

## **13.0 SAFEGUARDS**

### **13.1 PHYSICAL PROTECTION**

#### **13.1.1 PURPOSE OF REVIEW**

The purpose of this review is to determine with reasonable assurance that the applicant has committed to having a physical protection system that provides high assurance that activities involving special nuclear material (SNM) are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety. The physical protection system should be designed to protect against the design basis threats of theft or diversion of formula quantities of strategic special nuclear material (SSNM) and radiological sabotage as stated in 10 CFR 73.1(a). Physical protection requirements for applicants possessing formula quantities of SSNM are found in 10 CFR 73.20, 73.45, and 73.46.

#### **13.1.2 RESPONSIBILITY FOR REVIEW**

Primary: Physical Protection Specialist

Secondary: None

Supporting: Regional Physical Protection Inspector

#### **13.1.3 AREAS OF REVIEW**

The reviewer should review the applicant's submittal for an acceptable physical protection system that protects against the design basis threats of both theft or diversion of formula quantities of SSNM and radiological sabotage. The reviewer should ensure that the applicant has described how the general performance requirements of 10 CFR 73.20, the performance capabilities outlined in 10 CFR 73.45, and the specific measures included in 10 CFR 73.46 will be met through development, implementation, and maintenance of a physical protection system.

#### **13.1.4 ACCEPTANCE CRITERIA**

##### **13.1.4.1 Regulatory Requirements**

Specific references are as follows:

- A. In 10 CFR 73.20, the general performance objective and requirements for a fixed site physical protection system are defined.
- B. In 10 CFR 73.45, the performance capabilities for fixed site physical protection systems are defined.

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- C. In 10 CFR 73.46, specific measures for fixed site physical protection systems, subsystems, components, and procedures are detailed.
- D. Appendices B, C, G, and H to 10 CFR 73.46 provide additional requirements applicable to the MOX facility.

### **13.1.4.2 Regulatory Guidance**

The regulatory guidance for physical protection includes:

- A. Regulatory Guide 5.52, Standard Format and Content of a Licensee Physical Protection Plan for Strategic Special Nuclear Material at Fixed Sites (Other than Nuclear Power Plants), Rev. 3, December 1994.
- B. Regulatory Guide 5.55, Standard Format and Content of Safeguards Contingency Plans for Fuel Cycle Facilities (for comment), March 1978.
- C. Regulatory Guide 5.44, Perimeter Intrusion Alarm Systems, Rev. 3, October 1997.
- D. INFCIRC/225/ Rev. 4 (Corrected), The Physical Protection of Nuclear Material and Nuclear Facilities, June 1999.
- E. NUREG-BR0252, User's Guide to Physical Protection Documents Published by the NRC, November, 1998.

### **13.1.4.3 Regulatory Acceptance Criteria**

The reviewer will find the applicant's physical protection system acceptable if the physical protection plan commitments are consistent with 10 CFR 73.20, 73.45 and 73.46. The physical protection plan for the mixed oxide (MOX) facility shall contain inspectable commitments which shall be the basis for the NRC physical protection inspection program. Therefore, it is imperative that commitments be expressed in unambiguous terms. NRC has determined that public disclosure of the details of the physical protection system for a MOX facility could impact on common defense and security and should be classified as Confidential, National Security Information.

#### **13.1.4.3.1 Introduction and Schedule for Implementation**

The applicant should state its corporate name, the facility name, and the location of the facility. The applicant should describe the MOX facility and the type of SNM that will be utilized, its general layout, its surrounding area and the surrounding terrain. The reviewer should ensure that the applicant has included a map of the entire facility and other maps and illustrations, as appropriate. The applicant should indicate on these maps the owner controlled area; the location of all buildings; the locations of physical protection systems, subsystems, and major components; the protected area and all entry/exit points; vehicle barriers; all material access

areas; vital (if applicable) areas; controlled access areas; vaults; entry/exit control points; alarm stations; security posts; and response force staging areas.

The applicant should describe the schedule for implementing the physical protection plan. SSNM may not be stored or used at the MOX facility until the physical protection system is fully implemented and operational.

#### **13.1.4.3.2 General Performance Objectives**

The reviewer will determine that the applicant's commitments in this section are consistent with §73.46. In addition, the reviewer should verify the following:

The applicant has described, in general terms, how the physical protection system will have as its objective to provide high assurance that activities involving SNM are not inimical to the common defense and security and do not constitute an unreasonable risk to the public health and safety.

The applicant has described how, through the development, implementation, and maintenance of a physical protection system, the general performance objective and requirements outlined in 10 CFR 73.20 and the performance capability requirements of 10 CFR 73.45 will be met.

Further, the reviewer should ensure that the applicant has identified and described those portions of the physical protection system for which redundant and diverse components, as well as redundant and diverse subsystems and components, are necessary in order to ensure adequate performance, as required by 10 CFR 73.20(b)(2). In general terms, the applicant should describe the subsystems and components to be used to provide this redundancy and diversity and the ways in which these subsystems and components are redundant and diverse.

