U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

13.6.2 PHYSICAL SECURITY—DESIGN CERTIFICATION

REVIEW RESPONSIBILITIES

Primary - Organization responsible for the review of physical security

Secondary - None

I. AREAS OF REVIEW

The review of design certification (DC) applications involves the evaluation of the physical security systems, components, and measures (hereafter referred to as "physical security elements") identified to be within the scope of an applicant's design. The review must include the physical security elements within the physical design of the power reactor and supporting systems that are included in the DC application and may also include a review of the voluntarily submitted physical security elements.

The review should encompass the material intended to meet the general performance objective as described in Title 10 of the *Code of Federal Regulations* (CFR), Paragraph 73.55(b) as well as guidance provided in U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

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For a DC application, the review will also address combined license (COL) action items and requirements and restrictions (e.g., interface requirements and site parameters).

The physical security elements that are required within the review of a DC application are the elements that, because of their inherent nature, are included within the physical design of the power reactor and supporting systems. These physical security elements are usually designed, located, and constructed to directly support the protection of equipment essential to the safe operation of the power reactor.

As applicable, the review of the DC application would also include other physical security elements included within the physical design of the power reactor and supporting systems (e.g., the central alarm station (CAS), the secondary alarm station (SAS), and bullet-resistant enclosures).

The NRC considers physical security elements that are not within the physical design of the power reactor and supporting systems, but are included within a DC application to be voluntarily submitted physical security elements. The DC application review will include these physical security elements even though they are voluntarily submitted.

During the review, the reviewer should gain an understanding of the physical security elements that are included in the physical design of the power reactor and supporting systems. At a minimum, the DC application must address the physical security elements that are included in the physical design of the power reactor and supporting systems and describe how the regulatory requirements associated with these elements are met.

The following tables list the physical security elements that are required within the review of a DC application and a sample of physical security elements that the applicant may voluntarily submit for review.

The physical security elements that are required within the review of a DC application include, but are not limited to, the elements listed in Table 1.

Table 1 - Physical Security Elements Required within the Review of a DC Application

Element Number	Description	Requirement
1	Identify vital areas within the physical design and provide a list of vital equipment, by component and location, in vital areas.	10 CFR 73.55(e)(9)
2	Identify that the control room and spent fuel pool are within a vital area.	10 CFR 73.55(e)(9)
3	Provide a design description that confirms the bullet-resistant design of the control room.	10 CFR 73.55(e)(5)
4	Provide a design description of the physical barriers that protect vital areas (e.g., walls, ceilings, floors, doors, and gratings that comply with the definition of physical barrier provided in 10 CFR 73.2,	10 CFR 73.2 10 CFR 73.55(e)

Element Number	Description	Requirement
	"Definitions"), and describe how these barriers meet the applicable requirements of 10 CFR 73.55(e).	
5	Provide a design description (consistent with the stated function of the barrier) that confirms that openings in any barrier or barrier system established to meet the requirements of 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors against Radiological Sabotage," are secured and monitored to prevent the exploitation of the opening.	10 CFR 73.55(e)(4)
6	Provide a design description that confirms that all vital area portals and emergency exits are equipped with intrusion detection equipment and locking devices that allow for rapid egress during an emergency and that satisfy the vital area access requirements of 10 CFR 73.55.	10 CFR 73.55(e)(9)(ii)
7	Provide a design description that confirms that all unoccupied vital areas are locked and alarmed.	10 CFR 73.55(e)(9)(iii)
8	Include provisions for addressing the inspections, tests, analyses, and acceptance criteria (ITAAC) for those features within the scope of the design.	10 CFR 52.97(a)(2) 10 CFR 52.103(g) The physical security elements, required by regulations or portions of those elements or both, that the DC applicant has not resolved must be identified as COL action items.

The voluntary physical security elements of the review may consist of, but are not limited to, the elements listed in Table 2.

