Guidance Document

The contents of this document do not have the force and effect of law and are not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

Document Summary: The following document contains detailed information on how CISA construes the Risk-Based Performance Standards (RBPS) and how it evaluates facility compliance with those standards.

Document Title: Risk-Based Performance Standards Guidance

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Risk-Based Performance Standards Guidance

Chemical Facility Anti-Terrorism Standards

May 2009

Homeland Security

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Disclaimer Notice

RISK-BASED PERFORMANCE STANDARDS GUIDANCE DOCUMENT[1] DISCLAIMER

To assist high-risk facilities in selecting and implementing appropriate protective measures and practices and to assist Department of Homeland Security (DHS or Department) personnel in consistently evaluating those measures and practices for purposes of the Chemical Facility Anti-Terrorism Standards (CFATS), 6 CFR Part 27, DHS's Infrastructure Security Compliance Division has developed this *Risk-Based Performance Standards Guidance Document*. This Guidance reflects DHS's current views on certain aspects of the Risk-Based Performance Standards (RBPSs) and does not establish legally enforceable requirements for facilities subject to CFATS or impose any burdens on the covered facilities. Further, the specific security measures and practices discussed in this document are neither mandatory nor necessarily the "preferred solution" for complying with the RBPSs. Rather, they are examples of measures and practices that a high-risk facility may choose to consider as part of its overall strategy to address the RBPSs. High-risk facility owners/operators have the ability to choose and implement other measures to meet the RBPSs based on the facility's circumstances, including its tier level, security issues and risks, physical and operating environments, and other appropriate factors, so long as DHS determines that the suite of measures implemented achieves the levels of performance established by the CFATS RBPSs. For example, the Site Security Plan (SSP) for a facility that is considered high risk solely because of the presence of a theft/diversion chemical of interest (COI) likely will not have to include the same types of security measures as a facility that is considered high risk because of potential release hazards. Similarly, the SSP for a university or medical research facility would not be expected to include the same type or level of measures as the SSP for a complex chemical manufacturing plant with multiple COI and security issues.

[1] This document is a "guidance document" under Executive Order 12866, as amended, and the Office of Management and Budget's *Final Bulletin for Agency Good Guidance Practice*. This is the first guidance document that DHS has issued concerning the CFATS RBPSs and represents DHS's current thinking on the topic. It does not create or confer any rights for or on any person or operate to bind the public. Covered facilities may use alternate approaches if those approaches satisfy the requirements of the applicable statute and the CFATS regulations.

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Overview

In Section 550 of the Homeland Security Appropriations Act of 2007 (P.L. 109-295) (Act), Congress gave the Department of Homeland Security (DHS or the Department) regulatory authority over security at high-risk chemical facilities. In the Act, Congress instructed DHS to require all high-risk chemical facilities to complete security vulnerability assessments, develop site security plans, and implement protective measures necessary to meet DHS-defined risk-based performance standards.

Pursuant to its congressional mandate, on April 9, 2007, DHS promulgated the Chemical Facility Anti-Terrorism Standards (CFATS), the interim final regulations setting forth the requirements that high-risk (i.e., "covered") chemical facilities must meet to comply with the Act. Among other things, CFATS establishes eighteen Risk-Based Performance Standards (RBPSs) that identify the areas for which a facility's security posture will be examined, such as perimeter security, access control, personnel surety, and cyber security. To meet the RBPSs, covered facilities[2] are free to choose whatever security programs or processes they deem appropriate, so long as they achieve the requisite level of performance in each applicable area. The programs and processes that a high-risk facility ultimately chooses to implement to meet these standards must be described in the Site Security Plan (SSP) that every high-risk chemical facility must develop pursuant to the regulations. It is through a review of the SSP, combined with an on-site inspection, that DHS will determine whether or not a high-risk facility has met the requisite levels of performance established by the RBPSs given the facility's risk profile.[3]

To assist high-risk chemical facilities subject to CFATS in selecting and implementing appropriate protective measures and practices to meet the RBPSs, DHS's Infrastructure Security Compliance Division has developed this *Risk-Based Performance Standards Guidance* document (Guidance). This Guidance provides DHS's interpretations of the level of performance that facilities in each of the risk-based tiers created by CFATS should strive to achieve under each RBPS. It also seeks to help facilities comply with CFATS by describing in greater detail the 18 RBPSs enumerated in CFATS and by providing examples of various security measures and practices that could be selected to achieve the desired level of performance for each RBPS at each tier.[4]

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[2] Unless otherwise specifically indicated, the terms "facility" or "facilities" in this document refer to "covered" (i.e., high-risk) facilities as designated under CFATS.

[3] In the event that DHS preliminarily or finally disapproves a facility's submitted SSP, the facility may obtain a neutral adjudication of that disapproval in accordance with 6 CFR §§ 27.305 – 27.340 of the CFATS regulations, and may appeal an adverse Initial Decision resulting from such an adjudication to the Under Secretary for the National Protection and Programs Directorate in accordance with 6 CFR § 27.345.

[4] In the future, DHS is likely to periodically update this Guidance document to take into account lessons learned throughout CFATS implementation, describe new security approaches and measures that covered facilities may wish to consider implementing, and provide information on any new or revised RBPSs. DHS will make every effort to ensure the broadest dissemination of any subsequent versions of the Guidance document to the regulated community, including posting the revised version on the DHS website and sending e-mails to all Chemical Security Assessment Tool (CSAT) users informing them of the existence of a revised Guidance document.

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Inquiries on RBPS Guidance or Other CFATS Issues

For more information on this Guidance document or the CFATS, feel free to contact DHS via the CFATS Help Desk either via e-mail at csat@dhs.gov or by phone at 866-323-2957, or submit questions via regular mail addressed to Dennis Deziel, Deputy Director, Infrastructure Security Compliance Division, U.S. Department of Homeland Security, Mail Stop 8100, Washington, DC, 20528.

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CFATS Risk-Based Performance Standards

Pursuant to Section 550 of the Act, DHS is required to "establish risk-based performance standards for chemical facilities." In 6 CFR §27.230, DHS enumerated the 18 Risk-Based Performance Standards that covered chemical facilities must meet to be in compliance with CFATS.[5] The 18 RBPSs are repeated in Table 1.

"Performance standards" have a long and well-established history in Federal rulemakings.[6] As the Office of Management and Budget has explained, performance standards "state[ ] requirements in terms of required results with criteria for verifying compliance but without stating the methods for achieving required results."[7] Stated differently,

> A performance standard specifies the outcome required, but leaves the specific measures to achieve that outcome up to the discretion of the regulated entity. In contrast to a design standard or a technology-based standard that specifies exactly how to achieve compliance, a performance standard sets a goal and lets each regulated entity decide how to meet it.[8]

By employing performance standards, CFATS allows covered facilities the flexibility to choose the most cost-effective method for achieving a satisfactory level of security on the basis of each facility's risk profile. While providing flexibility, the performance standards used in CFATS nevertheless establish and maintain reasonable thresholds that covered facilities will have to reach in order to gain DHS approval under the regulation.

Table 1: Section 27.230 Risk-Based Performance Standards
(1) Restrict Area Perimeter. Secure and monitor the perimeter of the facility; **(2) Secure Site Assets.** Secure and monitor restricted areas or potentially critical targets within the facility; **(3) Screen and Control Access.** Control access to the facility and to restricted areas within the facility by screening and/or inspecting individuals and vehicles as they enter, including:

[5] A nineteenth RBPS, located at 6 CFR 27.230(a)(19), provides that regulated facilities must "[a]ddress any additional performance standards the Assistant Secretary may specify." This standard can be used if the Department identifies any additional performance standards that it believes regulated facilities should meet. To date, the Department has not identified any additional performance standards outside of the 18 RBPS enumerated in 6 CFR § 27.230 and reproduced in Table 1 herein. If the Department identifies any new performance standards, it will notify the regulated community through the *Federal Register*.

[6] See Cary Coglianese et al., *Performance-Based Regulation: Prospects and Limitations in Health, Safety, and Environmental Protection*, 55 Admin. L. Rev. 705, 706–07 (2003).

[7] OMB Circular A-119 (Feb. 10, 1998).

[8] Coglianese, *Performance-Based Regulation*, 55 Admin. L. Rev. at 709.

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Table 1: Section 27.230 Risk-Based Performance Standards

(i) Measures to deter the unauthorized introduction of dangerous substances and devices that may facilitate an attack or actions having serious negative consequences for the population surrounding the facility; and

(ii) Measures implementing a regularly updated identification system that checks the identification of facility personnel and other persons seeking access to the facility and that discourages abuse through established disciplinary measures;

(4) Deter, Detect, and Delay. Deter, detect, and delay an attack, creating sufficient time between detection of an attack and the point at which the attack becomes successful, including measures to:

(i) Deter vehicles from penetrating the facility perimeter, gaining unauthorized access to restricted areas or otherwise presenting a hazard to potentially critical targets;

(ii) Deter attacks through visible, professional, well-maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value targets;

(iii) Detect attacks at early stages, through countersurveillance, frustration of opportunity to observe potential targets, surveillance and sensing systems, and barriers and barricades; and

(iv) Delay an attack for a sufficient period of time to allow appropriate response through on-site security response, barriers and barricades, hardened targets, and well-coordinated response planning;

(5) Shipping, Receipt, and Storage. Secure and monitor the shipping, receipt, and storage of hazardous materials for the facility;

(6) Theft and Diversion. Deter theft or diversion of potentially dangerous chemicals;

(7) Sabotage. Deter insider sabotage;

(8) Cyber. Deter cyber sabotage, including by preventing unauthorized on-site or remote access to critical process controls, such as Supervisory Control and Data Acquisition (SCADA) systems, Distributed Control Systems (DCSs), Process Control Systems (PCSs), Industrial Control Systems (ICSs); critical business systems; and other sensitive computerized systems;

(9) Response. Develop and exercise an emergency plan to respond to security incidents internally and with the assistance of local law enforcement and first responders;

(10) Monitoring. Maintain effective monitoring, communications, and warning systems, including:

(i) Measures designed to ensure that security systems and equipment are in good working order and inspected, tested, calibrated, and otherwise maintained;

(ii) Measures designed to regularly test security systems, note deficiencies, correct for detected deficiencies, and record results so that they are available for inspection by the Department; and

(iii) Measures to allow the facility to promptly identify and respond to security system and equipment failures or malfunctions;

(11) Training. Ensure proper security training, exercises, and drills of facility personnel;

(12) Personnel Surety. Perform appropriate background checks on and ensure appropriate credentials for facility personnel, and, as appropriate, for unescorted visitors with access to restricted areas or critical assets, including:

(i) Measures designed to verify and validate identity;

(ii) Measures designed to check criminal history;

(iii) Measures designed to verify and validate legal authorization to work; and

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Table 1: Section 27.230 Risk-Based Performance Standards
(iv) Measures designed to identify people with terrorist ties; **(13) Elevated Threats.** Escalate the level of protective measures for periods of elevated threat; **(14) Specific Threats, Vulnerabilities, or Risks.** Address specific threats, vulnerabilities, or risks identified by the Assistant Secretary for the particular facility at issue; **(15) Reporting of Significant Security Incidents.** Report significant security incidents to the Department and to local law enforcement officials; **(16) Significant Security Incidents and Suspicious Activities**. Identify, investigate, report, and maintain records of significant security incidents and suspicious activities in or near the site; **(17) Officials and Organization**. Establish official(s) and an organization responsible for security and for compliance with these standards; and **(18) Records.** Maintain appropriate records.

As Section 550 of the Act requires that DHS use "risk-based" performance standards, the level of performance necessary to satisfy each RBPS is dependent on a facility's risk-based tier level. To achieve this, CFATS uses a "tiered" approach, wherein higher-tier facilities are expected to meet higher levels of performance than lower-tier facilities. (See 6 CFR § 27.230(a).) Generally speaking, Tier 1 facilities are expected to meet the highest level of performance, with the expected level of performance becoming less stringent as one moves down the tiers. However, for certain RBPSs (e.g., RBPS 17 – Officials and Organization; RBPS 18 – Records), the expected target level of performance is the same for more than one tier.

Regardless of tier level, all high-risk facilities must address all RBPSs. Note, however, that this requirement does not necessarily mean that specific security measures or practices must be implemented for each RBPS. A facility may be able to satisfactorily address an RBPS by the lack of any item on-site that could cause the security issue being addressed by the RBPS. For instance, if a facility has no dangerous chemicals for which theft or diversion is a security issue, then it does not need to implement any additional measures to comply with RBPS 6 – Theft and Diversion. Similarly, if a facility has no computers or other cyber equipment, it does not need to implement any additional measures to comply with RBPS 8 – Cyber.

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How to Use this Guidance Document

This Guidance document was developed to assist covered facilities in complying with the RBPSs established in CFATS. High-risk chemical facilities can use this document both to help them gain a sense of what types and combinations of security measures and processes are likely to satisfy a given RBPS for a facility at their tier level and to help them identify and select processes, measures, and activities that they may choose to implement to secure their facility. However, this Guidance document does not require any covered facility to adopt any specific measure or practice; a covered facility is free to adopt and implement any security measures or practices appropriate to its circumstances, so long as DHS determines that those measures are adequate to meet the applicable RBPS.

The programs and processes a high-risk facility ultimately chooses to implement to meet these standards must be described in the SSP that every high-risk chemical facility must develop pursuant to the regulations (6 CFR §§ 27.225, 27.245). It is through a review of the SSP, combined with an on-site inspection, that DHS will determine whether a facility has met the requisite level of performance given its risk profile. Information contained within the SSP, as well as information exchanged between the facility and DHS staff and/or inspectors during the inspection process, generally is considered Chemical-terrorism Vulnerability Information (CVI) under the CFATS rule and should only be shared with those who have a need to know and have been certified by DHS as authorized users of CVI (see 6 CFR § 27.400).

In addition to the overview and information on how to use this Guidance document, the introductory portion of the document contains some general considerations for high-risk facilities selecting security measures to comply with CFATS. Following the introductory portion of the document, the chapters of the Guidance document focus in order on the 18 RBPSs. Each of those chapters contains three primary sections:

- *Introductory Overview* — A brief explanation of the RBPS and what the RBPS is intended to accomplish. The RBPS's purpose is detailed in this section, and any terms of art used in the Guidance relating to the RBPS will be defined here as well.

- *Security Measures and Considerations* — A discussion of some potential security measures and/or activities that may be useful in meeting the goals of the RBPS, as well as some issues that covered facilities may wish to consider when selecting an appropriate combination of measures and practices to address an RBPS. This will include (1) an overview of the categories of security measures and/or activities that are recommended for consideration in identifying actions to meet the RBPS, (2) specific security measures and/or practices that a facility may want to implement or may already be implementing that could help it meet the RBPS, and (3) security and design considerations that a facility may want to take into account when determining what measures and/or practices to undertake. Additional

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detailed information on various protective activities and security and design considerations can be found in Appendix C. Note that the security measures listed in each chapter and in Appendix C are neither mandatory nor necessarily the "preferred solution." Nor are they the complete list of potential activities from which a facility can choose to meet each RBPS. Rather, they are some example measures that a facility may choose to implement as part of its overall strategy to address the RBPSs. Facility owners/operators may consider other solutions on the basis of the facility, its security risks, and its security program, so long as the suite of measures implemented achieve the targeted level of performance.

- *RBPS Metrics* — In tabular format, a statement of specific performance objectives (i.e., metrics) that DHS feels would be appropriate goals for facilities to consider in demonstrating compliance under each RBPS. The RBPS Metrics include a *summary* or high-level statement of the level of performance relative to each RBPS that DHS generally would expect to find at a compliant facility in that tier, and individual *metrics*, or specific targets, as examples that a facility may seek to achieve for specific, individual aspects of each RBPS. A summary and set of individual metrics is provided for each RBPS and each risk-based tier.

  Note that the metrics included within the RBPS Guidance document are for exemplary purposes only, and a facility need not necessarily meet any or all of the individual metrics to be in compliance with CFATS. Rather, the summary and individual metrics are meant to help a facility identify gaps in its own security posture and potentially mitigating activities by understanding the levels of performance that a compliant facility typically will be able to demonstrate. While a facility meeting all of the metrics is likely to be in compliance with the CFATS RBPS, the failure to meet any particular metric or summary level — or the substitution of alternative measures — does not automatically mean that a facility will not be in compliance with CFATS. In actuality, the levels of performance that a facility must achieve to be in compliance will be unique for each facility on the basis of its risk profile (as determined by a combination of its risk level, security issues, physical characteristics, etc.), and compliance status will be examined comprehensively on a case-by-case basis, rather than by measuring attainment of a finite list of prescribed objectives. Facilities may be able to demonstrate compliance with the RBPS through the use of other measures that DHS determines to be appropriate.

In addition to the three primary sections described above, many chapters contain a text box describing the attack scenarios that a facility should consider when determining what security measures and/or practices to implement to meet the RBPSs. Note that these are not "Design Basis" threats, and there is no specific requirement for a facility to be able to defend itself from each of these types of threats. Rather, the attack scenarios are analytical devices, supporting the evaluation of a facility's security and enabling DHS to conduct comparative risk analysis across the sector. Not all attack scenarios apply to every RBPS. Table 2 maps out which attack scenarios apply to which RBPSs. In the table, an X indicates that the RBPS is potentially applicable to the scenario, a blank box indicates that the RBPS is not applicable to the scenario, and a solid box indicates that the RBPS is indirectly applicable to the scenario. For those RBPSs for which none of the attack scenarios applies directly (e.g., RBPS 10 – Monitoring), there is no attack scenario text box included in the chapter discussing that RBPS.

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Table 2: Applicable Attack Scenarios and RBPS

	1) Restrict Area Perimeter	2) Secure Site Assets	3) Screen and Control Access	4) Deter, Detect, and Delay	5) Shipping, Receipt, and Storage	6) Theft and Diversion	7) Sabotage	8) Cyber	9) Response	10) Monitoring	11) Training	12) Personnel Surety	13) Elevated Threats	14) Specific Threats, Vulnerabilities, or Risks	15) Reporting Significant Sec Events	16) Significant Sec Incidents \Activities	17) Officials and Organization	18) Records
Aircraft									X		▌							▌
Assault Team	X	X	X	X	X				X		▌	X						▌
Maritime	X			X					X		▌							▌
Sabotage	X	X	X	X	X		X	X	X		▌	X						▌
Standoff	X	X	X	X	X				X		▌							▌
Theft/Diversion	X	X	X	X	X	X		X	X		▌	X						▌
Vehicle Borne Improvised Explosive Device (VBIED)	X	X	X	X	X				X		▌	X						▌

Following the chapters on the 18 RBPSs, a number of appendices have been included to provide additional assistance to covered facilities both in understanding this Guidance document and in complying with the RBPSs contained in the CFATS regime. These appendices include: (a) acronyms used in the Guidance document (Appendix A); (b) a compilation of all the RBPS Metrics by tier (Appendix B); and (c) additional information on Security Measures and Considerations that a facility may choose to use to help meet one or more of the RBPSs, including lists of additional resources by topical area (Appendix C).

Explanation of Terms

In this Guidance document, certain terms are used to assist covered facilities in understanding the RBPSs and in developing measures that could be incorporated in SSPs that satisfy the RBPS. These terms, and the way in which they are used in this document, may also be helpful to covered facilities in preparing and submitting their Chemical Security Assessment Tool (CSAT) SSPs; however, these terms, and the meanings given to them below, have no binding effect and do not alter or affect any definitions or other provisions of the CFATS regulations.

As used in this Guidance Document:

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"Facility" or "site"- means any defined extent of land, buildings, or rooms that are engaged in some unifying activity, such as, for example, manufacturing, storage, research, education, or agriculture. A "facility" or "site" is comprised of "assets" and is often contiguous or so nearly contiguous as to be easily managed as a single location. In some cases, however, a "facility" or "site" may also include assets engaged in managing the unifying activity but located outside the physical boundary of the facility. A "facility" or "site" can always be identified by a geographical location (latitude and longitude).

"Area" means a physical space that has some unifying use, activity, characteristic or feature (such as an operational, process control, security, or business center function) or a defining perimeter.

"Restricted area" means an area where there are special access controls, activity limitations, equipment requirements, or other special, defining measures (usually but not always security measures) employed to prevent unauthorized entry; limit access to specific personnel; or elevate security, safety, or some other characteristic to a higher degree of protection.

"Asset" means any on-site or off-site activities; process(es); systems; subsystems; buildings or infrastructure; rooms; capacities; capabilities; personnel; or response, containment, mitigation, resiliency, or redundancy capabilities that support the storage, handling, processing, monitoring, inventory/shipping, security, and/or safety of the facility's chemicals, including chemicals of interest (COI). "Assets" include but are not limited to:

1. Physical security infrastructure, activities, procedures, personnel, or measures that comprise all or part of the facility's system for managing security risks;
2. Physical safety infrastructure, activities, procedures, personnel, or measures that comprise all or part of the facility's system for managing process safety and emergency response measures;
3. Cyber systems involved in the management of processes, process safety, security, product or material stewardship, or business management and control;
4. Vessels, process equipment, piping, transport vessels, or any container or equipment used in the processing or holding of chemicals;
5. On-site and off-site response protocols;
6. Warehouses, vaults, storage bays, and similar infrastructure; and
7. Specially trained, qualified personnel who are engaged in the management of security and safety risk.

"Critical asset" means an "asset" whose theft, loss, damage, disruption, or degradation would result in significant adverse impacts to human life or health, national security, or critical economic assets.[9]

[9] As of the date of this Guidance document, DHS has not identified any facilities as high-risk based on national security or critical economic factors.

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General Considerations for Selecting Security Measures to Comply with CFATS

To assist high-risk facilities in selecting a suite of security measures and activities that both meet the CFATS performance standards and are tailored to the unique considerations associated with a facility, DHS offers the following general considerations.

The Non-Prescriptive Nature of Risk-Based Performance Standards. First and foremost, when selecting what security measures and activities to implement to comply with CFATS, a high-risk facility's owners or operators should keep in mind that because CFATS uses a performance-standard based approach, DHS is not requiring that any specific measure or activity be used. In fact, Congress has expressly prohibited DHS from disapproving a Site Security Plan on the basis of the presence or absence of a particular security measure. Accordingly, the measures and activities listed in each chapter and in Appendix C are neither mandatory nor necessarily the "preferred solution." Nor are they the complete list of potential activities from which a high-risk facility must choose to meet each RBPS. Rather, they are some example measures that a facility may choose to implement as part of its overall strategy to address the RBPSs. Facility owners/operators may consider other solutions on the basis of the facility, its security risks, and its security program, so long as the suite of measures implemented achieve the targeted level of performance.

The Impact of the Nature of the Security Issue Underlying the Facility's Risk Determination. Preliminary screening requirements for initially determining whether a facility is "high risk" under CFATS are triggered by the possession, in specified quantities, of certain types of COI, including:

- Chemicals with the potential to create a toxic cloud or vapor cloud explosion that would affect populations within and beyond the facility if intentionally released (i.e., release-toxic and release-flammable COI[10]);
- Chemicals with the potential to affect populations within and beyond the facility if intentionally detonated (i.e., release-explosive COI);
- Chemicals that could be stolen or diverted and used in explosives (EXPs) or improvised explosive devices (IEDs) (i.e., theft/diversion-EXPs/IEDs);
- Chemicals that could be stolen or diverted and used directly as chemical weapons (CWs) or weapons of mass effect (WMEs) or could be easily converted into CW

[10] For the purposes of illustration and guidance, many of the examples provided in this document refer to security issues and security measures related to COI, as listed in 6 CFR Part 27, Appendix A. However, actual security issues and measures that must be addressed in a Site Security Plan to satisfy the risk-based performance standards at any particular facility will not necessarily be limited to COI.

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(i.e., theft/diversion-WMEs and theft/diversion-CWs/chemical weapons plant [CWP] COI); and

- Possession of chemicals that, if mixed with other readily available materials, have the potential to create significant adverse consequences for human life or health (i.e., sabotage/contamination COI).[11]

While high-risk facilities must address all of the RBPSs, regardless of the security issue(s) associated with possession of the COI, facility owners and operators should keep those security issues in mind when designing the security measures for the facility's SSP. Different security measures or activities may be more or less effective depending on the specific security issues. In the following paragraphs, the Department discusses three security issues, along with examples of specific security measures and activities that facilities may want to consider if they face that particular security issue:[12]

- *Release COI* — For high-risk facilities whose primary security issue is possession of a release COI, the primary security goal often is the prevention of an intentional, uncontrolled release of the COI. Achieving this security goal presents a different challenge than the security goals associated with the other types of COI for two main reasons: (1) a successful physical attack on a release COI can take place from off-site, and (2) the harmful health and human life consequences typically will begin on-site.

  In light of the first unique concern, facilities with release COI could use certain specific protective measures or activities that facilities with only theft/diversion or sabotage security issues would not typically use. These measures or activities could include:

  - Strong vehicle barriers surrounding the release COI;
  - Elimination of clear lines of sight to the release COI;
  - Standoff distance around the release COI;
  - Limitations on on-site parking and additional parking security measures; and
  - Refusal to accept unannounced shipments or off-site staging of unannounced shipments until they can be verified.

  The second main concern (i.e., that the potential harmful consequences will almost always begin at a source on-site) suggests a need for certain specific activities that would be more beneficial to facilities with release COI than to facilities with other types of security issues. Such specific activities could include:

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[11] The Department also has the authority to declare facilities to be high risk based on the impact a terrorist incident could have on national security or critical economic assets ("economic or mission criticality"). As of the date of publication of this Guidance document, the Department has not yet listed any COI under CFATS or made any high-risk determinations on that basis. If, in the future, the Department uses either economic criticality or mission criticality as a basis for designating facilities as high risk, the Department likely will update this document to provide additional guidance to those facilities.

[12] Note that there are many security measures or activities that could be considered parts of a good security posture regardless of the security issue driving the facility's risk. These include, but are not limited to, access control systems, visitor security measures, a security force, monitoring and surveillance systems, cyber security, personnel surety (i.e., background checks), a clearly defined security organization, security equipment monitoring and testing, and security awareness training.

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- A comprehensive emergency response and crisis management plan;
- An on-site emergency notification system;
- Safe shutdown procedures for processes or areas using or containing the release COI; and
- Extensive training, including exercises and drills (involving local first responders when possible), on responding to an uncontrolled release.

- *Theft/diversion COI* — For facilities whose security issues are related primarily to the possession of theft/diversion COI, the primary security focus is not preventing a successful attack on the facility but rather preventing the acquisition of the COI by an adversary through theft or deception. Because of this different focus, some of the measures that are central to security at facilities with release COI, such as vehicle barriers, standoff distance, parking security measures, and vehicle inspections upon entry, may not be as critical to facilities with only theft/diversion COI. Instead, for facilities with theft/division COI, the primary means to prevent theft or diversion include inventory control systems that can monitor and/or track the theft/diversion of COI, procedures that make it more difficult to steal or divert the chemicals, and physical measures that make the actual movement of such chemicals more difficult. Specific measures that often are considered part of good security measures for facilities with theft/diversion COI include:

  - Intensive product stewardship efforts that include a "know your customer" program and verification of receipt of shipments;
  - Inventory control systems and/or relational databases that provide tracking of the quantity and physical location of all theft/diversion COI;
  - Restricted access to areas where theft/diversion COI is located;
  - Use of the "two-man rule" or constant monitoring of restricted areas to ensure that no person is provided access to theft/diversion COI alone or unmonitored;
  - Individual and vehicle inspections upon egress from areas containing theft/diversion COI;
  - Locked racks or other tamper-evident, physical means of securing man-portable containers of COI (e.g., chains and locks, tamper-resistant seals, movement alarms);
  - Cyber security for cyber systems involved not only in processes that physically involve the theft/diversion COI but also in business systems that support the sale, transfer, or distribution of the theft/diversion COI; and
  - Background checks not only on those individuals with physical access to critical assets (e.g., the theft/diversion COI) but also on employees who may never physically handle the COI but who are responsible for arranging the sale, transfer, or distribution of those COI or who have access to the critical cyber systems controlling the sale, transfer, or distribution of the COI.

  Additionally, while facilities with release COI generally should have a wide security footprint surrounding areas where the release COI is located, facilities with theft/diversion security issues will often find it more cost effective to focus their efforts primarily on securing the specific buildings or locations where the theft/diversion COI is manufactured, processed, used, or stored.

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- *Sabotage COI* — The primary security goal for facilities that possess sabotage/contamination COI is to prevent tampering with the COI. Because the consequences from tampering with sabotage COI typically occur well after the attack, the adversary is more likely to use deception rather than brute force. Accordingly, some of the more important measures for preventing sabotage typically include:

    - A strong personnel surety program for all employees with access to the COI,
    - A good access control system,
    - Visitor security measures,
    - Constant monitoring and surveillance of the COI and processes involving the COI, and
    - Tamper-resistant storage of the COI.

The Impact of the Type of Facility and Its Physical and Operating Environments. Just as the security issue(s) at a facility affect the suite of measures the facility will employ to meet the RBPSs, different types of facilities may vary widely in the types and level of security measures that are appropriate for their physical and operating environments. For instance, DHS would not expect a university or medical research facility to implement the same type or level of measures as a complex chemical manufacturing plant with multiple COI and security issues. The measures that a covered facility selects and describes in its Site Security Plan should be tailored not only to the facility's tier level and security issues but also to the type of facility and its physical and operating environments.

An Individual Measure May Support Achievement of Multiple Risk-Based Performance Standards. Protective measures and processes may be — but do not have to be — tailored to individual RBPSs. In many cases, a single protective measure or process can help a facility meet the targeted levels of performance for a variety of RBPSs at once. For instance, depending on how they are designed, perimeter barriers can assist a facility in meeting RBPSs 1, 2, 3, 4, and 6. Similarly, a security force, while alone likely insufficient to meet any single RBPS entirely, can help a facility meet the targeted level of performance for virtually every RBPS.

Layered Security/Combining Barriers and Monitoring to Increase Delay. Completely adequate perimeter security is rarely achievable through the deployment of a single security barrier or monitoring system; rather an optimal security solution typically involves the use of multiple protective measures providing "layers of security." Layering of security measures can be achieved in many different manners, such as by:

- Incorporating different types of security measures (e.g., integrating physical protective measures, such as barriers, lighting, and electronic security systems, with procedural security measures, such as procedures guiding how security personnel should respond to an incident);
- Using multiple lines of detection used to achieve protection-in-depth at critical assets; and
- Using complementary sensors with different means of detection (e.g., a closed circuit television (CCTV) and an intrusion detection system) to cover the same area.

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A layered approach to perimeter security potentially increases the opportunity to use existing facility and natural features or more applicable technologies to meet the performance objectives at a reduced cost.

Asset-Specific vs. Facility-Wide Measures. For many facilities, their level of risk will be driven by a finite number of assets contained within the facility.[13] When this occurs, a facility may want to consider employing asset-specific measures (as opposed to facility-wide measures) to meet the risk associated with the highest risk asset(s). For example, if a ten-acre facility has a single, finite Tier 2 asset and the rest of the assets on-site are Tier 4 risks or not high risk, to meet RBPS 1, it could be more cost effective for the facility to employ perimeter barriers meeting Tier 2 standards around only the Tier 2 asset, with perimeter barriers meeting Tier 4 standards around the entire facility's perimeter, than it would be to employ perimeter barriers meeting Tier 2 standards around the entire facility.

[13] A facility's tier level is the tier level assigned to the highest risk asset on-site. For example, if a facility has a building located on-site that contains a Tier 2 theft hazard, and 20 storage vessels, each of which is a Tier 4 release hazard, the facility is a Tier 2 facility despite the significantly larger number of Tier 4 assets on-site. In such a scenario, while the Tier 2 theft hazard must be protected to Tier 2 performance levels, the measures directed at the Tier 4 assets need only meet Tier 4 performance standards.

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RBPS 1 – Restrict Area Perimeter

RBPS 1 – Restrict Area Perimeter - Secure and monitor the perimeter of the facility.

The "Restrict Area Perimeter" RBPS addresses the need to provide for a controlled perimeter surrounding the facility or, optionally, the critical assets only if the restricted area is defined to be less than the entire facility. The purpose of RBPS 1 –Restrict Area Perimeter is to reduce the likelihood of unauthorized persons accessing the facility for malicious purposes, such as theft, sabotage, or intentional release of chemicals of interest. By securing and monitoring the perimeter of the facility, facility personnel can more easily and effectively control who enters and leaves the facility, both on foot and in vehicles, and they are better able to detect, delay, defend against, and respond to individuals or groups who seek unauthorized access to the facility. A well-secured perimeter additionally will help to deter intruders from seeking to gain access to the facility or from launching attacks from the area immediately outside a facility's perimeter.

Restricting the area perimeter involves two fundamental aspects — 'securing' the restricted area and 'monitoring' the restricted area. These two concepts, described below, act in unison to allow a facility to deter, detect, and defend against breaches of the facility perimeter.

- **Secure.** In the context of restricting area perimeter, 'secure' means physically limiting the accessibility of the facility such that there is a low likelihood of an adversary successfully breaching the facility perimeter or using the area immediately outside of the facility's perimeter to launch an attack. Securing a facility is frequently accomplished by using a combination of one or more layers of physical barriers (e.g., fencing, man-made obstacles, natural obstacles) and guard forces.

- **Monitor.** In the context of restricting area perimeter, 'monitor' refers to the need to have domain awareness of the perimeter, including the areas immediate beyond the perimeter (the "buffer zone") and the area just inside the perimeter. Frequently, effective monitoring is accomplished by using intrusion detection systems integrated with other electronic surveillance systems, often in conjunction with a security force, that monitor the facility perimeter to deter, detect, communicate, and evaluate the presence of unauthorized persons or vehicles or unauthorized activities.

Figure 1 shows how securing and monitoring a facility's perimeter through barriers or other delay mechanisms could help successfully prevent adversaries from reaching a target (e.g., critical asset) inside a facility.[14] In Figure 1, both the steps needed for a hypothetical attack and the time each

[14]Department of Defense, Unified Facilities Criteria (UFC) 4-021-02NF, Electronic Security Systems, October, 2006.

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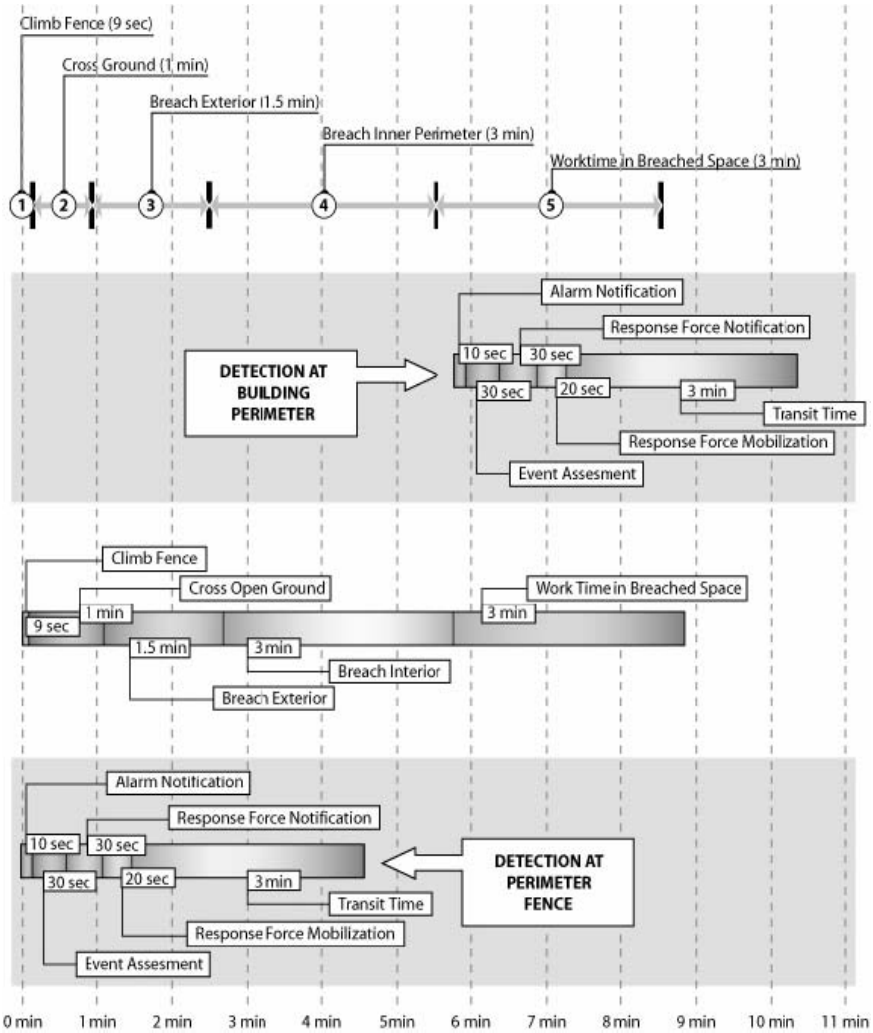
step would take are mapped against two facilities — one without perimeter barriers and monitoring equipment and one with perimeter barriers and/or monitoring equipment. In the first hypothetical attack (at the facility without perimeter barriers or monitoring equipment), initial detection of the attack is not made until the interior wall (or fence) of the critical asset has been breached, well after the adversaries have entered the facility. Because initial detection of the attack does not occur until six minutes into the attack, response forces do not arrive on the scene until after some compromise of the critical asset has been achieved. In the second hypothetical attack, however, thanks to the perimeter barriers and monitoring equipment, initial detection is made at the fence line, and response forces are able to arrive and intervene before the critical assets located at the interior of the facility are compromised.

Figure 1 – Barriers/Detection Performance



Source: Sandia National Laboratory.

This hypothetical attack could involve a disruption of a critical asset located near to the perimeter of the facility, or it may involve penetration of the facility to get near enough to a critical asset located in the interior of the facility in order to cause the desired damage, considering the weapon and its impact area. The goal of an attack may also be to commit a theft, in which case an adversary

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will need to get near enough to the asset to directly remove the targeted substances, such as man-portable quantities of a COI. Whatever the case, when designing a perimeter security system, a facility may want to consider all relevant potential terrorist attack scenarios based on the physical juxtaposition of its assets, the perimeter, and the related adversary considerations.

Security Measures and Considerations for Restricting Area Perimeter

Security Measures

Effective measures for securing a facility's perimeter often involve some combination of (1) perimeter barriers, (2) intrusion detection systems or other types of monitoring, (3) lighting, and (4) protective forces.

Perimeter Barriers

Perimeter barriers provide both physical obstacles and psychological deterrents to unauthorized entry, thereby delaying or preventing forced entry. Example barriers that could be implemented in support of RBPS 1 include, but are not limited to, the following:

- Barriers to humans (e.g., fences, gates);
- Barriers to vehicles (e.g., jersey barriers, berms, bollards, planters);
- Natural or landscaping barriers (e.g., hedge rows, rocks, timber, water); and
- Walls (e.g., brick, cinder block, poured concrete).

Applicable Threat Scenarios

When determining what protective measures to apply to meet the Restrict Perimeter Access performance standard, a facility might consider the following potential attack scenarios:

- Assault team
- Maritime
- Sabotage
- Standoff
- Theft/diversion
- VBIED

Perimeter barriers can be used in a variety of ways to restrict the area perimeter and increase overall facility security, including by:

- Controlling vehicular and pedestrian access,
- Providing channeling to facility entry-control points,
- Delaying forced entry, and
- Protecting critical assets.

Additional information on each of these types of barriers, including specific examples of each, can be found in Appendix C, along with factors that a facility may wish to consider when determining which, if any, perimeter barriers to implement.

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Monitoring

Monitoring and detection equipment are key components of many effective perimeter security postures. Often, facilities will monitor for security events through a combination of human oversight and one or more electronic sensors or other intrusion detection system (IDS) components interfaced with electronic entry-control devices and alarm reporting displays. Typically, when a sensor or other IDS component identifies an event of interest, an alarm notifies security personnel, who then will assess the event either directly by sending persons to the location of the event or remotely by directing personnel to evaluate sensor inputs and surveillance images.

There are many possible configurations of IDS components that together could satisfy the RBPS for securing and monitoring the facility perimeter. An effective IDS for a high-risk chemical facility could, for example, use a combination of two or more of the following items:

- Fence-mounted, beam, or open-area sensors (e.g., vibration detection sensors, video motion detection, infrared sensors, acoustic sensors);
- Remote surveillance (e.g., CCTV cameras, thermal images, Internet Protocol (IP) cameras);
- Human-based monitoring via protective forces.

To increase the reliability of a monitoring system, an owner/operator may elect to deploy multiple interactive, redundant, or sophisticated sensors or countermeasures at high-risk locations with the understanding that increased reliability also extends to the functional capabilities of the data-transmission system.

An integrated perimeter security system may include not only such components as sensors, remote surveillance, and human monitoring, but also the means of transmitting data gathered by the monitoring system and a reporting process for monitoring, controlling, and displaying information on security events. When such electronic components are included in the perimeter monitoring system, the owner/operator may wish to locate alarm-reporting devices and video monitors in a command and control center. Routine functions carried out in a control center may include selecting and assessing alarms; controlling video recording, playback, and display; checking the status of system components; changing sensor states; conducting some system self-tests; and controlling door locks.

Additional information on monitoring equipment, IDS elements, and command and control centers can be found in Appendix C, along with factors that a facility may wish to consider when determining which, if any, sensors or remote surveillance to deploy.

Security Lighting

Security lighting can help both to deter attempts at penetrating a facility's perimeter and assist in the monitoring and detection of any such attempts. Inadequate lighting can make it more difficult to monitor a perimeter and detect attempts to breach the perimeter either directly through human protective forces, or through certain types of monitoring and intrusion detection systems, such as CCTVs. Because of the increased likelihood of detection based on the presence of appropriate security lighting, maintaining a well-lit facility perimeter also can help deter adversaries from attempting to breach that perimeter.

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A wide variety of different types of security lighting is available for installation at facilities. When determining whether security lighting is an appropriate part of a facility's security posture and what type(s) of lighting to choose, a facility should consider such items as local weather conditions, available power sources, grounding, and interoperability with and support to other monitoring and detection systems, such as CCTVs.

Protective Forces

Protective forces are often used to enhance perimeter security and provide a means of deterrence, detection, delay, and response. Such forces can be proprietary or contracted and can be armed or unarmed. Protective forces can be used in a variety of ways, including by standing post at critical assets, monitoring critical assets using remote surveillance, or conducting roving patrols on a documented schedule that specifically includes identified targets, processes, or other critical assets. Protective forces may be qualified to interdict adversaries themselves or simply to deter and detect suspicious activities and to then call local law enforcement to provide an interdiction.

No matter how they are deployed, protective forces alone frequently do not provide sufficient perimeter security. Accordingly, if a facility employs protective forces, they may need to be used in combination with one or more of the other measures listed above to provide an appropriate level of security to meet the Restrict Area Perimeter performance standard.

Security Considerations

Layered Security/Combining Barriers and Monitoring to Increase Delay

Completely adequate perimeter security is rarely achievable through the deployment of a single security barrier or monitoring system; rather, an optimal security solution typically involves the use of multiple protective measures providing "layers of security." The layering of security measures can be achieved in many different ways, such as by:

- Incorporating different types of security measures (e.g., integrating physical protective measures, such as barriers, lighting, and electronic security systems, with procedural security measures, such as procedures guiding how security personnel should respond to an incident);
- Using multiple lines of detection to achieve protection-in-depth at critical assets; and
- Using complementary sensors with different means of detection (e.g., a CCTV and an intrusion detection system) to cover the same area.

A layered approach to perimeter security potentially increases the opportunity to use existing facility and natural features or more applicable technologies to meet the performance objectives at a reduced cost.

Securing Entire Perimeter vs. Securing Individual Asset

Depending on the size and location of the asset or assets driving a facility's risk, it may be more cost effective to focus security on the asset(s) rather than the entire perimeter. For instance, if a

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facility is large (e.g., covering 10 square miles) and has a single, relatively small Tier 1 asset (e.g., a single building or container), it could be significantly more cost effective to apply Tier 1 level perimeter barriers solely around the perimeter of the Tier 1 asset rather than around the entire facility. Accordingly, an owner/operator may wish to consider the benefits and costs related to completely enclosing a large facility within a single perimeter versus implementing multiple smaller, restricted-area perimeters.

Additional discussion on the pros and cons of securing an entire perimeter versus securing the individual critical assets contained therein is provided in the Introduction. For performance objectives related to securing individual critical assets, an owner/operator should refer to RBPS 2 – Secure Site Assets.

Physical and Environmental Considerations

When determining the selection and layout of perimeter security components, a facility owner/operator should take into consideration the physical and environmental characteristics of his or her facility. Important *physical considerations* for evaluating the cost effectiveness of perimeter countermeasures include:

- Perimeter length and convolution,
- Terrain and urbanization,
- Adjacent facilities and transportation corridors,
- Approach angles and vehicle speeds, and
- Availability of supporting infrastructure.

In addition to the physical considerations listed above, *environmental factors* also should be considered when making decisions regarding perimeter security, as certain environmental conditions can significantly affect sensor and lighting performance. For example, certain sensors or other IDS components that have near-perfect detection capabilities during good weather might be subject to unacceptably high levels of false alarms during inclement weather (e.g., fog, rain, wind). Similarly, security lighting that may be considered acceptable during ideal weather conditions may be insufficient during periods of inclement weather. Accordingly, an owner/operator should consider the impact of environmental conditions when making determinations regarding security lighting and sensors or other IDS components.

Additional discussion on physical and environmental factors to take into consideration when making security decisions can be found in Appendix C.

Command and Control Considerations

Many perimeter security measures, such as intrusion detection systems or CCTV systems, consist of various hardware and software elements that can only be effectively operated or monitored by trained personnel, and owner/operators often will locate these functions in a command and control center. When designing command and control centers, owner/operators should consider merging security monitoring and reporting systems with other systems, such as fire engineering reporting systems or process control. Technical merger of an active security system and a passive fire system may facilitate a common set of operational procedures (e.g., reporting, training, and

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emergency response) and prove a more cost-effective approach to overall facility safety and security management.

RBPS Metrics

Table 3 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 3: RBPS Metrics – RBPS 1 – Restrict Area Perimeter

RBPS 1 – Restrict Area Perimeter - Secure and monitor the perimeter of the facility.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has an extremely vigorous perimeter security and monitoring system that enables the facility to thwart most adversary penetrations and channel personnel and vehicles to access control points; including a perimeter intrusion detection and reporting system with multiple additive detection techniques that can demonstrate an extremely low probability that perimeter penetration would be undetected.	The facility has a vigorous perimeter security and monitoring system that enables the facility to thwart or delay most adversary penetrations and channel personnel and vehicles to access control points; including a perimeter intrusion detection and reporting system that can demonstrate a very low probability that perimeter penetration would be undetected.	The facility has a perimeter security and monitoring system that enables the facility to delay a significant portion of attempted adversary penetrations and channel personnel and vehicles to access control points; including a perimeter intrusion detection and reporting system that can demonstrate a low probability that perimeter penetration would be undetected.	The facility has a perimeter security and monitoring system that enables the facility to delay a portion of attempted adversary penetrations and channel personnel and vehicles to access control points; including a system to monitor and report unauthorized penetrations of the facility perimeter.

