Rulemaking: Alternative Physical Security Requirements for Advanced Reactors

Public Meeting

January 20, 2022

Agenda

- Welcome/ Opening Remarks
- Preliminary Proposed Rule Language
- Draft Guidance – key elements
- Next Steps and Schedule

Background

Rulemaking

- NRC is currently developing *Alternative Physical Security Requirements for Advanced Reactors* – proposed rule

- More information about this rulemaking and its supporting guidance can be found:
  - www.regulations.gov under docket ID: NRC-2017-0227

Supporting Guidance

- The NRC staff is developing DG-1365 (now DG-5072) which focuses on the physical security alternatives.
- The NRC staff is developing DG-5071 (Revision 2 to RG 5.81) which focuses on target sets.

Preliminary Proposed Rule Language

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Preliminary Proposed Rule Language

DECEMBER 2021:

Latest preliminary proposed rule language released for public awareness

ADAMS Accession No.: **ML21336A004**

NOTE: The NRC is making this preliminary proposed rule language available to the public solely for the purpose of providing information to the public and to provide preparatory material for upcoming public meetings. The release of the preliminary proposed rule language will facilitate discussions at upcoming public meetings. This language does not represent a final NRC staff position, nor has it been reviewed by the Commission. Therefore, the preliminary proposed rule language may undergo significant revision during the rulemaking process.

Preliminary Proposed Rule Language

FOCUS AREAS:

- 73.55(b)(3) – to address performance requirements
- 73.55(s) – new section on alternative physical security requirements
  - 73.55(s)(1) – general requirements including applicability and performance requirement
  - 73.55(s)(2) – specific alternatives

Preliminary Proposed Rule Language

10 CFR 73.55(b)(3)

- Utilizes technology-inclusive alternative to significant core damage and spent fuel sabotage for advanced reactors (non-light water reactors and small modular reactors):
- "**prevent a significant release of radionuclides from any source**"
- Retains "prevent significant core damage and spent fuel sabotage" for large light water reactors

Preliminary Proposed Rule Language

10 CFR 73.55(s)(1)

Previously proposed Eligibility Criteria have been replaced by a single applicability statement

- (s) *Alternative physical security requirements.*
  (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 one or more of the specific alternative physical security requirements in § 73.55(s)(2) provided that the applicant or licensee meets the requirements in § 73.55(s)(1)(ii) and (iii).

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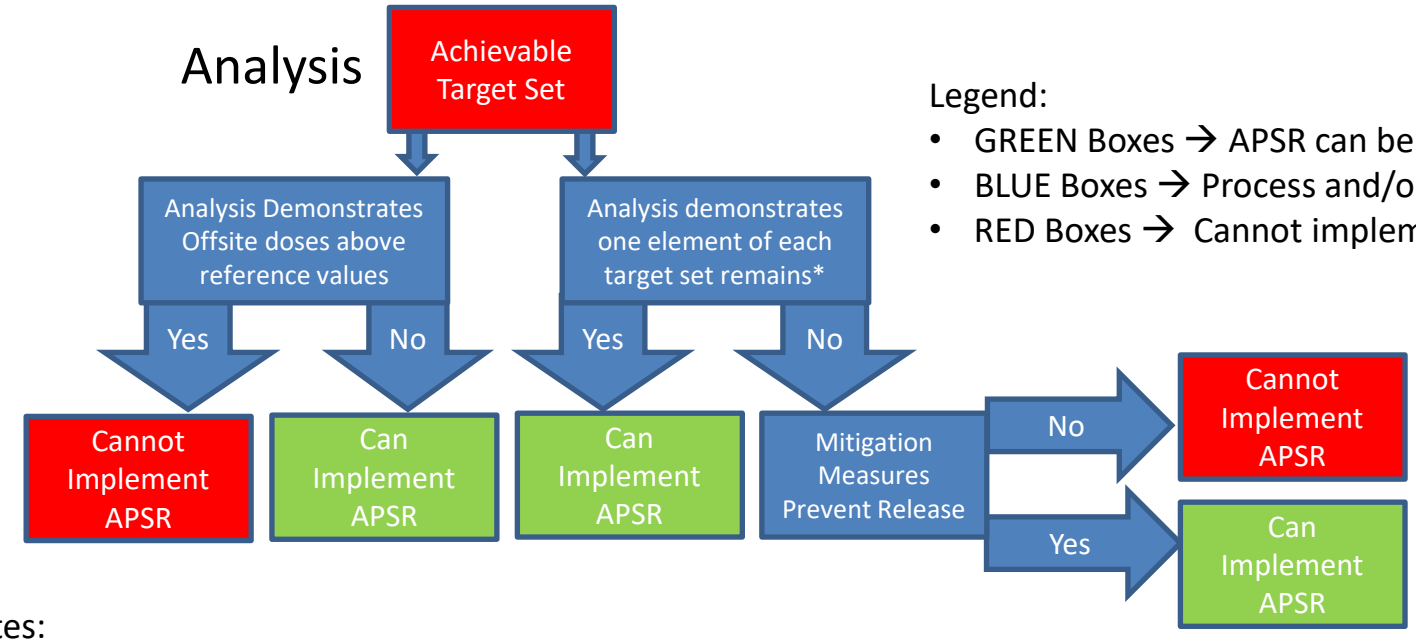
Preliminary Proposed Rule Language