Table 2 - Voluntary Physical Security Elements

Element Number	Description	Requirement
1	Identify vital areas that are not within the physical design of the power reactor and provide a list of vital equipment, by component and location, in vital areas.	10 CFR 73.55(e)(9)
2	Identify that the CAS, the SAS, and the secondary power supply (for alarm annunciation equipment and nonportable communications) are within a vital area.	10 CFR 73.55(e)(9) 10 CFR 73.55(i)(4)(iii)

Element Number	Description	Requirement
3	Provide a design description that confirms the bullet-resistant design of the CAS, the SAS, and the location that performs the last access control function for access to the protected area.	10 CFR 73.55(e)(5)
4	Provide a design description for the CAS and the SAS that confirms that both alarm stations are designed and equipped to ensure that a single act, in accordance with the definition of the design-basis threat of radiological sabotage provided in 10 CFR 73.1(a)(1), cannot disable both alarm stations and that the survivability of at least one alarm station is ensured to maintain the facility's ability (1) to detect and assess alarms, (2) to initiate and coordinate an adequate response, (3) to summon offsite assistance, and (4) to provide command and control.	10 CFR 73.55(i)(4)(i)
5	Provide a design description for the CAS and SAS that confirms that both alarm stations are constructed, located, protected, and equipped to the standards of the CAS and that both alarm stations are equal and redundant such that all functions needed to satisfy the requirements of 10 CFR 73.55(i) can be performed in both alarm stations.	10 CFR 73.55(i)(4)(iii)
6	Provide a design description of the physical barriers that protect vital areas (e.g., walls, ceilings, floors, doors, and gratings in accordance with the definition of physical barrier provided in 10 CFR 73.2) that are not within the scope of the physical design, and describe how these barriers meet the applicable requirements of 10 CFR 73.55(e).	10 CFR 73.2 10 CFR 73.55(e)
7	Provide a design description that confirms that access to vital equipment requires passage through at least two physical barriers.	10 CFR 73.55(e)(9)
8	Provide a design description that confirms that vital area barriers are separated from the protected area barrier.	10 CFR 73.55(e)(8)(C)
9	Provide a design description (consistent with the stated function of the barrier) that confirms that openings in any barrier or barrier system established to meet the requirements of 10 CFR 73.55 are secured and monitored to prevent the exploitation of the opening.	10 CFR 73.55(e)(4)

Element Number	Description	Requirement
10	Provide a design description that confirms that all vital area portals and emergency exits associated with vital areas that are not within the scope of the physical design are equipped with intrusion detection equipment and locking devices that allow for rapid egress during an emergency and that satisfy the vital area access requirements of 10 CFR 73.55.	10 CFR 73.55(e)(9)
11	Provide a design description that confirms that all unoccupied vital areas that are not within the scope of the physical design are locked and alarmed.	10 CFR 73.55(e)(9)
12	Provide the identification of locks used for the protection of the facility and special nuclear material as resistant to manipulation.	10 CFR 73.2
13	Provide a design description of the physical barrier(s) that comprises the protected area barrier and describe how the barrier(s) meets the applicable requirements of 10 CFR 73.55(e).	10 CFR 73.2 10 CFR 73.55(e)
14	Provide a design description that confirms that penetrations through the protected area barrier are secured and monitored to prevent exploitation.	10 CFR 73.55(e)(8)(ii)
15	Provide a design description that confirms that unattended openings that intersect a security boundary such as underground pathways are protected by a physical barrier and monitored by intrusion detection equipment or observed by security personnel at a frequency sufficient to detect exploitation.	10 CFR 73.55(i)(5)(iii)
16	Provide a design description of the isolation zone that confirms that an isolation zone is maintained in outdoor areas adjacent to the protected area perimeter barrier and that the size of the isolation zone permits observation on either side of the barrier. The description should also affirm that the isolation zone is monitored with intrusion detection and assessment equipment that can detect both the attempted and actual penetration of the protected area barrier before the penetration is completed and can provide real-time and playback/recorded video images of the detected activity before and after each alarm annunciation.	10 CFR 73.55(e)(7)(i) 10 CFR 73.55(e)(7)(i)(A) 10 CFR 73.55(e)(7)(i)(B) 10 CFR 73.55(e)(7)(i)(C)
17	Provide a design description for the intrusion detection and assessment systems that confirms that the systems can meet the performance criteria of the	10 CFR 73.55(i)

Element Number	Description	Requirement
	requirements of 10 CFR 73.55(i).	
18	Provide a design description that confirms that the intrusion detection and assessment equipment at the protected area perimeter remains operable from an uninterruptible power supply (UPS) in the event of the loss of normal power.	10 CFR 73.55(i)(3)(vii)
19	Provide a design description that confirms that measures have been established that limit the exposure of security personnel to possible attack, including the incorporation of bullet-resisting protected positions.	Appendix C(II) (B)(3)(c)(v)(3) to 10 CFR Part 73, "Nuclear Power Plant Safeguards Contingency Plans"
20	Identify target sets by providing a list of equipment or components, the location of the equipment or components, and a functional description of the equipment or components that comprise target sets.	10 CFR 73.55(f)
21	Include provisions for addressing the ITAAC for those features that are **not** within the scope of the design.	10 CFR 52.97(a)(2) 10 CFR 52.103(g) The physical security elements, required by regulations or portions of those elements or both, that the DC applicant has not resolved must be identified as COL action items.