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Table 3: RBPS Metrics – RBPS 1 – Restrict Area Perimeter				
RBPS 1 – Restrict Area Perimeter - Secure and monitor the perimeter of the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 1.1 – Perimeter Security	The facility has an extremely vigorous, high-integrity system to secure the perimeter that severely restricts or delays any attempts by unauthorized persons to gain access to the facility. To achieve this standard, a facility could, for example, use the following: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards. • A clear zone on either side of the fence that allows persons to be detected at the boundary. Where vehicles can access either side of the boundary, the clear zone is wide enough to allow detection of the presence of vehicles.	The facility has a vigorous, high-integrity system to secure the perimeter that would give unauthorized persons a very low probability of gaining access to the facility. To achieve this standard, a facility could, for example, use the following: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards. • A clear zone on either side of the fence that allows persons to be detected at the boundary. Where vehicles can access either side of the boundary, the clear zone is wide enough to allow detection of the presence of vehicles.	The facility has a system to secure the perimeter that would give unauthorized persons a low probability of gaining access to the facility. To achieve this standard, a facility could, for example, use a single security barrier, such as: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards.	The facility has a system to secure the perimeter that reduces the possibility of access to the facility by unauthorized persons. To achieve this standard, a facility could, for example, use a single security barrier, such as: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards.
Metric 1.2 – Vehicle Barriers	Vehicles would have a very low likelihood of accessing the facility by force anywhere along the entire perimeter where vehicle attack is a possible mode of attack. To achieve this, a facility could use, for example: • Vehicle deterrence measures, such as bollards, landscaping, berms, ditches, drainage swale, or buried concrete anchors retaining anti-vehicle cable wherever the perimeter is accessible to a vehicle. • Entrances equipped with traffic control systems to slow incoming traffic, such as serpentine barriers outside the gate.	Vehicles would have a low likelihood of accessing the facility by force anywhere along the entire perimeter where vehicle attack is a possible mode of attack. To achieve this, a facility could use, for example: • Vehicle deterrence measures, such as bollards, landscaping, berms, ditches, drainage swale, or buried concrete anchors retaining anti-vehicle cable wherever the perimeter is accessible to a vehicle. • Entrances equipped with traffic control systems to slow incoming traffic, such as serpentine barriers outside the gate.	Vehicles would have a reduced likelihood of accessing the facility by force anywhere along the entire perimeter where vehicle attack is a possible mode of attack. To achieve this, a facility could use, for example, active or passive barriers at perimeter control points where vehicles normally enter and leave the facility and other anti-vehicle barriers, such as ditches, revetments, or other man-made or naturally occurring barriers, for the remainder of the perimeter where vehicle attack is a possible mode of attack.	Vehicles would have a reduced likelihood of accessing the facility by force at the perimeter control points where vehicles normally enter and leave the facility. To achieve this, a facility could, for example, use anti-vehicle barriers such as ditches, revetments, or other man-made or naturally occurring barriers.

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Table 3: RBPS Metrics – RBPS 1 – Restrict Area Perimeter				
RBPS 1 – Restrict Area Perimeter - Secure and monitor the perimeter of the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 1.3 – Standoff Distance	Sufficient vehicle standoff distance or alternative protective means are provided to ensure that a VBIED is extremely unlikely to be able to compromise a critical asset.		N/A	
Metric 1.4 – Monitoring and Surveil-lance	The facility has an extremely reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously manned location. In the context of this metric, "real time" means that an adversary act virtually always is detected and reported to responders at the time of occurrence. "Extremely reliable" means that the monitoring system is operable during all anticipated conditions, including complete darkness, twilight, inclement weather, and loss of power; with monitoring system components designed, laid out, and constructed to avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility typically could, for example, use an integrated, multi-sensor system that: • Provides intrusion detection and video surveillance around 100% of the perimeter or 100% of the perimeter around all critical assets. • Provides images or other output that are continuously monitored by a dedicated person, software, or other detection method used in	The facility has a very reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously monitored location. In the context of this metric, "real time" means that an adversary act most likely is detected and reported to responders at the time of occurrence. "Very reliable" means that the monitoring system is operable during ambient light, inclement weather, and fluctuating power conditions; with monitoring system components designed, laid out, and constructed to avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility typically could, for example, use an integrated monitoring system that: • Provides intrusion detection and video surveillance around the facility perimeter or critical assets. • Provides images or other output that are continuously monitored by a dedicated person,	The facility has a reliable perimeter monitoring system that allows for the identification of the presence of an intrusion in real time for the area(s) containing critical asset(s). In the context of this metric, "real time" means that an adversary act likely is detected and reported to responders in a timely manner. "Reliable" means that the monitoring system is operable during ambient light conditions. To achieve this, a facility typically could, for example, use an integrated monitoring system that: • Provides intrusion detection and video surveillance around the facility perimeter or critical assets. • Has emergency back-up power and/or an equivalent written contingency procedure.	The facility has a monitoring system that allows for the identification of the presence of an intrusion in the area(s) containing critical asset(s). To achieve this, a facility typically could, for example, use security patrols of the facility or an integrated monitoring system that provides intrusion detection and video surveillance around the facility perimeter or critical assets and is fully operable during all lighting conditions.

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Table 3: RBPS Metrics – RBPS 1 – Restrict Area Perimeter				
RBPS 1 – Restrict Area Perimeter - Secure and monitor the perimeter of the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
	conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure. • Has general-area as well as access-portal (face-view) CCTV surveillance at all gates.	software, or other detection method used in conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure.		

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RBPS 2 – Secure Site Assets

RBPS 2 – Secure Site Assets - Secure and monitor restricted areas or potentially critical targets within the facility.

The purpose of RBPS 2 –Secure Site Assets is to secure and monitor restricted areas or potentially critical targets (i.e., critical assets)[15] within the facility. Critical assets may include not only locations where COI are manufactured, stored, or used but also other sensitive assets, such as process controls, security operations centers, and critical cyber systems. Similar in many respects to RBPS 1, this performance standard focuses on the protection and monitoring of COI and other critical assets that are located within a covered facility's perimeter. This RBPS also addresses malevolent acts perpetrated by insiders or insiders in collusion with outsiders, as well as internal security controls that provide additional deterrence, detection, and delay to facilitate timely response to security events.

Securing critical assets involves two fundamental aspects — 'securing' the critical asset(s) or the restricted area(s) in which the critical asset(s) are located and 'monitoring' the critical asset(s) or the relevant restricted area(s). These two concepts, described below, act in unison to allow a facility to deter, detect, and defend against unauthorized release, theft, or sabotage of critical assets.

- **Secure.** In the context of securing site assets, 'secure' means physically limiting the accessibility of the asset to reduce the likelihood of unauthorized release, theft, or sabotage. Securing an asset is frequently accomplished by using a combination of one or more layers of physical barriers (e.g., fencing, man-made obstacles, natural obstacles) and guard forces.

- **Monitor.** In the context of securing site assets, 'monitor' refers to the need to maintain regular surveillance or close observation over restricted areas and critical assets to detect, evaluate, and communicate the presence of unauthorized persons or activities. Frequently, effective monitoring is accomplished by using intrusion detection systems integrated with other electronic surveillance systems, often in conjunction with a security force, that monitor the restricted areas or critical assets to deter, detect, communicate, and evaluate the presence of unauthorized persons or vehicles or unauthorized activities.

Often the facility's protective system is organized in depth, containing an integrated suite of mutually supporting security elements that may include:

- Physical measures, such as barriers, lighting, and human observation, that are integrated as needed with technical security measures and monitoring systems; and

[15] DHS interprets the terms "critical asset" and "critical target" as used in 6 CFR § 27.230(a) to be interchangeable. For simplicity, this document generally refers to "critical assets."

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- Procedural measures, including controls in place before an incident occurs coupled with those employed in response to an incident.

The combination of protective systems frequently provides defense in depth to secure critical assets from malevolent acts perpetrated by insiders, outsiders, or insiders in collusion with outsiders.

Adequately securing critical assets often depends upon the overlapping principles that deter, detect, delay, and respond to unauthorized acts or individuals. A potential adversary, especially an insider, may perceive the risk of getting caught to be a significant factor in deterring his or her malevolent act. The effectiveness of deterrence varies with the adversary's refinement, the attractiveness of the asset, and the complexity of the attack scenario. The protective system depends on detection measures (human, electro-mechanical, or both) that sense or perceive (detect) an undesired or unauthorized action, assess that detection, delay the adversary, and communicate the event to response forces. Effective integrated protection systems that secure assets frequently provide all of these capabilities.

Applicable Threat Scenarios

When determining what protective measures to apply to meet the Secure Site Assets performance standards, a facility might consider the following potential attack scenarios:

- Assault team
- Sabotage
- Standoff
- Theft/diversion
- VBIED

Protective measures or additional controls are used to detect unauthorized presence; observe unauthorized behaviors; or determine the presence of prohibited items, such as firearms or explosives. Effectively securing critical assets may also involve the installation of additional physical barriers, such as internal fences, security enclosures, additional access-control requirements, or special security procedures. Defensive measures used to secure critical assets often protect those assets by delaying or preventing the adversary from reaching or sabotaging the asset or by physically protecting the asset from the effects of explosives, fire, or tampering.

Measures used to secure assets may be active, passive, or a combination of both. Active measures are either manually or automatically activated, whereas passive measures are already in place and do not rely upon some initiating event.

To effectively secure assets against forced entry or sabotage, detection of the adversary generally should occur at a point at which there is sufficient delay between the point of detection and the arrival of adequate response forces. Detection through monitoring may be achieved by direct human observation or by using a combination of technical security measures (e.g., alarm sensors, CCTV, thermal imagers, intelligent video) and human assessment of the situation to initiate the correct response.

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Security Measures and Considerations for Securing Site Assets

Security Measures

Increasing reliance should be placed on physical and technical systems to provide additional protection for critical assets. Threat, typically related to the type of chemical associated with the critical asset and the sophistication of the adversary, often defines the physical-security challenges of securing an asset. Effective protective systems frequently integrate the following mutually supporting elements: physical protective measures, procedural security measures, and counteractions or measures to facilitate the response to terrorist attack.

Perimeter Barriers

Perimeter barriers provide both physical obstacles and psychological deterrents to unauthorized entry, delaying or preventing forced entry. Example barriers that could be implemented in support of RBPS 2 include, but are not limited to, the following:

- Barriers to defeat/delay humans on foot (e.g., fences, gates),
- Barriers to defeat/deflect vehicles (e.g., jersey barriers, berms, bollards, planters),
- Natural or landscaping barriers (e.g., hedge rows, rocks, timber, water), and
- Walls (e.g., brick, cinder block, poured concrete).

Perimeter barriers can be used in a variety of ways to help secure restricted areas and/or critical assets and increase overall facility security, including by:

- Controlling vehicular and pedestrian access to restricted areas or critical assets,
- Providing channeling to the entry-control points of restricted areas,
- Delaying forced entry to restricted areas, and
- Protecting critical assets.

Additional information on each of these types of barriers, including specific examples of each, can be found in Appendix C, along with factors to consider when determining which, if any, perimeter barriers to implement.

Monitoring and Detection

Monitoring and detection equipment are key components of an effective security posture. Often, facilities will monitor for security events through a combination of human oversight and one or more electronic sensors or other IDS components interfaced with electronic entry-control devices and alarm-reporting displays. Typically, when a sensor or other IDS component identifies an event of interest, an alarm notifies security to assess the event either directly, by sending persons to the location of the event, or remotely by alerting personnel to evaluate sensor inputs and surveillance imagery.

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There are many possible configurations of IDS components that together satisfy the RBPS for securing and monitoring restricted areas or critical assets. IDS for high-risk chemical facilities often use a combination of two or more of the following items:

- Fence-mounted, beam, or open-area sensors (e.g., vibration detection sensors, video motion detection, infrared sensors, acoustic sensors);
- Remote surveillance (e.g., CCTV cameras, thermal images, IP cameras); and
- Human-based monitoring via protective forces.

To increase the reliability of a monitoring system, an owner/operator may elect to deploy multiple interactive, redundant, or sophisticated sensors or countermeasures at high-risk locations with the understanding that increased reliability also extends to the functional capabilities of the data-transmission system.

An integrated security system should not only consider the sensors, remote surveillance, and human monitoring, but also the means of transmitting data gathered by the monitoring system and a reporting process for monitoring, controlling, and displaying information on security events. When such electronic components are included in the monitoring system, the owner/operator may wish to locate alarm-reporting devices and video monitors in a command and control center. Routine functions carried out in a control center may include selecting and assessing alarms; controlling video recording, playback, and display; checking the status of system components; changing sensor states; conducting some system self-tests; and controlling door locks.

Additional information on monitoring equipment, IDS elements, and command and control centers can be found in Appendix C, along with factors to consider when determining which, if any, sensors, remote surveillance, and protective forces to deploy.

Security Lighting

Security lighting can help both to deter attempts at penetrating a restricted area and assist in the monitoring and detection of any such attempts. Inadequate lighting can make more difficult the tasks of monitoring a perimeter and detecting attempts to breach the perimeter either directly through human protective forces or through certain types of monitoring and intrusion detection systems, such as CCTVs. Because of the increased likelihood of detection based on the presence of appropriate security lighting, maintaining a well-lit perimeter around restricted areas or critical assets also can help deter adversaries from attempting to breach that perimeter.

A wide variety of different types of security lighting is available for implementation at facilities. When determining whether security lighting is an appropriate part of a facility's security posture and what type of lighting to choose, a facility should consider such items as local weather conditions, available power sources, grounding, and interoperability with and support to other monitoring and detection systems, such as CCTVs.

Protective Forces

Protective forces are often used to enhance security and provide a means of deterrence, detection, delay, and response. Such forces can be proprietary or contracted and can be armed or unarmed. Protective forces can be used in a variety of ways, including standing post at critical assets,

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monitoring critical assets using remote surveillance, or conducting roving patrols on a documented schedule that specifically includes identified targets, processes, or other critical assets. Protective forces may be qualified to interdict adversaries themselves or simply to deter and detect suspicious activities and to then call local law enforcement to provide an interdiction.

No matter how they are deployed, protective forces alone generally do not provide sufficient security. Accordingly, if a facility employs protective forces, it likely will need to use the protective forces in combination with one or more of the other measures listed above to provide an appropriate level of security to meet the Secure Site Assets performance standard.

Security Considerations

Layered Security/Combining Barriers and Monitoring to Increase Delay

Completely adequate security is rarely achievable through the deployment of a single security barrier or monitoring system; rather, an optimal security solution typically involves the use of multiple protective measures providing "layers of security." The layering of security measures can be achieved in many different ways, such as by:

- Incorporating different types of security measures (e.g., integrating physical protective measures, such as barriers, lighting, and electronic security systems, with procedural security measures, such as procedures guiding how security personnel should respond to an incident);
- Using multiple lines of detection to achieve protection-in-depth at critical assets; and
- Using complementary sensors with different means of detection (e.g., a CCTV and an intrusion detection system) to cover the same area.

A layered approach to security potentially increases the opportunity to use existing facility and natural features or more applicable technologies to meet the performance objectives at a reduced cost.

Securing Entire Perimeter vs. Securing Individual Asset

Depending on the size and location of the asset or assets driving a facility's risk, it may be more cost effective to focus security directly on the asset(s) rather than on the entire facility perimeter. For instance, if a facility is large (e.g., covering 10 square miles) and has a single, relatively small Tier 1 asset (e.g., a single building or container), it likely would be significantly more cost effective to apply Tier 1-level perimeter barriers solely around the perimeter of the Tier 1 asset rather than around the entire facility. Accordingly, an owner/operator may wish to consider the benefits and costs related to completely enclosing a large facility within a single perimeter versus implementing multiple smaller, restricted-area perimeters.

Additional discussion on the pros and cons of securing an entire perimeter versus securing the individual high-risk assets contained therein is provided in the Introduction. For performance objectives related to securing a facility's entire perimeter, an owner/operator should refer to RBPS 1 – Restrict Area Perimeter.

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Physical and Environmental Considerations

When determining the selection and layout of restricted area or critical asset security components, a facility owner/operator should take into consideration the physical and environmental characteristics of the facility. Important *physical considerations* for evaluating the cost effectiveness of countermeasures include:

- Asset size and restricted-area perimeter length and convolution,
- Terrain and urbanization,
- Adjacent facilities and transportation corridors,
- Approach angles and vehicle speeds,
- Availability of supporting infrastructure, and
- Response capabilities and timelines.

In addition to the physical considerations listed above, *environmental factors* also should be considered when making decisions regarding restricted area and critical asset security, as certain environmental conditions can significantly affect sensor and lighting performance. For example, certain sensors or other IDS components that have near-perfect detection capabilities during good weather might be subject to unacceptably high levels of false alarms during inclement weather (e.g., fog, rain, wind). Similarly, security lighting that may be considered acceptable during ideal weather conditions may be insufficient during periods of inclement weather. Accordingly, an owner/operator should consider the impact of environmental conditions when making determinations regarding security lighting and sensors or other IDS components.

Additional discussion on physical and environmental factors to take into consideration when making security decisions can be found in Appendix C.

Command and Control Considerations

Many security measures, such as intrusion detection systems or CCTV systems, consist of various hardware and software elements that can only be effectively operated or monitored by trained personnel, and owner/operators often will locate these functions in a command and control center. When designing security command and control centers, the facility owner/operator should consider merging security monitoring and reporting systems with other systems, such as fire engineering reporting systems or process control systems. The technical merger of an active security system and a passive fire system may facilitate a common set of operational procedures (e.g., reporting, training, and emergency response) and prove a more cost-effective approach to overall facility safety and security management.

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RBPS Metrics

Table 4 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 4: RBPS Metrics – RBPS 2 – Secure Site Assets				
RBPS 2 – Secure Site Assets - Secure and monitor restricted areas or potentially critical targets within the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility has additional vigorous barriers and systems to secure each restricted area and critical asset, including a highly reliable system that continuously monitors each restricted area and critical target, and can demonstrate an extremely high probability that unauthorized adversary actions would be detected and access would be denied to restricted areas or critical assets.	The facility secures and continuously monitors each restricted area and critical asset and can demonstrate a high probability that unauthorized adversary actions toward restricted areas or critical assets would be detected.	The facility secures and regularly monitors each restricted area and critical asset and can demonstrate a likelihood that unauthorized adversary actions toward restricted areas or critical assets would be detected.	The facility secures and periodically monitors each restricted area and critical asset to detect unauthorized adversary actions toward restricted areas or critical assets.
Metric 2.1 – Critical Asset and Restricted Area Perimeter Barriers	Where feasible and consistent with critical operational and safety considerations, the facility has an internal perimeter barrier (e.g., a security fence or equivalent barrier that meets industrial consensus standards) that severely restricts or delays any attempts by unauthorized persons to gain access to a Tier 1 restricted area or critical asset or a clearly defined and well-secured facility perimeter, combined with high-performance asset monitoring and strict administrative controls on asset access.	N/A		

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Table 4: RBPS Metrics – RBPS 2 – Secure Site Assets				
RBPS 2 – Secure Site Assets - Secure and monitor restricted areas or potentially critical targets within the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 2.2 – Critical Asset Vehicle Barriers	Vehicles would have a very low likelihood of accessing a critical asset's restricted area by force. To achieve this, a facility could, for example, use vehicle deterrence measures, such as bollards, berms, landscaping, ditches, drainage swales, or buried concrete anchors retaining anti-vehicle cable wherever the restricted area perimeter is accessible to a vehicle.	Vehicles would have a low likelihood of accessing a critical asset's restricted area by force. To achieve this, a facility could, for example, use vehicle deterrence measures, such as bollards, berms, landscaping, ditches, drainage swales, or buried concrete anchors retaining anti-vehicle cable wherever the restricted area perimeter is accessible to a vehicle.	N/A	
Metric 2.3 – Asset Standoff Distance	Sufficient vehicle standoff distance or alternative protective means are provided to ensure that a VBIED is extremely unlikely to be able to compromise a critical asset.		N/A	
Metric 2.4 – Monitoring and Surveillance	A combination of highly reliable technical security devices (e.g., special access controls, sensors, video), security patrols, and other monitoring systems are used to protect and continuously monitor restricted areas or critical assets (e.g., COI loading and unloading areas, critical valves, pipelines, manifolds, control rooms, storage facilities) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use a combination of measures, such as: • Posted security personnel or frequent security patrols. • An integrated, multi-sensor system that provides intrusion detection and video surveillance around 100% of the perimeter of the restricted area or critical assets, has emergency backup power and/or an equivalent written	Reliable technical security devices (e.g., special access controls, sensors, video), security personnel, and/or monitoring systems are used to protect and continuously monitor restricted areas or critical assets (e.g., COI loading and unloading areas, critical valves, pipelines, manifolds, control rooms, storage facilities) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use a combination of measures, such as: • Frequent security patrols. • An integrated monitoring system that provides intrusion detection and video surveillance around a significant portion of the perimeter of the restricted area or critical assets, has emergency backup power and/or an equivalent written contingency procedure, and provides	Reliable technical security devices (e.g., special access controls, sensors, video), security personnel, and/or monitoring systems are used to protect and monitor restricted areas or critical assets (e.g., COI loading and unloading areas, critical valves, pipelines, manifolds, control rooms, storage facilities) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use a combination of measures, such as: • Regular security patrols. • An integrated monitoring system that provides intrusion detection and video surveillance around a portion of the perimeter of the restricted area or critical assets and has emergency backup	Technical security devices (e.g., special access controls, sensors, video), security personnel, and/or monitoring systems are used to protect and monitor restricted areas or critical assets (e.g., COI loading and unloading areas) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use measures such as periodic security patrols or an integrated monitoring system that provides intrusion detection and video surveillance around designated critical assets and has emergency backup power and/or an equivalent written contingency procedure.

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Table 4: RBPS Metrics – RBPS 2 – Secure Site Assets				
RBPS 2 – Secure Site Assets - Secure and monitor restricted areas or potentially critical targets within the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
	contingency procedure, and provides images that are continuously monitored by dedicated persons, software, or other detection methods in conjunction with the system. • General-area as well as access-portal (face-view) CCTV surveillance at all gates.	images that are continuously monitored by dedicated persons, software, or other detection methods in conjunction with the system.	power and/or an equivalent written contingency procedure.	

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RBPS 3 – Screen and Control Access

RBPS 3 - Screen and Control Access - Control access to the facility and to restricted areas within the facility by screening and/or inspecting individuals and vehicles as they enter, including:
(i) Measures to deter the unauthorized introduction of dangerous substances and devices that may facilitate an attack or actions having serious negative consequences for the population surrounding the facility; and
(ii) Measures implementing a regularly updated identification system that checks the identification of facility personnel and other persons seeking access to the facility and that discourages abuse through established disciplinary measures.

RBPS 3 –Screen and Control Access, is focused on the identification, screening, and/or inspection of individuals and vehicles as they enter and exit the facility or restricted areas within a facility. Through identification, screening, and inspection, a facility is better able to prevent unauthorized access to the facility or its restricted areas and is more likely to deter and detect unauthorized introduction or removal of substances and devices that may cause a dangerous chemical reaction, explosion, or hazardous release.

Security Measures and Considerations for Screening and Controlling Assets

Security Measures

A variety of different types of measures may be used in conjunction to address RBPS 3 –Screen and Control Access. These include screening measures (e.g., personnel identification, hand-carried items inspections, vehicle identification, and vehicle inspections), control point measures (e.g., measures to control vehicular approach and denial), and parking security measures.

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Screen and Control Access performance standards, a facility might consider the following potential attack scenarios:

- Assault team,
- Sabotage,
- Standoff,
- Theft/diversion, and
- VBIED.

Personnel Identification

A primary component of successful screening and controlling of access is knowing who is allowed on-site. Personnel identification measures help a facility quickly determine whether or not an individual is permitted access to a facility or a restricted area, and certain identification measures can help both security officers and other employees quickly know whether or not an individual is authorized for access. Examples of personnel identification measures may include:

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- Conducting checks of government-issued photo identification (ID) cards prior to permitting facility access;
- Providing company-issued photo IDs to individuals permitted access to the facility or restricted areas of the facility that identify:
    - Employees,
    - Regular contractors,
    - Temporary contractors, and
    - Visitors;
- Providing facility-specific photo IDs to individuals permitted access to the facility or to restricted areas of the facility that identify:
    - Employees,
    - Regular contractors,
    - Temporary contractors, and
    - Visitors.

Depending on the level of security desired, a company may want to issue photo IDs (company- or facility-specific) that are linked with electronic access control systems, such as proximity ID readers or swipe-access controls for an added layer of security. Electronic access control systems can be tailored to specific locations within a facility, thus providing the ability to limit access to restricted areas to authorized individuals. They also have the additional benefit of maintaining a record regarding who has accessed what areas.

A personnel identification system is most effective when used in conjunction with the performance of background checks and other personnel surety measures. Such measures are the focus of RBPS 12 – Personnel Surety.

Hand-carried Items Inspection

A second common element of many good screening programs is the inspection of items brought into the facility or restricted areas of the facility, whether items are brought in by employees, contractors, or visitors. Among other things, inspections may include:

- Visual inspections,
- X-ray inspections,
- Use of metal detectors,
- Use of ionic explosives detection equipment, and
- Use of trained explosive detection canines.

The types of inspection measures implemented, the thoroughness of inspections, and the frequency of inspections may vary on the basis of a variety of factors, including the facility's tier (e.g., more vigorous and frequent measures may be suitable for higher tiers) and what individuals are being inspected (e.g., more frequent and thorough inspections may be desired for visitors than for employees).

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Vehicle Identification and Inspection

Another element of a comprehensive screening program is a vehicle identification and inspection program. Vehicle identification measures can include using a company- or facility-issued vehicle ID system (e.g., providing authorized vehicles with stickers or placards), using only known shippers and/or delivery companies, and requiring authorized bills of lading for access to the facility. These types of measures can help satisfy the standards established for RBPS 5 (Shipping, Receipt, and Storage) and are complemented by other measures recommended for RBPS 5 compliance.

Vehicle inspection measures that can be helpful in meeting the screening and access control standards include:

- Visual inspections,
- Use of trained explosive detection canines,
- Under/over vehicle inspection systems, and
- Cargo inspection systems.

Much like hand-carried item inspections, the type of vehicle inspection measures implemented, the thoroughness of inspections, and the frequency of inspections may vary on the basis of a variety of factors, including the facility's tier (e.g., more vigorous and frequent inspections may be suitable for higher tiers) and whose vehicle is being inspected (e.g., more frequent and thorough inspections may be desired for visitors or unscheduled delivery trucks than for employees or regularly scheduled deliveries).

Control Point Measures

Control point measures are measures used to help control vehicular access to a facility or a restricted area by calming traffic as it approaches the facility or restricted area, which provides an opportunity for vehicle identification to occur, and by denying access to unauthorized vehicles. Control point measures may include:

- Aligning roads in a manner to calm traffic (e.g., circles, serpentine roads);
- Bollards, barriers, K-Rails, etc., to cause serpentine traffic flow;
- Speed bumps or tables;
- Gates; and
- Identification points and rejection points prior to facility or restricted area access.

More information on these types of measures can be found in Appendix C.

Parking Security Measures

By limiting or managing parking on-site, a facility can help minimize ease of access to critical assets located inside the facility's perimeter. While one option is to completely prohibit on-site parking, less extreme measures are available, such as limiting on-site parking to certain vehicle classes — for example, by allowing only "corporate" vehicles or only full-time employees' vehicles on-site (i.e., no visitor or contractor parking within the facility perimeter). Another option is to allow

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parking on-site but locate it a significant distance away from the critical assets and prevent means of vehicular egress to the critical assets.

Security Considerations

Layered Security/Combining Barriers and Monitoring to Increase Delay

No matter the size of the facility or restricted area being secured, completely adequate security likely will not be achievable through the deployment of a single protective measure; rather, an optimal security solution typically involves the use of multiple protective measures providing "layers of security." Layering of security measures can be achieved in many different manners, such as by:

- Incorporating different types of security measures (e.g., integrating physical protective measures, such as barriers, lighting, and electronic security systems, with procedural security measures, such as procedures guiding how a security force should respond to an incident);
- Using multiple lines of detection to achieve protection-in-depth at critical assets; and
- Using complementary sensors with different means of detection (e.g., a CCTV and an intrusion detection system) to cover the same area.

A layered approach to security potentially increases the opportunity to use existing facility and natural features or more applicable technologies to meet the performance objectives at a reduced cost.

Physical and Environmental Considerations

When determining the selection and layout of security components, a facility owner/operator should take into consideration the facility's physical and environmental characteristics. Important *physical considerations* for evaluating the cost effectiveness of countermeasures include:

- Facility or restricted area size and perimeter length and convolution,
- Terrain and urbanization,
- Adjacent facilities and transportation corridors,
- Approach angles and vehicle speeds, and
- Availability of supporting infrastructure.

In addition to the physical considerations listed above, *environmental factors* also should be considered when making decisions regarding security, as certain environmental conditions can significantly affect sensor and lighting performance. For example, certain sensors or other IDS components that have near-perfect detection capabilities during good weather might be subject to unacceptably high levels of false alarms during inclement weather (e.g., fog, rain, wind). Similarly, security lighting that may be considered acceptable during ideal weather conditions may be insufficient during periods of inclement weather. Accordingly, an owner/operator should consider the impact of

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environmental conditions when making determinations regarding security lighting and sensors or other IDS components.

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Command and Control Considerations

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RBPS Metrics

Table 5 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 5: RBPS Metrics – RBPS 3 – Screen and Control Access

RBPS 3 - Screen and Control Access - Control access to the facility and to restricted areas within the facility by screening and/or inspecting individuals and vehicles as they enter, including:
(i) Measures to deter the unauthorized introduction of dangerous substances and devices that may facilitate an attack or actions having serious negative consequences for the population surrounding the facility; and
(ii) Measures implementing a regularly updated identification system that checks the identification of facility personnel and other persons seeking access to the facility and that discourages abuse through established disciplinary measures.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility employs a strict process for controlling access to the facility and screening all persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and, via a near real-time updated system, checks the identification of facility personnel and other persons seeking access to the facility. The facility can demonstrate an extremely high probability of detecting and preventing fraudulent entry and has a system to report such attempts to law enforcement.	The facility employs a process for controlling access to the facility and screening a high percentage of selected persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and, via a frequently updated system, checks the identification of facility personnel and other persons seeking access to the facility. The facility can demonstrate a high probability of detecting and preventing fraudulent entry and has a system to report such attempts to law enforcement.	The facility employs a process for controlling access to the facility and screening selected persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and, via a routinely updated system, checks the identification of facility personnel and other persons seeking access to the facility. The facility can demonstrate a likelihood of detecting and preventing fraudulent entry and has a system to report such attempts to law enforcement.	The facility employs a process for controlling access to the facility and screening selected persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and checks the identification of facility personnel and other persons seeking access to the facility. The facility has the capability to detect some attempts at fraudulent entry and has a system to report such attempts to law enforcement.
Metric 3.1 – Access Point Controls	The facility has a comprehensive access control system that can demonstrate an extremely high reliability in thwarting adversary attempts to gain unauthorized access. Sample measures to achieve this could include the following: • A system providing for the verification of the authorization for access by a photo ID card or biometrics. • Access points that are manned by security	The facility has an access control system that can demonstrate a high reliability in thwarting adversary attempts to gain unauthorized access. Sample measures to achieve this could include the following: • A system providing for the verification of the authorization for access by a photo ID card or biometrics. • Access points that are manned by security	The facility has an access control system that reliably thwarts adversary attempts to gain unauthorized access. Sample measures to achieve this could include the following: • A system providing for the verification of the authorization for access by a photo ID card or electronic key access. • Access points that are either manned by security personnel or are	The facility has a system to verify the identity of individuals seeking entry to restricted areas to control unauthorized access, such as the use of a photo ID card or electronic key access. Facility access points are either manned or continuously monitored.

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Table 5: RBPS Metrics – RBPS 3 – Screen and Control Access				
RBPS 3 – Screen and Control Access - Control access to the facility and to restricted areas within the facility by screening and/or inspecting individuals and vehicles as they enter, including: (i) Measures to deter the unauthorized introduction of dangerous substances and devices that may facilitate an attack or actions having serious negative consequences for the population surrounding the facility; and (ii) Measures implementing a regularly updated identification system that checks the identification of facility personnel and other persons seeking access to the facility and that discourages abuse through established disciplinary measures.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
	personnel when open for use and are either manned or continuously monitored at all other times. • Gates and anti-passback devices (e.g., turnstiles) activated by an electronic access system using badges for vehicle and personnel entrances for both the outer perimeter and internal restricted areas. • One or more separate access gates for contractor personnel. • Access control systems that are programmable to allow multilevel access.	personnel when open for use and are either manned or continuously monitored at all other times. • Gates and anti-passback devices (e.g., turnstiles) activated by an electronic access system using badges for vehicle and personnel entrances for both the outer perimeter and internal restricted areas. • Access control systems that are programmable to allow multilevel access.	continuously monitored. • Gates and anti-passback devices (e.g., turnstiles) activated by an electronic access system using badges for vehicle and personnel entrances for both the outer perimeter and internal restricted areas.	

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	Tier 1	Tier 2	Tier 3	Tier 4
Metric 3.2 – Identity Verification Systems	Unauthorized persons would be highly unlikely to gain unauthorized access due to the vigorousness of identity verification systems. Sample measures to achieve this could include the following: • All employees and other selected persons (e.g., resident contractors, transport drivers) are issued tamper-resistant ID badges with, at a minimum, the individual's name and photo, which are worn in a visible position when on-site. • All other personnel are documented, issued a temporary badge, and escorted while in restricted areas and escorted or continuously monitored elsewhere on-site. • Unknown vehicles remain outside the facility perimeter or in a secured area while they and their occupants are being vetted. • All unescorted personnel (e.g., employees, regular contractors, and transport drivers) are issued electronic photo ID badges that are integrated with the facility's access control system.	Unauthorized persons would be unlikely to gain unauthorized access due to the vigorousness of identity verification systems. Sample measures to achieve this could include the following: • All employees and other selected persons (e.g., resident contractors, transport drivers) are issued tamper-resistant ID badges with, at a minimum, the individual's name and photo, which are worn in a visible position when on-site. • All other personnel are documented, issued a temporary badge, and escorted while in restricted areas and escorted or continuously monitored elsewhere on-site. • Unknown vehicles remain outside the facility perimeter or in a secured area while they and their occupants are being vetted. • All unescorted personnel (e.g., employees, regular contractors, and transport drivers) are issued electronic photo ID badges that are integrated with the facility's access control system.	The facility has access control systems that provide for reasonable identity verification, such as the issuing of tamper-resistant ID badges to all facility employees, and the provision of visitor badges to, and escorting or monitoring of, all individuals without permanent ID badges.	

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Table 5: RBPS Metrics – RBPS 3 – Screen and Control Access

RBPS 3 – Screen and Control Access - Control access to the facility and to restricted areas within the facility by screening and/or inspecting individuals and vehicles as they enter, including:
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	Tier 1	Tier 2	Tier 3	Tier 4
Metric 3.3 – On-site Parking	Parking on-site is minimized and/or limited to discrete on-site areas that are located away from critical assets, and vehicular access to restricted areas is restricted (e.g., only company vehicles are allowed on-site, no personally owned vehicles may park on-site, and no delivery vehicles are allowed on-site without an escort).	Parking on-site is minimized and/or limited to discrete on-site areas that are located away from critical assets, and vehicular access to restricted areas is restricted (e.g., company vehicles and a very limited number of personally owned employee or contractor vehicles are authorized to park on-site, no visitors may park on-site, and delivery vehicles are escorted in restricted areas).	Authorized employee, contractor, and visitor vehicles parking on-site are kept to a minimum and/or limited to discrete on-site areas that are located away from critical assets. Some authorized delivery vehicles may have unescorted facility access.	N/A
Metric 3.4 – Screening and Inspections	The facility has a comprehensive screening system that extremely reliably deters the unauthorized introduction of dangerous substances to the facility. Sample measures to achieve this could include the following: • The facility has the ability to inspect all vehicles and all of the items carried by individuals seeking access to the facility and, under normal operating procedures, performs random, rigorous inspections of a percentage of all vehicles and hand-carried items both when inbound and, for restricted areas where theft/diversion or sabotage COI are located, outbound. • Inspections of individuals themselves are performed when the situation warrants. • Trucks and rail cars are inspected upon entering the facility and prior to loading.	The facility has a screening system that reliably deters the unauthorized introduction of dangerous substances to the facility. Sample measures to achieve this could include the following: • The facility has the ability to inspect all vehicles and all of the items carried by individuals seeking access to the facility and, under normal operating procedures, performs random, rigorous inspections of a percentage of all vehicles and hand-carried items. • Inspections of individuals themselves are performed when the situation warrants. • A percentage of trucks and rail cars are subject to random inspection upon entering the facility and prior to loading.	The facility has a screening system that reasonably deters the unauthorized introduction of dangerous substances to the facility. Sample measures to achieve this could include the following: • The facility has the ability to inspect all vehicles and all of the items carried by individuals seeking access to the facility and, under normal operating procedures, performs random, rigorous inspections of a percentage of all vehicles and hand-carried items. • Inspections of individuals themselves are performed when the situation warrants. • A percentage of trucks and rail cars are subject to random inspection upon entering the facility and prior to loading.	The facility has a screening system that reasonably deters the unauthorized introduction of dangerous substances to the facility, and it performs inspections of vehicles, individuals, and hand-carried items when the situation warrants.

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RBPS 4 – Deter, Detect, and Delay

RBPS 4 – Deter, Detect, and Delay - Deter, detect, and delay an attack, creating sufficient time between detection of an attack and the point at which the attack becomes successful, including measures to:

(i) Deter vehicles from penetrating the facility perimeter, gaining unauthorized access to restricted areas or otherwise presenting a hazard to potentially critical targets;

(ii) Deter attacks through visible, professional, well-maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value targets;

(iii) Detect attacks at early stages, through countersurveillance, frustration of opportunity to observe potential targets, surveillance and sensing systems, and barriers and barricades; and

(iv) Delay an attack for a sufficient period of time to allow appropriate response through on-site security response, barriers and barricades, hardened targets, and well-coordinated response planning.

Adequate protection depends upon the overlapping principles of deterrence, detection, and delay, combined with an effective response to unauthorized acts or individuals.

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Deter, Detect, and Delay performance standards, a facility might consider the following potential attack scenarios:

- Assault team
- Maritime
- Sabotage
- Standoff
- Theft/diversion
- VBIED

Deterrence refers to the ability to cause a potential attacker to perceive that the risk of failure is greater than that which they find acceptable, resulting in a determination that an attack is not worth the risk. Thus, deterrence measures are focused not on detecting or stopping an attack once in progress, but rather on convincing an adversary not to attack in the first place. The value of deterrence measures varies with the sophistication of the adversary, target attractiveness, and the difficulty of the attack.

Detection refers to the ability to identify potential attacks or precursors to an attack and to communicate that information, as appropriate. Detection measures typically include surveillance and other types of monitoring similar or identical to those applied in support of RBPS 1 –Restrict Area Perimeter. For a protective system to prevail, detection needs to occur prior to an attack (i.e., in the attack-planning stages) or early enough in the attack where there is sufficient delay between the point of detection and the successful conclusion of the attack for the arrival of adequate response forces to thwart the attempt.

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Delay refers to the ability to slow down an adversary's progress sufficiently to allow adequate protective forces to respond. Delay is often achieved through defensive measures used to harden or otherwise protect critical assets or through response force engagement that prevents the adversary from reaching a critical asset in an expeditious manner.

RBPS 4 provides standards for deterrence, detection, and delay for each tier. The expectation is that covered facilities, to varying degrees, will be able to deter, detect, and delay an attack, creating sufficient time between detection of an attack and the point at which the attack becomes successful, including:

- Measures to deter vehicles from penetrating the facility perimeter, gaining unauthorized access to restricted areas, or otherwise presenting a hazard to potentially critical targets (i.e., critical assets);
- Measures to deter attacks through visible, professional, well-maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value assets;
- Detecting attacks at early stages through countersurveillance, frustration of opportunity to observe critical assets, surveillance and sensing systems, and barriers and barricades; and
- Delaying an attack for a sufficient period of time to allow appropriate response through on-site security response[16], barriers and barricades, hardened targets, and well-coordinated response planning.

Security Measures and Considerations to Deter, Detect, and Delay

There are many different types of security measures that can be used effectively to deter, detect, and/or delay an adversary. These include perimeter barriers, monitoring and detection systems, security lighting, and protective forces. Often, a single measure can accomplish more than one of the deter, detect, delay principles.

Security Measures

Perimeter Barriers

Perimeter barriers serve to deter an adversary from attempting to attack and help delay (or entirely prevent) unauthorized entry. Sample barriers that have deterrence and or delaying affects include, but are not limited to:

- Barriers to humans (e.g., fences, gates);

[16] A "security response" is intended to engage and hopefully neutralize the adversaries, while an "emergency response" follows an attack and attempts to reduce the consequences in terms of loss of life and destruction of property or production capability.

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- Barriers to vehicles (e.g., jersey barriers, berms, bollards, planters);
- Natural or landscaping barriers (e.g., hedge rows, rocks, timber, water); and
- Walls (e.g., brick, cinder block, poured concrete).

Additional information on these types of barriers, including specific examples of each, can be found in Appendix C, along with factors to consider when determining which, if any, perimeter barriers to implement.

Monitoring and Detection Systems

Monitoring and detection equipment are key components of any effective deterrence and detection strategy. Often, facilities will monitor for security events through a combination of human oversight and one or more electronic sensors or other IDS components interfaced with electronic entry-control devices and alarm-reporting displays. Typically, when a sensor or other IDS component identifies an event of interest, an alarm notifies security, which then will assess the event either directly by sending persons to the location of the event or remotely by alerting personnel to evaluate sensor inputs and surveillance imagery.

There are many possible configurations of IDS components that serve to deter and detect adversaries. These include:

- Fence-mounted, beam, or open-area sensors (e.g., vibration detection sensors, video motion detection, infrared sensors, acoustic sensors);
- Remote surveillance (e.g., CCTV cameras, thermal images, IP cameras); and
- Human-based monitoring via protective forces (further details on protective forces can be found below).

Additional information on these IDS elements, including specific examples of each, can be found in Appendix C, along with factors to consider when determining which, if any, sensors, remote surveillance, and/or protective forces to deploy.

Security Lighting

Security lighting both helps to deter attacks on a facility and detect any such attempts. Inadequate lighting can make it more difficult to monitor a perimeter and detect attempts to breach the perimeter either directly through human protective forces or through certain types of monitoring and intrusion detection systems, such as CCTVs. Because of the increased likelihood of detection based on appropriate security lighting, maintaining a well-lit facility perimeter also can help deter adversaries from attempting to breach that perimeter.

A wide variety of different types of security lighting is available for installation at facilities. When determining whether security lighting is an appropriate part of a facility's security posture and what type(s) of lighting to choose, a facility should consider such items as local weather conditions, available power sources, grounding, and interoperability with and support to other monitoring and detection systems, such as CCTVs.

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Protective Forces

Protective forces are often used to enhance perimeter security and provide a means of deterrence, detection, delay, and response. Such forces can be proprietary or contracted and can be armed or unarmed. They may be qualified to interdict adversaries themselves or simply to deter and detect suspicious activities and to then call local law enforcement to provide an interdiction.

Security Considerations

Layered Security/Combining Barriers and Monitoring to Increase Delay

Complete deterrence, detection, and delay generally can not be achieved through the deployment of a single security barrier or monitoring system; rather, an optimal security solution typically involves the use of multiple protective measures providing "layers of security." The layering of security measures can be achieved in many different manners, such as by:

- Incorporating different types of security measures (e.g., integrating physical protective measures, such as barriers, lighting, and electronic security systems with procedural security measures, such as procedures guiding how a security force should respond to an incident);
- Using multiple lines of detection to achieve protection-in-depth at critical assets; and
- Using complementary sensors with different means of detection (e.g., a CCTV and an intrusion detection system) to cover the same area.

A layered approach to security potentially increases the opportunity to use existing facility and natural features or more applicable technologies to meet the performance objectives at a reduced cost. More information on layered approaches to security can be found in Appendix C.

Securing Entire Perimeter vs. Securing Individual Asset

Depending on the size and location of the asset or assets driving a facility's risk, it may be more cost effective to focus deterrence, detection, and delay efforts toward the asset(s) rather than the entire perimeter. For instance, if a facility is large (e.g., covering 10 square miles) and has a single, relatively small Tier 1 asset (e.g., a single building or container), it likely would be significantly more cost effective to apply Tier 1-level perimeter barriers solely around the perimeter of the Tier 1 asset rather than around the entire facility. Accordingly, an owner/operator may wish to consider the benefits and costs related to completely enclosing a large facility within a single perimeter versus implementing multiple smaller restricted-area perimeters.

Additional discussion on the pros and cons of securing an entire perimeter versus securing the individual critical assets contained therein is provided in the Introduction. For performance objectives related to securing individual assets, an owner/operator should refer to RBPS 2, Secure Site Assets.

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Physical and Environmental Considerations

When determining the selection and layout of deterrence, detection, and delay components, a facility owner/operator should take into consideration the physical and environmental characteristics of his or her facility. Important *physical considerations* for evaluating the cost effectiveness of countermeasures include:

- Perimeter length and convolution,
- Terrain and urbanization,
- Adjacent facilities and transportation corridors,
- Approach angles and vehicle speeds, and
- Availability of supporting infrastructure.

In addition to the physical considerations listed above, *environmental factors* also should be considered when making decisions regarding deterrence, detection, and delay, as certain environmental conditions can significantly affect sensor and lighting performance. For example, certain sensors or other IDS components that have near-perfect detection capabilities during good weather might be subject to unacceptably high levels of false alarms during inclement weather (e.g., fog, rain, wind). Similarly, security lighting that may be considered acceptable during ideal weather conditions may be insufficient during periods of inclement weather. Accordingly, an owner/operator should consider the impact of environmental conditions when making determinations regarding security lighting and sensors or other IDS components.

Additional discussion on physical and environmental factors to take into consideration when making security decisions can be found in Appendix C.

Command and Control Considerations

Many security measures, such as intrusion detection systems or CCTV systems, consist of various hardware and software elements that can only be effectively operated or monitored by trained personnel, and owners/operators often will locate these functions in a command and control center. When designing command and control centers, owners/operators should consider merging security monitoring and reporting systems with other systems, such as fire engineering reporting systems or process control. The technical merger of an active security system and a passive fire system may facilitate a common set of operational procedures (e.g., reporting, training, and emergency response) and prove a more cost-effective approach to overall facility safety and security management.

