Draft Technical Basis for a Rulemaking to Revise the Security Requirements for Facilities Storing Spent Nuclear Fuel and High-Level Radioactive Waste, Revision 1 [NRC-2009-0558]

A The Objectives of this Rulemaking

The Nuclear Regulatory Commission (NRC) is initiating this rulemaking to revise the existing security requirements in 10 CFR Part 73, "Protection of Plants and Materials," that apply during the storage of spent nuclear fuel (SNF) at an Independent Spent Fuel Storage Installation (ISFSI) and during the storage of SNF and/or High Level Waste (HLW) at a Monitored Retrievable Storage Installation (MRS). This rulemaking will also make conforming changes to the ISFSI and MRS licensing requirements in 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste." The NRC's specific objectives for this rulemaking are to: (1) update the ISFSI security regulations to improve the consistency and clarity of Part 73 regulations for both types of ISFSI licensees (i.e., general and specific), to reflect current Commission thinking on security requirements, and to incorporate lessons learned from security inspections and Force-on-Force (FOF) evaluations conducted since these regulations were last updated; (2) to make generically applicable requirements similar to those imposed on ISFSI licensees by the post-9/11 security orders; and (3) to use a risk-informed and performance based structure in updating the ISFSI and MRS security regulations.

Objective One – Consistency

The first objective has three components and is to propose a set of security requirements that will achieve consistent outcomes across the wide range of SNF and HLW storage facilities that either exist today, or could be licensed by the NRC under Part 72 in the future. The existing ISFSI and MRS security regulations in Part 73 are unnecessarily complex; have not been updated in more than a decade; and are difficult for the NRC staff, licensees, applicants, and other stakeholders to understand and apply. Moreover, these regulations are required to address a large number of variations, for example, the presence of both general- and specific-license ISFSIs; whether an ISFSI is stand alone or the ISFSI is collocated with a nuclear power reactor; and for a collocated ISFSI, whether the ISFSI is located inside or outside of the reactor's protected area. Additionally, the NRC has previously imposed different security requirements under Part 73 for different groups of ISFSIs (e.g., § 73.51 for an away from reactor ISFSI and § 73.55 for an ISFSI that is collocated with an operating reactor). Accordingly, one of the NRC's principal objectives of this rulemaking is to create a more consistent and coherent regulatory structure for these types of waste storage facilities; and thereby improve agency transparency, regulatory clarity, and the ease of use of these regulations.

The second component of the first objective is to propose security requirements that are consistent with the Commission's recent final rule updating the security requirements for nuclear power reactors (see 74 FR 13925; March 29, 2009). Where possible, the NRC intends to propose identical security requirements to those used in this recent reactor security rule. However, where this is not possible (e.g., constraints exist due the differing nature of these two types of facilities, differences in their physical protection programs, and differences in the applicable threat), the NRC intends to propose requirements that are functionally equivalent. An example of consistent regulations would be the requirements for protected area barriers the use of deadly force, and alternative measures.

The third component of the first objective is to propose security requirements that address lessons learned during the course of previous NRC inspections and FOF exercises held since the ISFSI security regulations were last updated; and lessons learned during licensing reviews of all of the power reactor security plans that were conducted in 2003 and 2004 (following the issuance of security orders to reactor licensees). An example of an inspection/FOF input the NRC is proposing to address is in the application of vehicle barrier systems to the SNF transfer pathway between the reactor and a collocated ISFSI with a separate protected area.

Objective Two – Generic Applicability of Security Orders

The second objective is to make generically applicable the appropriate provisions of the security orders issued by the NRC to ISFSI licensees following the terrorist attacks of September 11, 2001. In the aftermath of these attacks, the NRC developed security orders containing interim compensatory measures (ICMs) that were applied to existing dry and wet ISFSIs. However, these orders were only issued to existing ISFSI licensees and new licensees as they prepared to load SNF. Additionally, in 2007 the NRC updated the ICMs and retitled them as additional security measures (ASMs) and issued them with subsequent ISFSI security orders. The ICMs and ASMs contained measures that were controlled as Safeguards Information. The NRC is proposing to make provisions of these orders generically applicable in the proposed rulemaking and thus to decontrol non-sensitive requirements to increase agency transparency and regulatory clarity. Additionally, measures such as vehicle barrier systems would be added to the regulations in part 73. Finally, the NRC would also address lessons learned in inspecting the imposition of these security orders. The agency's long-term objective is to sunset these security orders after a final rule is issued, licensees have implemented the revised regulations, and the NRC has inspected a licensee's implementation of the revised regulations.

Objective Three – Use a Risk-Informed and Performance Based Structure

Historically, the NRC's development of security regulations for ISFSIs and MRSs has taken credit for the typical robust design features of SNF dry storage facilities. These facilities typically are massive structures that use steel and/or concrete to provide protection against radiation and against the release of radioactive materials due to design-basis accidents (e.g., drops during handling or movement, earthquakes, or tornado missiles). Because of this high degree of protection afforded by these massive structures for design basis accidents, the NRC has required ISFSI licensees to implement moderate security measures and a "detect, assess, and communicate" protective strategy that was appropriate to the risk of malevolent acts releasing radiation or radioactive material. Because of their greater risk of releasing radioactive material, the NRC has required power reactor licensees to implement extremely robust security measures and a "denial of task" protective strategy. A denial protective strategy requires the licensee's armed security personnel to interpose themselves between any adversaries and to use force, including deadly force, to neutralize any adversaries (i.e., to prevent the adversaries from reaching and destroying their targets). In contrast, ISFSI and MRS licensees implementing a "detect, assess, and communicate" protective strategy are required to contact their nearby local law enforcement agency (LLEA) and request that LLEA respond to the site. LLEA personnel are responsible for apprehending/neutralizing any adversaries. As may be expected, the length of time necessary for LLEA to accomplish this task is significantly longer than for the licensee's armed security personnel implementing a "denial" protective strategy.

Following the events of September 11, 2001, the NRC completed security assessments for a range of NRC-licensed facilities. For ISFSIs, the NRC's assessment was completed during

2003 to 2005 time frame and evaluated several types of dry storage casks designs that were viewed as being representative of the entire population of dry storage ISFSIs. These assessments evaluated both attacks using large aircraft and ground assaults using a variety of methods. The assessments generally concluded that no significant overall facility vulnerabilities were identified and thus no immediate changes in the security requirements for ISFSIs were necessary to ensure adequate protection of public health and safety. However, the assessments did challenge previous NRC conclusions on the ability of a malevolent act to breach shielding and/or confinement barriers and thus release radiation or radioactive material; and indicated that increased security requirements were warranted for specific scenarios such as these. Since these assessments discuss vulnerability information; and thus could be used as potential targeting tools, they are not publicly available.

In response to this new information and in recognition of regulatory challenges previously discussed, the NRC staff developed Commission policy paper SECY-07-0148 to update the ISFSI security requirements (redacted version of this policy paper is publicly available under ADAMS package no. ML080030050). The Commission directed the NRC to proceed with the development of a proposed rulemaking that uses a risk-informed and performance-based approach. In this approach, licensees would be required to calculate the onsite and offsite radiological dose consequences from the potential release of radioactive material from their storage facility, due to certain "security scenarios" specified by the NRC. Licensees would be required to verify that the dose from applicable scenarios would not exceed a 0.05-Sievert (Sv) (5-Rem) collective dose limit at the controlled area boundary. The requirement for licensees to specify a controlled area boundary and to meet a "5-Rem" dose limit for design basis accidents is specified in the current 10 CFR 72.106.[1] Therefore, the NRC is proposing to establish a security based dose limit in Part 73 that has the same values as found under the current 10 CFR 72.106

Licensees would use the information supplied by the NRC in combination with information specific to their facility (e.g., distance from the ISFSI or MRS to the controlled area boundary, specific storage cask type, specific fuel burnup (i.e., radionuclide inventory), and distance to the facility's site boundary) to calculate the potential dose and to verify that a 0.05-Sv (5-Rem) dose limit to be included in Part 73 has been met. The NRC envisions that licensees would use an iterative process that considers changes to parameters (e.g., distance to the controlled area boundary) in order to meet the 0.05-Sv (5-Rem) security dose limit. Licensees who could not meet the 0.05-Sv (5-Rem) dose limit (either with their current facility or by expanding the controlled area boundary of their facility) would be required to consider other options. These options could include increasing the size of the licensee's facility, using engineered security barriers/features to prevent a specific "security scenario," if possible, or shifting to a "denial" protective strategy to prevent the specific "security scenario" from succeeding.

