Implementation Guidance for NCP
(See MD 10.158 for detailed implementation guidance.)

Initiation of Non-Concurrence

Section A

- Employee notifies intent to non-concur, non-concurs on the subject document, and completes Section A.
- NCP Forms should ideally be submitted within 1 week of the verbal notification of the intent to engage in the NCP.
- If document marking is necessary, add the appropriate header/footer using the arrow key and mark the text within the “Reasons for Non-Concurrence and Proposed Alternatives” section in accordance with applicable agency guidance.
- Employee includes the title and ADAMS accession number of the document being non-concurred on (not the ADAMS number for the NCP Form--which doesn't go into ADAMS until process is complete). Include "N/A" if the document is not in ADAMS (e.g., inspection report not in ADAMS yet or document that includes Safeguards Information (SGI) or allegation-related information).
- If more than one employee non-concurs, include the additional names in Section A.
- Employees may choose to attach a separate Word document to address reasons for the non-concurrence, potential impact on the mission, and proposed alternatives. The form should be annotated, “See attached document,” and the attached document should be marked appropriately (if necessary), labeled (“Section A - Reasons for Non-Concurrence and Proposed Alternatives”).

  Note that the best way to describe the potential impact on the NRC's mission is in the context of the strategic goals, objectives, and strategies identified in the NRC Strategic Plan. For example, the submitter may conclude that there is an increase in the risk of the release of significant amounts of radioactive material to the environment (see safety objective). The submitter may conclude that there is an increase in the risk of an inadvertent release of classified information (see security objective). The submitter may conclude that the agency is not conducting itself in accordance with the Principles of Good Regulation (independence, openness, efficiency, clarity, and reliability) and that it could impact the performance of our mission (see vision statement).

- Employee must request an NCP tracking number by completing Section A of the NCP Form, signing it, and e-mailing it (and any continuation pages) and a copy of the subject document if it is not in ADAMS to NCPPM.Resource@nrc.gov.
- The NCP PM screens the submittal to ensure it is appropriate for the NCP and is completed correctly and signed. The NCP PM dates the form and adds the NCP tracking number, scans Section A and any other continuation pages, and e-mails the NCP Form to the employee's immediate supervisor, document signer, the employee, and all others on concurrence.

Section B

- Employee's immediate supervisor reviews the non-concurrence and, if a written evaluation is requested (see Section A), includes comments for the NCP Approver and others to consider. Immediate supervisor may document that they have no comments.
- Regardless of whether a written evaluation is requested, the employee's immediate supervisor signs Section B indicating that they have reviewed the non-concurrence and e-mails it to all others on concurrence, and NCPPM.Resource@nrc.gov.

Review of Non-Concurrence

Section C

- NCP Approver is responsible for reviewing the non-concurrence prior to the subject document being issued. NCP Approver is normally the document signer unless the document signer is not an SES manager or if the document signer is the individual's immediate supervisor, in which case the document signer should forward the NCP Form to the appropriate SES manager. Document signer continues to sign the subject document and the NCP Approver is added to the subject document concurrence. Lead office director is the NCP Approver if the EDO is the document signer.

Implementation Guidance for NCP
(See MD 10.158 for detailed implementation guidance.) (Continued)

- NCP Approver identifies the NCP Coordinator and forwards Sections A and B of the NCP Form to coordinate and document the evaluation and outcome in Section C. NCP Approver may choose to act as the NCP Coordinator.

- NCP Coordinator ensures that the non-concurring employee is included in discussions, when warranted, to maximize understanding and improve decisionmaking.

- If a written evaluation is requested, the NCP Coordinator documents the Summary of Issues (SOI) and e-mails it to the non-concurring employee for comment and consensus. Non-concurring employee reviews and responds to the SOI. The SOI ensures a common understanding of the issues and should be agreed upon before the NCP Form is evaluated by staff.

- NCP Coordinator completes Section C to reflect the review of issues and actions (if applicable) that were taken to address concerns, and the rationale for the outcome. Documentation should be complete, factual, and focused on the issues (not individuals) and should note any issues that were resolved to the employee's satisfaction. The level of detail must be sufficient so that an independent reader can understand the basis for the decision and outcome. If no action is taken, the reason(s) should be recorded on the form.

- NCP Coordinator ensures that the NCP Form is e-mailed to all employees on concurrence to support informed decisionmaking.

Final Review and Approval of Non-Concurrence

- NCP Approver reviews the NCP Form, may discuss with interested parties (including non-concurring employee), and may return NCP Form and subject document for additional action prior to signing Section C and prior to issuance of the subject document.

- Regardless of whether a written evaluation is requested, the NCP Approver signs Section C indicating that they have reviewed the non-concurrence prior to issuance of the subject document.

NCP Outcome and Record-Keeping

- After the process is complete and the subject document is signed, the NCP Coordinator completes the NCP cover page, including the outcome. If the non-concurring employee agrees with some changes made to the subject document, but still non-concurs, the NCP Coordinator should only check that box that applies.

- NCP Coordinator verifies whether the non-concurring employee wants the NCP Form public or non-public by checking the appropriate box. If the employee wants the NCP Form non-public, check the box on the NCP Form cover page that says **"This record is non-public and for official use only."**

- If the employee wants management to determine whether public release of the NCP Form (with or without redactions) is appropriate, the NCP Approver (with assistance from the NCP Coordinator) is responsible for performing a releasability review in accordance with "Releasability Review of NCP Forms" on the NCP Web site. If the NCP Approver determines that the NCP Form is appropriate for public release (with or without redactions), the NCP Coordinator checks the box on the NCP Form cover page that says **"This record has been reviewed and approved for public dissemination."**

- NCP Form (cover page and Sections A, B, and C) should be profiled in ADAMS using ADAMS Template NRC-006 (ML063120159), included in a package with the subject document, and filed in the NCP Forms folder in the ADAMS Main Library.

- NCP Coordinator will e-mail the completed NCP Form (ADAMS accession number) to NCPPM.Resource@nrc.gov.

- NCP PM will review the NCP Form for implementation completeness and post the NCP Form and issued subject document on the internal Web site.

[redacted]

NON-CONCURRENCE PROCESS COVER PAGE

The U.S. Nuclear Regulatory Commission (NRC) strives to establish and maintain an environment that encourages all employees to promptly raise concerns and differing views without fear of reprisal and to promote methods for raising concerns that will enhance a strong safety culture and support the agency's mission.

Employees are expected to discuss their views and concerns with their immediate supervisors on a regular, ongoing basis. If informal discussions do not resolve concerns, employees have various mechanisms for expressing and having their concerns and differing views heard and considered by management.

Management Directive, MD 10.158, “NRC Non-Concurrence Process,” describes the Non-Concurrence Process (NCP).

The NCP allows employees to document their differing views and concerns early in the decisionmaking process, have them responded to (if requested), and include them with proposed documents moving through the management approval chain to support the decisionmaking process.

NRC Form 757, “Non-Concurrence Process," is used to document the process.

Section A of the form includes the personal opinions, views, and concerns of a non-concurring NRC employee.

Section B of the form includes the personal opinions and views of the non-concurring employee's immediate supervisor.

Section C of the form includes the agency's evaluation of the concerns and the agency's final position and outcome.

NOTE: Content in Sections A and B reflects personal opinions and views and does not represent the official agency's position of the issues, nor official rationale for the agency decision. Section C includes the agency's official position on the facts, issues, and rationale for the final decision.

1. If the process was discontinued, please indicate the reason (and skip to #3):

   - ☐ Non-concurring employee(s) requested that the process be discontinued
   - ☐ Subject document was withdrawn

2. At the completion of the process, the non-concurring employee(s):

   - ☐ Concurred
   - ☑ Continued to non-concur
   - ☐ Agreed with some of the changes to the subject document, but continued to non-concur

3. For record keeping purposes:

   - ■ This record is non-public and for official use only
   - ☑ This record has been reviewed and approved for public dissemination

[redacted]

NRC FORM 757
(06-2019)
NRC MD 10.156

U.S. NUCLEAR REGULATORY COMMISSION

NON-CONCURRENCE PROCESS (Continued)

1. NCP Tracking Number: NCP-2022-003

Date: 04/28/2022

Section A - To Be Completed By Non-Concurring Employee

2. Title of Subject Document: SECY-22-XXXX, PROPOSED RULE: ALTERNATIVE PHYSICAL SECURITY REQUIREMENTS FOR ADVANCED REACTORS (RIN 3150-AK19)	3. ADAMS Accession Number: **ML21334A004;ML21334A007**
4. Document Signer: Dan Dorman	5. Document Signer's Phone Number (Enter 10 numeric digits): (301) 415-1705
6. Title of Document Signer: EXECUTIVE DIRECTOR FOR OPERATIONS	7. Office (Choose from the drop down list or fill in): OEDO
8. Name of Non-Concurring Employee(s): Peter S. Lee	9. Employee's Telephone Number (Enter 10 numeric digits): (301) 287-3690
10. Title of Non-Concurring Employee: Senior Program Manager	11. Office (Choose from the drop down list or fill in): NSIR

12. ☐ Document Author ☑ Document Contributor ☐ Document Reviewer ☐ On Concurrence

13. Name of Non-Concurring Employee's Supervisor: Anthony Bowers	14. Office (Choose from the drop down list or fill in): NSIR
15. Title of Non-Concurring Employee's Supervisor: Reactor Security Branch	16. Supervisor's Telephone Number (Enter 10 numeric digits): (301) 415-1955

17. ☑ I would like my non-concurrence considered and would like a written evaluation in Section B and C.

☐ I would like my non-concurrence considered, but a written evaluation in Sections B and C is not necessary.

18. When the process is complete, I would like management to determine whether public release of the NCP Form (with or without redactions) is appropriate (Select "No" if you would like the NCP Form to be non-public):

☑ Yes ☐ No

19. Reasons for the Non-Concurrence, Potential Impact on Mission, and the Proposed Alternatives

Please see, Enclosure (4): ML21334A007; Differing Views (public) of Pkg ML21334A003 containing Commission Paper PROPOSED RULE: ALTERNATIVE PHYSICAL SECURITY REQUIREMENTS FOR ADVANCED REACTORS (RIN 3150-AK19)(ML21334A004). See Attachment 1.

Additional reason warranting formally submitting non-concurrence is the staff (NRR authored) responses to differing views (see section titled "Differing Views," pages 9-10, seee Attachment 2, consists of statements without technical and regulatory basis and logical merit that arbitrarily dismisses the differing views without reasonable and due considerations. The staff responses to the differing views selectively characterized and mislead and misinform the Commission to continue uninformed, not RISKSmart, imposition of proposed requirements for alternative security requirements. The staff responses simply dismiss the Differing Views without bases and discredit the differing views based on materially false statements and incomplete and inaccurate information.

NON-CONCURRENCE PROCESS (Continued)

20. Signature and Date of Non-Concurring Employee

Peter S. Lee

Digitally signed by Peter S. Lee
Date: 2022.04.18 07:27:42 -04'00'

Section B - To Be Completed By Non-Concurring Employee's Supervisor

2. Title of Subject Document	3. ADAMS Accession Number
SECY-22-XXXX, PROPOSED RULE: ALTERNATIVE PHYSICAL SECURITY REQUIREMENTS FOR ADVANCED REACTORS (RIN 3150-AK19)	**ML21334A004;ML21334A007**

4. Name of Non-Concurring Employee's Supervisor	5. Office (Choose from the drop down list or fill in)
Anthony Bowers	NSIR
6. Title of Non-Concurring Employee's Supervisor	**7. Supervisor's Telephone Number** (Enter 10 numeric digits)
Reactor Security Branch	(301) 415-1955

8. Comments for the NCP Reviewer to Consider

Several aspects of this rulemaking, “Alternative Physical Security Requirements for Advanced Reactors (NRC-2017-0227; RIN: 3150-AK19),” have proven challenging to staff and management. Some of these challenges have been organizational in nature while others can be directly attributed to the scoping of this rulemaking and the staff's effort to address several `first-of-a kind' issues. These issues have included: 1) shared resources with Part 53 rulemaking, an aggressive schedule for both activities, and attempts to implement approaches from Part 53 into this rulemaking (e.g., no DBT) that would expand the scope beyond the Commission approved direction; 2) applicability of the Design Basis Threat (DBT) to advanced reactors; 3) the conduct of a safety consequence analysis considering a DBT-initiated attack; and 4) the concept of no onsite armed responders and reliance of law enforcement or other offsite responders to interdict and neutralize the DBT adversary). The collective staff, including the working group, Steering Committee, and senior management, have made numerous attempts to address staff differing views on these issues within the rulemaking such that they are included as a part of the rulemaking package.

The differing views provided by staff are characterized below. For management's consideration in dispositioning this NCP, my view on each of these items is also provided.

1. The proposed rule imposes unnecessary regulatory burden, which would be an avoidable impediment to a licensee or applicant that wants to apply alternative physical security requirement(s) in the design of a physical protection to meet the requirements of 10 CFR 73.55.

   Response: Agree, in part, and disagree, in part. The existing regulatory framework allows for advanced reactor applicants or licensees to provide alternatives to the existing prescribed security requirements in Part 73 without the need to perform a consequence analysis. This analysis is a `first-of-a-kind' and has never been done before - detailed guidance on how to perform this analysis does not exist. Under the existing framework, an applicant or licensee would only need to demonstrate that the security alternative provided would enable to the applicant or licensee to meet the performance objectives and requirements in 73.55(b), and 2) the alternative method would need to provide an equivalent level of protection. That said, there is a level of uncertainty for applicants and licensees in understanding what security alternatives may be acceptable to NRC staff. This rulemaking and supporting guidance provide clarity to stakeholders on certain security alternatives and standards acceptable to the NRC staff and may also minimize the need for any regulatory exemptions in the licensing process. This rulemaking and guidance will benefit from additional stakeholder engagement and input as part of the public comment period.

2. The proposed rule and its implementation set forth a 25 rem as an acceptable dose limit for members of the public for the Commission and establish a consequence-based approach for determining offsite release of up to 25 rem would not endanger public health and safety.

   Response: Disagree. The 25 rem reference value only provides an applicant or licensee an option to use one of the proposed alternative security requirements. This value does not change the licensing basis protection

standard upon which target sets will be based. Additionally, this value is not considered to be an acceptable dose to the public.

3. The proposed rule and implementation of 10 CFR 73.55(s)(1)(ii) and (s)(1)(iv) allows for relying on human actions in lieu of plant design features, SSCs and barriers that would not meet the Commission's expectations in the 2008 Policy Statement on Regulation of Advanced Reactors to reduce reliance on human actions.

