

APPENDIX A: PHYSICAL SECURITY HARDWARE – INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE (PS-ITAAC) CRITERIA TABLE

PS-ITAAC #1, Vital Area and Vital Area Barrier Requirements

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 73.55(e)(9)(i). “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 the security plans.”

10 CFR 73.55(e)(9)(iv). “More than one vital area may be located within a single protected area.”

10 CFR 73.55(e)(9)(v). “At a minimum, the following shall be considered vital areas: (A) The reactor control room; (B) The spent fuel pool; (C) The central alarm station; and (D) The secondary alarm station in accordance with § 73.55(i)(4)(iii).”

10 CFR 73.2, “Definitions”: “*Vital area* means any area which contains vital equipment.

“*Vital equipment* means any equipment, system, device, or material, the failure, destruction, or release of which could directly or indirectly endanger the public health and safety by exposure to radiation. Equipment or systems which would be required to function to protect public health and safety following such failure, destruction, or release are also considered to be vital.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1(a). Vital equipment will be located only within a vital area.	1(a). All vital equipment will be inspected to verify it is located within a vital area.	1(a). All vital equipment is located only within a vital area.
1(b). Access to vital equipment will require passage through at least two physical barriers.	1(b). All vital equipment physical barriers will be inspected to verify that access to the vital equipment requires passage through at least two physical barriers.	1(b). All vital equipment is located within a vital area which is located in the protected area such that access to the vital equipment requires passage through at least two physical barriers.

Criteria Guidelines

- a. All vital areas are located inside the protected area.

- b. Access to all vital equipment requires passage through the protected area barrier and a vital area barrier.
 - c. Vital areas are constructed in accordance with the NRC regulations and design specifications (i.e., design specifications for walls, floors and ceilings are met).
 - d. All openings (such as heating, overhead ventilation and cooling vents and windows) in vital area barriers are secured and monitored to prevent exploitation of the opening.
 - e. Physical barriers at vital area portals are consistent with NRC regulations and what was identified in the design certification and are installed in accordance with design specifications.
 - f. At a minimum, the reactor control room, the spent fuel pool, the central alarm station, and the secondary alarm station are designated as vital areas.
 - g. All vital equipment, is located in a vital area.
- Additional guidance is provided in Regulatory Guide (RG) 5.76, "Physical Protection Programs at Nuclear Power Reactors", July 2009; RG 5.69, "Guidance for the Application of Radiological Sabotage Design-Basis Threat in the Design, Development, and Implementation of a Physical Security Program that Meets 10 CFR 73.55. "Requirements", April 2007; "Nuclear Power Plant Security Assessment Guide," NUREG-CR-7145, issued April 2013; and Department of Energy, Sandia National Laboratories, Technology Transfer Manual SAND 2007-5591, "Nuclear Power Plant Security Assessment Technical Manual," September 2007. (None of these documents are publicly available.)

PS-ITAAC #2, Protected Area Barrier Requirements

10 CFR 73.55(e)(3)(i). "Physical barriers must be designed and constructed to (A) Protect against the design-basis threat of radiological sabotage; (B) Account for site-specific conditions; and (C) Perform their required function in support of the licensee physical protection program."

10 CFR 73.55(e)(3)(ii). "Physical barriers must provide deterrence, delay, or support access control."

10 CFR 73.55(e)(8)(i). "The protected area perimeter must be protected by physical barriers that are designed and constructed to: (A) Limit access into the protected area to only those personnel, vehicles, and materials required to perform official duties; (B) Channel personnel, vehicles, and materials to designated access control portals; and (C) Be separated from any other barrier designated as a vital area physical barrier, unless otherwise identified in the Physical Security Plan."

10 CFR 73.55(e)(8)(ii). "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."

10 CFR 73.55(i)(5)(iii). "Unattended openings that intersect a security boundary such as underground pathways must be protected by a physical barrier and monitored by intrusion detection equipment or observed by security personnel at a frequency sufficient to detect exploitation."

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2(a). Physical barriers for the protected area perimeter will not be part of vital area barriers unless otherwise identified in the Physical Security Plan."	2(a). The protected area perimeter barriers will be inspected.	2(a). Physical barriers at the perimeter of the protected area are separated from any other barrier designated as a vital area barrier unless otherwise identified in the Physical Security Plan."
2(b). Penetrations through the protected area barrier will be secured and monitored.	2(b). All penetrations through the protected area barrier will be inspected.	2(b). All penetrations through the protected area barrier are secured and monitored by intrusion detection equipment.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
2(c). Unattended openings that intersect a security boundary, such as underground pathways, will be protected by a physical barrier and monitored by intrusion detection equipment or provided surveillance at a frequency sufficient to detect exploitation.	2(c). All unattended openings within the protected area barriers will be inspected.	2(c). All unattended openings (such as underground pathways) that intersect a security boundary (such as the protected area barrier), are protected by a physical barrier and monitored by intrusion detection equipment or provided surveillance at a frequency sufficient to detect exploitation.

Criteria Guidelines

- a. The protected area barrier being constructed is consistent with what was identified in the design specifications and is constructed and installed in accordance with design specifications, including the incorporated vehicle access portals (i.e., sally ports).
- b. The protected area barrier is separated from vital area barriers unless otherwise specified in the security plans.
- c. The protected area barrier meets the design characteristics defined in the entry for “Physical Barriers” in 10 CFR 73.2, “Definitions.”
 - (1) “Fences constructed of No. 11 American Wire Gauge, or heavier wire fabric, topped by three strands or more of barbed wire or similar material on brackets angled inward or outward between 30 and 45 [degrees] from the vertical, with an overall height of not less than eight feet, including the barbed topping;
 - (2) “Building walls, ceilings and floors constructed of stone, brick, cinder block, concrete, steel or comparable materials (openings in which are secured by grates, doors, or covers of construction and fastening of sufficient strength that the integrity of the wall is not lessened by any opening), or walls of similar construction, not part of a building, provided with a barbed topping described in paragraph (1) of this definition of a height of not less than 8 feet; or
 - (3) “Any other physical obstruction constructed in a manner and of materials suitable for the purpose for which the obstruction is intended.”
- d. All building walls, ceilings, and floors of buildings which comprise a portion of the protected area barrier provide a level of protection (i.e., are constructed of materials) consistent with the characteristics defined in the entry for “Physical Barriers” in 10 CFR 73.2, “Definitions.”