The NRC is proposing to use a "risk-informed and performance-based" approach to help define a new regulatory structure for ISFSI security activities. The "risk-informed" element would apply a vulnerability assessment methodology against ISFSIs that is informed by both the intelligence community's developed threat stream and by vulnerability information that is not threat based (i.e., the evaluation of whether ISFSIs may be vulnerable to certain specific weapons effects for which an underlying threat stream does not currently support their inclusion under the DBT for

[1] The dose criteria in 10 CFR 72.106 includes separate limits of 0.05 Sv (5 Rem) total effective dose equivalent; 0.15 Sv (15 Rem) to the lens of the eye; and 0.5 Sv (50 Rem) as either the sum of the deep dose equivalent and any organ dose, or the shallow dose equivalent to the skin or any extremity. Collectively, these values are hereinafter referred to as the 0.05-Sv (5-rem) dose limit.

radiological sabotage). The "performance based" element would apply specific radiological dose acceptance limits to ISFSI security activities. This combined approach would provide licensees flexibility in crafting an appropriate security regulatory structure for ISFSIs that may be different than that used for power reactors and would provide clear and objective performance standards. This new approach would recognize that the security regulatory structure applied to ISFSIs may be appropriately different from the security regulatory structure applied to power reactors, due to significant differences in: (1) the designs of these two types of facilities; (2) the nature of their security vulnerabilities; (3) differences in the physical and regulatory approaches used to create defense-in-depth for these facilities; and (4) differences in the nature and size of a potential radiological release from these facilities.

The NRC views this proposed regulatory structure as affording current ISFSI licensees and any future ISFSI or MRS licensees with the greatest amount of flexibility in meeting the regulations; while ensuring the public and other stakeholders that all ISFSI and MRS facilities meet a specific and consistent standard for protecting public health and safety, the common defense and security, and the environment. This proposed regulatory structure is also consistent with the historic NRC regulatory model that requires licensees to demonstrate compliance with the NRC's regulations, and minimizes licensee fee costs and the impact on staff resources. Additionally, this approach provides consistency for the differing types of ISFSI licensees, and also provides a metric that is independent of future fuel loading characteristics and dry-cask storage designs. This approach also provides increased protection of Safeguards Information from unauthorized disclosure. The licensee's assessments that their ISFSI is in compliance with the 0.05-Sv (5-Rem) dose limit would be subject to review and/or inspection by NRC staff, as appropriate.

The NRC recognizes that some licensees, who are constrained by the footprint of their site, might have to implement a denial strategy for their ISFSI under this rulemaking. Alternatively, a licensee might conclude that the total life-cycle security costs associated with implementing a denial strategy at its ISFSI outweighs the transportation costs; the incremental change in life-cycle security costs associated with storing the extra SNF at an ISFSI implementing a detect, assess, and communicate strategy; and the licensing costs of such shipments. In such cases, the NRC recognizes that a licensee could conclude that shipment of SNF and storage at another ISFSI may incur lower costs. However, regardless of the location used to store the SNF, the NRC's goal in this rulemaking is to ensure that an adequate and consistent level of protection is afforded at all ISFSIs.

The NRC notes that existing licensees currently have the option to transport their SNF to another ISFSI or MRS. A request to transfer SNF to another ISFSI would require a license amendment for the receiving facility (either the Part 72 specific or general ISFSI licensee). Furthermore, such transportation of SNF would be required to comply with the NRC's safety requirements in 10 CFR Part 71, "Packaging and Transportation of Radioactive Material" and the NRC's security requirements for the transportation of SNF in 10 CFR 73.37, "Requirements for Physical Protection of Irradiated Reactor Fuel in Transit."

In implementing this new risk-informed and performance-based approach for ISFSI and MRS security, the NRC would discontinue the application of the design basis threat (DBT) for radiological sabotage to general license ISFSIs. The current regulations in 10 CFR 73.1(a) only apply the DBT for radiological sabotage to general license ISFSIs.[2] This is an example of

[2] Final rule - 10 CFR Part 73, "Design Basis Threat." Published in the *Federal Register* on March 19, 2007 (72 FR 12705).

inconsistent treatment of ISFSIs and MRSs. The Commission had previously indicated that the issue of whether or not to apply the DBT for radiological sabotage to all ISFSIs (and thus to MRSs as well) would be addressed in a future rulemaking.[3] This proposed rule would address this issue by not applying the DBT for radiological sabotage to any ISFSIs or MRSs.

In developing this approach, the NRC staff also considered the findings and recommendations contained in the National Academy of Sciences' (NAS') National Research Council report on "Safety and Security of Commercial Spent Nuclear Fuel Storage: Report to Congress," dated July 2004 (particularly those findings and recommendations contained in sections 4 and 5 of the NAS report). The NRC staff also considered the Commission's report to Congress on the National Academy of Sciences' National Research Council report on "Safety and Security of Commercial Spent Nuclear Fuel Storage," dated March 14, 2005. Both these reports contain classified national security information and are not publicly available. In 2006, the NAS published a redacted version of this study titled "Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report." This study is available from NAS for a fee (see the NAS website at http://www.nap.edu/catalog.php?record_id=11263#toc to obtain a copy of the public report). The NAS study was based, in part, upon the results of the NRC's security assessments described above.

Petition for Rulemaking (PRM-72-6), Item 11 – Hardened On-Site Storage

Petition for rulemaking (PRM-72-6),[4] Item no. 11, requests that the NRC "… require Hardened On-site Storage (HOSS) at all nuclear power plants as well as away-from-reactor dry cask storage; that all nuclear industry interim on-site or off-site dry cask storage installations or ISFSIs be fortified against attack." The technical content of Item no.11 appears to be relevant to this rulemaking updating ISFSI and MRS security requirements. The petitioner also quoted from the 2006 NAS public report mentioned above in support of their position.

As discussed previously, the NRC is proposing to require ISFSI and MRS licensees to calculate potential dose consequences arising from certain security scenarios. If these results exceed the 0.05-Sv (5-Rem) dose limit, then a licensee could use engineered security features to fortify the ISFSI or MRS against attack, or implement a denial protective strategy. Consequently, while the use of HOSS could be a engineered security solution to the dose analysis results for a particular facility, the NRC has not concluded that the use of HOSS should be mandated at all ISFSIs or MRSs. However, because item 11 raises issues that are relevant to this rulemaking, the NRC would consider addressing item 11 in the context of this proposed rule.

Stakeholder Outreach

Because of the Commission's direction in SRM-SECY-07-0148 to strongly encourage public comments to ensure all stakeholders' views are considered during the rulemaking process, the Office of Nuclear Security and Incident Response (NSIR) requests that the Office of Federal and State Materials and Environmental Management Programs (FSME) post draft versions of the proposed rule text to the *Federal e-Rulemaking Website* at www.regulations.gov to obtain stakeholder input during the development of the proposed rule. Additionally, NSIR staff posted

[3] See *Federal Register* on March 19, 2007 (72 FR 12705), under response to public comment Issue 5 (at 72 FR 12716): "… the NRC is currently considering future rulemakings to align the generally-licensed [ISFSI] and specifically-licensed ISFSI requirements and to evaluate the application of the DBT [for radiological sabotage]."

[4] The C-10 Research and Education Foundation, Inc. submitted petition for rulemaking (PRM-72-6) to the NRC on November 24, 2008. The NRC noticed receipt of PRM-72-6 and requested public comments in the *Federal Register* on March 3, 2009 (74 FR 91718).

a draft of this technical basis to the *Federal e-Rulemaking Website* for public comment under Docket ID **NRC-2009-0558**.