   Response: Disagree. The rulemaking would allow an applicant or licensee to consider mitigation strategies (including reliance on human action) for two purposes: 1) the conduct of the consequence analysis to determine whether use of the security alternatives is allowed or acceptable, and 2) as part of the target set identification process, to determine achievable target sets. The latter is consistent with the practice used by operating reactors. Neither of these purposes deter or dissuade advanced reactor designers from reducing their reliance on human actions.

4. The proposed rule, a more specific requirement in 10 CFR Part 73.55, provides a regulatory pathway for circumventing regulatory requirements established in the current framework for safety and security.

   Response: No comment. Legal in nature - I am not sure I fully understand the concern.

9. Signature and Date of Non-Concurring Employee's Supervisor

Anthony R. Bowers

Digitally signed by Anthony R. Bowers
Date: 2022.05.09 13:53:22 -04'00'

Section C - To Be Completed By NCP Coordinator

2. Title of Subject Document	3. ADAMS Accession Number
SECY-22-XXXX, PROPOSED RULE: ALTERNATIVE PHYSICAL SECURITY REQUIREMENTS FOR ADVANCED REACTORS (RIN 3150-AK19)	**ML21334A004;ML21334A007**

4. Name of NCP Coordinator	5. Office (Choose from the drop down list or fill in)
Steven Vitto	NSIR
6. Title of NCP Coordinator	**7. Coordinator's Telephone Number** (Enter 10 numeric digits)
Security Specialist	(301) 287-9216

8. Agreed Upon Summary of Issues

The following Summary of Issues was initially agreed upon on June 3, 2022, with the NCP submitter. Several iterations were held on May 10, 11, 16, 27, 31, and June 2, 3, and 8, 2022, to discuss and align on the below summary of issues.

The submitter disagrees with the staff response to the differing view based on the following:

- The staff responses consist of statements without technical and regulatory basis and logical merit.
- The staff responses dismiss the differing view based on incomplete and inaccurate information that is uninformed, not consistent with the NRC's Be riskSMART framework and that may mislead or misinform the Commission.

The differing view expressed by the submitter can be summarized into one underlying concern. The current proposed rule language in 10 CFR 73.55(s)(1)(ii), “Eligibility” and 73.55(s)(1)(iv), “Analysis” is not necessary to provide the technical and regulatory bases for the Commission's finding of assurance that the licensed activities do not constitute an unreasonable risk to the public health and safety. The submitter provided four individual issues and proposed alternative language that would address each of the issues raised in the differing view. The four items below comprise the agreed upon summary of issues:

1. The NCP-submitter asserts that the proposed rule would impose an unnecessary burden to applicants, licensees, and the NRC because it would require an applicant or licensee to analyze the consequence(s) of design basis threat-initiated events before implementing any of the alternative physical security requirements.
2. The NCP-submitter is concerned that the proposed rule: (1) redefines a dose of up to 25 rem as an acceptable level of exposure for members of the public; and (2) sets forth 25 rem in a 2-hour period total effective dose equivalent (TEDE) as an acceptable dose for members of the public.
3. The NCP-submitter asserts that: (1) the staff proposal has the potential of replacing physical protection of design features, SSCs, and physical barriers with other mitigation actions that rely on human action; (2) this is inconsistent with the Commission's 2008 Policy Statement on the Regulation of Advanced Reactors (73 FR 60612), which encourages less reliance on human actions; and (3) the staff proposal is explicitly allowing credit to outcomes predicated on mitigation in the eligibility criteria which is inconsistent with the defense in depth philosophy.
4. The NCP-submitter states that the proposed eligibility analysis requirements in 10 CFR 73.55(s)(1), a more specific requirement, would provide a regulatory pathway for circumventing the more general offsite consequences analyses that are required for reactor design analysis, assessment, and evaluation of consequences (e.g., 10 CFR Parts 50.34 (safety assessment), 50.59 (design basis),

52.79 (safety assessment), and 100.11 (reactor siting criteria)). In addition, the NCP submitter asserts that the more specific provisions of 10 CFR 73.55(s)(1)(ii) and (iv) would control and override the more general provisions for offsite consequences analyses (e.g., a licensee requesting a security exemption must meet the more specific requirements of 10 CFR 73.5 as opposed to the more general requirements of 10 CFR 50.12).

9. Evaluation of Non-Concurrence and Rationale for Decision

Overview

I appreciate the non-concurring staff member's use of the process to raise concerns and differing views. I also appreciate the comments provided by the non-concurring employee's supervisor in Section B. Thanks also to the NCP coordinator and the NSIR and NRR staff who helped me articulate the director's decisions.

The proposed Limited Scope Rule (LSR) (ML21334A003) establishes alternative physical security requirements for those advanced reactor applicants and licensees who meet the proposed eligibility criterion. The proposed eligibility criterion requires that an applicant or licensee demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event do not exceed the offsite dose reference values defined in 10 CFR 50.34(a)(1)(ii)(D) and 52.79(a)(1)(vi) before being able to use the alternative security measures. These values are the radiological consequence factors currently used to evaluate the acceptability of a proposed nuclear power plant site. While the concept of using offsite dose reference values has been used as criterion for siting and safety analysis of nuclear power plants for more than 40 years, this proposed approach introduces new methods that will use the same dose reference values as a criterion for demonstrating eligibility to meet certain alternative physical security requirements. As a result, developing novel concepts for alternative physical security requirements to protect an advanced reactor has presented complexities. Staff has made significant progress in this area by having frequent stakeholder engagements over the past 18 months to share concepts associated with the framework and receive feedback to refine the rule and its guidance.

As described in the draft SECY paper that will communicate the proposed LSR to the Commission, the requirements to determine eligibility to use the alternative physical security requirements (10 CFR 73.55(s)(1)(ii)) are consistent with the rulemaking plan approved by the Commission (SECY-18-0076, "Options and Recommendation for Physical Security for Advanced Reactors" (ML18170A051)) to "permit future applicants and licensees to demonstrate their safety case and technical basis to meet alternative requirements for a risk-informed, performance-based approach for designated portions of the physical security program." The staff noted that doing so in a limited-scope rulemaking, i.e., establishing predictable and acceptable alternatives to the physical security requirements for small modular reactors and non-light water reactors , would "promote regulatory stability, predictability, and clarity" and "eliminate the need for future applicants to propose alternatives or request exemptions from physical security requirements."

Staff Discussions

Over the past two years, during the weekly LSR Working Group (WG) meetings and at periodic Steering Committee (SC) meetings, there were numerous views discussed including the alternative views presented by the NCP submitter. In addition, there were many ad hoc and scheduled discussions among NSIR staff on the topics raised in this non-concurrence. These discussions directly impacted the proposed rule text and the draft guidance. The submitter has also had extensive discussions with subject matter experts in NSIR and NRR. Moreover, I scheduled a number of meetings with NSIR staff and with the broader WG to understand the WG's approach to the rule text and understand where alternative views exist. I held three meetings for approximately 1-hour each on October 15, October 20, and November 18, to discuss the consequence analysis and considerations on the use of a dose threshold. I held three longer alignment meetings in January, on January 24th, 1 to 4 pm, January 27th, 9 am to noon, and January 31st, 1 to 4 pm. These meetings provided the NCP submitter and other staff opportunities to raise issues and concerns with the novel approaches being taken in this rulemaking and potential impacts to NSIR's overall security programs.

After submittal of the NCP, the NCP review team has had several iterations with the NCP submitter on May 10, 11, 16, 27, 31, and June 3, 2022, to ensure that this evaluation adequately captured and clarified the submitter's differing views. I met and discussed the summary of issues and differing views with the NCP submitter on June 8, 2022 and again on June 15, 2022, to have a high-level conversation about the director's decisions.

Evaluation of Differing View, Item 1 - Unnecessary regulatory burden

The NCP-submitter asserts that the proposed rule would impose an unnecessary burden to applicants, licensees, and the NRC because it would require an applicant or licensee to analyze the consequence(s) of design basis threat-initiated events before implementing any of the alternative physical security requirements.

Director's Decision

The proposed rule accommodates advanced reactors with no achievable target sets; this is consistent with the aspirational goals set in the 2008 “Policy Statement on the Regulation of Advanced Reactors” (73 FR 60612). Dose calculations are only needed to determine eligibility if target sets can be potentially compromised. To reflect novel reactor designs (e.g., molten salt reactors) and credit the flexibilities made possible by advanced design features in devising the protective strategy (e.g., low power density and delayed fission product release), the staff needed to introduce significant radiological release as an alternative to significant core damage, which made dose the appropriate metric. The eligibility criterion, with its associated consequence analysis, is necessary to accomplish the purpose of the proposed rule. The eligibility dose criterion is thus effectively a screening tool for using the alternatives in the proposed rule. In practical terms, the proposed approach also achieves an equivalent level of safety and security by mitigating the potential residual risk in interdicting and neutralizing the adversary by restricting the use of alternatives to reactors that meet the eligibility criterion. If there is an achievable target set (or more), the eligibility dose reference value criterion ensures that the alternatives are used only when the risk to public health and safety is low.

Key Factors in Decision

- The proposed LSR provides a technology neutral performance measure, significant release of radionuclides, which encompasses a postulated security-initiated event that may cause a release to the environment exceeding that analyzed in the design basis accident.

- Within the proposed LSR and its guidance, no separate dose calculation needs to be performed if the consequences of a security-initiated event do not exceed those of any safety event and the physical protection program and protective strategy protects the target sets.
- For the currently operating fleet, target sets are comprised of safety SSCs that need to be protected to preclude significant core and spent fuel pool damage. For future advanced reactors, target sets may include other features (e.g., a confinement structure) that need to be protected in the event of a security-initiated event to preclude significant releases. If the license's protective strategy prevents all target sets from being compromised, no consequence analysis is needed.
- The consequence analysis is required if any target set could be compromised, limiting use of the alternatives to reactors that meet the eligibility criterion.

Discussion

The graded approach for applicants to show that the eligibility criterion is met is described in DG-5072, "Guidance for Alternative Physical Security Requirements for Small Modular Reactors and Non-Light-Water Reactors" that is accompanying the proposed LSR. Figure 1 of DG-5072, provides a high-level flow chart of the process for determining eligibility to use the alternative security measures and demonstrating continued compliance with the performance objectives in 10 CFR 73.55, with the alternatives applied.

To demonstrate eligibility, an applicant or licensee may rely on information from the safety analysis and the target set identification process to inform the radiological dose consequence determination. While the safety analysis information is to be based on accident scenarios, security-initiated events could have similar results. In order to use the safety analysis, the applicant needs to verify that a security event does not exacerbate results from the safety event. Additionally, if applicable, a licensee or applicant may utilize the analysis described in DG-5071, "Target Set Identification and Development for Nuclear Power Reactors," proposed Revision 2 to Regulatory Guide 5.81 (ML22021B529, non-public) (The revised guidance that modifies the target set identification process to accommodate the proposed change to the performance design requirement in 10 CFR 73.55(b)(3) is designated as official use only, security-related information since it includes information that is reasonably expected to be useful to terrorists in planning or executing an attack that does not qualify as safeguards or classified information.) to determine eligibility. The guidance reflects the new performance standard, preventing significant release of radionuclides, and identifies the means to credit mitigation before a release to the environment exceeds that analyzed in the design basis accident, that renders a target set unachievable for an advanced reactor. If a licensee does have achievable target sets at the end of the target set evaluation, an offsite radiological consequence analysis can be used to determine eligibility.

Implementing the alternatives may result in identifying additional elements in target sets that may be unique and different from the current large light water reactor (LWR) fleet. If an applicant can protect the unique target set elements with the LSR proposed security alternatives, then a consequence analysis is not required to determine eligibility. The consequence analysis to determine eligibility is required if any target set could be compromised.

The staff recognizes that the proposed consequence analysis requirement for a security-initiated design basis threat event is a `first-of-a-kind' proposal to identify and evaluate security event scenarios. The draft guidance adequately describes the parameters needed to evaluate the consequence analysis and outlines the steps how to perform such analysis. This regulatory guidance will be further refined as stakeholders review and provide comments on the proposed LSR rule and its associated guidance.

Evaluation of Differing View, Item 2 - 25 rem

The NCP-submitter is concerned that the proposed rule: (1) redefines a dose of up to 25 rem as an acceptable level of exposure for members of the public; and (2) sets forth 25 rem in a 2-hour period total effective dose equivalent (TEDE) as an acceptable dose for members of the public.

Director's Decision

The use of a dose-reference dose value in the proposed rule is consistent with its use elsewhere in the regulations, e.g., technical evaluations in 10 CFR 50.34(a)(1) and 10 CFR 52.79(a)(1), and the reactor siting criteria in 10 CFR 100.11. A reference dose used for design or siting purposes in no way alters the allowable dose limits for radiation workers and the public which are specified in 10 CFR Part 20, "Standards for Protection Against Radiation."

Key Factors in Decision

- Occupational and public dose limits and regulations continue to be defined in 10 CFR Parts 20, Subparts C and D, respectively.
- Reference values, such as those used in the technical evaluations in 10 CFR 50.34(a)(1) and 10 CFR 52.79(a)(1), and the reactor siting criteria in 10 CFR 100.11, use the 25 rem reference value as a benchmark; it is not a regulatory limit or threshold, nor is it a real dose to a member of the public.
- The performance requirements and technical evaluations that use the 25 rem dose reference value as a benchmark in the existing safety regulations and proposed security regulations do not make it an "acceptable" consequence, or a real dose. Dose reference values are intended as a means for applicants and licensees to demonstrate eligibility under 10 CFR 73.55(s)(1)(ii) to use the alternative physical security requirements.

Discussion

The WG and SC considered and discussed the NCP-submitter's concern regarding the application of the 25 rem dose reference value. In recognition of alternative views associated with the dose reference value, the WG included a specific question in the draft *Federal Register* notice accompanying the draft LSR SECY to solicit stakeholder feedback:

> *The NRC also considered using a more specific technology-inclusive requirement, such as the dose reference values currently found in §§ 50.34(a)(1)(ii)(D) and 52.79(a)(1)(vi). How could the NRC implement the use of such a dose-based requirement (e.g., offsite dose reference values) in the context of evaluating physical security for a site? If there should be alternative value(s) (such as a different dose-based or safety-based value(s)), what would be a suitable alternative value(s)? Please provide the basis for your response.*

The 25 rem dose is defined in several regulations (e.g., 10 CFR Parts 50, 52, and 100) as a *reference value* which is used to evaluate plant design features with respect to postulated reactor accidents, including design basis accidents, or DBAs. The DBA is a very low frequency (unlikely) event that is not expected to occur during the lifetime of a facility. (https://www.nrc.gov/reading-rm/basic-ref/glossary/beyond-design-basis-accidents.html) In accordance with the regulations, a nuclear facility must be designed and built to withstand a DBA without loss to the systems, structures, and components necessary to ensure public health and safety. The conditions under which the 25 rem dose reference value are used include considerations of the likelihood of DBAs, which has been endorsed by the Commission in previous rules (e.g., 10 CFR Parts 50, 52, and 100). The DBAs are not intended to be actual event sequences but are used as surrogates to allow the NRC and licensees to evaluate the *response* of a facility's

engineered safety features. By identifying and assessing the DBA, the NRC has been able to provide a useful perspective with regard to dose reference values that ought not to be exceeded, even for radiation workers under emergency conditions.

