CHAPTER 9

SECURITY

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1. INTRODUCTION

The definition of “Cargo Security” has greatly evolved over the past decade. Where theft was once the main focus of an airport’s cargo security program, the acts of September 11, 2001 and other terrorism-related threats and incidents have changed the scope of cargo security forever. The new definition of cargo security pertains to the safety of aircraft and the safeguarding of aircraft from terrorism-related activities. As mandated by The Department of Homeland Security (DHS) the Transportation Security Administration (TSA) has set forth approved security programs for airports to implement and follow. Although cargo theft remains an important consideration in today’s cargo security arena, this chapter will focus on the requirements of Title 49 in the Code of Federal Regulations, Chapter XII, Subchapter C, Part 1542 on Airport Security. Airports are issued security directives by the TSA. Part 1542 provides specific requirements for an airport’s security program including the areas of access control, SIDA (Secure Identification Display Areas), and AOA (Air Operations Areas).

Historically, air cargo consisted of time–sensitive or high-value products for which the higher cost of shipping by air represented a realistic trade-off for security and speed. Recognizing that the growth of the industry would in large part be linked to the protection of goods, air cargo security evolved as a loosely coordinated, inconsistent, but relatively efficient series of physical and administrative elements focused on the prevention of theft. The resultant business systems and physical infrastructure of modern goods movement in general were designed to reduce the potential for theft of goods by individuals within the employment envelope or by an external source.

Security remains at the forefront of an airport’s air cargo agenda and requires constant vigilance and continuous monitoring of the rules and regulations set forth by our lawmakers and government regulatory agencies. To gain a working understanding of an airport’s role in air cargo security, we will look at this topic from an airport management perspective and ask four basic questions of ourselves.

Cargo Screening – The Bottom Line

Under the current regulations, cargo screening has been delegated to the air carrier or an approved agent by the TSA. The airport has no direct role in the screening of cargo and remains a support function as described in the initial section in this chapter. Critical elements include access control to include perimeter security, vehicle security, and control and detection of unauthorized individuals on the airport; badging and background investigations; and finally, emergency law enforcement response. The TSA will enter into voluntary agreements with airports to test new cargo screening technologies. In these cases, the airport provides facilities and support but the cargo screening function and responsibility remains with either the TSA or the approved private entity.

The Role of the Airport Security Coordinator

Each airport must identify at least one Airport Security Coordinator (ASC) who serves as the primary point of contact with the TSA and has the power to implement immediate corrective action in the case of violations of security requirements. This Airport Security Coordinator must be available on a 24-hour basis. These requirements are contained in the TSA regulation. Most airports also identify alternate Airport Security Coordinators to serve as backups for the primary ASC. It is important that the ASC maintain an ongoing operational dialog with the TSA Federal Security Director in order to ensure a highly functional security capability at the airport. Good security is a function of cooperation and collaboration at the airport level.

The Importance of the Federal Security Director

The relationship between an airport manager, the Airport Security Coordinator and their Federal Security Director is extremely important. All significant security measures, procedures, and changes must be reflected in the Airport Security Program and approved by the Federal Security Director. The maintenance of ongoing communications and an appreciation of each other’s roles are central to making this a mutually productive and beneficial relationship.

The Terrorism Threat

In the Notice of Proposed Rule Making (NPRM) which the TSA published prior to issuing extensive regulatory changes, two critical risks were identified in the air cargo environment. They were: the use of cargo to introduce an improvised explosive device aboard a passenger aircraft; and, the hostile take-over of an all-cargo aircraft for use as a weapon. The magnitude of these risks was considered in view of credible threats and possible vulnerabilities. Extensive comments were received regarding the threat and proposed countermeasures from the time the NPRM was published (November 10, 2004 and the issuance of the Final Rule (May 26, 2006).

Terrorists have attempted to attack aviation via air cargo in the past and aviation continues to be a priority of terrorists. Past related incidents include:

- On American Airlines flight 444, a B727 flying between Chicago and Washington, DC, an IED constructed by Ted Kaczynski the Unabomber began smoking due to a reaction in the explosive. The pilot made an emergency landing.