Finally, the reviewer should verify that the applicant has described how the physical protection system is designed, tested, and maintained to ensure its continual effectiveness, reliability, and availability. This verification should be conducted onsite by the reviewer prior to plan approval.

#### **13.1.4.3.3. Design Basis Threat (10 CFR 73.1(a))**

The applicant has affirmed the intent to protect against the design basis threats of both theft or diversion of formula quantities of SSNM and radiological sabotage, as described in 10 CFR 73.1(a). For a MOX fuel fabrication facility, it is important that the physical protection system be designed both to protect against radiological sabotage, as well as to prevent theft of formula quantities of SSNM. With respect to radiological sabotage, the applicant is expected to establish a defensive strategy which would deny unauthorized access to areas of the plant which contain plutonium. The reviewer should ensure that the applicant has committed to maintain and update the physical protection plan to reflect any changes that are necessary to ensure the continual ability to protect against the design basis threats.

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### 13.1.4.3.4 Security Organization (10 CFR 73.46(b))

The performance objective of the security organization is to manage, control, and implement the physical protection system in a manner that is consistent with the physical protection plan and continually maintains its effectiveness. The reviewer should ensure that the applicant has clearly described the security organization that will be used at the facility. The security organization should be acceptable if the applicant's commitments are consistent with the requirements in §73.46(b), and associated Appendices B, C, G, and H of 10 CFR 73, and the following criteria:

- A. The applicant has stated whether the security organization is employed directly by the applicant or is a contractor to the applicant. If a contractor, the reviewer should ensure that the applicant described the written agreements between the applicant and contract guard force management that pertain to how the guard force will meet NRC's requirements in §73.46(b)(1) and in Appendix B, "General Criteria for Security Personnel," and Appendix H, "Weapons Qualification Criteria," to 10 CFR Part 73.
- B. The applicant has described the structure and management of the security organization, including both uniformed security personnel and other persons responsible for security-related functions, consistent with §73.46(b)(1). This discussion should include a description of each supervisory and management position, including responsibilities and lines of authority to facility and corporate management.
- C. The applicant has affirmed that at least one full-time member of the security organization will be onsite at all times with the authority to direct the physical protection activities of the security organization, consistent with §73.46(b)(2). The plan should also affirm that written security procedures will be used and provisions for written approval of such procedures, and any revision thereto, are developed and used, consistent with §73.46(b)(3).
- D. The applicant has affirmed that an approved Guard Force Training Plan, in accordance with Appendix B to Part 73 will be in effect. The physical protection plan should commit to having all members of the security organization trained, equipped, and qualified to perform each assigned security duty per 10 CFR Part 73 Appendix B and Appendix H as appropriate, consistent with §73.46(b)(4).
- E. The applicant has described how the security personnel, licensee employees or contractor employees will carry out their assigned duties or responsibilities upon the request of the NRC. The applicant should also affirm that, within any given period of time (e.g., at least one work shift or 8 hours), a member of the security organization will not be assigned to or have direct operational control over more than one of the redundant elements of a physical protection subsystem, if such assignment or control could result in the loss of effectiveness of the subsystem, consistent with §73.46(b)(5).
- F. The applicant has affirmed that every guard, armed response person, and Tactical Response Team (TRT) member will be armed and should describe the armament assigned

to members of the security force by position title, consistent with §73.46(b)(6). The applicant should include a description of the qualification and requalification program for guard and TRT members in night firing with assigned weapons, and, for TRT members only, a description of the training program in response tactics, consistent with §73.46(b)(7) and (8). In addition, equipment to be used by members of the security force in providing effective response capabilities should also be described.

- G. The applicant has described how scenarios for force-on-force exercises are developed, the design goals for conducting such exercises, and the frequency of exercises. The applicant should affirm that as a licensee it will permit NRC to observe one force-on-force exercise each year and that the NRC will receive a 60-day notice of the planned exercise, consistent with §73.46(b)(9).
- H. The applicant has affirmed that the records required by §73.46(b)(3)(i), (4), (7), (8) and (9) will be maintained/retained and has described how they will be maintained/retained.
- I. The applicant has described the physical fitness training program and medical examination for each guard, armed response person or TRT member consistent with §73.46(b)(10)-(12) to ensure that these personnel are able to perform their assigned duties under conditions of strenuous tactical engagements.