e. All penetrations and openings through the protected area barrier are secured and monitored to deter, delay and detect exploitation of the penetration or opening.

f. All unattended openings (such as underground pathways) that intersect a security boundary (such as the protected area barrier) are protected by a physical barrier and monitored by intrusion detection equipment or observed at a frequency sufficient to detect exploitation.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors", July 2009; RG 5.69, "Guidance for the Application of Radiological Sabotage Design-Basis Threat in the Design, Development, and Implementation of a Physical Security Program that Meets 10 CFR 73.55 Requirements", April 2007; NUREG/CR-0181, "Barrier Penetration Database," July 1987; and NRC-endorsed Nuclear Energy Institute (NEI) 09-05, "Guidance on the Protection of Unattended Openings that Intersect a Security Boundary." None of these documents is publicly available, although a supplement to NEI 09-05 is (as Agencywide Documents Access and Management System (ADAMS) Accession No. ML13022A403).

PS-ITAAC #3, Isolation Zone Requirements

10 CFR 73.55(e)(7)(i). “An isolation zone must be maintained in outdoor areas adjacent to the protected area perimeter barrier. The isolation zone shall be: (A) Designed and of sufficient size to permit observation and assessment of activities on either side of the protected area barrier; (B) Monitored with intrusion detection equipment designed to satisfy the requirements of § 73.55(i) and be capable of detecting both attempted and actual penetration of the protected area perimeter barrier before completed penetration of the protected area perimeter barrier; and (C) Monitored with assessment equipment designed to satisfy the requirements of § 73.55(i) and provide real-time and play-back/recorded video images of the detected activities before and after each alarm annunciation.”

10 CFR 73.55(e)(7)(ii). “Obstructions that could prevent the licensee’s capability to meet the observation and assessment requirements of this section must be located outside of the isolation zone.”

10 CFR 73.55(e)(8)(iv). “Where building walls or roofs comprise a portion of the protected area perimeter barrier, an isolation zone is not necessary provided that the detection and, assessment requirements of this section are met, appropriate barriers are installed, and the area is described in the security plans.”

10 CFR 73.2, “Definitions”: “*Isolation zone* means any area adjacent to a physical barrier, clear of all objects which could conceal or shield an individual.

“*Physical barrier* means: (1) Fences constructed of No. 11 American wire gauge, or heavier wire fabric, topped by three strands or more of barbed wire or similar material on brackets angled inward or outward between 30 and 45 [degrees] from the vertical, with an overall height of not less than eight feet, including the barbed topping; (2) Building walls, ceilings and floors constructed of stone, brick, cinder block, concrete, steel or comparable materials (openings in which are secured by grates, doors, or covers of construction and fastening of sufficient strength such that the integrity of the wall is not lessened by any opening), or walls of similar construction, not part of a building, provided with a barbed topping described in paragraph (1) of this definition of a height of not less than 8 feet; or (3) Any other physical obstruction constructed in a manner and of materials suitable for the purpose for which the obstruction is intended.

“*Protected area* means an area encompassed by physical barriers and to which access is controlled.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
3(a). Isolation zones will exist in outdoor areas adjacent to the physical barrier at the perimeter of the protected area that allows 20 feet on either side of the barrier to permit observation and assessment.	3(a). The outdoor areas adjacent to the protected area perimeter barrier will be inspected.	3(a). The isolation zones exist in outdoor areas adjacent to the physical barrier at the perimeter of the protected area are constructed so that 20 feet on either side of the barrier permits observation and assessment of activities in the event of its penetration or attempted penetration.
3(b). Isolation zones will be monitored with intrusion detection and assessment equipment that is designed to provide detection and assessment of activities within the isolation zone.	3(b). The intrusion detection equipment for monitoring the isolation zones will be tested.	3(b). Isolation zones are monitored by intrusion detection and assessment equipment capable of providing detection and assessment of activities within the isolation zone.
3(c). Areas where permanent buildings do not allow sufficient observation distance between the intrusion detection system and the protected area barrier (e.g., the building walls are immediately adjacent to, or are an integral part of, the protected area barrier) will be monitored with intrusion detection and -assessment equipment that is designed to detect the attempted or actual penetration of the protected area perimeter barrier before completed penetration of the barrier and to permit assessment of detected activities.	3(c). Inspections of areas of the protected area perimeter barrier that do not have isolation zones will be performed.	3(c). Areas where permanent buildings do not allow sufficient observation distance between the intrusion detection system and the protected area barrier (e.g., the building walls are immediately adjacent to, or an integral part of, the protected area barrier) are monitored with intrusion detection and assessment equipment that detects attempted or actual penetration of the protected area perimeter barrier before completed penetration of the barrier and permits assessment of detected activities.

Criteria Guidelines

- a. Isolation zones are established in outdoor areas adjacent to the protected area barrier in accordance with the applicant's security plans.
- b. Isolations zones are of sufficient size to provide the ability to observe and assess activities on either side of the protected area barrier (i.e., 20 feet (6.1 meters) on either side).

- c. The isolation zone is monitored by intrusion detection and assessment equipment in a way consistent with the requirements of 10 CFR 73.55(i)(1).
 - d. Any areas of the protected area perimeter where an isolation zone is not required (i.e., in areas where building walls or roofs comprise a portion of the protected area barrier) are equipped with intrusion detection and assessment equipment to meet the detection and assessment requirements of 10 CFR 73.55.
 - e. Isolation zone is clear of obstructions that prevent the capability of observation and assessment.
- Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009; NUREG-1959, "Intrusion Detection Systems and Subsystems: Technical Information for NRC Licensees," March 2011; and Department of Energy, Sandia National Laboratories, Technology Transfer Manuals SAND99-2389, "Video Assessment," and SAND99-2391, "Exterior Intrusion Detection." Of these documents, only NUREG-1959 is publicly available (as ADAMS Accession No. ML11112A009).