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RBPS Metrics

Table 6 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 6: RBPS Metrics – RBPS 4 – Deter, Detect, and Delay

RBPS 4 - Deter, Detect, and Delay - Deter, detect, and delay an attack, creating sufficient time between detection of an attack and the point at which the attack becomes successful, including measures to:
(i) Deter vehicles from penetrating the facility perimeter, gaining unauthorized access to restricted areas, or otherwise presenting a hazard to potentially critical targets;
(ii) Deter attacks through visible, professional, well-maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value targets;
(iii) Detect attacks at early stages, through countersurveillance, frustration of opportunity to observe potential targets, surveillance and sensing systems, and barriers and barricades; and
(iv) Delay an attack for a sufficient period of time to allow appropriate response through on-site security response, barriers and barricades, hardened targets, and well-coordinated response planning.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	Through a series of protective security layers incorporating strong security measures, the facility has a very high likelihood of deterring, detecting, and delaying all adversaries to a degree sufficient to allow response to thwart the adversary action before it achieves mission success. This includes a highly reliable ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.	Through the use of security measures, the facility can deter, detect, and delay most adversaries to a degree sufficient to allow response to thwart the adversary action before it achieves mission success. This includes a reliable ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.	The facility can demonstrate a reasonable ability to deter, detect, and delay adversaries that allows appropriate response, including a reasonable ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.	The facility can demonstrate some ability to deter, detect, and delay adversaries, including some ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.
Metric 4.1 – Deterrence and Delay (General)	Through a combination of on-site security, barriers and barricades, hardened targets, and well-coordinated security response planning, the facility has a very high likelihood of deterring an attack and/or delaying an attack for a sufficient period of time to allow appropriate security response.	Through a combination of on-site security, barriers and barricades, hardened targets, and well-coordinated security response planning, the facility has a high likelihood of deterring an attack and/or delaying an attack for a sufficient period of time to allow appropriate security response.	Through a combination of on-site security, barriers and barricades, hardened targets, and well-coordinated security response planning, the facility has some ability to deter and/or delay an attack to allow appropriate security response.	The facility has some ability to deter and/or delay an attack to allow appropriate security response through well-coordinated security response planning.

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(ii) Deter attacks through visible, professional, well-maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value targets;
(iii) Detect attacks at early stages, through countersurveillance, frustration of opportunity to observe potential targets, surveillance and sensing systems, and barriers and barricades; and
(iv) Delay an attack for a sufficient period of time to allow appropriate response through on-site security response, barriers and barricades, hardened targets, and well-coordinated response planning.

	Tier 1	Tier 2	Tier 3	Tier 4
Metric 4.2 – Deterrence and Delay Vehicle Barriers	The facility has highly reliable man-made or natural vehicle deterrence measures (e.g., crash-rated, anti-vehicle barriers; landscaping; ditches; drainage swales) that deter vehicles from penetrating the facility perimeter and make it highly unlikely that a vehicle could gain access by force or otherwise present a hazard to critical assets.	The facility has reliable man-made or natural vehicle deterrence measures (e.g., crash-rated, anti-vehicle barriers; landscaping; ditches; drainage swales) that deter vehicles from penetrating the facility perimeter and make it unlikely that a vehicle could gain access by force or otherwise present a hazard to critical assets.	The facility has man-made or natural vehicle deterrence measures (e.g., crash-rated, anti-vehicle barriers; landscaping; ditches; drainage swales) that deter vehicles from penetrating the facility perimeter and make it difficult for most vehicles to breach the control point by force or otherwise present a hazard to critical assets.	The facility has some man-made or natural vehicle deterrence measures (e.g., active or passive barriers, landscaping, ditches, drainage swales) that deter vehicles from accessing the facility without authorization.
Metric 4.3 – Detection Monitoring and Surveillance	The facility has an extremely reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously manned location. In the context of this metric, "real time" means that an adversary act virtually always is detected and reported to responders at the time of occurrence. "Extremely reliable" means that the monitoring system is operable during all anticipated conditions, including during complete darkness, twilight, inclement weather, and loss of power, with monitoring system components designed, laid out, and constructed to	The facility has a very reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously monitored location. In the context of this metric, "real time" means that an adversary act most likely is detected and reported to responders at the time of occurrence. "Very reliable" means that the monitoring system is operable during ambient light, inclement weather, and fluctuating power conditions, with monitoring system components designed, laid out, and constructed so as to	The facility has a reliable perimeter monitoring system that allows for identification of the presence of an intrusion in real time for the area(s) containing critical asset(s). In the context of this metric, "real time" means that an adverse act likely is detected and reported to responders in a timely manner. "Reliable" means that the monitoring system is operable during ambient light conditions. To achieve this, a facility could, for example, use an integrated monitoring system that: • Provides intrusion detection and video surveillance around critical assets.	The facility has a monitoring system that allows for identification of the presence of an intrusion in the area(s) containing critical asset(s). To achieve this, a facility could, for example, use security patrols of the facility or an integrated monitoring system that provides intrusion detection and video surveillance around critical assets, is fully operable during all lighting conditions, and has emergency backup power and/or an equivalent written contingency procedure.

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(ii) Deter attacks through visible, professional, well-maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value targets;
(iii) Detect attacks at early stages, through countersurveillance, frustration of opportunity to observe potential targets, surveillance and sensing systems, and barriers and barricades; and
(iv) Delay an attack for a sufficient period of time to allow appropriate response through on-site security response, barriers and barricades, hardened targets, and well-coordinated response planning.

	Tier 1	Tier 2	Tier 3	Tier 4
	avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility could, for example, use an integrated, multi-sensor system that: • Provides intrusion detection and video surveillance around 100% of the facility's perimeter or 100% of the perimeter around all critical assets. • Provides images or other output that are continuously monitored by a dedicated person, software, or other detection method used in conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure. • Has general-area as well as access-portal (face-view) CCTV surveillance at all gates.	avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility could, for example, use an integrated monitoring system that: • Provides intrusion detection and video surveillance around critical assets that do not have passive vehicle barriers. • Provides images or other output that are continuously monitored by a dedicated person, software, or other detection method used in conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure.	• Has emergency backup power and/or an equivalent written contingency procedure.	

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(ii) Deter attacks through visible, professional, well-maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value targets;
(iii) Detect attacks at early stages, through countersurveillance, frustration of opportunity to observe potential targets, surveillance and sensing systems, and barriers and barricades; and
(iv) Delay an attack for a sufficient period of time to allow appropriate response through on-site security response, barriers and barricades, hardened targets, and well-coordinated response planning.

	Tier 1	Tier 2	Tier 3	Tier 4
Metric 4.4 – Detection Security Operations Centers	The facility has a very high likelihood of detecting attacks at early stages through countersurveillance, frustration of opportunity to observe critical assets, surveillance and sensing systems, and barriers or barricades. To achieve this level of detection, a facility could, for example, maintain a facility-wide intrusion detection system that is continually monitored from a Security Operations Center and has an adequate backup capability.	The facility has a high likelihood of detecting attacks at early stages through countersurveillance, frustration of opportunity to observe critical assets, surveillance and sensing systems, and barriers or barricades. To achieve this level of detection, a facility could, for example, maintain a facility-wide intrusion detection system that is continually monitored from a Security Operations Center.	The facility has some ability to detect attacks at early stages through countersurveillance, frustration of opportunity to observe critical assets, surveillance and sensing systems, and barriers or barricades.	The facility has some ability to detect attacks at early stages.
Metric 4.5 – Interdiction by Security Forces or Other Means	The facility is extremely likely to be able to detect and initiate a response to armed intruders resulting in the intruders being interdicted before they reach a critical asset. This capability may be achieved by a facility security force, sufficient delay tactics to allow local law enforcement to respond before the adversary achieves mission success, standoff distances (for VBIEDs), process controls or systems that rapidly render the critical asset nonhazardous even if a breach of containment were to occur (e.g., a rapid chemical neutralization system), or other equivalent measures. If security forces are used, they may be contract or proprietary, mobile or posted, armed or unarmed, or a combination thereof.	The facility is likely to be able to detect and initiate a response to armed intruders, resulting in the intruders being interdicted before they reach a critical asset. This capability may be achieved by a facility security force, sufficient delay tactics to allow local law enforcement to respond before the adversary achieves mission success, standoff distances (for VBIEDs), process controls or systems that rapidly render the critical asset nonhazardous even if a breach of containment were to occur (e.g., a rapid chemical neutralization system), or other equivalent measures. If security forces are used, they may be contract or proprietary, mobile or posted, armed or unarmed, or a combination thereof.	The facility has some ability to detect and initiate a response to armed intruders resulting in the intruders being interdicted before they reach a critical asset. This capability may be achieved by a facility security force, sufficient delay tactics to allow local law enforcement to respond before the adversary achieves mission success, standoff distances (for VBIEDs), process controls or systems that rapidly render the critical asset nonhazardous even if a breach of containment were to occur (e.g., a rapid chemical neutralization system), or other equivalent measures. If security forces are used, they may be contract or proprietary, mobile or posted, armed or unarmed, or a combination thereof.	

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RBPS 5 – Shipping, Receipt, and Storage

RBPS 5 – Shipping, Receipt, and Storage - Secure and monitor the shipping, receipt, and storage of hazardous materials for the facility.

RBPS 5 –Shipping, Receipt, and Storage is designed to help a facility minimize the risk of theft or diversion of any of its hazardous materials.[17] In addition, improved inventory control and control of transportation containers on-site helps to prevent tampering or sabotage, and decreases the likelihood that a foreign substance could be introduced into feedstock, incidental chemicals, or products leaving the facility that could later interact with the hazardous material to cause a harmful reaction on- or off-site. Good shipping, receipt, and storage practices typically include maintaining all transportation containers that are used for storage but are not incident to transportation, including transportation containers connected to equipment at a facility for loading or unloading and transportation containers detached from the motive power (e.g., a locomotive, truck/tractor) that delivered the container to the facility, inside the facility's security perimeter and under the security control of the facility.

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Shipping, Receipt, and Storage performance standards, a facility might consider the following potential attack scenarios:

- Assault team
- Sabotage
- Standoff
- Theft/diversion
- VBIED

Security Measures and Considerations for Shipping, Receipt, and Storage

Security Measures

Product Stewardship

Product stewardship is a term used to describe a product-centered approach to protection of hazardous

[17] In using the terms "hazardous materials" in RBPS 5 and "potentially dangerous chemicals" in RBPS 6, DHS generally means COI as listed in Appendix A of CFATS. Those terms may also include, however, other chemicals at a covered facility that pose risks comparable to, or that substantially contribute to, the risks posed by COI listed in Appendix A (i.e., chemicals that have the potential to create significant adverse consequences to human life or health if that facility is subjected to terrorist attack, compromise, infiltration, or exploitation). DHS expects covered facilities to be familiar with their own chemicals (e.g., to know which chemicals are hazardous materials under the Federal hazardous materials transportation laws administered by the U.S. Department of Transportation, 49 U.S.C. §§ 5101, et seq.). Any facility that needs assistance in determining which chemicals and hazardous materials must be addressed under RBPS 5 or 6 in its SSP may request technical assistance from DHS.

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materials, and calls for manufacturers, retailers, and consumers to share responsibility for reducing the potential for theft, contamination, or misuse of toxic or flammable chemicals. Voluntary product stewardship activities have been taking place within the chemical industry for many years, and so the inclusion of such activities as a component of meeting RBPS 5 would be a natural application of normal business practices.

Good product stewardship generally allows a facility to know where its product is located at all times; ensures that the material is being delivered to or received from a known, approved individual or entity; and helps prevent the theft or diversion of materials through force or deception. Elements of a good product stewardship program may include:

- Strict vehicle identification and entry authorization, shipping, and control procedures that are subject to a testing program to confirm reliability.
- Procedures for handling the arrival of an unknown carrier at the facility, including the staging of a vehicle and its driver until both the driver and the load are vetted and approved.
- Confirmation by the facility employee who is responsible for a given shipment of feed materials or products to or from the facility that the shipment is expected and approved.
- Advance planning and approval of inbound and outbound shipments of hazardous materials.
- An active, documented "know your customer" program that includes a policy of refusing to sell hazardous materials to those who do not meet the pre-established customer qualification criteria. Examples of such criteria may include:
    - Verification and/or evaluation of the customer's on-site security,
    - Verification that shipping addresses are valid business locations,
    - Confirmation of financial status,
    - Establishment of normal business-to-business payment terms and methods (e.g., not allowing cash sales), and
    - Verification of product end-use.
- Proper identification checks and verification of transactions for customer pickup of packaged hazardous materials.
- A review procedure with appropriate redundancies in place for all shipping, receiving, and delivery of hazardous materials.

Inventory Control

There are multiple inventory control systems and relational databases that could be used for tracking hazardous materials at covered facilities that range in size from single stockrooms to large, multisite enterprise environments. The systems differ in many respects but generally include the following elements:

- Lists all the hazardous materials at the covered facility;
- Provides tracking of the quantity and the physical location of each hazardous material;
- Monitors use by authorized personnel;
- Allows the generation of reports on hazardous materials by location, vendor, name, etc.;
- Provides container-based tracking of multiple lots, vendors, and sizes;
- Tracks disposal and maintains a record of disposed containers;

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- Contains purchasing/receiving records for materials management; and
- Is linked to Materials Safety Data Sheets (MSDS) information.

More advanced inventory control systems can rapidly detect when hazardous materials have been removed from their proper locations. Examples of such systems are process controls that monitor the level, weight, volume, or other process parameters that measure the inventory of hazardous materials.

Inventory control of hazardous materials also can be enhanced through the use of physical security and/or control procedures, such as:

- Physical measures and/or procedures that restrict access to storage of hazardous materials by allowing access only to authorized individuals;
- Performance of background checks on employees with unescorted access to hazardous materials;
- Training of employees working in restricted areas to identify and report suspicious behavior;
- Monitoring of critical process equipment containing hazardous materials by operations or other personnel directly via patrols and CCTV to reduce the potential for tampering or sabotage;
- Provision of a locked rack or other tamper-evident, physical means of securing man-portable containers of theft/diversion hazardous materials. Examples include:
    - Chains and locks that cannot be cut or breached with man-powered tools,
    - Movement alarms on the containers, and
    - Entry/motion detectors and alarms for the buildings or rooms where the containers are stored.
- Transportation of hazardous materials by drivers who are issued facility badges pursuant to third-party verification of background suitability or have other proof of suitability, such as a transportation worker identification card (TWIC);
- Procedures prohibiting vehicle entry and egress at unmanned gates; and
- Inspection of all vehicles upon egress from the facility or restricted area for hazardous materials.

Security Considerations

Business Benefits

If carried out properly, many of the activities that help increase shipping, receipt, and storage security can provide significant benefits on the business side as well, as they often focus on such areas as customer relations, inventory control, and value chain management. When determining which measures and/or processes to implement in regard to this RBPS, a facility's security officer may want to coordinate with the operations and business groups at the facility and/or corporate headquarters to identify which activities can have the most benefit to both disciplines.

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Layered Security

Completely adequate protection is rarely achievable solely through the implementation of a single security measure. Rather, an appropriate security solution typically depends upon the use of multiple countermeasures providing "layers of security" for protection. This approach may include not only the layering of multiple physical protective measures but also the effective integration of physical protective measures with procedural security measures, including procedures in place before an incident and those employed in response to an incident.

RBPS Metrics

Table 7 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 7: RBPS Metrics – RBPS 5 – Shipping, Receipt, and Storage

RBPS 5 – Shipping, Receipt, and Storage - Secure and monitor the shipping, receipt, and storage of hazardous materials for the facility.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has documented processes for securing and monitoring the shipment, receipt, and storage of hazardous materials that make it extremely unlikely that such materials would be made available to an unauthorized individual or an individual without a legitimate use for the material.	The facility has documented processes for securing and monitoring the shipment, receipt, and storage of hazardous materials that make it unlikely that such materials would be made available to an unauthorized individual or an individual without a legitimate use for the material.	The facility has documented processes for securing and monitoring the shipment, receipt, and storage of hazardous materials that reduce the likelihood that such materials would be made available to an unauthorized individual or an individual without a legitimate use for the material.	
Metric 5.1 – Security of Transportation Containers On-site	The facility adequately secures all transportation containers of hazardous materials on-site that are used for storage and are not incident to transportation, including transportation containers connected to equipment at a facility for loading or unloading and transportation containers detached from the motive power (e.g., a locomotive, truck/tractor) that delivered the container to the facility. Effective security generally includes storing the container within the facility's security perimeter and under the facility's security control, considering the container in the facility's SSP, and securing and monitoring rail cars and other containers by using measures consistent with the materials that they contain.			
Metric 5.2 – "Know-Your-Customer" Provisions	The facility has an active, documented "know your customer" program that may include a policy of refusing to sell hazardous materials to those who do not meet pre-established customer qualification criteria, such as confirmation of identity, verification and/or evaluation of on-site security, verification that shipping addresses are valid business locations, confirmation of financial status, establishment of normal business-to-business payment terms and methods (e.g., not allowing cash sales), and verification of product end-use.			The facility has a "know your customer" program.
Metric 5.3 – Carrier and Shipment Facility Access	The facility has strict vehicle identification and entry authorization, shipping, and control procedures that are subject to a testing program to confirm reliability. If an unknown carrier arrives at the facility, the vehicle and its driver are staged until both the driver and the load are vetted and approved.			The facility has vehicle identification and entry authorization, shipping, and control procedures.

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Table 7: RBPS Metrics – RBPS 5 – Shipping, Receipt, and Storage				
RBPS 5 – Shipping, Receipt, and Storage - Secure and monitor the shipping, receipt, and storage of hazardous materials for the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 5.4 – Confirmation of Shipments	The facility has effective security procedures regarding shipments, generally including: • Procedures that require the relevant facility party to confirm all shipments of feed materials or products to or from the facility before allowing the vehicle or its driver/passengers on-site. • Advance planning and approval of all inbound and outbound shipments of hazardous materials (unannounced shipments are not allowed). • Proper identification checks and verification prior to customer pickup of packaged hazardous materials.		The facility has effective security procedures regarding shipments, generally including: • Procedures that require the relevant facility party to confirm most shipments of feed materials or products to or from the facility before allowing the vehicle or its driver/passengers on-site. • Advance planning and approval of most inbound and outbound shipments of hazardous materials. • Proper identification checks and verification prior to customer pickup of packaged hazardous materials.	
Metric 5.5 – Verification of Sales and Orders	A review procedure with appropriate redundancies is in place for all shipping, receiving, and delivery of hazardous materials. In particular, the facility has a process to verify receipt of orders for hazardous materials, and written procedures are in place detailing the specific instructions and requirements to control activities related to sales and storage of hazardous materials.			N/A

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RBPS 6 – Theft or Diversion

RBPS 6 - Theft and Diversion - Deter theft or diversion of potentially dangerous chemicals.

RBPS 6 – Theft or Diversion establishes performance standards focused on preventing the theft or diversion of potentially dangerous chemicals (e.g., chemical weapons, chemical weapons precursors, explosives, explosive precursors, or other chemicals of interest that could be used to inflict harm at a facility or off-site).[18]

Security Measures and Considerations for Theft or Diversion

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Theft or Diversion performance standards, a facility might consider the following potential attack scenario:

- Theft/diversion

Security Measures

The primary means to prevent the theft or diversion of potentially dangerous chemicals is through inventory control systems that can monitor and/or track such chemicals, procedures that make it more difficult to steal or divert the chemicals, and physical measures that make the actual movement of such chemicals more difficult.

Inventory Controls

There are multiple inventory control systems and relational databases used for tracking potentially dangerous chemicals that could be used at covered facilities that range in size from single stockrooms to large, multi-site enterprise environments. The systems differ in many respects but generally have the following elements in common:

- Include lists of all the potentially dangerous chemicals in the covered facility;
- Provide tracking of the quantity and the physical location of each potentially dangerous chemicals;
- Monitor use by authorized personnel;
- Allow generation of reports listing potentially dangerous chemicals by location, vendor, name, etc.;
- Provide container-based tracking of multiple lots, vendors, and sizes;
- Track disposal and maintains a record of disposed containers;
- Generate purchasing/receiving records for materials management; and
- Are linked to MSDS information.

[18] See n.17 above.

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Procedural Measures

Procedural measures also can help minimize the ease with which theft or diversion of potentially dangerous chemicals can occur as well. Measures that a facility might want to consider include:

- Restricting access to areas with potentially dangerous chemicals to authorized personnel only.
- Employing a "two-man rule" whereby no individual is allowed to go unescorted into the area where any potentially dangerous chemical is located.
- Performing background checks on employees with access to potentially dangerous chemicals.
- Training employees who work in restricted areas to identify and report suspicious behaviors.
- Prohibiting vehicle entry and egress from unmanned gates.
- Issuing ID badges to drivers transporting potentially dangerous chemicals after the completion of third-party verification of background suitability.

Physical Measures

Various physical measures or activities can help minimize the likelihood of theft or diversion of potentially dangerous chemicals including, for example, limiting access to potentially dangerous chemicals, inhibiting the portability of potentially dangerous chemicals, monitoring areas that contain potentially dangerous chemicals, and screening individuals and vehicles. Specific measures a facility may wish to implement include:

- Operations or other personnel monitor locations containing potentially dangerous chemicals directly via patrols and/or via CCTV.
- Locked racks or other tamper-evident, physical means of securing man-portable containers of potentially dangerous chemicals. Examples include:
    - Chains and locks that cannot be cut or breached with man-powered tools,
    - Movement alarms on the containers,
    - Entry/motion detectors and alarms for the buildings or rooms where the containers are stored, and
- Inspection of all vehicles upon egress from the facility or restricted area for potentially dangerous chemicals.

Security Considerations

Business Benefits

If carried out properly, many of the activities that help increase shipping, receipt, and storage security can provide significant benefits on the business side as well, as the activities often focus on

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such areas as customer relations, inventory control, and value chain management. When determining which measures and/or processes to implement in regard to this RBPS, a facility's security officer may want to coordinate with the operations and business groups at the facility and/or corporate headquarters to identify which activities can have the most benefit to both disciplines.

Layered Security

Completely adequate protection is rarely achievable solely through implementing a single security measure. Rather, an appropriate security solution typically depends upon the use of multiple countermeasures providing "layers of security" for protection. This approach may include not only the layering of multiple physical protective measures but also the effective integration of physical protective measures with procedural security measures, including procedures in place before an incident and those employed in response to an incident.

RBPS Metrics

Table 8 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 8: RBPS Metrics – RBPS 6 – Theft and Diversion

RBPS 6 - Theft and Diversion - Deter theft or diversion of potentially dangerous chemicals.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has multiple, vigorous security measures that are extremely effective in deterring the theft or diversion of potentially dangerous chemicals.	The facility has multiple security measures that are effective in deterring theft or diversion of potentially dangerous chemicals.	The facility has security measures that reduce the likelihood of theft or diversion of potentially dangerous chemicals.	The facility has security measures intended to deter theft or diversion of potentially dangerous chemicals.
Metric 6.1 – Restricted Access to Potentially Dangerous Chemicals	Vigorous controls and procedures exist that restrict access to storage of potentially dangerous chemicals by allowing access only to authorized individuals.	Controls and procedures exist that restrict access to storage of potentially dangerous chemicals by allowing access only to authorized individuals.		Controls and procedures exist that restrict access to storage of potentially dangerous chemicals.
Metric 6.2 – "Know-Your-Customer" Provisions	The facility has an active, documented "know your customer" program that includes a policy of refusing to sell potentially dangerous chemicals to those who do not meet pre-established customer qualification criteria, such as confirmation of identity, verification and/or evaluation of on-site security, verification that shipping addresses are valid business locations, confirmation of financial status, establishment of normal business-to-business payment terms and methods (e.g., not allowing cash sales), and verification of product end-use.			The facility has a "know your customer" program.
Metric 6.3 – Background Checks	All employees and contractors involved with potentially dangerous chemicals have undergone background surety investigations and have been trained to identify and report suspicious behaviors. Drivers transporting potentially dangerous chemicals are issued facility badges subsequent to third-party verification of background suitability.			

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Table 8: RBPS Metrics – RBPS 6 – Theft and Diversion				
RBPS 6 - Theft and Diversion - Deter theft or diversion of potentially dangerous chemicals.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 6.4 – Monitoring Potentially Dangerous Chemicals	Personnel monitor critical process equipment containing potentially dangerous chemicals directly via patrols, CCTV, or other method to reduce the potential for tampering, sabotage, or theft. Additionally, security tags (e.g., a Radio Frequency Identification Device (RFID) or similar systems) are attached to or embedded in containers of potentially dangerous chemicals.		Personnel monitor critical process equipment containing potentially dangerous chemicals directly via patrols, CCTV, or other method to reduce the potential for tampering, sabotage, or theft.	
Metric 6.5 – Physical Security of Potentially Dangerous Chemicals	A locked rack or other physical means of securing man-portable containers of potentially dangerous chemicals is provided. The method(s) used are resistant to breach or tampering. Examples include chains and locks that cannot be cut or breached with man-powered tools, movement alarms on the containers, and entry/motion detectors and alarms for the buildings or rooms where the containers are stored.			
Metric 6.6 – Vehicular Access	Vehicle entry and egress to locations with potentially dangerous chemicals is through a manned or monitored entry point.			
Metric 6.7 – Vehicle Inspections	All vehicles are inspected upon egress from the facility or restricted area for potentially dangerous chemicals.	A percentage of vehicles are inspected upon egress from the facility or restricted area for potentially dangerous chemicals on a random basis.		N/A
Metric 6.8 – Inventory Control	The facility has an inventory control system for potentially dangerous chemicals that can either rapidly detect when such chemicals have been removed from their proper location or are monitored to identify attempts to remove such chemicals in an unauthorized manner. Examples of such systems include process controls that monitor the level, weight, volume, or other process parameters that measure the inventory of potentially dangerous chemicals or other security measures (e.g., monitoring, access controls) combined with cross-checking of inventory through periodic inventory reconciliation to ensure that no product loss has occurred.			
Metric 6.9 – Tamper-Evident Devices	The facility employs tamper-evident seals for the vehicle valves and other appurtenances that can indicate if a shipment has been tampered with.		N/A	
Metric 6.10 - Cyber Security for Potentially Dangerous Chemicals	The facility has implemented appropriate cyber security measures and procedures for business systems that manage the ordering and/or shipping of potentially dangerous chemicals as well as any other cyber systems that contain personally identifiable information for those individuals who manage critical business systems or who could be exploited to steal or divert potentially dangerous chemicals.			

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RBPS 7 – Sabotage

RBPS 7 – Sabotage - Deter insider sabotage.

Insider sabotage is a deliberate action aimed at weakening an employer through subversion. Deterring insider sabotage prevents the facility's own property and activities from being used by a potential terrorist against the facility. Sabotage is usually associated with the activity of an individual or group whose actions result in the destruction or damaging of a productive or vital facility, and it is of particular concern for facilities that are high risk based on their production of mission-critical or economically critical chemicals.

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Sabotage performance standards, a facility might consider the following potential attack scenario:

- Sabotage

Although most acts of sabotage do not have a primary objective of inflicting casualties, sabotage tied to terrorism may be specifically intended to generate casualties and injuries. Chemicals of interest that have the potential to create significant adverse consequences for human life or health if sabotaged or otherwise contaminated are listed in Appendix A to CFATS as sabotage COI.

Security Measures and Considerations for Sabotage

Security Measures

Examining the background of employees or contractors can greatly reduce the likelihood of the occurrence of insider sabotage, as does ensuring that visitors and contractors have legitimate business on-site and are escorted when necessary. In addition, restricting access to certain chemicals of interest or to sensitive areas of a facility through administrative controls and physical security measures limits the potential for sabotage. Finally, cyber security measures are the primary means for minimizing a facility's vulnerability to cyber sabotage.

Background Investigations

DHS believes personnel surety to be a key component of a successful chemical facility security program, with the level of screening commensurate with the level of access granted. Because sabotage is typically carried out by or with the help of an insider, the performance of background investigations on those individuals with access to sensitive areas of a facility is the best way to prevent sabotage. Background checks can be defined as the process of acquiring information on an individual through third-party services, government organizations, and private individuals to make a "suitability determination" regarding their ability to access sensitive areas. As background investigations are the focus of RBPS 12, significant additional detail can be found in the chapter that discusses RBPS 12, as well as in Appendix C.

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The level and depth of background investigations to reduce the likelihood of sabotage should be tied to the potential severity of the consequences that could occur because of sabotage and are applicable to individuals with potential access to restricted areas or critical assets capable of generating those undesired consequences.

Visitor Controls

Physical-security precautions against sabotage include the screening, identification, and control of visitors. Visitors are generally classed in the following categories:

- Persons with whom the covered facility has business (such as suppliers, customers, and inspectors);
- Individuals or groups who desire to visit a covered facility for personal or educational, technical, or scientific reasons;
- Individuals or groups specifically sponsored by or representing the government; and
- Individuals or groups on guided tours to selected portions of the covered facility in the interest of public relations.

By implementing identification and control mechanisms for visitors, facilities can help mitigate the risks posed by visitors. Identification and control mechanisms to consider include the following:

- Positive identification of visitors;
- Validation of the visit by contacting appropriate facility personnel;
- The use of visitor registration forms to provide a record of the visitor and the time, location, and duration of the visit;
- The use of visitor cards/badges; and
- Visitor escort requirements.

Physical Security Measures

Physical security measures that make access to areas where sabotage can occur more difficult help both to deter sabotage attempts and defend against sabotage attempts. Physical security measures that can be used to deter and defend against sabotage come in a variety of types. For more information on standard physical security measures, please refer to RBPSs 1, 3, and 4.

Cyber Security Measures

Sabotage can also be performed by using cyber means. While background investigations, visitor controls, and physical security measures help protect against physical sabotage, they are of limited value against cyber sabotage attempts. To prevent cyber sabotage, cyber security measures are needed. An in-depth discussion of various cyber security measures and policies that a facility may want to employ is contained in RBPS 8 –Cyber, as well as in Appendix C.

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Security Considerations

Layered Security

Completely adequate protection is rarely achievable solely through implementing a single security measure. Rather, an appropriate security solution typically depends upon the use of multiple countermeasures providing "layers of security" for protection. This approach may include not only the layering of multiple physical protective measures but also the effective integration of physical protective measures with procedural security measures, including procedures in place before an incident and those employed in response to an incident.

RBPS Metrics

Table 9 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 9: RBPS Metrics – RBPS 7 – Sabotage

RBPS 7 - Sabotage - Deter insider sabotage.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has procedures and security measures in place that are effective at deterring, detecting, delaying, and responding to sabotage.			The facility has procedures and security measures in place that are aimed at deterring, detecting, delaying, and responding to sabotage.
Metric 7.1 – Procedures	The facility has procedures in place to deter, detect, delay, and respond to sabotage, such as routine equipment inspections for tampering, awareness training, process safety measures, restricted access to sensitive areas, and protocols for verifying the identity and shipment orders of carriers who arrive to remove transportation containers of sabotage COI from the facility.			
Metric 7.2 – Tamper-Evident Devices	The facility utilizes active tamper-evident devices to secure critical-asset (e.g., sabotage COI) transportation containers. The devices(s) used are fairly resistant to breach or tampering and indicate when attempts to tamper with the containers have occurred. Examples include car seals or other tamper-indicating devices, physical locks on transportation container valves or access hatches/openings, chains and locks that cannot readily be cut or breached with man-powered tools, alarms on the valves or access hatches/openings of the transportation containers, and entry/motion detectors and alarms for the buildings or rooms where the transportation containers are stored.			
Metric 7.3 – Visitor Controls	The facility has documented and implemented strict visitor identification, escort, and access control procedures that include verification of visitor background suitability or constant visitor escort by appropriately vetted personnel in restricted areas.	The facility has documented and implemented visitor identification, escort, and access control procedures that include verification of visitor background suitability or constant visitor escort by appropriately vetted personnel in restricted areas.	The facility has documented and implemented visitor identification, escort, and access control procedures.	The facility has implemented visitor identification, escort, and access control procedures.

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RBPS 8 – Cyber

RBPS 8 - Cyber – Deter cyber sabotage, including preventing unauthorized on-site or remote access to critical process controls, such as Supervisory Control and Data Acquisition (SCADA) systems, Distributed Control Systems (DCSs), Process Control Systems (PCSs), Industrial Control Systems (ICSs), critical business systems, and other sensitive computerized systems.

Cyber systems (e.g., SCADA systems, DCSs, PCSs, ICSs, critical business systems, and other sensitive computerized systems) are integrated throughout the operations of chemical facilities, including in controlling sensitive processes, granting authorized access, and enabling business. Protecting against cyber sabotage of these systems is an essential component in managing overall risk for a facility. A comprehensive approach of appropriate security policies, practices, and people to prevent, protect, respond to, and recover from incidents deters cyber sabotage.

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Cyber performance standards, a facility might consider the following potential attack scenarios:

- Sabotage
- Theft/diversion

A comprehensive approach to cyber security typically will involve policies and procedures that address all cyber systems used by a facility, with certain enhanced security activities directed at critical systems. Cyber systems that a facility might consider critical for purposes of this RBPS include, but are not limited to, those that monitor and/or control physical processes that contain a COI; are connected to other systems that manage physical processes that contain a COI; or contain business or personal information that, if exploited, could result in the theft, diversion, or sabotage of a COI. Specific examples of cyber systems that a facility may wish to consider critical include:

- A control system (including a remotely operated control system) that directly monitors and/or controls manufacturing or other physical processes that contain COI;
- A business system at the headquarters that manages ordering and/or shipping of a COI;
- A business system (at the facility, headquarters, or outsourced) that contains personally identifiable information for those individuals who could be exploited to steal, divert, or sabotage a COI;
- An access control or security monitoring system that is connected to other systems;
- Enterprise resource planning systems that conduct critical functions in support of chemical processes for COI or a COI supply chain activity;
- E-mail and fax systems used to transmit sensitive information related to ordering and/or shipping of a COI;
- A noncritical control system on the same network as a critical control system;
- A sales system that is connected to the data historian for a critical control system;
- A watchdog system (e.g., Safety Instrumented System (SIS)) for a critical control system; and
- A system hosting critical or sensitive information that, if exploited, could result in the theft or diversion of a COI or sabotage its processing (e.g., Web site, intranet).

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Examples of cyber systems that a facility likely would not consider critical include:

- A control system that is not connected to any critical systems,
- A business system at the headquarters that contains no personally identifiable information,
- An access control or security monitoring system that is not connected to other systems or networks,
- A sales system that is not connected to the data historian for a critical control system,
- A financial system for the facility/organization, and
- A system hosting noncritical and nonsensitive information about the facility (e.g., Web site, intranet).

Note that whether a covered facility's cyber systems are located or managed on-site (e.g., at the covered facility) or off-site (e.g., at corporate headquarters or a vendor's location), generally is not a factor in determining whether or not a particular cyber system is critical. Moreover, a covered facility's cyber security practices should apply regardless of the location of the cyber system.

Security Measures and Considerations for Cyber

Security Measures

Effectively securing a facility's cyber systems from attack or manipulation typically includes a combination of policies and practices in several categories: (1) security policy, (2) access control, (3) personnel security, (4) awareness and training, (5) monitoring and incident response, (6) disaster recovery and business continuity, (7) system development and acquisition, (8) configuration management, and (9) audits. The following subsections provide brief descriptions of each of these cyber security areas. Additional detail on each can be found in Appendix C.

Security Policy

Security Policies, Plans, and Procedures. Security policies, plans/processes, and procedures that specifically address operational constraints, sensitivity issues, and processing environment issues are common starting points for cyber security, whether they are addressed in general information technology (IT) documentation or contained in their own dedicated documentation. One security policy document that is especially worthwhile is a formal change management process. Without a defined process that takes into account policy mandates, security concerns, business impact, authorization, and oversight, changes can weaken the stability and security of a system. Development and distribution of a cyber change management process supports the achievement of the most effective and efficient application of network and system updates, reduces the likelihood of the introduction of malicious code, and reduces the chance of human error. In addition to procedural documents governing the change management process, audit logs documenting who made changes to what and when also are useful tools.

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Cyber Security Officials. Designating an individual to be responsible for cyber security often helps establish management support for cyber security, as well as providing direction, accountability, and oversight to cyber security. Examples include a Chief Information Officer, an IT Cyber Security Specialist, or a System Administrator.[19]

Access Control

System Boundaries. The process of uniquely assigning information resources/assets to a cyber system defines the boundaries for that system. While some systems may be defined by lines of direct management control, it is also possible for system boundaries to be established on the basis of functional or business purpose. Facilities have flexibility in determining what constitutes the boundaries of a cyber system and should consider factors that promote effective information security.

External Connections. Understanding and managing connectivity — that is, the possibility of transferring data electronically (e.g., through external access, such as the wireless connection, or portable cyber equipment, such as flash drives) — is typically an essential component of cyber security. Because cyber vulnerabilities can be exploited in many ways, connectivity is not as simple as whether or not a wired connection to the Internet is openly in use. Network back doors exist in the form of wireless connections, modems, portable electronic devices, and media, such as laptop computers, personal digital assistants (PDAs), universal serial bus (USB) drives, compact disks (CDs), or floppy disks, etc. By verifying external connections through the use of network tools designed for this purpose, managers can greatly increase the security environments of their systems and networks.

Business and control networks often are connected for efficiency or economy or because common or public networks are used for communications or as integral parts of the larger system. Unfortunately, this opens the control systems network to the vulnerabilities of the general business infrastructure, including the Internet — issues for which they typically were not designed and which often are not managed. Firewalls can be used to control access, but most firewalls common in the industry today do not inspect for valid control system protocol contents, which frequently makes the firewall an ineffective barrier between the systems. Other methods exist for configuring the networks to limit access to control systems (e.g., segregating business and control networks), but taking this approach may impact efficiency or economy. For these reasons, a good cyber security posture typically will include rules governing system interconnection, especially when connections exist to components outside of an organization's direct control.

Remote Access and Rules of Behavior. Remote access (e.g., via the Internet, Virtual Private Network (VPN), modems) occurs when users (e.g., employees, vendors, maintenance personnel, and others) access or communicate with a cyber system outside of a facility where that cyber system resides. Rules of behavior are often established by the facility and made available to all cyber system users. Those rules typically describe user responsibilities, expected behavior with regard to information system usage (e.g., appropriate Web sites, conduct of personal business), including remote access activities.

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[19] Note that the individual responsible for cyber security at a facility does not necessarily need to be located at the facility. For additional information on recommendations regarding a facility's security officials and organizations, please see RBPS 17 – Officials and Organization.

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Least Privilege. Facilities are encouraged to employ the "least privilege" concept (i.e., granting people only as much access as they need to perform their assigned job functions and no more).

Password Management. Managing passwords is a key component of a good cyber security program. Password management often includes immediately changing all default passwords provided with any systems or applications and establishing parameters and rules for password structure. Typically, parameters take into account not only the structure of the password (e.g., requiring at least one uppercase and one lowercase letter) but also address the frequency of password changes (e.g., requiring a user to change his or her password every 90 days). In instances where changing default passwords is not technically feasible (e.g., a control system with a hard-coded password), then appropriate compensating security controls (e.g., physical controls) are often implemented.

Personnel Security

Criticality Sensitivity Review. It is a good cyber security practice to review all roles to determine the types/levels of sensitive materials to which someone filling that role is allowed access. Assigning a "high," "medium," or "low" rating to a role is a common labeling process and can be very useful so long as those terms are well defined for the business. An example rating would be a rating of high for system administrators.

Unique Accounts. Organizations typically establish unique accounts for each individual user in order to provide appropriate access and accountability. When accounts are shared among multiple individuals, it cannot be determined which user is responsible for a given action. Additionally, if a security breach occurs, it can be difficult to identify the source of that breach if it comes from a shared account. Accordingly, it is generally good cyber security practice to use individual-user accounts where technically feasible.

In some control systems environments, it may be standard practice to use a single group account for multiple users. Management may make a risk-based decision to allow this practice; however, the risk associated with that decision should be managed with appropriate compensating controls.

Separation of Duties. Although people often play multiple roles within an organization, it is generally a good idea to have each of these roles and their related security needs defined and separated as much as possible. This distinction allows for natural checks and balances, which is important for preventing human error and internal misuse of systems and information. A balance between what is good for security and what access is needed to allow business to be conducted smoothly is often the goal.

Access Control Lists. Actively managing access for changing roles of employees (e.g., termination, transfer) is one way to ensure that only appropriate access is allowed. Immediate review of all role changes is recommended. For all employees who have departed under adverse circumstances, however, it is recommended that all access rights (both physical and electronic) be revoked by close of business the same day.

Third-party Cyber Support. Managing relationships with external service providers, business partners, and vendors should be considered so that they do not compromise the security of an organization.

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Physical Access to Cyber Systems and Information Storage Media. Marking and otherwise restricting specific physical areas where cyber systems and information storage media are located or managed in a facility can greatly improve security. Combined with a role-based security model, personnel can know where they are and are not allowed.

Awareness and Training

The human component is often the most vulnerable aspect of a system. As a result, a good cyber security program generally involves making system users aware of the need for security and instructing them on their roles in keeping the cyber system secure. A documented cyber security training program, which establishes the types and frequency of training, is one effective way to accomplish this. Basic topics that a facility may want all employees to receive could include:

- General company policy review,
- Roles and responsibilities,
- Password procedures,
- Acceptable practices, and
- Whom to contact and how to report suspected inappropriate or suspicious activity.

Training is most effective when refreshed and reinforced on a predetermined schedule and when updated to reflect the changing threat and vulnerability environment. An effective training program may provide for different training regimens for employees based on their differing roles.

Cyber Security Controls, Monitoring, Response, and Reporting

Cyber Security Controls. Viruses, worms, Trojan horses, and other malicious software code proliferate on the Internet and mutate on an unpredictable basis. Malicious code is so common that without automated protection it is a near certainty that systems will be infected. Even without access to the Internet, malicious code can be introduced to an organization through actions (even unintended) of employees, support personnel, vendors, and business partners. Antivirus software can be implemented on a facility's systems when architecture and application permit it, and such software should be updated (after appropriate testing) on a regular basis. Additionally, with the prevalence of e-mail borne viruses and other spam messages including malicious software attachments, owners/operators should consider filtering e-mail attachments.

For control systems where system architectures or operational requirements may not permit the use of antivirus software, layered defenses can be used to prevent events or intrusions from reaching vulnerable control systems.

Network Monitoring. Facility's monitor networks for unauthorized or malicious access to maintain situational awareness and mitigate risk. An IDS can be used to monitor networks. IDSs are designed to capture network or host traffic, analyze it for known attack patterns, and take specified action when it recognizes an intrusion or attempted intrusion. An IDS can be software or hardware and can be network-based or host-based. Recognizing and logging events and incidents is a critical component of network monitoring.

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Incident Response. Incident response is an important part of a comprehensive cyber security program, and a good cyber security program typically will include a defined Computer Emergency Response function that can be contacted in the event of a cyber emergency and that is specially trained to identify, contain, and resolve a cyber intrusion, denial-of-service attack, virus, worm attack, or other cyber incident.

Incident Reporting. Recognizing security events and alerting management and the DHS United States Computer Emergency Readiness Team (US-CERT) (www.us-cert.gov) about the incidents and their potential for harm are important elements in obtaining the appropriate support and resources to effectively manage cyber security, thus limiting the damage from future cyber attacks.[20]

Safety Instrumented Systems. Safety Instrumented Systems (SISs) are systems that take action when something goes wrong on a cyber system or elsewhere in an automated process and process conditions range outside of the normal operating envelope. An SIS typically provides interlocks or responses to prevent or mitigate catastrophic events and/or consequences of a cyber attack. An SIS is an independent system implemented for the purpose of taking a process to a safe state when pre-determined conditions are violated. When networked with the control systems they stand to protect, an SIS may be subject to the exploitation of the same vulnerabilities if not appropriately secured.

Reporting Cyber Security Incidents

In addition to reporting cyber security incidents to facility or corporate management, a facility should report cyber security incidents to DHS's U.S. Computer Emergency Readiness Team (US-CERT). Incidents can be reported to US-CERT online (at www.us-cert.gov) or via telephone at1-888-282-0870.

Disaster Recovery and Business Continuity

Post-Incident Measures. A good cyber security posture typically includes Continuity of Operations Plans (COOP), IT Contingency, and Disaster Recovery Plans for its critical cyber assets, all of which incorporate cyber security considerations during contingency operations and recovery/reconstitution activities. As recovery operations (i.e., those operations addressed in the COOP, IT Contingency, and Disaster Recovery Plans) are often performed under pressure, systems often are vulnerable to security concerns when they are underway, and thus it is important to consider cyber security during such operations.

System Development and Acquisition

Systems Life Cycle. Including cyber security throughout the system development life cycle, from system design through procurement, implementation, operation, and disposal, is generally part of good cyber security. By integrating system security into the existing development life cycle, a

[20] When reporting on a cyber incident that involves CVI, the individual making the report should determine first whether the recipient is a CVI Authorized User before sharing any CVI information and may wish to exclude CVI information from the report if necessary to prevent any hindrances in the proper dissemination of the report. Note that filing a report with US-CERT does not automatically make the report or the information contained therein CVI.

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facility can ensure that money is budgeted, personnel are designated, and requirements are gathered for security at appropriate times.

Configuration Management

Cyber Asset Identification. Maintaining a current inventory of hardware (e.g., cyber systems, networks, network devices, media devices), software (e.g., applications), information, and services (e.g., virus checking) on the network has numerous benefits. Network elements can be located, tracked, diagnosed, and maintained with far greater efficiency than if not documented. The vulnerabilities of network elements are identified and evaluated for applicability to the operating environment and then factored into a risk-management decision.

Network/System Architecture. A cohesive set of network/system architecture diagrams or other documentation, including nodes, interfaces, and information flows, ensures a comprehensive understanding of connectivity, dependency, and security vulnerability based on the system's current operating environment.

Audits

Audits are generally important to maximize the effectiveness of the cyber security measures that have been put in place. Facilities with strong cyber programs typically will report the results of audits to senior management so that findings can be understood, agreed upon, and mitigated with management support.

Security Considerations

Potential Off-site Aspect of Cyber Security

Given the nature of today's information technology environment, it is not unusual for IT equipment, IT data, or even IT staff to be located off-site. For instance, corporations with multiple facilities may keep central data servers and processing units in a single location at one facility, may locate cyber security officers and other cyber staff at corporate headquarters, and may have backup data stored at facilities managed by third parties. End users connected to a facility's cyber system may be scattered not only across the country but even outside of the United States. As a result, facility cyber security often is not limited to the physical site of the facility itself. Good cyber security practices will lead a facility to take a comprehensive view of all its cyber assets, whether equipment, people, or data and whether located on-site, at corporate headquarters, or elsewhere.

Interconnectivity of Critical and Seemingly Non-Critical Systems

Often, a facility's numerous cyber systems may be interconnected in one form or another. If connected, some seemingly noncritical systems may warrant additional security attention as they are a potential avenue for access to systems that manage critical processes, such as a process involving a chemical of interest. When analyzing the security posture of a critical system, it is important to identify connected systems and review their security as well.

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Impact of Risk Drivers

As in the world of physical security, facility characteristics have a great deal of impact on the appropriate cyber security posture for a facility. For example, if the facility is high risk because of a release hazard, it likely needs to focus cyber security on its process control systems, as well as those cyber systems that assist in controlling access to the facility. However, if theft/diversion is the risk driver, then securing cyber business systems to ensure that shipments and customers are proper may be more important than securing the process control systems.

Physical Security for Cyber Assets

Cyber systems can be compromised not only electronically but also physically. Accordingly, physically protecting critical cyber assets is a key component of a comprehensive cyber security program. Marking and otherwise restricting specific physical areas in a facility can greatly improve security when combined with a role-based security model in which all personnel know exactly where they are and are not allowed. Accordingly, when implementing physical security measures pursuant to other RBPSs, it is a good idea to consider physical security for sensitive cyber assets, such as control rooms, local area network (LAN) and server rooms, and wiring closets.