#### **13.1.4.3.5 Physical Barrier Subsystems (10 CFR 73.46(c))**

A performance objective of physical barriers is to define areas within which authorized activities and conditions are permitted. Other performance objectives of barriers are to channel persons, vehicles and material to or from entry/exit control points; to delay or deny unauthorized penetration attempts by persons, vehicles or material; and to delay any unauthorized SSNM removal attempts sufficient to assist detection and assessment and permit a timely response by the security force to prevent the intended act. The reviewer should ensure that the applicant has clearly described the physical barrier subsystems that will be used at the facility. This section should be acceptable if the applicant's commitments are consistent with the requirements in §73.46(c) and the following criteria:

- A. The applicant has described the facility's protected, controlled access, material access, and vital (if applicable) area barriers, discussed the purpose of each barrier, and described the spatial relationship between the protected area and material access or vital areas, consistent with §73.46(c)(2).
- B. The applicant has affirmed that the perimeter of the protected area will be provided with two physical barriers, as defined in §73.2. The inner barrier must be positioned, constructed and maintained to enhance assessment of penetration attempts and to delay attempts at unauthorized exit from the protected area, consistent with §73.46(c)(1). The applicant should commit to installing the protected area barrier fence so that it cannot be lifted to allow an individual to crawl under. The applicant should describe any access points in the protected area barrier, their use, and how they are controlled and protected to ensure the integrity of the barrier.

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- C. The applicant has described the location and size of all isolation zones at the facility. Affirmation should be given that the isolation zones adjacent to the physical barriers at the perimeter of the protected area should be at least 6.1 m (20 ft) wide and be maintained clear of obstacles or structures on either side of the barriers to permit assessment, consistent with §73.46(c)(3).
- D. The applicant has affirmed that the location and placement of vehicle barriers will provide protection against radiological sabotage by the design basis explosive (classified) or the use of a vehicle for transporting personnel and their equipment into the protected area to aid in the theft of SSNM. The physical description of the barrier system should be included, along with a commitment that the barrier can adequately counter the design basis vehicle (classified), consistent with §73.46(c)(1). If other than a commercially available barrier is used, any testing conducted to validate the penetration resistance of the barrier should be discussed.
- E. The applicant has described the lighting system provided to ensure illumination for all required monitoring, observation, and assessment activities for all exterior areas within the protected area. The commitment for illumination should be not less than 2.15 lumen per meter<sup>2</sup> (0.2 footcandle) measured horizontally at ground level, consistent with §73.46(c)(4). The applicant should discuss emergency backup power for protected area lighting and assessment capability if normal power is lost.
- F. The applicant has described the purpose of each process material access area at the facility and the protection afforded SSNM (other than alloys, fuel elements, or fuel assemblies) while in these material access areas. Both physical and procedural protective measures should be described, consistent with §73.46(c)(5).
- G. The applicant has affirmed that physical barrier subsystems will be in place to assure that SSNM is stored or processed only in a material access area, vital equipment is located only within a vital area, and both vital and material access areas are located within a protected area. Physical barriers will be maintained for a vital or material access area which are separated from any physical barrier at the perimeter of the protected area. The applicant should describe the level of physical hardening for the wall, floors, and ceilings of these areas. The number, location and types of entry/exit portals should be described. Methods used to provide hardening of the portals (during opened and closed conditions) should be described. Hardening for ventilation and other openings greater than 619.4 cm<sup>2</sup> (96 square inches), with the smaller dimension of 15.2 cm (6 inches) or greater, should be described. Access to vital equipment or SSNM will require passage through at least three physical barriers.
- H. The applicant has affirmed that SSNM, other than alloys, fuel elements, or fuel assemblies, shall be stored in a vault when not undergoing processing if the material can be used directly in the manufacture of a nuclear explosive device, consistent with §73.46(c)(5). The applicant should describe the purpose; the construction of the walls, ceiling and floor; and the location and type of entry portal to each vault. The penetration delay time for the vault

should be estimated by the applicant based on the vault construction method and construction materials and considering penetration by tools and by explosive techniques. Affirmation should be given that the penetration delay time will be greater than the time required for the TRT to respond.

- I. The applicant has described the construction and use of tamper-indicating containers for the storage of SSNM (other than alloys, fuel elements, or fuel assemblies), consistent with §73.46(c)(5).
- J. The applicant has described how fuel elements and fuel assemblies will be stored and protected.

#### **13.1.4.3.6 Access Control Subsystems and Procedures (10 CFR 73.46(d))**

The performance objective of access authorization controls and procedures is to provide current authorization lists and entry criteria. The performance objectives of entry controls and procedures are to verify the identity of persons, vehicles, and materials and to assess such identity against current authorization lists and entry criteria before permitting entry, and to initiate timely response measures to deny unauthorized entries. The reviewer should ensure that the applicant has clearly described the access control subsystems that will be used at the facility. This section should be acceptable if the applicant's commitments are consistent with the requirements in §73.46(d) and the following criteria:

- A. The applicant has described the numbered picture badge identification system used at the facility, consistent with §73.46(d)(1). This description should include a discussion of procedures used for badging individuals authorized access to the protected area and for individuals not employed by the applicant, but who require frequent and extended access to the protected area. Instructions that badged individuals receive in proper badge procedures should also be discussed, along with procedures for accommodating non-badged emergency response individuals during emergency situations. Verification of authorization can be accomplished by use of systems such as bio-metrics, personal identification numbers, card readers, or combinations thereof. Badges should not be taken off-site unless the applicant commits to using a highly reliable method of verifying personal identity such as bio-metrics. The applicant should affirm that blank badge material will be controlled. The applicant should affirm that the badge of an employee terminated for cause should be immediately retrieved or deleted from the computerized access system
- B. The applicant has affirmed that badges will be required to be displayed by all individuals while inside the protected area, consistent with §73.46(d)(1).
- C. The applicant has committed to procedures for determining an individual's need for access to a vital area, material access area, or controlled access area; procedures for the distribution and maintenance of lists of authorized individuals; procedures for ensuring the maintenance of the two-man rule within material access areas and vaults; procedures for ensuring that no activities other than those that require access to SSNM or necessary maintenance are permitted within material access areas; and methods used to visually

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identify individuals authorized unescorted access to vital areas, material access areas, or controlled access areas, consistent with §73.46(d)(2). This discussion should note differences in procedures, if any, between working and non-working hours (nights, weekends, and holidays) and normal versus emergency conditions. The applicant should commit that access to material access areas and vaults requires a minimum of two individuals to be present. The applicant should commit to only allowing unescorted access to vital, material access or controlled access areas to individuals with a government security clearance and a need-to-know.

- D. The applicant has described how it will control all points of personnel access into the protected area, under both normal and emergency conditions, consistent with §73.46(d)(4). This description should include a discussion of methods used to identify individuals and to verify individuals' authorization; methods used to verify emergency conditions; and procedures for conducting searches of individuals for firearms, explosives, and incendiary devices. The search function for detecting both firearms and explosives must use detector equipment. The equipment used should represent the current state-of-the-art equipment that is commercially available. The capabilities of the search equipment should be described. The applicant should also describe what actions it takes, including the use of pat-down searches, if it suspects an individual of trying to introduce contraband into the protected area or if the search equipment is not operating satisfactorily. The applicant should describe how it will determine that the equipment is operating properly. The applicant should commit to having the individual responsible for the last access control point prior to entering the protected area to be protected by a bullet-resisting structure hardened to at least the Underwriters' Laboratories, Inc. (UL)752/Class IV level and preferably to the 7.62 mm level of protection.
- E. Individuals exempted from any of the aforementioned access controls should be identified. The distribution and maintenance of authorization lists should also be described.
- F. The applicant has affirmed that it will establish and follow written procedures that will permit access-control personnel to identify materials in hand-carried packages that are not authorized entry to the protected area, during both normal and emergency conditions, consistent with §73.46(d)(5). Further, the applicant should describe procedures for searching hand-carried packages at personnel and vehicle access points for firearms, explosives, and incendiary devices.
- G. The applicant has affirmed that it will establish and follow written procedures that will permit access-control personnel to identify materials in delivered packages that are not authorized entry to the protected area during both normal and emergency conditions, consistent with §73.46(d)(6). Further, methods used to check for proper identification and authorization should be described along with search procedures for firearms, explosives, and incendiary devices. Any activities exempted from the above procedures should be described. The development, distribution, and maintenance of authorized (or unauthorized) materials lists should be described.



- H. The applicant has described procedures used for controlling all points of vehicle access (non-emergency and emergency) into the protected area and how written procedures are established and followed that will permit access-control personnel to identify vehicles that are authorized entry to the protected area, consistent with §73.46(d)(3). The distribution and maintenance of these procedures should be described. Search procedures of all vehicles requiring entry to the protected area for firearms, explosives, and incendiary devices should also be described. Any vehicles exempt from the aforementioned procedures should be described, consistent with §73.46(d)(7). Procedures used in escorting vehicles within the protected area, and areas where vehicles may have access, along with the purpose for the access, should be discussed.
- I. The applicant has described the control and use of designated licensee vehicles within the protected area, consistent with §73.46(d)(8).
- J. The applicant has described the methods it proposes to use to control all points of personnel access to material access areas, vital areas, and controlled access areas, including methods used to verify identification and authorization, consistent with §73.46(d)(9). The applicant shall affirm that at least two armed and appropriately trained guards shall be posted at each material access area control point whenever in use. Personnel exit searches from material access areas should also be discussed, and the applicant should affirm that at least two individuals, who are not authorized access to that material access area, will conduct separate, independent searches for concealed SSNM. The applicant should affirm that material access area exit searches for SNM and metal can detect standards, consistent with NRC classified criteria.
- K. The applicant has described procedures for verifying material entry authorizations and procedures for verifying quantity and type of material, consistent with §73.46(d)(9). These descriptions should include the components to be used in the detection of unauthorized materials that are hand-carried by authorized individuals, or mailed or otherwise shipped, as part of an authorized shipment. The applicant has described how normal conditions differ between regular working hours and non-working hours (nights, weekends, and holidays).
- L. The applicant has described methods used to control all points of vehicle access (non-emergency and emergency) to material access areas, vital areas, and controlled access areas, including the establishment and maintenance of written procedures that will permit access control personnel to identify those vehicles that are authorized entry to material access and vital areas, consistent with §73.46(d)(9). Vehicle exit searches should also be described, and the applicant should affirm that searches will be conducted by a team of at least two individuals.
- M. The applicant has described procedures and areas used for searching contaminated wastes coming from a material access area, consistent with §73.46(d)(10).
- N. The applicant has described containers, procedures, and areas used for shipping SSNM offsite, consistent with §73.46(d)(11) and (12). The applicant should affirm that the packaging and shipping process will be conducted by a team of at least two individuals.