PS-ITAAC #4, Protected Area Perimeter Intrusion Detection and Assessment Systems Requirements

10 CFR 73.55(e)(7)(i). “An isolation zone must be maintained in outdoor areas adjacent to the protected area perimeter barrier. The isolation zone shall be: (A) Designed and of sufficient size to permit observation and assessment of activities on either side of the protected area barrier; (B) Monitored with intrusion detection equipment designed to satisfy the requirements of § 73.55(i) and be capable of detecting both attempted and actual penetration of the protected area perimeter barrier before completed penetration of the protected area perimeter barrier; and (C) Monitored with assessment equipment designed to satisfy the requirements of § 73.55(i) and provide real-time and play-back/recorded video images of the detected activities before and after each alarm annunciation.”

10 CFR 73.55(i)(1). “The licensee shall establish and maintain intrusion detection and assessment systems that satisfy the design requirements of § 73.55(b) and provide, at all times, the capability to detect and assess unauthorized persons and facilitate the effective implementation of the licensee’s protective strategy.”

10 CFR 73.55(i)(2). “Intrusion detection equipment must annunciate and video assessment equipment shall display concurrently, in at least two continuously staffed onsite alarm stations [...]”

10 CFR 73.55(i)(3). “The licensee’s intrusion detection and assessment systems must be designed to: [...] (vii) Ensure intrusion detection and assessment equipment at the protected area perimeter remains operable from an uninterruptible power supply in the event of the loss of normal power.”

10 CFR 73.55(e)(3)(i). “Physical barriers must be designed and constructed to: (A) Protect against the design basis threat of radiological sabotage; (B) Account for site-specific conditions; and (C) Perform their required function in support of the licensee physical protection program.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
4(a). The perimeter intrusion detection system will be designed to detect penetration or attempted penetration of the protected area perimeter barrier before completed penetration of the barrier, and for subsequent alarms to annunciate concurrently in at least two continuously manned onsite alarm stations (central and secondary alarm stations).	4(a). Tests of the intrusion detection system will be performed.	4(a). The intrusion detection system can detect penetration or attempted penetration of the protected area perimeter barrier before completed penetration of the barrier, and subsequent alarms annunciate concurrently in at least two continuously manned onsite alarm stations (central and secondary alarm stations).
4(b). The perimeter assessment equipment will be designed to provide video image recording with realtime display and playback capability that can enable assessment of detected activities before and after each alarm annunciation at the protected area perimeter barrier.	4(b). Tests of the video assessment equipment will be performed.	4(b). The perimeter assessment equipment is capable of realtime display of video images and playback of recorded video images that enables assessment of detected activities before and after each alarm annunciation at the protected area perimeter barrier.
4(c). The intrusion detection and -assessment equipment at the protected area perimeter will be designed to remain operable from an uninterruptible power supply in the event of the loss of normal power.	4(c). Tests of the uninterruptible power supply will be performed.	4(c). All Intrusion detection and -assessment equipment at the protected area perimeter remains operable from an uninterruptible power supply in the event of the loss of normal power.

Criteria Guidelines

- a. Normal power supply for intrusion detection and -assessment equipment at the protected area perimeter possesses the capability to provide adequate power to operate these systems.
- b. Intrusion detection and assessment equipment at the protected area perimeter remains operable from an uninterruptible power supply (UPS) in the event of a loss of normal power.
- c. The UPS for intrusion detection and assessment equipment possesses the capability to provide adequate power to operate these systems.

- d. The power transfer from the operating power supply to the UPS enables the intrusion detection and assessment systems to remain operable without disruption.
- e. The protected area perimeter intrusion detection system must perform as designed and is capable of detecting both attempted and actual penetration of the protected area barrier before completed penetration of the protected area barrier.
- f. The video assessment system assets at the protected area perimeter must perform as designed and provide realtime video images and playback of recorded video images of detected activities before and after each alarm annunciation.
- g. Perimeter intrusion detection and -assessment systems will be tested in accordance with the applicant's testing procedures.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009; NUREG-1959, "Intrusion Detection Systems and Subsystems: Technical Information for NRC Licensees," March 2011; and Department of Energy, Sandia National Laboratories, Technology Transfer Manuals SAND-2388, "Interior Intrusion Detection"; SAND99-2389, "Video Assessment"; and SAND99-2391, "Exterior Intrusion Detection." Of these documents, only NUREG-1959 is publicly available (as ADAMS Accession No. ML11112A009).

PS-ITAAC #5, Illumination Requirements

10 CFR 73.55(i)(6)(ii). “The licensee shall provide a minimum illumination level of 0.2 foot-candles, measured horizontally at ground level, in the isolation zones and appropriate exterior areas within the protected area. Alternatively, the licensee may augment the facility illumination system by means of low-light technology to meet the requirements of this section or otherwise implement the protective strategy.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criterion
5. Isolation zones and exterior areas within the protected area will be provided with illumination to permit assessment in the isolation zones and observation of activities within exterior areas of the protected area.	5. The illumination in isolation zones and exterior areas within the protected area will be tested.	5. Illumination in isolation zones and exterior areas within the protected area is 0.2 foot (0.06 meters) candles measured horizontally at ground level or alternatively augmented, sufficiently to permit assessment and observation.