B Background

The NRC requires high assurance of adequate protection of public health and safety, the common defense and security, and the environment for the secure storage of spent nuclear fuel (SNF) and high-level radioactive waste (HLW). The NRC meets this strategic goal by requiring licensees to comply with security requirements specified in Title 10 of the Code of *Federal Regulations*, Part 73 (10 CFR Part 73), "Physical Protection of Plants and Materials." Following the terrorist attacks of September 11, 2001, the NRC has achieved this requisite high assurance for all independent spent fuel storage installations (ISFSIs) (i.e., facilities that are licensed to store SNF) through a combination of existing security regulations in 10 CFR Part 73 and the issuance of security orders to existing individual licensees. These orders ensured that a consistent overall protective strategy is in place for all types of ISFSIs, given the current threat environment. The issuance of these orders was noticed in the *Federal Register* (FR).[5] Subsequent to the issuance of these orders to existing ISFSI licensee, the NRC issued security orders to all new ISFSI licensees, before such facilities began operation. These subsequent orders were also noticed in the FR.[6] The NRC has not issued any licenses for an MRS, nor are any applications for a license for an MRS pending before the NRC. The Commission's most recent comprehensive reviews of ISFSI security regulations occurred in conjunction with rulemakings in 1994 and 1998.[7] [8] The NRC notes that ISFSIs were considered during this 1994 rulemaking; however, the Commission ultimately concluded that land vehicle bomb protection requirements were not necessary for ISFSIs at that time.

The current security regulations for ISFSIs are quite complex and pose challenges both to NRC staff and to the regulated industry. This regulatory complexity is due to multiple factors, including: two different types of ISFSI licenses (general and specific licenses) under 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste," and varying applicability of regulations based upon whether the ISFSI is collocated with an operating power reactor, is collocated with a decommissioning power reactor, or is located away from any power reactors.[9]

In recognition of these various challenges, the NRC staff presented policy paper SECY-07-0148, dated August 28, 2007, to the Commission which summarized the current regulatory structure for ISFSI security, analyzed several policy and process issues, and provided recommendations in order to obtain early Commission direction on the development of an ISFSI security rulemaking. A redacted version of policy paper SECY-07-0148 is publicly available (see NRC Agencywide Documents Access and Management Systems (ADAMS) Accession

---

[5] See *Federal Register* on October 23, 2002 (67 FR 65150 and 67 FR 65152).

[6] For example, see *Federal Register* on August 25, 2004 (69 FR 52314).

[7] Final rule - 10 CFR Part 73, "Protection Against Malevolent Use of Vehicles at Nuclear Power Plants." Published in the *Federal Register* on August 1, 1994 (59 FR 38889).

[8] Final rule - 10 CFR Parts 60, 72, 73, 74 and 75, "Physical Protection for Spent Nuclear Fuel and High Level Radioactive Waste." Published in the *Federal Register* on May 15, 1998 (63 FR 26955).

[9] For the purposes of this technical basis, the term "collocated, specific licensee" represents a specific-license ISFSI that is collocated at a power reactor facility which has an NRC license to operate. The term "non-collocated, specific licensee" will include both a specific-license ISFSI that is collocated with a power reactor with a possession-only license and a specific-license ISFSI located away from any power reactors. This nomenclature is reflected in Figure1 below.

Number ML080030050) under the NRC's Electronic Reading Room (see http://www.nrc.gov/reading-rm.html). Subsequently, the Commission, in a Staff Requirements Memorandum (SRM-SECY-07-0148), dated December 18, 2007, (see ADAMS Accession Number ML073530119), directed the NRC staff to accomplish a proposed security rulemaking for the storage of SNF and to develop supporting regulatory guidance documents. The Commission's SRM also directed the staff to strongly encourage public comments to ensure all stakeholders' views are considered during the rulemaking process, especially with regard to potential licensing, emergency preparedness, and security plan impacts. As stated previously, this rulemaking is in response to the Commission's direction.

Current ISFSI Security Regulatory Structure

In addition to storing SNF in spent fuel pools under a reactor facility's license, spent fuel can also be safely and securely stored in facilities licensed independent of a reactor site using both wet and dry storage systems. Under the licensing regulations in 10 CFR Part 72, there are two types of ISFSI licenses (i.e., general and specific) that are available for the storage of spent fuel. Physical security requirements are located in various sections in 10 CFR Part 73 depending on the type of licensee. Additionally, the regulations in 10 CFR 72.212(b)(5), require general licensees to establish a physical protection program that protects the spent fuel against the design-basis threat (DBT) for radiological sabotage (10 CFR 73.1) in accordance with the regulations for power reactor security under 10 CFR 73.55. For general-license ISFSIs, neither 10 CFR 72.212(b)(5) nor 10 CFR 73.55 impose a dose limit for security events (i.e., acts of radiological sabotage). However, certain specific-license ISFSIs are required to meet the dose limits of 10 CFR 72.106 which specifies a 0.05-Sievert (Sv)(5-rem) dose limit for security-related events, resulting in a loss of control of the facility.[10]

The staff has developed Figure 1 below as an aid in describing the complexity and applicability of the current ISFSI licensing and security regulations under 10 CFR Parts 72 and 73, respectively.

[10] The dose criteria in 10 CFR 72.106 includes separate limits of 0.05 Sv (5 Rem) total effective dose equivalent; 0.15 Sv (15 Rem) to the lens of the eye; and 0.5 Sv (50 Rem) as either the sum of the deep dose equivalent and any organ dose, or the shallow dose equivalent to the skin or any extremity. Collectively, these values are referred to as the 0.05-Sv (5-Rem) dose limit.

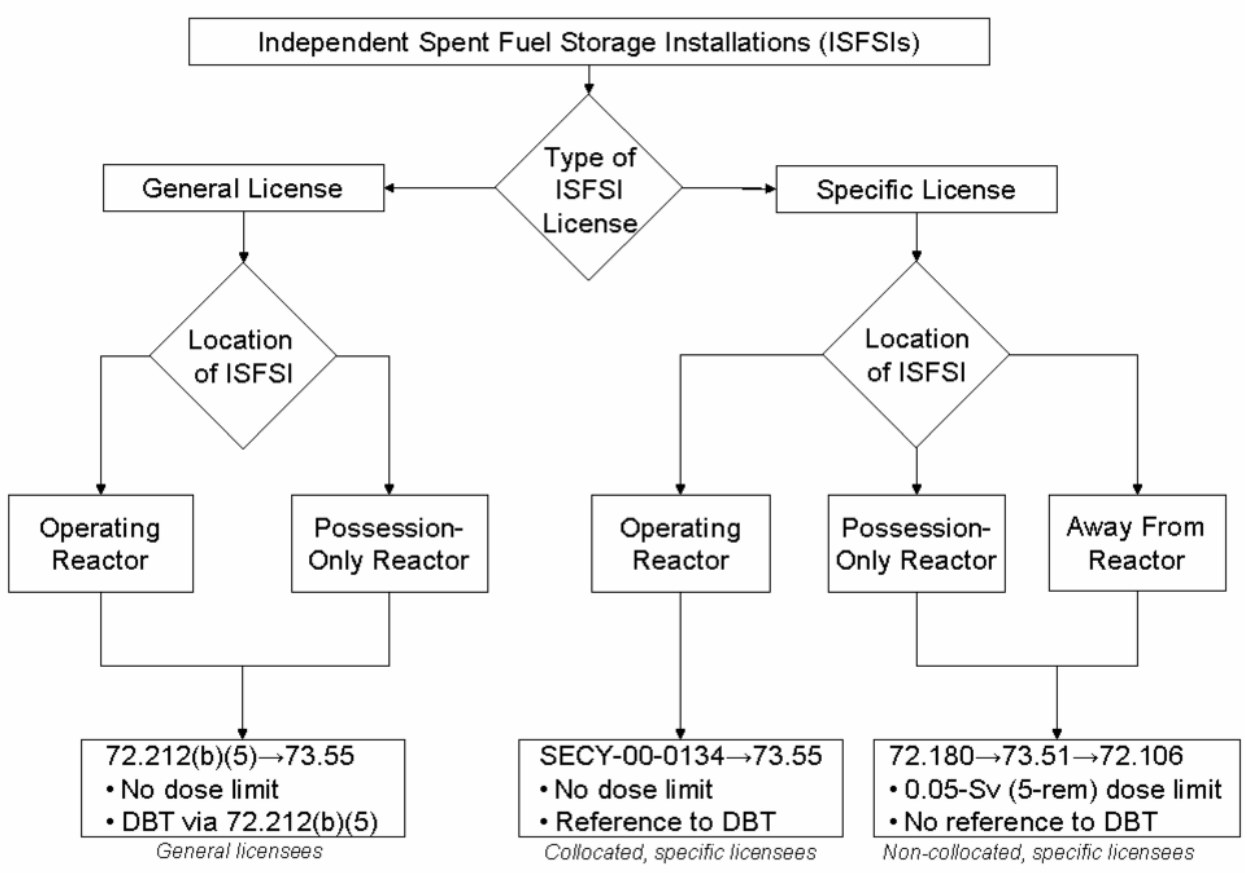

Figure 1. Current NRC Security Regulations for ISFSIs

Based on their applicability provisions, the regulations in 10 CFR 72.180, 10 CFR 72.182, and 10 CFR 73.51 currently apply to all specific-license ISFSIs without any exceptions. However, past staff practice has permitted collocated, specific licensees to develop their ISFSI's security plans in accordance with the more stringent requirements of 10 CFR 73.55.[11] Additionally, the statements of consideration accompanying a Part 72 final rule clarifying the applicability of the various provisions of Part 72 to general licensees, specific licensees, and certificate holders indicated that specific licensees collocated at an operating 10 CFR Part 50 power reactor facility are excluded from the provisions of 10 CFR 73.51.