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- O. The applicant has described individuals, by job function, who may be designated as escorts, and procedures used for escorting individuals during both routine and emergency situations. Such procedures should describe individuals requiring escort, escort/visitor ratios, badging procedures, and escort training and record-keeping, consistent with §73.46(d)(13). The applicant should commit to a maximum escort/visitor ratio of at least one escort to five visitors.
- P. The applicant has described procedures for controlling all keys, locks, combinations, and related equipment used to control access to protected, material access, vital, and controlled access areas. The discussion should describe the circumstances under which such keys, locks, etc., are changed and procedures followed when the employment of an employee with access to such keys, locks, etc., is terminated, consistent with §73.46(d)(14). The applicant should commit to changing keys, locks, combinations, and related equipment at least when there is evidence of compromise to any of the items that a terminated employee had access.
- Q. The applicant has committed to controlling information regarding the presence of NRC safeguards inspectors, consistent with §73.46(d)(15).
- R. The applicant should describe record-keeping procedures for: (1) current written procedures that permit access-control personnel to identify vehicles that are authorized and those materials that are not authorized entry to protected, material access and vital areas; (2) findings of drum-scanning and tamper-sealing of containers of contaminated wastes exiting from material access areas; and (3) the required log of escorted individuals, consistent with §73.46(d)(3), (10) and (13).

### **13.1.4.3.7 Detection, Surveillance and Alarm Subsystems and Procedures (10 CFR 73.46(e))**

The performance objectives of detection, surveillance, and alarm subsystems and procedures are to detect, assess, and communicate any unauthorized access or penetrations or such attempts by persons, vehicles, or materials at the time of the act or the attempt so that the response can be such as to prevent the unauthorized access or penetration. The reviewer should ensure that the applicant has clearly described the detection, surveillance, and alarm subsystems that will be used at the facility. This section should be acceptable if the applicant's commitments are consistent with the requirements in §73.46(e) and the following criteria:

- A. The applicant has described the intrusion detection system that will be installed in the isolation zone between the two barriers at the protected area perimeter, consistent with §73.46(e)(1). The applicant should commit to providing a volumetric intrusion detection system, which is capable of detecting an individual weighing a minimum of 35 kg (77 lbs), whether the individual is running, walking, crawling, jumping, or rolling through the isolation zone of the protected area. The capabilities, installation, and testing of the intrusion detection equipment should be consistent with Regulatory Guide 5.44, Revision 3.

- B. The applicant has described the location of all emergency exits and described the protection afforded them, consistent with §73.46(e)(2). The applicant should commit to maintaining all emergency exits in the protected, material access, vital and controlled access areas locked to prevent entry from outside and equipping them with local audible and visible alarms.
- C. The applicant has described the protection and surveillance afforded: (1) unoccupied material access and vital areas; (2) the location of SSNM within process material access areas; (3) vaults and process areas that contain SSNM that has not been alloyed or encapsulated, including a description of procedures for access to these particular vaults and process areas, consistent with §73.46(e)(3). Equipment that is used to provide this protection, along with associated detection capabilities, should be described. The applicant should commit to having all unoccupied material access areas where plutonium is located equipped with volumetric intrusion detection equipment and closed circuit television (CCTV) for remote assessment. The applicant should affirm that access to unoccupied vaults and process areas requires that an individual other than the alarm station operator be present or have knowledge of access.
- D. The applicant has described how all security stations and individuals (by job position), consistent with §73.46(e)(4), will be provided with duress alarms. The type of duress alarms used, where they are monitored, and emergency backup power should be described.
- E. The applicant has described the location, construction, and characteristics of the central and secondary alarm stations, consistent with §73.46(e)(5). The applicant should commit to having all required alarms annunciate in a continuously manned central alarm station located within the protected area and in at least one other continuously manned independent onsite station. Continuous manning of alarm stations and methods used for annunciation of required alarms should be described, along with protection afforded the stations (both procedural and physical), so that a single act cannot remove the capability of calling for assistance or responding to an alarm. Affirmation also should be provided that the alarm stations are bullet-resisting to at least the UL 752/Class IV level, and preferably to the 7.62 mm level of protection. If other than commercially available armoring material is utilized, any testing or engineering studies conducted to validate the penetration resistance of the barrier should be described. Affirmation should be given that access to the alarm stations is controlled on a strict need-to-know basis and the central alarm station not contain any operational activities that would interfere with the execution of alarm response functions. The applicant should describe the annunciation systems at the alarm stations and commit to indicating the status of all alarms and alarm zones in both alarm stations.
- F. The applicant has described (i) how detection equipment and alarm annunciation shall remain operable from independent emergency power sources, (ii) duration of operation in the event of loss of normal power, and (iii) indications given upon loss of normal power and transfer to standby power, consistent with §73.46(e)(6). The applicant should also affirm that switch over to standby power will be automatic and not cause false alarms.