Review Interfaces

Other Standard Review Plan (SRP) sections interface with this section as follows:

1. NUREG-0800, Chapter 14, "Initial Test Program and ITAAC-Design Certification," Section 14.3.12, "Physical Security Hardware—Inspections, Tests, Analyses, and Acceptance Criteria," (PS-ITAAC).

2. NUREG-0800, Chapter 13, "Conduct of Operations," Section 13.6.1, "Physical Security—Combined License and Operating Reactor."

3. NUREG-0800, Chapter 13, Section 13.6.3, "Physical Security—Early Site Permit."

The specific acceptance criteria and review procedures are contained in the referenced SRP sections.

II. ACCEPTANCE CRITERIA

Requirements

Acceptance criteria are based on meeting the relevant requirements of the following Commission regulations:

1. 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities.”

2. 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants.”

3. 10 CFR 73.1(a)(1), “Purpose and Scope”, “Radiological Sabotage.”

4. 10 CFR 73.2, “Definitions.”

5. 10 CFR 73.55 and Appendix B, “General Criteria for Security Personnel,” Appendix C, “Nuclear Power Plant Safeguards Contingency Plans,” Appendix G, “Reportable Safeguards Events,” and Appendix H, “Weapons Qualification Criteria,” to 10 CFR Part 73.

6. 10 CFR Part 74, “Material Control and Accounting of Special Nuclear Material.”

7. 10 CFR 73.70(f), “Records.”

8. 10 CFR 100.21(f), "Non-seismic siting criteria.”

Regulatory guidance documents that may be applicable are as follows:

1. RG 1.70, “Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition).”

2. RG 1.91, “Evaluations of Explosions Postulated to Occur on Transportation Routes near Nuclear Power Plants.”

3. RG 4.7, “General Site Suitability Criteria for Nuclear Power Stations.”

4. RG 5.7, “Entry/Exit Control for Protected Areas, Vital Areas, and Material Access Areas.”

5. RG 5.12, “General Use of Locks in the Protection and Control of Facilities and Special Nuclear Materials.”

6. RG 5.44, “Perimeter Intrusion Alarm Systems.”

7. RG 5.54, “Standard Format and Content of Safeguards Contingency Plans for Nuclear Power Plants.”

8. RG 5.65, “Vital Area Access Controls, Protection of Physical Security Equipment, and Key and Lock Controls.”

9. RG 5.66, “Access Authorization Program for Nuclear Power Plants,” Revision 0, June 1991.

10. RG 5.68, “Protection against Malevolent Use of a Vehicle at Nuclear Power Plants.”

11. RG 5.69, “Guidance for the Application of the Radiological Sabotage Design-Basis Threat in the Design, Development, and Implementation of a Physical Security Program That Meets 10 CFR 73.55 Requirements (Safeguards).”

12. RG 5.74, “Managing the Safety/Security Interface.”

13. RG 5.75, “Training and Qualification of Security Personnel at Nuclear Power Reactor Facilities.”

14. RG 5.76, “Physical Protection Programs at Nuclear Power Reactors.”

15. RG 5.77, “Insider Mitigation Program.”

SRP Acceptance Criteria

Specific SRP acceptance criteria that the NRC finds acceptable for meeting the relevant requirements of the agency’s regulations identified above are listed below for the review described in this SRP section. The SRP is not a substitute for the NRC’s regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide acceptable methods of compliance with NRC regulations.

1. 10 CFR 73.55(e). Physical barriers must be designed and constructed to protect against the design-basis threat of radiological sabotage; account for site-specific conditions; perform their required function in support of the licensee physical protection program; provide deterrence, delay, or support access control; and support the effective implementation of the licensee’s protective strategy. Consistent with the stated function to be performed, openings in any barrier or barrier system must be secured and monitored to prevent exploitation of the opening. The reactor control room; the CAS; the location within which the last access control function for access to the protected area is performed; and, in accordance with 10 CFR 73.55(i)(4)(iii), the SAS must be bullet resisting. The protected area perimeter barrier must be designed and constructed to be separated from any other barrier designated as a vital area physical barrier. Penetrations through the protected area barrier must be secured and monitored in a manner that prevents or delays and detects the exploitation of any penetration. Vital equipment must be located only within vital areas, which must be located within a protected area so that access to vital equipment requires passage through at least two physical barriers except as otherwise approved by the Commission and identified in security plans. The licensee shall protect all vital area access portals and vital area emergency exits with intrusion detection equipment and locking devices that allow for rapid egress during an emergency and that satisfy the vital area entry control requirements of 10 CFR 73.55. Unoccupied vital areas must be locked and alarmed. At a minimum, the reactor control room; spent fuel pool; the CAS; and, in accordance with 10 CFR 73.55(i)(4)(iii), the SAS shall be considered vital areas. At a minimum, the