Criterion Guidelines

- a. The normal power supply for illumination in the isolation zones at the protected area perimeter, which the applicant requires for assessment, possesses the capability to provide adequate power to operate these systems.
- b. Illumination in the isolation zones at the protected area perimeter, which the applicant requires for assessment, remains operable from an uninterruptible power supply in the event of a loss of normal power.
- c. The uninterruptible power supply for the illumination equipment, which the applicant requires for assessment, possesses the capability to provide adequate power to operate these systems.
- d. The power transfer from the operating power supply to the uninterruptible power supply enables the illumination equipment the applicant requires for assessment to remain operable without disruption.
- e. Illumination equipment in the isolation zones at the protected area perimeter, which the licensee requires for assessment, provides an illumination level of 0.2 foot-candles (0.06 meters) measured horizontally at ground level or the necessary illumination for the specific assessment methodology (e.g., low-light technology) being implemented to provide assessment.

- f. Illumination equipment located in the exterior areas of the protected area provides an illumination level of 0.2 foot candles (0.06 meters) measured horizontally at ground level or the necessary illumination to implement the protective strategy.
- g. Illumination equipment and assessment equipment (such as cameras that possess low-light capabilities) used to augment or in lieu of illumination equipment will be tested in accordance with the applicant's testing procedure.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009 (not publicly available), and NUREG-1959, "Intrusion Detection Systems and Subsystems: Technical Information for NRC Licensees," March 2011 (ADAMS Accession No. ML1112A009).

PS-ITAAC #6, Bullet-Resisting Barriers Requirements

10 CFR 73.55(e)(5). "Bullet Resisting Physical Barriers. The reactor control room, the central alarm station, and the location within which the last access control function for access to the protected area is performed, must be bullet-resisting."

10 CFR 73.55(i)(4)(iii). "Applicants for an operating license under the provisions of 10 CFR Part 50 of this chapter, or holders of a COL under the provisions of 10 CFR Part 52 of this chapter, shall construct, locate, protect, and equip both the central and secondary alarm stations to the standards for the central alarm station contained in this section. Both alarm stations shall be equal and redundant, such that all functions needed to satisfy the requirements of this section can be performed in both alarm stations."

Note: 10 CFR 73.55(a)(6) states, "Applicants for an operating license under the provisions of 10 CFR Part 50 of this chapter, or holders of a COL under the provisions of 10 CFR Part 52 of this chapter, that do not reference a standard design certification or reference a standard design certification issued after May 26, 2009 shall meet the requirement of 10 CFR 73.55(i)(4)(iii)."

10 CFR 73.2, "Definitions": "*Bullet/resisting* means protection against complete penetration, passage of fragments of projectiles, and spalling (fragmentation) of the protective material that could cause injury to a person standing directly behind the bullet-resisting barrier."

Design Commitment	Inspections, Tests, Analyses	Acceptance Criterion
6. The external walls, doors, ceiling, and floors in the main control room, central alarm station, secondary alarm station, and the location of the last access control function for access to the protected area will be bullet-resistant, to at least Underwriters Laboratories Ballistic Standard 752, "The Standard of Safety for Bullet-Resisting Equipment," Level 8, or National Institute of Justice Standard 0108.01, "Ballistic Resistant Protective Materials," Type III.	6. Type test, analysis, or a combination of type test and analysis of the external walls, doors, ceiling, and floors in the main control room, central alarm station, secondary alarm station, and the location of the last access control function for access to the protected area will be performed.	6. A report exists and concludes that the walls, doors, ceilings, and floors in the main control room, central alarm station, secondary alarm station, and the last access control function for access to the protected area are bullet-resistant to at least Underwriters Laboratories Ballistic Standard 752, Level 8, or National Institute of Justice Standard 0108.01, Type III.

Criterion Guideline

The control room, central alarm station, secondary alarm station and the final access control location are constructed in accordance with the design specifications that demonstrate bullet-resistant capabilities.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009 (not publicly available), and Underwriters Laboratory UL 752, "Ballistic Standards."

PS-ITAAC #7, Vehicle Control Measures Requirements

10 CFR 73.55(e)(10). “Vehicle control measures. Consistent with the physical protection program design requirements of § 73.55(b), and in accordance with the site-specific analysis, the licensee shall establish and maintain vehicle control measures, as necessary, to protect against the design basis threat of radiological sabotage vehicle bomb assault.”

10 CFR 73.55(e)(10)(i). “Land vehicles. Licensees shall: (A) Design, construct, install, and maintain a vehicle barrier system, to include passive and active barriers, at a standoff distance adequate to protect personnel, equipment, and systems necessary to prevent significant core damage and spent fuel sabotage against the effects of the design basis threat of radiological sabotage land vehicle bomb assault. (B) Periodically check the operation of active vehicle barriers and provide a secondary power source, or a means of mechanical or manual operation in the event of a power failure, to ensure that the active barrier can be placed in the denial position to prevent unauthorized vehicle access beyond the required standoff distance. (C) Provide periodic surveillance and observation of vehicle barriers and barrier systems adequate to detect indications of tampering and degradation or to otherwise ensure that each vehicle barrier and barrier system is able to satisfy the intended function. (D) Where a site has rail access to the protected area, install a train derailer, remove a section of track, or restrict access to railroad sidings and provide periodic surveillance of these measures.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
7(a). The vehicle barrier system will be designed, installed, and located at the necessary standoff distance to protect against the design-basis threat vehicle bombs.	7(a). Type test, inspections, and analysis will be performed for the vehicle barrier system.	7(a). A validated report reviewed in accordance with NUREG/CR-6190 exists and concludes that the vehicle barrier system will protect against the design-basis threat vehicle bombs based on the standoff distance for the system.
7(b). Provide a secondary power source or a means of mechanical or manual operation in the event of a power failure to ensure that the active barrier can be placed in the denial position to prevent unauthorized vehicle access beyond the required standoff distance.	7(b). Tests of installed systems and equipment will be performed.	7(b). The secondary power source, or a means of mechanical or manual operation in the event of a power failure, ensure that the active barrier can be placed in the denial position to prevent unauthorized vehicle access beyond the required standoff distance.

Criteria Guidelines

- a. Vehicle barriers (active and passive) are constructed, installed, and secured in place in accordance with the design specifications.