Layered Security

Completely adequate protection is rarely achievable solely through implementing a single security measure. Rather, an effective security solution typically depends upon the use of multiple countermeasures providing "layers of security" for protection. This approach may include not only the layering of multiple physical protective measures but also the effective integration of physical protective measures with cyber and procedural security measures, including procedures in place before an incident and those employed in response to an incident.

RBPS Metrics

Table 10 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 10: RBPS Metrics – RBPS 8 – Cyber

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has in place cyber security policies, procedures, and measures that result in a low risk of a successful attack on the facility's critical cyber systems or use of a facility's critical cyber systems to carry out or facilitate an attack.			
8.1 Cyber Security Policies				
Metric 8.1.1 – Security Policies, Plans, and	The facility has documented and distributed cyber security policies (including a change management policy), plans/processes, and supporting procedures commensurate with the facility's current		The facility has documented and distributed cyber security policies (including a change management policy) or plans/processes commensurate with the facility's current IT operating environment.	

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RBPS 8 - Cyber – Deter cyber sabotage, including preventing unauthorized onsite or remote access to critical process controls, such as Supervisory Control And Data Acquisition (SCADA) systems, Distributed Control Systems (DCS), Process Control Systems (PCS), Industrial Control Systems (ICS); critical business systems; and other sensitive computerized systems.

	Tier 1	Tier 2	Tier 3	Tier 4
Procedures	IT operating environment.			
Metric 8.1.2 – Cyber Security Officials	The facility has designated one or more individuals to manage cyber security who can demonstrate proficiency through a combination of training, education, and/or experience sufficient to develop cyber security policies and procedures and ensure compliance with all applicable industry and governmental cyber security requirements.			
8.2 Access Control				
Metric 8.2.1 – Systems Boundaries	The facility has identified and documented systems boundaries (i.e., the electronic perimeter) and has implemented security controls to limit access across those boundaries.			
Metric 8.2.2 – External Connections	The facility has established and documented a business requirement for every external connection to/from its critical systems, and external connections have controls that permit access only to authorized and authenticated users.			
Metric 8.2.3 – Least Privilege	The facility practices the concept of least privilege.			
Metric 8.2.4 – Remote Access and Rules of Behavior	The facility has defined allowable remote access (e.g., Internet, VPN, modems) and rules of behavior. Those rules describe user responsibilities and expected behavior with regard to information system usage, to include remote access activities (e.g., appropriate Web sites, conduct of personal business).			
Metric 8.2.5 – Password Management	The facility has documented and enforces authentication methods (including password structures) for all administrative and user accounts. Additionally, the facility changes all default passwords and ensures that default passwords for new software, hardware, etc., are changed upon installation. In instances where changing default passwords is not technically feasible (e.g., a control system with a hard-coded password), the facility has implemented appropriate compensating security controls (e.g., physical controls).			
8.3 Personnel Security				
Metric 8.3.1 – Criticality Sensitivity Review	The facility has reviewed and established security requirements for positions that permit access to critical cyber systems.			
Metric 8.3.2 – Unique Accounts	The facility has established and enforces unique accounts for each individual user and administrator, has established security requirements for certain types of accounts (e.g., administrative access to the system), and prohibits the sharing of accounts. In instances where users function as a group (e.g., control system operators) and user identification and authentication is role based, then appropriate compensating security controls (e.g., physical controls) have been implemented.			
Metric 8.3.3 Separation of Duties	IT management, systems administration, and IT security duties are divided among three different individuals. In instances where this is not feasible, appropriate compensating security controls (e.g., administrative controls) have been implemented.		IT management, systems administration, and IT security duties are not performed by the same individual. In instances where this is not feasible, appropriate compensating security controls (e.g., administrative controls, such as review and oversight) have been implemented.	
Metric 8.3.4 – Access Control Lists	The facility maintains access control lists, and ensures that accounts with access to critical/sensitive information or processes are modified, deleted, or de-activated expeditiously for personnel leaving under adverse action and when users no longer require access (e.g., when personnel leave the company, complete a transfer into a new role, or their responsibilities change).		The facility maintains access control lists, and ensures that accounts with access to critical/sensitive information or processes are modified, deleted, or de-activated in a timely manner for personnel leaving under adverse action and when users no longer require access (e.g., when personnel leave the company, complete a transfer into a new role, or their responsibilities change).	

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	Tier 1	Tier 2	Tier 3	Tier 4
Metric 8.3.5 – Third-party Cyber Support	The facility ensures that service providers and other third parties with responsibilities for cyber systems have appropriate personnel security procedures/practices in place commensurate with the personnel surety requirements for facility employees.			
Metric 8.3.6 – Physical Access to Cyber Systems and Information Storage Media	The facility has role-based physical access controls to restrict access to critical cyber systems and information storage media.			
8.4 Awareness and Training				
Metric 8.4.1 – Cyber Security Training	The facility ensures that employees receive role-based cyber security training on a regular basis that is applicable to their responsibilities and before obtaining access to the facility's critical cyber systems.		The facility ensures that employees receive role-based cyber security training on a regular annual basis that is applicable to their responsibilities and within a reasonable period of time of obtaining access to the facility's critical cyber systems.	
8.5 Cyber Security Controls, Monitoring, Response, and Reporting				
Metric 8.5.1 – Cyber Security Controls	The facility has implemented cyber security controls to prevent malicious code from exploiting critical cyber systems, and it applies appropriate software security patches and updates to systems as soon as possible given critical operational and testing requirements.			
Metric 8.5.2 – Network Monitoring	The facility monitors networks in near real time for unauthorized access or the introduction of malicious code, with immediate alerts, and logs cyber security events, reviews the logs daily, and responds to alerts in a timely manner. Network monitoring may occur on-site or off-site. Where logging of cyber security events on their networks is not technically feasible (e.g., logging degrades system performance beyond acceptable operational limits), appropriate compensating security controls (e.g., monitoring at the network boundary) are implemented.		The facility monitors networks for unauthorized access or the introduction of malicious code and logs cyber security events, reviews the logs weekly, and responds to alerts in a timely manner. Network monitoring may occur on-site or off-site. Where logging of cyber security events on their networks is not technically feasible (e.g., logging degrades system performance beyond acceptable operational limits), appropriate compensating security controls (e.g., monitoring at the network boundary) are implemented.	
Metric 8.5.3 – Incident Response	The facility has a defined 24 × 7 × 365 computer incident response capability for cyber incidents.		The facility has defined computer incident response capability for cyber incidents.	
Metric 8.5.4 – Incident Reporting	Significant cyber incidents are reported to senior management and to the DHS's US-CERT at www.us-cert.gov.			
Metric 8.5.5 – Safety Instrumented Systems	Facilities with control systems that have SISs have configured the SIS so that they have no unsecured remote access and cannot be compromised through direct connections to the systems managing the processes they monitor. *Note: this metric only applies to control systems.*			
8.6 Disaster Recovery and Business Continuity				
Metric 8.6.1 – Post-Incident Measures	The facility's alternate facility operations and primary facility recovery/reconstitution phases have cyber security measures consistent with those in place for the original operational functions.			

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	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
8.7 System Development and Acquisition				
Metric 8.7.1 – Systems Life Cycle	The facility integrates cyber security into the system life cycle (i.e., design, procurement, installation, operation, and disposal). The facility has established security requirements for all systems and networks before they are put into operation and for all operational systems and networks throughout their life cycles.			
8.8 Configuration Management				
Metric 8.8.1 – Documenting Business Needs	The facility has documented a business need for all networks, systems, applications, services, and external connections.			
Metric 8.8.2 – Cyber Asset Identification	The facility has identified hardware, software, information, and services and has disabled all unnecessary elements where technically feasible. The facility also has identified and evaluated potential vulnerabilities and implemented appropriate compensating security controls.			
Metric 8.8.3 – Network/ System Architecture	The facility has an asset inventory of all critical IT systems and a cohesive set of network/system architecture diagrams or other documentation, including nodes, interfaces, and information flows.		The facility has an asset inventory of all critical IT systems.	
8.9 Audits				
Metric 8.9.1 – Audits	The facility conducts regular audits that measure compliance with the facility's cyber security policies, plans, and procedures and reports audit results to senior management.		The facility conducts periodic audits that measure compliance with the facility's cyber security policies, plans, and procedures and reports audit results to senior management.	

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RBPS 9 – Response

RBPS 9 – Response – Develop and exercise an emergency plan to respond to security incidents internally and with assistance of local law enforcement and first responders.

RBPS 9 – Response sets the performance standard for the development and exercising of emergency response plans for security incidents at the facility. Emergency response within this context primarily refers to the response of appropriately trained personnel (either facility personnel or external first responders) to a fire, aerial release or other loss of containment of a chemical of interest, or similar results of a security incident. This RBPS includes plans to mitigate and/or respond to the consequences of a security incident and to report security incidents internally and externally in a timely manner. The security response to the incident itself and the adversaries perpetrating it is covered in RBPS 4.

Security Measures and Considerations for Response

In the context of this RBPS, "response" includes actions to mitigate the consequences of adversary actions. An appropriate response may involve not only designated facility emergency response personnel but all facility personnel (including security personnel), as well as local law enforcement and other off-site emergency responders. Because the RBPS applies to a wide variety of facilities with chemicals of interest, security measures are likely to address the identification of the hazards, planning for effective response, identification of the number and capabilities of the various responders to different types of adversary events, and the equipping and training of response personnel to maximize their efficiency.

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Response performance standards, a facility might consider the following potential attack scenarios:

- Aircraft
- Assault team
- Maritime
- Sabotage
- Standoff
- Theft/diversion
- VBIED

Security Measures

Properly equipped personnel who understand the potential consequences of a security incident and the need for timely, effective actions, when coupled with well-rehearsed response plans, reduce the probability of an attack achieving the adversaries' desired goals by mitigating the consequences of a terrorist event. Practiced response plans help ensure that on-site responders and emergency-response units from local law enforcement, firefighting, ambulance, mutual aid, and rescue agencies are not impeded from reaching the location of the security event. Drills and exercises test response plan capabilities and identify suspected vulnerabilities. Drills and exercises (see RBPS 11 – Training) also train staff and reaction-group leadership to identify and adjust to changes in threats and adversary capabilities.

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Emergency Plans and Processes

One of the most important elements for a successful response to an incident is a well-thought-out, documented crisis management plan for responding to an incident, upon which the relevant individuals have been trained. The types of activities that a facility may want to address in its overarching crisis management plan to help it in the event of a security breach or other incident include:

- Contingency plans,
- Continuity of operations plans,
- Emergency response,
- Post-incident security (e.g., post-terrorist attack, security incident, accident, hurricane, or other natural disaster),
- Evacuation,
- Notification control and contact requirements,
- Re-entry, and
- Security response.

Crisis management plans generally include any documented agreements with off-site responder services, such as ambulance support, environmental restoration support, explosive device disposal support, firefighting support, hazardous material spill/recovery support, marine support, and medical support. Crisis management plans also typically include specific roles and responsibilities for the crisis management team, the incident commander, the on-scene commander, operational control, and timekeeping. Security personnel or other facility employees likely will play an expansive role in any emergency response (e.g., immediately managing the aftermath of an event, properly directing emergency personnel arriving on-site), and the facility's crisis management plan typically will describe their roles in emergency response.

Training, Drills, and Exercises

The best plans are of limited value in a crisis if the individuals who are to implement them are not prepared to do so. Consequently, proper training, drills, and exercises are a critical part of any adequate response capability. Training, drills, and exercises are the subject of their own RBPS, and additional details on each can be found in Chapter 11 – Training, as well as in Appendix C.

Emergency Response Equipment

The following equipment can be valuable in helping a facility successfully respond to a security incident:

- A radio system that is redundant and interoperable with law enforcement and emergency response agencies.
- Backup communications systems, such as cell phones and desk phones.
- An emergency notification system (e.g., a siren or other facility-wide alarm system).
- Automated control systems or other process safeguards for all process units to rapidly place critical asset(s) in a safe and stable condition and procedures for their use in an emergency.

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- Emergency safe-shutdown procedures for all process units.
- Emergency backup power for all communications, emergency notification, security systems, and process control systems and/or an equivalent written contingency procedure in place that is designed, laid out, and constructed to avoid common cause/dependent failures and equipped with redundant signal processing.

Security Considerations

Emergency Response vs. Security Response

It is important not to confuse a "security response" intended to engage and hopefully neutralize the adversaries with the broader "emergency response" that follows an attack and attempts to reduce the severity of the event and lessen the consequences in terms of loss of life and destruction of property or production capability. The initial "security response" has tactical considerations addressed in RBPS 4 – Deter, Detect, and Delay, whereas the "emergency response" relates to the more traditional efforts to contain the damage and lessen the consequences after a security event. These planning considerations overlap to some degree, and both involve establishing strong, functional, relationships with the various response organizations and personnel that may be needed to support this performance standard. It should be noted that individuals involved in security response activities also often have an integral role in emergency response, and this dual role should be taken into consideration when developing comprehensive crisis management plans.

Backup Power, Communications, and Process Safeguards

In the event of a security incident, some of the basic services typically required to respond to an event — for example, power, communications — may be disrupted. When designing a crisis management plan, a facility may want to consider whether it has backup power for security and backup communications systems (as well as the power to run them).

Similarly, having a procedure for safe shutdown that takes several hours or days, while effective for some accidents or other safety incidents, may not suffice in the case of a security incident. Thus, a facility may want to review its process safeguards — for example, "process controls" that safely and quickly shut down a process involving chemicals of interest — and examine whether they can be implemented quickly with less-than-ideal power levels, communications, or other support systems.

A facility may want to take these extenuating circumstances into account when designing and performing emergency response training and drills. It generally is most effective when training and drills realistically exercise the capabilities and flexibility of the response organizations to address multiple, higher-order security events.

Collaboration with Local Law Enforcement and other First Responders

Including local law enforcement and first responders (e.g., emergency medical technicians (EMTs), fire, hazardous materials (hazmat)) in the development and exercising of an emergency plan can have significant benefits for the facility. In addition to helping the facility prepare to take quick and decisive action in the event of an attack or other breach of security, establishing relationships with

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local law enforcement improves responder understanding of the facility's layout and of hazards associated with the facility. The first time that the local law enforcement, fire, or EMT entities responsible for responding to incidents at a facility actually access the facility should not be the day of a security incident.

Interrelation to Safety Planning

Most of the measures, activities, and procedures that are useful in responding to security incidents are equally useful when the incident is caused by an accident, natural disaster, or other source. Accordingly, when developing response plans, training individuals on proper response techniques, or procuring equipment to use during responses, security personnel should consider coordinating with the facility's process safety engineer or other individual in charge of safety at the facility.

RBPS Metrics

Table 11 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 11: RBPS Metrics – RBPS 9 – Response

RBPS 9 – Response – Develop and exercise an emergency plan to respond to security incidents internally and with assistance of local law enforcement and first responders.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a documented, comprehensive crisis management plan that details how the facility will respond to security incidents and regularly runs exercises and drills to improve its ability to implement the plan.			The facility has a documented crisis management plan that details how the facility will respond to security incidents and runs exercises and drills to improve its ability to implement the plan.
Metric 9.1 – Comprehensive Crisis Management Plan	The facility has a comprehensive crisis management plan that may include: • Documented agreements and/or written procedures for emergency response, including off-site responder services, such as ambulance support, explosive device disposal support, firefighting support, hazardous material spill/recovery support, and medical support. • Roles and responsibilities for the crisis management team, the incident commander, the on-scene commander, operational control, and timekeeping. • Contingency plans, continuity of operations plan, emergency response plans, evacuation plans, media response plans, notification control and contact requirements, re-entry plans, and security response plans. • Emergency safe-shutdown procedures for critical process units, such as those processing chemicals of interest.			The facility has a comprehensive crisis management plan that may include: • Documented agreements and/or written procedures for emergency response, including off-site responder services, such as ambulance support, explosive device disposal support, firefighting support, and hazardous material spill/recovery support. • Documented emergency response plans.

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Table 11: RBPS Metrics – RBPS 9 – Response				
RBPS 9 – Response – Develop and exercise an emergency plan to respond to security incidents internally and with assistance of local law enforcement and first responders.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 9.2 – Communication Systems	The facility has a communications and emergency notification system with emergency backup power and/or an equivalent written contingency procedure in place that is designed, laid out, and constructed to avoid common cause/dependent failures and equipped with redundant signal processing. A typical system includes: • An emergency notification system (e.g., siren or other facility-wide alarm system). • A redundant radio system that is interoperable with law enforcement and emergency response agencies. • Other backup communications systems, such as cell phones or desk phones.			The facility has a redundant communications system and an emergency notification system (e.g., siren or other facility-wide alarm system).
Metric 9.3 – Process Safeguards	All process units have an automated control system or other process safeguards to rapidly place critical assets in a safe and stable condition and procedures for their use in an emergency. Additionally, all process units have a procedure for safe shutdown in an emergency.			
Metric 9.4 – Outreach	The facility has an active outreach program to the community and local law enforcement and emergency responders. Examples of outreach activities include participation in the Local Emergency Planning Committee (LEPC) (where local first responders are LEPC members), Community Hazards Emergency Response-Capability Assurance Process (CHER-CAP) (where local first responders are CHER-CAP members), Buffer Zone Protection Program (BZPP) activities, Neighborhood Watch Programs (where industry and businesses are included in these programs), or participation by the facility in incident response drills and exercises in conjunction with off-site responder organizations.			

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RBPS 10 – Monitoring

RBPS 10 – Monitoring Maintain effective monitoring, communications and warning systems, including:
(i) Measures designed to ensure that security systems and equipment are in good working order and inspected, tested, calibrated, and otherwise maintained;
(ii) Measures designed to regularly test security systems, note deficiencies, correct for detected deficiencies, and record results so that they are available for inspection by the Department; and
(iii) Measures to allow the facility to promptly identify and respond to security system and equipment failures or malfunctions.

Maintaining effective monitoring, communications, and warning systems allows the facility to notify internal personnel and local responders in a timely manner about security incidents. Regular tests, repairs, and improvements to the warning and communications system increase the reliability of such systems and will improve response time. Complying with the manufacturers' instructions and specifications for frequency of testing, repair, and replacement schedules increases the likelihood that the physical security equipment will function as it is expected to and decreases the likelihood that it will malfunction. Instituting a regular, written plan for the maintenance, testing, calibration, and inspection of equipment will help ensure that such activities take place as equipment that is functioning well is often overlooked. Records of maintenance, testing, and calibration of security equipment must be maintained as specified in 6 CFR §27.255(a)(4).

Security Measures and Considerations for Monitoring

Security Measures

Maintaining effective monitoring, communications, and warning systems includes taking steps designed to ensure that security systems and equipment are in good working order and inspected, tested, calibrated, and otherwise maintained; regularly testing security systems; noting deficiencies; correcting detected deficiencies; recording results so that they are available for inspection by the Department; and promptly identifying and responding to security system and equipment failures or malfunctions. To meet these objectives, it is recommended that a facility:

- Develop a written procedure to regularly inspect, test, calibrate, repair, and maintain security systems and systems related to security, such as communications and emergency notification equipment. The procedure should identify responsibilities, tasks, their frequencies of occurrence, and the documentation required.
- Perform inspection, testing, and maintenance tasks on a regular basis and in accordance with the manufacturer's instructions.
- Include all security equipment, such as gates, cameras, lights, alarms, and keypad entry systems, in the routine inspection and maintenance.

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- Employ appropriate temporary security measures when performing maintenance, as well as in response to nonroutine outages, equipment failures and malfunctions.
- Document nonroutine incidents and promptly report them to the Facility Security Officer (FSO).
- Have procedures to verify the identity and each occurrence of contractor personnel who perform inspection, testing, and maintenance of security equipment (other than resident contractors who are included in the personnel surety program in RBPS 12).

Security Considerations

Manufacturer's Recommendations

Typically, most security equipment comes with manufacturer's recommendations as to the types of testing, inspection, calibration, and maintenance that should be performed and the frequency with which those activities should be performed. Generally speaking, it is a good idea to perform these activities in accordance with the manufacturer's instructions and as frequently as the manufacturer recommends. If a piece of security equipment arrives lacking such instructions, a facility may want to contact either the manufacturer or the vendor from whom they obtained the equipment to obtain recommendations concerning performance of any specific activities.

RBPS Metrics

Table 12 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 12: RBPS Metrics – RBPS 10 – Monitoring

RBPS 10 – Monitoring - Maintain effective monitoring, communications and warning systems, including:
(i) Measures designed to ensure that security systems and equipment are in good working order and inspected, tested, calibrated, and otherwise maintained;
(ii) Measures designed to regularly test security systems, note deficiencies, correct for detected deficiencies, and record results so that they are available for inspection by the Department; and
(iii) Measures to allow the facility to promptly identify and respond to security system and equipment failures or malfunctions.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a written plan to regularly inspect, test, calibrate, and maintain security systems.			
Metric 10.1 – Inspection, Testing, and Preventative Maintenance (ITPM) Procedures	The facility has written procedures, including responsibilities, tasks, and frequencies, to regularly inspect, test, calibrate, repair, and maintain security systems (e.g., gates, cameras, lights, alarms, keypad entry systems) and related equipment, such as communications and emergency notification equipment. Typically, the facility bases its ITPM process on the tasks and their frequencies identified in the manufacturer's recommendations; where the manufacturer has not made ITPM recommendations, the tasks and their frequencies are based on the operating history of the equipment, its operating environment, the redundancy installed, and other factors as approved by the FSO.			
Metric 10.2 – Outages	Appropriate temporary security measures are implemented in response to nonroutine outages, equipment failures, and malfunctions, and such incidents are documented and promptly reported to the FSO.			
Metric 10.3 – Repairs	The facility has a written plan to record and repair deficiencies in security-related equipment.			

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Table 12: RBPS Metrics – RBPS 10 – Monitoring				
RBPS 10 – Monitoring - Maintain effective monitoring, communications and warning systems, including: (i) Measures designed to ensure that security systems and equipment are in good working order and inspected, tested, calibrated, and otherwise maintained; (ii) Measures designed to regularly test security systems, note deficiencies, correct for detected deficiencies, and record results so that they are available for inspection by the Department; and (iii) Measures to allow the facility to promptly identify and respond to security system and equipment failures or malfunctions.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 10.4 – Maintenance Personnel Surety	The facility has procedures to verify the identity and each occurrence of contractor personnel who perform inspection, testing, and maintenance of security equipment (other than resident contractors who are included in the personnel surety program in RBPS 12).			

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RBPS 11 – Training

RBPS 11 – Training - Ensure proper security training, exercises, and drills of facility personnel.

RBPS 11 – Training details the performance standards related to security and response training, exercises, and drills. By performing proper security training, exercises, and drills, a facility enables its personnel to be better able to identify and respond to suspicious behavior, attempts to enter or attack a facility, or other malevolent acts by insiders or intruders. Well-trained personnel who practice how to react will be more effective at detecting and delaying intruders and provide increased measures of deterrence against unauthorized acts.

A strong training program typically includes not only personnel-specific exercises and drills but also joint activities involving both facility personnel and law enforcement and first responders. Including law enforcement and first responders in training, exercises, and drills improves responder understanding of the layout and hazards associated with the facility while strengthening relationships with the emergency response community.

Security Measures and Considerations for Training

As one means of complying with RBPS 11, a facility should consider a Security Awareness and Training Program (SATP) commensurate with its level of risk. An SATP is a predefined and documented set of training activities that focus on relevant security-related issues for the facility and enhance the overall security awareness of facility employees. A comprehensive SATP typically applies to all levels of facility personnel, including executives, management, operational, and technical employees. Objectives of an SATP may include validating plans, policies and procedures and ensuring that personnel are familiar with alert, notification, deployment, and other related security procedures. Typical components of a comprehensive SATP include:

a. **Training –** Hands-on activities, seminars, orientations, workshops, on-line or interactive programs, briefings, and lectures that focus on relevant security-related issues for the facility.

b. **Exercises –** A predefined and documented set of scheduled activities that represent a realistic rehearsal or simulation of an emergency to promote preparedness; improve the response capability of individuals; and validate plans, policies, and procedures. Examples include tabletop exercises, functional exercises, and full-scale exercises.

c. **Drills –** Drills are a subset or type of exercise focused on a single specific operation or function. Drills can be used to provide training with new equipment, develop new policies or procedures, or practice and maintain current skills.

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d. **Tests –** Testing is the technique of demonstrating the correct operation of all equipment, procedures, processes, and systems that support the security infrastructure. Tests could be static tests, dynamic tests, or functional tests.

e. **Joint Initiatives –** Joint initiatives are training, exercises, or drills that involve the participation of organizations or entities outside of the facility, such as law enforcement or first responders, in conjunction with facility personnel.

Security Measures

Training

Regularly scheduled training should be considered to ensure the readiness of all facility personnel. Training plans are developed and implemented to prepare individuals and groups (i.e., protective forces) to accomplish certain tasks by using selected equipment under specific scenarios. Training may include hands-on activities, seminars, orientations, workshops, on-line or interactive programs, briefings, and lectures.

The frequency of occurrence, length of the training session(s), and the depth of the coverage of the information provided and discussed will vary based on the audience and method of training selected. Typically, if the audience consists of designated security personnel, the details of security procedures, operations, communications, etc., will warrant extended discussion. Awareness training for the entire workforce might include such topics as incident identification and notification.

Exercises

Exercises are conducted for the purpose of validating elements, both individually and collectively, of a facility's security posture and response capability. An exercise should be a realistic rehearsal or simulation of an emergency, in which individuals and organizations demonstrate the tasks that would be expected of them in a real emergency. Exercises should provide emergency simulations that promote preparedness; improve the response capability of individuals and organizations; validate plans, policies, procedures, and systems; and determine the effectiveness of the command, control, and communication functions and event-scene activities. Exercises may vary in size and complexity to achieve their respective purposes. Three typical types of exercises that a facility may want to include as part of an SATP are:

1. **Tabletop Exercises,** which simulate an emergency situation in an informal, stress-free environment. They are designed to elicit constructive discussion as participants examine and resolve problems based on existing plans. There is minimal attempt at simulation, no utilization of equipment or deployment of resources, and no response-time pressures. The success of these exercises is largely determined by group participation in the identification of problem areas. They provide an excellent format to use in familiarizing newly assigned/appointed security personnel and senior security officials with established or emerging concepts and/or plans, policies, procedures, systems, and facilities.

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2. **Functional Exercises,** which are fully simulated, interactive exercises. They validate the capability of a group (i.e., protective force) or facility to respond to a simulated event testing one or more procedures and/or functions of the facility's security plan. Functional exercises focus on the policies, procedures, roles, and responsibilities of single or multiple security functions before, during, or after a security-related event.

3. **Full-Scale Exercises,** which simulate an actual security event. They are field exercises designed to evaluate the operational capabilities of the facility's physical and procedural security measures in a highly stressful environment. Typically, a full-scale exercise activity involves multiple parties having responsibility in the SSP for responding to a security-related event who participate in a preplanned event in which the entire SSP is rehearsed with respect to a security-related scenario. Full-scale exercises involve personnel and the equipment they would use both in central control/coordinating locations and in the field.

The evaluation of an exercise should identify systemic weaknesses and suggest corrective actions that will enhance facility preparedness and response. Following an exercise, a comprehensive debriefing and after-action report are typically useful. Facilities performing such reviews may want to collect data for incorporation into a remedial action plan that provides input for annual revisions.

Drills

Drills are a coordinated, supervised activity normally employed to exercise a single specific operation or function. Drills are also used to provide training with new equipment, develop new policies or procedures, or practice and maintain current skills.

Tests

Testing is the technique of demonstrating the correct operation of all equipment, procedures, processes, and systems that support the security infrastructure. The testing process validates that the equipment and systems conform to specifications and operate in real-world environments and that procedures and processes are viable. Testing also is used as the verification and validation technique to confirm that backup equipment and systems closely approximate the operations of the primary equipment and systems. Depending on the measures and benchmarks desired, there are a variety of methods that can be used to test the functionality of both primary and backup equipment, such as:

1. **Static Tests,** which determine whether all essential components of the equipment and systems are in place and meet the specification and design requirements of the facility.

2. **Dynamic Tests,** which verify that all of the required equipment and systems function independently of and/or in concert with each other and satisfy the operational requirements of the organization.

3. **Functional Tests,** which verify that the procedures for operating the equipment and systems are correct. This testing helps ensure that when trained and qualified personnel are

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required to utilize the equipment and systems, the instructions for operations are clear and complete.

Joint Initiatives

Joint initiatives are activities that afford the facility the opportunity to participate in joint organization/agency (e.g., facility and local law enforcement) exercises to rehearse and exercise coordinated security-related procedures.

Security Considerations

Tailoring Training Requirements

To maximize the benefit of a security awareness and training program, a facility may want to tailor training topics to specific classes of employees, as not all facility employees need the same level of training. For example, detailed training on security procedures, the operating of security equipment, security response protocols, and security laws and regulations may not be worthwhile for employees who do not have specific security responsibilities. Conversely, certain training topics, such as incident identification and notification, are beneficial for the entire workforce. Table 13 below provides examples of recommended training topics and the individuals within the organization who are most likely to benefit from that training.

Table 13: Suggested Training Topics

Training Topic	FSO/ Assistant FSO	Personnel with Security Responsibilities	All Remaining Employees
Security laws and regulations	X		
Threats	X		
Security organization/duties and responsibilities	X		
CSAT components: ▪ Top Screen ▪ Security Vulnerability Assessment (SVA) ▪ SSP ▪ Personnel Screening Database	X		
Security measures and management of SSPs	X		
Requirements for SSP	X		
Drills and training	X		
Inspections and screening	X		
Recordkeeping	X		
Knowledge of current security threats and patterns	X	X	
Recognition and detection of dangerous substances and devices: ▪ Recognizing explosive materials ▪ Recognizing explosive devices ▪ Improvised explosives (e.g., using industrial materials) ▪ VBIEDs ▪ Hand-carried weapons ▪ Surveillance devices (e.g., camera phones)	X	X	X

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Table 13: Suggested Training Topics			
Training Topic	**FSO/ Assistant FSO**	**Personnel with Security Responsibilities**	**All Remaining Employees**
Recognition of suspicious behavior	X	X	X
Techniques used to circumvent security measures	X	X	X
Crowd and traffic management and control techniques	X	X	
Security–related communications	X	X	
Knowledge of emergency procedures, contingency plans, and crisis management plans	X	X	
CVI certification	X	X	
Operation of security equipment and systems	X	X	
Testing, calibration, and maintenance of security equipment and systems	X	X	
Relevant provisions of the SSP	X	X	X
Methods of physical screening of persons and personal effects	X	X	
The general meaning and consequential requirements of the different DHS Threat Levels	X	X	X

Frequency of Training, Drills, and Exercises. How frequently a facility chooses to conduct training, drills, and exercises likely will depend on a variety of factors. Such factors include the facility's risk tier, the training topic, the composition of the training's target audience, and the size of the facility. Table 14 below provides some recommended frequencies for various types of training, drills, and exercises by tier.

Table 14: Recommended Frequency (by Tier) of Sample Activities Under RBPS 11				
Activity	**Tier 1**	**Tier 2**	**Tier 3**	**Tier 4**
Testing of alert, notification, and activation procedures	Quarterly	Quarterly	Semiannually	Semiannually
Testing of communications capability	Quarterly	Quarterly	Semiannually	Semiannually
Security awareness briefing (or other means of refresher for the entire workforce) and pre-employment for all new or temporary workers	Annually	Annually	Annually	Annually
Training for protective force personnel	Quarterly	Quarterly	Semiannually	Annually
Training for management personnel	Annually	Annually	Annually	Annually
Drills	Semiannually	Annually	Annually	Annually
Tabletop exercise	Every 2 years	Every 3 years	N/A	N/A
Functional exercise	Annually	Annually	N/A	N/A
Full-scale exercise (with law enforcement and first responders)	Every 2 years	Every 3 years	N/A	N/A

Recordkeeping for Training

Pursuant to 6 CFR §27.255(a)(1), a covered facility must keep records of the date, location, time of day, and duration of each training session; a description of the training; the name and qualifications of the instructor(s); a list of the attendees, which includes the signature of each attendee and at least one other unique identifier for each attendee; and the results of any evaluation

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or training.[21] Accordingly, when developing an SATP, a facility may wish to consider how to best incorporate these recordkeeping functions.

RBPS Metrics

Table 15 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 15: RBPS Metrics – RBPS 11 – Training

RBPS 11 - Training – Ensure proper security training, exercises, and drills of facility personnel.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a security awareness and training program for all facility personnel that includes drills and exercises designed to test and improve performance of aspects of the Site Security Plan and its supporting implementing procedures.			
Metric 11.1 – Security Training Program for Security Personnel	The facility has a documented security awareness and training program and a corresponding set of minimum skills and competencies for security personnel, as well as a testing program through which security personnel can demonstrate their ability to perform their security-related tasks in a reliable and effective manner. A typical training program will include such features as: • Training is provided on recognition of a security incident, reporting of a security incident, emergency procedures, and operation of security equipment. • Training is held on a regular basis for security personnel. • Objectives are established for each element of the training plan. • Training records are maintained in accordance with 6 CFR § 27.255(a)(1).			
Metric 11.2 – Security Training Program for Non-Security Personnel	The facility has a documented security awareness and training program for employees and resident contractors who do not have direct security responsibilities, and a testing program through which these employees and resident contractors can demonstrate their understanding of their roles in security. A typical training program will include features such as: • Training provided on recognition of a security incident, reporting of a security incident, emergency procedures, and operation of security equipment. • Training is held on a regular basis for employees and resident contractors who do not have direct security responsibilities. • Objectives are established for each element of the training plan. • Training records are maintained in accordance with 6 CFR § 27.255(a)(1).			
Metric 11.3 – Drills and Exercises	The facility plans and conducts security drills and exercises, which are documented and reviewed for lessons learned, on a periodic basis.			

[21] Note that this recordkeeping requirement applies only to security-related training.

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RBPS 12 – Personnel Surety

RBPS 12 - Personnel Surety - Perform appropriate background checks on and ensure appropriate credentials for facility personnel, and as appropriate, for unescorted visitors with access to restricted areas or critical assets, including;
(i) measures designed to verify and validate identity;
(ii) measures designed to check criminal history;
(iii) measures designed to verify and validate legal authorization to work; and
(iv) measures designed to identify people with terrorist ties.

Personnel surety is a key component of a successful chemical facility security program. Measures and aspects of a successful personnel surety program should build on the in-place corporate programs, as applicable. A successful personnel surety program can significantly improve a facility's capability to deter, detect, and defend against insider threats or covert attacks. RBPS 12 – Personnel Surety establishes performance standards focused on this critical area and addresses the need for a high-risk chemical facility to ensure that individuals allowed on-site have suitable backgrounds for their level of access.

Security Measures and Considerations for Personnel Surety

Security Measures

The primary means of satisfying the personnel surety performance standards is through the implementation of an appropriate background check program.

Applicable Threat Scenarios

When determining which protective measures to apply to meet the Personnel Surety performance standards, a facility might consider the following potential attack scenarios:

- Assault team
- Sabotage
- Theft/diversion
- VBIED

Background Checks

It is important to note that the use of background checks in the context of RBPS 12 is not intended to alter, limit, or conflict with other Federal, state, or local laws and rules (see 6 CFR § 27.405(b) and 72 Fed. Reg. 17719, 17727), including those protecting workers' or applicants' rights. Similarly, background checks under RBPS 12 are not intended to be used by facilities to inappropriately or unlawfully discriminate or retaliate against employees or applicants.

In the context of CFATS RBPS 12, a background check is the process of acquiring information on an individual regarding the legal authority to work for a high-risk chemical facility, have access to its restricted areas, or for other activities that involve access to a restricted area or critical asset at a high-risk chemical facility. Background checks can range from simple employment screening

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(i.e., using public or commercially available records and investigation to confirm or disprove the accuracy of an applicant's resume) to comprehensive investigations that consider prior criminal activity, immigration status, credit checks, potential terrorist ties, and other, more in-depth analysis.

Under 6 CFR § 27.230(a)(12), facilities are required to perform four types of background checks on both facility personnel (i.e., employees and contractors) who have access to restricted areas or critical assets and on unescorted visitors who have access to restricted areas or critical assets:

1. *Measures designed to verify and validate identity*. This typically involves a social security/name trace search, which reveals names associated with a social security number, past and present addresses, and fraudulent use of social security numbers. Results may also be used to cross-reference addresses supplied by the applicant to ensure the integrity of the information on the job application or resume.

2. *Measures designed to check criminal history*. This typically involves a search of publicly or commercially available databases, such as county, state, and/or Federal criminal record repositories for jurisdictions in which an individual has worked or resided. A typical criminal history search would uncover any criminal charges, outstanding warrants, dates, sentencing, and disposition for felonies and/or misdemeanors. In conducting or evaluating such a search, a facility may wish to consult the federally established list of disqualifying crimes applicable to hazmat drivers and transportation workers at ports (see 49 CFR § 1572.103).

   A second type of search that often is used to check criminal history is a national criminal scan. A national scan serves as a supplement to Criminal History Searches by searching to identify criminal activity in jurisdictions outside of the geographical locations of current and previous residence and employment.

3. *Measures designed to verify and validate legal authorization to work*. The standard way to validate legal authorization to work is through the filing of U.S. Citizenship and Immigration Services (USCIS) Form I-9: Employment Eligibility Verification or through DHS's E-Verify program.

4. *Measures designed to identify people with terrorist ties*. Because information regarding terrorist ties is not publicly available, the Department is developing a system through which regulated facilities will be able to have relevant individuals screened by DHS through the Terrorist Screening Database (TSDB).[22]

In addition to the four required types of checks, facilities may want to consider additional voluntary checks for their employees. Table 16 provides a list of activities that a facility may wish to consider as part of the background check process.

[22] Note that to minimize redundant background checks of workers, a person who has successfully undergone a security threat assessment conducted by DHS and is in possession of a valid DHS credential (such as a TWIC, hazardous materials endorsement (HME) license, NEXUS, or Free and Secure Trade (FAST) credential) will not need to undergo additional vetting by DHS. The facility, however, still must provide DHS with sufficient identifying information about the individual and his credential to allow DHS to verify that the credential still is valid.

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Table 16: Examples of Background Check Options	
Background Check Contents	• Verification of social security number consistent with any applicable law.[23] • Verification of the name and address of each previous employer, the period employed, and the job title. • A search of Federal, state, and county criminal records in all jurisdictions in which the individual has worked or resided during the previous seven (7) years, including all geographical areas listed on the application, resume, and the social security number address verification report. The records search includes Federal, state, and/or county (or equivalent) felony and misdemeanor convictions; deferred adjudication; pleas of no contest; and unresolved indictments or other charges of crimes or offenses, except to the extent consideration of any such categories are prohibited by applicable law. Minor traffic offenses are not generally relevant; however, driving while intoxicated (DWI) or driving under the influence (DUI) may be relevant. • For employees whose job responsibilities involve operating motor vehicles, information from the Department of Motor Vehicles in, but not necessarily limited to, the geographic areas listed on the application, resume, or social security number and address verification in order to reveal violations and convictions. • E-Verify or USCIS Form I-9. • Screening for terrorist ties through the TSDB.

There are a variety of methods through which a facility or corporation can conduct background checks, such as hiring personal investigators, using one of many commercial Web sites that will perform specific searches for a fee, and/or utilizing third-party providers to implement or manage the facility's personnel surety program. Corporations or facilities also can choose to perform the searches on their own as many records, such as criminal records, are available to the public for a small fee.

DHS views the background check process as one of the many pieces of the SSP. Once the facility receives the Letter of Authorization under 6 CFR § 27.245 denoting preliminary approval of the SSP, the facility should then proceed with all necessary background checks, if it has not done so already.

Special Laws Applying to Background Checks

Because of the potential sensitivity of the information uncovered, employment screening is subject to a set of laws and regulations to protect individuals in the event of misuse of data or fraud. Laws that may apply, depending on the type of background checks conducted, include the Fair Credit Reporting Act and the Driver's Privacy Protection Act. When conducting background checks, a corporation or facility should ensure that it is complying with all applicable laws, including applicable state regulations. The facility or operator may not necessarily be responsible for the compliance of contractors. The contractor may be required by contract or under law to meet background check requirements. By virtue of the contractor relationship, the corporation or facility may not know or receive results except for notice that the contractor passed.

[23] Facilities may wish to consider using the Social Security Number Verification System (SSNVS), which is provided by the Social Security Administration (SSA) to all employers, to verify that employee names and social security numbers match the SSA's records.

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Transportation Worker Identification Credential (TWIC)

TWICs are tamper-resistant biometric credentials issued to workers who require unescorted access to secure areas of ports, vessels, outer continental shelf facilities, and all credentialed merchant mariners. The TWIC was established by Congress through the Maritime Transportation Security Act (MTSA) and is administered by the Transportation Security Administration (TSA) and U.S. Coast Guard. Before receiving a TWIC, an individual must provide certain information to DHS and is subject to a background investigation. As numerous chemical facilities are located in port areas, many employees, contractors, or visitors to a facility may be in possession of a TWIC. Given the background investigation performed prior to receipt of a TWIC, which includes a check of the TSDB, a facility may choose to forgo additional background checks on any individual who possesses a current, authentic TWIC. However, the facility must still submit the name and credential information for any such person to DHS in order to satisfy RBPS 12. (See 72 FR 17709.)

RBPS Metrics

Table 17 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 17: RBPS Metrics – RBPS 12 – Personnel Surety

RBPS 12 - Personnel Surety - Perform appropriate background checks on and ensure appropriate credentials for facility personnel, and as appropriate, for unescorted visitors with access to restricted areas or critical assets, including,
(i) measures designed to verify and validate identity;
(ii) measures designed to check criminal history;
(iii) measures designed to verify and validate legal authorization to work; and
(iv) measures designed to identify people with terrorist ties.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	Appropriate background checks have been successfully completed for all individuals (e.g., employees, contractors, unescorted visitors) who have access to restricted areas or critical assets.			
Metric 12.1 – New/Prospective Employees & Unescorted Visitors	All new/prospective employees and contractors, as well as any unescorted visitors, who have access to restricted areas or critical assets have appropriate background checks. Access to restricted areas or critical assets is allowed after appropriate background checks have been successfully completed.			
Metric 12.2 – Existing Employees	All existing employees and contractors who have access to restricted areas or critical assets undergo background investigations in an expedited but reasonable period from the date of the preliminary approval of the SSP. Investigations are repeated for all individuals at regular intervals thereafter.			All existing employees and contractors who have access to restricted areas or critical assets undergo background investigations in an expedited but reasonable period from the date of the preliminary approval of the SSP.
Metric 12.3 – Contents of Background Checks	The background checks are conducted in accordance with documented requirements established by the corporation, facility, or FSO.			

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Table 17: RBPS Metrics – RBPS 12 – Personnel Surety				
RBPS 12 – Personnel Surety - Perform appropriate background checks on and ensure appropriate credentials for facility personnel, and as appropriate, for unescorted visitors with access to restricted areas or critical assets, including, (i) measures designed to verify and validate identity; (ii) measures designed to check criminal history; (iii) measures designed to verify and validate legal authorization to work; and (iv) measures designed to identify people with terrorist ties.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Metric 12.4 – Terrorist Screening	Processes are in place to provide DHS with the necessary information to allow DHS to screen individuals (e.g., employees, contractors, unescorted visitors) who have access to restricted areas or critical assets against the TSDB.			
Metric 12.5 – Audit	The background check program is audited annually.			

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RBPS 13 – Elevated Threats

RBPS 13 - Elevated Threats - Escalate the level of protective measures for periods of elevated threat.

The ability to escalate the levels of security measures for periods of elevated threat provide a facility with the capacity to increase security measures to better protect against known increased threats or generalized increased threat levels declared by the Federal government. By maintaining the ability to increase security measures, the facility does not have to expend time and resources on more vigorous security measures unless and until warranted.

The "Elevated Threats" RBPS addresses the need to escalate the level of protective measures for periods of elevated threat designated by DHS. The purpose of the RBPS is to enhance facility and operational security, while reducing the likelihood of a successful attack, through the implementation of scalable security measures and actions in response to changes in the Homeland Security Advisory System (HSAS) threat levels. The simplest way for a facility to meet the standards sought by RBPS 13 is to have a set of documented and implementable security procedures that provide for a change in the facility's security posture based on an elevated HSAS threat level. Properly responding to and implementing appropriate security measures in response to different threat levels significantly improves a facility's capability to "Deter, Detect, and Delay" a threat (see RBPS 4), greatly reducing the likelihood of a successful attack during a period of elevated threat.

Security Measures and Considerations for Elevated Threats

Security Measures

Designing appropriate security measures for periods of elevated threat typically involves both the awareness of a period of elevated threat and the identification of security measures tailored to the elevated threat.

Awareness of an Elevated Threat Level

DHS and its Federal security partners use a variety of mechanisms to inform the public of potential threats. The primary means of informing the public of an elevated threat is the HSAS color-coded Threat Level System. Facilities will typically tie increased security measures for elevated threats to an increase in the HSAS threat level. In addition, targeted threat information is made available to the public in the form of Homeland Security Threat Advisories and Homeland Security Information Bulletins.

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Color-coded Threat Level System

The Color-coded Threat Level System is used by the Federal government to communicate with public safety officials and the public at large through a threat-based, color-coded system. This system informs economic sectors or geographic regions that they may be facing an elevated threat, thus allowing them to implement additional protective measures to reduce the likelihood or impact of an attack. DHS recognizes that raising the threat condition has economic, physical, and psychological effects on the nation and only does so when specific threat information calls for such an increase. The five color codes and their meanings are as follows:

1. **Low Condition (GREEN)** — a Low Condition is declared when there is a low risk of terrorist attacks.
2. **Guarded Condition (BLUE)** — a Guarded Condition is declared when there is a general risk of terrorist attacks.
3. **Elevated Condition (YELLOW)** — an Elevated Condition is declared when there is a significant risk of terrorist attacks.
4. **High Condition (ORANGE)** — a High Condition is declared when there is a high risk of terrorist attacks.
5. **Severe Condition (RED)** — a Severe Condition reflects a severe risk of terrorist attacks.

The sample security measures in this Guidance document are based upon a YELLOW threat level. Accordingly, for purposes of this RBPS, an ORANGE or RED threat level is considered an elevated threat level.

Homeland Security Threat Advisories

Homeland Security Threat Advisories contain actionable information about an incident involving, or a threat targeting, critical national networks, infrastructures, or assets. Often, these threat advisories also suggest a change in readiness posture, protective actions, or other response in light of the actionable information. This category includes products formerly named alerts, advisories, and sector notifications. Advisories are targeted to Federal, state, and local governments; private sector organizations; and international partners.

Homeland Security Information Bulletins

Homeland Security Information Bulletins communicate information of interest to the nation's critical infrastructures that may not meet the timeliness, specificity, or significance thresholds of threat advisories or other warning messages. Such information may include statistical reports, periodic summaries, incident response or reporting guidelines, common vulnerabilities and patches, and configuration standards or tools. It also may include preliminary requests for information. Bulletins are targeted to Federal, state, and local governments; private sector organizations; and international partners.