Therefore, the staff has only subjected non-collocated, specific licensees to the requirements of 10 CFR 72.180, which states such licensees must establish, maintain, and implement a detailed plan for physical protection as described in 10 CFR 73.51. The regulations in 10 CFR 73.51 require non-collocated, specific licensees to have a physical protection system that is designed such that a loss of control of the facility (e.g., from a terrorist attack) would not result in a radiation exposure exceeding a 0.05-Sv (5-rem) dose limit at the controlled area boundary (i.e., the safety dose limits of 10 CFR 72.106). Unlike the regulations in 10 CFR 72.212(b)(5), neither 10 CFR 72.182 nor 10 CFR 73.51 includes specific language

[11] For the purposes of this technical basis, the term "collocated, specific licensee" represents a specific-license ISFSI that is collocated at a power reactor facility which has an NRC license to operate. The term "non-collocated, specific licensee" will include both a specific-license ISFSI that is collocated with a power reactor with a possession-only license and a specific-license ISFSI located away from any power reactors. This nomenclature is reflected in Figure 1 above.

requiring a specific ISFSI licensee to protect the spent fuel or high-level radioactive waste against the DBT for radiological sabotage.

In fact, 10 CFR 73.1 lists exceptions to certain DBT requirements for various classes of licensees. Specific-license ISFSIs had previously been identified as being exempted from certain provisions of the DBT rule, but were removed in the March 2007 final rule. This was because 10 CFR 72.182 did not contain specific language requiring protection of the spent fuel (in a specific-license ISFSI) against the DBT for radiological sabotage (i.e., the intent of the rule was for 10 CFR 73.1 to remain consistent with 10 CFR 72.182). Consequently, the NRC's current regulations do not specify whether collocated, specific-license ISFSIs are required to protect against the DBT for radiological sabotage, in contrast to the clear requirements of 10 CFR 72.212(b)(5) for general-license ISFSIs to protect the spent fuel against the DBT for radiological sabotage.

Based on their applicability provisions, 10 CFR 72.180, "Physical Protection Plan," and 10 CFR 73.51, "Requirements for the Physical Protection of Stored Spent Nuclear Fuel and High-level Radioactive Waste," apply to all specific-license ISFSIs without any options. However, past staff practice has permitted collocated, specific licensees to develop their ISFSI's security plans based upon on the requirements of 10 CFR 73.55.[12] Additionally, the statements of consideration accompanying a Part 72 final rule clarifying the applicability of the various provisions of Part 72 to general licensees, specific licensees, and certificate holders indicated that specific licensees collocated at an operating 10 CFR Part 50 ("Domestic Licensing of Production and Utilization Facilities") power reactor facility are excluded from the provisions of 10 CFR 73.51.[13] Therefore, in practice, the staff has only subjected non-collocated, specific licensees to the requirements of 10 CFR 72.180, which states such licensees must establish, maintain, and implement a detailed plan for physical protection as described in 10 CFR 73.51. Even though both general and collocated, specific licensees are required to comply with selected provisions of 10 CFR 73.55, the final power reactor security rule revising this regulation did not address security requirements for collocated, specific-license ISFSIs, but the Commission chose to defer this issue to a separate future rulemaking.[14]

Finally, the NRC notes that conservatisms may exist in the modeling of the quantity of radiological material that might be released from an attack against spent fuel in a storage cask. Subsequent to any possible future studies, we acknowledge the possibility of differences in potential scenarios.

Impacts of Using a Denial Protective Strategy

Under a dose-based acceptance criteria, some ISFSI or MRS licensees might have to revise their current protective strategy from a "detect, assess, and communicate" protective strategy to a "denial of task" protective strategy due to site-specific limitations (e.g., limited room to expand the distance between their ISFSI or MRS and their controlled area boundary). Consequently, if a constrained licensee cannot meet the dose limit through the use of passive security measures (e.g., the use of engineered security features or through changes to the ISFSI's design), one of

[12] Letter to Mr. James P. O'Hanlon, "Request for Exemption from 10 CFR 73.51(d)(3) Requirements, North Anna Independent Spent Fuel Storage Installation (ISFSI) and Surry ISFSI (TAC Nos. L22707 and L22708)," ADAMS No. ML060320261, dated November 12, 1998.

[13] Final Rule - 10 CFR Part 72, "Clarification and Addition of Flexibility." Published in the *Federal Register* on August 21, 2000 (65 FR 50606). See public comment Issue A.1 (at 65 FR 50608).

[14] Final rule - 10 CFR Parts 50, 52, 72, and 73, "Power Reactor Security Requirements." Published in the *Federal Register* on March 27, 2009 (74 FR 13925).

the options available to the licensee would be to use active security measures (e.g., a "denial" protective strategy) to prevent a successful terrorist attack. The NRC envisions that only very few licensees may be sufficiently constrained to be unable to meet the radiological dose criterion through the use of passive security measures and thus would be compelled to shift to a "denial of task" protective strategy. Moreover, the NRC anticipates continuing the current practice of not performing force-on-force (FOF) exercises against ISFSI licensees implementing a "detect, assess, and communicate" protective strategy. However, if an ISFSI licensee revises its security program to employ a "denial of task" protective strategy, then the NRC staff would reevaluate the need for a FOF exercise against that ISFSI on a case-by-case basis.

The use of a "denial of task" protective strategy raises issues of sufficient technical complexity to necessitate prior staff review and approval of a licensee's security plan. The NRC bases this conclusion on: (1) experience gained by NRC staff in the 2003 - 2004 reviews of changes to reactor security plans to implement the security and DBT orders and the resultant degree of complexity and the need for interactions with licensees; and (2) a desire to maintain an appropriate independence and separation of NRC security plan review and approval and inspection functions. For a specific-license ISFSI, NRC prior review and approval of applicant's initial security plans is required under the current regulations. Under 10 CFR 72.44(e), "License Conditions," licensees may make certain changes to their security plan without NRC prior review and approval, if such changes do not decrease the effectiveness of the security plan. For a general-license ISFSI, the security requirements for the ISFSI are incorporated in the security plan (required under Part 50) for the associated power reactor license and are subject to inspection by NRC regional staff, not to staff prior review and approval. Similarly, reactor licensees are permitted under 10 CFR 50.54(p)(1), "Conditions of Licenses," to make certain changes to their security plan without prior NRC review and approval, provided such changes do not decrease the effectiveness of their security plan. In all likelihood, a general-license ISFSI's shift to a denial protective strategy would not decrease the effectiveness of the associated power reactor's security plan under 10 CFR 50.54(p)(1). However, as discussed earlier and notwithstanding the provisions of 10 CFR 50.54(p)(1), the staff would revise the regulations to require a reactor licensee, associated with a general-license ISFSI who chooses to employ a "denial of task" protective strategy for the ISFSI, to submit its security plan (for protecting both the reactor and ISFSI) to the NRC for prior review and approval. A licensees submittal of a security plan for a site implementing a “denial” protective strategy for the NRC’s review and approval, would be a specific licensing action under the associated Part 50 license that would create a potential hearing right under section 189 of the AEA.[15]

