR 73.110, “Technology-inclusive requirements for protection of digital computer and communication systems and networks,” establishes regulations for the development and maintenance of cybersecurity programs for future Part 53 licensees. This proposed section implements a graded approach to determine the level of cybersecurity protection required for digital computers, communication systems, and networks.

Proposed 10 CFR 73.120, “Access authorization program for commercial nuclear plants,” would address access authorization for future commercial nuclear plants. The proposed language in

10 CFR 73.120 provides an alternative graded approach to the existing framework under 10 CFR 73.55; 10 CFR 73.56, “Personnel access authorization requirements for nuclear power plants”; and 10 CFR 73.57, “Requirements for criminal history records checks of individuals granted unescorted access to a nuclear power facility, a non-power reactor, or access to Safeguards Information,” commensurate with risk. The proposed requirements are similar to the existing access authorization programs for nonpower reactors and materials licensees under 10 CFR 37.21, “Personnel access authorization requirements for category 1 or category 2 quantities of radioactive material.”

Overview of Environmental Assessment

The staff prepared a draft environmental assessment (Enclosure 2) to evaluate the environmental impacts of the proposed rule and document the staff’s finding of no significant impact, in accordance with the requirements of 10 CFR 51.21, “Criteria for and identification of licensing and regulatory actions requiring environmental assessments,” and the National Environmental Policy Act of 1969, as amended. The draft environmental assessment focuses on those aspects of the proposed rulemaking for which there is a potential for the revised requirements to affect the environment differently than those for a facility licensed under 10 CFR Part 50 or 10 CFR Part 52. Based on the draft environmental assessment, the NRC staff determined that the proposed action would not have a significant effect on the quality of the human environment. In a separate rulemaking before the Commission, SECY-21-0098, “Proposed Rule: Advanced Nuclear Reactor Generic Environmental Impact Statement” (ML21222A044), the staff developed a technology-neutral and performance-based environmental impact assessment that, if approved by the Commission, could be applied in commercial nuclear plant applications under Part 53.

Overview of Regulatory Analysis

The NRC staff prepared a draft regulatory analysis to determine the expected quantitative and qualitative costs and benefits of the proposed rule. The analysis concludes that the rulemaking would be cost beneficial, meaning the total quantified benefits would exceed the costs. The proposed rule would result in net averted costs to the industry and the NRC of approximately $53.6 million using a 7 percent discount rate. In addition, the staff finds that the qualitative benefits (regulatory certainty, public confidence, and other non-quantified benefits), considered along with the quantitative net benefits, further support proceeding with the proposed regulatory action. The NRC staff’s view is that the use of qualitative factors is appropriate in this case because implementation of Part 53 would be voluntary. Enclosure 3 includes additional information on the costs and benefits of the proposed rule.

Overview of Stakeholder Engagement

As noted previously, in SRM-SECY-20-0032, the Commission directed the NRC staff to prepare and release preliminary draft rule language, followed by public outreach and dialogue, and then further revise the language until the NRC staff had established the rudiments of its proposed rule for Commission consideration. To implement the Commission’s direction, the staff undertook an unprecedented program of stakeholder engagement, recognizing the importance of this rulemaking to the advanced reactor community and interested stakeholders from a broad range of backgrounds and organizations.

On November 6, 2020, the NRC published a *Federal Register* notice (85 FR 71002) describing plans for the periodic release of preliminary proposed rule language, meetings with

stakeholders, and affording opportunities to stakeholders to provide input during the development of this draft proposed rule. On December 10, 2021, the NRC published a second notice (86 FR 70423) announcing the extension of the development of the draft proposed rule and related interactions with stakeholders until August 31, 2022. Sections of the preliminary proposed rule language were iteratively released through August 2022. Over the course of this public engagement period, the staff released preliminary proposed rule language for review and feedback 21 times.

Since September 2020, the NRC staff has held 24 public meetings with external stakeholders and 16 public meetings with the ACRS to discuss the Part 53 rulemaking. Numerous letters from stakeholders provided various views. Stakeholders also submitted suggestions for clarifications, additions, and deletions to the preliminary proposed rule language. In addition, the ACRS wrote several interim letters to the Chair on this rulemaking (ML20295A647, ML21140A354, ML22040A361, and ML22196A292) and issued its final letter on November 22, 2022 (ML22319A104). The staff considered the inputs received in the development of this draft proposed rule. Enclosure 1, section II.B, includes additional information on stakeholder views.

To solicit additional targeted feedback on key topics during the public comment period, the NRC staff is proposing specific requests for comment on several issues in the draft proposed rule. These can be found in Section VII, “Specific Requests for Comment,” of Enclosure 1 and include a request for comment on the requirements related to the financial qualification of license applicants. The inclusion of the financial qualification questions was directed by the Commission in the SRM for SECY-18-0026, “Proposed Rule: Financial Qualifications Requirements for Reactor Licensing (RIN 3150-AJ43)” (ML22195A097). The staff has included the questions as directed by the Commission, with minor editorial changes for clarity and to address publication preferences of the Office of the Federal Register.