Specifically, in 10 CFR 50.34(a)(1) and 10 CFR Part 52.79(a)(1), the 25 rem dose reference value is used as a required evaluation parameter in a nuclear power plant's *Preliminary Safety Analysis Report.* Licensees must perform an evaluation and analysis of the postulated fission product release from a DBA to evaluate the two following offsite radiological consequence criteria:

- An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose >25 rem total effective dose equivalent (TEDE).

- An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose >25 rem TEDE

In footnote 7 to §50.34 and footnote 6 to §52.79, the Commission stated that the use of 25 rem:

> is not intended to imply that this number constitutes an acceptable limit for an emergency dose to the public under accident conditions. Rather, this dose value has been set forth in this section as a reference value, which can be used in the evaluation of plant design features with respect to postulated reactor accidents, to assure that these designs provide assurance of low risk of public exposure to radiation, in the event of an accident.

In NRC's 1996 revisions to its power reactor siting criteria in 10 CFR Part 100 (61 FR 65157), the Statements of Consideration specifically explained how the Commission interpreted its use of the 25 rem dose over the 2-hour period:

> Although the Commission recognizes that evaluation of the dose to a hypothetical individual over any two-hour period may not be entirely consistent with the actions of an actual individual in an accident, the intent is to assure that the short-term dose to an individual will not be in excess of the acceptable value, even where there is some variability in the time that an individual might be located at the exclusion area boundary. In addition, *the dose calculation should not be taken too literally with regard to the actions of a real individual, but rather is intended primarily as a means to evaluate the effectiveness of the plant design and site characteristics in mitigating postulated accidents* [emphasis added].

Neither the technical evaluations in 10 CFR 50.34(a)(1) and 10 CFR 52.79(a)(1), nor the reactor siting criteria in 10 CFR 100.11, which both use the 25 rem dose reference value as a benchmark, are the requirements to manage public or worker radiation exposures; nor are they acceptable consequences. Public dose limits and regulations continue to be defined in 10 CFR Part 20, Subpart D --*Radiation Dose Limits for Individual Members of the Public*, and remain at 0.1 rem (1 mSv) per year. Occupational dose limits and regulations also remain the same and are defined in 10 CFR Part 20, Subpart C.

In summary, the 25 rem dose is simply a *reference value* used as a benchmark (not an actual public dose limit) that is proposed to be used in the LSR to evaluate reactor designs and performance of SSCs following a security-initiated event in order to assure that such designs provide assurance of low risk to the public regarding exposure to radiation, if such events do occur.

Evaluation of Differing view, Item 3 - Eligibility analysis impact on protective strategy development

The NCP-submitter asserts that: (1) the staff proposal has the potential of replacing physical protection of design features, SSCs, and physical barriers with other mitigation actions that rely on human action; (2) this is inconsistent with the Commission's 2008 Policy Statement on the Regulation of Advanced Reactors (73 FR 60612), which

encourages less reliance on human actions; and (3) the staff proposal is explicitly allowing credit to outcomes predicated on mitigation in the eligibility criteria which is inconsistent with the defense in depth philosophy.

Director's Decision

The proposed rule makes it possible to credit increased safety margins as well as inherent and passive safety features, as anticipated in the Commission's 2008 Policy Statement (73 FR 60612). It also allows crediting human actions only when performance can be demonstrated and does not require plant personnel to take extraordinary actions, e.g., by putting their life in danger. This is consistent with crediting human actions elsewhere in the NRC's regulatory framework, most notably in the target set identification process of Regulatory Guide 5.81. Moreover, any safety features and actions credited under the proposed draft rule can only be credited by other regulations if they fully meet the requirements set forth in those other regulations. For example, the eligibility analysis proposed in 10 CFR 73.55(s)(1) cannot be used to reclassify risk-significant SCCs without meeting all the requirements of 10 CFR 50.69.

Key Factors in Decision

- The intent of the eligibility consequence analysis is to demonstrate the ability to use the proposed alternative security measures. Developing the protective strategy is a separate process and does not rely on the eligibility analysis.
- The flexibility offered by the proposed rule's alternative security requirements that allows reduced reliance on onsite armed responders, as articulated in the Commission's 2008 Policy statement, encourages advanced reactor designers to consider security objectives more holistically during the design process.
- An applicant must meet the regulations or request an exemption from the regulations.

Discussion

The NCP-submitter raises concerns that an applicant or licensee may use the eligibility consequence analysis in a way as to provide a pathway for misapplying the regulations, resulting in a significant reduction in safety and security. The eligibility consequence analysis is used to demonstrate the ability to use the proposed alternative security measures through comparison to the dose reference value to provide assurance of low risk to the public regarding exposure to radiation. Developing the protective strategy is a separate process and does not rely on the eligibility analysis. The grouping and categorization of equipment into target sets is an integral component in the development of a physical protection program and protective strategy and is outlined in DG-5071. The staff will use the appropriate standard review process found in NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition,” (NUREG-0800, Formerly issued as NUREG-75/087) to review and approve the physical security plans.

The proposed LSR allows an applicant or licensee to consider mitigation strategies (including reliance on human action) for two distinct purposes: (1) as part of the target set identification process, to determine achievable target sets; and (2) the conduct of the consequence analysis to determine whether use of the security alternatives is allowed or acceptable. The first is consistent with the practice used by operating LWRs today (except they protect against significant core damage and spent fuel sabotage instead of protecting against a significant release of radionuclides). For advanced reactors, if the process under the proposed rule identifies target sets that can be

compromised by a DBT adversary, then an analysis is conducted to verify that there are no offsite releases above the dose reference values. The consequence analysis proposed in the LSR does not replace the safety analysis that must be performed by the licensee and therefore, the change in protective strategy should not impact how the licensee makes the safety classification of its equipment under 10 CFR 50.69.

The guidance accompanying the proposed limited scope rule will provide applicants with better understanding of how to meet the proposed regulations, including use of the consequence analysis. As described in the guidance an applicant or licensee needs to describe in their security plans how they intend to implement alternative physical security requirement(s). These plans need to address how each alternative is applied and integrated with other requirements in 10 CFR 73.55 for the design of a physical protection program that meets the performance objective and requirements of 10 CFR 73.55(b). While this rule does allow mitigation and focus on radiological release, the overall framework to protect against the design basis threat of radiological sabotage is still maintained.

As described in the proposed LSR SECY, the proposed rule does not conflict with the Commission's 2008 Policy Statement (73 FR 60612) because the proposed rule does not rely on human actions but allows for minimum operator actions consistent with the current regulatory framework. Furthermore, the flexibility offered by the proposed rule's alternative security requirements that allow reduced reliance on onsite armed responders encourages advanced reactor designers to consider security objectives more holistically during the design process. A design that meets the proposed rule's eligibility criterion is less likely to need to rely on onsite armed responder personnel in the development of its physical security program. Hence, the proposed rule is fully aligned with the Commission's expectations laid out in the 2008 Policy Statement on the Regulation of Advanced Reactors.

Additionally, the agency has processes in place, oversight to confirm compliance, and licensing to review and evaluate applications, including exemption requests to ensure safety and security. An applicant or licensee must meet the regulations or request an exemption for all applicable regulations. The changes proposed in the regulations provide additional flexibility for licensees to prove eligibility and apply a specific set of predetermined acceptable physical security alternatives. The application of these alternatives will still be subject to both the licensing and oversight process to ensure reasonable assurance of adequate protection is maintained.

Evaluation of Differing View, Item 4 - Pathway for circumventing

The NCP-submitter states that the proposed eligibility analysis requirements in 10 CFR 73.55(s)(1), a more specific requirement, would provide a regulatory pathway for circumventing the more general offsite consequences analyses that are required for reactor design analysis, assessment, and evaluation of consequences (e.g., 10 CFR 50.34 (safety assessment), 50.59 (design basis), 52.79 (safety assessment), and 100.11 (reactor siting criteria)). In addition, the NCP submitter asserts that the more specific provisions of 10 CFR 73.55(s)(1)(ii) and (iv) would control and override the more general provisions for offsite consequences analyses (e.g., a licensee requesting a security exemption must meet the more specific requirements of 10 CFR 73.5 as opposed to the more general requirements of 10 CFR 50.12).

Director's Decision

The applicability of regulatory requirements is contained in the regulations themselves. How specific the requirements are does not determine their range of applicability. For example, 10 CFR 50.12, “Specific exemptions” states in § 50.12(a), “…from the requirements of the regulations in this part” and is therefore only applicable to the provisions of 10 CFR Part 50. Also, §73.5, “Specific exemptions” states, “…exemptions from the requirements of the

regulations in this part" and is therefore only applicable to the provisions of 10 CFR Part 73. Similarly, the proposed 10 CFR 73.55(s)(1) consequence analysis cannot be used to meet the consequence analysis requirements of Parts 50, 52, or 100 unless the analysis fully meets the requirements of those regulations.

Key Factors in Decision

- An applicant must meet the regulations or request an exemption from the regulations.
- The agency has processes in place, oversight to confirm compliance, and licensing to review and evaluate applications, including exemption requests to ensure safety and security.

Discussion

The NCP submitter raises concerns that an applicant or licensee may use the alternatives to provide a pathway for incorrectly applying the regulations, resulting in a reduction in safety and security. The limited-scope rulemaking aligns with the overall physical security framework and existing process for developing physical protection systems for large LWRs. Both large LWRs and advanced reactors are required to protect against the DBT of radiological sabotage. Advanced reactor applicants or licensees identify the minimum combination of equipment, operator actions, and structures that, if all were prevented from performing their intended safety function or prevented from being accomplished, barring extraordinary actions by plant operators, result in a significant release of radionuclides. This is the same approach that large LWRs use today (except they protect against significant core damage and spent fuel sabotage instead of protecting against a significant release of radionuclides). For advanced reactors, if the process under the proposed rule identifies target sets that can be compromised by a DBT adversary, then an analysis is conducted to verify that there is no offsite release above the dose reference values as the entry criterion for use of these alternatives. This process looks at several factors and allows crediting inherent or engineered features and provides a method to identify minimum credible operator actions and credit offsite support. Thus, the proposed rule does not circumvent regulatory requirements established in the current framework for safety and security.

An applicant or licensee must always meet the general performance objective of 10 CFR 73.55(b)(3) which describes what the physical protection program must be designed to prevent. While the proposed LSR does allow mitigation, changes the focus from significant core damage to radiological release, and allows the use of alternative security measures, the overarching general performance objective and requirements to protect against the design basis threat of radiological sabotage must continue to be met.

The agency has processes in place, oversight to confirm compliance, and licensing to review and evaluate applications, including exemption requests to ensure safety and security. An applicant or licensee must meet the regulations or request an exemption for all applicable regulations. The changes proposed in the regulations to provide additional flexibility for licensees prove eligibility and thus apply a specific set of predetermined acceptable physical security alternatives. The application of these alternatives will still be subject to both the licensing and oversight process to ensure reasonable assurance of adequate protection is maintained.

In conclusion, I do not find that the proposed 10 CFR 73.55(s)(1) consequence analysis is a pathway to circumvent existing regulations. An applicant voluntarily electing to implement the alternative security requirements in 10 CFR 73.55(s) performs the analysis in 10 CFR 73.55(s)(1) in addition to any general consequence analysis requirements found in 10 CFR Parts 50, 52, and 100. Insights from the safety analysis can inform the 10 CFR 73.55(s) security-

initiated consequence analysis but do not offer a path for reducing safety or security requirements.

NCP Conclusion

I have reviewed the NCP and the proposed LSR SECY and have given consideration to the associated guidance, the related SRM_SECY-18-0076, and several historical documents that together provide the basis for the proposed LSR for alternative physical security requirements for advanced reactors. Given all the available information, I have concluded that the approach taken by staff in development of the LSR is in accordance with agency policies, regulations, and guidance and no further edits are necessary.

10. Signature and Date of NCP Coordinator

Steven C. Vitto

Digitally signed by Steven C. Vitto
Date: 2022.06.17 08:10:22 -04'00'

11. Signature and Date of NCP Approver

Mirela Gavrilas

Digitally signed by Mirela Gavrilas
Date: 2022.06.17 11:56:12 -04'00'

Attachment 1

Alternative Physical Security Requirements for Advanced Reactors Proposed Rule: DIFFERING VIEWS

An NSIR staff member provided differing views on the proposed rule. The staff member's differing views arise from the proposed provisions within 10 CFR 73.55(s)(1)(ii), "Eligibility," where "[t]he applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event(s) do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter," and 10 CFR 73.55(s)(1)(iv), "Analysis," where "[t]he applicant or licensee electing to meet one or more of the alternative security requirements in paragraph (s)(2) of this section must perform a technical analysis demonstrating how it meets the criteria in paragraph (s)(1)(ii) of this section." The differing views are characterized in the following problem statements:

- The proposed rule imposes unnecessary regulatory burden, which would be an avoidable impediment to a licensee or applicant that wants to apply alternative physical security requirement(s) in the design of a physical protection to meet the requirements of 10 CFR 73.55.

- The proposed rule and its implementation set forth a 25 rem as an acceptable dose limit for members of the public for the Commission and establish a consequence-based approach for determining offsite release of up to 25 rem would not endanger public health and safety.

- The proposed rule redefines a dose of up to 25 rem as acceptable level of exposure for members of the public and set forth this new standard for the Commission the release of radiation hazards is acceptable and will not endanger the public health and safety.

- The proposed rule and implementation of 10 CFR 73.55(s)(1)(ii) and (s)(1)(iv) allows for relying on human actions in lieu of plant design features, SSCs and barriers that would not meet the Commission's expectations in 2008 Policy Statement on Regulation of Advanced Reactors to reduce reliance on human actions.

- The proposed rule, a more specific requirement in 10 CFR Part 73.55, provides a regulatory pathway for circumventing regulatory requirements established in the current framework for safety and security.

The details of the bases for the differing views indicated above, along with the potential impact on mission and alternatives for resolutions are provided in this enclosure as Differing Views No.1, No.2, No.3.a, and No.3.b.