secondary power supply systems for alarm annunciation equipment and the secondary power supply systems for non-portable communications equipment shall be located in a vital area.

2. 10 CFR 73.55(g). Consistent with the function of each barrier or barrier system, personnel, vehicles, and material access shall be controlled, as applicable, at each access control point in accordance with the physical protection program design requirements of 10 CFR 73.55(b). Access control portals shall be located outside of, or concurrent with, the physical barrier system through which access is controlled. Access control portals shall be equipped with locking devices, intrusion detection equipment, and surveillance equipment consistent with their intended function. Access control systems shall be designed to accommodate the potential need for rapid ingress or egress of authorized individuals during emergency conditions or situations that could lead to emergency conditions.

3. 10 CFR 73.55(i). Intrusion detection and assessment systems must be established and maintained to satisfy the design requirements of 10 CFR 73.55(b) and to provide, at all times, the capability to detect and assess unauthorized persons and facilitate the effective implementation of the licensee's protective strategy. Intrusion detection equipment must annunciate, and video assessment equipment shall display concurrently, in at least two continuously staffed onsite alarm stations. Intrusion detection and assessment systems must be designed to provide visual and audible annunciation of the alarm, ensure that annunciation of an alarm indicates the type and location of the alarm, ensure that alarm devices that include transmission lines to annunciators are tamper indicating and self-checking, and provide an automatic indication when the alarm system or a component of the alarm system fails or when the system is operating on the backup power supply. Intrusion detection and assessment equipment at the protected area perimeter must remain operable from a UPS in the event of the loss of normal power. Both alarm stations must be designed and equipped to ensure that a single act, in accordance with the definition of design-basis threat of radiological sabotage provided in 10 CFR 73.1(a)(1), cannot disable both alarm stations. The survivability of at least one alarm station shall be ensured to maintain the facility's ability to detect and assess alarms, initiate and coordinate an adequate response to an alarm, summon offsite assistance, and provide command and control. The CAS shall be located inside a protected area. The interior of the CAS must not be visible from the perimeter of the protected area. Applicants for an operating license under the provisions of 10 CFR Part 50 or holders of a COL under the provisions of 10 CFR Part 52 shall construct, locate, protect, and equip both the CAS and the SAS to the standards for the CAS. Both alarm stations shall be equal and redundant such that all functions needed to satisfy the requirements of 10 CFR 73.55 can be performed in both alarm stations.

4. 10 CFR 73.55(j). Both alarm stations must be equipped with radio or microwave-transmitted two-way voice communication, either directly or through an intermediary, in addition to conventional telephone service between local law enforcement authorities and the site and a system for communication with the control room. Non-portable communication equipment must remain operable from independent power sources in the event of the loss of normal power.

Technical Rationale

The technical rationale for application of these acceptance criteria to the areas of review addressed by this SRP section is discussed in the following sections and paragraphs:

1. 10 CFR 73.1(a)(1) establishes the description of the design-basis threat for radiological sabotage.

2. 10 CFR 73.2 establishes definitions for terminology used in this part of the regulation and also contains specific criteria for physical protection elements required in 10 CFR Part 73.

3. 10 CFR 73.55 establishes the detailed requirements for development and implementation of a physical security program that will have as its objective to provide high assurance in protecting against the design-basis threat of radiological sabotage.

4. 10 CFR 73.70(f) establishes the required records and reports of the site security alarm system.

5. 10 CFR Part 74 establishes material control and accounting requirements of special nuclear material.

6. 10 CFR 100.21(f) requires site characteristics to be such that adequate security plans and measures can be developed.

III. REVIEW PROCEDURES

The reviewer will select material from the procedures described below, as may be appropriate for a particular case.

These review procedures are based on the identified SRP acceptance criteria. For deviations from these acceptance criteria, the staff should review the applicant's evaluation of how the proposed alternatives provide an acceptable method for complying with the relevant NRC requirements identified in Subsection II.