Overview of Implementation Guidance

If the Commission issues the proposed rule for public comment, the NRC staff would also issue for public comment the following 10 draft guidance documents supporting the implementation of proposed requirements in this rulemaking:

- DG-1413, “Technology-Inclusive Identification of Licensing Events for Commercial Nuclear Plants” (ML22257A173)

- DG-1414, “Alternative Evaluation for Risk Insights Methodology” (ML22257A248)

- DG-5073, “Fitness-for-Duty Programs for Commercial Nuclear Plants and Manufacturing Facilities Licensed Under 10 CFR Part 53” (ML22200A037)

- DG-5074, “Access Authorization Program for Commercial Nuclear Plants” (ML22199A246)

- DG-5075, “Establishing Cybersecurity Programs for Commercial Nuclear Plants Licensed Under 10 CFR Part 53” (ML22199A257)

- DG-5076, “Guidance for Technology-Inclusive Requirements for Physical Protection of Licensed Activities at Commercial Nuclear Plants” (ML22203A131)

- DG-5078, “Fatigue Management for Nuclear Power Plant Personnel at Commercial Nuclear Plants Licensed Under 10 CFR Part 53” (ML22264A109)

- DRO-ISG-2023-01, “Operator Licensing Programs” (ML22266A066)

- DRO-ISG-2023-02, “Interim Staff Guidance Augmenting NUREG-1791, ‘Guidance for Assessing Exemption Requests from the Nuclear Power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m),’ for Licensing Commercial Nuclear Plants under 10 CFR Part 53” (ML22266A068)

- DRO-ISG-2023-03, “Development of Scalable Human Factors Engineering Review Plans” (ML22266A072)

Enclosure 1, section XVIII, includes additional information on implementing guidance.

Overview of Backfitting and Issue Finality Considerations

The addition of Part 53 through this proposed rule would not be an NRC action within the scope of the 10 CFR Part 50 backfitting and 10 CFR Part 52 issue finality provisions. The conforming changes to various parts of 10 CFR Chapter I, including the amendments to 10 CFR Part 26 and 10 CFR Part 73 that would establish new approaches for fitness-for-duty and security programs, respectively, for commercial nuclear plants, would not meet the definitions of “backfitting” in 10 CFR 50.109(a)(1), 10 CFR 70.76(a)(1), and 10 CFR 72.62(a) or affect the issue finality of any approval granted under 10 CFR Part 52.

RECOMMENDATION:

The NRC staff recommends that the Commission approve the enclosed proposed rule for publication in the *Federal Register*.

If the Commission approves publication of the proposed rule, the NRC staff will complete the following activities:

1. Publish the proposed rule in the *Federal Register* for a 60-day public comment period.

2. Submit the information collection requirements to the Office of Management and Budget for its review and approval on or immediately after the date of publication of the proposed rule in the *Federal Register*.

3. Work with the Office of Congressional Affairs to inform the appropriate congressional committees.

4. Work with the Office of Public Affairs on an appropriate public communication when the proposed rule is published in the *Federal Register*.

5. Hold a public meeting during the comment period for the proposed rule.

COORDINATION:

The Office of the General Counsel reviewed this package and has no legal objection to the publication of the proposed rule. The Office of the Chief Financial Officer reviewed this package and has no concerns with the estimated resources in Enclosure 5.

In SRM-SECY-20-0032, the Commission approved the staff's recommendation that the Committee to Review Generic Requirements does not need to review this rule. In addition, the Committee declined to review the backfitting and issue finality assessment for this proposed rule.

The staff met with the ACRS on November 2, 2022. In a letter to the Commission dated November 22, 2022, the ACRS recommended that the staff proceed with this rulemaking package. The staff responded to the final ACRS letter on February 10, 2023 (ML22341A047).

Daniel H. Dorman

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Date: 2023.03.01 12:12:32 -05'00'

Daniel H. Dorman
Executive Director
for Operations

Enclosures:
1. Proposed Rule *Federal Register* Notice
2. Draft Environmental Assessment
3. Draft Regulatory Analysis
4. Alternative Approaches Considered for Selected Topics during the Development of Part 53
5. Estimated Rulemaking Resources (nonpublic)

SUBJECT: PROPOSED RULE: RISK-INFORMED, TECHNOLOGY-INCLUSIVE REGULATORY FRAMEWORK FOR ADVANCED REACTORS (RIN 3150-AK31; NRC-2019-0062) DATED: March 1, 2023

WITS: SRM-S20-0032-3/OEDO-YY-XXXXX

Accession Number: ML21162A093 (Pkg) **SECY-012**

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