DIFFERING VIEW NO.1

The U.S. Nuclear Regulatory Commission's (NRC's) issuance of the proposed rule could impose unnecessary regulatory burden, which would be an avoidable impediment to a licensee or applicant that wants to apply alternative physical security requirements in the design of a physical protection system to meet the requirements of Title 10 of the *Code of Federal*

Regulations (10 CFR) 73.55, “Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage.”

Regulatory and Technical Basis

- ***The current regulatory framework in 10 CFR 73.55 does not require a licensee or applicant to perform a consequence analysis (e.g., to analyze the consequences of security-initiated events (those initiated by the design-basis threat (DBT))).***

The proposed rule, 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) (Revision 37, February 2022), currently states the following:

> (1) General requirements.
> (i) Applicability. The requirements of this section apply to an applicant for or holder of a license for a small modular reactor, as defined in § 171.5 of this chapter, or a non-light-water reactor under part 50 of this chapter or part 52 of this chapter.
>
> (ii) Eligibility. The applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security initiated event(s) do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter.
>
> (iii) Identification and Documentation. The applicant or licensee must identify the specific alternative physical security requirement(s) it intends to implement as part of its physical protection program and demonstrate how the performance requirements set forth in this section are met when the selected alternative(s) is used.
>
> (iv) Analysis. An applicant or licensee electing to meet one or more of the alternative security requirements in paragraph (s)(2) of this section must perform a technical analysis demonstrating how it meets the criteria in paragraph (s)(1)(ii) of this section. The licensee must maintain the analysis until the certifications required by § 50.82(a)(1) of this chapter or § 52.110(a) of this chapter have been docketed by the NRC.

The two proposed provisions (ii and iv) above establish that a licensee (or applicant for an operating license) must perform a site-specific analysis to evaluate potential offsite radiological consequences of security-initiated events. The proposed rule further states, as illustrated by the table below, that before implementing any of the alternatives in 10 CFR 73.55(s)(2), a licensee or applicant must satisfy the requirements of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv). This includes providing an analysis of potential offsite radiological consequences from postulated security-initiated (DBT-initiated) events, to show that such an event would result in an offsite release below the dose value of 25 rem (i.e., the radiation dose in any 2-hour period following the onset of the postulated fission product release would not exceed 25 rem total effective dose equivalent (TEDE)).

Comparison of Proposed Rule and Existing Rule	
Proposed 10 CFR 73.55(s)	**Existing 10 CFR 73.55(r), Alternative measures**
(1) General Requirement (i) Applicability. The requirements of this section apply to an applicant for or holder of a license for a small modular reactor, as defined in § 171.5 of this chapter, or a non-light-water reactor under part 50 of this chapter or part 52 of this chapter.	(1) The Commission may authorize an applicant or licensee to provide a measure for protection against radiological sabotage other than one required by this section if the applicant or licensee demonstrates that:
(ii) Eligibility. The applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event(s) do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter.	Not required.
(iii) Identification and Documentation. The applicant or licensee must identify the specific alternative physical security requirement(s) it intends to implement as part of its physical protection program and demonstrate how the performance requirements set forth in this section are met when the selected alternative(s) is used.	(1)(i) The measure meets the same performance objectives and requirements specified in paragraph (b) of this section…. (2) The licensee shall submit proposed alternative measure(s) to the Commission for review and approval in accordance with §§ 50.4 and 50.90 of this chapter before implementation. (3) In addition to fully describing the desired changes, the licensee shall submit a technical basis for each proposed alternative measure. The basis must include an analysis or assessment that demonstrates how the proposed alternative measure provides a level of protection that is at least equal to that which would otherwise be provided by the specific requirement of this section.
(iv) Analysis. An applicant or licensee electing to meet one or more of the alternative security requirements in paragraph (s)(2) of this section must perform a technical analysis	Not required.

demonstrating how it meets the criteria in paragraph (s)(1)(ii) of this section. The licensee must maintain the analysis until the certifications required by § 50.82(a)(1) of this chapter or § 52.110(a) of this chapter have been docketed by the NRC.	

Contrary to the proposed rule, the Commission's current requirement in 10 CFR 73.55(r), which includes the necessary exemptions to prescribed requirements for implementing alternatives under 10 CFR 73.5, "Specific exemptions," does not require a licensee or applicant to perform an analysis to demonstrate that the consequences of a postulated radiological release resulting from a postulated security-initiated event do not exceed the offsite dose reference values defined in 10 CFR 50.34, "Contents of applications; technical information," and 10 CFR 52.79, "Contents of applications; technical information in final safety analysis report." Such an analysis to justify a request to implement an alternative is not required either under 10 CFR 73.55(r) or for the necessary exemption from prescribed security requirements in 10 CFR 73.55. Under the regulatory framework in 10 CFR 73.55, the technical basis must demonstrate that the alternative measure provides a level of protection that is equal to that of the corresponding specific requirement in 10 CFR 73.55 (i.e., the alternative meets the performance objectives and requirements in 10 CFR 73.55(b)). This justifies the implementation of the proposed alternative. The same technical basis justifies specific exemptions from prescribed security requirements that may be necessary to implement the alternative. This technical basis is the same as that required in the proposed rule, as the acceptability of the alternative is based on how the applicant or licensee would design and implement the alternative physical security requirements to meet the requirements of 10 CFR 73.55. This is evident from the proposed rule in 10 CFR 73.55(s)(1)(iii), which requires the licensee or applicant to demonstrate how it will meet the performance requirements in 10 CFR 73.55(b)(3) when using the selected alternatives.

Despite the similarities between the current and proposed rule, the proposed rule imposes the unnecessary burden that a licensee or applicant must perform consequence analyses. A consequence analysis for security-initiated events, based on the DBT of radiological sabotage defined in 10 CFR 73.1 (i.e., intentional acts that target structures, systems, and components (SSCs) and barriers), is given as an acceptable way for an applicant or licensee to meet the condition for eligibility to implement alternative physical security requirements in the design of its physical protection program. This is an unnecessary impediment for advanced reactor licensees or applicants because they could request implementation of the same alternative physical security requirements through 10 CFR 73.55(r) without performing any consequence analyses. Therefore, the differing view is that the proposed rule imposes an unnecessary burden on advanced reactor designers, licensees, and applicants that are considering and applying alternatives in their physical protection program designs. By issuing the proposed rule, the NRC could impede the efficient industrywide adoption of alternative means and methods, including innovative approaches, in the designs of physical protection programs for advanced reactors.

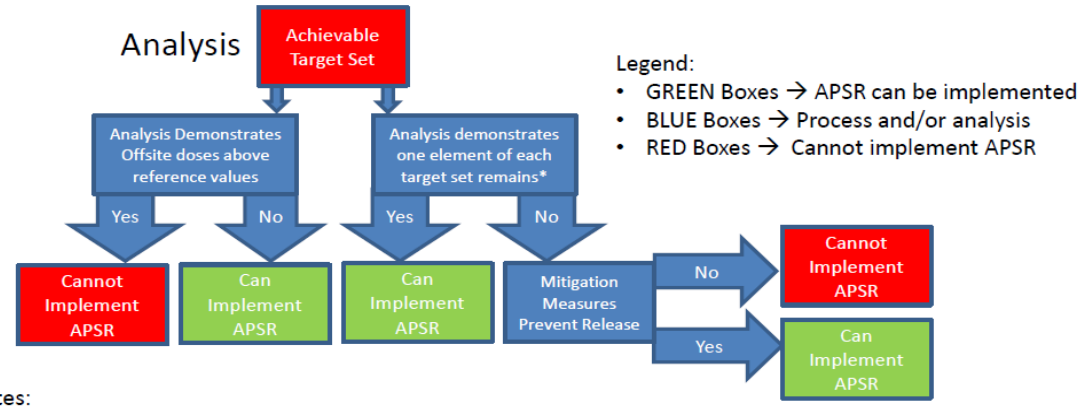
- ***The safety of reactors (including operating light-water reactors, light-water and nonlight-water small modular reactors, and advanced reactors) is ensured by the comprehensive safety requirements and safety-related SSCs that are documented in the final safety analysis report.***

The current safety regulatory framework, in 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities,” and 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” establishes necessary and sufficient safety requirements through safety and hazards analyses and assessments of the site and the facility, which identify design features (e.g., SSCs and barriers) to be incorporated to protect a reactor, ensuring extremely low probability for accidents that could result in the release of significant quantities of radioactive fission products. Specifically, the provisions in 10 CFR 50.34(a)(1)(ii) and 10 CFR 50.34(a)(1)(ii)(D) for a 10 CFR Part 50 operating license, and similarly the provisions in 10 CFR 52.79(a)(1)(vi) and 10 CFR 52.79(a)(2)(iv) for a 10 CFR Part 52 combined license, along with hazards analyses and analyses of design-basis accidents, ensure a comprehensive identification of safety-related SSCs and barriers, as well as risk-significant nonsafety-related SSCs, that must function as designed to ensure safe reactor operation. This identification establishes the basis for licensing.

A licensee’s final safety analysis report documents the safety basis established by meeting the regulatory requirements in the current safety regulatory framework. The analyses, assessments, and evaluations performed under the current safety regulatory framework do not include consequence analysis for intentional acts, either internal or external, based on the characteristics, attributes, and capabilities of the DBT of radiological sabotage specified in 10 CFR 73.1, “Purpose and scope.” The currently required design-basis accidents analyses and safety assessments, including aircraft impact assessments, do not consider failure of the design features, SSCs, and barriers due to security threats up to and including the DBT of radiological sabotage. The current regulations do not require a licensee or applicant to perform additional beyond-design-basis analyses, assessments, and evaluations of DBT-initiated accident scenarios; to determine progressions of accidents not previously analyzed; or to assess the potential offsite radiological consequences. (Such analysis would include, for example, identifying DBT-initiated events; assessing DBT-caused fuel, systems, and facility damage ratios; evaluating DBT-caused release fractions; and analyzing the potential offsite consequences of DBT-caused accident sequences and DBT-caused dispersion of radiological source term.) Instead, the safety basis for licensing, as analyzed and documented for a safety envelope of operations that the Commission finds acceptable, relies on the licensee’s meeting the security requirements in 10 CFR 73.55. When adequately designed and implemented, a physical protection program that satisfies the requirements in 10 CFR 73.55 is deemed to provide adequate protection against the DBT of radiological sabotage. This protection forms the technical and regulatory bases for the Commission’s finding of assurance that the licensed activities do not constitute an unreasonable risk to the public health and safety.

Unlike the current safety and security regulatory framework, the implementation of the proposed rule requires that an analysis be performed to evaluate potential offsite consequences based on a consequence threshold of 25 rem, including additional analysis of DBT-initiated scenarios. This requirement, illustrated below, was presented in public meetings on October 19, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21291A238), and January 20, 2022 (ADAMS Accession No. ML22019A075).

Preliminary Proposed Rule Language



Notes:
- APSR = Alternative Physical Security Requirements
- Analysis is specific to the ability of the credited features of a facility design to: (1) prevent the DBT from compromising a full target set within a bounding time or, (2) identify a time to compromise full target set.
- Mitigative measures occur after a bounding time and before an offsite release greater than reference values occurs.
- Time when an offsite release occurs for mitigation measures = time identified in target set for offsite release + time identified to compromise the full target set.

Under the current regulations and regulatory framework, the licensee or applicant uses 25 rem as the reference value in its analyses, assessments, and evaluations to identify the necessary design features, SSCs, and barriers. For example, compliance with 10 CFR 50.34(a)(1)(ii) and 10 CFR 50.34(a)(1)(ii)(D) or with 10 CFR 52.79(a)(1)(vi) and 10 CFR 52.79(a)(2) means that, crediting the safety functions of plant features, SSCs, and barriers identified, the postulated fission product release (using the expected demonstrable containment leak rate and any fission product cleanup systems intended to mitigate accident consequences) would not lead to a radiation dose above 25 rem. The current requirements of 10 CFR 73.55, when met and acceptably implemented, provide adequate protection to ensure maintenance of the safety basis as analyzed and documented in the final safety analysis report. The current regulations and regulatory framework for the safety/security interface make it unnecessary to require an analysis within the framework of 10 CFR 73.55; doing so would impose an arbitrary applicability requirement (or eligibility condition) on licensees wishing to apply the alternatives in 10 CFR 73.55(s)(2) in their designs. The differing view asks why the consequence analysis requirement in the proposed rule is necessary.

Under the current regulations and regulatory framework, an additional analysis of potential offsite consequences, implemented as illustrated above, to include analysis of DBT-initiated events, would intentionally not meet the requirement of 10 CFR 73.55 (i.e., would result in inadequate protection) and would be otherwise unnecessary, without any regulatory or technical merit.

The following explains this in the context of licensing, to show the unnecessary burden resulting in part from the proposed requirement, which goes beyond the current security regulation and regulatory framework. The logic is that, if the two points described below are true, then the

proposed rule would be creating an unnecessary requirement. In other words, if a licensee's or applicant's design has already met the requirements, through the analyses, assessments, and evaluations completed for either an NRC-certified design or an operating license or combined license, then the design already identifies plant design features, SSCs, and barriers based on the 25-rem reference. If the licensee or applicant has also demonstrated that it has a physical protection program that satisfies the performance objective and requirements in 10 CFR 73.55 using alternative physical security requirements, then, by the finding of the Commission, it has provided adequate security to maintain the safety design features.

The question is why the consequence analysis requirement in the proposed rule is necessary if the following are true:

- On the safety side, the NRC uses 25 rem as a reference value during the design certification process to ensure that a reactor design has the necessary design features, SSCs, and barriers to adequately protect against release of fission product that would endanger the public, design-basis internal random events, and external events. That is, the design features, SSCs, and barriers will be sufficiently available and reliable, through redundancy, diversity, and independence, to perform their intended safety functions. These design features, SSCs, and barriers are the reason for the low likelihood that postulated accidents as analyzed will cause unacceptable offsite consequences.

- On the security side, meeting the requirements of 10 CFR 73.55 provides reasonable assurance that a licensee can adequately defend against the DBT adversary (i.e., intentional, nonrandom internal and external hazards). The physical protection program minimizes the likelihood that intentional acts (i.e., DBT-initiated events) will be able to compromise the design features, SSCs, and barriers and cause unacceptable offsite consequences. The physical protection program also protects against accidents and consequences beyond those analyzed on the safety side (i.e., it eliminates the need to analyze consequences of intentional acts based on the DBT characteristics, attributes, and capabilities described in 10 CFR 73.1).