Sample Security Measures for an Elevated Threat Level

A High Condition (ORANGE) is declared when there is a high risk of terrorist attacks. In addition to the measures and procedures in place as part of the facility's steady-state protective posture, a

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high-risk chemical facility may want to consider implementing the following measures when the threat level is elevated to ORANGE:

- Coordinating necessary security efforts with Federal, state, and local law enforcement agencies or any National Guard or other appropriate armed forces organizations;
- Taking additional precautions at public events held on-site and possibly considering alternative venues or even cancellation;
- Preparing to execute contingency procedures, such as moving to an alternate facility or dispersing the workforce;
- Assigning emergency response personnel and pre-positioning and mobilizing specially trained teams or resources;
- Adding additional barriers at vehicle access points and around critical assets and restricted areas to control traffic and increase standoff distances;
- Adding additional illumination for remote areas;
- Decreasing the number of personnel authorized to be on-site;
- Extending physical protection of vulnerable points;
- Increasing frequency of perimeter patrols;
- Increasing security force allocations;
- Increasing rail car inspections;
- Increasing personnel and vehicle screening inspections;
- Requiring mandatory visitor escorts;
- Minimizing the number of gates in use;
- Instituting off-site mail handling;
- Instituting parking restrictions;
- Postponing projects and activities where critical assets are more exposed or vulnerable;
- Instituting real-time reporting capability between the security control center and the main process control center; and
- Reinforcing barriers at remote or unused gates.

A Severe Condition (RED) reflects a severe risk of terrorist attacks. In addition to the protective measures taken under the ORANGE threat level, a high-risk chemical facility may want to consider implementing the following measures when the threat level is elevated to RED:

- Increasing or redirecting personnel to address critical emergency needs;
- Decreasing the number of personnel on-site to "essential" personnel only;
- Deploying night vision devices for security force;
- Performing constant perimeter patrols;
- Instituting maximum security force staffing;
- Inspecting 100% of rail cars;
- Performing100% personnel- and vehicle-screening inspections;
- Prohibiting visitors on-site;

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- Prohibiting parking on-site (except for vehicles that are always kept inside the restricted area);
- Locking down the control center to deny access to unauthorized personnel; and
- Arranging to have in place a secure armed response capability by making use of any combination of proprietary, contract, local, state, and/or Federal resources where safety at the facility is not compromised.

Security Considerations

Length of Period of Elevated Threat Level

The length of an elevated threat-level period is not predetermined but rather is based on the specific threat environment that causes the elevation of the threat level. Accordingly, there is the possibility that an elevated threat level may last for a significant period of time (e.g., weeks or months). In the case of an extended period of elevated threat, it may not be feasible for a facility to maintain some of the measures it chooses to implement for a brief period of elevated threat (e.g., limiting facility access to only critical personnel; hiring armed or unarmed guards). Accordingly, when planning for the potential of having to increase its security posture on the basis of an elevated threat level, a facility may want to develop options not only for rapidly implementing an increased security posture but also for migrating from a short-term elevated security posture to a longer-term and more economical elevated security posture.

Layered Security

Completely adequate protection is rarely achievable solely through implementing different security measures for changes in the HSAS threat level. Rather, an adequate security solution typically depends upon the use of multiple countermeasures providing "layers of security" that protect critical assets from malevolent acts. This approach includes not only the layering of multiple physical protective measures but also the effective integration of physical protective measures with procedural security measures, including procedures in place before an incident and those employed in response to an incident.

Availability of Personnel During Periods of Elevated Threat

Plans for dealing with periods of elevated threat often will call for increased activity for certain individuals, such as security personnel, local law enforcement, and other first responder services. However, it is not unusual for the same security personnel, local law enforcement, or other similar individuals to be part of the response plans for multiple locations or to have other responsibilities during periods of elevated threat. As a result, a plan that worked during exercises may be ineffectual during an actual event. Accordingly, when planning for elevated threat periods, it is important to consider whether or not a specific individual identified in the plan has been assigned other responsibilities that may impact his or her ability to perform identified duties during a period of elevated threat that is not limited to a specific facility.

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Additional Resources on Responding to Elevated Threat Levels

Additional information on responding to elevated threat levels can be found on-line in the following locations:

- Department of Homeland Security: *Homeland Security Advisory System* (www.dhs.gov/xinfoshare/programs/Copy_of_press_release_0046.shtm);
- Ready.gov (www.ready.gov);
- *Threat Advisory System Response Guideline, Considerations and Potential Actions in Response to the Department of Homeland Security Advisory System*, ASIS International, 2004 (www.asisonline.org/guidelines/guidelinesthreat.pdf).

RBPS Metrics

Table 18 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 18: RBPS Metrics – RBPS 13 – Elevated Threats

RBPS 13 - Elevated Threats - Escalate the level of protective measures for periods of elevated threat.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility has a documented process for rapidly implementing an increased security posture in response to the elevation of the DHS HSAS threat level and has the ability to carry out that process in a timely manner.			
Metric 13.1 – Procedures	The facility has a written process and procedures for implementing security measures and increasing its security posture during periods of elevated threat to levels commensurate with the elevated threat. These security measures are specified and described in the SSP and tied to the HSAS threat level established by DHS.			
Metric 13.2 – Time Limits	The facility can very quickly achieve the security measures associated with each respective increased HSAS threat level while maintaining the measures already in use during normal operating periods.	The facility can quickly achieve the security measures associated with each respective increased HSAS threat level while maintaining the measures already in use during normal operating periods.		The facility can achieve the security measures associated with each respective increased HSAS threat level in a reasonable time period while maintaining the measures already in use during normal operating periods.

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RBPS 14 – Specific Threats, Vulnerabilities, or Risks

RBPS 14 – Specific Threats, Vulnerabilities, or Risks Address specific threats, vulnerabilities or risks identified by the Assistant Secretary for the particular facility at issue.

A particular high-risk chemical facility may face threats or vulnerabilities that were not identified in the facility's SVA. In some instances, new information about a threat, vulnerability, risk, or a new situation or information may come to the attention of the facility, the Department, or state or local authorities with responsibility for security. Addressing these previously unidentified, unrecognized, and/or specific facility threats, vulnerabilities, or risks is imperative to maintaining the security of the facility.

The purpose of the RBPS is to enhance facility and operational security, while reducing the likelihood of a successful attack, through the implementation of scalable security measures and actions in response to identified facility-specific threats, vulnerabilities, or risks. Essentially, CFATS is requiring that any high-risk chemical facility address any and all threats, vulnerabilities, and risks specific to that facility, as identified by the Assistant Secretary, in order to decrease the likelihood of a successful attack on its facility, personnel, products, or community.

Security Measures and Considerations for Specific Threats, Vulnerabilities, or Risks

Unless notified by DHS of threats, vulnerabilities, or risks specific to the facility, a facility need not implement any measures to be in compliance with RBPS 14. Should a specific threat, vulnerability, or risk be identified, DHS can at that time work with the facility in identifying appropriate measures, procedures, or other activities that the facility could use to address the identified threat, vulnerability, or risk.

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RBPS Metrics

Table 19 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 19: RBPS Metrics – RBPS 14 – Specific Threats, Vulnerabilities, or Risks				
RBPS 14 - Specific Threats, Vulnerabilities, or Risks - Address specific threats, vulnerabilities or risks identified by the Assistant Secretary for the particular facility at issue.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility has implemented security measures that address any and all specific threats, vulnerabilities, or risks identified for the facility by the Assistant Secretary.			
Metric 14.1 – RBPSs	Measures implemented to address the specific threats, vulnerabilities, or risks meet the metrics for all other applicable RBPSs for the facility.			
Metric 14.2 – Documentation in SSP	Measures implemented to address the specific threats, vulnerabilities, or risks are documented in the SSP.			
Metric 14.3 – Training	All applicable employees have been trained on the measures implemented to address the specific threats, vulnerabilities, or risks in accordance with the facility security awareness and training program.			

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RBPS 15 – Reporting of Significant Security Incidents

RBPS 15 - Reporting of Significant Security Incidents - Report significant security incidents to the Department and to local law enforcement officials.

RBPS 15 – Reporting of Significant Security Incidents addresses the importance for high-risk chemical facilities to promptly and adequately report all significant security incidents to the appropriate facility personnel, local law enforcement entities, and DHS. Pursuant to 6 CFR §27.230(a)(15), a facility is required to report significant security incidents to the Department and to local law enforcement officials. To facilitate the accomplishment of this responsibility, a facility should establish protocols governing the reporting of an incident to facility security and up through the security chain of command of the facility and the company that owns or operates the facility. Additionally useful are protocols for determining whether or not a security incident is significant and warrants informing DHS and/or local law enforcement, as well as the process for actually reporting the incident.

Security Measures and Considerations for Reporting of Significant Security Incidents

Security Measures

Complying with RBPS 15 typically involves four basic steps: (1) identifying a security incident; (2) reporting it to facility security; (3) determining whether or not the incident is a "significant security incident;" and, if it is a significant security incident, (4) reporting it to DHS and local law enforcement.

Identifying and reporting a security incident to facility security. The easiest way for a facility to prepare its employees to identify and report security incidents is to clearly articulate to its employees, and especially to its security staff, how to identify a security incident and how to respond to it, including to whom to report the incident. This can be achieved, for example, by establishing clear protocols regarding security incidents and training facility employees on these protocols as part of a facility security awareness and training program.

Determining whether an incident is a "significant" security incident. A broad spectrum of events may be considered a security incident, ranging from trespassing, vandalism, and petty theft, to cyber attacks, bomb threats, and armed attacks. Determining whether or not an incident is serious enough to be considered "significant" and thus reported to DHS and local law enforcement is generally within the discretion of the facility and typically will be determined by the FSO or other senior manager. "Significant security incidents" likely will include incidents that arise based on an

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intentional threat (i.e., potential attack scenarios) that attempt to or successfully circumvent a security measure and/or a metric of any RBPS, including, for example:

Reporting Security Incidents to DHS

If a facility identifies a significant security incident or significant cyber security incident, that incident should be reported to DHS. Significant noncyber incidents should be reported to the National Infrastructure Coordinating Center (NICC) via e-mail (nicc@dhs.gov) or phone (1-202-282-9201). Significant cyber security incidents should be reported to DHS's US-CERT online (www.us-cert.gov) or via phone (1-888-282-0870).

- An intentional, unauthorized, successful, or unsuccessful breach of the facility's restricted area perimeter;
- An intentional, unauthorized, successful, or unsuccessful breach of any critical asset's restricted area perimeter;
- An intentional, unauthorized, successful, or unsuccessful act to either forcefully or covertly bypass, circumvent, or pass through any access control point;
- Any incident in the vicinity of the facility or any act against the facility that requires the facility to implement additional security measures, activate procedures, or respond to with the intent of actively deterring, detecting, and/or delaying an actual threat;
- Any inventory control issues, product stewardship issues, theft, or diversion of any chemical of interest or other dangerous chemical; the act of tampering with any chemical of interest or any transportation container used to transport a chemical of interest; or introduction of any foreign substance into any chemical of interest or into any transportation container carrying or used to carry a chemical of interest;
- Any act of tampering with malicious intent to cause undesirable consequences through the act itself; and
- Any incident with malicious intent to adversely affect operations of critical cyber assets, including IT equipment used to provide security for the facility or to manage processes involving chemicals of interest or critical assets of the facility.

Reporting an incident to DHS or local law enforcement. If a significant security incident is detected while in progress, the first call typically should be to local law enforcement and emergency responders via 911. Similarly, it is recommended that a facility report the incident immediately to local first responders via 911 if the incident has concluded but an immediate emergency response is necessary. Once the incident has concluded and any immediate resulting emergency has been dealt with, a facility should use a nonemergency number to inform local first responders (if they had not already been contacted) and DHS. Within DHS, incidents should be reported to the National Infrastructure Coordinating Center (NICC) at nicc@dhs.gov or at 202-282-9201. In addition to the NICC, a facility may wish to contact its local FBI Field Office, whose phone number can be found online at www.fbi.gov/contact/fo/ focities.htm.

Scenario-Specific Decisions on Significance

Whether an incident is significant will depend on the specific circumstances surrounding the incident, and blanket decisions regarding whether a category of actions is or is not significant may not be the best approach. For instance, trespassing may not rise to the level of significant if the

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trespasser is a teenager skateboarding on a facility parking lot, but trespassing clearly is significant if the trespasser is performing surveillance for a potential terrorist attack.

Near Misses

Simply because an attack or other incident is not carried out successfully does not mean that the incident was insignificant and should not be reported. Whether a "near miss" — that is, an adversarial action that was attempted but not successfully completed — is significant depends on the specific circumstances, such as the desired outcome of the attempt and the motive for the attempt. All near misses should be reviewed to determine whether or not reporting to DHS or local law enforcement is justified.

RBPS Metrics

Table 20 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 20: RBPS Metrics – RBPS 15 – Reporting of Significant Security Incidents

RBPS 15 - Reporting of Significant Security Incidents - Report significant security incidents to the Department and to local law enforcement officials.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a process in place to rapidly and efficiently report security incidents to the appropriate entities (e.g., corporate management, local law enforcement, DHS).			
Metric 15.1 – Reporting Procedures	The facility has written procedures and related personnel training that specifically identify the types of incidents to report, the process for reporting these incidents, to whom these incidents should be reported, and who is responsible for reporting such incidents.			
Metric 15.2 – Whom to Notify	Any detection of a suspicious person, vehicle, or device or facility intrusion alarm triggers an immediate notification of facility security personnel and, if appropriate, local law enforcement and DHS. The facility promptly communicates with authorized law enforcement and DHS subsequent to any verified loss or theft of dangerous chemicals, such as chemicals of interest.			

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RBPS 16 – Significant Security Incidents and Suspicious Activities

RBPS 16 - Significant Security Incidents and Suspicious Activities Identify, investigate, report, and maintain records of significant security incidents and suspicious activities in or near the site.

The "Significant Security Incidents and Suspicious Activities" RBPS addresses the need for high-risk chemical facilities to promptly and adequately identify, investigate, report, and maintain records of significant security incidents and suspicious activities in or near the facility. This RBPS complements RBPS 15 – Reporting of Significant Security Incidents.

Security Measures and Considerations for Significant Security Incidents and Suspicious Activities

Security Measures

As part of its responsibilities under RBPS 16, it is anticipated that a facility would undertake the following activities in regard to any significant security incidents and suspicious activities:

1. **Identify** – any process by which unusual behavior, suspicious activity, and/or actual incidents are identified by the facility. This effort includes such activities as monitoring, inspections, alarms, patrols, and security awareness and training, all of which are addressed in greater detail in connection with other RBPSs.

2. **Investigate** – the process implemented by the facility to understand, resolve, and learn from all of the circumstances, evidence, and other factors surrounding a security incident or suspicious activity.

3. **Report** – the process of informing facility security and management, local law enforcement and first responders, and DHS of an incident or suspicious activity. Reports of significant security incidents are required under the regulations pursuant to RBPS 15.

4. **Maintain Records** – any processes used by the facility to keep records of security incidents or suspicious activities. Pursuant to 6 CFR §27.255 (a)(3), a facility is required to keep

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certain information on incidents and breaches of security for a period of at least three years. Methods of meeting this requirement are discussed in greater detail in RBPS 18 – Records.

Security Considerations

The Varied Purposes of Investigating, Reporting, and Maintaining Records

When developing protocols for identifying, investigating, reporting, and maintaining records of security incidents and suspicious activities, it is important to keep in mind that each of these activities simultaneously serves multiple purposes. For instance, proper investigation, reporting, and recordkeeping assists a facility not only in identifying whether an incident or suspicious activity truly has occurred but also in gathering evidence for the potential prosecution of the individuals perpetrating the act and helping to identify weaknesses or gaps in a facility's security posture that may have been exploited so that those gaps can be closed.

RBPS Metrics

Table 21 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 21: RBPS Metrics – RBPS 16 – Significant Security Incidents and Suspicious Activities

RBPS 16 – Significant Security Incidents and Suspicious Activities - Identify, investigate, report, and maintain records of significant security incidents and suspicious activities in or near the site.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has documented processes and procedures for identifying, investigating, reporting on, and maintaining records of significant security incidents and suspicious activities.			
Metric 16.1 – Investigation Procedures	The facility has written procedures, either in its SSP or elsewhere, and ensures that qualified personnel conduct thorough investigations of significant security incidents and suspicious activities and thoroughly investigate such incidents and activities, including "near misses," to determine their level of threat, any vulnerabilities that were exploited, and what security upgrades, if any, are warranted to reduce security risk.			
Metric 16.2 – Lessons Learned	Lessons learned from security incidents are disseminated to appropriate facility personnel in a timely manner in meetings, by e-mail, or as part of the ongoing security awareness program, depending upon the nature of the incident.			

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RBPS 17 – Officials and Organization

RBPS 17 - Officials and Organization - Establish official(s) and an organization responsible for security and for compliance with these standards.

RBPS 17 – Officials and Organization concerns the identification of the individual(s) and organization(s) within a company that are responsible for facility security, including compliance with all of the RBPSs. Pursuant to RBPS 17, a facility must identify at least one official, as well as the organization within the company, who is responsible for security and compliance with the RBPSs. The manner in which a facility structures its security organization to meet this specific RBPS is likely to depend in large part on how large or complex a facility or its ownership structure is. A larger, more complex facility is likely to have a more complex organization responsible for compliance than a smaller, lower-tiered facility and also is more likely to employ an individual whose principal job responsibility is facility security.

Security Measures and Considerations for Officials and Organization

Security Measures

DHS generally anticipates that each facility will identify either a Facility Security Officer or other individual who serves as the point of contact in regard to CFATS-related communications, as well as a facility security organization responsible for implementing the Site Security Plan at the facility. Please note that, depending on the size and complexity of the corporation as well as the risks associated with a given facility, a facility's security organization may consist of only one or two individuals.

Facility Security Officers. Around the time that the facility is notified that it must submit an SVA and SSP (i.e., after DHS informs the facility that it is, in fact, a "high-risk" facility), it should consider designating an FSO or other individual responsible for compliance with the RBPSs, if it has not already done so. Potential responsibilities of the FSO (or equivalent individual) may include:

- Conducting and supervising the submission of the Security Vulnerability Assessment;
- Preparing the initial Site Security Plan and updating it;
- Conducting annual internal security audits;
- Hosting DHS inspections;
- Designing and documenting security training for all employees;
- Maintaining required records;

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- Planning and documenting security drills;
- Ensuring that security equipment is properly maintained, calibrated, and tested;
- Understanding and maintaining a list of local emergency responders, local law enforcement, and local DHS Protective Security Advisors;
- Responding to, recording, and reporting all security incidents;
- Ensuring material accountability and control for facilities where theft and diversion of COI or other dangerous chemicals are a concern ;
- Ensuring notification of plant personnel regarding changes in security procedures or DHS threat level;
- Other activities associated with the management of facility security per 6 CFR Part 27; and
- Understanding current security threats and patterns related to the facility.

Qualifications for being an FSO (or equivalent) may include:

- Understanding the security organization of the facility;
- Understanding the requirement to comply with the CFATS RBPSs;
- Experience in emergency preparedness, response, and planning for disasters;
- Familiarity with responsibilities and functions of local, state, and Federal law enforcement agencies; and
- Ability to recognize characteristics and behavioral patterns of persons who are likely to threaten security.

The individual designated to serve as the FSO (or equivalent) and the manner in which he or she carries out his or her responsibilities are likely to vary greatly by company. For example, some FSOs may be dedicated full-time to facility security, while for others, security is only one of multiple responsibilities. Additionally, some FSOs may be located on-site, while others may be located elsewhere (e.g., corporate headquarters). Finally, in many cases an FSO will be responsible for security at a single facility; in other cases, an individual FSO may be responsible for security at multiple facilities.

Facility Security Organizations. In addition to designating an FSO or equivalent individual, facilities are required to identify the organization responsible for facility compliance with the RBPSs. The size and structure of the security organization is likely to vary based on a variety of factors, such as size of the facility, complexity of security at the facility, the security risks associated with the facility, and whether or not the facility's parent company has multiple facilities that are CFATS-regulated facilities.

As part of many facility security organizations, a facility is likely to designate security responsibilities to various individuals. These may or may not include the following individuals:

- The owner/operator of the facility or his designate,
- A Facility Security Officer (FSO),
- A Cyber Security Officer (this individual may or may not be the same as the FSO),
- A designated Alternate FSO,
- A Corporate Security Officer who coordinates security across facilities, and
- The Facility Plant Manager.

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Potential security responsibilities for these other individuals include the following:

- *Owner/operator of the facility*: the role of the owner/operator is to define a security organizational structure in writing that identifies specific security duties and responsibilities.
- *Cyber Security Officer*: the role of the Cyber Security Officer is to oversee cyber security issues at the facility.
- *Alternate FSO*: the role of the alternate FSO is to be able to function in place of the FSO should circumstances or the owner/operate dictate. Responsibilities assigned to the FSO become the responsibility of the Alternate FSO in the FSO's absence.
- *Corporate Security Officer (CSO)*: the role of the CSO is to coordinate security at a corporate level if more than one facility is subject to CFATS.
- *Facility Plant Manager*: the role of the facility plant manager is to ensure cooperation of facility personnel with the requirements of the SSP and CFATS, such as:
    - Coordinating training in security awareness and other security issues for facility personnel who are not designated to serve on the security organization;
    - Ensuring that security considerations are acknowledged and implemented throughout the facility;
    - Being cognizant of security risks and issues related to the facility, the community, and the current threat level;
    - Ensuring that adequate space and resources are available for the security organization; and
    - Ensuring that employees can report and question security procedures without fear of retribution.

Security Considerations

Cyber Security Officers

If a facility has significant cyber assets, it likely will want to designate a specific Cyber Security Officer to be in charge of oversight of cyber security issues at the facility. This individual may be the FSO or other individual and may be located at the facility or elsewhere (e.g., corporate headquarters). To avoid potential conflicts of interest between systems operation and security, a facility may want the CSO to be a different individual than the individual(s) responsible for IT management or systems administration.

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RBPS Metrics

Table 22 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 22: RBPS Metrics – RBPS 17 – Officials and Organization

RBPS 17 - Officials and Organization - Establish official(s) and an organization responsible for security and for compliance with these standards.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has established one or more officials and an organization responsible for security and for compliance with the RBPSs; and the names, contact information, and responsibilities of such officials are included in the SSP.			
Metric 17.1 – Owner/Operator Responsibilities	The owner/operator is responsible for defining a security organizational structure in writing that identifies specific security duties and responsibilities.			
Metric 17.2 – Corporate Security Officer Responsibilities	The Corporate Security Officer is responsible for coordinating security at a corporate level when a corporation has more than one facility subject to CFATS.			
Metric 17.3 – Facility Security Officer (FSO)/ Assistant FSO Responsibilities	The Facility Security Officer is responsible for security at the facility, including leading the implementation of the RBPSs on a facility level. The Alternate FSO is responsible for filling in for the FSO when the FSO is unavailable.			
Metric 17.4 – Cyber Security Officer	The Cyber Security Officer is responsible for oversight of cyber security issues at the facility. This individual may be the FSO or other individual and may be located at the facility or elsewhere (e.g., corporate headquarters).			
Metric 17.5 – Facility Management Roles	The facility plant manager is responsible for ensuring cooperation of facility personnel with the requirements of the SSP and the RBPSs.			

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RBPS 18 – Records

RBPS 18 - Records Maintain appropriate records.

RBPS 18 – Records addresses the creation, maintenance, protection, storage, and disposal of appropriate security-related records pursuant to 6 CFR § 27.255 and the activities required to make these records available to DHS upon request.

Security Measures and Considerations for Records

Security Measures

Section 27.255 of CFATS requires covered facilities to keep the following records for three (3) years:

- Training;
- Drills and exercises;
- Incidents and breaches of security;
- Maintenance, calibration, and testing of security equipment;
- Security threats;
- Audits of SSPs (including audits required under 6 CFR § 27.225(e)) and Security Vulnerability Assessments;
- Letters of authorization and approval from DHS; and
- Documentation identifying the results of audits and inspections conducted pursuant to 6 CFR §27.250.

The following records must be retained for at least six (6) years:

- Submitted Top-Screens;
- Submitted Security Vulnerability Assessments;
- Submitted Site Security Plans; and
- All related correspondence with the Department.

The standard embodied in RBPS 18 — to maintain appropriate records — implicitly covers creation, maintenance, protection, storage, and disposal of affected records and the activities required to make such records available to DHS upon request pursuant to 6 CFR §§ 27.250(a) and 27.255(b), as follows:

1. **Creation** of records refers to the preparation of a detailed written account of a covered activity. Writing this information down or recording it electronically creates a written record of it. Backup files, duplicates, or copies should be protected and maintained or

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disposed of in compliance with the RBPS, 6 CFR § 27.255, and/or the CFATS provisions regarding CVI, 6 CFR § 27.400.

2. **Maintenance** of records refers to keeping the written or electronic records in an accessible location and ensuring they are not disposed of before the time period for their retention has elapsed. Records may be maintained in paper or electronic format. Records should be maintained where they will not be disturbed, damaged, or lost.

3. **Protection** of records refers to safeguarding the written or electronic records from theft, destruction, amendment, damage, misuse, or unauthorized access. This activity includes protecting records physically as well as ensuring that CVI records are not distributed to unauthorized users.

4. **Storage** refers to keeping records in an appropriate and accessible location. Such a location may or may not be at the actual facility, but the location should be known and accessible to facility personnel should they need to retrieve such records for a DHS inspection or audit. If records are kept locked, more than one person should be able to access the records in order to produce them for a DHS inspection/audit.

5. **Disposal** refers to the destruction of records that are no longer required to be retained by the covered facility. Some records must be retained under 6 CFR § 27.255 for 3 years and some for 6 years (see list above). After this period elapses, facilities are no longer required by CFATS to maintain these records and may choose to dispose of such records rather than continuing to store them, provided that destruction of CVI complies with 6 CFR § 27.400(k).

6. **Making records available** means that the records can be produced by the facility to which they pertain for examination and copying by DHS within a reasonable period of time. This requirement applies not only to records created under CFATS but also to records necessary for security purposes that are kept pursuant to other Federal programs or regulations (see 6 CFR § 27.255(c)).

Security Considerations

Chemical-terrorism Vulnerability Information (CVI)

It should be noted that all records required to be created or retained under 6 CFR § 27.255 are considered CVI under 6 CFR § 27.400((b)(6) and must be protected, maintained, and marked as such unless records maintained under § 27.255(1)–(5) were created to satisfy a regulatory requirement other than 6 CFR Part 27. (See 72 Fed. Reg. 17715 dated April 9, 2007.) For additional information on CVI, please refer to the DHS Chemical Security Web site (www.dhs.gov/chemicalsecurity).

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RBPS Metrics

Table 23 provides a narrative summary of the security posture of a hypothetical facility at each tier in relation to this RBPS and some example measures, activities, and/or targets that a facility may seek to achieve that could be considered compliant with the RBPS.

Table 23: RBPS Metrics – RBPS 18 – Records				
RBPS 18 - Records - Maintain appropriate records.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility creates, maintains, protects, stores, and makes available for inspection by DHS certain records related to its security program.			
Metric 18.1 – Training Records	The facility retains security training records, in paper or electronic format, for at least 3 years. The training records include the date and location of each training session, time of day and duration of each session, a description of the training, the name and qualifications of the instructor, a list of attendees (including each attendee's signature), and the results of any evaluation or testing.			
Metric 18.2 – Records of Drills and Exercises	The facility retains records of drills and exercises, in paper or electronic format, for at least 3 years. Such records include, for each drill or exercise, the date held, a description of the drill or exercise, a list of participants, a list of equipment (other than personal equipment) tested or employed in the exercise, the name(s) and qualifications of the exercise director, and any best practices or lessons learned that may improve the Site Security Plan.			
Metric 18.3 – Records of Security Incidents	The facility retains records of incidents and breaches of security, in paper or electronic format, for at least 3 years. Such records include the date and time of occurrence, location within the facility, a description of the incident or breach, the identity of the individual(s) to whom it was reported, and a description of the response.			
Metric 18.4 – Maintenance Records	The facility retains records of maintenance, calibration, and testing of security equipment, in paper or electronic format, for at least 3 years. Such records include the date and time, name and qualifications of the technician(s) doing the work, and the specific security equipment involved for each occurrence of maintenance, calibration, and testing.			
Metric 18.5 – Records of Security Threats	The facility retains records of security threats, in paper or electronic format, for at least 3 years. Such records include the date and time of occurrence, how the threat was communicated, who received or identified the threat, a description of the threat, to whom it was reported, and a description of the response.			
Metric 18.6 – Audit Records	The facility retains records of audits, in paper or electronic format, for at least 3 years. Such records include, for each audit, a record of the audit, results of the audit, names(s) of the person(s) who conducted the audit, and a letter certified by the covered facility stating the date that the audit was conducted.			
Metric 18.7 – Letters of Authorization	The facility retains all Letters of Authorization and Approval from DHS and documentation identifying the results of audits and inspections conducted pursuant to §27.250, in paper or electronic format, for at least 3 years.			
Metric 18.8 – Correspondence with DHS	The facility retains records of submitted Top-Screens, Security Vulnerability Assessments, Site Security Plans, and all related correspondence with the Department, in paper or electronic format, for at least 6 years.			
Metric 18.9 – ASP	The facility retains records related to an Alternative Security Program, which is submitted in lieu of a Security Vulnerability Assessment (Tier 4 only) or a Site Security Plan (all Tiers) pursuant to §27.235, for at least 6 years.			

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Appendix A – Acronyms

BZPP	Buffer Zone Protection Plan
CD	Compact Disk
CFATS	Chemical Facility Anti-Terrorism Standards
COI	Chemical of Interest
CSAT	Chemical Security Assessment Tool
CVI	Chemical-terrorism Vulnerability Information
CCTV	Closed Circuit Television
CHER-CAP	Community Hazards Emergency Response-Capability Assurance Process
CFR	Code of Federal Regulations
COOP	Continuity of Operations Plans
CSO	Corporate Security Officer
CW	Chemical Weapon
CWP	Chemical Weapons Precursor
DCS	Distributed Control System
DHS	Department of Homeland Security
DOD	Department of Defense
DOS	Department of State
DPPA	Driver's Privacy Protection Act
DUI/DWI	Driving Under the Influence/Driving While Intoxicated
EMT	Emergency Medical Technicians
EXP	Explosive
FAST	Fast and Secure Trade
FSO	Facility Security Officer
HSA	Homeland Security Advisor
Hazmat	Hazardous Materials
HME	Hazardous Materials Endorsement
HSAS	Homeland Security Advisory System
ICCP	Intercontrol Center Communications Protocol
ICS	Industrial Control System
ID	Identification
IDS	Intrusion Detection System
IED	Improvised Explosive Device
IP	Internet Protocol
IT	Information Technology
ITPM	Inspection, Testing, and Preventative Maintenance
LAN	Local Area Network
LEPC	Local Emergency Planning Committee
LLE	Local Law Enforcement
MSDS	Material Safety Data Sheet
MTSA	Maritime Transportation Security Act
NICC	National Infrastructure Coordinating Center
PBX	Private Branch Exchange
PCS	Process Control System

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PDA	Personal Digital Assistant
PLC	Programmable Logic Controller
PSA	Protective Security Advisor
RFID	Radio Frequency Identification Device
RBPS	Risk Based Performance Standard
RTU	Remote Terminal Unit
SIS	Safety Instrumented System
SATP	Security Awareness and Training Program
SCADA	Supervisory Control and Data Acquisition
SSA	Social Security Administration
SSNVS	Social Security Number Verification System
SSP	Site Security Plan
SVA	Security Vulnerability Assessment
TSA	Transportation Security Administration
TSDB	Terrorist Screening Database
TWIC	Transportation Worker Identification Card
UFC	United Facilities Criteria
US-CERT	United States Computer Emergency Readiness Team
USB	Universal Serial Bus
USCIS	United States Citizenship and Immigration Services
VBIED	Vehicle-Borne Improvised Explosive Device
VPN	Virtual Private Network
VoIP	Voice Over Internet Protocol
WME	Weapons of Mass Effect

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Appendix B – RBPS Metrics by Tier

RBPS 1 – Restrict Area Perimeter - Secure and monitor the perimeter of the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility has an extremely vigorous perimeter security and monitoring system that enables the facility to thwart most adversary penetrations and channel personnel and vehicles to access control points; including a perimeter intrusion detection and reporting system with multiple additive detection techniques that can demonstrate an extremely low probability that perimeter penetration would be undetected.	The facility has a vigorous perimeter security and monitoring system that enables the facility to thwart or delay most adversary penetrations and channel personnel and vehicles to access control points; including a perimeter intrusion detection and reporting system that can demonstrate a very low probability that perimeter penetration would be undetected.	The facility has a perimeter security and monitoring system that enables the facility to delay a significant portion of attempted adversary penetrations and channel personnel and vehicles to access control points; including a perimeter intrusion detection and reporting system that can demonstrate a low probability that perimeter penetration would be undetected.	The facility has a perimeter security and monitoring system that enables the facility to delay a portion of attempted adversary penetrations and channel personnel and vehicles to access control points; including a system to monitor and report unauthorized penetrations of the facility perimeter.

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Metric 1.1 – Perimeter Security	The facility has an extremely vigorous, high-integrity system to secure the perimeter that severely restricts or delays any attempts by unauthorized persons to gain access to the facility. To achieve this standard, a facility could, for example, use the following: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards. • A clear zone on either side of the fence that allows persons to be detected at the boundary. Where vehicles can access either side of the boundary, the clear zone is wide enough to allow detection of the presence of vehicles.	The facility has a vigorous, high-integrity system to secure the perimeter that would give unauthorized persons a very low probability of gaining access to the facility. To achieve this standard, a facility could, for example, use the following: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards. • A clear zone on either side of the fence that allows persons to be detected at the boundary. Where vehicles can access either side of the boundary, the clear zone is wide enough to allow detection of the presence of vehicles.	The facility has a system to secure the perimeter that would give unauthorized persons a low probability of gaining access to the facility. To achieve this standard, a facility could, for example, use a single security barrier, such as: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards.	The facility has a system to secure the perimeter that reduces the possibility of access to the facility by unauthorized persons. To achieve this standard, a facility could, for example, use a single security barrier, such as: • An exterior perimeter security fence or equivalent barrier that meets industrial consensus standards.
Metric 1.2 – Vehicle Barriers	Vehicles would have a very low likelihood of accessing the facility by force anywhere along the entire perimeter where vehicle attack is a possible mode of attack. To achieve this, a facility could use, for example: • Vehicle deterrence measures, such as bollards, landscaping, berms, ditches, drainage swale, or buried concrete anchors retaining anti-vehicle cable wherever the perimeter is accessible to a vehicle. • Entrances equipped with traffic control systems to slow incoming traffic, such as serpentine barriers outside the gate.	Vehicles would have a low likelihood of accessing the facility by force anywhere along the entire perimeter where vehicle attack is a possible mode of attack. To achieve this, a facility could use, for example: • Vehicle deterrence measures, such as bollards, landscaping, berms, ditches, drainage swale, or buried concrete anchors retaining anti-vehicle cable wherever the perimeter is accessible to a vehicle. • Entrances equipped with traffic control systems to slow incoming traffic, such as serpentine barriers outside the gate.	Vehicles would have a reduced likelihood of accessing the facility by force anywhere along the entire perimeter where vehicle attack is a possible mode of attack. To achieve this, a facility could use, for example, active or passive barriers at perimeter control points where vehicles normally enter and leave the facility and other anti-vehicle barriers, such as ditches, revetments, or other man-made or naturally occurring barriers, for the remainder of the perimeter where vehicle attack is a possible mode of attack.	Vehicles would have a reduced likelihood of accessing the facility by force at the perimeter control points where vehicles normally enter and leave the facility. To achieve this, a facility could, for example, use anti-vehicle barriers such as ditches, revetments, or other man-made or naturally occurring barriers.

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Metric 1.3 – Standoff Distance	Sufficient vehicle standoff distance or alternative protective means are provided to ensure that a VBIED is extremely unlikely to be able to compromise a critical asset.		N/A	
Metric 1.4 – Monitoring and Surveillance	The facility has an extremely reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously manned location. In the context of this metric, "real time" means that an adversary act virtually always is detected and reported to responders at the time of occurrence. "Extremely reliable" means that the monitoring system is operable during all anticipated conditions, including complete darkness, twilight, inclement weather, and loss of power; with monitoring system components designed, laid out, and constructed to avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility typically could, for example, use an integrated, multi-sensor system that: • Provides intrusion detection and video surveillance around 100% of the perimeter or 100% of the perimeter around all critical assets. • Provides images or other	The facility has a very reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously monitored location. In the context of this metric, "real time" means that an adversary act most likely is detected and reported to responders at the time of occurrence. "Very reliable" means that the monitoring system is operable during ambient light, inclement weather, and fluctuating power conditions; with monitoring system components designed, laid out, and constructed to avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility typically could, for example, use an integrated monitoring system that: • Provides intrusion detection and video surveillance around the facility perimeter or critical assets. • Provides images or other output that are continuously	The facility has a reliable perimeter monitoring system that allows for the identification of the presence of an intrusion in real time for the area(s) containing critical asset(s). In the context of this metric, "real time" means that an adversary act likely is detected and reported to responders in a timely manner. "Reliable" means that the monitoring system is operable during ambient light conditions. To achieve this, a facility typically could, for example, use an integrated monitoring system that: • Provides intrusion detection and video surveillance around the facility perimeter or critical assets. • Has emergency back-up power and/or an equivalent written contingency procedure.	The facility has a monitoring system that allows for the identification of the presence of an intrusion in the area(s) containing critical asset(s). To achieve this, a facility typically could, for example, use security patrols of the facility or an integrated monitoring system that provides intrusion detection and video surveillance around the facility perimeter or critical assets and is fully operable during all lighting conditions.

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	output that are continuously monitored by a dedicated person, software, or other detection method used in conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure. • Has general-area as well as access-portal (face-view) CCTV surveillance at all gates.	monitored by a dedicated person, software, or other detection method used in conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure.		
RBPS 2 – Secure Site Assets - Secure and monitor restricted areas or potentially critical targets within the facility.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility has additional vigorous barriers and systems to secure each restricted area and critical asset, including a highly reliable system that continuously monitors each restricted area and critical target, and can demonstrate an extremely high probability that unauthorized adversary actions would be detected and access would be denied to restricted areas or critical assets.	The facility secures and continuously monitors each restricted area and critical asset and can demonstrate a high probability that unauthorized adversary actions toward restricted areas or critical assets would be detected.	The facility secures and regularly monitors each restricted area and critical asset and can demonstrate a likelihood that unauthorized adversary actions toward restricted areas or critical assets would be detected.	The facility has additional vigorous barriers and systems to secure each restricted area and critical asset, including a highly reliable system that continuously monitors each restricted area and critical target, and can demonstrate an extremely high probability that unauthorized adversary actions would be detected and access would be denied to restricted areas or critical assets.

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Metric 2.1 – Critical Asset and Restricted - Area Perimeter Barriers	Where feasible and consistent with critical operational and safety considerations, the facility has an internal perimeter barrier (e.g., a security fence or equivalent barrier that meets industrial consensus standards) that severely restricts or delays any attempts by unauthorized persons to gain access to a Tier 1 restricted area or critical asset or a clearly defined and well-secured facility perimeter, combined with high-performance asset monitoring and strict administrative controls on asset access.	N/A		
Metric 2.2 – Critical Asset Vehicle Barriers	Vehicles would have a very low likelihood of accessing a critical asset's restricted area by force. To achieve this, a facility could, for example, use vehicle deterrence measures, such as bollards, berms, landscaping, ditches, drainage swales, or buried concrete anchors retaining anti-vehicle cable wherever the restricted area perimeter is accessible to a vehicle.	Vehicles would have a low likelihood of accessing a critical asset's restricted area by force. To achieve this, a facility could, for example, use vehicle deterrence measures, such as bollards, berms, landscaping, ditches, drainage swales, or buried concrete anchors retaining anti-vehicle cable wherever the restricted area perimeter is accessible to a vehicle.	N/A	
Metric 2.3 – Asset Standoff Distance	Sufficient vehicle standoff distance or alternative protective means are provided to ensure that a VBIED is extremely unlikely to be able to compromise a critical asset.		N/A	
Metric 2.4 – Monitoring and Surveillance	A combination of highly reliable technical security devices (e.g., special access controls, sensors, video), security patrols, and other monitoring systems are used to protect and continuously monitor restricted areas or critical assets (e.g., COI loading and unloading areas, critical valves, pipelines,	Reliable technical security devices (e.g., special access controls, sensors, video), security personnel, and/or monitoring systems are used to protect and continuously monitor restricted areas or critical assets (e.g., COI loading and unloading areas, critical valves, pipelines,	Reliable technical security devices (e.g., special access controls, sensors, video), security personnel, and/or monitoring systems are used to protect and monitor restricted areas or critical assets (e.g., COI loading and unloading areas, critical valves, pipelines,	A combination of highly reliable technical security devices (e.g., special access controls, sensors, video), security patrols, and other monitoring systems are used to protect and continuously monitor restricted areas or

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	manifolds, control rooms, storage facilities) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use a combination of measures, such as: • Posted security personnel or frequent security patrols. • An integrated, multi-sensor system that provides intrusion detection and video surveillance around 100% of the perimeter of the restricted area or critical assets, has emergency backup power and/or an equivalent written contingency procedure, and provides images that are continuously monitored by dedicated persons, software, or other detection methods in conjunction with the system. • General-area as well as access-portal (face-view) CCTV surveillance at all gates.	manifolds, control rooms, storage facilities) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use a combination of measures, such as: • Frequent security patrols. • An integrated monitoring system that provides intrusion detection and video surveillance around a significant portion of the perimeter of the restricted area or critical assets, has emergency backup power and/or an equivalent written contingency procedure, and provides images that are continuously monitored by dedicated persons, software, or other detection methods in conjunction with the system.	manifolds, control rooms, storage facilities) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use a combination of measures, such as: • Regular security patrols. • An integrated monitoring system that provides intrusion detection and video surveillance around a portion of the perimeter of the restricted area or critical assets and has emergency backup power and/or an equivalent written contingency procedure.	critical assets (e.g., COI loading and unloading areas, critical valves, pipelines, manifolds, control rooms, storage facilities) to detect attempts to gain unauthorized access to, tamper with, sabotage, steal, or remove without authorization critical assets. To achieve this, a facility could, for example, use a combination of measures, such as: • Posted security personnel or frequent security patrols. • An integrated, multi-sensor system that provides intrusion detection and video surveillance around 100% of the perimeter of the restricted area or critical assets, has emergency backup power and/or an equivalent written contingency procedure, and provides images that are continuously monitored by dedicated persons, software, or other detection methods in conjunction with the system. • General-area as well as access-portal (face-view) CCTV surveillance at all gates.

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RBPS 3 – Screen and Control Access - Control access to the facility and to restricted areas within the facility by screening and/or inspecting individuals and vehicles as they enter, including: (i) Measures to deter the unauthorized introduction of dangerous substances and devices that may facilitate an attack or actions having serious negative consequences for the population surrounding the facility; and (ii) Measures implementing a regularly updated identification system that checks the identification of facility personnel and other persons seeking access to the facility and that discourages abuse through established disciplinary measures.				
	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility employs a strict process for controlling access to the facility and screening all persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and, via a near real-time updated system, checks the identification of facility personnel and other persons seeking access to the facility. The facility can demonstrate an extremely high probability of detecting and preventing fraudulent entry and has a system to report such attempts to law enforcement.	The facility employs a process for controlling access to the facility and screening a high percentage of selected persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and, via a frequently updated system, checks the identification of facility personnel and other persons seeking access to the facility. The facility can demonstrate a high probability of detecting and preventing fraudulent entry and has a system to report such attempts to law enforcement.	The facility employs a process for controlling access to the facility and screening selected persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and, via a routinely updated system, checks the identification of facility personnel and other persons seeking access to the facility. The facility can demonstrate a likelihood of detecting and preventing fraudulent entry and has a system to report such attempts to law enforcement.	The facility employs a process for controlling access to the facility and screening selected persons and vehicles seeking access to restricted areas. The process deters the unauthorized introduction of dangerous substances and devices to the facility, and checks the identification of facility personnel and other persons seeking access to the facility. The facility has the capability to detect some attempts at fraudulent entry and has a system to report such attempts to law enforcement.
Metric 3.1 – Access Point Controls	The facility has a comprehensive access control system that can demonstrate an extremely high reliability in thwarting adversary attempts to gain unauthorized access. Sample measures to achieve this could include the following: • A system providing for the verification of the authorization for access by a photo ID card or biometrics. • Access points that are manned by security personnel when open for use and are either manned	The facility has an access control system that can demonstrate a high reliability in thwarting adversary attempts to gain unauthorized access. Sample measures to achieve this could include the following: • A system providing for the verification of the authorization for access by a photo ID card or biometrics. • Access points that are manned by security personnel when open for use and are either	The facility has an access control system that reliably thwarts adversary attempts to gain unauthorized access. Sample measures to achieve this could include the following: • A system providing for the verification of the authorization for access by a photo ID card or electronic key access. • Access points that are either manned by security personnel or are continuously monitored.	The facility has a system to verify the identity of individuals seeking entry to restricted areas to control unauthorized access, such as the use of a photo ID card or electronic key access. Facility access points are either manned or continuously monitored.

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	or continuously monitored at all other times. • Gates and anti-passback devices (e.g., turnstiles) activated by an electronic access system using badges for vehicle and personnel entrances for both the outer perimeter and internal restricted areas. • One or more separate access gates for contractor personnel. • Access control systems that are programmable to allow multilevel access.	manned or continuously monitored at all other times. • Gates and anti-passback devices (e.g., turnstiles) activated by an electronic access system using badges for vehicle and personnel entrances for both the outer perimeter and internal restricted areas. • Access control systems that are programmable to allow multilevel access.	• Gates and anti-passback devices (e.g., turnstiles) activated by an electronic access system using badges for vehicle and personnel entrances for both the outer perimeter and internal restricted areas.	

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Metric 3.2 – Identity Verification Systems	Unauthorized persons would be highly unlikely to gain unauthorized access due to the vigorousness of identity verification systems. Sample measures to achieve this could include the following: • All employees and other selected persons (e.g., resident contractors, transport drivers) are issued tamper-resistant ID badges with, at a minimum, the individual's name and photo, which are worn in a visible position when on-site. • All other personnel are documented, issued a temporary badge, and escorted while in restricted areas and escorted or continuously monitored elsewhere on-site. • Unknown vehicles remain outside the facility perimeter or in a secured area while they and their occupants are being vetted. • All unescorted personnel (e.g., employees, regular contractors, and transport drivers) are issued electronic photo ID badges that are integrated with the facility's access control system.	Unauthorized persons would be unlikely to gain unauthorized access due to the vigorousness of identity verification systems. Sample measures to achieve this could include the following: • All employees and other selected persons (e.g., resident contractors, transport drivers) are issued tamper-resistant ID badges with, at a minimum, the individual's name and photo, which are worn in a visible position when on-site. • All other personnel are documented, issued a temporary badge, and escorted while in restricted areas and escorted or continuously monitored elsewhere on-site. • Unknown vehicles remain outside the facility perimeter or in a secured area while they and their occupants are being vetted. • All unescorted personnel (e.g., employees, regular contractors, and transport drivers) are issued electronic photo ID badges that are integrated with the facility's access control system.	The facility has access control systems that provide for reasonable identity verification, such as the issuing of tamper-resistant ID badges to all facility employees, and the provision of visitor badges to, and escorting or monitoring of, all individuals without permanent ID badges.