The staff notes that some Part 50 licensees who are currently using the Part 72 general license process have required amendments to their Part 50 license to accommodate the presence of the ISFSI, thus creating a potential hearing right under the Part 50 license. An example of this was for heavy loads issues (e.g., the use of single failure proof cranes and revised heavy load pathways). Therefore, revising the necessary regulations to require a general-license ISFSI, who was compelled to adopt a "denial of task" protective strategy, to submit the site (reactor and ISFSI) security plan to the NRC for review and approval would be consistent with the current Part 50 reactor license/Part 72 general-license ISFSI regulations. Consequently, the

[15] The current 10 CFR Part 72 general license regulations implement provisions of Sections 133 and 218(a) of the *Nuclear Waste Policy Act of 1982*, as amended (42 U.S.C. 10153 and 10198, respectively). Section 218(a) mandated that the Commission by rule approve technologies for the dry storage of spent fuel at civilian nuclear power reactors, "without to the extent practicable," the need for additional site specific (i.e., licensing) approvals by the Commission. Under the NRC’s current Part 72 general license regulations, no site-specific licensing actions are required to store spent nuclear fuel under the general license (10 CFR 72.210) contained in Part 72, Subpart K, for the cask designs approved under 10 CFR 72.214).

staff's view is that the potential for hearing requests would be essentially the same as it is under the current regulations.

Petition for Rulemaking (PRM-72-6), Item 11 – Hardened On-Site Storage

On November 24, 2008, the C-10 Research and Education Foundation, Inc., submitted a petition for rulemaking to the NRC that requested changes to both the safety requirements found in 10 CFR Part 72 and the security requirements found in 10 CFR Part 73, that apply to the dry storage of spent nuclear fuel. The NRC docketed this petition for rulemaking as Docket No. PRM-72-6. The NRC issued a notice of receipt and request for comments on this petition in the *Federal Register* (74 FR 9178) on March 3, 2009. A copy of the petition and any public comments submitted in response to this notice can be found at the *Federal e-Rulemaking Website* at http://www.regulations.gov under Docket ID [NRC-2008-0649]. As discussed above, the issues raised by the petitioner in item 11 of PRM-72-6 are relevant to this proposed rulemaking.

C. Background on Why the Current Regulation Needs to be Revised

The existing security requirements in 10 CFR Part 73 for waste storage facilities licensed to possess SNF and HLW have been in place without change, in many cases, since the late 1980's and the 1990's. As new applications for ISFSIs were received and new cask designs for general licensed ISFSIs were approved, differing approaches were requested by the applicants and approved by the NRC. As a result, the existing ISFSI security regulatory structure in 10 CFR Part 73 is complex, difficult for the NRC staff, licensees, and the public to understand and apply, and does not meet the NRC's objective of regulatory clarity. This proposed rulemaking seeks to remove the existing complexities and to clarify ISFSI and MRS security regulations and institute a risk-informed and performance-based structure to these regulations that would be consistent for all ISFSI and MRS facilities.

This proposed rulemaking also seeks to update these regulations to make generically applicable requirements similar to those previously imposed by the security orders issued by the NRC to ISFSI licensees following the terrorist attacks of September 11, 2001. Additionally, the NRC's post -9/11 security assessment of several types to spent fuel storage systems indicated that improvements to the security requirements for such facilities were appropriate. These assessments challenged previous NRC conclusions on the ability of a malevolent act to breach shielding and/or confinement barriers and thus release radiation or radioactive material; and indicated that increased security requirements were warranted.

Finally, this proposed rule seeks to eliminate the disparate application of the DBT for radiological sabotage to ISFSI and MRS facilities under the current regulations by not applying the DBT for radiological sabotage to such facilities, but instead applying a risk-informed and performance-based approach with a specific dose acceptance standard.

D. Role of This Rulemaking in Terms of the NRC Strategic Plan

This proposed rulemaking supports the NRC Strategic Goal of Security and strategic objectives of openness and effectiveness. The Strategic Goal of Security is intended to provide high assurance that licensees will protect public health and safety, the common defense and security, and the environment from malevolent acts against the SNF and HLW stored in these facilities; and thus ensure the secure use and management of radioactive materials. The

strategic outcome for the Strategic Goal of Security is to prevent any instances in which NRC-licensed materials are used domestically in a manner hostile to the United States.

To support the NRC's objectives of openness and effectiveness the NRC staff has continued to actively inform stakeholders and the public of the agency's proposed actions in this rulemaking and sought informed comment during the agency's rulemaking process. In support of this objective, the NRC staff has made a number of presentations on these concepts to the public, licensees, and other stakeholders. These presentations have included the 2009 Waste Management Conference in Phoenix, AZ on March 3, 2009 (see ADAMS Accession No. ML090060183); the 2009 Nuclear Energy Institute Dry Storage Forum in Bonita Springs, FL on May 12, 2009 (see ADAMS Accession No. ML092310526); and the 2009 ISFSI Security Conference in Stone Mountain, GA on October 15, 2009 (see ADAMS Accession No. ML092820591). Additionally, on June 30, 2009, the staff held a Webinar to provide the public, licensees, and other stakeholders technical and policy information on this proposed rulemaking (see ADAMS Accession No. ML092310560).

In addition, the NRC staff posted a draft of this revised technical basis on the *Federal e-Rulemaking Website* at http://www.regulations.gov under Docket ID **NRC-2009-0558** on December xx, 2009, to obtain public, licensee, and other stakeholder comments and input. The NRC staff also published a notice of availability of this draft technical basis in the *Federal Register* (74 FR xxxxx) on December xx, 2009. Finally, the NRC staff held a Webinar on January 14, 2010, to facilitate the submission of informed comments and questions on this technical basis from the public, licensees, certificate holders, and other stakeholders.

Overall, yy organizations or members of the public participated in the Webinar [**list types of stakeholders**]. The NRC received xx comments on this technical basis. A summary of the comments received on the draft technical basis was also posted on the *Federal e-Rulemaking Portal* under Docket ID **NRC-2009-0558** (see also ADAMS Accession No. ML10dddxxxx).

E. Scope of this Rulemaking

The overall scope of this rulemaking would include revising existing regulations in 10 CFR Part 72 and Part 73, and adding new regulations in 10 CFR Part 73. This would include the following regulations –

- In 10 CFR 72.180, the NRC would update this requirement to use a cross reference to the new ISFSI security requirements for ISFSIs and MRSs established by this rule in Part 73.
- In 10 CFR 72.182, the NRC would update the requirements to reflect the performance objectives for the ISFSI and MRS security rulemaking (see objectives above).
- In 10 CFR 72.212(b)(5), the NRC would remove specific security requirements for general license ISFSIs from this regulation and instead use a cross reference to the new ISFSI security requirements for ISFSIs established by this rule in Part 73.
- In 10 CFR 73.1(a), the NRC would remove language that subjects a general license ISFSI to the DBT for radiological sabotage.
- In 10 CFR 73.51, the NRC would remove language applying this regulation to ISFSIs or MRSs.
- In 10 CFR 73.400, 73.405, etc., the NRC would add a new series of regulations that would provide the security requirements for all types of ISFSIs and MRSs. This would consist of a performance objective and overview section and specific requirements sections that would apply to specific types of facilities. These specific requirements sections would address the

different types of ISFSIs (e.g., collocated dry-storage ISFSIs, away-from-reactor dry-storage ISFSIs, and pool ISFSIs) and the application of different protective strategies (for these different types of facilities). MRSs would be grouped with away from reactor ISFSIs.

This rulemaking would not include any revisions to the security requirements in the current 10 CFR 73.51 that apply to a geologic repository operations area (GROA) (i.e., a geologic repository facility licensed by the NRC to dispose of SNF and HLW under 10 CFR Parts 60 or 63).

F. Access Authorization and Fingerprinting

Requirements for fingerprinting and background investigations to allow unescorted access to ISFSIs and MRSs would be addressed in this proposed rulemaking. However, the technical basis for these requirements has already been submitted to FSME in a separate memo from Richard P. Correia to Dennis K. Rathbun, dated September 30, 2008 (see ADAMS Package No. ML082270355). Although that memo did not specifically include MRSs, the technical bases applied to ISFSIs in this area should be applied to MRSs as well. The NRC has issued security orders imposing Access Authorization requirements on ISFSI licensees since August 18, 2004. The NRC has also issued security orders imposing fingerprinting requirements on ISFSI licensees since February 23, 2007. These previous requirements should be reflected in the regulatory analysis supporting the proposed rule.