Therefore, the differing view is that the proposed rule would impose an unnecessary regulatory requirement for applying alternative measures and an increased burden in demonstrating compliance with such a requirement in the security basis for licensing. (At a minimum, it would increase the licensee's or applicant's burden in preparing and submitting analyses, as well as the NRC staff's burden in reviewing how the analyses evaluate the potential offsite radiological consequences, in accordance with 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv), within the security plans.) By issuing the rule as proposed, the NRC will impede the use of alternatives in the physical protection designs of advanced reactor designers and applicants.

- ***The security regulations are structured to ensure adequate protection for the minimum sets of safety-related SSCs, so that those SSCs will be available to perform the safety functions designed to protect public health and safety by preventing radiological sabotage by the DBT adversary.***

The security regulatory framework of 10 CFR Part 73, "Physical Protection of Plants and Materials," establishes graded standards of physical protection commensurate with the risks of activities involving special nuclear material (i.e., in terms of material attractiveness and

radiological consequence). For power reactors, regardless of the reactor design, 10 CFR 73.55(b)(1) states the following:

> The licensee shall establish and maintain a physical protection program, to include a security organization, which will have as its objective to provide high assurance that activities involving special nuclear material are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.

When the performance and prescriptive requirements in 10 CFR 73.55 are met and implemented, the Commission has found, and will find, that a licensee has provided, or an applicant for an operating license has demonstrated, adequate protection against the DBT for radiological sabotage. That is, the licensee or applicant has protected against the potential for the DBT to cause the failure of safety-related design features, SSCs, or barriers, and has thus maintained the safety and licensing basis as analyzed, providing reasonable assurance that activities licensed do not constitute unreasonable risks to public health and safety or to the protection of the environment.

Contrary to the Commission's current regulatory framework and regulations, the proposed rule would require a licensee or applicant to perform a site-specific analysis to evaluate potential offsite radiological consequences, despite a finding of adequate protection. The proposed rule would require unnecessary analysis and would establish a new regulatory position that is contrary to the longstanding regulatory and technical basis for the Commission finding of adequate protection.

Furthermore, the analysis required by 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv), as shown in the figure above, will allow a licensee or applicant to undermine the current safety and security regulatory framework. Specifically, a licensee or applicant could evaluate the potential offsite consequences of a loss of identified design features, SSCs, or barriers (e.g., those identified through safety analysis, assessments, and evaluations using reference values, the DBA, etc.) due to a DBT-initiated event, based on availability of mitigation equipment and ability to move freely to perform mitigation to prevent release up to an offsite dose of 25 rem. By establishing a provision in 10 CFR 73.55 that allows for reliance on mitigation measures (human actions) to prevent release, the NRC would enable licensees and applicants to intentionally erode current safety and security standards. Differing Views No. 2 and No. 3 of this enclosure address this point in more detail.

The proposed guidance for implementation specifies that an acceptable implementation of the required consequence analysis is one based on DBT-initiated events with an acceptable offsite release of up to 25 rem TEDE to members of the public. The proposed rule, as implemented, will impose an unnecessary burden and create a regulatory impediment for licensees and applicants considering or applying alternative measures in their physical protection program designs.

- ***Applicants or licensees must perform a site-specific analysis to evaluate potential offsite radiological consequences.***

The first part of the proposed requirement, 10 CFR 73.55(s)(1)(ii), states, "The applicant or licensee must demonstrate that the consequences of a postulated radiological release that

results from a postulated security-initiated event do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter." The second part, 10 CFR 73.55(s)(1)(iv), states, "An applicant or licensee electing to meet one or more of the alternative security requirements in § 73.55(s)(2) must provide a technical analysis demonstrating how it meets the criteria in (s)(1)(ii)." The applicant or licensee must also show that its physical protection program design, with the alternative(s), meets the design requirement of preventing a significant radiological release.

For an acceptable implementation of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv), a licensee or applicant wishing to demonstrate eligibility to use some or all of the alternative security measures in 10 CFR 73.55(s)(2) should develop scenarios testing its ability to uphold the site's physical security plan (e.g., to protect target set equipment or prevent an offsite release from exceeding reference doses) while employing the alternative measures. Possible scenarios to evaluate include, but are not limited to, the following:

(1) A DBT-initiated event that compromises some or all target sets and does not involve human actions to mitigate a potential radiological release. Such an event should not result in offsite doses above the reference values in 10 CFR 50.34(a)(1)(ii)(D)(1)–(2) and 10 CFR 52.79(a)(1)(vi)(A)–(B).

(2) A DBT-initiated event that compromises some or all target sets and results in core damage or causes a release of radionuclides from any source before offsite doses exceed the reference values in 10 CFR 50.34(a)(1)(ii)(D)(1)–(2) and 10 CFR 52.79(a)(1)(vi)(A)–(B). The response to such an event may involve both onsite and offsite resources to interdict the adversary force and mitigate the release.

The consequence analysis required by the proposed rule, as described for implementation above, uses a threshold of 25 rem TEDE in a 2-hour period as an acceptable dose limit for members of the public.

Unlike the proposed rule and implementation, the current regulatory framework requires that a licensee or applicant identify all safety-related SSCs, including barriers for safety of reactor operations protecting against risk of core damage and risk of release of radiological nuclides (i.e., 10 CFR 50.34 or 10 CFR 52.79 analysis, assessment, and evaluation). The proposed rule modifies the design performance objective from "prevent significant core damage" to "prevent significant release," to ensure the protection of those SSCs and barriers whose failure would lead to offsite release endangering public health and safety.

According to the proposed implementation guidance, a licensee or applicant would consider intentional acts of radiological sabotage based on the characteristics, attributes, and capabilities of the DBT adversary. Whether the radiological consequences of DBT-initiated scenarios would be considered a danger to public health and safety would depend on whether the resulting radiation exposure was above 25 rem, the threshold defined for significant release. A dose of up to 25 rem would not be considered a significant release, but a dose greater than 25 rem would be considered a significant release and therefore a danger to public health and safety.

The differing view is that the technical analysis required by the proposed rule in 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) is an unnecessary burden. This is because the current safety and security regulatory framework, by requiring safety and hazards analyses

and assessments such as those of 10 CFR 50.34 and 10 CFR 52.79, establishes what safety-related SSCs and barriers must remain reliable and available to perform their intended safety functions (i.e., to prevent core damage or prevent release of radiation hazards to the environment). In the discussion below, this is referred to as Step A.

The design of the physical protection program in accordance with 10 CFR 73.55, referred to as Step B, enables plant features, SSCs, and barriers to perform their required safety functions by protecting them from threats up to and including the DBT of radiological sabotage. A licensee or applicant wishing to use alternative physical security requirements must demonstrate that the resulting physical protection program will meet all the performance and prescriptive requirements of 10 CFR 73.55. This ensures that the identified SSCs and barriers will perform the required safety functions and are adequately protected against intentional acts based on the DBT of radiological sabotage. Under the current regulatory framework for security, this notion of adequate protection constitutes a necessary and sufficient standard, and a necessary and sufficient regulatory footprint, for the Commission to make its finding.

In the current safety and security regulatory framework, the Commission does not require a licensee or applicant to evaluate potential offsite radiological consequences when either considering or applying an alternative measure. Nor does it expand its regulatory footprint to impose additional analysis of potential offsite radiological consequences (referred to as Step C), after the licensee has satisfied the requirements that the Commission has deemed necessary and sufficient for adequate protection.

To reiterate, the key technical and regulatory concern is that the proposed rule and implementation would require licensees and applicants to perform Step C despite having completed Steps A and B. Under the current regulatory framework, Step C is not required; instead, the SSCs and barriers determined to be safety-related are considered adequately protected if the requirements of 10 CFR 73.55 are met (e.g., the protective strategy will interdict and neutralize the DBT of radiological sabotage; the design of the physical protection program prevents significant releases that would endanger public health and safety or the environment). (For licensees and applicants applying 10 CFR 50.69, “Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors,” the SSCs and barriers in question may include RISC-2 SSCs (which are nonsafety-related but perform safety-significant functions), along with, from a security perspective, any equipment or systems whose failure would lead to common-cause failure of RISC-1 and RISC-2 SSCs.)

The requirement of Step C in the proposed rule and implementation is the additional burden that is otherwise not required based on adequate protection. Step C is the analysis of offsite consequences of intentional acts based on the DBT; it requires licensees and applicants to identify and evaluate accident scenarios not previously considered, based on the intentional failure of plant features, SSCs, and barriers that safety analysis has already shown to be reliable and available. This consequence analysis is not well-defined, and the NRC staff has proposed only high-level guidance that does not sufficiently explain how to perform the analysis. This means that the analysis will be complex and costly to complete, and costly for the staff to review, without adding any information needed for the Commission to make its findings of adequate safety and security.

The following example illustrates the burden imposed by Step C in the context of 10 CFR 50.150, “Aircraft impact assessment.” (Another example would be the design for

mitigation of loss of offsite power for all reactor plants to protect against the risk of station blackout.)

In 10 CFR 50.150, the Commission has established the following regulatory basis for adequate protection from the potential impact of a large commercial aircraft. The requirements relevant to this discussion are the following:

- The regulation at 10 CFR 50.150(a) states that each applicant must perform a design-specific assessment of the effects on the facility of the impact of a large commercial aircraft. Using realistic analyses, the applicant must identify and incorporate design features and functional capabilities to show that, with reduced use of operator actions, (i) the reactor core remains cooled, or the containment remains intact, and (ii) spent fuel cooling or spent fuel pool integrity is maintained.

- The regulation at 10 CFR 50.150(a)(2) states that the assessment must be based on the beyond-design-basis impact of a large commercial aircraft used for long-distance flights in the United States, with the aviation fuel loading typically used in such flights, and an impact speed and angle of impact considering the ability of both experienced and inexperienced pilots to control large commercial aircraft at the low altitude representative of a nuclear power plant's low profile.

The first provision above requires the licensee or applicant to perform an assessment and identify and incorporate design features to protect the reactor core, containment, and spent fuel from the potential impact of a commercial aircraft. The licensee or applicant must show that these features protect the SSCs required to maintain core cooling or containment integrity, and to maintain spent fuel cooling or spent fuel pool integrity. The assessment required by this provision is Step A; this corresponds to the safety and hazards analyses and assessments of 10 CFR 50.34 and 10 CFR 52.79, which identify plant features that must remain reliable and available to perform their intended safety functions of maintaining core cooling or containment integrity and spent fuel cooling or spent fuel pool integrity.

In Step B, the licensee or applicant designs its protection strategy (e.g., relying on interposing structures, the design of building outer structures, the reinforcement of inner building walls for structural integrity, the use of fire-separating barriers, the fireproofing of structures, reconfiguration of the automatic fire suppression system, etc.) so that the plant can withstand beyond-design-basis impacts of commercial aircraft with the characteristics of 10 CFR 50.150(a)(2). The protection strategy, if adequately designed and incorporated, provides assurance that the required SSCs or barriers can perform the safety functions described in 10 CFR 50.150(a) with reduced use of operator actions. When the requirements for aircraft impact assessment above have been met through Steps A and B, the Commission will find that the licensee or applicant has shown reasonable assurance of adequate protection from the risk of the beyond-design-basis impact of a large commercial aircraft.

For this example, Step C would be a site-specific analysis to evaluate the potential offsite radiological consequences of a failure of the design features intended to protect against the impact of a large commercial aircraft. Such an analysis is unnecessary in this case, as it is also for the requirement of 10 CFR 73.55, because the licensee or applicant has already met the Commission standard for adequate protection of the design features required to maintain core

and spent fuel cooling or containment and spent fuel pool integrity against the beyond-design-basis impact of a large commercial aircraft.

As illustrated in the example, under the current security regulatory framework, the Commission makes a finding of adequate protection when a licensee or applicant has met the requirements of 10 CFR 73.55 to protect against threats up to and including the DBT of radiological sabotage. The proposed requirement of an additional consequence analysis has no regulatory or technical justification and is an unnecessary burden to licensees and applicants wishing to apply alternative physical security requirements in their physical protection program designs.

Potential Impact on Mission

The requirements of 10 CFR 73.55(s)(1), as proposed and implemented, will result in an unnecessarily large regulatory footprint and regulatory overreach and create an impediment to advanced reactor designers and applicants wishing to apply alternative methods or approaches to meet the requirements of 10 CFR 73.55.

This rule, if made final as indicated, will adversely affect the NRC's plan for efficiency, clarity, and reliability in accomplishing its mission, which is to license and regulate the Nation's civilian use of radioactive materials so as to provide reasonable assurance of adequate protection of public health and safety, to promote the common defense and security, and to protect the environment. Specifically, the adoption of the proposed rule and its implementation will result in the following:

- Inefficiency: The proposed regulations are not consistent with the degree of risk reduction they would achieve, as the requirements are unnecessary and would not minimize the use of resources or lead to regulatory decisions made without undue delay.

- Lack of clarity: The proposed regulations are not coherent, logical, and practical. There is no clear nexus between the proposed regulations and agency goals and objectives, whether explicitly or implicitly stated. The agency's longstanding principle of adequate protection would no longer be readily understood and easily applied.

- Absence of reliability: The proposed regulations would undermine the currently established regulations, which have been deemed reliable for maintaining acceptably low levels of risk based on the best available knowledge from research and operational experience, and considering safety and security interactions, technological uncertainties, and the diversity of licensee and regulatory activities. The proposed regulations would not be consistent with current regulations and would not contribute to regulatory stability for advanced reactors.

Proposed Alternative

The following changes to the proposed rule in 10 CFR 73.55(s)(1) would eliminate the unnecessary burden and remove regulatory impediments for an applicant or a licensee wishing to implement alternative measures:

(1) General requirements.

(i) Applicability. An applicant or licensee of a small modular reactor, as defined in § 171.5 of this chapter, or non-light-water reactor that is licensed under part 50 of this chapter or part 52 of this chapter may elect to meet one or more of the alterative security requirements in § 73.55(s)(2).

~~(ii) Eligibility. The applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter~~.

(ii~~i~~) Identification and Documentation. The applicant or licensee must identify the specific alternative physical security requirement(s) it intends to implement as part of its physical protection program and demonstrate how the performance requirements set forth in the requirements of this section are met when selected alternative(s) is used.