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- G. The applicant has described the physical protection afforded alarm systems, including transmission media, to ensure that the system is not being tampered with, compromised, or on standby power without the knowledge of the licensee, consistent with §73.46(e)(7). The applicant should affirm that all tamper alarms will annunciate in either the access or secure mode.
- H. The applicant has described methods used to monitor all exterior areas within the protected area for unauthorized persons, vehicles, materials, and activities and the duration or periodicity of such monitoring, consistent with §73.46(e)(8). Criteria used in defining authorized and unauthorized activities and conditions within the protected area should be described, along with methods for developing, maintaining, and distributing lists of authorized activities and conditions. The applicant should commit to monitoring or conducting random patrols within the protected area at least several times each shift.
- I. The applicant has described methods used to observe individuals within material access areas, to assure that SSNM is not moved to unauthorized locations or moved in an unauthorized manner, consistent with §73.46(e)(9). The duration or periodicity of such monitoring should be described along with criteria used in defining authorized and unauthorized activities and conditions within the material access area. Methods for developing, maintaining, and distributing lists of authorized activities and conditions should be described. The applicant should commit to using CCTV to observe these areas periodically during working hours and for remote access during non-working hours.

### **13.1.4.3.8 Communication Subsystems (10 CFR 73.46(f))**

The performance objective of communication subsystems is to provide for notification of an attempted unauthorized or unconfirmed removal of SSNM or attempted act of radiological sabotage so that response can be such as to prevent the unauthorized act. The reviewer should ensure that the applicant has clearly described the communication subsystems that will be used at the facility. The communication subsystems should be acceptable if the applicant's commitments are consistent with the requirements in §73.46(f) and the following criteria:

- A. The applicant has described how each guard, watchman, armed response person, or TRT member on duty will be capable of maintaining continuous communications with the individual in each continuously manned alarm station, consistent with §73.46(f)(1). The applicant should also describe how the individual in each continuously manned alarm station will be capable of calling for assistance from other guards, watchmen, armed response personnel, or TRT members and from local law enforcement authorities.
- B. The applicant has described the redundant and diverse systems used to ensure the capability of communications with the local law enforcement authority, consistent with §73.46(f)(2). Cellular phone service may be an acceptable alternative method of communications if the service is reliable and provides complete coverage of the area of concern.

- C. The applicant has described methods used to keep the non-portable communications equipment it uses operable in the event of loss of normal power, consistent with §73.46(f)(3). The applicant should discuss the length of time the equipment will operate on the emergency power source. All sources of emergency power should be protected and located within the protected area.

#### **13.1.4.3.9 Test and Maintenance Programs (10 CFR 73.46(g))**

The performance objective of test and maintenance is to provide confidence that security equipment will be available and reliable to perform its function when needed. The review should ensure that the applicant has clearly described the test and maintenance programs that will be used at the facility. The test and maintenance programs should be acceptable if the applicant's commitments are consistent with the requirements in §73.46(g) and the following criteria:

- A. The applicant has described the testing and maintenance programs for: (1) intrusion alarms; (2) emergency exit alarms; (3) communications equipment; (4) physical barriers; and (5) other physical protection-related devices and equipment such as CCTV, locks, emergency power sources, alarm annunciators, duress alarms, search equipment, etc. used pursuant to 10 CFR 73.46 during the installation and construction, pre-operational and operational tests of the physical protection subsystems and components, consistent with §73.46(g)(1)-(3). This discussion should also include the purpose for and intended level of testing and maintenance programs. In addition, specific methods for testing each type of equipment should be discussed, along with periodicity of testing, consistent with §73.46(g)(3). The applicant should commit to having a testing program for the perimeter intrusion detection system consistent with Regulatory Guide 5.44, Revision 3. The applicant should describe the sensitivity of the SNM, metal, explosive, and x-ray search equipment and the device used for calibration. The applicant should commit to using a device comparable to one which meets the American Society for Testing and Materials (ASTM) F792 standard, "Standard Practice for Design and Use of Ionizing Radiation Equipment for the Detection of Items Prohibited in Controlled Access Areas," consistent with NRC classified criteria.
- B. The applicant has described the preventive maintenance program established to ensure the maintenance of all physical protection-related subsystems and components in operable and reliable condition, consistent with §73.46(g)(4) and (5). The applicant should describe corrective actions or compensatory measures used in the event of component failure within physical protection systems.
- C. The applicant has described procedures used in performing repairs and maintenance of physical protection systems, consistent with §73.46(g)(5). The applicant should commit that all repairs and maintenance will be performed by two individuals working as a team and that performance verification tests will be conducted after maintenance has been completed.
- D. The applicant has described how it will review and audit its security program, consistent with §73.46(g)(6). This discussion should include the periodicity of the review and audit, a

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description of who will conduct the review and audit, items to be covered by the review and audit, how the review and audit will be documented, to whom the review and audit findings will be provided for review, and the record-keeping associated with the review and audit program.