G. General Security Requirements

The proposed requirements specified in this technical basis would establish the objectives and minimum security performance standards that would be located under 10 CFR Part 73 that licensees, who are authorized to store SNF and HLW under the provisions of 10 CFR Part 72, must meet in order to provide high assurance that the storage of such SNF and HLW does not pose an unacceptable risk to public health and safety, the common defense and security, and the environment. These proposed requirements would apply to any facility authorized to store SNF or HLW under the provisions 10 CFR Part 72, and would apply to all such current and future licensees.

As an overall objective, licensees would be required to meet the following security performance capabilities:

(1) Evaluate the potential radiological consequences due to the release of radiation or radioactive material from the applicable security scenarios (that are specified by the NRC) using site specific information (input parameters). Calculate the potential dose that could be received by an individual located between the facility and the ISFSI's or MRS' site boundary. Verify that the dose received by an individual on or beyond the ISFSI's or MRS' controlled area boundary would not exceed the 0.05-Sv (5-Rem) dose limit; and

(2) If the potential dose would exceed the 0.05-Sv (5-Rem) dose limit, then the licensee would be required to establish and implement security measures to meet this dose limit or to modify the input parameters in this evaluation in order to meet this dose limit. Otherwise the licensee would be required to identify and implement changes to their security program, to the design or operation of the ISFSI or MRS, to the licensee's protective strategy, or to employ natural or

engineered security features that would either prevent to prevent the applicable security scenario(s) from causing a release of radiation or radioactive material.

(3) Evaluate the effects from the detonation of a land-based or waterborne vehicle bomb attack (the size of the explosive and the vehicle characteristics are specified by the NRC) against the storage casks, facility, or pool; against the central and secondary alarm stations; against security personnel defensive positions (if the licensee employs a denial strategy); and against a transfer container if the transfer pathway is not protected by a temporary or permanent vehicle barrier system.

(4) Design, install, and implement a vehicle barrier system (VBS) to mitigate the effects of a land-based or waterborne vehicle bomb attack. The design of the VBS may use natural landform obstacles. A separate analysis for any potential waterborne vehicle bomb vulnerability would not be required for facilities where the land-based evaluation envelops the entire SNF or HLW storage facility. The design of engineered VBS components would be required to meet an international consensus technical standard for VBS hardware under ASTM Standard F2656-07 for the applicable vehicle characteristics specified by the NRC.[16] Further detailed information is provided in a later VBS paragraph.

(5) Design, install, and implement the equipment, personnel, procedures, and policies of the physical security program (e.g., alarm stations, protected area barriers, detection and assessment, training, contingency response, etc.)

Existing licensees would be required to revise and update their Physical Security Plans (PSPs) to reflect any necessary changes to their physical protection system or protective strategy in order to meet these security performance objectives. Licensees who choose to implement a denial protective strategy would be required to submit their security plans to the NRC for prior review and approval. These submittals would be via a license amendment or via a license application, as applicable.

H. Specific Security Requirements: Specific Security Points of Consideration

The proposed regulations defining the physical protection systems for SNF or HLW storage facilities would require a multi-faceted approach. Licensees would be required to analyze their facility (1) against certain security scenarios and verify any potential dose releases are within regulatory limits, and (2) against specific adversary characteristics (e.g., a land-based or waterborne vehicle bomb assault) and to implement a vehicle barrier system to protect the SNF, HLW, and critical security functions. In an effort to continue to protect against potential adversaries that are multi-facetted in their approach, technically savvy, and ever adapting to defensive methodologies, the licensees would be required to evaluate their security program against security performance (adversary) characteristics that are specified by the NRC. Licensees would also be required to establish security hardware systems (e.g., central alarm stations, intrusion detection and monitoring systems, protected area barriers, communication systems, and search and assessment systems) to best address these potential malevolent acts. Licensees would be further required to establish security personnel systems (e.g., controls over access to protected areas and Safeguards Information, fitness for duty programs, and insider

[16] ASTM Standard F2656, 2007, "Standard Test Method for Vehicle Crash Testing of Perimeter Barriers," ASTM International, West Conshocken, PA, 2007, DOI 10.1520/F2656-07, www.astm.org.

mitigation programs) and to plan and coordinate with offsite local law enforcement agency (LLEA) personnel for LLEA responses to security emergencies. Licensees would be required to establish training and qualification programs for security personnel and contingency response programs that are integrated into the licensee's emergency preparedness program.

The proposed regulations would be structured in a manner that addresses significant operational differences between these similar types of facilities (e.g., ISFSIs that are located at reactors, located inside a reactor's protected area, or are located away from any reactors and MRSs), yet achieves consistent security outcomes across this class of licensees. However, differences in some requirements and the NRC's review of the PSPs may be created for licensees implementing a "detect, assess, and communicate" protective strategy, versus those implementing a "denial" strategy. The regulations would also allow for flexibility in where the licensee documents these PSPs. For example, an ISFSI that is collocated at a reactor site could incorporate the ISFSI's PSPs within an appendix of the reactor's PSP, or the ISFSI PSPs could exist as stand alone documents). In either case, the content of the plans would be the same.

The proposed regulations would build upon the current ISFSI security regulations, the NRC staff's accumulation of lessons learned from the last two decades of security inspections, FOF exercises, and review of implementation of security orders; and the NRC's recent final rule revising the power reactor security requirements (74 FR 13926; March 27, 2009). These 'Lessons Learned' do not reside in an integrated staff document. Rather, these are shared issues and concerns raised by NRC staff during the course of inspections, FOF evaluations, and security plan licensing reviews over the last decade. Except where specifically highlighted as a new requirement, it is the NRC's intent to update existing requirements to provide more clarity and detail for the security functional areas. The proposed regulations then, would address the following security performance capabilities and functions:

(1) **Vulnerability Driven Physical Protection Program**

In an effort to conform to a risk-informed and performance-based structure, all references to applying the DBT for radiological sabotage against an ISFSI or MRS (i.e., a threat-based approach) would be removed from regulations in 10 CFR Parts 72 and 73. The basis for this is discussed above. Instead, licensees would be required to use information provided by the NRC from ISFSI and MRS security performance (adversary) characteristics and ISFSI and MRS security scenarios to assess vulnerabilities and to develop physical security programs that prevent and mitigate these vulnerabilities in order to achieve acceptable outcomes. Licensees would not be required to evaluate against aircraft impacts. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(2) **Physical Security Plan**

The licensee would be required to develop, establish, and maintain a PSP for the facility that describes how the security protective strategy will be implemented. The PSP would be required to provide for the integration of security activities, including the response to security emergencies, amongst security, operations, radiation protection, and emergency preparedness personnel. The PSP would describe the functions, composition, and roles and responsibilities for security personnel, security hardware and barriers, and security analyses in

implementing the licensee's protective strategy. The licensee's PSP would address the controls for keys, locks, combinations, and computer systems. ISFSIs collocated with a power reactor, would have the option to integrate the ISFSI's PSP into the reactor's PSP (e.g., as an appendix to the reactor's PSP). Alternatively, the licensee could develop a standalone PSP for the ISFSI. The licensee would also be able to integrate ISFSI security activities and functions with the reactor security activities and functions, as it desired. However, any integration of ISFSI and reactor security activities and functions would not be permitted to have an adverse effect on the security of the reactor (see Item 25 below). While this has been informally allowed in the past, this specific flexibility would be added as a new regulation.