- b. The power supplies (primary and secondary) for active vehicle barriers possess the capability to adequately operate these systems.
- c. Vehicle barriers are located at appropriate standoff distances to protect vital equipment and controls and certain security systems and components from a vehicle bomb (land-based or waterborne) in accordance with the design-basis threat of radiological sabotage.
- d. A Blast Analysis report with the minimum safe standoff distance to protect against the DBT vehicle bombs is completed and updated on the final design of the plant.
- e. Active vehicle barriers operate as designed and will be tested in accordance with the applicant's testing procedures.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009; RG 5.68, "Protection Against Malevolent Use of Vehicles at Nuclear Power Plants", August 1994; RG 5.69, "Guidance for the Application of Radiological Sabotage Design-Basis Threat in the Design, Development, and Implementation of a Physical Security Program that Meets 10 CFR 73.55 Requirements," April 2007; NUREG/CR-6190, "Protection Against Malevolent Use of Vehicles at Nuclear Power Plants - Updated to Reflect Revised DBT", March 2004; NUREG/CR-4250, "Vehicle Barriers: Emphasis on Natural Features," July 1985; U.S. Army Corps of Engineers, PDC-TR 06-05, "Evaluating Adequacy of Landform Obstacles as Vehicle Barriers," August 2007; and Department of Energy, Sandia National Laboratories, Technology Transfer Manuals SAND99-2486, "Explosives Protection," and SAND2001-2168, "Access Delay Technology, Volume 1." Of these documents, only RG 5.68 is publicly available (as ADAMS Accession No. ML003739379).

PS-ITAAC #8, Personnel, Vehicle, and Material Access-Control Portals and Search Equipment Requirements

10 CFR 73.55(h)(2). "Owner controlled area searches. [...] (iv) Vehicle searches must be accomplished through the use of equipment capable of detecting firearms, explosives, incendiary devices, or other items which could be used to commit radiological sabotage, or through visual and physical searches, or both, to ensure that all items are identified before granting access."

10 CFR 73.55(h)(2)(v). "Vehicle access control points must be equipped with video surveillance equipment that is monitored by an individual capable of initiating a response."

10 CFR 73.55(h)(3)(i). "Protected area searches. Licensees shall search all personnel, vehicles and materials requesting access to protected areas. (i) The search for firearms, explosives, incendiary devices, or other items which could be used to commit radiological sabotage shall be accomplished through the use of equipment capable of detecting these items, or through visual and physical searches, or both, to ensure that all items are clearly identified before granting access to protected areas. [...]"

10 CFR 73.55(g)(1)(i)(A) and (B). "Access controls. (1) Consistent with the function of each barrier or barrier system, the licensee shall control personnel, vehicle, and material access, as applicable, at each access control point in accordance with the physical protection program design requirements of § 73.55(b). (i) To accomplish this, the licensee shall: (A) Locate access control portals outside of, or concurrent with, the physical barrier system through which it controls access. (B) Equip access control portals with locking devices, intrusion detection equipment, and surveillance equipment consistent with the intended function."

10 CFR 73.55(g)(5)(i). "The licensee shall design the access control system to accommodate the potential need for rapid ingress or egress of authorized individuals during emergency conditions or situations that could lead to emergency conditions."

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
8(a). Access control points will be established and designed to control personnel and vehicle access into the protected area.	8(a). A combination of tests and inspections of installed systems and equipment will be performed.	8(a). Access control points exist for the protected area, are configured to control access, and are equipped with locking devices, intrusion detection equipment, and surveillance equipment consistent with the intended function.
8(b). Access control points will be established and designed with equipment for the detection of firearms, explosives, incendiary devices or other items which could be used to commit radiological sabotage at the protected area personnel access points.	8(b). Tests of installed systems and equipment will be performed.	8(b). Detection equipment exists and is capable of detecting firearms, explosives, incendiary devices, or other items which could be used to commit radiological sabotage at the protected area personnel access control points.

Criteria Guidelines

- a. The physical barriers at personnel and material access portals of the protected area are consistent with what was identified in the design specifications and were constructed and installed in accordance with design specifications.
- b. Special-purpose detection equipment (e.g., explosive, metal, and X-ray detection equipment) is consistent with what was identified in the design specifications, was installed in accordance with design specifications, and is configured to prevent unauthorized bypass.
- c. The special-purpose detection equipment located at protected area personnel access portals provides the capability to detect firearms, explosives, and incendiary devices or other items which could be used to commit radiological sabotage, as applicable, and this equipment will be tested in accordance with the applicant's testing procedures.
- d. The special-purpose detection equipment used for material search provides the capability to detect firearms, explosives, and incendiary devices or other items which could be used to commit radiological sabotage, as applicable, and this equipment will be tested in accordance with the applicant's testing procedures.

- e. The special-purpose detection equipment used for vehicle search provides the capability to detect firearms, explosives, and incendiary devices or other items which could be used to commit radiological sabotage, as applicable, and this equipment will be tested in accordance with the applicant's testing procedures.
- f. Verify, through the observation of testing activities, that the access-control equipment (for personnel, vehicles, and material) at protected area access portals operates as designed, was installed as identified in security plans and implementing procedures, and will be tested in accordance with the applicant's testing procedures.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009; NUREG-1964, "Access Control Systems: Technical Information for NRC Licensees," April 2011; and Department of Energy, Sandia National Laboratories, Technology Transfer Manual SAND2000-2142, "Entry Control & Contraband Detection Systems." Of these documents, only NUREG-1964 is publicly available (as ADAMS Accession No. ML11115A078).

PS-ITAAC #9, Picture Badge Identification System Requirement

10 CFR 73.55(g)(6)(ii). "The licensee shall implement a numbered photo identification badge system for all individuals authorized unescorted access to the protected area and vital areas."

Design Commitment	Inspections, Tests, Analyses	Acceptance Criterion
9. An access control system with a numbered photo identification badge system will be installed and designed for use by individuals who are authorized access to protected areas and vital areas without escort.	9. The access control system and the numbered photo identification badge system will be tested.	9. The access authorization system with a numbered photo identification badge system is installed and provides authorized access to protected and vital areas only to those individuals with authorization for unescorted access.