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Metric 3.3 – On-site Parking	Parking on-site is minimized and/or limited to discrete on-site areas that are located away from critical assets, and vehicular access to restricted areas is restricted (e.g., only company vehicles are allowed on-site, no personally owned vehicles may park on-site, and no delivery vehicles are allowed on-site without an escort).	Parking on-site is minimized and/or limited to discrete on-site areas that are located away from critical assets, and vehicular access to restricted areas is restricted (e.g., company vehicles and a very limited number of personally owned employee or contractor vehicles are authorized to park on-site, no visitors may park on-site, and delivery vehicles are escorted in restricted areas).	Authorized employee, contractor, and visitor vehicles parking on-site are kept to a minimum and/or limited to discrete on-site areas that are located away from critical assets. Some authorized delivery vehicles may have unescorted facility access.	N/A

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Metric 3.4 – Screening and Inspections	The facility has a comprehensive screening system that extremely reliably deters the unauthorized introduction of dangerous substances to the facility. Sample measures to achieve this could include the following: • The facility has the ability to inspect all vehicles and all of the items carried by individuals seeking access to the facility and, under normal operating procedures, performs random, rigorous inspections of a percentage of all vehicles and hand-carried items both when inbound and, for restricted areas where theft/diversion or sabotage COI are located, outbound. • Inspections of individuals themselves are performed when the situation warrants. • Trucks and rail cars are inspected upon entering the facility and prior to loading.	The facility has a screening system that reliably deters the unauthorized introduction of dangerous substances to the facility. Sample measures to achieve this could include the following: • The facility has the ability to inspect all vehicles and all of the items carried by individuals seeking access to the facility and, under normal operating procedures, performs random, rigorous inspections of a percentage of all vehicles and hand-carried items. • Inspections of individuals themselves are performed when the situation warrants. • A percentage of trucks and rail cars are subject to random inspection upon entering the facility and prior to loading.	The facility has a screening system that reasonably deters the unauthorized introduction of dangerous substances to the facility. Sample measures to achieve this could include the following: • The facility has the ability to inspect all vehicles and all of the items carried by individuals seeking access to the facility and, under normal operating procedures, performs random, rigorous inspections of a percentage of all vehicles and hand-carried items. • Inspections of individuals themselves are performed when the situation warrants. • A percentage of trucks and rail cars are subject to random inspection upon entering the facility and prior to loading.	The facility has a screening system that reasonably deters the unauthorized introduction of dangerous substances to the facility, and it performs inspections of vehicles, individuals, and hand-carried items when the situation warrants.

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RBPS 4 – Deter, Detect, and Delay - Deter, detect, and delay an attack, creating sufficient time between detection of an attack and the point at which the attack becomes successful, including measures to:
(i) Deter vehicles from penetrating the facility perimeter, gaining unauthorized access to restricted areas, or otherwise presenting a hazard to potentially critical targets;
(ii) Deter attacks through visible, professional, well maintained security measures and systems, including security personnel, detection systems, barriers and barricades, and hardened or reduced-value targets;
(iii) Detect attacks at early stages, through countersurveillance, frustration of opportunity to observe potential targets, surveillance and sensing systems, and barriers and barricades; and
(iv) Delay an attack for a sufficient period of time to allow appropriate response through on-site security response, barriers and barricades, hardened targets, and well-coordinated response planning.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	Through a series of protective security layers incorporating strong security measures, the facility has a very high likelihood of deterring, detecting, and delaying all adversaries to a degree sufficient to allow response to thwart the adversary action before it achieves mission success. This includes a highly reliable ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.	Through the use of security measures, the facility can deter, detect, and delay most adversaries to a degree sufficient to allow response to thwart the adversary action before it achieves mission success. This includes a reliable ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.	The facility can demonstrate a reasonable ability to deter, detect, and delay adversaries that allows appropriate response, including a reasonable ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.	The facility can demonstrate some ability to deter, detect, and delay adversaries, including some ability to deter penetration by an unauthorized vehicle, deter vehicle access to restricted areas, and deter vehicles presenting a hazard to critical assets.
Metric 4.1 – Deterrence and Delay General	Through a combination of on-site security, barriers and barricades, hardened targets, and well-coordinated security response planning, the facility has a very high likelihood of deterring an attack and/or delaying an attack for a sufficient period of time to allow appropriate security response.	Through a combination of on-site security, barriers and barricades, hardened targets, and well-coordinated security response planning, the facility has a high likelihood of deterring an attack and/or delaying an attack for a sufficient period of time to allow appropriate security response.	Through a combination of on-site security, barriers and barricades, hardened targets, and well-coordinated security response planning, the facility has some ability to deter and/or delay an attack to allow appropriate security response.	The facility has some ability to deter and/or delay an attack to allow appropriate security response through well-coordinated security response planning.

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Metric 4.2 – Deterrence and Delay Vehicle Barriers	The facility has highly reliable man-made or natural vehicle deterrence measures (e.g., crash-rated, anti-vehicle barriers; landscaping; ditches; drainage swales) that deter vehicles from penetrating the facility perimeter and make it highly unlikely that a vehicle could gain access by force or otherwise present a hazard to critical assets.	The facility has reliable man-made or natural vehicle deterrence measures (e.g., crash-rated, anti-vehicle barriers; landscaping; ditches; drainage swales) that deter vehicles from penetrating the facility perimeter and make it unlikely that a vehicle could gain access by force or otherwise present a hazard to critical assets.	The facility has man-made or natural vehicle deterrence measures (e.g., crash-rated, anti-vehicle barriers; landscaping; ditches; drainage swales) that deter vehicles from penetrating the facility perimeter and make it difficult for most vehicles to breach the control point by force or otherwise present a hazard to critical assets.	The facility has some man-made or natural vehicle deterrence measures (e.g., active or passive barriers, landscaping, ditches, drainage swales) that deter vehicles from accessing the facility without authorization.
Metric 4.3 – Detection Monitoring and Surveillance	The facility has an extremely reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously manned location. In the context of this metric, "real time" means that an adversary act virtually always is detected and reported to responders at the time of occurrence. "Extremely reliable" means that the monitoring system is operable during all anticipated conditions, including during complete darkness, twilight, inclement weather, and loss of power, with monitoring system components designed, laid out, and constructed to avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility could, for example, use an integrated, multi-sensor	The facility has a very reliable perimeter monitoring system that continuously monitors the entire length of the facility perimeter or the perimeter around each critical asset, allows for the identification and evaluation of an intrusion in real time, and provides notification of intrusion to a continuously monitored location. In the context of this metric, "real time" means that an adversary act most likely is detected and reported to responders at the time of occurrence. "Very reliable" means that the monitoring system is operable during ambient light, inclement weather, and fluctuating power conditions, with monitoring system components designed, laid out, and constructed so as to avoid common cause/dependent failures and provide redundant signal processing equipment where digital signal processing is used. To achieve this, a facility could, for example, use an integrated monitoring system that: • Provides intrusion	The facility has a reliable perimeter monitoring system that allows for identification of the presence of an intrusion in real time for the area(s) containing critical asset(s). In the context of this metric, "real time" means that an adverse act likely is detected and reported to responders in a timely manner. "Reliable" means that the monitoring system is operable during ambient light conditions. To achieve this, a facility could, for example, use an integrated monitoring system that: • Provides intrusion detection and video surveillance around critical assets. • Has emergency backup power and/or an equivalent written contingency procedure.	The facility has a monitoring system that allows for identification of the presence of an intrusion in the area(s) containing critical asset(s). To achieve this, a facility could, for example, use security patrols of the facility or an integrated monitoring system that provides intrusion detection and video surveillance around critical assets, is fully operable during all lighting conditions, and has emergency backup power and/or an equivalent written contingency procedure.

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	system that: • Provides intrusion detection and video surveillance around 100% of the facility's perimeter or 100% of the perimeter around all critical assets. • Provides images or other output that are continuously monitored by a dedicated person, software, or other detection method used in conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure. • Has general-area as well as access-portal (face-view) CCTV surveillance at all gates.	detection and video surveillance around critical assets that do not have passive vehicle barriers. • Provides images or other output that are continuously monitored by a dedicated person, software, or other detection method used in conjunction with the system. • Has emergency backup power and/or an equivalent written contingency procedure.		
Metric 4.4 – Detection Security Operations Centers	The facility has a very high likelihood of detecting attacks at early stages through countersurveillance, frustration of opportunity to observe critical assets, surveillance and sensing systems, and barriers or barricades. To achieve this level of detection, a facility could, for example, maintain a facility-wide intrusion detection system that is continually monitored from a Security Operations Center and has an adequate backup capability.	The facility has a high likelihood of detecting attacks at early stages through countersurveillance, frustration of opportunity to observe critical assets, surveillance and sensing systems, and barriers or barricades. To achieve this level of detection, a facility could, for example, maintain a facility-wide intrusion detection system that is continually monitored from a Security Operations Center.	The facility has some ability to detect attacks at early stages through countersurveillance, frustration of opportunity to observe critical assets, surveillance and sensing systems, and barriers or barricades.	The facility has some ability to detect attacks at early stages.

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Metric 4.5 – Interdiction by Security Forces or Other Means	The facility is extremely likely to be able to detect and initiate a response to armed intruders resulting in the intruders being interdicted before they reach a critical asset. This capability may be achieved by a facility security force, sufficient delay tactics to allow local law enforcement to respond before the adversary achieves mission success, standoff distances (for VBIEDs), process controls or systems that rapidly render the critical asset nonhazardous even if a breach of containment were to occur (e.g., a rapid chemical neutralization system), or other equivalent measures. If security forces are used, they may be contract or proprietary, mobile or posted, armed or unarmed, or a combination thereof.	The facility is likely to be able to detect and initiate a response to armed intruders, resulting in the intruders being interdicted before they reach a critical asset. This capability may be achieved by a facility security force, sufficient delay tactics to allow local law enforcement to respond before the adversary achieves mission success, standoff distances (for VBIEDs), process controls or systems that rapidly render the critical asset nonhazardous even if a breach of containment were to occur (e.g., a rapid chemical neutralization system), or other equivalent measures. If security forces are used, they may be contract or proprietary, mobile or posted, armed or unarmed, or a combination thereof.	The facility has some ability to detect and initiate a response to armed intruders resulting in the intruders being interdicted before they reach a critical asset. This capability may be achieved by a facility security force, sufficient delay tactics to allow local law enforcement to respond before the adversary achieves mission success, standoff distances (for VBIEDs), process controls or systems that rapidly render the critical asset nonhazardous even if a breach of containment were to occur (e.g., a rapid chemical neutralization system), or other equivalent measures. If security forces are used, they may be contract or proprietary, mobile or posted, armed or unarmed, or a combination thereof.

RBPS 5 – Shipping, Receipt, and Storage – Secure and monitor the shipping, receipt, and storage of hazardous materials for the facility.

	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility has documented processes for securing and monitoring the shipment, receipt, and storage of hazardous materials that make it extremely unlikely that such materials would be made available to an unauthorized individual or an individual without a legitimate use for the material.	The facility has documented processes for securing and monitoring the shipment, receipt, and storage of hazardous materials that make it unlikely that such materials would be made available to an unauthorized individual or an individual without a legitimate use for the material.	The facility has documented processes for securing and monitoring the shipment, receipt, and storage of hazardous materials that reduce the likelihood that such materials would be made available to an unauthorized individual or an individual without a legitimate use for the material.	
Metric 5.1 – Security of Transportation Containers On-site	The facility adequately secures all transportation containers of hazardous materials on-site that are used for storage and are not incident to transportation, including transportation containers connected to equipment at a facility for loading or unloading and transportation containers detached from the motive power (e.g., a locomotive, truck/tractor) that delivered the container to the facility. Effective security generally includes storing the container within the facility's security perimeter and under the facility's security control, considering the container in the facility's SSP, and securing and monitoring rail cars and other containers by using measures consistent with the materials that they contain.			

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Metric 5.2 – "Know-Your-Customer" Provisions	The facility has an active, documented "know your customer" program that may include a policy of refusing to sell hazardous materials to those who do not meet pre-established customer qualification criteria, such as confirmation of identity, verification and/or evaluation of on-site security, verification that shipping addresses are valid business locations, confirmation of financial status, establishment of normal business-to-business payment terms and methods (e.g., not allowing cash sales), and verification of product end-use.	The facility has a "know your customer" program.
Metric 5.3 – Carrier and Shipment Facility Access	The facility has strict vehicle identification and entry authorization, shipping, and control procedures that are subject to a testing program to confirm reliability. If an unknown carrier arrives at the facility, the vehicle and its driver are staged until both the driver and the load are vetted and approved.	The facility has vehicle identification and entry authorization, shipping, and control procedures.
Metric 5.4 – Confirmation of Shipments	The facility has effective security procedures regarding shipments, generally including: • Procedures that require the relevant facility party to confirm all shipments of feed materials or products to or from the facility before allowing the vehicle or its driver/passengers on-site. • Advance planning and approval of all inbound and outbound shipments of hazardous materials (unannounced shipments are not allowed). • Proper identification checks and verification prior to customer pickup of packaged hazardous materials.	The facility has effective security procedures regarding shipments, generally including: • Procedures that require the relevant facility party to confirm most shipments of feed materials or products to or from the facility before allowing the vehicle or its driver/passengers on-site. • Advance planning and approval of most inbound and outbound shipments of hazardous materials. • Proper identification checks and verification prior to customer pickup of packaged hazardous materials.
Metric 5.5 – Verification of Sales and Orders	A review procedure with appropriate redundancies is in place for all shipping, receiving, and delivery of hazardous materials. In particular, the facility has a process to verify receipt of orders for hazardous materials, and written procedures are in place detailing the specific instructions and requirements to control activities related to sales and storage of hazardous materials.	N/A

RBPS 6 - Theft and Diversion - Deter theft or diversion of potentially dangerous chemicals.

	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**
Summary	The facility has multiple, vigorous security measures that are extremely effective in deterring the theft or diversion of potentially dangerous chemicals.	The facility has multiple security measures that are effective in deterring theft or diversion of potentially dangerous chemicals.	The facility has security measures that reduce the likelihood of theft or diversion of potentially dangerous chemicals.	The facility has security measures intended to deter theft or diversion of potentially dangerous chemicals.
Metric 6.1 – Restricted Access to Potentially Dangerous Chemicals	Vigorous controls and procedures exist that restrict access to storage of potentially dangerous chemicals by allowing access only to authorized individuals.	Controls and procedures exist that restrict access to storage of potentially dangerous chemicals by allowing access only to authorized individuals.		Controls and procedures exist that restrict access to storage of potentially dangerous chemicals.

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Metric 6.2 – "Know-Your-Customer" Provisions	The facility has an active, documented "know your customer" program that includes a policy of refusing to sell potentially dangerous chemicals to those who do not meet pre-established customer qualification criteria, such as confirmation of identity, verification and/or evaluation of on-site security, verification that shipping addresses are valid business locations, confirmation of financial status, establishment of normal business-to-business payment terms and methods (e.g., not allowing cash sales), and verification of product end-use.	The facility has a "know your customer" program.
Metric 6.3 – Background Checks	All employees and contractors involved with potentially dangerous chemicals have undergone background surety investigations and have been trained to identify and report suspicious behaviors. Drivers transporting potentially dangerous chemicals are issued facility badges subsequent to third-party verification of background suitability.	
Metric 6.4 – Monitoring Potentially Dangerous Chemicals	Personnel monitor critical process equipment containing potentially dangerous chemicals directly via patrols, CCTV, or other method to reduce the potential for tampering, sabotage, or theft. Additionally, security tags (e.g., a Radio Frequency Identification Device (RFID) or similar systems) are attached to or embedded in containers of potentially dangerous chemicals.	Personnel monitor critical process equipment containing potentially dangerous chemicals directly via patrols, CCTV, or other method to reduce the potential for tampering, sabotage, or theft.
Metric 6.5 – Physical Security of Potentially Dangerous Chemicals	A locked rack or other physical means of securing man-portable containers of potentially dangerous chemicals is provided. The method(s) used are resistant to breach or tampering. Examples include chains and locks that cannot be cut or breached with man-powered tools, movement alarms on the containers, and entry/motion detectors and alarms for the buildings or rooms where the containers are stored.	
Metric 6.6 – Vehicular Access	Vehicle entry and egress to locations with potentially dangerous chemicals is through a manned or monitored entry point.	
Metric 6.7 – Vehicle Inspections	All vehicles are inspected upon egress from the facility or restricted area for potentially dangerous chemicals.	A percentage of vehicles are inspected upon egress from the facility or restricted area for potentially dangerous chemicals on a random basis.	N/A
Metric 6.8 – Inventory Control	The facility has an inventory control system for potentially dangerous chemicals that can either rapidly detect when such chemicals have been removed from their proper location or are monitored to identify attempts to remove such chemicals in an unauthorized manner. Examples of such systems include process controls that monitor the level, weight, volume, or other process parameters that measure the inventory of potentially dangerous chemicals or other security measures (e.g., monitoring, access controls) combined with cross-checking of inventory through periodic inventory reconciliation to ensure that no product loss has occurred.	
Metric 6.9 – Tamper Evident Devices	The facility employs tamper-evident seals for the vehicle valves and other appurtenances that can indicate if a shipment has been tampered with.	N/A
Metric 6.10 – Cyber Security for Potentially Dangerous Chemicals	The facility has implemented appropriate cyber security measures and procedures for business systems that manage the ordering and/or shipping of potentially dangerous chemicals as well as any other cyber systems that contain personally identifiable information for those individuals who manage critical business systems or who could be exploited to steal or divert potentially dangerous chemicals.	
RBPS 7 – Sabotage - Deter insider sabotage.		

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	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has procedures and security measures in place that are effective at deterring, detecting, delaying, and responding to sabotage.			The facility has procedures and security measures in place that are aimed at deterring, detecting, delaying, and responding to sabotage.
Metric 7.1 – Procedures	The facility has procedures in place to deter, detect, delay, and respond to sabotage, such as routine equipment inspections for tampering, awareness training, process safety measures, restricted access to sensitive areas, and protocols for verifying the identity and shipment orders of carriers who arrive to remove transportation containers of sabotage COI from the facility.			
Metric 7.2 – Tamper Evident Devices	The facility utilizes active tamper-evident devices to secure critical-asset (e.g., sabotage COI) transportation containers. The devices(s) used are fairly resistant to breach or tampering and indicate when attempts to tamper with the containers have occurred. Examples include car seals or other tamper-indicating devices, physical locks on transportation container valves or access hatches/openings, chains and locks that cannot readily be cut or breached with man-powered tools, alarms on the valves or access hatches/openings of the transportation containers, and entry/motion detectors and alarms for the buildings or rooms where the transportation containers are stored.			
Metric 7.3 – Visitor Controls	The facility has documented and implemented strict visitor identification, escort, and access control procedures that include verification of visitor background suitability or constant visitor escort by appropriately vetted personnel in restricted areas.	The facility has documented and implemented visitor identification, escort, and access control procedures that include verification of visitor background suitability or constant visitor escort by appropriately vetted personnel in restricted areas.	The facility has documented and implemented strict visitor identification, escort, and access control procedures that include verification of visitor background suitability or constant visitor escort by appropriately vetted personnel in restricted areas.	The facility has documented and implemented visitor identification, escort, and access control procedures that include verification of visitor background suitability or constant visitor escort by appropriately vetted personnel in restricted areas.

RBPS 8 - Cyber – Deter cyber sabotage, including preventing unauthorized onsite or remote access to critical process controls, such as Supervisory Control And Data Acquisition (SCADA) systems, Distributed Control Systems (DCS), Process Control Systems (PCS), Industrial Control Systems (ICS); critical business systems; and other sensitive computerized systems.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has in place cyber security policies, procedures, and measures that result in a low risk of a successful attack on the facility's critical cyber systems or using a facility's critical cyber systems to carry out or facilitate an attack.			
8.1 Cyber Security Policies				
Metric 8.1.1 – Security Policies, Plans, and Procedures	The facility has documented and distributed cyber security policies (including a change management policy), plans/processes, and supporting procedures commensurate with the facility's current IT operating environment.		The facility has documented and distributed cyber security policies (including a change management policy) or plans/processes commensurate with the facility's current IT operating environment.	
Metric 8.1.2 – Cyber Security	The facility has designated one or more individuals to manage cyber security who can demonstrate proficiency through a combination of training, education, and/or experience sufficient to develop cyber			

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Officials	security policies and procedures, and ensure compliance with all applicable industry and governmental cyber security requirements.	
8.2 Access Control		
Metric 8.2.1 – Systems Boundaries	The facility has identified and documented systems boundaries (i.e., the electronic perimeter) and has implemented security controls to limit access across those boundaries.	
Metric 8.2.2 – External Connections	The facility has established and documented a business requirement for every external connection to/from their critical systems, and external connections have controls that permit access only to authorized and authenticated users.	
Metric 8.2.3 – Least Privilege	The facility practices the concept of least privilege.	
Metric 8.2.4 – Remote Access and Rules of Behavior	The facility has defined allowable remote access (e.g., Internet, VPN, modems) and rules of behavior. Those rules describe user responsibilities, expected behavior with regard to information system usage, to include remote access activities (e.g., appropriate Web sites, conduct of personal business).	
Metric 8.2.5 – Password Management	The facility has documented and enforces authentication methods (including password structures) for all administrative and user accounts. Additionally, the facility changes all default passwords and ensures that default passwords for new software, hardware, etc., are changed upon installation. In instances where changing default passwords is not technically feasible (e.g., a control system with a hard-coded password), the facility has implemented appropriate compensating security controls (e.g., physical controls).	
8.3 Personnel Security		
Metric 8.3.1 – Criticality Sensitivity Review	The facility has reviewed and established security requirements for positions that permit access to critical cyber systems.	
Metric 8.3.2 – Unique Accounts	The facility has established and enforces unique accounts for each individual user and administrator, has established security requirements for certain types of accounts (e.g., administrative access to the system), and prohibits the sharing of accounts. In instances where users function as a group (e.g., control system operators) and user identification and authentication is role based, appropriate compensating security controls (e.g., physical controls) have been implemented.	
Metric 8.3.3 Separation of Duties	IT management, systems administration, and IT security duties are divided among three different individuals. In instances where this is not feasible, appropriate compensating security controls (e.g., administrative controls) have been implemented.	IT management, systems administration, and IT security duties are not be performed by the same individual. In instances where this is not feasible, appropriate compensating security controls (e.g., administrative controls such as review and oversight) have been implemented.
Metric 8.3.4 – Access Control Lists	The facility maintains access control lists, and ensures that accounts with access to critical/sensitive information or processes are modified, deleted, or de-activated expeditiously for personnel leaving under adverse action and when users no longer require access (e.g., when personnel leave the company, complete a transfer into a new role, or their responsibilities change).	The facility maintains access control lists, and ensures that accounts with access to critical/sensitive information or processes are modified, deleted, or de-activated in a timely manner for personnel leaving under adverse action and when users no longer require access (e.g., when personnel leave the company, complete a transfer into a new role, or their responsibilities change).
Metric 8.3.5 – Third-party Cyber Support	The facility ensures that service providers and other third parties with responsibilities for cyber systems have appropriate personnel security procedures/practices in place commensurate with the personnel surety requirements for facility employees.	
Metric 8.3.6 – Physical Access to Cyber Systems and Information	The facility has role-based physical access controls to restrict access to critical cyber systems and information storage media.	

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Storage Media		
8.4 Awareness and Training		
Metric 8.4.1 – Cyber Security Training	The facility ensures that employees receive role-based cyber security training applicable to their responsibilities on a regular basis and before obtaining access to the facility's critical cyber systems.	The facility ensures that employees receive role-based cyber security training applicable to their responsibilities on a regular annual basis and within a reasonable period of time of obtaining access to the facility's critical cyber systems.
8.5 Cyber Security Controls, Monitoring, Response, and Reporting		
Metric 8.5.1 – Cyber Security Controls	The facility has implemented cyber security controls to prevent malicious code from exploiting critical cyber systems, and applies appropriate software security patches and updates to systems as soon as possible given critical operational and testing requirements.	
Metric 8.5.2 – Network Monitoring	The facility monitors networks in near real time for unauthorized access or introduction of malicious code with immediate alerts and logs cyber security events, reviews the logs daily, and responds to alerts in a timely manner. Network monitoring may occur on-site or off-site. Where logging of cyber security events on their networks is not technically feasible (e.g., logging degrades system performance beyond acceptable operational limits), appropriate compensating security controls (e.g., monitoring at the network boundary) are implemented.	The facility monitors networks for unauthorized access or introduction of malicious code and logs cyber security events, reviews the logs weekly, and responds to alerts in a timely manner. Network monitoring may occur on-site or off-site. Where logging of cyber security events on their networks is not technically feasible (e.g., logging degrades system performance beyond acceptable operational limits), appropriate compensating security controls (e.g., monitoring at the network boundary) are implemented.
Metric 8.5.3 – Incident Response	The facility has a defined 24 × 7 × 365 computer incident response capability for cyber incidents.	The facility has defined computer incident response capability for cyber incidents.
Metric 8.5.4 – Incident Reporting	Significant cyber incidents are reported to senior management and to the DHS's US-CERT at www.us-cert.gov.	
Metric 8.5.5 – Safety Instrumented Systems	Facilities with control systems that have safety instrumented systems (SIS) have configured the SIS so that they have no unsecured remote access and cannot be compromised through direct connections to the systems managing the processes they monitor. *Note: this metric only applies to control systems*	
8.6 Disaster Recovery and Business Continuity		
Metric 8.6.1 – Post-Incident Measures	The facility's alternate facility operations and primary facility recovery/reconstitution phases have cyber security measures consistent with those in place for the original operational functions.	
8.7 System Development and Acquisition		
Metric 8.7.1 – Systems Life Cycle	The facility integrates cyber security into the system life cycle (design, procurement, installation, operation, and disposal). The facility has established security requirements for all systems and networks before they are put into operation, and for all operational systems and networks throughout their life cycle.	
8.8 Configuration Management		
Metric 8.8.1 – Documenting Business Needs	The facility has documented a business need for all networks, systems, applications, services, and external connections.	
Metric 8.8.2 – Cyber Asset Identification	The facility has identified hardware, software, information, and services and has disabled all unnecessary elements where technically feasible. The facility also has identified and evaluated potential vulnerabilities and implemented appropriate compensating security controls.	
Metric 8.8.3 – Network/	The facility has an asset inventory of all critical IT systems and a cohesive set of network/system	The facility has an asset inventory of all critical IT systems.

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System Architecture	architecture diagrams or other documentation including nodes, interfaces, and information flows.	
8.9 Audits		
Metric 8.9.1 – Audits	The facility conducts regular audits that measure compliance with the facility's cyber security policies, plans, and procedures and reports audit results to senior management.	The facility conducts periodic audits that measure compliance with the facility's cyber security policies, plans, and procedures and reports audit results to senior management.

RBPS 9 – Response – Develop and exercise an emergency plan to respond to security incidents internally and with assistance of local law enforcement and first responders.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a documented, comprehensive crisis management plan that details how the facility will respond to security incidents and regularly runs exercises and drills to improve its ability to implement the plan.			The facility has a documented crisis management plan that details how the facility will respond to security incidents and runs exercises and drills to improve its ability to implement the plan.
Metric 9.1 – Comprehensive Crisis Management Plan	The facility has a comprehensive crisis management plan that may include: • Documented agreements and/or written procedures for emergency response, including off-site responder services, such as ambulance support, explosive device disposal support, firefighting support, hazardous material spill/recovery support, and medical support. • Roles and responsibilities for the crisis management team, the incident commander, the on-scene commander, operational control, and timekeeping. • Contingency plans, continuity of operations plan, emergency response plans, evacuation plans, media response plans, notification control and contact requirements, re-entry plans, and security response plans. • Emergency safe-shutdown procedures for critical process units, such as those processing chemicals of interest.			The facility has a comprehensive crisis management plan that may include: • Documented agreements and/or written procedures for emergency response, including off-site responder services, such as ambulance support, explosive device disposal support, firefighting support, and hazardous material spill/recovery support. • Documented emergency response plans.
Metric 9.2 – Communication Systems	The facility has a communications and emergency notification system with emergency backup power and/or an equivalent written contingency procedure in place that is designed, laid out, and constructed to avoid common cause/dependent failures and equipped with redundant signal processing. A typical system includes: • An emergency notification system (e.g., siren or other facility-wide alarm system). • A redundant radio system that is interoperable with law enforcement and emergency response agencies. • Other backup communications systems, such as cell phones or desk phones.			The facility has a redundant communications system and an emergency notification system (e.g., siren or other facility-wide alarm system).

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Metric 9.3 – Process Safeguards	All process units have an automated control system or other process safeguards to rapidly place critical assets in a safe and stable condition and procedures for their use in an emergency. Additionally, all process units have a procedure for safe shutdown in an emergency.
Metric 9.4 – Outreach	The facility has an active outreach program to the community and local law enforcement and emergency responders. Examples of outreach activities include participation in the Local Emergency Planning Committee (LEPC) (where local first responders are LEPC members), Community Hazards Emergency Response-Capability Assurance Process (CHER-CAP) (where local first responders are CHER-CAP members), Buffer Zone Protection Program (BZPP) activities, Neighborhood Watch Programs (where industry and businesses are included in these programs), or participation by the facility in incident response drills and exercises in conjunction with off-site responder organizations.

RBPS 10 - Monitoring - Maintain effective monitoring, communications and warning systems, including:
(i) Measures designed to ensure that security systems and equipment are in good working order and inspected, tested, calibrated, and otherwise maintained;
(ii) Measures designed to regularly test security systems, note deficiencies, correct for detected deficiencies, and record results so that they are available for inspection by the Department; and
(iii) Measures to allow the facility to promptly identify and respond to security system and equipment failures or malfunctions.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a written plan to regularly inspect, test, calibrate, and maintain security systems.			
Metric 10.1 – Inspection, Testing, and Preventative Maintenance (ITPM) Procedures	The facility has written procedures, including responsibilities, tasks, and frequencies, to regularly inspect, test, calibrate, repair, and maintain security systems (e.g., gates, cameras, lights, alarms, keypad entry systems) and related equipment, such as communications and emergency notification equipment. Typically, the facility bases its ITPM process on the tasks and their frequencies identified in the manufacturer's recommendations; where the manufacturer has not made ITPM recommendations, the tasks and their frequencies are based on the operating history of the equipment, its operating environment, the redundancy installed, and other factors as approved by the FSO.			
Metric 10.2 – Outages	Appropriate temporary security measures are implemented in response to nonroutine outages, equipment failures, and malfunctions, and such incidents are documented and promptly reported to the FSO.			
Metric 10.3 – Repairs	The facility has a written plan to record and repair deficiencies in security-related equipment.			
Metric 10.4 – Maintenance Personnel Surety	The facility has procedures to verify the identity and each occurrence of contractor personnel who perform inspection, testing, and maintenance of security equipment (other than resident contractors who are included in the personnel surety program in RBPS 12).			

RBPS 11 - Training - Ensure proper security training, exercises, and drills of facility personnel.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a security awareness and training program for all facility personnel that includes drills and exercises designed to test and improve performance of aspects of the Site Security Plan and its supporting implementing procedures.			
Metric 11.1 – Security Training Program for Security Personnel	The facility has a documented security awareness and training program and a corresponding set of minimum skills and competencies for security personnel, as well as a testing program through which security personnel can demonstrate their ability to perform their security-related tasks in a reliable and effective manner. A typical training program will include such features as: • Training is provided on recognition of a security incident, reporting of a security incident, emergency procedures, and operation of security equipment. • Training is held on a regular basis for security personnel. • Objectives are established for each element of the training plan. • Training records are maintained in accordance with 6 CFR § 27.255(a)(1).			
Metric 11.2 – Security Training Program for Non-Security Personnel	The facility has a documented security awareness and training program for employees and resident contractors who do not have direct security responsibilities, and a testing program through which these employees and resident contractors can demonstrate their understanding of their roles in security. A typical training program will include features such as: • Training provided on recognition of a security incident, reporting of a security incident, emergency procedures, and operation of security equipment.			

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	• Training is held on a regular basis for employees and resident contractors who do not have direct security responsibilities. • Objectives are established for each element of the training plan. • Training records are maintained in accordance with 6 CFR § 27.255(a)(1).
Metric 11.3 – Drills and Exercises	The facility plans and conducts security drills and exercises, which are documented and reviewed for lessons learned, on a periodic basis.

RBPS 12 – Personnel Surety - Perform appropriate background checks on and ensure appropriate credentials for facility personnel, and as appropriate, for unescorted visitors with access to restricted areas or critical assets, including,
(i) measures designed to verify and validate identity;
(ii) measures designed to check criminal history;
(iii) measures designed to verify and validate legal authorization to work; and
(iv) measures designed to identify people with terrorist ties.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	Appropriate background checks have been successfully completed for all individuals (e.g., employees, contractors, unescorted visitors) who have access to restricted areas or critical assets.			
Metric 12.1 – New/Prospective Employees & Unescorted Visitors	All new/prospective employees and contractors, as well as any unescorted visitors, who have access to restricted areas or critical assets have appropriate background checks. Access to restricted areas or critical assets is allowed after appropriate background checks have been successfully completed.			
Metric 12.2 – Existing Employees	All existing employees and contractors who have access to restricted areas or critical assets undergo background investigations in an expedited but reasonable period from the date of the preliminary approval of the SSP. Investigations are repeated for all individuals at regular intervals thereafter.			All existing employees and contractors who have access to restricted areas or critical assets undergo background investigations in an expedited but reasonable period from the date of the preliminary approval of the SSP.
Metric 12.3 – Contents of Background Checks	The background checks are conducted in accordance with documented requirements established by the corporation, facility, or FSO.			
Metric 12.4 – Terrorist Screening	Processes are in place to provide DHS with the necessary information to allow DHS to screen individuals (e.g., employees, contractors, unescorted visitors) who have access to restricted areas or critical assets against the TSDB.			
Metric 12.5 – Audit	The background check program is audited annually.			

RBPS 13 – Elevated Threats - Escalate the level of protective measures for periods of elevated threat.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a documented process for rapidly implementing an increased security posture in response to the elevation of the DHS HSAS threat level and has the ability to carry out that process in a timely manner.			
Metric 13.1 – Procedures	The facility has a written process and procedures for implementing security measures and increasing their security posture during periods of elevated threat to levels commensurate with the elevated threat. These security measures are specified and described in the Site Security Plan (SSP) and tied to the HSAS threat level established by DHS.			
Metric 13.2 – Time Limits	The facility can very quickly achieve the	The facility can quickly achieve the security measures associated with each respective increased HSAS threat		The facility can achieve the security

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	security measures associated with each respective increased HSAS threat level while maintaining the measures already in use during normal operating periods.	level while maintaining the measures already in use during normal operating periods.	measures associated with each respective increased HSAS threat level in a reasonable time period while maintaining the measures already in use during normal operating periods.

RBPS 14 – Specific Threats, Vulnerabilities, or Risks - Address specific threats, vulnerabilities or risks identified by the Assistant Secretary for the particular facility at issue.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has implemented security measures that address any and all specific threats, vulnerabilities, or risks identified for the facility by the Assistant Secretary.			
Metric 14.1 – RBPSs	Measures implemented to address the specific threats, vulnerabilities, or risks meet the metrics for all other applicable RBPSs for the facility.			
Metric 14.2 – Documentation in SSP	Measures implemented to address the specific threats, vulnerabilities, or risks are documented in the SSP.			
Metric 14.3 – Training	All applicable employees have been trained on the measures implemented to address the specific threats, vulnerabilities, or risks in accordance with the facility security awareness and training program.			

RBPS 15 – Reporting of Significant Security Incidents - Report significant security incidents to the Department and to local law enforcement officials.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has a process in place to rapidly and efficiently report security incidents to the appropriate entities (e.g., corporate management, local law enforcement, DHS).			
Metric 15.1 – Reporting Procedures	The facility has written procedures and related personnel training that specifically identify the types of incidents to report, the process for reporting these incidents, to whom these incidents should be reported, and who is responsible for reporting such incidents.			
Metric 15.2 – Whom to Notify	Any detection of a suspicious person, vehicle or device, or facility intrusion alarm triggers an immediate notification of facility security personnel and, if appropriate, local law enforcement and DHS. The facility promptly communicates with authorized law enforcement and DHS subsequent to any verified loss or theft of dangerous chemicals such as chemicals of interest.			

RBPS 16 – Significant Security Incidents and Suspicious Activities - Identify, investigate, report, and maintain records of significant security incidents and suspicious activities in or near the site.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has documented processes and procedures for identifying, investigating, reporting on, and maintaining records of significant security incidents and suspicious activities.			
Metric 16.1 – Investigation Procedures	The facility has written procedures, either in its SSP or elsewhere, and ensures that qualified personnel conduct thorough investigations of significant security incidents and suspicious activities and thoroughly investigate such incidents and activities, including "near misses," to determine their level of threat, any vulnerabilities that were exploited, and what security upgrades, if any, are warranted to reduce security risk.			
Metric 16.2 – Lessons Learned	Lessons learned from security incidents are disseminated to appropriate facility personnel in a timely manner in meetings, by e-mail, or as part of the ongoing security awareness program, depending upon the nature of the incident.			

RBPS 17 – Officials and Organization - Establish official(s) and an organization responsible for security and for compliance with these standards.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility has established one or more officials and an organization responsible for security and for compliance with the RBPSs; and the names, contact information, and responsibilities of such officials are included in the SSP.			

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Metric 17.1 – Owner/Operator Responsibilities	The owner/operator is responsible for defining a security organizational structure in writing that identifies specific security duties and responsibilities.
Metric 17.2 – Corporate Security Officer Responsibilities	The Corporate Security Officer is responsible for coordinating security at a corporate level when a corporation has more than one facility subject to CFATS.
Metric 17.3 – Facility Security Officer (FSO) / Assistant FSO Responsibilities	The Facility Security Officer is responsible for security at the facility, including leading the implementation of the RBPSs on a facility level. The Alternate FSO is responsible for filling in for the FSO when the FSO is unavailable.
Metric 17.4 – Cyber Security Officer	The Cyber Security Officer is responsible for oversight of cyber security issues at the facility. This individual may be the FSO or other individual and may be located at the facility or elsewhere (e.g., corporate headquarters).
Metric 17.5 – Facility Management Roles	The facility plant manager is responsible for ensuring cooperation of facility personnel with the requirements of the SSP and the RBPSs.

RBPS 18 – Records - Maintain appropriate records.

	Tier 1	Tier 2	Tier 3	Tier 4
Summary	The facility creates, maintains, protects, stores, and makes available for inspection by DHS certain records related to its security program.			
Metric 18.1 – Training Records	The facility retains security training records, in paper or electronic format, for at least 3 years. The training records include the date and location of each training session, time of day and duration of each session, a description of the training, the name and qualifications of the instructor, a list of attendees (including each attendee's signature), and the results of any evaluation or testing.			
Metric 18.2 – Records of Drills and Exercises	The facility retains records of drills and exercises, in paper or electronic format, for at least 3 years. Such records include, for each drill or exercise, the date held, a description of the drill or exercise, a list of participants, a list of equipment (other than personal equipment) tested or employed in the exercise, the name(s) and qualifications of the exercise director, and any best practices or lessons learned that may improve the Site Security Plan.			
Metric 18.3 – Records of Security Incidents	The facility retains records of incidents and breaches of security, in paper or electronic format, for at least 3 years. Such records include the date and time of occurrence, location within the facility, a description of the incident or breach, the identity of the individual(s) to whom it was reported, and a description of the response.			
Metric 18.4 – Maintenance Records	The facility retains records of maintenance, calibration, and testing of security equipment, in paper or electronic format, for at least 3 years. Such records include the date and time, name and qualifications of the technician(s) doing the work, and the specific security equipment involved for each occurrence of maintenance, calibration, and testing.			
Metric 18.5 – Records of Security Threats	The facility retains records of security threats, in paper or electronic format, for at least 3 years. Such records include the date and time of occurrence, how the threat was communicated, who received or identified the threat, a description of the threat, to whom it was reported, and a description of the response.			
Metric 18.6 – Audit Records	The facility retains records of audits, in paper or electronic format, for at least 3 years. Such records include, for each audit, a record of the audit, results of the audit, names(s) of the person(s) who conducted the audit, and a letter certified by the covered facility stating the date that the audit was conducted.			
Metric 18.7 – Letters of Authorization	The facility retains all Letters of Authorization and Approval from DHS and documentation identifying the results of audits and inspections conducted pursuant to §27.250, in paper or electronic format, for at least 3 years.			
Metric 18.8 – Correspondence with DHS	The facility retains records of submitted Top-Screens, Security Vulnerability Assessments, Site Security Plans, and all related correspondence with the Department, in paper or electronic format, for at least 6 years.			

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Metric 18.9 – ASP	The facility retains records related to an Alternative Security Program, which is submitted in lieu of a Security Vulnerability Assessment (Tier 4 only) or a Site Security Plan (all Tiers) pursuant to §27.235, for at least 6 years.

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Appendix C – Security Measures and Security Considerations

Throughout this Guidance document, basic information on security measures and security considerations is provided relative to each Risk Based Performance Standard (RBPS) contained in the Chemical Facility Anti-Terrorism Standards, 6 CFR Part 27. The following is a more detailed look at various examples of (1) physical security measures; (2) cyber security measures; and (3) security procedures, policies, and plans that could be used by facilities to address the variety of security risks that they face. Included for each of these three areas is a discussion on the types of measures, procedures, policies, or plans that a facility may want to employ; considerations to have in mind when selecting which measures, procedures, policies, and plans to implement; the RBPSs that a specific measure, procedure, or policy is likely to impact; and additional online resources where more information can be found on specific related topics.

It should be noted that no single measure, policy, or procedure listed below will alone satisfy the security needs of a facility. Rather, effective facility security typically involves the successful integration of a suite of measures, procedures, and policies targeted to the unique risks each facility faces. It should also be noted that no covered facility is required to adopt any or all of the specific measures, policies, or procedures discussed below in order to comply with the RBPSs established by CFATS. Rather, covered chemical facilities are free to include any measures they think appropriate to demonstrate compliance with the RBPSs in their Site Security Plans (SSP) under §§ 27.225(a)(2) and 27.230(a) of CFATS, provided that the Department of Homeland Security determines upon review that the SSP meets the applicable RBPSs and otherwise satisfies the requirements of § 27.225.

Physical Security Measures

A wide range of physical security measures are available to help reduce the risks associated with chemical facilities. Generally speaking, physical security measures are most useful for reducing the risks of direct, physical attacks against the facility. Categories of physical security measures that a facility should consider include (1) perimeter barriers; (2) monitoring and intrusion detection systems; (3) security lighting; (4) and security forces.

Perimeter Barriers

Perimeter barriers reduce the likelihood of unauthorized persons accessing the facility for malicious purposes such as theft, sabotage, or intentional release of chemicals of interest. By securing and monitoring the perimeter of the facility, facility personnel can more easily and effectively control who enters and leaves the facility, both on foot and in vehicles, and are better able to detect, delay,

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defend against, and respond to individuals or groups who seek unauthorized access to the facility. A well-secured perimeter additionally will help to deter intruders from seeking to gain access to the facility or from launching attacks from the area immediately outside a facility's perimeter.

Perimeter barriers provide both physical obstacles and psychological deterrents to unauthorized entry, delaying or preventing forced entry. Perimeter barriers can be used in a variety of ways to restrict the area perimeter and increase overall facility security, including:

- Controlling vehicular and pedestrian access,
- Providing channeling to facility entry-control points,
- Delaying forced entry, and
- Protecting critical assets.

Perimeter barriers generally can be either man-made or natural.

Man-made Barriers

As the name suggests, man-made barriers are those that are manufactured by humans. Typically, man-made perimeter barriers come in three varieties: (1) barriers to humans, (2) barriers to vehicles, and (3) walls. Common examples of all three of these varieties of barriers are contained in Table C1.

Table C1: Common Man-made Barriers

Barriers to Humans	Barriers to Vehicles	Walls

• Barbed wire (on the ground)
• Casehardened chains and locks
• Concertina wire (on the ground)
• Fence
  - Chain link
  - Concrete
  - Metal
  - Vinyl
  - Wood
• Gate
  - Chain link
  - Metal
  - Wood
	• Anti-vehicle cable
	• Beam
	• Berm
	• Bollard
	• Vehicle capture net
	• Cable-beam/cantilever
	• Casehardened chains and locks
	• Drop arm (crash rated)
	• Embankment
	• Fence
	  - Concrete
	  - Metal
	  - Chain link
	  - Vinyl
	  - Wood
	• Gate
	  - Chain link
	  - Metal
	  - Wood
		• Brick
		• Cinder block
		• Metal
		• Poured concrete

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Table C1: Common Man-made Barriers		
Barriers to Humans	**Barriers to Vehicles**	**Walls**
	• Jersey barrier/K-rail • Planter • Slalom or serpentine chicane • Wedge barrier	

Barriers to Humans

Barriers to humans protect critical assets by controlling pedestrian access and delaying or preventing forced entry. The typical human barrier consists of a combination of fencing and gates. Fencing is the most basic first line of deterrence and defense.

The most commonly used man-made human barrier by industrial facilities is chain-link fencing. Chain-link fencing is readily available through a variety of sources and is easily and inexpensively maintained. This type of fence provides clear visibility for security patrols, and is available in varieties that can be installed in almost any environment.

While fencing alone typically is not sufficient at high-risk facilities, its level of effectiveness can be elevated simply by adding barbed wire, razor wire, or other available toppings to increase intrusion difficulty.

Barriers to Vehicles

Vehicle barriers protect critical assets by controlling vehicular access and delaying or preventing forced entry. Barriers typically are placed either along a facility's perimeter to protect it from direct penetration, or arranged in a manner to control and slow traffic as it approaches facility access points.

Vehicle barriers are often given "K Ratings," which indicate the size and speed of vehicle the barrier can be expected to stop. These ratings are based on the kinetic energy represented by the mass of a vehicle and its impact velocity. To be certified with a Department of State "K" rating, a barrier must demonstrate the ability to stop a 15,000–pound (lb) vehicle, with the bed of the vehicle not penetrating the barrier by more than 36 inches (in.). The "K" ratings are:

K4	15,000-lb vehicle impacting at 30 miles per hour (mph)
K8	15,000-lb vehicle impacting at 40 mph
K12	15,000-lb vehicle impacting at 50 mph

Additional information on Department of State (DOS) security measures can be obtained from the DOS Bureau of Diplomatic Security, Physical Security Program, Physical Security Division (DS/PSP/PSD).

Common man-made vehicle barriers include[24]:

[24] http://transit-safety.volpe.dot.gov/security/SecurityInitiatives/DesignConsiderations/CD/ appd.htm.

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- Jersey barriers (or other concrete barriers): Jersey barriers, which were originally designed to serve as highway medians, are concrete barriers specifically designed to impede moving vehicles. These barriers come in a variety of forms, and are available both as premade sets that can be assembled at a facility, or can be cast in place with special concrete-forming equipment. Jersey barriers also are often referred to as K rails.