For licensees implementing a "detect, assess and communicate" protective strategy, the PSP would be required to describe the licensee's arrangements, including any associated agreements with their nearby LLEA, explaining the response capabilities and timing, including the numbers of responding LLEA personnel. All existing ISFSI licensees implement a voluntary "detect, assess, and communicate" protective strategy. The PSP would also be required to describe the licensee's roles and responsibilities during LLEA-led take-back and recovery operation. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

For licensees who based upon their analysis and dose calculations choose to use a "denial" protective strategy, such licensees would be required to submit their PSPs to the NRC for prior review and approval. These PSPs would be submitted as part of a license application or a license amendment, irrespective of whether the licensee was using the general or specific license provisions of 10 CFR Part 72. Specific licensees would submit these PSPs as an amendment under the provision of 10 CFR 72.56. General licensees would submit these PSPs as an amendment to the collocated reactor's license under the provisions of 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit." In this context, the PSPs would include the training and qualification plan, and the contingency response plan. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

Based upon the NRC staff's recent experience in completing comprehensive reviews of the security plans for power reactor facilities, the NRC views the complexity of a denial-based PSP, along with the likely need to request additional information, as necessitating an evaluation by the agency's technical security experts in the NRC's Office of Nuclear Security and Incident Response. Consequently, to accomplish such an evaluation requires that a license submit their PSPs to the NRC for prior review and approval.

The NRC's regulations on using a general license to store SNF at an ISFSI do not currently require any site-specific licensing approvals by the NRC. However, under Section 218(a) of the Nuclear Waste Policy Act of 1982 (NWPA), as amended, (42 U.S.C. 10198), Congress directed the Commission to implement by rule the use of dry storage technologies "without, to the maximum extent practicable, the need for additional site-specific approvals by the Commission" (i.e., licensing actions and hearings). Consequently, Section 218(a) of the

NWPA does not prohibit all site-specific licensing actions under the ISFSI general license process. Therefore, the NRC views the prior review and approval of PSPs (which would be considered a site-specific licensing action) as necessary, appropriate, and consistent with the NWPA for the PSPs' of an ISFSI or a MRS facility that chooses to implement a denial-based protective strategy.

(3) **Training and Qualification Plan**

The licensee would be required to develop, establish, and maintain a training and qualification plan for the security forces that describes how the criteria set forth in Appendix B to 10 CFR Part 73 are maintained and trained to. These plans would include routine performance evaluation to validate these measures. These specific areas for evaluation include: assessing and responding to threats, insider mitigation, rules for use of deadly force, weapons training, maintenance of qualifications, and support of LLEA response and recovery activities. Further information on the training of security personnel on the use of deadly force is provided below. This is a requirement under the current regulations for ISFSIs and MRSs.

(4) **Contingency Response Plan**

The licensee would be required to develop, establish, and maintain a security contingency response plan that describes how the security forces would implement the licensee's protective strategy in response to off-normal, abnormal, and emergency security events. The plan would address LLEA interactions and licensee roles and responsibilities in supporting LLEA response and recovery activities. This is a requirement under the current regulations for ISFSIs and MRSs.

(5) **Access Authorization Program**

The licensee would be required to develop, establish, and maintain an access authorization program, including fingerprinting, for access to the protected area of an ISFSI or MRS, or to access to Safeguards Information for these facilities. The purpose scope and implementation of the access authorization program would be described in the PSP or addressed in a stand alone document. Processes for the removal, reinstatement, and revalidation of those individuals granted unescorted access to the ISFSI would be developed and included in the program. This plan would address visitors and procedures for escort and access screening. This is a new requirement that did not previously exist in the NRC's regulations for ISFSIs and MRSs, but was imposed by security orders for ISFSIs.

(6) **Insider Mitigation Program**

The licensee would be required to develop, establish, and maintain an insider mitigation program as part of its access authorization program and physical security program. The insider mitigation program would be required to address passive insiders, active insiders, and active-violent insiders and access to physical security systems and spaces as well as cyber systems that are important to the safety or the security of the ISFSI or MRS facility. This is a new

requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(7) **Vehicle Barrier Systems**

The licensee would be required to complete a blast analysis for land-based and waterborne vehicle bombs. The licensee would be required to deploy a permanent Vehicle Barrier System (VBS) for an ISFSI or MRS facility. The licensee would be required to analyze their facility against both a land-based vehicle bomb assault and any applicable waterborne vehicle bomb assault. The design of the VBS may use natural landform obstacles. A separate analysis for any potential waterborne vulnerability would not be required for facilities where the land-based evaluation envelops the entire facility. The NRC will specify the bomb and vehicle characteristics used in these analyses. The establishment of a VBS is intended to be an integral part of the overall facility's physical protective system. This is a new requirement that did not previously exist in the NRC's regulations for ISFSIs and MRSs, but was imposed by security orders for ISFSIs.

The VBS may use engineered components and landform obstacles to achieve the necessary standoff distance to mitigate any blast or shrapnel effects for necessary components of the facility. The VBS is intended to provide sufficient standoff distance, in any situation, no less than 35 feet, to mitigate against blast and shrapnel effects for the SNF and/or HLW facility and storage containers, the primary and secondary alarm stations, armed response personnel defensive positions (for licensee's implementing a denial protective strategy), and any other equipment necessary for the safety and security of the ISFSI or MRS facility.

For collocated ISFSI facilities where the ISFSI is located outside the reactor facility's Protected Area (PA) (i.e., the ISFSI is in a separate PA), the licensee's blast analysis and VBS, including the use of landform obstacles, would also be required to encompass the pathway used for transferring SNF from the reactor facility to the ISFSI storage area. However, the VBS would not require the use of permanent components (i.e., temporary barriers could be used). For away from reactor ISFSIs or an MRS, the receiving facility and the storage area would be required to be located with a PA that protected by an appropriate VBS or landform obstacles.

VBS systems would be required to permit the passage of authorized personnel, equipment, and vehicles into the ISFSI or MRS and could use remotely operated or manual mechanisms to permit the passage of equipment and vehicles into the ISFSI or MRS. Licensees would be required to meet an international consensus technical standard for VBS hardware under ASTM Standard F2656-07 for the bomb and vehicle characteristics specified by the NRC. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(8) **Physical Barrier Systems**

The licensee would be required to develop, establish, and maintain two physical barriers for their facility, including the design, use, and construction of any normal and alternate personnel and equipment access points. One barrier would

be the Protected Area (PA) barrier. The second barrier would consist of the cask, storage vault, or storage pool walls. The descriptions of the first (i.e., PA) physical barriers would continue to address components, such as barrier fencing, isolation zones, intrusion detection systems, assessment and monitoring systems, bullet resisting barriers for occupied personnel areas, illumination requirements for assessment and observation, or the use of night capable observation systems that would meet the specific requirements equivalent to the Commission's recent final rule in10 CFR 73.55(c)(5). Licensees may use visible or non-visible spectrum (e.g. infra-red) illumination systems provided that the guards possess the necessary equipment to assess the facility remotely and locally in response to alarms. The PA barrier systems are integrated with the detection and assessment systems and would also be required to provide for access and inspection portals for both personnel and equipment. For the second barrier, the licensee would describe the nature and composition of the second barrier. Note, this second barrier is not the VBS system mentioned in item 7 above. This is a requirement under the current regulations for ISFSIs and MRSs.

(9) **Intrusion detection systems**

The licensee would be required to develop, establish, and maintain intrusion detection systems (IDS) as part of its PA barrier. These systems would also be required to be supervisory alarmed and tamper indicating. The licensee's plans would describe the necessary calibration and testing requirements that are necessary to achieve the required sensitivity in detecting intrusions. The description would also include interfaces with the alarms stations, assessment and monitoring systems, and video capture systems. This is a requirement under the current regulations for ISFSIs and MRSs.

(10) **Video Capture**

The licensee would be required to monitor the isolation zones of the PA barrier with intrusion detection equipment that is capable of detecting both attempted and actual penetration of the PA perimeter. The licensee would be required to use assessment equipment (for monitoring the PA isolation zones) that is capable of providing real-time and play-back/recorded video images of the detection activities before and after each isolation zone alarm annunciation. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(11) **Access Points and Search Equipment**

The licensee would be required to develop, establish, and maintain process and procedures for searching personnel, equipment, and vehicles that enter a PA for contraband, firearms, ammunition, and explosives. This would include the use of explosive and metal detectors. The licensee would be required to describe the methodology, items to be searched for, training requirements, personnel involved in search, search equipment capabilities and requirements, and remote monitoring of search areas and activities by video surveillance. The licensee would also be able to use physical searches, in lieu of detection equipment, if individuals had been previously searched, for example an ISFSI that is located

separate from a reactor facility could rely upon security systems for entry into the reactor protected area to accomplish the initial search of an individual. This is a requirement under the current regulations for ISFSIs and MRSs.