~~(iv) Analysis. An applicant or licensee electing to meet one or more of the alternative security requirements in § 73.55(s)(2) must provide a technical analysis demonstrating how it meets the criteria in (s)(1)(ii). The licensee must maintain the analysis until the certifications required by § 50.82(a)(1) of this chapter or § 52.110(a) of this chapter have been docketed by the NRC.~~

There are concerns about the use of “preventing significant core damage” as a performance objective for advanced reactor physical protection programs, since this objective would not encompass advanced reactors in which radiation hazards may reside outside of the reactor core in a reactor vessel. To address these concerns, the NRC should consider the following modification of 10 CFR 73.55(b)(3):

(b)(3) For a licensee holding an operating license under the provisions of part 50 of this chapter or a combined license under the provisions of part 52 of this chapter for a non-light-water reactor, other than a small modular reactor, as defined in § 171.5 of this chapter, the physical protection program must be designed to prevent significant core damage and spent fuel sabotage. For a small modular reactor licensee or a non-light-water reactor licensee licensed under part 50 of this chapter or part 52 of this chapter, the physical protection program must be designed to protect against the loss of structures, systems, components, and barriers that prevent a significant release of radionuclides from any source.

DIFFERING VIEW NO. 2

The proposed rule and its implementation set forth 25 rem as an acceptable dose limit for members of the public. They establish a consequence-based approach assuming that an offsite release of up to 25 rem would not be a consequence that endanger public health and safety.

Regulatory and Technical Basis

- ***The proposed rule redefines a dose of up to 25 rem as acceptable level of exposure for members of the public. It applies this new standard as the threshold for the staff to determine whether a given release of radiation hazards is acceptable and will not endanger the public health and safety.***

The implementation of the proposed rule requiring a site-specific analysis to evaluate offsite consequences uses the value of 25 rem TEDE over a 2-hour duration as a consequence threshold, with doses up to 25 rem to members of the public being acceptable, and doses over 25 rem not being acceptable. For an acceptable implementation of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv), a licensee or applicant wishing to demonstrate eligibility to use some or all of the alternative security measures in 10 CFR 73.55(s)(2) should develop scenarios testing its ability to uphold the site's physical security plan (e.g., to protect target set equipment or prevent an offsite release from exceeding reference doses) while employing the alternative measures. Possible scenarios to evaluate include, but are not limited to, the following:

(1) A DBT-initiated event that compromises some or all target sets and does not involve human actions to mitigate a potential radiological release. Such an event should not result in offsite doses above the reference values in 10 CFR 50.34(a)(1)(ii)(D)(1)–(2) and 10 CFR 52.79(a)(1)(vi)(A)–(B).

(2) A DBT-initiated event that compromises some or all target sets and results in core damage or causes a release of radionuclides from any source before offsite doses exceed the reference values in 10 CFR 50.34(a)(1)(ii)(D)(1)–(2) and 10 CFR 52.79(a)(1)(vi)(A)–(B). The response to such an event may involve both onsite and offsite resources to interdict the adversary force and mitigate the release.

The consequence analysis required by the proposed rule, as described for implementation above, uses a threshold of 25 rem TEDE in a 2-hour period as an acceptable dose limit for members of the public. For comparison, 25 rem is the dose limit for workers performing emergency services to save lives or protect large populations (without informed consent).

Contrary to the proposed rule, the differing view is that the 25-rem consequence threshold used in the proposed rule far exceeds the Commission's established dose limits in 10 CFR 20.1301, "Dose limits for individual members of the public," which are 2 mrem per hour and 100 mrem per year for individual members of the public, excluding dose from background radiation and medical exposure.

- ***Establishing the dose to emergency workers as acceptable for members of the public conflicts with Commission regulations.***

Currently, the dose limits for workers performing emergency services to save lives or protect large populations are (1) greater than 25 rem only on a voluntary basis, for persons informed of the risk and selected healthy individuals, preferably over the age of 45, and (2) up to 25 rem (without informed consent) when a lower dose limit is not practicable. It should be emphasized that these limits apply to emergency conditions. In addition, the dose limit associated with the protection of valuable property is up to 10 rem when a lower dose is not practicable, or by planned special exposure if time permits. For a worker recovering deceased victims, the dose limit is no more than 5 rem or by planned special exposure.

The proposed rule and implementation set forth a dose limit for members of the public that equals the current limit for workers performing emergency services. Unlike radiation workers, members of the public are not informed individuals who give consent and willingly, knowingly, and voluntarily accept the risks of radiation exposure. The implementation of the proposed rule would suggest, through guidance, that a drastically higher dose limit (12,500 mrem per hour as opposed to 2 mrem per hour) is acceptable for members of the public. This limit exceeds the 10-rem limit established for emergency workers protecting valuable property. It also exceeds other public limits. For example, in 40 CFR Part 190, “Environmental Radiation Protection Standards for Nuclear Power Operations,” the Environmental Protection Agency establishes a dose limit of 25 mrem per year as acceptable for any member of the public. This annual dose rate is thousands of times lower than the 25,000 mrem in 2 hours that the proposed guidance considers acceptable.

The dose limit of 25 rem for members of the public is not supported by current NRC regulations or by regulations outside of the agency. The differing view is that, through guidance on implementing the proposed requirements of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.5(s)(1)(iv), the staff has set forth a new Commission standard on acceptable dose limit for members of the public that equals the limit for radiation workers, namely 25 rem.

- ***The use of 25 rem as a consequence-based criterion is outside of the current regulatory framework for safety analyses, assessments, or evaluations.***

The regulations at 10 CFR 50.34(a)(1)(ii) and 10 CFR 50.34(a)(1)(ii)(D) establish the regulatory basis for using 25 rem as a reference value in the evaluation of plant design features with respect to postulated reactor accidents, in order to ensure extremely low risk of reactor accidents and low risk of public exposure to radiation. Specifically, 10 CFR 50.34(a)(1)(ii) states that the preliminary safety analysis report must include the following:

> A description and safety assessment of the site and a safety assessment of the facility. It is expected that reactors will reflect through their design, construction and operation an extremely low probability for accidents that could result in the release of significant quantities of radioactive fission products.

The areas to be covered by the safety assessments include those described in 10 CFR 50.34(a)(1)(ii)(D):

> The safety features that are to be engineered into the facility and those barriers that must be breached as a result of an accident before a release of radioactive material to the environment can occur. Special attention must be directed to plant design features intended to mitigate the radiological consequences of accidents. In performing this assessment, an applicant shall assume a fission product release[6] from the core into the containment assuming that the facility is operated at the ultimate power contemplated. The applicant shall perform an evaluation and analysis of the postulated fission product release, using the expected demonstrable containment leak rate and any fission product cleanup systems intended to mitigate the consequences of the accidents, together with applicable site characteristics, including site meteorology, to evaluate the offsite radiological consequences. Site characteristics must comply with part 100 of this chapter. The evaluation must determine that:
>
> (1) An individual located at any point on the boundary of the exclusion area for any 2 hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 rem[7] total effective dose equivalent (TEDE).
>
> (2) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE)."

Footnote 6 to these regulations clarifies the following:

> The fission product release assumed for this evaluation should be based upon a major accident, hypothesized for purposes of site analysis or postulated from considerations of possible accidental events. Such accidents have generally been assumed to result in substantial meltdown of the core with subsequent release into the containment of appreciable quantities of fission products.

Footnote 7 states the following:

> A whole body dose of 25 rem has been stated to correspond numerically to the once in a lifetime accidental or emergency dose for radiation workers which, according to NCRP recommendations at the time could be disregarded in the determination of their radiation exposure status (see NBS Handbook 69 dated June 5, 1959). However, its use is not intended to imply that this number constitutes an acceptable limit for an emergency dose to the public under accident conditions. Rather, this dose value has been set forth in this section as a reference value, which can be used in the evaluation of plant design features with respect to postulated reactor accidents, in order to assure that such designs provide assurance of low risk of public exposure to radiation, in the event of such accidents.

The implementation guidance for the analysis required by paragraphs (ii) and (iv) of the proposed rule, 10 CFR 73.55(s)(1), confirms as acceptable a consequence-based approach,

rather than a risk-based approach (i.e., one based on the product of consequence and likelihood). Current NRC regulations promote a risk-based approach, in line with the NRC's goal of being a risk-informed and performance-based regulator. In the risk-based approach, a physical protection program design could achieve high assurance of protection by ensuring that the DBT of radiological sabotage would have very low likelihood. Contrary to the established regulations and regulatory framework, the consequence-based approach using 25 rem as an acceptable consequence for public health and safety conflicts with the Commission's risk-based approach. This consequence-based approach has not been reviewed or approved by the Commission, especially not in the context of the limited-scope security rulemaking for advanced reactors.

Furthermore, under the consequence-based approach using the 25-rem threshold, since offsite release of radiation hazards up to 25 rem would constitute an acceptable dose to the public, the plant features and barriers preventing such a release would no longer be considered safety-related, and licensees would not be required to protect them accordingly. Specifically, SSCs that would be treated as safety-related under the current regulations (for licensees and applicants applying 10 CFR 50.69, these include RISC-2 SSCs, which are nonsafety-related but perform safety-significant functions, and any equipment or systems whose failure would lead to common-cause failure of RISC-1 or RISC-2 SSCs) could be reclassified as RISC-3 or RISC-4, corresponding respectively to safety-related or nonsafety-related SSCs that perform functions of low safety significance. Under the consequence-based approach of the proposed rule with a reference value of 25 rem, licensees would no longer have to protect SSCs and barriers as target set elements if their failure would result in offsite release of no more than 25 rem. The approach would no longer be risk-based or risk-informed, and would allow licensees to reduce or eliminate SSCs and barriers that would otherwise be categorized and treated as being required for assurance of low risk of public exposure to radiation. Licensees would no longer be required to protect these SSCs and barriers from the DBT of radiological sabotage.

Based on the regulatory and technical discussions above, the differing view is that the proposed rule and its implementation guidance should not assert that 25 rem is an acceptable dose limit for members of the public. This limit was established for emergency workers, and the NRC's current regulations and regulatory framework do not support its use for members of the public, nor has the Commission considered or approved it.

In addition, the use of 25 rem as an acceptance criterion in a consequence-based approach is contrary to the current regulations and the risk-based (i.e., risk-informed and performance-based) regulatory framework. It falls outside of the Commission's directions and the scope of the limited-scope rule on security for advanced reactors using alternatives in designs of physical protection programs.

Potential Impact on Mission

The adoption of this proposed rule and its implementation, which set forth a consequence-based approach with 25 rem as the acceptance criterion, will adversely affect the NRC's plan for efficiency, clarity, and reliability in accomplishing its mission, which is to license and regulate the Nation's civilian use of radioactive materials so as to provide reasonable assurance of adequate protection of public health and safety, and to promote the common defense and security, and to protect the environment. .Specifically, the adoption of the proposed rule and its implementation will result in the following:

- Inefficiency: The proposed regulations are not consistent with the degree of risk reduction they would achieve, as the consequence-based approach using 25 rem as an acceptable dose limit for members of the public is contrary to the current risk-based (risk-informed and performance-based) regulatory framework. The risk-based approach is a longstanding standard practice for reasonable assurance of protection of public health and safety. The implementation of a consequence-based approach that conflicts with or undermines the current risk-based safety and security framework would cause undue delay in regulatory decisions and could compromise the safety bases for findings of reasonable assurance of adequate protection.

- Lack of clarity: The proposed regulations are not coherent, logical, and practical. There is no clear nexus between the proposed regulations and agency goals and objectives, whether explicitly or implicitly stated. The consequence-based approach in the proposed regulations would circumvent the agency's longstanding principle of adequate protection through a risk-informed and performance-based approach, and the regulations and regulatory framework would no longer be readily understood and easily applied.

- Absence of reliability: The proposed regulations would undermine the currently established regulations, which have been deemed reliable for maintaining acceptably low levels of risk based on the best available knowledge from research and operational experience, and considering safety and security interactions, technological uncertainties, and the diversity of licensee and regulatory activities. The consequence-based criteria (with the 25-rem threshold) in the proposed regulations would not result in prompt, fair, and decisive administration and would not contribute to regulatory stability for advanced reactors.

Proposed Alternative

The following changes to the proposed rule in 10 CFR 73.55(s)(1) would eliminate the use of the consequence-based approach and the 25-rem acceptance criterion and would thus resolve the differing view:

> (1) General requirements.
> (i) Applicability. An applicant or licensee of a small modular reactor, as defined in § 171.5 of this chapter, or non-light-water reactor that is licensed under part 50 of this chapter or part 52 of this chapter may elect to meet one or more of the alterative security requirements in § 73.55(s)(2).
>
> ~~(ii) Eligibility. The applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter~~.
>
> (ii~~i~~) Identification and Documentation. The applicant or licensee must identify the specific alternative physical security requirement(s) it intends to implement as part of its physical protection program and demonstrate how the performance requirements set forth in the requirements of this section are met when selected alternative(s) is used.

~~(iv) Analysis. An applicant or licensee electing to meet one or more of the alternative security requirements in § 73.55(s)(2) must provide a technical analysis demonstrating how it meets the criteria in (s)(1)(ii). The licensee must maintain the analysis until the certifications required by § 50.82(a)(1) of this chapter or § 52.110(a) of this chapter have been docketed by the NRC.~~

There are concerns about the use of “preventing significant core damage” as a performance objective for advanced reactor physical protection programs, since this objective would not encompass advanced reactors in which radiation hazards may reside outside of the reactor core in a reactor vessel. To address these concerns, the NRC should consider the following modification of 10 CFR 73.55(b)(3):

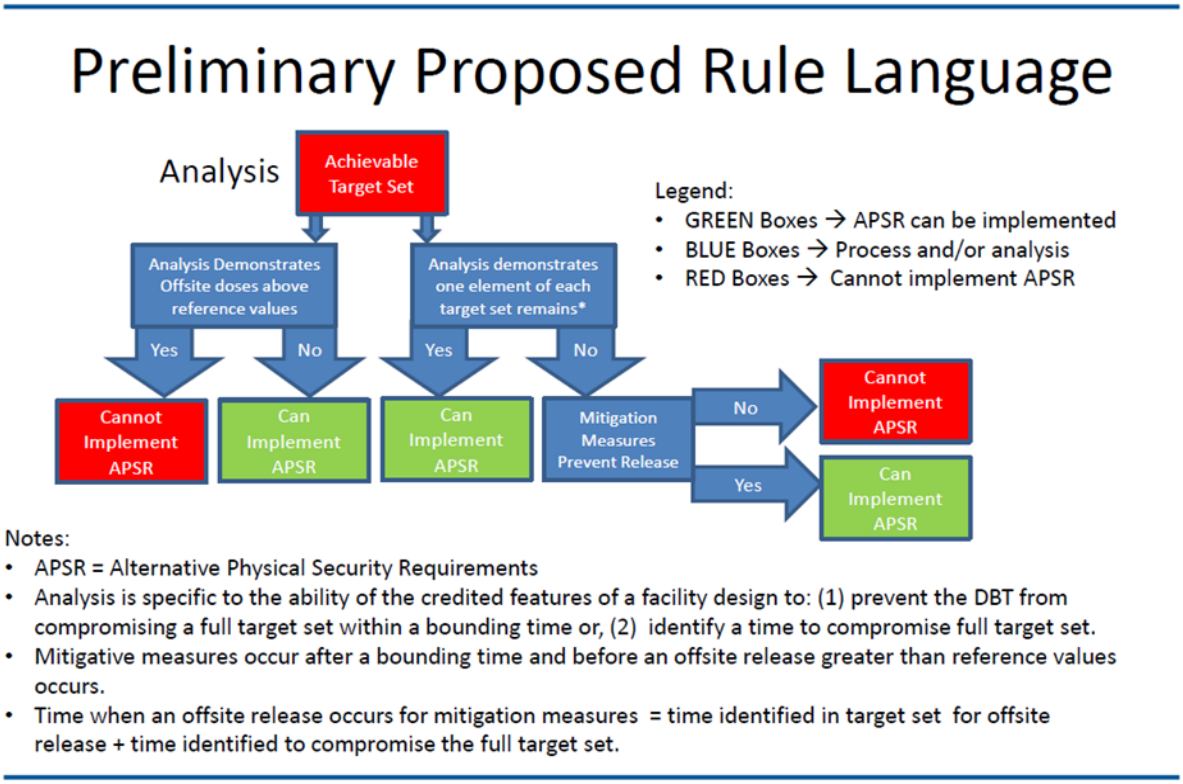
(b)(3) For a licensee holding an operating license under the provisions of part 50 of this chapter or a combined license under the provisions of part 52 of this chapter for a light light-water reactor, other than a small modular reactor, as defined in § 171.5 of this chapter, the physical protection program must be designed to prevent significant core damage and spent fuel sabotage. For a small modular reactor licensee or a non-light-water reactor licensee licensed under part 50 of this chapter or part 52 of this chapter, the physical protection program must be designed to protect against the loss of structures, systems, components, and barriers that prevent a significant release of radionuclides from any source.