- E. The commitment for the frequency of the annual audit should not vary by more than plus or minus 1 month.

### **13.1.4.3.10 Contingency and Response Plans and Procedures (10 CFR 73.46(h))**

The performance objective of contingency and response plans and procedures is to provide for predetermined response to safeguards contingency events so that the adversary will be engaged and impeded until offsite assistance arrives. The reviewer should ensure that the applicant has clearly thought out potential contingencies and has clearly described contingency and response plans that will be used by the facility. The contingency and response plans should be acceptable if the applicant's plans are consistent with the requirements in §73.46(h), developed in accordance with the criteria in Appendix C to Part 73, and the following criteria:

- A. The applicant has established a safeguards contingency plan for dealing with threats, thefts, and radiological sabotage related to SSNM and its facility and commits to maintain and follow the plan, consistent with §73.46(h)(1).
- B. The applicant has described the documented response arrangements it has made with the local law enforcement agencies, consistent with §73.46(h)(2). This should include estimated number of response individuals with specific response times of arrival that are consistent with NRC classified criteria.
- C. The applicant has described the number of TRT members immediately available for response and the duties they will be assigned. TRT members may be physically located at the facility or at a nearby facility such that their response is timely, effective, and is not easily interdicted to ensure protection against the design basis threats defined in §73.1(a). In addition, the required force of guards or armed responders available on-site to assist the TRT should be described, along with a discussion of the rationale for determining the number of individuals in this force of guards or armed responders and the availability of this force, consistent with §73.46(h)(3).
- D. The applicant has described its planned response procedures for dealing with detection of abnormal presence or activity of persons or vehicles within an isolation zone, the protected area, a material access area, or a vital area or evidence, or indication of intrusion into the protected area, material access area, or a vital area should be described, as well as the methods for assessing the threat and responding to the threat, consistent with §73.46(h)(4). The applicant should establish a defensive strategy which would deny unauthorized access to areas of the facility which contain plutonium. The applicant should commit to requiring guards to interpose themselves between vital areas and material access areas and any adversary attempting entry for purposes of radiological sabotage or theft of SSNM, to

intercept any persons exiting with SSNM, and to inform local law enforcement of the threat and request assistance.

- E. The applicant has described the instructions that guards and armed responders will receive in the use of force, including the use of deadly force, in preventing or impeding theft of SSNM, consistent with §73.46(h)(5).
- F. The applicant has described the methods that will be used for providing assessment of all protected areas alarms. The applicant should commit to using CCTV or other suitable means which limits exposure of responding personnel to possible attack to assess the protected area barrier and associated isolation zones, consistent with §73.46(h)(6). The applicant should commit to the CCTV providing unobstructed view of the protected area barrier and isolation zones with no blind spots.
- G. The applicant has described methods that will be used for assessing alarms occurring within unoccupied vaults and unoccupied material access areas containing plutonium and the timeliness of assessment. The applicant should commit to using at least two security personnel to assess alarms by CCTV or other remote means that occur within unoccupied vaults and unoccupied material access areas, consistent with §73.46(h)(7).
- H. The applicant has described methods that will be used for assessing alarms occurring within unoccupied vaults and unoccupied material access areas containing alloyed or encapsulated SSNM and the timeliness of assessment. The applicant should commit to using at least two security personnel to remotely assess alarms by CCTV, or by at least two security personnel who are searched before exiting the material access areas, consistent with §73.46(h)(8).
- I. The applicant has described how it will establish, maintain, and retain as a record the current safeguards contingency plan, consistent with §73.46(h)(1) and (2).

#### **13.1.4.3.11 Reporting of Safeguards Events (10 CFR 73.71)**

Acceptance should be based on the fact that the applicant adequately addresses how and when it will report safeguards events to the NRC and follows the criteria in 10 CFR Part 73, Appendix G, "Reportable Safeguards Events."

### **13.1.5 REVIEW PROCEDURES**

#### **13.1.5.1 Acceptance Review**

The primary reviewer should perform an acceptance review to determine if the application (construction or license) adequately addresses the applicable items in Section 13.1.3, "Areas of Review."

## Safeguards

Guidance specific to the application for construction approval and the license application is provided below.

### J. Application for Construction Approval

Although the applicant is not expected to submit a physical protection plan with the application for construction approval, the applicant should commit to developing and implementing a physical protection system that meets or exceeds the acceptance criteria in Section 13.1.4. If provided by the applicant, the primary reviewer should evaluate the proposed location and construction technique and materials of the buildings; protected, vital, material access, and controlled access area barriers; vehicles barriers; alarm stations; security search or control points; and vaults to ensure that the commitments and program goals, as described in Section 13.1.3, are appropriate for physical protection at the design stage.