For DC reviews, the reviewer should carefully examine the information submitted and compare it against the acceptance criteria as described in Subsection II. If the applicant chooses to provide only the minimum required information, the reviewer will review the application to determine if sufficient information exists to formulate a positive determination.

If the reviewer determines that the application contains insufficient information to make a positive determination, then the reviewer should identify those issues that he or she has deemed unresolved and that a future applicant that herein references the specific design will need to further address.

The physical security elements that the DC applicant has partially met or has not addressed should be described in such a manner that a COL applicant would be able to address them during the COL licensing process. For those physical security elements that the DC applicant has partially met, the applicant should explicitly identify which part of the requirement it has met

and which part of the requirement the COL applicant will be required to meet, referencing the design. Physical security elements that are required by regulations or portions of those elements or both that the DC applicant has not resolved must be identified as COL action items.

The following are required elements:

1. Text and figures (D-size drawings) must identify and depict vital areas that are within the physical design of the power reactor with adequate visual clarity to allow for review. Vital equipment must be listed by component and identified by location within vital areas.

2. Descriptive text and figures must identify and depict the control room and spent fuel pool as located within a vital area.

3. A design description of the control room must identify that the materials for the physical barriers (e.g., walls, floors, ceiling, and doors) that protect the control room will be bullet-resisting and are specified to be, at a minimum, as identified in RG 5.76 "Physical Protection Programs at Nuclear Power Reactors," Paragraph 4.6.2. A specification of greater bullet resistance is acceptable.

4. A design description of vital areas must identify that the materials used for vital area physical barriers (e.g., walls, floors, ceiling, and doors) comply with the definition of physical barriers provided in 10 CFR 73.2.

5. A description must identify the physical barriers that are used to protect openings in a vital area physical barrier (e.g., vital area ventilation ducts and water drainage grates). This description must identify how the facility will secure and monitor the physical barriers used to protect an opening in a vital area barrier to prevent exploitation and whether these barriers meet the criteria provided in 10 CFR 73.2 for barriers that protect openings in a physical barrier system.

6. A design description of vital area portals and vital area emergency exits (e.g., entrance and exit doors) must demonstrate that the materials of the physical barrier at the portals and emergency exits are consistent with those identified in the definition of physical barriers provided in 10 CFR 73.2. The description must also address the access control equipment and locking devices that allow for rapid egress by means of portals and emergency exits and that meet the vital area access requirements of 10 CFR 73.55. The description must identify access points for vital areas by type (e.g., personnel, vehicle, and equipment) and location. Text and figures (D-size drawing with adequate visual clarity) must describe and depict the locations of vital area access points.

7. A description must identify that all unoccupied vital areas will be locked and alarmed. The description must include the type of detection aids (e.g., balanced magnetic switch) and locking devices (e.g., magnetic lock) used at the access control portals of vital areas. The description must identify other associated access control equipment (e.g., key card and biometric device) for each access control point.

8. Provisions must be included to address ITAAC for ITAAC-related physical security elements that are within the scope of the physical design of the power reactor and supporting systems. Adequate design information must be provided for those ITAAC-related elements within the scope of the design. COL action items must be identified for

those ITAAC-related elements within the scope of the design that are partially addressed.

The following are voluntary elements:

1. Text and figures (D-size drawings) should identify and depict vital area(s) that are **not** within the physical design of the power reactor with adequate visual clarity to allow for review. Vital equipment should be listed by component and identified by location within vital areas.

2. A description should identify that the CAS, the SAS, and the secondary power supply for alarm annunciation and non-portable communication equipment are located within a vital area. The description of the CAS and SAS should indicate whether the specific alarm station is a stand-alone building or structure that is designed and protected as a vital area or whether the specific alarm station is co-located within a vital area that was designed to protect other vital equipment.

3. A description of the CAS, the SAS, and the location that performs the last access control function should identify that the materials for the physical barriers (e.g., walls, floors, ceiling, and doors) that protect these locations will be bullet resisting and are specified to be, at a minimum, as identified in RG 5.76 “Physical Protection Programs at Nuclear Power Reactors,” Paragraph 4.6.2. A specification of greater bullet resistance is acceptable.

4. A design description of the CAS and SAS should demonstrate that both alarm stations are designed and equipped to ensure that a single act, in accordance with the definition of design-basis threat of radiological sabotage provided in 10 CFR 73.1(a)(1), cannot disable both alarm stations and that the survivability of at least one alarm station is ensured to maintain the facility’s ability to detect and assess alarms, initiate and coordinate an adequate response, summon offsite assistance, and provide command and control. The description should include site-specific information such as the identification and location of equipment essential to alarm station functions in relation to physical protection features that provide the equipment protection from a single act (e.g., protected or vital area barriers) and should describe the equipment configuration that demonstrates alarm station redundancy that ensures the ability of at least one alarm station to continue to provide the required functions after the loss of the other alarm station.