- Bollards: A bollard is a post made of concrete, stainless steel, aluminum, cast iron, or other durable material, that creates an aboveground obstacle. Bollards can be fixed or retractable. At the high end, bollards are constructed to completely stop most vehicles.

- Chain-link gate reinforcement: Wire ropes are fastened to gates and anchored on either side of the gate. For a relatively weak gate, the reinforcement transfers the force of a vehicle impact to a more substantial anchor system. It can be used on many different gate applications.

- Cable barriers: Cable is fastened to each post with U-clamps and is periodically anchored. The barrier prevents light vehicles from crashing through a standard chain-link fence. One disadvantage is that the cable can be covertly cut when installed along the outermost perimeter.

- Drum and Cable Barriers: Drums are filled with dirt, rock, or concrete and attached by aircraft cable to another drum or fixed object. This typically involves minimal setup time and expense. This can be a cost-effective application since empty storage drums, dirt, and rock are readily available.

- Dragnet: This consists of a chain-link "net" assembly with arresting cables attached to an energy absorber that is attached to the anchor system. In the open position, the dragnet is suspended above the access road. When a vehicle hits the dragnet in the closed (dropped) position, the energy from the impact is transferred through the arresting cables to an energy absorber that brings the vehicle to a controlled stop.

- Removable nuisance barrier: A pipe driven into the ground and fastened with a coil chain is used to channel traffic and create marked isolation zones around sensitive areas, equipment, and buildings. It can be set up and removed quickly and easily.

- Guardrail: Standard highway guardrails or median barriers; cable, W-beam, or box beam guardrails are used as a perimeter barrier. They are not designed to prevent head-on penetrations but can immobilize a lightweight vehicle attempting an intrusion.

- Traffic control island with vehicle barriers: Standard guard post, with two automatic gates, a custom base, platform curb assembly with three pass-throughs, and barrier posts provide protection for security personnel stationed at vehicle entrance.

- Motorized barricade: This refers to a steel barricade that can be deployed to close off vehicle access. Several activation options are possible, such as remote switch or card reader.

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- Hydraulic barricade: Upon major impact, the hydraulic barricade lifting mechanism absorbs the shock. In emergency situations, a steel barricade closes off vehicle access in just one second.

- Electronic barrier gate: Chain-link gates and turnstiles used for vehicle and personnel entrances, electronic barrier gates may be activated by remote switch, numerical code, or card reader.

- Tire-penetrating traffic barrier (one-way tire treadles): A row of steel teeth that are unidirectional, spring-loaded, and embedded in the road. The barrier punctures the tires of an intruding vehicle, while allowing passage of vehicles in the opposite direction.

- Portable roadblock tire-puncturing device: Hollow stainless steel spikes mounted on aluminum scissors action arms expand to stretch across a vehicle access. Anchors hold the scissors in place. The system expands to cover 21 feet (ft) and folds into a case weighing 35 lb. When an intruding vehicle passes over the system, the spikes detach from the aluminum frame and embed into the vehicle's tires. This opens several "tubes," which cause rapid uniform deflation and prevent the holes from sealing. Since the air loss from all tires is uniform, the operator is more likely to maintain control of the vehicle. These devices are most effective against light vehicles with standard 3/4-inch thick rubber tires.

Walls

Walls are one of the most common types of barriers. Various types of walls are used for interior, as well as exterior, security boundary separation. Walls typically play an important part as visual barriers and deterrents. Additionally, depending on its structure, a wall can serve as a human barrier and/or a vehicle barrier.

While exterior walls are typically not as economical as chain-link fencing, the use of exterior walls as barriers is frequently necessary. Walls provide less visibility of storage or secured areas and can be matched to the surrounding architecture and buildings. In addition, some varieties of exterior walls are less climbable, and thus more secure, than security fencing or other barriers that offer hand-holds.

Natural Barriers

Natural barriers can be effective against both human and vehicle penetration and be more aesthetically pleasing than their man-made counterparts. Natural barriers include hills, outcroppings, lakes, ponds, hedgerows, rocks, and timber. They can be naturally occurring or be made by relocating natural materials. Some of the most common natural barriers are vegetation, water, and terrain[25]:

[25] http://transit-safety.volpe.dot.gov/security/SecurityInitiatives/DesignConsiderations/CD/ appd.htm.

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- Vegetation: Vegetation along standoff zone perimeters and on off-road approaches to the perimeters can deter aggressors from approaching the protected facility from that route. Vegetation may also slow the approach of vehicles by providing obstacles to direct approach. Closely spaced plants in multiple, overlapping rows with trunk diameters greater than 5 in. are the best deterrents to vehicles. Perimeter barriers capable of stopping moving vehicles can be integrated with vegetation planted for aesthetic purposes. Because mature plants are the most effective deterrents, the plant material should be provided by retaining existing vegetation where possible.

- Water: The effectiveness of bodies of water used as barriers to moving vehicles has not been quantified, but their value in slowing vehicles and as a deterrent is obvious. Water that is deep enough to submerge the exhaust pipes of vehicles will provide an effective barrier. Lesser depths may only slow vehicles. For example, cars and light trucks will be limited to speeds of approximately 25 mph by large bodies of water only 6 in. deep. Bodies of water 3 ft deep would act as barriers to moving vehicles. If the body of water floor is uneven or contains several deep trenches, the effectiveness as a barrier increases significantly.

- Terrain: Terrain features such as ditches, berms, hills, or large rocks may provide effective barriers to vehicles. Rocks or groups of rocks that have a collective mass equal to approximately twice that of the threatening vehicle make effective barriers. To be effective, rock ditches and berms must span the approach route. Those of lesser extent or too small to stop a vehicle can be used to slow vehicle approach. In designing terrain obstacles, circuitous, off-road approach routes are far more effective than direct routes. As an example, the use of inclines can slow vehicle approaches by limiting the driver's ability to accelerate.

Security Considerations for Perimeter Barriers

The choice of an appropriate barrier is affected not only by the cost of the equipment, installation, and maintenance, but by the more important aspects of effectiveness and functionality. Certainly the highest consideration in an effective boundary measure is its ability to prevent unauthorized penetration. Unfortunately, no one barrier-type provides the security solution to all types of adversaries.

The facility perimeter may be of a number of different designs at various locations due to a variety of natural and operational reasons. A "layered" approach to perimeter barriers and monitoring potentially increases the opportunity to reduce cost and uses existing facility natural features or more applicable technologies to meet the performance objectives.

An owner/operator may wish to consider the benefits and costs related to completely enclosing a large facility footprint within a single perimeter versus implementing multiple, smaller restricted-area perimeters.

The owner/operator may achieve a higher level of security performance by deploying barriers behind the intrusion detection system so that an intruder would activate an alarm sensor before defeating the barrier(s), thereby providing additional time for assessment and response. Barriers located in front of alarm sensors serve to mark property boundaries and may keep people and

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animals from wandering onto a facility, but they provide little or no additional response time because an adversary can usually breach the barrier without activating any intrusion detection sensors.

Access points work best when they permit passage of authorized persons with relative ease. While the number of access points should be kept to a minimum, access points typically are needed for routine maintenance and emergency operations.[26]

Performance Standards Affected by Perimeter Barriers

The implementation of perimeter barriers can have a significant impact in helping a facility achieve RBPSs 1, 2, 3, and 4. Perimeter barriers can also have a smaller or secondary impact on meeting RBPSs 6 and 13.

Additional Resources on Perimeter Barriers

Perimeter Barriers	
RESOURCES	**SOURCES**
Protection of Assets Manual, ASIS International	http://www.protectionofassets.com/ (Access available through: www.asisonline.org)
Chain-Link Fabric Security Fences and Gates, Australian Standard AS 1725-2003, Chainwire Security Fencing Committee.	Available through: www.ansi.org
Chain Link Fence Manufacturer's Institute Security Fencing Recommendations, Chain Link Fence Manufacturers Institute	http://codewriters.com/asites/page.cfm?usr=clfma&pageid=887
"Design Approach," Chapter 3, *Physical Security*, Department of Army Field Manual 3-19.30, January 8, 2001	www.globalsecurity.org/military/library/policy/army/fm/3-19-30/ch3.htm
"Protective Barriers, " Chapter 4, *Physical Security*, Department of Army Field Manual 3-19.30, January 8, 2001	www.globalsecurity.org/military/library/policy/army/fm/3-19-30/ch4.htm
"Security and Force Protection," DRMS-1-4160.14, Vol. 1, Chapter 2, Defense Reutilization and Marketing Service, Defense Logistics Agency	www.drms.dla.mil/publications/4160.14/section1/s1c4.pdf
Electrical Installations – Electric Security Fences, Australian/New Zealand Standard AS/NZS 3016:2002	Available through: www.ansi.org
From Jericho to Jersey Barrier, Richard Kessinger, CPP	http://www.securitymanagement.com/article/jericho-jersey-barrier
Glass In Building. Security Glazing. Testing and Classification of Resistance Against Bullet Attack, BS EN 1063:2000	Available through: www.ansi.org
Introduction to Security, Sixth Edition, Robert J. Fischer, Gion Green, Butterworth-Heinemann, 1998 (ISBN: 0-7506-9860-8)	Available through numerous booksellers online

[26] DHS, Transportation Security Administration, *Recommended Security Guidelines for Airport Planning, Design and Construction*, June 15, 2006

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Navy's Physical Security Equipment Program and Anti-terrorism Services, Antiterrorism and Force Protection Ashore Program (ATFP Ashore)	http://atfp.nfesc.navy.mil/atfp_faq.html
Crime Prevention Through Environmental Design	www.cpted.net
Transit Security Design Considerations, Federal Transit Administration (FTA), Office of Research and Innovation, U.S. Department of Transportation	http://transit-safety.volpe.dot.gov/Security/SecurityInitiatives/DesignConsiderations/CD/front.htm#toc

Monitoring

Security events are monitored through a combination of human oversight and a variety of technical sensors interfaced with electronic entry-control devices, remote surveillance imaging, and alarm-reporting displays. When an event of interest to security is identified, it is either assessed directly by sending persons to that location or remotely assessed by personnel evaluating sensor inputs and surveillance images.

Types of Monitoring

An integrated technical security system frequently includes sensors; CCTV or thermal imaging cameras for assessing alarms; electronic access control; means of transmitting the data; and a reporting system for monitoring, controlling, and displaying information on security events. The owner/operator may wish to consider each of several interrelated elements of the perimeter security system: intrusion detection system, alarm display, video assessment, and system integration.

The owner/operator may consider various display and annotation systems to enhance the efficiency and effectiveness of monitoring the perimeter security system, including:

- Programming a video system controller to perform video functions automatically (e.g., begin video recording at a location when a sensor or alarm is tripped) and record time/location data.
- Using sets of video monitors to display identical information at different locations or different times, providing live and recorded scenes for evaluation.
- Connecting the video controller to a host computer that collects and processes alarm information and stores alarm scenes within milliseconds after the alarm occurs, bypassing and enhancing manual control.
- Attaching the video switcher to a host alarm computer to enhance archiving by recording real-time and alarm playback scenes.
- Using alarm data backup to avoid loss in the event of main computer failure or line cuts between the multiplexers.

Intrusion detection systems provide early warning of unauthorized penetration. Each system consists of various hardware and software elements operated by trained personnel with security responsibilities. The owner/operator may wish to consider locating these functions in a command and control center. Consideration for command and control centers may include merging security monitoring and reporting systems with other systems such as fire engineering reporting systems or

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process control. Technical merger of an active security system and a passive fire system may facilitate a common set of operational procedures (e.g., reporting, training, and emergency response). Intrusion detection, which monitors for attacks, is less a preventative measure than a response measure, although some would argue that it is a deterrent. Intrusion detection has a high incidence of false alarms. In many jurisdictions, law enforcement will not respond to alarms from intrusion detection systems.

The goal of a command and control center is to synchronize the different elements of access control and screening technologies in a centralized location.

Intrusion Detection System

Intrusion detection systems (IDSs) provide early warning of unauthorized penetration. IDSs typically consist of various hardware and software elements operated by trained personnel with security responsibilities. The system triggers an alarm or other notice of an attempted breach, which can be used for activating corresponding cameras or for dispatching personnel to investigate the alarm.

There are limitless possible configurations of IDS components that together satisfy the RBPS for securing and monitoring the facility perimeter. The expectation is that owners/operators will implement and configure a set of security countermeasure components that will meet or exceed the expectations of the RBPSs for the tier-level metric that is applicable to their facility.

As reflected in the Table C2, a wide variety of technical security elements for consideration by the owner/operator can comprise systems that meet the RBPS. These elements generally fall into five categories:

- Fence-mounted sensors,
- Beam sensors,
- Open-area sensors,
- Remote surveillance, and
- Human-based elements.

Table C2: Common Technical Security and Intrusion Detection System Elements

Fence-mounted Sensors	Beam Sensors	Open Area Sensors	Remote Surveillance	Human-based
• "Break wire" sensor • Balanced-pressure line • Buried geophone • Capacitance	• Infrared (IR) break beam • Passive infrared sensors	• Acoustic sensor • Active infrared • Buried line sensors • Intelligent video • Magnetic-field	• CCTV cameras • Thermal imagers • IP Cameras	• Protective forces, dedicated (posted) • Protective force roving patrols • Dedicated operators

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Table C2: Common Technical Security and Intrusion Detection System Elements				
Fence-mounted Sensors	**Beam Sensors**	**Open Area Sensors**	**Remote Surveillance**	**Human-based**
sensor • E-field sensor • Fiber-optic cables • Intelligent video • Magnetic polymer • Ported coaxial cable • Taut wire sensor • Vibration-detection sensors • Video motion detection		sensor • Microwave or volumetric sensors • Monostatic or bistatic sensors • Passive infrared sensors • Photoelectric motion detector • Radar • Vibration detection sensor • Video motion detection		• Local law enforcement

The desired intrusion detection system provides a high probability of detecting and reporting intruders into the restricted area perimeter, and accomplished through a variety of perimeter and critical area protection measures. General principles for consideration include:

- The line of intrusion sensors around the areas to be protected should be continuous.
- Multiple lines of detection achieve protection-in-depth at critical assets.
- Complementary sensors covering the same area but using different means of detection (such as a video camera used in conjunction with an alarm) decrease the probability of defeat.
- Alarm combination and priority schemes enhance system effectiveness.
- Tamper protection on junction boxes and sensor housings minimizes bypass attacks.
- Sensors placed in clear zones (i.e., zones that are not subject to environmental disturbances, such as foliage, birds, squirrels, etc.) have alarms whose validity are more easily assessed and are less prone to nuisance alarms.
- Exterior sensor systems in combination with other perimeter security systems may reduce protective force staff size and the reliance on staffed checkpoints.
- Nuisance alarm rates due to environmental causes (wind, rain, birds, etc.) should be a major consideration for technical applications.

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Control systems can be vulnerable to a variety of attacks. Securing control systems poses significant challenges, including limited specialized security technologies and potentially high cost.[27]

CCTV

CCTV surveillance systems have proven their worth for facility security for more than 40 years. The equipment is relatively inexpensive compared to other means of surveillance, provides detailed images of scenes for positive assessment of what is happening, operates for years with minimal maintenance, and requires minimal operator training.[28]

When CCTV cameras are used, these lighting factors should be considered[29]:

- Color rendering index: Choose an appropriate lamp that has accurate color reproduction.
- Reflectance of materials: Consider the material that will be illuminated and its ability to reflect and transmit light.
- Direction of reflected lighting: Identify whether reflected lighting will assist or interfere with camera operation.

Intelligent Video[30]

Intelligent video originated with motion detection circuits, which detected changes in the characteristic of the video signal in a defined area of the screen known as a "window." An operator could then be alerted to an event as it happened, greatly reducing the need for operators to stare at video monitors for long periods of time. The effectiveness of this technology has improved, especially in digital systems where software has been developed to cope with shadowing, blowing trees, and other environmental effects that created false positive alerts in early systems.

Digital video systems are now able to detect multiple objects in a scene (and exclude areas of the scene) and track objects as they move across the scene.

Security Considerations for Monitoring

Perimeter monitoring system is less a preventative measure than a response measure. Intrusion detection has a high incidence of false alarms.

When electronic components are included in the perimeter monitoring system, the owner/operator may wish to locate alarm reporting devices and video monitors in a command and control center. To increase the reliability of a monitoring system, an owner/operator may elect to deploy multiple interactive, redundant, or sophisticated sensors or countermeasures at high-risk

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[27] Government Accountability Office, *Crticial Infrastructure and Protection: Challenges and Efforts to Secure Control Systems*, March 2004 (GAO-04-354).
[28] DHS, Transportation Security Administration, Recommended Security Guidelines for Airport Planning, Design and Construction, June 15, 2006.
[29] ASIS 2004, Chapter 19 – Security and Protective Lighting.
[30] DHS, Transportation Security Administration, Recommended Security Guidelines for Airport Planning, Design and Construction, June 15, 2006

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locations with the understanding that increased reliability also extends to the functional capabilities of the data-transmission system.

Performance Standards Affected by Monitoring

The implementation of monitoring systems can have a significant impact in helping a facility achieve RBPSs 1, 2, 3, 4, and 10.

Additional Resources on Monitoring

Monitoring	
IDS Sensors, Perimeter Sensors, Line Sensors, IDS Maintenance	
RESOURCES	**SOURCES**
CCTV for Security Professionals, Matchett, Alan, Butterworth-Heinemann, 2003 (ISBN: 0-7506-7303-6)	Available through numerous booksellers online
Assessing the Impact of CCTV, Gill, Martin, and Spriggs, Angela, UK Home Office Research Study 292, Home Office Research, Development and Statistics Directorate February 2005	www.asisonline.org/newsroom/crisisResponse/cctv.pdf
"Electronic Security Systems," Chapter 6, *Physical Security*, Department of Army Field Manual FM-3-19.30, January 8, 2001	www.globalsecurity.org/military/library/policy/army/fm/3-19-30/ch6.htm
"Alarms: Intrusion Detection Systems," Chapter 9, *Effective Physical Security*, Part Two/ Equipment, Third Edition, Fennelly, Lawrence J., Butterworth-Heinemann, 1997 (ISBN: 0-7506-9873-X)	Available through numerous booksellers online
Walk-Thru Metal Detectors for Use in Concealed Weapon and Contraband Detection, Law Enforcement and Correction Standard and Testing Program, National Institute of Justice, NIJ Standard 0601.02, U.S. Department of Justice, January 2003	www.ncjrs.gov/pdffiles1/nij/193510.pdf
Perimeter Security Sensor Technologies Handbook, Defense Advanced Research Projects Agency (DARPA), 1997	www.nlectc.org/perimetr/full2.htm
The Design and Evaluation of Physical Protection Systems, Part Two, Design Physical Protection Systems, Garcia, Mary Lynn, Butterworth-Heinemann, 2001 (ISBN: 0-7506-7367-2)	Available through numerous booksellers online
Unified Facilities Criteria: UFC 4-022-01, *Security Engineering: Entry Control Facilities/Access Control Points* (05-25-2005), U.S. Department of Defense	www.wbdg.org/

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Security Lighting

Security lighting can help to both deter attempts at penetrating a facility's perimeter and assist in the monitoring and detection of any such attempts. Inadequate lighting can make it more difficult to monitor a perimeter and detect attempts to breach the perimeter. Due to the increased likelihood of detection based on appropriate security lighting, maintaining a well-lit facility perimeter also can help deter adversaries from attempting to breach that perimeter. Many different types of security lighting are available for implementation at facilities.

Security Considerations for Security Lighting

When determining if security lighting is an appropriate part of a facility's security posture and what type of lighting to choose, a facility owner/operator should consider factors such as available power sources, grounding, and interoperability with and support to other monitoring and detection systems, such as CCTVs. Local weather and environmental conditions can also significantly affect sensor and lighting performance. For example, certain sensors or other IDS components that have near-perfect detection capabilities during good weather might be subject to unacceptably high levels of false alarms during inclement weather (e.g., fog, rain, wind). Similarly, security lighting that may be considered acceptable during ideal weather conditions may be insufficient during periods of inclement weather. Accordingly, an owner/operator should consider the impact of environmental conditions when making determinations regarding security lighting.

Performance Standards Affected by Security Lighting

The implementation of security lighting can have a significant impact in helping a facility achieve RBPSs 1, 2, 3, and 4 and a smaller impact on achieving RBPSs 6, 7, and 9.

Additional Resources on Security Lighting

Lighting Systems	
RESOURCES	**SOURCES**
"Security Lighting," Chapter 8, *Effective Physical Security*, Part Two, Third Edition, Fennelly, Lawrence J., Butterworth-Heinemann, 1997 (ISBN: 0-7506-9873-X)	Available through numerous booksellers online
Exterior Security Lighting, Section 4.7 of Mil-HDBK-1013/1A, Design Guidelines for Physical Security of Facilities, 1993	assist.daps.dla.mil/quicksearch/basic_profile.cfm?ident_number=54120
Guideline on Security Lighting for People, Property, and Public Spaces, GL-1-03, The Illuminating Engineering Society of North America	www.iesna.org/shop/item-detail.cfm?ID=G-1-03&storeid=1
"The Outer Defenses: Building & Perimeter Protection, Lighting," Chapter 8, *Introduction to Security*, Seventh Edition, Robert J. Fischer & Gion Green, 1998 (ISBN: 0-7506-9860-8)	Available through numerous booksellers online
Lighting Research Center Webpage	www.lrc.rpi.edu/researchTopics/applicationsDesign/securityResources.asp
"Physical Security Lighting," Chapter 5, Department of	www.globalsecurity.org/military/library/policy/army/fm/

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Lighting Systems	
Army Field Manual 3-19.30, *Physical Security*, , January 8, 2001	3-19-30/ch5.htm#pgfId-1024523

Security Forces

Protective forces are often used to enhance perimeter security and provide a means of deterrence, detection, delay, and response. Such forces can be proprietary or contracted, and can be armed or unarmed. Protective forces can be used in a variety of ways, including standing post at critical assets, monitoring critical assets using remote surveillance, or conducting roving patrols on a documented schedule that specifically includes identified targets, processes, or other critical assets. Protective forces may be qualified to interdict adversaries themselves or they may simply deter and detect suspicious activities and call local law enforcement to provide an interdiction.

Security Considerations for Security Forces

No matter how they are deployed, protective forces alone generally do not provide sufficient perimeter security. If a facility employs protective forces, they likely will need to be used in combination with one or more of the other measures listed above to provide an appropriate level of security to meet the Restrict Area Perimeter performance standard.

Depending on the circumstances, joint security details among co-located facilities or facilities sharing common infrastructure may be appropriate.

Performance Standards Affected by Security Forces

The use of security forces can have a significant impact on every RBPS.

Additional Resources on Security Forces

Physical Security	
RESOURCES	**SOURCES**
Protection of Assets Manual, ASIS International	http://www.protectionofassets.com/ (Access available through: www.asisonline.org)
Installation Antiterrorism Force-Protection Planning	http://usacac.leavenworth.army.mil/CAC/milreview/download/English/MarApr02/flynn.pdf
Terrorism Knowledge Base, National Memorial Institute for the Prevention of Terrorism Web site	www.tkb.org/Home.jsp
DoD Minimum Antiterrorism Standoff Distances for Buildings, UFC 4-010-10	http://www.acq.osd.mil/ie/irm/irm_library/UFC4_010_01-31JUL2002.pdf
Effective Physical Security, Part One: Design, Second Edition, Lawrence J. Fennelly	Available through numerous booksellers online
Force Protection 2001, National Defense University	www.jfsc.ndu.edu/library/publications/bibliography/force_protection.asp
Introduction to Security, Part III – Basics of Defense, Seventh Edition, Robert J. Fischer, Gion Green, Butterworth-Heinemann, 1998 (ISBN: 0-7506-9860-8)	Available through numerous booksellers online
Risk Analysis and the Security Survey, James F. Broder, CPP,	Available through numerous booksellers online

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Second Edition	
Risk Management for Security Professionals, Carl A. Roper (ISBN 0-7506-7113-0)	Available through numerous booksellers online
Securing the Ports of NY & NJ, Submitted by Steven's Institute of Technology	www.stevens.edu/main/home
The Design and Evaluation of Physical Protection Systems, Mary Lynn Garcia, Sandia National Laboratories	Available through numerous booksellers online
Unified Facilities Criteria, DoD Minimum Antiterrorism Standards for Buildings, UFC 4-010-01, July 31, 2002	www.tisp.org/files/pdf/dodstandards.pdf
American Chemistry Council Guidance on Conducting Contractor Background Checks	www.responsiblecaretoolkit.com/pdfs/Background.pdf
Guide to Background Checks, Illinois Association of Chiefs of Police	www.integrasecurity.org/GuideMay2004.pdf
"The Outer Defense, Building and Perimeter Protection," Chapter 8, *Introduction to Security*, Seventh Edition, Robert J. Fischer & Gion Green	Available through numerous booksellers online
Design Guidelines for Physical Security of Facilities, Mil-HDBK-1013/1A, December 15, 1993	http://www.wbdg.org/ccb/NAVFAC/DMMHNAV/1013_1a.pdf
Specific Countermeasures at USCG webpage	http://homeport.uscg.mil/mycg/portal/ep/channelView.do?channelId=-18389&channelPage=/ep/channel/default.jsp&pageTypeId=13489
Vehicle Inspection Checklist and other related documents available on the *Technical Support Working Group* Web site	www.tswg.gov
Handbook of Information Security Management, The CISSP Open Study Guides Web Site	www.cccure.org/Documents/HISM/ewtoc.html
United Facilities Criteria (UFC) Security Engineering: Entry Control Facilities/Access Control Points, U.S. Department of Defense, May 2005, UFC-4022-1	www.wbdg.org/ccb/DOD/UFC/4_022_01.pdf
Government Emergency Telecommunications Service, National Communications System (NCS) 2004	http://gets.ncs.gov/

Cyber Security Measures

A wide variety of policies, procedures, and measures are available for helping secure a facility's cyber system from attack or manipulation. They include: (1) security policy, (2) access control, (3) personnel security, (4) awareness and training, (5) monitoring and incident response, (6) disaster recovery and business continuity, (7) system development and acquisition, (8) configuration management, and (9) audits.

Types of Cyber Security Measures

Security Policy

Security policies, plans, and procedures. A typical starting point for any cyber security program is the documentation of policies, plans, and procedures, all of which are related but serve distinctly different purposes:

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- A *policy* is the highest level document that states what a company, group, or department will and will not do. An example of a policy is a document that states, "All data will be secure," "Change management processes will be followed for all projects," "Systems with a high availability rating will be online 99.999% of the time" or "IT security will be effectively managed on all systems including access control and business systems."
- A *plan/process* is the document that describes a methodology for achieving the policy's goals. An example of a plan document might be a System Security Plan that makes statements such as, "All public facing web servers use Secure Sockets Layer (SSL) certificates with mandatory 128-bit encryption" or "all systems perform nightly incremental backups and weekly full backups."
- A *procedure* is a set of step-by-step instructions for executing an action. A procedure document will detail steps and contain statements such as, "Step One: order SSL certificate from Vendor X. Step Two: Install certificate on web server. Step Three: Test using multiple web browsers." A procedure will often go into even greater detail by stating exactly which options to choose and what buttons and options to physically select to accomplish the goal.

Security policies, plans, and procedures that specifically address operational constraints, sensitivity issues, and processing environment issues can be addressed in general information technology (IT) documentation or specified in their own dedicated documentation. Given the unique security considerations surrounding control systems, facilities may want to develop policies, plans, and procedures specific to control systems.

Formal change management process. A change management process is a process outlining the steps an organization will take to request, evaluate, plan, implement, and measure the impact of a change to a system. Good cyber security calls for a formal change management process that is both documented and distributed to relevant parties. Without a defined process that takes into account policy mandates, security concerns, business impact, authorization, and oversight, changes can weaken the stability and security of a system. A cyber change management process ensures the most effective and efficient application of network and system updates, reduces the likelihood of the introduction of malicious code, and reduces the chance of human error.

Generally, monitoring of changes is carried out through a formal cyber change management process which should have documents outlining the entire change process, including testing prior to the introduction of new or changed components into the operational environment. In addition to procedural documents, audit logs often are kept to document who made changes to what and when.

Formal designation of a cyber security officer. Formally designating an individual to be responsible for cyber security helps establish management support for cyber security as well as providing direction, accountability, and oversight for cyber security. Examples of qualified cyber security individuals include:

- Chief Information Officer,
- Information Technology Cyber Security Specialist,

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- System Administrator, and
- Certified Information Systems Security Professional.

Access Control

Verifying and managing external connections. Understanding and managing connectivity — that is, the possibility of transferring data electronically (e.g., through external access such as a wireless connection or portable cyber equipment such as flash drives) — is an essential component of cyber security. Because cyber vulnerabilities can be exploited in many ways, connectivity is not as simple as whether or not a wired connection to the Internet is openly in use. Network back doors exist in the form of wireless connections, modems, and portable electronic devices and media such as laptop computers, personal digital assistants (PDAs), universal serial bus (USB) drives, compact disks (CD), and floppy disks. Only by verifying external connections through the use of network tools designed for this purpose can managers be certain of the security environment of their systems and networks.

It is also good cyber security practice for all external connections to/from critical systems to have a documented business need and for organizations to have a policy that no new connections can be established without management authorization and documentation. Examples of external connections to a system or network are modems used to dial in for maintenance or to access data; connections between control systems and business systems; or Internet accessible nodes like firewalls, routers, mail servers, web servers, and Domain Name System (DNS) servers.

A common misconception regarding connectivity is that if an organization does not subscribe to an Internet Service Provider, it is not connected (often referred to as "air gapped"). Often ignored are wireless devices not visibly plugged in (e.g., wireless LAN, wireless sensors, and wireless cameras) and modems that may or may not be enabled all the time, and may or may not be under the control of the organization (e.g., vendor provided). Testing (i.e., scanning) is the only effective way of detecting these unseen connections. Employee actions, including the use of portable devices and/or media, can be as effective a means of connecting to internal assets, systems, and networks as an Internet connection.

The "least privilege" concept. The concept of "least privilege" means that people are granted only as much access as they need to perform their assigned job function and no more. Examples of the least privilege concept in action include allowing only appropriate personnel to access proprietary business data or allowing only systems administration personnel access to system-level files and permission to grant access rights to other users.

Password Management. Managing passwords is a key component of a good cyber security program. Successful password management includes immediately changing all default passwords provided with any systems or applications and establishing appropriate parameters and rules that for password structure.

Default Passwords. Most systems and applications are installed with a factory default password that needs to be changed. If default passwords are not immediately changed, unauthorized individuals familiar with a product may be able to access it. This is especially true because default passwords are often posted on Web sites. Typical systems and applications with default passwords include firewalls, programmable switches, major application installations, and routers. Some applications,

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such as database software, often contain multiple default passwords. Administrators unfamiliar with the product may change only one password without realizing that additional passwords need to be reset. Accordingly, good cyber security practice includes ensuring that all default passwords are changed for every system and application that a facility possesses.

Password Structure. There are many parameters and rules that can be applied to a password structure. Typical rules focus on the structure of the password (e.g., passwords must be at least seven letters and have at least one uppercase and one lowercase letter) and the frequency of password changes (e.g., requiring a user to change his or her password every 90 days). It is important to find an appropriate balance between complexity and frequency of change, and the associated business needs and practicality. Larger passwords requiring special characters are more secure, but harder for users to remember. Regardless of what password structure is chosen, the system should be structured so that all passwords meet the mandated attributes before they are accepted. Likewise, if a facility requires its employees to change passwords every 90 days, the system should track timeframes, remind users when it is time to change their password, and enforce the change.

Proper configurations to limit access. Business and control networks often are connected for efficiency or economy, or because common or public networks are used for communications or as integral parts of the larger system. Unfortunately, this opens the control systems network to the vulnerabilities of the general business infrastructure, including the Internet—issues for which they were not designed, and often are not managed. Firewalls can be used to control access, but most firewalls common in the industry today do not inspect for valid control system protocol contents, thus making the firewall an ineffective barrier between the systems. Firewalls utilized in control system environments should support, understand, and filter control system specific protocols (e.g., Intercontrol Center Communications Protocol (ICCP)). Other methods exist for configuring networks to limit access to control systems (e.g., segregating business and control networks), but this may affect efficiency or economy and should be considered as part of a joint business/security decision.

Rules governing interconnections. Many systems are interconnected. A good cyber security posture typically includes rules governing interconnections, especially when these connections are to components outside of the organization's direct control. This includes ensuring that remote connections to all control systems, components, and devices are addressed, including remote terminal units (RTUs), programmable logic controllers (PLCs), and end-unit devices (actuators, sensors, valves, etc.).If Company A has an open connection to Company B, Company A is only as secure as Company B.

Personnel Security

Role-based access rights. It is a good cyber security practice to review all roles to determine what types/levels of sensitive materials someone filling that role is allowed access to. Assigning a "high," "medium," or "low" rating to a role is a standard labeling process, and can be very useful as long as those terms are well defined for the business. An example would be a rating of "high" for system administrators.

Additionally, although people often fill multiple roles within an organization, each role and its related security needs should be defined and separated. This allows for natural checks and balances, which is key for preventing human error and internal misuse of systems and information.

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Two roles that a facility should strongly consider separating are the IT Security and Systems Administrator, as they often have natural conflicting goals (more secure vs. faster or more efficient). When both roles are assigned to the same individual, organizations are left with the potential for a conflict of interest. For the highest risk facilities, it is often good to have separate individuals in charge of IT Management, IT Security, and System Administration. For lesser risk facilities, simply separating the System Administrator and the individual in charge of IT security should suffice.

Providing individual user accounts. When accounts are shared among multiple individuals, it cannot be determined which user is responsible for a given action. Additionally, if a security breach occurs, it can be difficult to identify the source of that breach if it comes from a shared account. Accordingly, providing individual user accounts where technically feasible is good cyber security.

The most common violation of this basic security rule is found with the administrator account on a given system, particularly with the root account on UNIX systems. Although each user and/or administrator may have their own account, it is often more convenient to log in using the default administrator account to perform maintenance and other activities. When this account is shared and a problem with the system or with missing data arises, it can be impossible to identify who is accountable. Another example of this practice occurs in control systems environments that operate on a 24/7 schedule. A user may log in at the beginning of their shift and leave their account logged in after they have left and the next shift has taken over, or a group account may be used.

In some control systems environments, it may be standard practice to use a single group account for multiple users. Management may make a risk-based decision to allow this practice; however, the risk associated with that decision should be managed with other security controls.

Managing changes in roles. Actively managing access for changing roles of employees (e.g., termination, transfer, demotion) ensures that only appropriate access is allowed. Immediate review of all role changes is recommended. For all employees who have departed under adverse circumstances, however, it is recommended that all access rights (both physical and electronic) be revoked by close of business the same day. This includes immediate revocation of system and application accounts, e-mail access, keys, keycards, and all other credentials immediately upon termination of an employee, without exception.

Managing external service providers. External service providers, business partners, and vendors could potentially present risk to an organization's cyber security. Ensuring that partner organizations subject their personnel to security requirements acceptable to you if they are to have access to your facilities, systems, information, and intellectual property is good cyber security. Common tools to manage this include memoranda of agreements, nondisclosure agreements, confidentiality agreements, and conflict of interest agreements.

Awareness and Training

The human component is often the most vulnerable aspect of a system. As a result, a good cyber security program generally involves making system users aware of the need for security and instructing them on their role in keeping the cyber system secure. A documented cyber security

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training program, which establishes types and frequency of training, is the best way to accomplish this. Cyber security training can include group briefings, online instruction, or written policy and procedure reviews. Basic topics that a facility may want employees to be trained on include:

- General company policy review,
- Roles and responsibilities,
- Password procedures,
- Acceptable practices, and
- Whom to contact and how to report suspected inappropriate or suspicious activity.

Training is most effective when refreshed and reinforced on a predetermined schedule and when training courses are updated to reflect the changing threat and vulnerability environment. An effective training program may provide for different training regimens appropriate for employees with different roles. For example, system administrators typically need more training than standard users because of their access to highly sensitive material. Also, training for personnel requiring access to proprietary information is not necessarily warranted for all employees.

Monitoring and Incident Response

Computer Emergency Response Function. Incident response is an important part of a comprehensive cyber security program. A good cyber security program typically will include a defined Computer Emergency Response function that can be contacted in the event of a cyber emergency and that is specially trained to identify, contain, and resolve a cyber intrusion, denial of service attack, virus, worm attack, or other cyber incident.

Network Monitoring. Facilities monitor networks for unauthorized or malicious access to maintain situational awareness and mitigate risk. An intrusion detection system (IDS) can be used to monitor networks. An IDS is a system designed to capture network or host traffic, analyze it for known attack patterns, and take specified action when it recognizes an intrusion or attempted intrusion. An IDS can be software or hardware and can be network-based (i.e., captures and analyzes all network traffic) or host-based (i.e., installed on, and analyzing traffic for, a single device). Hardware solutions are more suitable for larger volumes of data. There are several open-source IDS applications available for free download. For best results, IDS utilized in control system environments should understand control system traffic and protocols and should detect unusual or unexpected control systems traffic.

Event recognition and logging. Recognizing and logging events and incidents is critical to overall system and network security. Recognizing security events for what they are and making management aware of the incidents and their potential for harm is a critical element in obtaining the appropriate support and resources to effectively manage cyber security, thus limiting the damage from future cyber attacks. The actions of logging incidents and frequently reviewing the log files help ensure that threats to system security are addressed promptly, stability is maintained, and systems are operating at maximum efficiency. Administrators use log files to understand typical system behavior and how it will vary before and during an incident. Good cyber security includes scheduled log reviews and maintenance of evidence that they were reviewed. An automated review of log files is most desirable as it is done continuously, while a manual review is a laborious process.

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Watch-dog Systems. Watch-dog systems are systems that take action when something goes wrong on the cyber system, typically providing interlocks or responses to prevent or mitigate catastrophic events and/or consequences of a cyber attack. A safety watch-dog system is an independent system implemented for the purpose of taking a process to a safe state when predetermined conditions are violated. Examples of watchdog systems include Safety Instrumented Systems (SIS) and Plant/Reactor Protection Systems.

Recently, the trend has been toward networking these systems with the control systems they stand to protect. By doing this, the watch-dog systems are subject to the exploitation of the same vulnerabilities. In order to ensure that watchdog systems are available and functioning as expected, these systems should be separately secured. One way to do this is through a firewall that recognizes control and watch-dog system protocols, thus effectively separating both systems.

Many events are low order and do not rise to the level of reporting to management. These are typically events that are handled appropriately by firewalls. Those that get by or that do damage need to be reported to management. The more severe the damage, the higher the reporting should be.

Malicious Code Prevention. Viruses, worms, Trojan horses, and other malicious software code proliferate on the Internet and mutate on an unpredictable basis. Malicious code is so common that without automated protection it is a near certainty that systems will be infected. Even in the absence of Internet access, malicious code can be introduced to an organization through actions (even unintended) of employees, support personnel, vendors, and business partners. Antivirus software can be implemented on a facility's system when architecture and application permit it, and such software should be updated (after appropriate testing) on a regular basis.

For control systems where system architectures or operational requirements may not permit the use of antivirus software, layered defenses can be used to prevent the events or intrusions from reaching vulnerable control systems.

With the prevalence of e-mail-borne viruses and other spam messages including malicious software attachments, it is best practice for owner/operators to filter e-mail attachments (e.g., executable files) for control systems that have e-mail and apply some level of filtering that will remove attachments with dangerous file extensions. Filtering of e-mail attachments can be done at either the individual workstation or more effectively at the e-mail server that routes all messages to recipients. Examples of files known to have the ability to propagate worms and viruses are ".exe," ".zip," and ".jpg."

Disaster Recovery and Business Continuity

A good cyber security posture typically also includes Continuity of Operations Plans (COOP), IT Contingency, and Disaster Recovery Plans for its critical cyber assets, all of which incorporate cyber security considerations during contingency operations and recovery/reconstitution activities. As recovery operations (i.e., those operations addressed in COOP, IT Contingency, and Disaster Recovery Plans) are often done under pressure, systems often are vulnerable when they are underway, and thus it is important to consider cyber security during such operations. Examples

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would include ensuring that cyber security best practices are followed when setting up an alternate system or network and when rebuilding and reconfiguring the primary systems and networks.

System Development and Acquisition

Integrate cyber security into development life cycle. Including cyber security throughout the development life cycle, from system design through procurement, implementation, operation, and disposal, is good cyber security. By integrating system security into the existing development life cycle, a facility can ensure that money is budgeted, personnel are designated, and requirements are gathered for security at appropriate times rather than after it is inconvenient, prohibitively expensive, or impossible.

One example of incorporating cyber security into the development life cycle is having statements and steps to follow regarding cyber security in developmental plan documents. For instance, during a requirements gathering phase, cyber security may be a foundation issue; all system design changes consider the impact on cyber security before being approved and during implementation; and critical or sensitive information is cleansed from systems prior to disposal or redeployment.

Configuration Management

Maintain inventory of cyber infrastructure: Maintaining a current inventory of the components of a cyber infrastructure has numerous benefits, including supporting the locating, tracking, diagnosing, and effective maintenance of cyber assets.

Examples of items to be inventoried include internet access points, Web sites, VPNs, gateways, routers, firewalls, wireless access points, modems, vendor maintenance connections, Internet Protocol (IP) address ranges, RTUs, PLCs, access control systems, CCTV systems, private branch exchange (PBX) telephone systems, alarm systems, fire control systems, radios, wireless devices, servers, proxies, workstations, and printers. For control systems, inventory of internal network nodes may also want to include IP-enabled field controllers and field devices.

It is a good idea to inventory all external communications media and components, including modems, network configurations (e.g., Ethernet, token ring, ATM, Sonet), dial-up modem lines, point-to-point leased lines, wireless (e.g., 802.11 standard wireless local area network, Bluetooth, satellite, microwave), and Voice Over Internet protocol (VoIP), as each component must be known in order to be secured. Because external communications media and components can be used not only for remote connections, but also by vendors for remote maintenance, they have the potential for allowing individuals unknown to system operators or beyond their control (even sometimes outside of the range of phone lines in use by the company, thus masking them from normal efforts to detect and manage) to have access. If not identified and properly managed, these components can leave systems open to vulnerabilities.

Documenting business needs. It is good cyber security practice for all applications and services (e.g., operating systems, databases, e-mail, office applications, Internet browsing, VoIP) to have a documented business need and for organizations to ensure that no new applications or services can be installed or enabled without management authorization and documentation where technically feasible.

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Regular patches and updates. As new vulnerabilities are discovered in operating systems and software applications, patches and other updates are released to deal with them. Updating systems and networks with these patches should be done on a scheduled basis and should follow a documented procedure. The complex nature of systems and networks occasionally introduces secondary vulnerabilities in an attempt to remedy another. Regular updates ensure that these also are countered in a timely and effective manner. The most common example of this is the regular releases of security patches for operating systems by software vendors.

Audits

Audits are generally considered essential to maximize the effectiveness of the cyber security measures that have been put in place. Facilities with strong cyber security programs typically will report the results of audits to senior management so that findings can be understood and agreed upon and mitigated with management support. If planned properly, audit requirements and assessments can be established that minimize the risk of disruption to business processes. A regular program of IT audits typically will involve the development of a schedule; checklists for use during the audits; procedures for carrying out audits; and recording, analyzing, and reporting findings.

Security Considerations for Cyber Security Measures

Potential Off-site Aspect of Cyber Security

Given the nature of today's information technology environment, it is not unusual for IT equipment, IT data, or even IT staff to be located off-site. For instance, corporations with multiple facilities may keep central data servers and processing units in a single location at one facility, may have cyber security officers and other cyber staff located only at corporate headquarters, and may have backup data stored at facilities managed by third parties. End users connected to a facility's cyber system may be scattered not only across the country, but even outside of the United States. As a result, facility cyber security often is not limited to the physical location of the facility itself. Good cyber security practices include a facility taking a holistic view of all its cyber assets, be they equipment, people, or data, and be they located on-site, at corporate headquarters, or elsewhere.

Interconnectivity of Critical and Seemingly Noncritical Systems

Often, all of a facility's cyber systems will be interconnected in one form or another. As a result, some seemingly noncritical systems may warrant additional security attention as they are a potential avenue for access to the more critical systems that they are connected to. When analyzing the security posture of a critical system, it is important to identify all systems that are connected to it and review their security as well, as many times the security of the system is only as strong as its weakest link.

Impact of Risk Drivers

Much like in the world of physical security, the facility characteristics driving the risk have a great deal of impact on the appropriate cyber security posture for a facility. For example, if the facility is high risk due to a release hazard, it likely needs to focus cyber security on its process control systems, as well as those cyber systems that assist in controlling access to the facility. However, if

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theft/diversion is the risk driver, then securing cyber business systems to ensure shipments and customers are proper may be more important than securing the process control systems.

Physical Security for Cyber Assets

Cyber systems can be compromised not only electronically but physically. Protecting a server with an ID and password is not enough if someone can simply reach out and unplug it, or worse, pull a hard disk drive with sensitive data out of the machine and put it in their pocket. Accordingly, physically protecting critical cyber assets is typically a key component of a comprehensive cyber security program.

Marking and otherwise restricting specific physical areas in a facility can greatly improve security, as can guarding access to backup media and other external copies of data, especially when combined with a role-based security model through which all personnel know exactly where they are and are not allowed. Also beneficial are measures to ensure that only authorized individuals are able to physically access sensitive IT areas, such as control rooms, LAN and server rooms, wiring closets, and workstations operating sensitive applications (e.g., access control or CCTV monitoring software).

Some examples of tools used to physically restrict access include electronic access control, cipher locks, physical keys, visual control, and policy. Electronic access control is the most effective, followed by cipher locks, physical keys, and visual control. Developing only a policy is the least effective but is still more desirable than having no controls. Suitability reviews and job assignment can be used to help identify which staff is granted access to certain restricted areas, equipment, and information. It is also a good practice for facilities to ensure that restricted IT areas cannot be accessed by going over or under the building's internal partitions such as via low-hanging panel ceilings or raised floors. Sensitive IT areas are best protected when bordered by true floor to true ceiling walls. Alternately, areas above the ceiling or below the floor may be secured by wire partitions and/or alarmed to detect/prevent intrusion.

Layered Security

Completely adequate protection is rarely achievable solely through implementing a single security measure. Rather, the optimal security solution typically depends upon the use of multiple countermeasures providing layers of security for protection. This may include not only the layering of multiple physical protective measures, but also the effective integration of physical protective measures with procedural security measures, including procedures in place before an incident and those employed in response to an incident.

Managing External Service Providers

External service providers, business partners, and vendors could potentially present risk to an organization's cyber security. Good cyber security includes ensuring that partner organizations subject their personnel to security requirements acceptable to you if they are to have access to your facilities, systems, information, and intellectual property. Common tools to assist in this include memoranda of agreements, nondisclosure agreements, confidentiality agreements, and conflict of interest agreements.

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Performance Standards Affected by Cyber Security Measures

Cyber security measures have the most direct impact on RBPS 8. Cyber security measures can secondarily impact RBPSs 5, 6, 7, and 10.

