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

Differing View Enclosure 4: Problem Statements Associated with the Eligibility and Analysis Requirements

NRC management and staff appreciate the raising of the differing view during the development of the proposed rule language but did not incorporate the view into the proposed rule for the reasons discussed below. The staff does not agree that the differing view in Enclosure 4 accurately characterizes the proposed rule's requirements, including the eligibility criterion, the associated analysis, and the implementation of the voluntary alternative measures found in proposed Title 10 of the *Code of Federal Regulations* (10 CFR) 73.55(s)(2).

One problem statement made in the differing view in Enclosure 4 states that the analysis required by proposed 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 staff disagrees. The differing view is largely based on a comparison of the process in 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. However, the process in 10 CFR 73.55(r) does not address how an advanced reactor applicant or licensee can demonstrate the required eligibility to implement one or more of the alternative physical security requirements described in the proposed rule. 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)."

Once an applicant or licensee demonstrates, through analysis, that they are eligible to use the alternative security measures found in proposed 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) would enable the applicant or licensee to satisfy the relevant requirements in 10 CFR 73.55. These plans would 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).

Another problem statement made in the differing view in Enclosure 4 is that the proposed rule establishes a radiation dose of 25 rem total effective dose equivalent (25 rem TEDE) (in any 2-hour period following the onset of the postulated fission product release) as an acceptable dose limit for members of the public. The staff does not agree that the proposed rule establishes a dose limit that it finds acceptable for public exposure. 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 in the NRC's regulations. For example, in 10 CFR 50.34(c) and 52.79(a)(35), applicants are required to submit a safety analysis demonstrating that the dose reference values are met, and in 10 CFR 50.67, "Accident source term," the dose reference values are used to assess revisions to accident source terms used in design basis radiological consequence analysis. In 10 CFR 100.11, "Determination of exclusion area, low population zone, and population center distance," these same values are used in determining the exclusion area and the low population zone for a commercial nuclear power reactor site. 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 would 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 stated by the Commission in the "Reactor Site Criteria Including Seismic and Earthquake Engineering Criteria for Nuclear Power Plants," final rule (61 FR 65157, 65161; December 11, 1996), "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." 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 those requirements in 10 CFR Part 20, "Standards for Protection Against Radiation," that would apply to advanced reactor licensees.

Another problem statement in the differing view asserts that the proposed rule circumvents regulatory requirements established in the current framework for safety and security. The staff disagrees. The limited-scope rulemaking aligns with the overall physical security framework and existing process for developing physical protection systems for large light-water reactors (LWRs). Both large LWRs and advanced reactors would be required to protect against the design basis threat (DBT) of radiological sabotage. Advanced reactor applicants or licensees would 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, would likely 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 would 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 minimum credible operator actions and credit offsite support. Thus, the proposed rule would not circumvent regulatory requirements established in the current framework for safety and security.

In addition, the proposed rule would not conflict with the 2008 Policy Statement because the proposed rule would not rely on human actions but would allow for minimum operator actions consistent with the current regulatory framework. Furthermore, the flexibility offered by the proposed rule's alternative security requirements that would allow reduced reliance on onsite armed responders would encourage advanced reactor designers to consider security objectives more holistically during the design process. A design that meets the proposed rule's eligibility criterion would be 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.

Differing View Enclosure 5: Risks Associated with Allowing Licensees to Rely on Law Enforcement to Interdict and Neutralize the Design Basis Threat of Radiological Sabotage

NRC management and staff appreciate the raising of the differing view during the development of the proposed rule language but did not incorporate the view into the proposed rule for the reasons discussed below. The differing view asserts that there are differences in the risks between the use of proprietary or contract armed responders and law enforcement that the differing view has characterized as residual or unmitigated risks. Not all staff members agree that the impact of these residual risks is significant. This is the basis for the differing view. However, the staff, including staff members who hold this differing view, agree that the proposed rule requirements related to relying on law enforcement or other offsite armed responders to interdict and neutralize an adversary threat would provide high assurance[1] of adequate protection of public health and safety.

There are limited circumstances where an advanced reactor applicant or licensee would need to credit reliance on law enforcement to demonstrate eligibility to use the proposed physical security alternatives. Those circumstances relate to reliance on law enforcement actions to credit certain types of operator actions in the target set screening process. An applicant or licensee proposing to rely on law enforcement in this manner would have to demonstrate that such reliance was reasonable based on their particular situation. The NRC would review the licensee's evaluation as presented in its security plan.

The staff notes that it is possible that there could be non-LWRs or SMRs designed such that offsite consequences are shown to be less than the dose reference values used to establish design basis accidents without a response to interdict and neutralize an adversary during a security-initiated event. In cases where an applicant could demonstrate such an outcome, there may be no need to continue to require the licensee for such a facility to interdict and neutralize adversary threats; in such a case, the applicant could request an exemption. However, addressing this class of reactors within the current framework of the physical security requirements for power reactors would prove challenging and the staff did not believe relieving a class of commercial power reactors from the responsibility to interdict and neutralize the threat would be consistent with its commitment to retain the current overall framework for security requirements in this limited-scope rule.

---

[1] The Commission stated in staff requirements memorandum (SRM) "SRM-SECY-16-0073 – Options and Recommendations for the Force-On-Force Inspection Program in Response to SRM-SECY-14-0088," dated October 5, 2016, that "the concept of 'high assurance' of adequate protection found in the NRC security regulations is equivalent to 'reasonable assurance' when it comes to determining what level of regulation is appropriate." The Commission re-iterated this point in "SRM-SECY-18-0076 – Options and Recommendation for Physical Security for Advanced Reactors," dated November 19, 2018.