(12) **Alarm Station Capabilities**

The licensee would be required to develop, establish, and maintain alarm stations for security personnel to monitor the facility; assess normal, off-normal, and emergency security events; communicate with security personnel, LLEA contacts, and other components of a collocated facility's personnel (e.g., operations, maintenance, and emergency response organizations); and exercise command and control over security personnel in any response to security events. The licensee would be required to have two alarm stations that are redundant and independent and not susceptible to single-node failures. The licensee would continue to be required to have a central alarm station (CAS) and a secondary alarm station (SAS). The CAS would be required to be located at the facility and would be required to be located with in a protected area with bullet resisting barriers. However, the CAS would not be required to be located inside the SNF or HLW storage areas (i.e., the CAS would not be required to be located within a radiation area). The SAS would be permitted to be remotely located from the facility and could monitor more than one SNF and HLW storage facility. This is a requirement under the current regulations for ISFSIs and MRSs.

(13) **Redundant Communications Equipment Capabilities**

The licensee would be required to develop, establish, and maintain communications for the Security Force that would provide a redundant means of communication between security personnel, the CAS and/or SAS, as well as between the CAS and the SAS. Acceptable communication methods between sources could consider cellular phones, land line phones, hand held and fixed station radio systems, as well as any real time communications system available and utilized by the licensee. The licensee's system would be required take into account any onsite and offsite power and communication resources to ensure effective command and control during normal, abnormal, and emergency events. This is a requirement under the current regulations for ISFSIs and MRSs.

(14) **Independent Power Systems**

Under this new requirement, the licensee would be required to establish, and maintain independent power sources in the event of the loss of normal power. Examples of security systems for consideration include non-portable communications, alarm systems, and any emergency response equipment deemed necessary through appropriate analysis by the licensee. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(i)(5). This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(15) **Single Node Failures**

The licensee would be required to ensure the operability of those systems necessary for the security of the facility are not disrupted by the destruction of, or damage to, a single node by either a security threat or natural phenomena. Licensees would use a performance-based approach to achieve redundant and diverse systems that are not subject to single-node failures. Security engineered design features may also be used to protect a single-node vulnerability to achieve this objective. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(16) **Force-on-Force Security Evaluations**

The NRC staff is not proposing that the Commission consider any class of SNF or HLW storage facility licensed under 10 CFR Part 72 as appropriate, for conducting NRC evaluated force on force exercises.

In evaluating the nature of the risks from SNF and HLW storage facilities, the nature and mechanism of the potential releases of radioactive material from acts of sabotage against an ISFSI or MRS, the potential responses from security personnel to such acts, and the costs and risks of such exercises, the NRC does not see sufficient value in conducting NRC-evaluated FOF exercises for ISFSI and MRS facilities to outweigh the potential costs and safety risks associated with FOF exercises.

However, the proposed rule would require licensees implementing a denial protective strategy, as part of their quality assurance program, to conduct their own performance evaluations for their security personnel protecting an ISFSI or MRS. This would be similar to that recently approved by the Commission for power reactors under Section VI.C.3 of Appendix B to Part 73. For ISFSIs located at a reactor facility, such licensee FOF evaluations of the ISFSI facility may be integrated with the licensee FOF evaluations of the reactor facility's security performance. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(17) **Deadly Force Training**

The licensee would be required to develop, establish, and maintain training for armed security personnel on applicable State restrictions on the use of force, up to and including the use of deadly force. Such training would be part of a licensee's training and qualification plan for armed security personnel. Licensees would also be required to retrain armed security personnel on such restrictions annually. Licensees collocated at a reactor site would be able to integrate armed ISFSI security personnel's training with armed reactor security personnel's training, in lieu of establishing a separate program. This is a requirement under the current regulations for ISFSIs and MRSs.

(18) **Suspension of Security Measures**

Licensees would be permitted to suspend certain security measures during exigent or emergency situations, e.g., suspend roving patrols during hazardous

situations, such as flooding, hurricanes, or tornados. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(p). This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(19) **Alternative Measures**

Licensees would be permitted to propose alternative security measures to the NRC from those established by these proposed regulations, provided these alternative measures meet the same performance objectives and requirements specified in these proposed regulations. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(r). This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(20) **Records**

Licensees would be required to maintain records of security activities and make them available to the Commission for inspection, copy, and removal. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(q). This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(21) **Compensatory Measures**

Licensees would be required to identify criteria and measures to compensate for degraded or inoperable equipment, systems, and components that are necessary to meet these proposed requirements. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(o). This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(22) **Maintenance, Testing, and Calibration**

Licensees would be required to establish, maintain, and implement a maintenance, testing and calibration program to ensure that security systems and equipment are tested for operability and performance at predetermined intervals, maintained in operable condition, and are capable of performing their intended functions. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(n). This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(23) **Security Program Reviews**

Licensees would be required to periodically review each element of their security program. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(m).

This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(24) **Key Facility Security and Emergency Response Information**

Licensees would be required to provide descriptive information on their facility that would be used by the NRC to rapidly evaluate the potential impacts upon SNF and HLW storage facilities resulting from rapid changes to the threat environment. The NRC intends to integrate this information into a database that would be available to decision makers in the NRC's Headquarters Operations Center and to Headquarters and Regional security staff. This would include:

Distance from the storage facility to the controlled area boundary;
Distance from the storage facility to the site boundary;
Facility location (latitude and longitude);
Type of facility (pool, dry vault, horizontal or vertical dry storage casks, etc.);
For dry storage casks, the number and type of casks used; and
The protective strategy used.
.

Existing licensees would provide this information to the NRC within 90 days of the effective date of a final rule. New licensees would provide this information to the NRC at the time of commencement of initial operation of their facility. All licensees would provide updated information annually to the NRC (by January 15 of each year) to address the previous calendar year or to indicate no changes from their previous submittal.

Currently this information is sent to the NRC piecemeal manner, or is available onsite in licensee records. The NRC recognizes that the submission of this information is a new reporting burden; however, the NRC's initial estimate of 20 staff hours per licensee per year is not considered a significant impact. This is a new requirement that did not previously exist in the NRC's regulations or security orders for ISFSIs and MRSs.

(25) **Armed Security Officers and Armed Responders**

Licensees would be required to determine the number of armed security officers necessary to implement the protective strategy that is necessary to defend against the security scenarios and security performance (adversary) characteristics specified by the NRC. The minimum number of armed security officers would be specified in the licensee's security plans. Of these armed security officers, a minimum of two individuals must be available to assess conditions at the ISFSI or MRS and evaluate alarms (in order for the licensee to accomplish a "detect, assess, and communicate" protective strategy); and to provide access control at a collocated ISFSI that does not have a dedicated access control facility. For an ISFSI collocated with a power reactor, these two individuals may not also serve as armed responders for the power reactor facility's security plan (i.e., security personnel may not be double counted (credited as able to respond) in physically separated facilities).

Licensees implementing a “denial” protective strategy would also be required to determine the number of armed responders necessary to implement the protective strategy that is necessary to defend against the security scenarios and security performance (adversary) characteristics specified by the NRC to interdict and neutralize the NRC specified adversaries. The minimum number of armed responders would be specified in the licensee’s security plans. This provision would be similar to language recently approved by the Commission in the final power reactor security rule under 10 CFR 73.55(k). These are new requirements that did not previously exist in the NRC’s regulations for ISFSIs and MRSs.

(26) **Effective Date and Compliance Date**

The NRC would propose that a final rule on these ISFSI and MRS regulations take effect 30 days after its publication in the *Federal Register*. However, existing licensees would have one (1) year from the effective date of the final rule to complete required analyses, design and develop necessary solutions, and, if necessary, submit any revised security plans to the NRC. Licensees would then have six (6) additional months for implementation and to achieve full compliance with the final rule.

The NRC recognizes that implementing these new provisions is not simple and would provide this time to allow for licensees to complete required engineering analyses; procure and install any new security equipment; revise security, operations, and maintenance procedures; and train affected personnel.

Licensees who choose to implement a denial strategy would be required to submit their plans and analyses to the NRC for prior review and approval within one year, to achieve timely submission objectives. Licensees would continue under their current security plans until NRC approval is received and they would be deemed to be in compliance with these requirements.