10 CFR 73.55(s)(1)

(ii) ***Identification.*** The applicant or licensee must identify the specific alternative physical security requirement(s) it intends to implement as part of its physical protection program.

(iii) ***Analysis.*** The applicant or licensee must perform a site-specific analysis to evaluate the potential offsite radiological consequences and demonstrate how the performance requirements set forth in § 73.55(b)(3) are met when selected alternatives are used. 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.

Preliminary Proposed Rule Language



Legend:

- GREEN Boxes → APSR can be implemented
- BLUE Boxes → Process and/or analysis
- RED Boxes → Cannot implement APSR

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.

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Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)

- Five proposed specific alternative physical security requirements:
  1. eliminating the requirement for a minimum number of onsite armed responders
  2. eliminating all the requirements for any onsite armed responders assigned to interdict and neutralize the DBT in cases where reliance on offsite law enforcement or other offsite responders to fulfill the interdiction and neutralization capabilities is sufficient
  3. allowing alternative means for accomplishing delay other than with physical barriers
  4. allowing the secondary alarm station to be located offsite
  5. allowing the secondary alarm station to no longer be considered a vital area

Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(i)

(i) ***Alternative requirement for armed responders.*** A licensee that meets § 73.55(s)(1)(i) is relieved from the requirement for the minimum number of armed responders in § 73.55(k)(5)(ii).

Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(ii)

(ii) ***Alternative requirements for interdiction and neutralization*.** A licensee that meets § 73.55(s)(1)(i) and has no armed response personnel onsite whose primary duty is to respond to, interdict, and neutralize acts of radiological sabotage:

(A) May rely on law enforcement or other offsite responders to fulfill the interdiction and neutralization functions required by § 73.55(b)(3)(i).

(*1*) The licensee must maintain the capability to detect and assess threats required by § 73.55(b)(3)(i).

(*2*) The licensee must provide adequate delay to enable law enforcement or other offsite responders to fulfill the interdiction and neutralization functions for threats up to and including the DBT of radiological sabotage.

Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(ii)

(*3*) The licensee must provide necessary information about the facility and make available periodic training to law enforcement or other offsite responders to fulfill the interdiction and neutralization functions for threats up to and including the DBT of radiological sabotage.

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Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(ii)

(*4*) The licensee must fully describe in the safeguards contingency plan the role that law enforcement or other offsite responders will play in the licensee's protective strategy when relied upon to fulfill the interdiction and neutralization capabilities required by § 73.55(b)(3)(i). The description must provide sufficient detail to enable the NRC to determine that the licensee's physical protection program provides high assurance of protection against threats up to and including the DBT of radiological sabotage.

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Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(ii)

(*5*) The licensee must identify criteria and measures to compensate for the degradation or absence of law enforcement or other offsite responders and propose suitable compensatory measures that meet the requirements of § 73.55(o)(2) and (3) to address this degradation.

Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(ii)

(B) Is relieved from:

(*1*) Applying the requirements in § 73.55(k)(3) through (7) and the requirement in § 73.55(k)(8)(ii) to law enforcement responders.

(*2*) The training and qualification requirements related to armed response personnel in 10 CFR Part 73, Appendix B, Section VI, for law enforcement responders, except for the performance evaluation program requirements related to armed response personnel in 10 CFR Part 73, Appendix B, Section VI.C.3, which the licensee shall continue to satisfy for all armed response personnel, including law enforcement.

(*3*) The requirement in 10 CFR Part 73, Appendix C, Section II.B.3.c.(iv) related to armed responders.

Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(iii)

(iii) ***Alternative requirements for physical barriers.*** A licensee that meets § 73.55(s)(1)(i) may utilize means other than physical barriers and barrier systems to satisfy the physical protection program design requirements of § 73.55(e). Acceptable means can be any method(s) that accomplishes the delay and access control functions necessary to allow the licensee to implement its physical protection program.

Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(iv)

(iv) ***Alternative requirements for onsite secondary alarm stations.*** A licensee that meets § 73.55(s)(1)(i):

(A) May have one alarm station located offsite notwithstanding the requirement in § 73.55(i)(2) to have at least two alarm stations located onsite. The central alarm station must remain onsite.

(B) With a secondary alarm station located offsite, is relieved from the requirement in § 73.55(i)(4)(iii) to construct, locate, and protect the offsite alarm station to the standards for the central alarm station. The licensee is not relieved from the requirement in § 73.55(i)(4)(iii) that both alarm stations shall be equipped and redundant, such that all functions needed to satisfy the requirements of § 73.55(i)(4) can be performed in both alarm stations.

Preliminary Proposed Rule Language

10 CFR 73.55(s)(2)(v)

(v) ***Alternative requirements for vital areas.*** A licensee that meets § 73.55(s)(1)(i):

(A) Is relieved from the requirement in § 73.55(e)(9)(v)(D) to designate an offsite secondary alarm station as a vital area.

(B) Is relieved from the requirement in § 73.55(e)(9)(vi) to locate the secondary power supply systems for an offsite secondary alarm station in a vital area.

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Draft Guidance: Key Elements

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DG-1365 (now DG-5072)

- Redesignated as DG-5072
- What is DG-5072?
  - New guidance for small modular reactors and non-light water reactors to apply select alternatives to requirements in § 73.55
- What are the major pieces within § 73.55?
  - Guidance for (s)(1)
  - Guidance for (s)(2)

DG-5072: Overview of (s)(1) guidance

- Guidance explains one approach for addressing the requirements in § 73.55(s)(1) that will demonstrate the ability to use the alternative security measures
- These requirements are:
  - Identify the specific alternative physical security requirement(s)
  - Perform a site-specific analysis to evaluate the potential offsite radiological consequences and demonstrate how the performance requirements set forth in § 73.55(b)(3) are met

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DG-5072: “Significant Release"

- A release of offsite doses that approach or exceed the reference values defined in §§ 50.34(a)(1)(ii)(D)(*1*) and (*2*) and 52.79(a)(1)(vi)(A) and (B)
- The 25-rem reference dose has been used in Parts 50, 52, 70 and 100 as a reference value that is used to evaluate plant design features with respect to postulated reactor accidents, including design basis accidents (DBAs)
- 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.

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DG-5072: What Happened with NEI 20-05?

- In letter dated October 29, 2021 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21306A365)) NEI requested NRC to stop the review of NEI 20-05
- NRC staff incorporated some of the guidance from NEI 20-05 into DG-5072 and DG-5071, to include:
  - target set identification
  - radiological dose consequence analysis
  - scenario development
- NRC staff continues to develop DG-5072 to support the proposed rule language for alternative measures

DG-5072: Consequence Analysis

- An activity performed by the applicant or licensee to determine radiation doses at the exclusion area boundary and the outer boundary of the low population zone from postulated radiological releases
- Needed to demonstrate applicability for using the alternative security measures found in § 73.55(s) for the physical protection program

DG-5072: Overview of (s)(2) guidance

Staff anticipates that this guidance will include:

- methods and approaches the staff would find acceptable for satisfying the alternative security requirements in § 73.55(s)(2);
- a methodology for calculating security delay time; and
- explanatory information and clarifications related to the relief provided within the alternatives proposed in § 73.55(s)(2).

DG-5071

- Revision to RG 5.81, “Target Set Identification and Development for Nuclear Power Reactors”
- This revision provides guidance to:
  - identify target sets for SMRs and non-LWRs consistent with changes to 73.55(b)(3).
    - Prevent a significant release of radionuclides from any source.
  - utilize the target set process to determine applicability of alternative physical security requirements.

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DG-5071: Target Set Definition

- 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 operations, would likely result in a significant release of radionuclides from any source (e.g., sufficient damage to the radionuclide inventory to exceed the radionuclide release fraction analyzed for the design basis accident and creation of a release pathway).