Additional Resources on Cyber Security Measures

Information and Cyber Security	
RESOURCES	**SOURCES**
CERT: Preventing Insider Sabotage: Lessons Learned from Actual Attacks, Dawn Cappelli, November 14, 2005, Carnegie Mellon University	www.cert.org/archive/pdf/InsiderThreatCSI.pdf
Cert-Coordination Center Survey Site-Index	www.cert.org
Computer Incident Advisory Capability , U.S. Department of Energy, Office of Cyber Security	www.ciac.org/ciac/index.html
Computer Security Resources, U.S. Computer Emergency Readiness Team	www.us-cert.gov/resources.html
Cyber Security Alerts, U.S. Computer Emergency Readiness Team	www.us-cert.gov/cas/alerts/
Defense Information Systems Agency	www.disa.mil/main/prodsol/index.html
Effective Physical Security, Part Two, Equipment, Third Edition, Fennelly, Lawrence J., Butterworth-Heinemann, 1997 (ISBN: 0-7506-9873-X)	Available through numerous booksellers online
Incident Management, Carnegie Mellon University	https://buildsecurityin.us-cert.gov/portal/article/bestpractices/incident_management/overview.xml
Federal Financial Institutions Examination Council's (FFIEC) Information Security	www.ffiec.gov/ffiecinfobase/booklets/information_security/infosec_toc.htm
Insider Threat Study: Computer System Sabotage in Critical Infrastructure Sectors, National Threat Assessment Center, U.S. Secret Service	www.cert.org/archive/pdf/insidercross051105.pdf
NIST Special Publication 800-30: Risk Management Guidelines for Information Technology Systems, Computer Security Division, National Institute of Standards and Technology	http://csrc.nist.gov/publications/nistpubs/800-30/sp800-30.pdf
NIST Special Publication 800-53: Recommended Security Controls for Federal Information Systems, Computer Security Division, National Institute of Standards and Technology	http://csrc.nist.gov/publications/nistpubs/800-53-Rev1/800-53-rev1-final-clean-sz.pdf
NIST Special Publication 800-82: Guide to Industrial Control Systems (ICS) Security, Computer Security Division, National Institute of Standards and Technology	http://csrc.nist.gov/publications/drafts/800-82/draft_sp800-82-fpd.pdf
Guide to ISA-99 Standards Manufacturing and Control Systems Security, the International Society of Automation	http://www.isa.org/Content/Microsites988/SP99,_Manufacturing_and_Control_Systems_Security1/Home964/Guide_to_the_ISA-99_Standards.pdf
Safeguarding Your Technology. Practical Guidelines for Electronic Education Information Security, National Center for Education Statistics	http://nces.ed.gov/pubs98/safetech/index.asp
Examples of Policies for Information/Cyber Security, SANS Institute, Security Policy Projects	www.sans.org/resources/policies/
Handbook of Information Security Management, The CISSP Open Study Guides Web Site	www.cccure.org/Documents/HISM/ewtoc.html

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The National Strategy to Secure Cyberspace	www.whitehouse.gov/pcipb/
The Security Portal for Information System Security Professionals, Information/Links & Suppliers for Network Security	www.infosyssec.com/infosyssec/physfac1.htm
Window Security.com, Articles and Tutorials	www.windowsecurity.com/articles_tutorials/

Security Procedures, Policies, and Plans

An effective facility security posture will incorporate a wide variety of security procedures policies, and plans. These procedures, policies, and plans typically will detail how a facility performs a myriad of security related tasks, including: (1) Inventory Controls/Product Stewardship; (2) Managing Control Points; (3) Screening; (4) Personnel Surety/Background Checks; (5) Exercises and Drills; and (6) Training.

Inventory Controls/Product Stewardship

Product stewardship is a term used to describe a product-centered approach to protection of potentially dangerous chemicals, calling for manufacturers, retailers, and consumers to share responsibility for reducing the potential for theft, contamination, or misuse of such chemicals. Voluntary product stewardship activities have been taking place within the chemical industry for many years, so inclusion as a component of the CFATS is the natural evolution of recommended business practice.

Types of Inventory Controls/Product Stewardship

Inventory controls can be used to track, for example, chemicals of interest at covered facilities from single stockrooms to large, multi-site enterprise environments. Inventory control systems may differ in many respects, but generally could include the following elements:

- Lists all the chemicals of interest at the facility;
- Provides tracking of the quantity and the physical location of each chemical;
- Monitors use by authorized personnel;
- Allows generation of reports listing chemicals of interest by location, vendor, name, etc.;
- Provides container-based tracking of multiple lots, vendors, and sizes;
- Tracks disposal and maintains a record of disposed containers;
- Includes purchasing/receiving record for materials management; and
- Is linked to MSDS information.

Security Considerations for Inventory Controls/Product Stewardship

A properly utilized inventory control system can provide not only a level of security for COI, but in most cases also can offer a financial benefit to the company by limiting interruptions in production due to lack of material or loss of sales due to limited stock. A good inventory control system will take into account raw materials, in-process or semi-finished materials, and finished goods ready for sale or transport.

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A facility may want to consider limiting access to areas where potentially dangerous chemicals are stored to authorized personnel only as a means of inventory control and may want to implement a system that requires anyone entering an area where such chemicals are stored to both sign in and sign out.

Physical barriers, such as fences and vehicle barriers may also be utilized as an effective means of inventory control. For example, by physically blocking access to an area where theft COI are stored a facility owner/operator can achieve a higher level of security related to that COI.

Maintaining quality records of sales, deliveries, and transfers can assist an owner/operator in maintaining control over the inventory. As part of maintaining accurate records an owner/operator may find it helpful to conduct regular on-site counts of all materials stored in a facility. By conducting regular counts the owner/operator effectively controls inventory and is aware at any given time of the quantities of COI on-site.

Performance Standards Affected by Inventory Controls/Product Stewardship

The implementation of inventory controls/product stewardship can have a significant impact in helping a facility achieve RBPSs 1, 2, 3, 4, 5, 6, and, to some extent, 10.

Additional Resources on Inventory Controls/Product Stewardship

INVENTORY CONTROL SYSTEMS	
RESOURCES	**SOURCES**
Railroad Commission of Texas Case Study : Case study on the Benefits of Implementing an Inventory Control System	www.rrc.state.tx.us/divisions/og/key-programs/ogkwchgo.html
Inventory Control Overview and Ideas, U.S. Small Business Administration	www.ct-clic.com/Newsletters/customer-files/inventory0602.pdf

Managing Control Points

Control points, screening, and parking security measures (in conjunction with other types of security measures) are the preferred and recommended solution to provide proper access control and meet the performance standards of the Access Control and Screening RBPS. Control points, screening, and parking security measures could be implemented to meet the Access Control and Screening RBPS to address approach, denial, personnel identification, hand-carried items inspection, vehicle identification, and vehicle inspections (Table C3).

Because control systems are not self-administering, they should be periodically tested and policed. A typical procedure is the vulnerability test, or "created-error" check, in which an error or breach, such as an erroneous invoice, is deliberately planted in the system to see if it is detected and reported.

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Table C3: Control Point Considerations	
Approach	**Denial**
• Traffic Calming – Reduce the speed of incoming vehicles (all Tiers) - Road alignment (circle, serpentine) - Drop-in or retractable bollards (to cause serpentine traffic flow) - Barriers (all Tiers) □ Bollards □ Jersey Barriers or K-Rails - Speed bumps, tables, or serpentine approach (all Tiers) - Gates □ Not crash rated (Tier 4) □ K-4 (Tiers 3 & 4) □ K-6 (Tiers 2 & 3) □ K-8 (Tiers 1 & 2) □ K-10 (Tiers 1 & 2) □ K-12 or greater (Tier 1) • Identification (all Tiers) - Identify potential threat vehicles, including those attempting entry through the outbound lanes of traffic	• Rejection point prior to facility access (Tiers 1, 2, & 3)

Types of Managing Control Points

Control point measures are measures used to help control vehicular access to a facility by calming traffic as it approaches the facility, providing an opportunity for vehicle identification to occur, and by denying facility access to unauthorized vehicles. There are many different systems and policies that can effectively manage access to a facility. The individual owner/operator will need to consider the costs associated with each type of system as it relates to the COI stored/used at the facility. Control point measures include:

- Aligning roads in a manner to calm traffic (e.g., circles, serpentine roads),
- Bollards, barriers, K-Rails, etc., to cause serpentine traffic flow,
- Speed bumps or tables,
- Gates, and
- Identification points and rejection points prior to facility access.

By limiting or managing parking on-site, a facility can help minimize ease of access to critical assets located inside the facility's perimeter. While completely prohibiting on-site parking is one option, less extreme measures are available, such as limiting on-site parking to certain vehicle classes—e.g., only "corporate" vehicles allowed on-site or only full-time employee vehicles allowed on-site (i.e., no visitor or contractor parking within the facility perimeter). Another option is to allow parking on-site but locate it a significant distance away from the critical assets, and prevent means of vehicular egress to the critical assets.

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Security Considerations for Managing Control Points

It is unlikely that any one type of control point management will be effective on its own; rather, a combination of tools will likely need to be used. By layering a number of systems at a facility the owner/operator can increase security across a broader range of threats. A layered approach to asset security potentially increases the opportunity to use existing facility and natural features or more applicable technologies to meet the performance objectives at a reduced cost.

Performance Standards Affected by Managing Control Points

The implementation of procedures for the managing of control points can have a significant impact in helping a facility achieve RBPSs 1, 2, 3, 4, and, to a lesser extent, 8 and 12.

Additional Resources on Managing Control Points

MANAGING CONTROL POINTS	
RESOURCES	**SOURCES**
Issues, Status and Trends, Security Industry Association	www.securitymanagement.com/files/biometrics_physicalaccess0206.pdf
Security Guidelines for American Enterprises Abroad, U.S. Department of State, Overseas Security Advisory Council, November 1994	www.state.gov/documents/organization/19790.pdf
Radio Frequency Identification (RFID) Technology, University of Washington	www.cs.washington.edu/homes/suciu/PCSI-2007-05-0050.pdf

Screening

Through identification, screening, and inspection, a facility is better able to prevent unauthorized access to the facility and more likely to deter and detect unauthorized introduction or removal of substances and devices that may cause a dangerous chemical reaction, explosion, or hazardous release.

Types of Screening

A variety of different types of measures may be used to perform screening, such as personnel identification, hand-carried items inspections, vehicle identification, and vehicle inspections. A list of considerations for each type of screening is contained in Table C4, and additional details on each follow.

Table C4: Screening Considerations Applicable to All Tiers

Personnel Identification	Hand-carried Items Inspection	Vehicle Identification	Vehicle Inspection
Employees Govt.-issued photo ID Facility-specific photo ID Electronic access control	• Employees • Regular contractors	• Known shippers only	• Employee / contractor personal vehicles • Company vehicles

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badge Regular contractors Govt.-issued photo ID Company-issued photo ID Facility-specific photo ID Electronic access control badge Temporary contractors Govt.-issued photo ID Company-issued photo ID Facility-specific photo ID Electronic access control badge Visitors Govt.-issued photo ID Company-issued photo ID Facility-specific photo ID Electronic access control badge	• Temporary contractors • Visitors • Inspection may include: - Visual inspection - Use of trained dogs Ionic explosives detection - X-ray inspection - Metal detectors	• Authorized bill of lading • Facility-issued vehicle ID system	• Contractor vehicles • Visitor vehicles • Delivery trucks • Vehicle inspection may include: Visual inspection - Use of trained dogs - Under/over vehicle inspection systems - Cargo inspection systems

Personnel Identification

A primary component of successfully screening and controlling access is knowing who is allowed on-site. Personnel identification measures help a facility quickly determine whether or not an individual is permitted facility access, and certain identification measures can help both security officers and other employees quickly know whether or not an individual is authorized for facility access. Examples of personnel identification measures include:

- Conducting checks of government-issued photo IDs prior to permitting facility access.
- Providing company-issued photo IDs to individuals permitted access to the facility, identifying:
    - Employees,
    - Regular contractors,
    - Temporary contractors, and
    - Visitors.
- Providing facility-specific photo IDs to individuals permitted access to the facility, identifying:
    - Employees,
    - Regular contractors,
    - Temporary contractors, and
    - Visitors.

Depending on the level of security desired, a facility may want to issue photo IDs (company or facility-specific) that are linked with electronic access control systems, such as proximity ID readers

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or swipe access controls, for an added layer of security. Electronic access control systems can be tailored to specific locations within a facility, thus providing the ability to limit access to restricted areas to authorized individuals. They also have the additional benefit of maintaining a record regarding who has accessed what areas.

A personnel identification system is most effective when used in conjunction with the performance of background checks and other personnel surety measures. Such measures are the focus of RBPS 12 – Personnel Surety.

Hand-Carried Items Inspection

A second element of a vigorous screening program is the inspection of items brought into the facility, whether brought in by employees, contractors, or visitors. Among other things, inspections may include:

- Visual inspections,
- X-ray inspections,
- Use of metal detectors,
- Use of ionic explosives detection equipment, and
- Use of trained explosive detection canines.

The type of inspection measures implemented, the thoroughness of inspections, and the frequency of inspections may vary based on a variety of factors, including the facility's tier (e.g., more vigorous and frequent measures may be suitable for higher tiers) and who is being inspected (e.g., more frequent and thorough inspections may be desired for visitors than for employees).

Vehicle Identification and Inspection

Another element of a comprehensive screening program is a vehicle identification and inspection program.

Vehicle identification measures can include using a facility-issued vehicle ID system (e.g., providing authorized vehicles with stickers or placards), using only known shippers and/or delivery companies, and requiring authorized bills of lading for access to the facility. These types of measures can help satisfy the standards established for RBPS 5 – Shipping, Receipt, and Storage, and are complemented by other measures recommended for RBPS 5 compliance.

Vehicle inspection measures that can be helpful in meeting the screening and access control standards include:

- Visual inspections,
- Use of trained explosive detection canines,
- Under/over vehicle inspection systems, and
- Cargo inspection systems.

Much like hand-carried item inspections, the type of vehicle inspection measures implemented, the thoroughness of inspections, and the frequency of inspections may vary based on a variety of

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factors, including the facility's tier (e.g., more vigorous and frequent inspections may be suitable for higher tiers) and whose vehicle is being inspected (e.g., more frequent and thorough inspections may be desired for visitors or unscheduled delivery trucks than for employees or regularly scheduled deliveries).

Security Considerations for Screening

Layered Security

No matter the size of the individual asset being secured, completely adequate security likely will not be achievable through the deployment of a single protective measure; rather an optimal security solution typically involves the use of multiple protective measures providing "layers of security." Layering of security measures can be achieved in many different manners, such as:

- Incorporating different types of security measures (e.g., integrating physical protective measures, such as barriers, lighting, and electronic security systems with procedural security measures, such as procedures guiding how security personnel should respond to an incident),
- Using multiple lines of detection to achieve protection-in-depth at critical assets, and
- Using complementary sensors with different means of detection (e.g., a CCTV and an intrusion detection system) to cover the same area.

A layered approach to asset security potentially increases the opportunity to use existing facility and natural features or more applicable technologies to meet the performance objectives at a reduced cost.

Physical and Environmental Considerations

When determining the selection and layout of asset security components, a facility owner/operator should take into consideration the physical and environmental characteristics surrounding the asset. Important physical considerations for evaluating the cost effectiveness of countermeasures include:

- Asset size and asset perimeter length and convolution,
- Terrain and urbanization,
- Adjacent facilities and transportation corridors,
- Approach angles and vehicle speeds, and
- Availability of supporting infrastructure.

In addition to the physical considerations listed above, environmental factors also should be considered when making decisions regarding asset security, as certain environmental conditions can significantly affect sensor and lighting performance. For example, certain sensors or other IDS components that have near-perfect detection capabilities during good weather might be subject to unacceptably high levels of false alarms during inclement weather (e.g., fog, rain, wind). Similarly, security lighting that may be considered acceptable during ideal weather conditions may be insufficient during periods of inclement weather. Accordingly, an owner/operator should consider

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the impact of environmental conditions when making determinations regarding security lighting and sensors or other IDS components.

Command and Control Considerations

Many asset security measures, such as intrusion detection systems or CCTV systems, consist of various hardware and software elements that can be operated or monitored effectively only by trained personnel, and owner/operators often will locate these functions in a command and control center. When designing command and control centers, owner/operators should consider merging security monitoring and reporting systems with other systems such as fire engineering reporting systems or process control. Technical merger of an active security system and a passive fire system may facilitate a common set of operational procedures (e.g., reporting, training, and emergency response), and prove a more cost-effective approach to overall facility safety and security management.

Performance Standards Affected by Screening

The implementation of screening can have a significant impact in helping a facility achieve RBPSs 1, 2, 3, 4, and 6.

Additional Resources on Screening

SCREENING	
RESOURCES	**SOURCES**
Transportation Port Worker, Interim Screening Program, U.S. Coast Guard, Transportation Security Administration, April 25, 2006	www.uscg.mil/hq/g-m/mp/pdf/Part125GuidanceFinal.pdf
Technical Support Working Group	www.tswg.gov
Trusted Access Task Force: *Screening, Credentialing, and Perimeter Access Controls Report*, The President's National Security Telecommunications Advisory Committee, January 19, 2005	www.ncs.gov/nstac/reports/2005/Final%20TATF%20Report%2004-25-05.pdf

Personnel Surety/Background Checks

Background investigation: DHS believes personnel surety to be a key component of a successful chemical facility security program, with the level of screening commensurate with the access provided. Examining personnel backgrounds is the process of acquiring information on an individual through third-party services, government organizations, and private individuals to make a "suitability determination" for the future actions based upon past actions. Background investigations can also verify the accuracy of an applicant's employment history, educational history, and credentials, as well as confirm the lack of criminal history and sanctions. Such investigations rely primarily on public or private records to confirm or disprove the accuracy of an applicants' resume or job application. Because of the potential sensitivity of the information

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uncovered, background investigations are subject to a unique set of laws and regulations to protect employees and consumers in the event of misuse of data or fraud.

Types of Personnel Surety/Background Checks

The contents, type, and depth of background investigations vary widely. Most basic checks consist of at least the following elements:

a) Criminal record search,
b) Employment verification,
c) Education verification,
d) Driving record, and
e) Credit check.

In a due-diligence investigation, many additional elements could be added – from multi-jurisdictional civil searches to interviews with friends, family, and neighbors. The level and depth of background investigations to reduce the likelihood of sabotage or other threats should be tied to the potential severity of the consequences that could occur, and applicable to individuals with potential access to the area(s) or the specific asset(s) capable of generating those undesired consequences.

There are a variety of types of investigative searches that can be used by employers or potential employers. Many commercial Web sites will offer specific searches to employers for a fee. Services like these typically will perform the background checks, supply the company with adverse action letters, and offer to ensure compliance with applicable legal requirements throughout the process. It is important to be selective about which pre-employment screening agency you use. A legitimate company should be willing to explain the process to you and should have some type of application process to ensure that they are providing information to only legitimate businesses. Many employers choose to search the most common records, such as criminal records, driving records, and education verification themselves. Other searches such as sex offender registry, credential verification, reference checks, and credit reports are becoming increasingly common. Employers should consider the position in question when determining which types of searches to include and typically should use the same types of searches for every applicant being considered for one position. Examples of searches that facilities may wish to consider under RBPS 12 include:

- Criminal History Searches: This typically involves searching multiple county, state and Federal data repositories that contain criminal records of individuals entered into the respective system. County courts generally are the most comprehensive source of information for criminal activity. County search results provide criminal charges, dates, sentencing, and disposition for felonies and/or misdemeanors in the county seat court of the requested jurisdiction. Detailed dockets and supporting information are also available. Statewide repositories vary in detail and scope of information for each state. Data available may reflect arrest information obtained by police departments, county cases forwarded from local courts, or other criminal data housed by the state. Federal search results will provide information on criminal activity that occurred outside state or local jurisdiction and was prosecuted at the district court level. Personal identification requirements for criminal history searches may include: first

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name, middle initial, last name, date of birth, social security number, and the desired county to search. Release from the individual may be required prior to conducting this type of search.

- National Criminal Scan: This is an effective tool to screen applicants who have lived in numerous locations or whose previous positions required travel across state lines. This type of background check is recommended as a supplemental search to criminal history screening to identify criminal activity in jurisdictions outside of current and previous residence and employment geographical locations. Personal identification requirements for national criminal scan may include first name, middle name, last name, and date of birth.

- Social Security/Name Trace: This search reveals names associated with a social security number, past and present addresses, and fraudulent use of social security numbers. Results may be used to cross-reference addresses supplied by applicant to ensure the integrity of the information on the job application or resume. Personal identification requirements for social security/name trace may include social security number, first name, middle initial, and last name.

- Credit Report: This type of check is relevant for all security-related positions that involve access to cash, expensive equipment, or financial record keeping. This check provides the employer insight to the applicant's level of fiduciary responsibility. Personal identification requirements for credit reports include: social security number, first name, middle initial, last name, and address. Release from the individual may be required prior to conducting this type of search.

- Motor Vehicle Records (MVR): This screen is relevant for all security-related positions that may require the use of a motor vehicle. In some states, convictions of driving under the influence of drugs or alcohol are not revealed on the criminal record and are placed on the MVR. Motor vehicle reports include such items as DUI arrests and convictions, reckless behavior, moving violations, suspensions, and revocations. Additionally, they outline the type of license approved and any restrictions to that license. These searches should comply with any applicable laws or rules, such as the Driver's Privacy Protection Act (DPPA). Personal identification requirements for this type of search include: social security number, first name, middle initial, last name, issuing state, license number, and date of birth. Release from the individual may be required prior to conducting this type of search.

- Personal References: This type of check is relevant for all applicants for any position with security implications. Key questions to references should address the following: dependability, adaptability, written and verbal communication, learning abilities, positive qualities, and areas for development. The reference should also have an opportunity to offer additional comments regarding the applicant. Personal identification requirements for this type of check include: first name, last name, maiden name (if applicable), and reference name and phone number.

- Military Service Verification: This service is recommended for all applicants for any security-related position stating military service on the job application or resume. This

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type of check is unique in that it provides information that is not normally found in employment and education screenings. This report provides such details as dates of service, rank, pay, decorations and medals, performance, and reason for discharge. Personal identification requirements for this type of search include: first name, middle initial, last name, date of birth, military branch, and location. Release from the individual may be required prior to conducting this type of search.

- Civil Court Records: Civil court records reveal if a person or company is involved in non-criminal lawsuits including litigation for tort, contract, or real estate disputes. The data typically come directly from the individual counties and contain filings of court cases containing all plaintiffs, defendants, case numbers, date of filings, and judgment.

- Education Confirmation: This type of check is relevant for all applicants for security-related positions. Level of education is one of the most common item falsified on a job application or resume. Checks should verify academic credentials at all institutions including high school, college, and technical and trade schools. Checks should also provide verification of attendance, degrees, course certifications, GPAs, honors, course of study, and dates attended. Personal identification requirements for this type of search include: first name, middle initial, last name, maiden name if applicable, date of birth, social security number, institution name, state, years attended, and degree(s) received. Release from the individual may be required prior to conducting this type of search.

- Employment Verification: This type of check is relevant for all applicants for security-related positions due to the fact that employment history is often embellished. Employment checks verify present and past employment, including wages, dates of employment, job title, and responsibilities. These results can also provide information on work habits, interaction with others, disciplinary actions, attendance, and eligibility for re-hire. Personal identification requirements for this type of search includes: first name, last name, maiden name (if applicable), social security number, employer's name, and employer's state. The employer may require a signed release. Additional information provided, such as dates employed, position title, and reason for separation can be used to further validate the information provided by the applicant.

An example of a typical background check under RBPS 12 could include the following:

- Verification of social security number.
- Name and address of each employer and the period employed providing information on job title, responsibilities, overall job performance, reason for departure and eligibility for re-hire.
- Confirmed dates of high school attendance. For applicants who attended college, verify dates of attendance and credits or degrees earned.
- A search of Federal, state, and county records in all jurisdictions in which the individual has worked or resided during the previous seven (7) years, including all geographical areas listed on the application, resume, and the social security number address verification report. The records search includes Federal, state, county (or equivalent) felony and misdemeanor convictions, deferred adjudication, pleas of no contest, and unresolved indictments or other charges of crimes or offenses, except to the extent that consideration

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of any such categories is prohibited by applicable law. Minor traffic offenses are not generally relevant; however, DWI/DUI is relevant and reported.
- For employees whose job responsibilities involve operating motor vehicles. Information from the Department of Motor Vehicles in, but not limited to, the geographic areas listed on the application, resume, or social security number address verification; to reveal violations and convictions.
- All employees and resident contractors whose job responsibilities involve financial or security responsibilities go through credit verification to show debt load, payment history, and information on civil actions such as judgments, liens, collections, or bankruptcies.
- E-verify or USCIS Form I-9.
- Screening for terrorist ties through the Terrorist Screening Database, as provided by the Department.

Examples of background check anomalies that a facility could consider significant under appropriate circumstances include:

- Individual is under indictment for, or who has been convicted in any court of, a crime punishable by imprisonment for a term exceeding one year;
- Individual is a fugitive from justice;
- Individual is an unlawful user of or addicted to any controlled substance (as defined in section 102 of the Controlled Substances Act (21 U.S.C. 802) and § 555.11);
- Individual has been adjudicated as a mental defective or has been committed to a mental institution;
- Individual may be denied admission to the United States or removed from the United States under the Immigration and Nationality Act (8 U.S.C. 1101 et seq.);
- Individual has been discharged from the armed forces under dishonorable conditions;
- Individual, having been a citizen of the United States, has renounced citizenship;
- Individual has been convicted within the preceding 7-year period of a felony or found not guilty of a felony by reason of insanity;
- Individual is a terrorism security risk to the United States;
- Individual has been released from incarceration within the preceding 5-year period for committing a felony.

Security Considerations for Personnel Surety/Background Checks

An "adjudicative" process is an examination by a company or facility of a sufficient amount of data, collected from one or more of the types of background checks previously discussed, to make an affirmative determination that the person is suitable for employment. This process is the careful weighing of a number of variables known as the "whole person" concept. Available, reliable, and relevant information about the person, past and present, favorable and unfavorable, should be considered in reaching a determination. In evaluating the relevance of an individual's conduct, the adjudicator typically considers factors such as:

a) The nature, extent, and seriousness of the conduct;
b) The circumstances surrounding the conduct, to include knowledgeable participation;
c) The frequency of and how recent the conduct;
d) The individual's age and maturity at the time of the conduct;

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e) The voluntariness of participation;
f) The presence or absence of rehabilitation and other pertinent behavioral changes;
g) The motivation for the conduct;
h) The potential for pressure, coercion, exploitation, or duress; and
i) The likelihood of continuation or recurrence.

Each case should be judged on its own merits, and final determination remains the responsibility of the facility.

Visitor controls: Physical-security precautions include the screening, identification, and control of visitors. Visitors are generally classed in the following categories:

- Persons with whom the covered facility has business (such as suppliers, customers, and inspectors);
- Individuals or groups who desire to visit a covered facility for personal or educational, technical, or scientific reasons;
- Individuals or groups specifically sponsored by or representing the government; and
- Guided tours to selected portions of the covered facility in the interest of public relations.

Certain actions can mitigate the risks posed by visitors. While background checks cannot identify all visitors who pose a risk, they are a valuable tool for alerting management of situations that may warrant more attention and control. Identification and control mechanisms for visitors should be in place. They may include the following:

- Positive identification of visitors;
- Contacting facility personnel to validate the visit;
- The use of visitor registration forms to provide a record of the visitor and the time, location, and duration of his visit;
- The use of visitor cards/badges; and
- Visitor escort requirements.

Individual visitors or groups of visitors entering a restricted area should meet specific prerequisites before being granted access.

Performance Standards Affected by Personnel Surety/Background Checks

The implementation of personnel surety/background checks can have a significant impact in helping a facility achieve RBPSs 7 and 12.

Additional Resources on Personnel Surety/Background Checks

Background Checks	
RESOURCES	**SOURCES**
Employee Background Screening, ASIS International	www.asisonline.org/guidelines/guidelinespreemploy.pdf
Personnel & Training, CIP-004, NERC	www.nerc.com/pub/sys/all_updl/standards/rs/CIP-004-1.pdf

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Exercises and Drills

High-risk chemical facilities should develop a security awareness and training program that includes all levels of facility personnel, including executives, management, operational, and technical employees. The program should include: policy, guidance, and standards; training courses and materials; exercises of varying types and scope designed to improve the overall organizational deterrence, detection, delay, and response capability to security and/or other emergency situations; a schedule; and evaluation and remedial action programs. Objectives of a security awareness and training program may include:

- Validate plans, policies, and procedures; and
- Ensure that personnel are familiar with alert, notification, deployment, and other related security procedures.

Several aspects are generally important for a facility to implement a successful security awareness and training program, including the need to train, exercise, drill, and test all facility employees on security.

A Security Awareness and Training Program is a predefined and documented set of scheduled activities, which include training, exercises, drills, tests, and joint initiatives that focus on relevant security related issues for the facility and enhance the overall security awareness of all facility employees.

As part of the facility's security awareness and training program, training typically consists of a predefined and documented set of scheduled activities, which may include a deliberate blend of hands-on activities, seminars, orientations, workshops, on-line or interactive programs, briefings, and lectures, that focus on relevant security related issues for the facility and enhance the overall security awareness of all facility employees.

Regularly scheduled training should be conducted to ensure the readiness of all facility personnel. Training plans are developed and implemented to prepare individuals and groups (i.e., protective forces) to accomplish certain tasks, using selected equipment, under specific scenarios. This training may encompass a deliberate blend of hands-on activities, seminars, orientations, workshops, on-line or interactive programs, briefings, and lectures.

Types of Exercises and Drills

As part of the facility's security awareness and training program, exercises should consist of a predefined and documented set of scheduled activities that represent a realistic rehearsal or simulation of an emergency that promote preparedness; improve the response capability of individuals; and validate plans, policies, and procedures. Exercises may include a blend of tabletop exercises, functional exercises and full-scale exercises that focus on relevant security-related issues for the facility and enhance the overall security awareness of all facility employees.

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Exercises typically are conducted for the purpose of validating elements, both individually and collectively, of a facility's security posture and response capability. An exercise should be a realistic rehearsal or simulation of an emergency, in which individuals and organizations demonstrate the tasks that would be expected of them in a real emergency. Exercises generally should provide emergency simulations that promote preparedness; improve the response capability of individuals and organizations; validate plans, policies, procedures, and systems; and determine the effectiveness of the command, control and communication functions and event-scene activities. Exercises may vary in size and complexity to achieve their respective purposes.

The evaluation of an exercise typically should identify systemic weaknesses and suggest corrective actions that will enhance facility preparedness and response. Following an exercise, a comprehensive debriefing and after-action report should be completed. All data collected should be incorporated into a remedial action plan that provides input for annual revisions.

Drills are a coordinated, supervised activity normally used to exercise a single specific operation or function. Drills are also used to provide training with new equipment, to develop new policies or procedures, or to practice and maintain current skills.

As part of the facility's security awareness and training program, tests could consist of a predefined and documented set of scheduled activities, which may include a deliberate blend of static tests, dynamic tests, and functional tests that focus on relevant security related issues for the facility and enhance the overall security awareness of all facility employees.

Testing is the technique of demonstrating the correct operation of all equipment, procedures, processes, and systems that support the security infrastructure. The testing process validates that the equipment and systems conform to specifications and operate in the required environments and that procedures and processes are viable. Testing is used as a verification and validation technique to confirm that backup equipment and systems closely approximate the operations of the primary equipment and systems. Based on the measures and benchmarks desired, there are a variety of methods that can be used to test the functionality of backup environments, including:

- **Tabletop Exercises:** Tabletop exercises simulate an emergency situation in an informal, stress-free environment. They are designed to elicit constructive discussion as participants examine and resolve problems based on existing plans. There is minimal attempt at simulation, no utilization of equipment or deployment of resources, and no time pressures. The success of these exercises is largely determined by group participation in the identification of problem areas. They provide an excellent format to use in familiarizing newly assigned/appointed security personnel and senior security officials with established or emerging concepts and/or plans, policies, procedures, systems, and facilities.
- **Functional Exercises:** Functional exercises are fully simulated interactive exercises. They validate the capability of a group (i.e., protective force) or facility to respond to a simulated event testing one or more procedures and/or function of the facility's security plan. Functional exercises focus on policies, procedures, and roles and responsibilities of single or multiple security functions before, during, or after a security related event.
- **Full-Scale Exercises:** Full-scale exercises simulate an actual security event. They are field exercises designed to evaluate the operational capabilities of the facility's security measures (i.e., physical measures and procedural measures) in a highly stressful environment. This

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realism can be accomplished through mobilization and response of facility personnel, equipment and resources.

- S**tatic Tests:** Static tests determine if all essential components of the equipment and systems are in place and meet the specification and design requirements of the facility.
- **Dynamic Tests:** Dynamic tests verify that all of the equipment and systems function independently of each other, function in concert with each other and satisfy the operational requirements of the organization.
- **Functional Tests:** Functional tests verify that the procedures for operating the equipment and systems in the backup environment are correct. This testing ensures that when trained and qualified personnel utilize the backup equipment and systems, the instructions for operations are clear and complete.

Security Considerations for Exercises and Drills

As part of the facility's security awareness and training program, and a sub-set or type of exercise, drills generally consist of a predefined and documented set of scheduled activities that are used to exercise a single specific operation or function and can also be used to provide training with new equipment, to develop new policies or procedures, or to practice and maintain current skills.

Performance Standards Affected by Exercises and Drills

The implementation of exercises and drills can have a significant impact in helping a facility achieve RBPSs 9 and 11.

Additional Resources on Exercises and Drills

Exercises/Drills/Tests	
RESOURCES	**SOURCES**
ASIS Disaster Preparation Guide, 2003	www.asisonline.org/newsroom/crisisResponse/disaster.pdf
DHS Ready Business Emergency Planning Guide & Fact Sheet to Small to Mid-sized Businesses	www.asisonline.org/newsroom/crisisResponse/103105readybiz.pdf
On-Scene Commander's Guide for Responding to Biological/Chemical Threats, November 1, 1999, National Domestic Preparedness Office	www.au.af.mil/au/awc/awcgate/ndpo/oscg_ndpo.pdf
Security Awareness, training course from U.S. Dept. of Transportation, for DOT Hazmat Employees, under HM-232	www.hazmatschool.com/descriptions/DOT_1362_information.html

Training

The length of the training and the depth of the coverage of the information provided and discussed will vary based on the audience and method of training selected. Typically, if the audience is designated security personnel, details of security procedures, operations, communications, etc., warrant extended discussion. Awareness training for the entire workforce might include topics such as incident identification and notification. Major topics or components of a training syllabus could include:

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- Overview of the security awareness and training program,
- Description of the facility's security organization,
- Roles and responsibilities,
- Identification of a security incident,
- Notification of a security incident,
- Response to a security incident,
- Security related standard operating procedures, and
- Relationship with local response entities.

Types of Training

Typically, a facility's security awareness and training program consists of a predefined and documented set of scheduled activities, which may include a deliberate blend of hands-on activities, seminars, orientations, workshops, on-line or interactive programs, briefings and lectures that focus on relevant security related issues for the facility and enhance the overall security awareness of all facility employees.

To maximize the benefit of a security awareness and training program, training topics should be tailored to specific classes of employees, as not all facility employees need the same level of training. For example, detailed training on security procedures, operating security equipment, security response protocols, and security laws and regulations may not be worthwhile for employees who do not have specific security responsibilities. Conversely, certain topics such as incident identification and notification are beneficial for the entire workforce. Table C5 provides a list of various training topics and the individuals within the organization who are most likely to benefit from that training.

Table C5: Suggested Training Requirements

Training Topic	FSO/Asst FSO	Personnel with Security Responsibilities	All Remaining Employees
Security Laws and Regulations	X		
Threats	X		
Security Organization/Duties and Responsibilities	X		
CSAT Components ▪ Top Screen ▪ SVA ▪ SSP ▪ Personnel Screening Database	X		
Security Measures and Management of SSPs	X		
Requirements for SSP	X		
Drills and Training	X		
Inspections and Screening	X		
Recordkeeping	X		
Knowledge of current security threats and patterns	X	X	
Recognition and detection of dangerous substances and devices	X	X	X

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Table C5: Suggested Training Requirements			
Training Topic	**FSO/Asst FSO**	**Personnel with Security Responsibilities**	**All Remaining Employees**
▪ Recognizing explosive materials ▪ Recognizing explosive devices ▪ Improvised explosives (e.g., using industrial materials) ▪ VBIEDs ▪ Hand-carried weapons ▪ Surveillance devices (e.g., camera phones)			
Recognition of suspicious behavior	X	X	X
Techniques used to circumvent security measures	X	X	X
Crowd and traffic management and control techniques	X	X	
Security related communications	X	X	
Knowledge of emergency procedures, contingency plans, and crisis management plans	X	X	
CVI certification	X	X	
Operation of security equipment and systems	X	X	
Testing, calibration, and maintenance of security equipment and systems	X	X	
Relevant provisions of the SSP	X	X	X
Methods of physical screening of persons and personal effects	X	X	
The meaning and the consequential requirements of the different DHS Threat Levels in general	X	X	X

Security Considerations for Training

Frequency of Training, Drills, and Exercises. How frequently a facility chooses to conduct training, drills, and exercises likely will depend on a variety of factors. Such factors include the facility's risk tier, the training topic, the composition of the training's target audience, and the size of the facility. Table C6 provides some recommended frequencies for various types of training, drills, and exercises by Tier.

Table C6: Recommended Frequency (by Tier) of Sample Activities Under RBPS 11				
Activity	**Tier 1**	**Tier 2**	**Tier 3**	**Tier 4**
Testing of alert, notification, and activation procedures	Quarterly	Quarterly	Semiannually	Semiannually
Testing of communications capability	Quarterly	Quarterly	Semiannually	Semiannually
Security awareness briefing (or other means of refresher for the entire workforce) and pre-employment for all new or temporary workers	Annually	Annually	Annually	Annually
Training for protective force personnel	Quarterly	Quarterly	Semiannually	Annually
Training for management personnel	Annually	Annually	Annually	Annually
Drills	Semiannually	Annually	Annually	Annually
Tabletop exercise	Every 2 years	Every 3 years	N/A	N/A
Functional exercise	Annually	Annually	N/A	N/A

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Full-scale exercise (with law enforcement and first responders)	Every 2 years	Every 3 years	N/A	N/A

Performance Standards Affected by Training

The implementation of monitoring systems can have a significant impact in helping a facility achieve RBPSs 1, 2, 3, 4, and 11.

Additional Resources on Training

Training	
RESOURCES	**SOURCES**
Private Security Officer Selection and Training Guideline, ASIS International, 2004	www.asisonline.org/guidelines/guidelinesprivatedraft.pdf
Security Planning and Disaster Recovery. Maiwald, Eric and William Sieglend, 2002, American Public Works Association (APWA) (ISBN: 007222830X)	Available through numerous booksellers online
"Site Security & Verification," Implementation Guide for Responsible Care®, Security Code of Management Practices, July 2002	www.americanchemistry.com
"Value Chain Activities," Implementation Guide for Responsible Care®, Security Code of Management Practices, September 2002	www.americanchemistry.com
Emergency Preparedness Checklist, Federal Emergency Management Agency (FEMA), 1997	www.fema.gov/pdf/library/epc.pdf

Additional Resources

General Resources	
RESOURCES	**SOURCES**
Protection of Assets Manual, ASIS International	http://www.protectionofassets.com/ (Access available through: www.asisonline.org)
Security Toolkit, Case Studies, Guidelines, Report and White Papers Information and guidance ASIS security experts	www.asisonline.org/toolkit/toolkit.xml
Chemical Group Security Assessment and Best Practices Report, New Jersey Domestic Security Preparedness Taskforce, Infrastructure Advisory Committee, April 30, 2003	www.state.nj.us/dep/rpp/brp/security/downloads/NJ%20Best%20Practices%20Chemical%20Sector.pdf
Chemical Site Security Vulnerability Assessment Model & Manual, Synthetic Organic Chemical Manufacturers Association (SOCMA)	www.socma.org/Products/VulnerabilityAnalysis.htm
Critical Infrastructure Protection: Challenges and Efforts to Secure Control Systems, Report GAO-04-354, US General Accounting Office, March 30, 2004	www.gao.gov/new.items/d04354.pdf
Physical Security, Department of Army Field Manual	www.globalsecurity.org/military/library/policy/army/fm/3

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FM-3-19.30, January 8, 2001	-19-30/index.html
"Security Lighting," Chapter 8, *Effective Physical Security*, Part Two, Third Edition, Fennelly, Lawrence J., Butterworth-Heinemann, 1997 (ISBN: 0-7506-9873-X)	Available through numerous booksellers online
Enhancing Security of Hazardous Materials Shipment Against Acts of Terrorism or Sabotage Using RSPA's Risk Management Self-Evaluation Framework (RMSEF), U.S. Department of Transportation, January 2002	http://hazmat.dot.gov/riskmgmt/rmsef/rmsef_security_template.pdf
"Pipeline Infrastructure Security," Fox, Jack, July 13-16, 2003, Baltimore, Maryland, Reston, VA/ASCE, 0-7844-0690-1	www.pubs.asce.org/WWWdisplay.cgi?0301702
Guidelines for Analyzing and Managing the Security Vulnerabilities of Fixed Chemical Sites, American Institute of Chemical Engineers (AIChE) Center for Chemical Process Safety, August, 2002	www.aiche.org/Publications/pubcat/listings/081690877X.aspx
"Infrastructure Security, Dependencies, and Asset Management," Heller, Miriam, July 13-16, 2003, Baltimore, Maryland, Reston, VA/ASCE, 0-7844-0690-1	www.pubs.asce.org/WWWdisplay.cgi?0301782
Introduction to Security, Sixth Edition, Robert J. Fischer, Gion Green, Butterworth-Heinemann, 1998 (ISBN: 0-7506-9860-8)	Available through numerous booksellers online
"*Joint Tactics, Techniques and Procedures for Antiterrorism,*" U.S. Joint Chiefs of Staff, Joint Pub 3-07.2, March 1998	www.fas.org/irp/doddir/dod/jp3_07_2.pdf
National Gas Utility Sector Critical Infrastructure Protection, American Gas Association, February 2005	www.aga.org
Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks, FEMA 427, December 2003	www.fema.gov/plan/prevent/rms/rmsp427
Recommended Security Guidelines for Facilities, Navigation and Vessel Inspection Circular No. 11-02 (NVIC 11-02), January 13, 2003	www.uscg.mil/hq/g-m/nvic/11-02.pdf
Risk Analysis and the Security Survey, James F. Broder, CPP, Butterworth-Heinemann, 2000 (ISBN: 0-7506-7089-4)	Available through numerous booksellers online
"*Application of Integrated Control Systems for Improved Protection,*" Rostami, Jamal, and H. Besharatian, July 13-16, 2003, Baltimore, Maryland, Reston, VA/ASCE, 0-7844-0690-1	www.pubs.asce.org/WWWdisplay.cgi?0301724
Security Guidelines for American Enterprises Abroad, US Department of State, Overseas Security Advisory Council, November 1994	www.state.gov/documents/organization/19790.pdf
Security Management On-Line	www.securitymanagement.com
The Design and Evaluation of Physical Protection Systems, Garcia, Mary Lynn, Butterworth-Heinemann, 2001 (ISBN: 0-7506-7367-2)	Available through numerous booksellers online
The Security Portal for Information System Security Professionals, Information/Links & Suppliers for Security	www.infosyssec.com/infosyssec/physfac1.htm
Threat Advisory System Response Guideline, ASIS International, 2004	www.asisonline.org/guidelines/guidelinesthreat.pdf
Unified Facilities Criteria: Design and O&M: Mass Notification	www.wbdg.org/ccb/DOD/UFC/4_021_01.pdf

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Systems, U.S. Department of Defense, December 2002	
Vulnerability Analysis Methodology for Chemical Facilities (VAM-CF), 2002	Sandia National Laboratories
Security Planning and Design, Demkin, Joseph A., ed., The American Institute of Architects, Wiley, 2003 (ISBN: 047127156X)	Available through numerous booksellers online
Building Security: Handbook for Architectural Planning and Design, Nadel, Barbara A., FAIA, McGraw-Hill Professional, 2004 (ISBN: 0071411712)	Available through numerous booksellers online

Corporate Security Policies and Security Policy Administration

RESOURCES	SOURCES
Responsible Care© Security Code of Management Practices, American Chemistry Council	www.americanchemistry.com/s_acc/bin.asp?CID=373&DID=1255&DOC=FILE.PDF"
Security Guidelines for the Petroleum Industry, American Petroleum Institute, April 2003	www.api.org/policy/otherissues/upload/SecurityGuideEd3.pdf
Threat Advisory System Response Guideline, Considerations and Potential Actions in Response to the Department of Homeland Security Advisory System, ASIS International, 2004	www.asisonline.org/guidelines/guidelinesthreat.pdf
Mail Center Security Guide, Publication 166, U.S. Postal Service	www.usps.com/cpim/ftp/pubs/pub166/welcome.htm

Security Awareness and Training

RESOURCES	SOURCES
ASIS Disaster Preparation Guide, 2003	www.asisonline.org/newsroom/crisisResponse/disaster.pdf
Bomb Threats and Physical Security Planning, National Security Institute	http://nsi.org/library/terrorism/bombthreat.html
DHS Ready Business Emergency Planning Guide & Fact Sheet to Small to Mid-sized Businesses	www.asisonline.org/newsroom/crisisResponse/103105readybiz.pdf
Emergency Preparedness Checklist, Federal Emergency Management Agency (FEMA), 1997	www.fema.gov/pdf/library/epc.pdf
"*Value Chain Activities*," *Implementation Guide for Responsible Care®*, Security Code of Management Practices, September 2002	www.americanchemistry.com
"*Site Security & Verification*," *Implementation Guide for Responsible Care®*, Security Code of Management Practices, July 2002	www.americanchemistry.com
On-Scene Commander's Guide for Responding to Biological/Chemical Threats, November 1, 1999, FBI: National Domestic Preparedness Office	www.au.af.mil/au/awc/awcgate/ndpo/oscg_ndpo.pdf
Security Awareness, training course from US Dept. of Transportation, for DOT Hazmat Employees, under HM-232	www.hazmatschool.com/descriptions/DOT_1362_information.html
"Security Design," Chapter 8, *Facilities Standards for the Public Building Service*	www.gsa.gov/gsa/cm_attachments/GSA_DOCUMENT/p100-2003c8_R2E-qD-b_0Z5RDZ-i34K-pR.pdf
Security Planning and Disaster Recovery. Maiwald, Eric, and William Sieglend, 2002, American Public Works Association (APWA) (ISBN: 007222830X)	http://www.aiche.org/Publications/pubcat/listings/081690877X.aspx
Chief Security Officer Guideline, ASIS International, 2004	www.asisonline.org/guidelines/guidelineschief.pdf
Private Security Officer Selection and Training Guideline, ASIS	www.asisonline.org/guidelines/guidelinesprivatedraft.pdf

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International, 2004	
Company Security Officer, 2003 Edition, International Maritime Organization	www2.imo.org/b2c_imo/b2c/init.do
Guarding America: Security Guards and U.S. Critical Infrastructure, Parfomak, Paul W., Congressional Research Service, Nov. 12, 2004	www.fas.org/sgp/crs/RL32670.pdf

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