5. A design description of the CAS and SAS should demonstrate that both alarm stations are constructed, located, protected, and equipped to the standards of the CAS and that both alarm stations are equal and redundant such that all functions needed to satisfy the requirements of 10 CFR 73.55(i) can be performed in both alarm stations. The description should identify that both alarm stations are located inside the protected area, are protected as vital areas, and are equipped to ensure that both alarm stations maintain the same operational capabilities.

6. A design description of vital areas that are **not** within the physical design of the power reactor should identify that the materials used for vital area physical barriers (e.g., walls, floors, ceiling, and doors) comply with the definition of physical barriers provided in 10 CFR 73.2.

7. A design description should demonstrate that access to vital equipment requires passage through at least two physical barriers. The description may identify the protected area barrier as one of these physical barriers and the vital area barrier as the second.

8. A design description should demonstrate that vital area barriers are separated from the protected area barrier.

9. A description should identify the physical barriers that are used to protect openings in a physical barrier system (e.g., gate access in the protected area barrier fence, an opening through the vehicle barrier system, and openings in vital area barriers that are **not** within the physical design of the power reactor). The description should address how the facility will secure and monitor the barriers to prevent exploitation and whether the barrier meets the criteria identified in 10 CFR 73.2 for barriers that protect openings in a physical barrier system.

10. A design description of vital area portals and vital area emergency exits (e.g., doors) **not** within the physical design of the power reactor and supporting systems should demonstrate that the materials of the physical barriers at the portals and emergency exits are consistent with those identified in the definition of physical barriers provided in 10 CFR 73.2. The description should also address the access control equipment and locking devices that allow for rapid egress by means of the portals and emergency exits and that meet the vital area access requirements of 10 CFR 73.55. The description should identify access points for vital areas by type (e.g., personnel, vehicle, and equipment) and location. Text and figures (D-size drawing with adequate visual clarity) should describe and depict the locations of vital area access points.

11. A description should identify that all unoccupied vital areas (**not** within the physical design of the power reactor) will be locked and alarmed. The description should include the type of detection aids (e.g., balanced magnetic switch) and locking devices (e.g., magnetic lock) used at the access control portals of vital areas. The description should provide other associated access control equipment (e.g., key card and biometric device) for each access control point.

12. A description should identify locks that are used for the protection of the facility and special nuclear material by location and function. The description should distinguish all locks identified for the protection of the facility and special nuclear material as possessing the applicable characteristics in accordance with the definition of locks provided in 10 CFR 73.2.

13. A design description of the physical barrier(s) comprising the protected area barrier (e.g., a fence constructed of No. 11 American wire gauge or a heavier wire fabric and building walls that comply with the definition of physical barriers provided in 10 CFR 73.2) should address how the barrier(s) meets the applicable requirements of 10 CFR 73.55(e). For example, physical barriers are designed and constructed to protect against the design-basis threat of radiological sabotage, provide deterrence, delay or support access control, and support the effective implementation of the protective strategy.

14. A design description should address the methodology used to secure (e.g., the lock on an access gate) and monitor (e.g., intrusion detection system or surveillance by a member of the security organization) penetrations through the protected area barrier that prevents or delays and detects the exploitation of the penetrations. The description should address those penetrations that perform an intended function within the protected area perimeter barrier itself (e.g., access gates within the protected area fence that provide access to the isolation zone and associated intrusion detection equipment). The description provided may identify the protected area perimeter intrusion detection and assessment equipment as the methodology used to monitor penetrations within the actual protected area perimeter barrier.

15. A description should address the methodology used to protect unattended openings such as underground pathways that intersect a security boundary. The description should include the type(s) of physical barriers used to protect the pathways and the type of monitoring (intrusion detection or observation at a frequency sufficient to detect exploitation) implemented. The description should address all barriers and monitoring methodologies for unattended openings that the site implements.

16. A description of the isolation zone design should address the requirements for the isolation zone to be located in outdoor areas adjacent to the protected area perimeter barrier and to permit observation on either side of the protected area barrier. The description should also include the intrusion detection and assessment equipment that monitors the isolation zone and the isolation zone configuration that provides the capability to detect both attempted and actual penetration of the protected area barrier before the penetration is completed and that provides real-time and playback/recorded video images of detected activities before and after each alarm annunciation.