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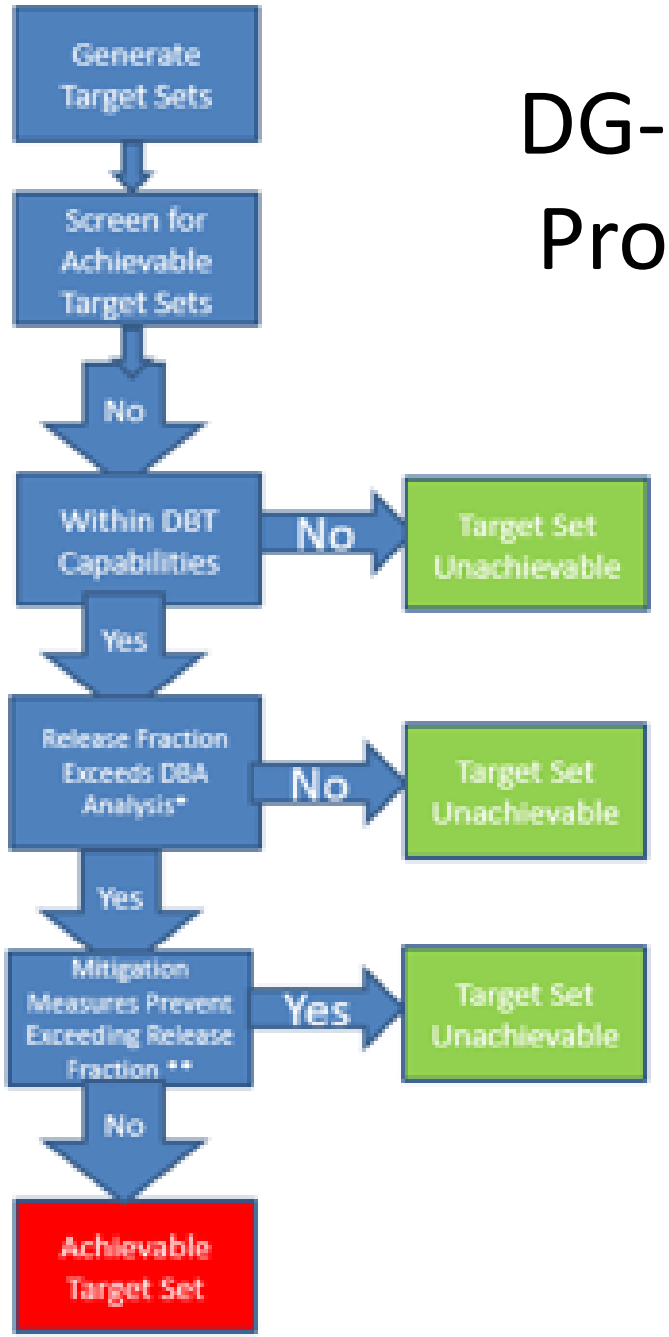
DG-5071: Advanced Reactors Proposed Target Set Process



NOTES

- APSR = Alternative Physical Security Requirement
- DBA = Design Basis Accident
- SBT = Security Bounding Time
- AIPT = Adversary Interference Preclusion Time

LEGEND

GREEN Boxes → APSR can be implemented
BLUE Boxes → Process and/or analysis
RED Boxes → Cannot implement APSR using target set process; however, a consequence analysis can be performed in accordance with DG-5072 (DG-1365).

*At an SBT
** After an AIPT and before exceeding a DBA release fraction

Next Steps

- Finalize draft proposed rule package
- Finalize draft guidance
  - DG-5071
  - DG-5072 (formerly DG-1365)
- Begin concurrence process

Schedule

- Proposed Rule to the Commission:
  06/28/2022

- Final Rule to the Commission:
  10/19/2023

Transformation Survey

The Nuclear Regulatory Commission (NRC) staff is seeking your feedback on the agency's transformation efforts. We are transforming to become a modern, risk-informed regulator so we are in the best position to continue to meet our safety and security mission. Transformation will help us keep pace with the highly dynamic, interconnected environment in which we operate, and be prepared to regulate an industry with evolving technologies. Transforming also provides us an opportunity to streamline processes and procedures and maximize efficiencies to better serve the American public.

Please take a moment and click on the link below for more information and to complete this brief survey: https://forms.office.com/g/EMgzZGbZjM)

The estimated burden to respond to this voluntary information collection is ten (10) minutes. Your responses will be kept confidential and will only be used internally to help us assess the impact of our transformation efforts in meeting our mission.

Thank You!

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Regulations.gov docket ID: NRC-2017-0227

Please provide feedback on this public meeting using this link: https://www.nrc.gov/public-involve/public-meetings/contactus.html

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