- In 1995 following his attempt to place leave-behind IED's on U.S. carriers flying in Asia, Ramzi Yousef constructed two IED's to be placed in cargo on board two U.S. carriers flying from Bangkok to the U.S. Upon arriving at the airport, one of Yousef's co-conspirators was intimidated by the array of security measures in place at Bangkok and was deterred from attempting to introduce the IED's as cargo.

- In 2010 explosives were shipped from Yemen disguised as printer cartridges. While the aircraft was not the target this did increase the call for cargo security. It should be noted that this plot was foiled by intelligence gathering and not by cargo screening technology.

2. BACKGROUND

Since the Gulf War in 1991, more and more carriers and airports have placed increasing emphasis on air cargo (especially belly cargo) as a key component of their overall revenues. In the case of airports, cargo capacity has become very important in the generation of jobs, and in certain instances, has become a major factor in the economy leading to the location/relocation of large regional logistics and distribution facilities. Airport facilities and infrastructure have been designed to accommodate and encourage cargo growth even at airports that are geographically constrained. Carriers have established separate lines of business, unique route structures, and capital investment at select airports in order to meet cargo revenue and service objectives.

An expanded focus on security applications to include both anti-theft and anti-terrorism has had a substantial impact on all segments of the industry, and impacted the financial viability of a number of carriers and airports. By way of example, as a result of September 11, 2001, a decision was made to prohibit mail weighing more than 16 ounces from flying as belly cargo. The result found by the Committee on Commerce, Science, and Transportation on October 2002 estimated $90 million revenue loss to the passenger carriers in the twelve-month period to September 2002[1].

The air cargo industry has an enormous supporting business infrastructure of small, medium, and large size firms that tend to cluster around major gateways and/or large shipping hubs. These firms include customs brokers, freight forwarders, container freight stations, consolidators, etc., all of which are directly involved in the landside elements of shipping. These are the firms that, for the most part, work as direct links between carriers and shippers and consignees. They are also the firms that generate and control substantial portions of the paperwork (or electronic documentation) associated with shipping.

A general economic downturn that began in 2000, adversely affected air cargo in terms of growth rates, and in some markets, total volumes. After September 11, 2001 cargo activity was immediately impacted.

[1] http://www.gpo.gov/fdsys/pkg/CHRG-107shrg92436/html/CHRG-107shrg92436.htm

As a result, given the already weakened fiscal position of so many businesses, the financial stability of the entire aviation industry was compromised. Critical impacts included:

- Loss of airport revenue
- Loss of airline revenue
- Increased use of trucking
- Increased use of freighters
- Permanent escalation of insurance costs
- Consolidation among smaller firms
- Failure of smaller support firms
- Failure of many small cargo airlines
- Higher operating costs because of security
- Longer processing time because of security
- Increased available freighter capacity driving down rates

3. THE PARTIES INVOLVED – BASIC ROLES

3.1 The Airport

The most basic role of the airport is that of landlord. It provides the land on which the aircraft operators land and take off. It also provides and controls access to those parties wanting access to the aircraft. At its most basic the airport is in the business of providing the aircraft operators the rights to use the land and, as a result, providing the access to the aircraft. Implicit in the role of providing access is the role of controlling access. That is, restricting the rights of certain individuals at certain times, based on specific criteria. It is at this point that the airport's primary operational function and primary security function become identical -- access control. This holds true for cargo security as well as aviation security in general. In the largest sense this includes other perimeter security measures, including fences; doors and gates; employee and vehicle identification systems; and law enforcement response.

It must be remembered that access control is not an end in itself. It is a tool by which important assets are protected. In the past the primary asset in need of protection was the passenger aircraft to prevent hijackings and the introduction of explosive devices. More recently it has been recognized that those areas of the airport in which cargo is handled and stored must be protected to prevent the introduction of explosive devices and/or hijackers in cargo.

True access control has three critical elements. First, in the most primary sense, access by unauthorized individuals must be prevented or deterred. Second, unauthorized access of the protected area of the airport must be detected, and third, those persons or vehicles who have gained unauthorized access must be apprehended. It is a triad of responsibilities which comprise the single function of access control. All these functions must be formalized, documented and assembled in a single document known as the Airport Security Program.