Criterion Guidelines

- a. Access control systems (badging and biometric) are consistent with what was identified in the design specification and are installed in accordance with the design specifications.
- b. Supervision and control over the badging process is established at protected area access portals and in other areas outside the protected area that are designated for badging activities.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009 (not publicly available), and NUREG-1964, "Access Control Systems: Technical Information for NRC Licensees," April 2011 (ADAMS Accession No. ML11115A078).

PS-ITAAC #10, Access Control of Vital Areas Requirements

10 CFR 73.55(e)(9)(iii). “Unoccupied vital areas must be locked and alarmed.”

10 CFR 73.55(i)(2). “Intrusion detection equipment must annunciate and video assessment equipment shall display concurrently, in at least two continuously staffed onsite alarm stations [...]”.

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
10. Unoccupied vital areas will be designed with locking devices and intrusion detection devices that annunciate in the central and secondary alarm stations.	10. Tests of unoccupied vital areas’ intrusion detection equipment and locking devices will be performed.	10. Unoccupied vital areas are locked and alarmed. Intrusion detection devices detected intrusions in such areas and annunciated in both the central and secondary alarm stations.

Criteria Guidelines

- a. All barriers at vital area access portals are equipped with intrusion detection equipment and locking devices.
- b. The intrusion detection equipment and locking devices installed on vital area barriers at vital area access portals (personnel doors, equipment doors, vehicle doors, equipment hatches, etc.) are consistent with what was identified in the design specification and are constructed and installed in accordance with design specifications.
- c. Vital area barrier intrusion detection equipment and access control devices operate as designed and will be tested in accordance with the applicant’s testing procedures.

Additional guidance is provided in RG 5.76, “Physical Protection Programs at Nuclear Power Reactors,” July 2009; NUREG-1964, “Access Control Systems: Technical Information for NRC Licensees,” April 2011; and Department of Energy, Sandia National Laboratories, Technology Transfer Manual SAND-2388 “Interior Intrusion Detection.” Of these documents, only NUREG-1964 is publicly available (as ADAMS Accession No. ML11115A078).

PS-ITAAC #11, Alarm Station Requirements

10 CFR 73.55(i)(2). "Intrusion detection equipment must annunciate and video assessment equipment shall display concurrently, in at least two continuously staffed onsite alarm stations [...]."

10 CFR 73.55(i)(4)(i). "Both alarm stations required by paragraph (i)(2) of this section must be designed and equipped to ensure that a single act, in accordance with the design basis threat of radiological sabotage defined in § 73.1(a)(1), cannot disable both alarm stations. The licensee shall ensure the survivability of at least one alarm station to maintain the ability to perform the following functions: (A) Detect and assess alarms; (B) Initiate and coordinate an adequate response to an alarm; (C) Summon offsite assistance; and (D) Provide command and control."

10 CFR 73.55(i)(4)(ii). "Licensees shall: (A) Locate the central alarm station inside a protected area. The interior of the central alarm station must not be visible from the perimeter of the protected area. [...] (F) Ensure that an alarm station operator cannot change the status of a detection point or deactivate a locking or access control device at a protected or vital area portal, without the knowledge and concurrence of the alarm station operator in the other alarm station."

10 CFR 73.55(i)(4)(iii). "Applicants for an operating license under the provisions of 10 CFR Part 50 of this chapter, or holders of a COL under the provisions of 10 CFR Part 52 of this chapter, shall construct, locate, protect, and equip both the central and secondary alarm stations to the standards for the central alarm station contained in this section. Both alarm stations shall be equal and redundant, such that all functions needed to satisfy the requirements of this section can be performed in both alarm stations."

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
11(a). Intrusion detection equipment and video assessment equipment will annunciate and display concurrently in at least two continuously manned onsite alarm stations (central and secondary alarm stations).	11(a). Tests of intrusion detection equipment and video assessment equipment will be performed.	11(a). Intrusion detection equipment and video assessment equipment annunciate and display concurrently in at least two continuously manned onsite alarm stations (central and secondary alarm stations).
11(b). Central and secondary alarm stations will be located inside the protected area and will be designed so that neither alarm station's interior is visible from the perimeter of the protected area.	11(b). The central and secondary alarm station locations will be inspected.	11(b). Central and secondary alarm stations are located inside the protected area, and neither of the alarm stations' interiors is visible from the perimeter of the protected area.

table 11(c). The alarm system will not allow the status of a detection point, locking mechanism, or access control device to be changed without the knowledge and concurrence of the alarm station operator in the other alarm station.	11(c). Tests of intrusion detection equipment and access control equipment will be performed.	11(c). The alarm system does not allow the status of a detection point, locking mechanism, or access control device to be changed without the knowledge and concurrence of the alarm station operator in the other alarm station.
11(d). Central and secondary alarm stations will be designed, equipped, and constructed such that no single act, in accordance with the design-basis threat of radiological sabotage, can simultaneously remove the ability of both the central and secondary alarm stations to (1) detect and assess alarms, (2) initiate and coordinate an adequate response to alarms, (3) summon offsite assistance, and (4) provide effective command and control.	11(d). Tests, inspections, and analysis of the central and secondary alarm stations will be performed.	11(d). A report exists and concludes that the central and secondary alarm stations are designed, equipped, and constructed such that no single act, in accordance with the design-basis threat of radiological sabotage, can simultaneously remove the ability of both the central and secondary alarm stations to (1) detect and assess alarms, (2) initiate and coordinate an adequate response to alarms, (3) summon offsite assistance, and (4) provide effective command and control.
11(e). Both the central and secondary alarm stations will be constructed, located, protected, and equipped to the standards for the central alarm station (alarm stations need not be identical in design but shall be equal and redundant, capable of performing all functions required of alarm stations).	11(e). Inspections and analysis of the central and secondary alarm stations will be performed.	11(e). A report exists and concludes the central and secondary alarm stations are located, constructed, protected, and equipped to the standards of the central alarm station and are functionally redundant. (Stations need not be identical in design.)