DIFFERING VIEW NO. 3a

The implementation of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) is contrary to the Commission's expectation, established in the Policy Statement on the Regulation of Advanced Reactors (Volume 73 of the *Federal Register*, page 60612; October 14, 2008), that advanced reactor designs should include reduced reliance on human actions.

Technical Basis

The acceptable implementation of the proposed rule requires that an analysis be performed to evaluate potential offsite consequences based on a consequence threshold of 25 rem, including additional analyses of security-initiated (i.e., DBT-initiated) scenarios, as illustrated below.



As stated earlier, this illustration was presented during public meetings on October 19, 2021, and January 20, 2022. It shows how the implementation of the proposed rule would allow for a licensee or applicant, through analysis performed under the proposed rule, to substitute mitigation measures relying on human actions for plant features, SSCs, and barriers identified through safety analyses, assessments, and evaluations in the safety and design bases. For example, under the proposed rule, the SSCs and barriers maintaining core cooling or containment integrity and spent fuel cooling or spent fuel pool integrity may be eliminated if analysis shows that mitigation measures can prevent any release resulting in a dose above 25 rem.

In addition, the illustration shows how the proposed rule undermines the current safety and security regulatory framework by allowing a licensee or applicant to downgrade the categorization, and the associated treatment, of SSCs and barriers based on 10 CFR 50.69. That is, under the proposed rule, a licensee or applicant may show that with mitigation measures, the failure of certain SSCs and barriers that are currently classified as RISC-1 or RISC-2 (or whose failure would lead to common-cause failure of RISC-1 or RISC-2 SSCs) would result in offsite release of no more than 25 rem. The licensee could then reclassify these SSCs and barriers as RISC-3 or RISC-4 or eliminate them altogether, considering them unnecessary for ensuring low risk of offsite release, although they are considered necessary under current design requirements for safety.

In relation to the safety/security interface, the implementation of the proposed rule allows the licensee or applicant to use a consequence analysis, based on consequences mitigated by reliance on human actions, to justify reducing the plant security posture, eliminating the protection of SSCs and barriers that otherwise would have been identified as target set equipment and protected by the design of the physical protection program. It should be noted that mitigation measures would be applied within a defense-in-depth strategy, to provide sufficient margin in safety and security designs to account for the uncertainties in the risk of public exposure to radiation resulting from design-basis accidents and beyond-design-basis events (e.g., aircraft impacts, Fukushima Dai-ichi event, and the DBT of radiological sabotage).

The following discussion uses the previous example of aircraft impact assessment to illustrate how the proposed rule may be implemented. Mitigation measures for potential consequences of an aircraft impact are required by 10 CFR 50.54(hh)(1), which states, in part, the following:

> Each licensee shall develop, implement, and maintain procedures that describe how the licensee will address the following areas if the licensee is notified of a potential aircraft threat:
>
> (iii) Contacting all onsite personnel and applicable offsite response organizations.
>
> (iv) Onsite actions necessary to enhance the capability of the facility to mitigate the consequences of an aircraft impact.
>
> (vi) Dispersal of equipment and personnel, as well as rapid entry into site protected areas for essential onsite personnel and offsite responders who are necessary to mitigate the event; and
>
> (vii) Recall of site personnel.

If the licensee or applicant has procedures to address the onsite actions necessary to enhance the capability of the facility to mitigate the consequences, dispersal of equipment and personnel and the recall of site personnel, as specified in 10 CFR 50.54(hh)(1), then under the proposed rule, human actions may be substituted for protection against potential offsite consequences, based on consequence analysis using the 25-rem criterion. With respect to security, the design of the physical protection program may be based on mitigation measures established to satisfy 10 CFR 50.54(hh)(1), without the design features, SSCs, or barriers identified as necessary through safety analysis, assessments, and evaluations. The level of safety for advanced reactors licensed under this framework would not equal that of currently licensed reactors,

which rely on design features, engineered SSCs, and barriers, together with planning and contingencies for mitigation measures, to reduce risk and establish defense in depth.

The Commission's 2008 Policy Statement on the Regulation of Advanced Reactors states the following:

> Regarding advanced reactors, the Commission expects, as a minimum, at least the same degree of protection of the environment and public health and safety and the common defense and security that is required for current generation light-water reactors (LWRs). Furthermore, the Commission expects that advanced reactors will provide enhanced margins of safety and/or use simplified, inherent, passive, or other innovative means to accomplish their safety and security functions.

Among the attributes that the Commission recommends for consideration in advanced reactor designs are the following:

- Designs that minimize the potential for severe accidents and their consequences by providing sufficient inherent safety, reliability, redundancy, diversity, and independence in safety systems, with an emphasis on minimizing the potential for accidents over minimizing the consequences of such accidents….

- Designs that incorporate the defense-in-depth philosophy by maintaining multiple barriers against radiation release, and by reducing the potential for, and consequences of, severe accidents….

- Designs that include considerations for safety and security requirements together in the design process such that security issues (e.g., newly identified threats of terrorist attacks) can be effectively resolved through facility design and engineered security features, and formulation of mitigation measures, with reduced reliance on human actions.

The Commission also expects that "the safety features of these advanced reactor designs will be complemented by the operational program for Emergency Planning."

It is recognized that neither the Commission's policy statements nor staff-developed regulatory guides constitute regulatory requirements. Licensees and applicants are not obligated to adhere, in full or in part, to Commission policy statements or Commission-issued regulatory guides. They may choose to apply the staff guidance from a regulatory guide in full or in part, as they see fit, or to modify it, or to use other methods than described.

In particular, licensees and applicants are not legally obligated to comply with the guidance in DG-5071, "Target Set Identification and Development for Nuclear Power Reactors," or in DG-5072, "Guidance for Alternative Physical Security Requirements for Non-Light-Water Reactors and Small Modular Reactors." Neither the language nor the regulatory history of 10 CFR 73.55(f), on target sets, compels the interpretation that a licensee or applicant must conform to the guidance in DG-5071 and DG-5072, or to apply the guidance in one before or in consideration of applying the other, to perform the analysis required by the proposed rule in 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv).

Contrary to the expectations in the Commission's policy statement, the staff position on an acceptable method for the analysis required by the proposed rule provides for reliance on human actions to perform mitigation measures that would allow licensees and applicants to eliminate design features, SSCs, and barriers identified as necessary in the safety analysis, or to downgrade their risk categorization and treatment. As discussed above, this reduces both safety and security and compromises defense in depth. It also contravenes the Commission's expectation that safety features of advanced reactor designs will be complemented by emergency preparedness planning and response; it allows for safety features and SSCs instead to be replaced by mitigation measures.

In summary, the proposed rule allows licensees and applicants to rely on human actions in place of designed and engineered safety features. This is contrary to the Commission's expectation that advanced reactor designs should emphasize safety and security through design and engineering features, complemented by mitigation measures, with reduced reliance on human actions. The proposed rule allows licensees and applicants to eliminate the physical protection of design features, SSCs, and barriers that would otherwise be protected from the DBT of radiological sabotage. The differing view is that the proposed rule, through the analysis described in its implementation, should not allow licensees and applicants to rely on mitigation measures (human actions) for safety, because this would conflict with the Commission's expectations in the Policy Statement on the Regulation of Advanced Reactors.

Potential Impact on Mission

The proposed rule and its implementation, by allowing for reliance on mitigation measures (human actions), will affect the effectiveness of the NRC's licensing and regulations in providing reasonable assurance of adequate protection of public health and safety. Specifically, the adoption of the proposed rule and its implementation will result in the following:

- Inefficiency: The proposed regulations are not consistent with the degree of risk reduction they would achieve, as their implementation would allow for mitigation measures (human actions) to replace adequate physical protection of safety-related design features, SSCs, and barriers for preventing an offsite radiological release. This is contrary to safety requirements and to the risk-based approach of the current regulatory framework. It would reduce the security measures protecting against the DBT of radiological sabotage for advanced reactors, which would cause undue delay in regulatory decisions and potentially undo the current safety licensing basis for findings of reasonable assurance of protection.

- Lack of clarity: The proposed regulations are not coherent, logical, and practical. There is no clear nexus between the proposed regulations and agency goals and objectives, whether explicitly or implicitly stated. The consequence-based approach and reliance on mitigation measures in the proposed regulations undermine the agency's longstanding position of using a risk-based approach to apply established requirements for adequate protection. The regulations and regulatory framework would no longer be readily understood and easily applied.

- Absence of reliability: The proposed regulations would undermine the currently established regulations, which have been deemed reliable for maintaining acceptably

low levels of risk based on the best available knowledge from research and operational experience, and considering safety and security interactions, technological uncertainties, and the diversity of licensee and regulatory activities. The implementation of mitigation measures relying on human actions, rather than on design features, SSCs, and barriers, would not be consistent with current regulations and would not lead to prompt, fair, and decisive administration contributing to regulatory stability for advanced reactors.

Proposed Alternative

Paragraphs (ii) and (iv) of the proposed rule in 10 CFR 73.55(s)(1) should be removed to eliminate the requirement to perform an analysis to evaluate potential offsite consequences. In the current security framework of 10 CFR 73.55, the design of the physical protection program is aimed at protecting the design features, SSCs, and barriers that have been determined, through a safety analysis, to be necessary for assurance of adequate safety. The suggested change removes the proposed requirement that would allow licensees and applicants to circumvent the current safety and security requirements. It also removes the reliance on human actions implied by the implementation of the proposed rule, which is contrary to the Commission's Policy Statement on the Regulation of Advanced Reactors. The suggested change is to remove paragraphs (ii) and (iv) from the proposed rule text of 10 CFR 73.55(s)(1):

~~(ii) Eligibility. The applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter.~~

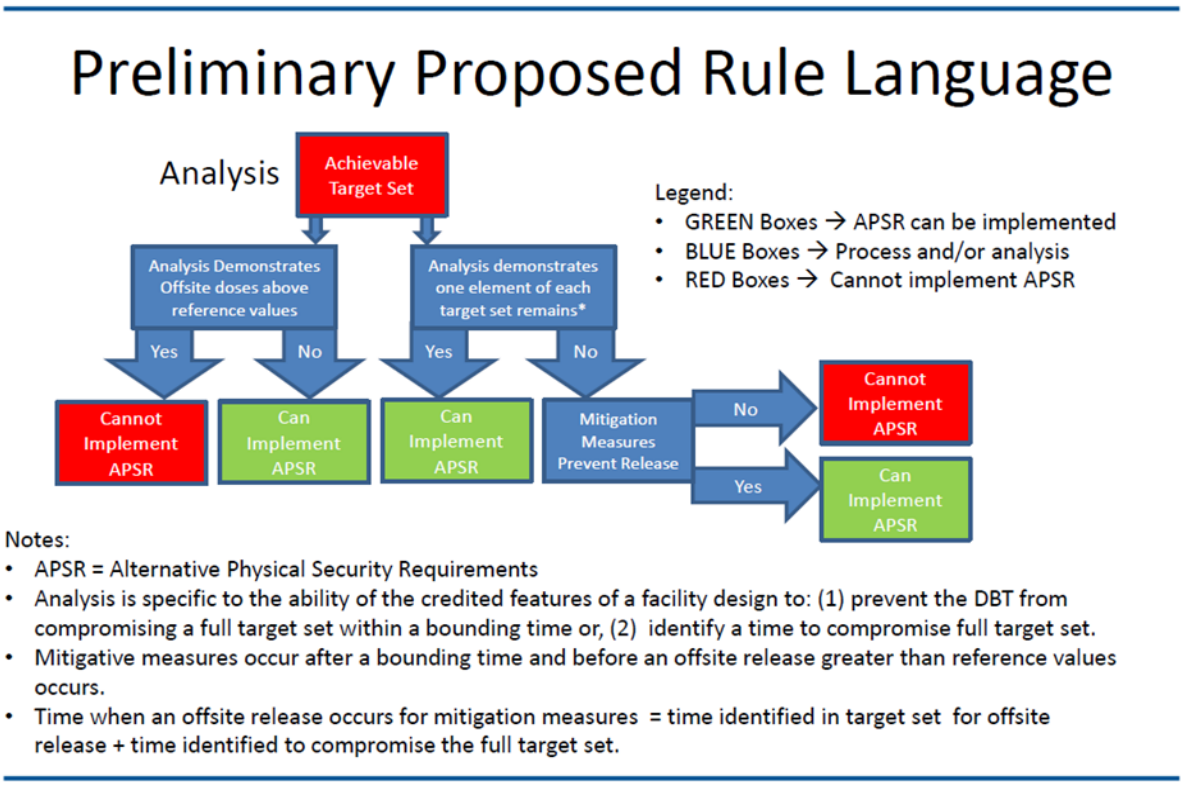
~~(iv) Analysis. An applicant or licensee electing to meet one or more of the alternative security requirements in § 73.55(s)(2) must provide a technical analysis demonstrating how it meets the criteria in (s)(1)(ii). The licensee must maintain the analysis until the certifications required by § 50.82(a)(1) of this chapter or § 52.110(a) of this chapter have been docketed by the NRC~~.