17. A description of the intrusion detection and assessment systems should identify that the systems can provide alarm annunciation and video assessment concurrently in two continuously manned alarm stations, provide visual and audible annunciation of alarms, provide a visual display from which the assessment of a detected activity can be made, provide an alarm annunciation that indicates the type and location of the alarm, provide tamper indication and the self-checking of alarm devices and transmission lines to annunciators, and support the initiation of a timely response.

18. A description should identify that the intrusion detection and assessment equipment that the licensee requires for detection and assessment at the protected area perimeter remains operable from a UPS during the loss of normal power. This description may include protected area perimeter lighting used as an assessment component or a form of low-light technology that augments lighting for assessment during the loss of normal power, as applicable.

19. A description should address the measures (e.g., bullet-resisting enclosures and protected positions) that limit the exposure of security personnel to attack. The description should include the bullet-resisting capabilities of these enclosures or positions as specified. At a minimum, these enclosures and positions should meet the bullet-resisting specifications as identified in RG 5.76 “Physical Protection Programs at Nuclear Power Reactors,” Paragraph 4.6.2. A specification of greater bullet resistance is acceptable. A specification of greater bullet resistance is acceptable. If blast resistance

is specified, the description should provide technical information on how the blast resistance was determined.

20. A description of target sets should include a list of equipment or components that comprise each target set, should identify the location of the equipment or components, and should describe the function of the equipment or components.

21. Provisions should be included to address ITAAC for ITAAC-related physical security elements that are **not** within the scope of the physical design of the power reactor and supporting systems. Adequate design information should be provided for these ITAAC-related physical security elements. COL action items should be identified for those ITAAC-related physical security elements **not** within the scope of the design that are partially addressed.

For the review of a DC application, the reviewer should follow the above procedures to verify that the design, including requirements and restrictions (e.g., interface requirements and site parameters), set forth in the final safety analysis report (FSAR) meets the acceptance criteria. DC applicants refer to the FSAR as the design control document. The reviewer should also consider the appropriateness of identified COL action items. The reviewer may identify additional COL action items; however, the DC FSAR should incorporate the COL action items to ensure that they are addressed during a COL application.

After this review, the reviewer should follow SRP Section 14.3, "Standard Plant Designs, Initial Test Program—Final Design Approval," for the review of Tier I information for the design, including the postulated site parameters, interface criteria, and ITAAC.

IV. EVALUATION FINDINGS

The reviewer should verify that the applicant has provided sufficient information and that the review and calculations (if applicable) support conclusions of the following type to be included in the staff's safety evaluation report. The reviewer should also state the bases for these conclusions.

For DC reviews, the findings will also summarize the staff's evaluation of requirements and restrictions (e.g. interface requirements and site parameters) and COL action items relevant to this SRP section.

The evaluation finding at the DC stage should be substantially equivalent to the following statement:

> The applicant provided a description of the design that included specific physical security elements for protecting the plant against potential acts of radiological sabotage and the theft of special nuclear material. The applicant adequately described the design of the physical security elements in accordance with 10 CFR 73.2, 10 CFR 73.55, and applicable regulatory guidance. The applicant identified, in its application, the physical security elements within the scope of the design used for the protection of the facility and special nuclear material, provisions for addressing ITAAC for design features, and COL action items. Accordingly, the staff concludes that the applicant provided reasonable

assurance that the physical security elements within the scope of the plant design will provide adequate protection against acts of radiological sabotage and the theft of special nuclear material in accordance with 10 CFR 73.55.

(Note that the theft of nuclear material consideration is only for those designs intended to use mixed oxide fuel.)

V. IMPLEMENTATION

The staff will use this SRP section in performing safety evaluations of DC applications submitted by applicants under 10 CFR Part 50 or 10 CFR Part 52. Except when the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the staff will use the method described herein to evaluate conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications immediately to accommodate DC and COL application schedules.

VI. REFERENCES

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3. Sulfredge, D., "Waterborne Sub-Surface Blast Effects to the Design Basis Threat," Oak Ridge National Laboratory, Oak Ridge, TN. Safeguards Information.

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5. Sulfredge, D., and B. Tegeler, "Guidance for Using Underwater Explosion (UNDEX) Data for Estimating Loads on Submerged Targets," Oak Ridge National Laboratory, Oak Ridge, TN, and U.S. Nuclear Regulatory Commission, Washington, DC. Unclassified.