Criteria Guidelines

- a. The central and secondary alarm stations are located inside the protected area and neither alarm station's interior is visible from the perimeter of the protected area.
- b. The security computer systems, intrusion detection equipment, video assessment equipment, communications equipment, and power supplies extending to the alarm stations have no single-point vulnerability (i.e., share no common junctions which would disable any one of these capabilities in both alarm stations).

c. Alarm station operators cannot change the status of a detection point or deactivate a locking or access control device at a protected area or vital area portal without the knowledge and concurrence of the alarm station operator in the other alarm station.

d. The central and secondary alarm stations receive alarm annunciations concurrently and possess video assessment display equipment that provides the capability to view the area of detected activity concurrently.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009; NUREG-1959, "Intrusion Detection Systems and Subsystems: Technical Information for NRC Licensees", March 2011; and Department of Energy, Sandia National Laboratories, Technology Transfer Manual SAND99-2390 "Alarm Communication". Of these documents, only NUREG-1959 is publicly available (as ADAMS Accession No. ML11112A009).

PS-ITAAC #12, Secondary Power Supplies for Alarm-Annunciation and Communication Equipment Requirement

10 CFR 73.55(e)(9)(vi). “At a minimum, the following shall be located within a vital area: (A) The secondary power supply systems for alarm annunciation equipment; and (B) The secondary power supply systems for nonportable communications equipment.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criterion
12. The secondary security power supply system for alarm annunciator equipment and nonportable communications equipment will be located within a vital area.	12. The secondary security power supply system will be inspected.	12. The secondary security power system for alarm annunciator equipment and nonportable communications equipment is located within a vital area.

Criterion Guideline

The secondary power supply for alarm annunciation and nonportable communication equipment is located in a vital area.

Additional guidance is provided in RG 5.76, “Physical Protection Programs at Nuclear Power Reactors”, July 2009, not publicly available.

PS-ITAAC #13, Console Displays and Alarms for Intrusion Detection Systems Requirements

10 CFR 73.55(i)(3). “The licensee’s intrusion detection and assessment systems must be designed to:

- “(i) Provide visual and audible annunciation of the alarm.
- “(ii) Provide a visual display from which assessment of the detected activity can be made.
- “(iii) Ensure that annunciation of an alarm indicates the type and location of the alarm.
- “(iv) Ensure that alarm devices to include transmission lines to annunciators are tamper indicating and self-checking.
- “(v) 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.
- “(vi) Support the initiation of a timely response in accordance with the security plans, licensee protective strategy, and associated implementing procedures.”

10 CFR 73.2, “Definitions”: “*Intrusion alarm* means a tamper indicating electrical, electromechanical, electrooptical, electronic or similar device which will detect intrusion by an individual into a building, protected area, vital area, or material access area, and alert guards or watchmen by means of actuated visible and audible signals.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
13(a). Security alarm devices, including transmission lines to annunciators, will be tamper-indicating and self-checking (e.g., an automatic indication is provided when failure of the alarm system or a component occurs or when on standby power), and alarm annunciation indicates the type of alarm (e.g., intrusion alarms, emergency exit alarm) and its location.	13(a). All security alarm devices and transmission lines will be tested.	13(a). Security alarm devices, including transmission lines to annunciators, are tamper-indicating and self-checking; an automatic indication is provided when failure of the alarm system or a component occurs or when the system is on standby power; the alarm annunciation indicates the type and location of the alarm.

13(b). Intrusion detection and -assessment systems will be designed to provide visual display and audible annunciation of alarms in both the central and secondary alarm stations.	13(b). Intrusion detection and -assessment systems will be tested.	13(b). The intrusion detection systems provide a visual display and audible annunciation of all alarms concurrently in at least two continuously manned onsite alarm stations (central and secondary alarm stations).
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Criteria Guidelines

- a. The intrusion detection system provides a visual and audible annunciation of all alarms in both the central and secondary alarm stations.
- b. The intrusion detection and assessment system provides a visual display, in both the central and secondary alarm stations, from which an assessment of the detected activity can be made.
- c. Alarm annunciations received, in both the central and secondary alarm stations, indicate the type and location of the alarm.
- d. Alarm devices, including transmission lines to annunciators, are tamper-indicating and self-checking.
- e. All automatic indication must be received in the central and secondary alarm stations when the alarm system or a component of the system fails or when the system is operating on backup power.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009; NUREG-1959, "Intrusion Detection Systems and Subsystems: Technical Information for NRC Licensees," March 2011; and Department of Energy, Sandia National Laboratories, Technology Transfer Manuals SAND-2388, "Interior Intrusion Detection"; SAND99-2389, "Video Assessment"; SAND99-2390, "Alarm Communication & Display"; and SAND99-2391, "Exterior Intrusion Detection." Of these documents, only NUREG-1959 is publicly available (as ADAMS Accession No. ML11112A009).

PS-ITAAC #14, Intrusion Detection Systems' Recording Requirements

10 CFR 73.55(i)(4)(ii)(h). "Maintain a record of all alarm annunciations, the cause of each alarm, and the disposition of each alarm."

10 CFR 73.70(f). "A record at each onsite alarm annunciation location of each alarm, false alarm, alarm check, and tamper indication that identifies the type of alarm, location, alarm circuit, date, and time. In addition, details of response by facility guards and watchmen to each alarm, intrusion, or other security incident shall be recorded. The licensee[s] shall retain each record for three years after the record is made."

Design Commitment	Inspections, Tests, Analyses	Acceptance Criterion
14. Intrusion detection systems' recording equipment will record onsite security alarm annunciations, including each alarm, false alarm, alarm check, and tamper indication and the type of alarm, location, alarm circuit, date, and time.	14. The intrusion detection systems' recording equipment will be tested.	14. Intrusion detection systems' recording equipment is capable of recording each onsite security alarm annunciation, including each alarm, false alarm, alarm check, and tamper indication and the type of alarm, location, alarm circuit, date, and time.