### K. License Application

Specifically, the license application should address Section 13.1.3 in full. The applicant is expected to provide a physical protection plan with the license application.

If the primary reviewer verifies that physical protection is adequately addressed (construction or license), the primary reviewer should accept the application for the safety evaluation in Section 13.1.5.2. If the primary reviewer identifies significant deficiencies in the material provided, the primary reviewer should request that the applicant submit additional information prior to the start of the safety evaluation.

#### **13.1.5.2 Safety Evaluation**

After determining that the application is acceptable for review in accordance with either Section 13.1.5.1(A) (construction) or 13.1.5.1(B) (license), the primary reviewer should perform an evaluation against the acceptance criteria described in Section 13.1.4. On the basis of its review, the reviewer may request that the applicant provide additional information or modify the application to meet the acceptance criteria in SRP Section 13.1.4.

Guidance specific to the application for construction approval and the license application is provided below.

### A. Application for Construction Approval

The primary reviewer should establish that the applicant's proposed design, location, construction technique, and material for elements of the physical protection system and related commitments will lead to a physical protection plan that will meet or exceed the regulatory acceptance criteria in Section 13.1.4.



## B. License Application

The primary reviewer should verify that sufficient information has been provided under Section 13.1.4.3, with respect to the physical protection plan, and that the information provided is consistent with the guidance in this SRP chapter.

When the evaluation is complete, the primary reviewer should prepare the physical protection input for the Safety Evaluation Report (SER), as described in Section 13.1.6 using the acceptance criteria from Section 13.1.4.

### 13.1.6 EVALUATION FINDINGS

The primary reviewer should document the physical protection evaluation by preparing material suitable for inclusion in the SER. The primary reviewer should describe the review, identify any alternative measures that will be used, explain the basis for the findings, and state the conclusions.

The reviewer could document the safety evaluation for the application for construction approval as follows:

*The reviewer reviewed the application for construction approval for [insert name of facility] according to Section 13.1 of NUREG-1718. The reviewer evaluated [Insert a summary statement of what was evaluated] and found that [summarize the findings].*

*The reviewer concluded that the applicant provided adequate commitments and goals for the design of a physical protection system and that these commitments and goals should result in a physical protection plan that will meet or exceed the requirements in 10 CFR 73.20, 73.45 and 73.46 and guidance outlined in NUREG-1718. As a result, the applicant meets the requirements under proposed 10 CFR Part 70 for construction approval of the facility in the area of physical protection.*

The reviewer could document the safety evaluation for the license application as follows:

*The reviewer reviewed the license application for [insert facility name] according to Section 13.1 of NUREG-1718. The reviewer evaluated [Insert a summary statement of what was evaluated] and found [insert a description of the findings]. Based on the review of the license application, the reviewer concluded that the applicant adequately described and documented physical protection system and provided a plan to address the regulations in 10 CFR 73.20, 10 CFR 73.45 and 10 CFR 73.46. Meeting the requirements given above provides an acceptable basis for the finding that, insofar as physical protection is concerned, the applicant meets the associated requirements in 10 CFR Parts 73.20, 73.45 and 73.46 and therefore the physical protection plan is acceptable to support licensed operation under 10 CFR Part 70.*

## Safeguards

### 13.1.7 REFERENCES

- A. Regulatory Guide 5.52, Standard Format and Content of a Licensee Physical Protection Plan for Strategic Special Nuclear Material at Fixed Sites (Other than Nuclear Power Plants), Rev. 3, December 1994.
- B. Regulatory Guide 5.44, Perimeter Intrusion Alarm Systems, Rev. 3, October 1997.
- C. Regulatory Guide 5.55, Standard Format and Content of Safeguards Contingency Plans for Fuel Cycle Facilities, March 1978.
- D. Code of Federal Regulations, Title 10, Part 73.20, General Performance Objectives and Requirements.
- E. Code of Federal Regulations, Title 10, Part 73.45, Performance Capabilities for Fixed Site Physical Protection Systems.
- F. Code of Federal Regulations, Title 10, Part 73.46, Fixed Site Physical Protection Systems, Subsystems, Components, and Procedures.
- G. Code of Federal Regulations, Title 10, Part 73.71, Reporting of Safeguards Events.
- H. Code of Federal Regulations, Title 10, Part 11, Criteria and Procedures for Determining Eligibility for Access to Or Control Over Special Nuclear Material.
- I. Code of Federal Regulations, Title 10, Part 25, Access Authorization for Licensee Personnel.
- J. Code of Federal Regulations, Title 10, Part 95, Security Facility Approval and Safeguarding of National Security Information and Restricted Data.
- K. Regulatory Guide 5.7, Entry/Exit Control for Protected Areas, Vital Areas, and Material Access Areas, Rev. 1, May 1980.
- L. Battelle Columbus Division, NUREG-CR 5172, Tactical Training Reference Manual, April 1989.
- M. Battelle Columbus Division, NUREG-CR 5081, Tactical Exercise Planning Handbook, April 1989.