6. NUREG/CR-4250, "Vehicle Barriers: Emphasis on Natural Features," Sandia National Laboratory, Albuquerque, NM. Unclassified.

7. Regulatory Information Summary 2003-06, "High Security Protected and Vital Area Barrier/Equipment Penetration Manual," U.S. Nuclear Regulatory Commission, Washington, DC. Safeguards Information.

8. FM 5-250, "Explosives and Demolitions," Department of the Army, Washington, DC. Restricted to government agencies and their contractors. Export Controlled.

9. DOETIC-11268, "Manual for the Prediction of Blast and Fragment Loading for Structures," U.S. Department of Energy, Washington, DC. Unclassified.

10. SD-STD-02.01, “Certification Standard, Test Method for Vehicle Crash Testing of Perimeter Barriers and Gates,” U.S. State Department, Washington, DC. Unclassified.

11. Department of Defense and Department of State certified vehicle barrier list (updated periodically by the U.S. Army Corps of Engineers, Omaha, NE, and available at https://pdc.usace.army.mil/library/BarrierCertification/). Unclassified.

12. TM 5-1300, “Structures To Resist the Effects of Accidental Explosions,” Department of Defense, Washington, DC. Unclassified. (Also designated as Air Force AFR 08-22 and Navy NAVFAC P-3897).

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14. Air Force Manual (AFMAN) 91-201, “Explosive Safety Standard,” U.S. Air Force, Washington, DC. Unclassified.

15. NUREG/CR-6190, “Protection against Malevolent Use of Vehicles at Nuclear Power Plants,” U.S. Army Corps of Engineers, Omaha, NE. Safeguards Information.

16. Window Glazing Analysis Response and Design (WINGARD) Software, U.S. General Services Administration, Washington, DC. Restricted. (Available at www.oca.gsa.gov).

17. Regulatory Information Summary 2005-09, “High Security Protected and Vital Area Barrier Breaching Analysis,” U.S. Nuclear Regulatory Commission, Washington, DC. Safeguards Information.

18. PDC-TR-01-01, “Structural Assessment of Spent Fuel Pools Attacked with a Sophisticated Sabotage Threat,” U.S. Army Corps of Engineers, Omaha, NE. Safeguards Information.

19. PDC-TR-01-02, “Structural Assessment of Spent Fuel Pools Attacked with an Unsophisticated Sabotage Threat,” U.S. Army Corps of Engineers, Omaha, NE. Safeguards Information.

20. NIJ Standard 0108.01, “Ballistic Resistant Protective Materials,” National Institute of Justice, Washington, DC. Unclassified.

21. UL 752, “Standard for Bullet-Resisting Equipment,” Underwriters Laboratories Inc. Unclassified.

22. U.S. Nuclear Regulatory Commission, “Policy Statement on Severe Reactor Accidents regarding Future Designs and Existing Plants,” *Federal Register*, Vol. 50, p. 32138.

23. NUREG-1226, “Development and Utilization of the NRC Policy Statement on the Regulation of Advanced Nuclear Power Plants,” U.S. Nuclear Regulatory Commission, Washington, DC.

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26. NUREG/CR-1381, “A Methodology for Evaluating Safeguards Capabilities for Licensed Nuclear Facilities,” Sandia National Laboratories, Albuquerque, NM. Unclassified.

27. NUREG/CR-1198, “Design Guidance and Evaluation Methodology for Fixed-Site Physical Protection Systems,” Sandia National Laboratories, Albuquerque, NM. Unclassified.

28. NUREG/CR-2643, “A Review of Selected Methods for Protecting against Sabotage by an Insider,” Sandia National Laboratories, Albuquerque, NM. Unclassified.

29. NUREG/CR-2585, “Nuclear Power Plant Damage Control Measures and Design Changes for Sabotage Protection,” Sandia National Laboratories, Albuquerque, NM. Unclassified.

30. RG 1.206, “Combined License Applications for Nuclear Power Plants.”

31. RG 5.76, “Physical Protection Programs at Nuclear Power Reactors.”

SRP Section 13.6.2
"Physical Security – Design Certification"
Description of Changes

This Revision 1 to SRP Section 13.6.2, dated October 2010, updates the initial issuance of this section, dated March 2007, to reflect the changes of the recently issued 10 CFR Part 73, Power Reactor Security Rule (published in the *Federal Register* on March 27, 2009 (74 FR 13926)).

The technical changes in accordance with the new 10 CFR Part 73 Rule are incorporated in each section of this revision (Revision 1, dated October 2010) of the SRP as applicable.