DIFFERING VIEW NO. 3b

The proposed rule, at 10 CFR 73.55(s)(1)(ii) and (iv), introduces a more specific requirement for consequence analysis in 10 CFR 73.55 and provides a regulatory pathway for circumventing requirements established in the current safety and security framework for power reactors.

Regulatory Basis

The acceptable implementation of the proposed rule requires that an analysis be performed to evaluate potential offsite consequences based on a consequence threshold of 25 rem, including additional analyses of security-initiated (i.e., DBT-initiated) scenarios, as illustrated below.



As previously stated, the illustration above, presented during public meetings on October 19, 2021, and January 20, 2022, captures a method that the staff finds acceptable for performing the analysis required under the proposed provisions of paragraphs (ii) and (iv) of 10 CFR 73.55(s)(1). The implementation guidance for the proposed rule appears in DG-5071 and DG-5072.

The proposed rule, in 10 CFR 73.55(s)(1)(ii) and (iv), gives more specific requirements for analysis of potential offsite consequences. It provides a regulatory pathway for circumventing the regulatory requirements established in the current framework for the safety of nuclear power reactors, such as the provisions of 10 CFR 50.34(a)(1)(ii)(D) for analysis, assessment, and evaluation of offsite consequences. The more specific provisions of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) would control over the more general provisions of 10 CFR 50.34(a)(1)(ii)(D) for analysis of potential offsite consequences. The provisions of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) on analysis of offsite consequences are narrower in scope than the provisions in 10 CFR Parts 50, 52, and 100 (e.g., in 10 CFR 50.34, 10 CFR 50.69, 10 CFR 52.79, and 10 CFR 100.11, “Determination of exclusion area, low population zone, and population center distance”).

The example below, on specific exemptions, illustrates how a more specific provision would control over a more general provision. The regulations in 10 CFR 50.12, “Specific exemptions,” state the following:

> (a) The Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of the regulations of this part, which are—
>
> (1) Authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security.
>
> (2) The Commission will not consider granting an exemption unless special circumstances are present. Special circumstances are present whenever—
>
> (i) Application of the regulation in the particular circumstances conflicts with other rules or requirements of the Commission; or
>
> (ii) Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule; or
>
> (iii) Compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated; or
>
> (iv) The exemption would result in benefit to the public health and safety that compensates for any decrease in safety that may result from the grant of the exemption; or
>
> (v) The exemption would provide only temporary relief from the applicable regulation and the licensee or applicant has made good faith efforts to comply with the regulation; or
>
> (vi) There is present any other material circumstance not considered when the regulation was adopted for which it would be in the public interest to grant an exemption. If such condition is relied on exclusively for satisfying paragraph (a)(2) of this section, the exemption may not be granted until the Executive Director for Operations has consulted with the Commission.

The regulations in 10 CFR 52.7, “Specific exemptions,” state the following:

> The Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of the regulations of this part. The Commission’s consideration will be governed by § 50.12 of this chapter, unless other criteria are provided for in this part, in which case the Commission’s consideration will be governed by the criteria in this part. Only if those criteria are not met will the Commission’s considerations be governed by § 50.12 of this chapter. The Commission’s consideration of requests for exemptions from requirements of the regulations of other parts in this chapter, which are applicable by virtue of this part, shall be governed by the exemption requirements of those parts.

The regulations in 10 CFR 73.5 state the following:

> The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security, and are otherwise in the public interest.

The regulations in 10 CFR 73.5 address specific exemptions to the requirements of 10 CFR Part 73. The regulations in 10 CFR 50.12 and 10 CFR 52.7 set forth the criteria by which the Commission may grant exemptions to the requirements of 10 CFR Part 50 and 10 CFR Part 52, respectively.

The more specific provision in 10 CFR 73.5 is controlling over the more general provisions in 10 CFR 50.12 and 10 CFR 52.7. The criteria for approval of exemptions under 10 CFR 73.5 are specific to security objectives and are narrower in scope than the general exemption criteria in 10 CFR 50.12 and 10 CFR 52.7. In the last quarter of 2020, the Commission granted the requests of currently operating power reactor licensees to follow the provisions of 10 CFR 73.5 over those of 10 CFR 50.12; this demonstrates that the more specific requirement, in this case that of 10 CFR 73.5, is controlling.

With respect to the proposed rule, this means that a licensee or applicant would have to perform the analyses of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) in lieu of the analyses, assessments, and evaluations of potential offsite consequences required under the general provisions. A licensee or applicant could no longer rely on the latter (e.g., on 10 CFR 50.34(a)(1)(ii)(D)) or on the results of analyses that did not cover security-initiated (i.e., DBT-initiated) events beyond those required in the current regulatory framework for safety. Licensees and applicants would no longer be obligated to meet both the general and the specific provisions for analysis of potential offsite consequences; through the specific provisions of 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv), they could consider and incorporate mitigation measures (human actions) to achieve protection of advanced reactors. The differing view is that the proposed rule would control over the more general provisions on analysis of potential offsite consequences (e.g., 10 CFR Parts 50, 52, and 100), thus permitting a licensee or applicant to circumvent the regulatory requirements in the current framework for safety and security for power reactors.

Potential Impact on Mission

This proposed rule, incorporating specific provisions in 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) that would be controlling over more general provisions for analysis of potential offsite consequences, will affect the effectiveness of the NRC's licensing and regulations in providing reasonable assurance of adequate protection of public health and safety. Specifically, adoption of the proposed rule will result in the following:

- Inefficiency: The proposed regulations are inconsistent with the degree of risk reduction they achieve, as their implementation would allow for mitigation measures (human actions) to replace adequate physical protection of safety-related design features, SSCs and barriers for preventing an offsite radiological release. The method proposed as acceptable under 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) would circumvent the safety requirements and the risk-based approach of the current regulatory framework. It would also reduce security, causing undue delay in regulatory decisions

and potentially undoing the current safety licensing basis for findings of reasonable assurance of adequate protection.

- Lack of clarity: The proposed regulations are not coherent, logical, and practical. There is no clear nexus between the proposed regulations and agency goals and objectives, whether explicitly or implicitly stated. The proposed security requirements in 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv), which are based on a consequence analysis allowing reliance on human actions for mitigation, would be controlling over the more general requirements elsewhere in the NRC's regulations, and would therefore undermine the agency's longstanding principle of adequate protection through a risk-based approach. The regulations and regulatory framework would no longer be readily understood and easily applied.

- Absence of reliability: The proposed regulations would undermine the currently established regulations, which have been deemed reliable for maintaining acceptably low levels of risk based on the best available knowledge from research and operational experience, and considering safety and security interactions, technological uncertainties, and the diversity of licensee and regulatory activities. The implementation of the proposed requirements would be inconsistent with current regulations and would allow a licensee or applicant to circumvent current safety requirements. It would not lead to prompt, fair, and decisive administration or contribute to regulatory stability for advanced reactors.

Proposed Alternative

The NRC should remove 10 CFR 73.55(s)(1)(ii) and 10 CFR 73.55(s)(1)(iv) in the proposed rule to eliminate the requirement to perform an analysis to evaluate potential offsite consequences. This will ensure that there is no specific provision for such analysis that would be controlling over the general provisions elsewhere in the regulations for analysis, assessments, and evaluations of potential offsite consequences. In the current security framework of 10 CFR 73.55, the design of the physical protection program is aimed at protecting the design features, SSCs, and barriers that have been determined to be necessary for assurance of adequate safety. The suggested change removes the provisions that would allow licensees and applicants to circumvent the current requirements for analysis, assessments, and evaluations for safety and security. The suggested change is to remove the proposed requirements in 10 CFR 73.55(s)(1)(ii) and (iv):

~~(ii) Eligibility. The applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter.~~

~~(iv) Analysis. An applicant or licensee electing to meet one or more of the alternative security requirements in § 73.55(s)(2) must provide a technical analysis demonstrating how it meets the criteria in (s)(1)(ii). The licensee must maintain the analysis until the certifications required by § 50.82(a)(1) of this chapter or § 52.110(a) of this chapter have been docketed by the NRC~~.

Attachment 2

SECY-22-XXXX (dated 04-13-2022) states in part the following response to Enclosure (4), Differing View, :

Differing Views under Enclosure 4

An NSIR staff member provided differing views on the proposed rule (Enclosure 4). The staff member's differing views arise from the proposed provisions within 10 CFR 73.55(s)(1)(ii), "Eligibility," where "[t]he applicant or licensee must demonstrate that the consequences of a postulated radiological release that results from a postulated security-initiated event do not exceed the offsite dose reference values defined in §§ 50.34 and 52.79 of this chapter" and 10 CFR 73.55(s)(1)(iv), Analysis, where "[a]n applicant or licensee electing to meet one or more of the alternative security requirements in § 73.55(s)(2) must provide a technical analysis demonstrating how it meets the criteria in (s)(1)(ii)." The differing views are characterized in the following problem statements:

- The proposed rule imposes unnecessary regulatory burden, which would be an avoidable impediment to a licensee or applicant that wants to apply the proposed alternative physical security requirement(s) in the design of their physical protection to meet the requirements of 10 CFR 73.55.

- The proposed rule redefines a dose of up to 25 rem as an acceptable level of exposure for members of the public and sets forth that this new standard for the release of radiation hazards is acceptable and will not endanger the public health and safety.

- The proposed rule and implementation of 10 CFR 73.55(s)(1)(ii) and (s)(1)(iv) allows for relying on human actions in lieu of plant design features, SSCs and barriers. This would not meet the Commission's expectations in the 2008 Policy Statement on Regulation of Advanced Reactors to reduce reliance on human actions.

- The proposed rule, more specifically the requirement in 10 CFR 73.55, provides a regulatory pathway for circumventing regulatory requirements established in the current framework for safety and security.

Enclosure 4 describes the details of these differing views. These views have been presented to the steering committee for this rulemaking. **The staff appreciates these differing views being raised but did not incorporate the views into the proposed rule for the reasons discussed below.**

The staff does not think that these differing views accurately characterize the proposed rule's requirements, including the eligibility criterion, the associated analysis, and the implementation of the voluntary alternative measures found in 10 CFR 73.55(s)(2). The staff does not agree that if implemented, the proposed rule would impose unnecessary regulatory burden, circumvent existing regulatory requirements or the current regulatory

framework for safety and security, or rely on human action instead of plant design for mitigation measures. One of the differing views in Enclosure 4 states the analysis required by 10 CFR 73.55(s)(1)(iv), imposes unnecessary regulatory burden on a licensee or applicant that wants to apply the proposed alternative physical security requirement(s) in the design of its physical protection program. The view is largely based on a comparison of the proposed rule to the process an applicant could use under the existing requirements in 10 CFR 73.55(r), "Alternative measures," to propose alternatives to existing requirements in 10 CFR 73.55. The requirement in the proposed rule to determine eligibility to use the alternative physical security requirements (10 CFR 73.55(s)(1)(ii)) is consistent with the rulemaking plan approved by the Commission to "permit future applicants and licensees to demonstrate their safety case and technical basis to meet alternative requirements for a risk-informed, performance-based approach for designated portions of the physical security program." The staff noted in SECY-18-0076 that an important part of the rulemaking would "involve developing performance criteria for applying alternative physical security requirements that are associated with attributes of reactor designs (e.g., potential accident consequences and timelines)." The staff further noted that doing so in a limited-scope rulemaking would "promote regulatory stability, predictability, and clarity" and "eliminate the need for future applicants to propose alternatives or request exemptions from physical security requirements."

The proposed rule was developed in a manner consistent with the rulemaking plan and the Commission's direction in SRM-SECY-18-0076. Accordingly, the limited-scope rulemaking would retain the current overall physical security framework and align with the current process for large light-water reactors in developing physical protection systems. In other words, applicants or licensees will identify the minimum combination of equipment, operator actions, and/or structures that, if all are prevented from performing their intended safety function or prevented from being accomplished, barring extraordinary actions by plant operators, would likely result in a significant release of radionuclides. This is the same approach that large light-water reactors use today (except they use significant core damage as a surrogate for protecting against release of radionuclides). If the process under the proposed rule identifies targets sets that can be compromised by a DBT adversary, an analysis is conducted to verify that there will be no offsite release above the dose reference values. This process would look at several factors and would allow crediting inherent or engineered features and provide a method to identify credible operator actions and credit offsite support.

Once an applicant or licensee demonstrates, through analysis, that they are eligible to use the alternative security measures found in 10 CFR 73.55(s)(2), they would follow the existing process described in current NRC guidance documents related to the content of license applications. They would describe in their security plans (i.e., Physical Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, or Cyber Security Plan, as applicable) how they intend to implement alternative physical security requirement(s), and how implementation of the alternative(s) will enable the applicant or licensee to satisfy the relevant requirements in 10 CFR 73.55. These plans must address

how each alternative is applied and integrated with other requirements in 10 CFR 73.55 for the design of a physical protection program that meets the performance objective and requirements of 10 CFR 73.55(b).

The staff is proposing to use the dose reference values from 10 CFR 50.34(a)(1)(ii)(D) and 10 CFR 52.79(a)(1)(vi) as a means for applicants and licensees to demonstrate eligibility under 10 CFR 73.55(s)(1)(ii) to use the alternative physical security requirements The dose reference values are part of the overall power reactor siting and design evaluations intended to ensure a low risk of public exposure to radiation. The technical basis for the use of the dose reference values is well documented. The dose reference values would be used in a similar manner under the proposed rule. The dose reference values are not a new dose limit or an acceptable limit for an emergency dose to the public under accident conditions. Applicant or licensee assessments used to demonstrate meeting the proposed rule's eligibility criterion include the evaluation of plant design features with respect to postulated reactor accidents, regardless of whether they are safety or security initiated. Such evaluations are meant to provide assurance that designs being evaluated represent a low risk of public exposure to radiation in the event of such accidents. As previously stated by the Commission, these dose calculations should not be taken too literally with regard to the actions of a real individual, but rather are intended primarily as a means to evaluate the effectiveness of the plant design and site characteristics in mitigating postulated accidents. Similarly, the goal of the analysis in this proposed rule is to assess the effectiveness of the design to withstand postulated security events. Nothing in this rule would change the requirements in 10 CFR Part 20, "Standards for Protection Against Radiation," that would apply to advanced reactor licensees.