Criterion Guideline

The intrusion detection system shall maintain a record of alarm annunciations and the alarm stations shall have the capability to record the cause of each alarm and the disposition of each alarm.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009; NUREG-1959, "Intrusion Detection Systems and Subsystems: Technical Information for NRC Licensees," March 2011; and Department of Energy, Sandia National Laboratories, Technology Transfer Manuals SAND99-2391, "Exterior Intrusion Detection"; SAND-2388, "Interior Intrusion Detection"; and SAND99-2389, "Video Assessment". Of these documents, only NUREG-1959 is publicly available (as ADAMS Accession No. ML11112A009).

PS-ITAAC #15, Emergency Exits from the Protected Area and Vital Areas Requirements

10 CFR 73.55(e)(8)(iii). "All emergency exits in the protected area must be alarmed and secured by locking devices that allow prompt egress during an emergency and satisfy the requirements of this section for access control into the protected area."

10 CFR 73.55(e)(9)(ii). "The licensee shall protect all vital area access portals and vital area emergency exits with intrusion detection equipment and locking devices that allow rapid egress during an emergency and satisfy the vital area entry control requirements of this section."

Design Commitment	Inspections, Tests, Analyses	Acceptance Criterion
15. Emergency exits through the protected area perimeter and vital area boundaries will be alarmed with intrusion detection devices and secured by locking devices that allow prompt egress during an emergency.	15. Tests of emergency exits through the protected area perimeter and vital area boundaries will be performed.	15. Emergency exits through the protected area perimeter and vital area boundaries are alarmed with intrusion detection devices and secured by locking devices that allow prompt egress during an emergency.

Criterion Guidelines

- a. All intrusion detection equipment and locking devices installed on emergency exits (personnel doors, equipment doors, vehicle doors, etc.) from the protected area and vital areas are consistent with what was identified in the design specification and are constructed or installed in accordance with design specifications.
- b. All vital area emergency exits are equipped with intrusion detection equipment.
- c. All emergency exits from the protected area and vital areas are equipped with locking devices that allow prompt egress during an emergency.
- d. All vital area emergency exits remain locked and alarmed when the area is unoccupied.
- e. The intrusion detection equipment and access-control devices for all emergency exits from the protected area and vital areas operate as designed and are tested in accordance with the applicant's testing procedures.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009, and Department of Energy, Sandia National Laboratories, Technology Transfer Manuals SAND-2388, "Interior Intrusion Detection"; SAND99-2389, "Video Assessment," and SAND99-2391, "Exterior Intrusion Detection." None of these documents is publicly available.

PS-ITAAC #16, Communication Requirements

10 CFR 73.55(j)(3). “All on-duty security force personnel shall be capable of maintaining continuous communication with an individual in each alarm station, and vehicle escorts shall maintain continuous communication with security personnel. All personnel escorts shall maintain timely communication with the security personnel.”

10 CFR 73.55(j)(4). “The following continuous communication capabilities must terminate in both alarm stations required by this section: (i) 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 (ii) A system for communication with the control room.”

10 CFR 73.55(j)(5). “Non-portable communications equipment must remain operable from independent power sources in the event of the loss of normal power.”

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
16(a). The central and secondary alarm stations will have conventional (landline) telephone service with the control room and local law enforcement authorities.	16(a). Tests of the central and secondary alarm stations' conventional (landline) telephone service will be performed.	16(a). The central and secondary alarm stations are equipped with conventional (landline) telephone service with the control room and local law enforcement authorities.
16(b). The central and secondary alarm stations will be capable of continuous communication with on-duty security force personnel.	16(b). Tests of the central and secondary alarm stations' continuous communication capabilities will be performed.	16(b). The central and secondary alarm stations are capable of continuous communication with on-duty watchmen, armed security officers, armed responders, or other security personnel who have responsibilities within the physical protection program and during contingency response events.
16(c). Nonportable communications equipment in the central and secondary alarm stations will remain operable from an independent power source in the event of the loss of normal power.	16(c). Tests of the nonportable communications equipment will be performed.	16(c). All nonportable communication devices (including conventional telephone systems) in the central and secondary alarm stations remain operable (without disruption) during the loss of normal power.

Criteria Guidelines

- a. All nonportable communication devices (including conventional telephone landline systems) in the central and secondary alarm stations are wired to an independent power supply that enables those systems to remain operable (without disruption) during the loss of normal power.
- b. All independent power supply for nonportable communication equipment possesses the capability to provide adequate power to operate these systems.
- c. All power transfer from the operating power supply to the independent power supply enables the nonportable communication equipment to remain operable without disruption.
- d. All continuous communication capability with onsite and offsite resources (i.e., both (1) radio- or microwave-transmitted two-way voice communications and conventional telephone between the site and local law enforcement and (2) a system for communication with the control room) terminates in both central and secondary alarm stations and the equipment in the central and secondary alarm stations is in accordance with the regulations.
- e. All on-duty security force personnel are capable of maintaining continuous communication with an individual in each of the central and secondary alarm stations
- f. The central and secondary alarm stations maintain continuous communication with local law enforcement authorities.

Additional guidance is provided in RG 5.76, "Physical Protection Programs at Nuclear Power Reactors," July 2009, and Department of Energy, Sandia National Laboratories, Technology Transfer Manual SAND99-2392, "Protecting Secure Communications." Neither of these documents is publicly available.

SRP Section 14.3.12
Description of Changes

**PHYSICAL SECURITY HARDWARE - INSPECTIONS, TESTS, ANALYSES, AND
ACCEPTANCE CRITERIA**

This Revision 2 to SRP Section 14.3.12 updates Revision 1 of this section, dated May 2010, to incorporate the requirements for vehicle control measures under 10 CFR 73.55 (e)(10)(i)(B) and incorporate recommendations from NRC Regulatory Issue Summary 2008-05, "Lessons Learned to Improve Inspections, Tests, Analyses, and Acceptance Criteria Submittal" Revision 1, September 23, 2010.

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