Overlaying these several operational security functions of the airport, however, is a larger security function which, though not required by regulation or law, is of paramount importance. The airport must create a culture of respect and involvement for security. This is a management function that cannot be overestimated. Management respect and consideration for airport security (including air cargo security) creates a top down attitude that tends to pervade airport management and all tenants and organizations that belong to that particular airport community. A management attitude that is respectful of security ultimately results in an airport environment that is safe, orderly and secure – an environment that is unattractive to individuals or organizations that are planning to conduct a terrorist attack.

3.2 Aircraft Operators/ Air Carriers

Historically, in the scheme of cargo security it is the air carrier, most particularly the passenger air carrier that has been the target for terrorist attacks. Beyond this, it is not only the air carriers that are the target, but the passengers traveling on a particular air carrier. It is the combination of passengers with an air carrier that are identifiable with a particular country or political entity that makes it the target. In this two-element target, the passengers may serve as hostages or victims of a terrorist event. In the 9/11 attacks, the air carrier served not as the target but as the tool or instrument of the terrorist attack -- the terrorist targets becoming more prominent political assets/symbols or a significantly larger group of victims. It is the presence of the air carriers at the airports that create the need for airport security.

Belly Carriers

The passenger airlines, for which cargo often represents the margin of profit on many routes, have experienced decreases in both capacity and demand. On the airside, the effects of 9/11 were immediate. First, the number of commercial flights was dramatically reduced. At hub airports, operations dropped as much as 27%. The resultant loss in belly cargo capacity forced the diversion of cargo to trucking and freighter/integrator traffic. Second, the TSA restricted the nature of cargo that could be carried in passenger aircraft. This also accelerated the diversion. Third, carriers in many instances reduced the size of the aircraft, lowering operating costs, but also reducing belly capacity. Fourth, restrictions on the amount of personal possessions that passengers can carry on board forced additional baggage into the bellies, and further reduced available capacity for freight and mail. The bottom line is that the fundamentals of the goods movement infrastructure have shifted, and the result has and will continue to impact the nature of and demand for relevant airport facilities.

Freighter Operators

Freighter operators were the initial beneficiaries of the system's diminished belly capacity. Generally, security requirements are less stringent for these carriers enabling them to capture a greater percentage of the market. With most wide-body freighter operations focusing on international traffic, the challenge is to establish a level of confidence with security controls at international shipping points, given the almost limitless shipping points from which freight can originate. The imposition of unilateral security standards on a global basis is not immediately practical or politically viable, and restrictions on carriers or points of origin may appear arbitrary and be deemed an undue constraint of trade. (The term aircraft operator is used interchangeably with the term air carrier.) It should be noted that integrated carriers, have on their own, established very stringent security measurses.

Indirect Air Carriers

An Indirect Air Carrier is not an air carrier at all. An Indirect Air Carrier (IAC) does not typically operate or possess aircraft to carry cargo. By definition an IAC may not have an FAA operating air carrier certificate. An IAC is a company that arranges for the goods of another company to be transported by air. It is, in essence, an air freight forwarder. It is a middleman in the chain of operations and security for cargo. Nonetheless it is an important middle man since the integrity of cargo must be ensured from its origin at a trustworthy shipper to its loading in the secure cargo hold of an aircraft. IAC's are not granted operating certificates by the TSA in the same way that airports or air carriers are granted certificates by the FAA. IAC's are granted approvals to operate and conduct business in accordance with their approved security programs. IAC's are regulated under 49 CFR 1546. There are over 5,000 IAC's in the U.S.

Shippers

The term shipper is not defined in the TSA regulations. It is generally understood to mean the individual or entity that originates and tenders cargo for air transportation. The shipper, via ownership of the cargo, has the authority to move it, ship it, or possess it. Shippers are viewed as the initial point in the air cargo supply chain. In some cases, a shipper may utilize the services of a warehouse operator or other third party to store their products. In this case, the shipper remains the entity that owns the cargo and initiates its shipment. In such a case, the warehouse operator would be acting as an agent of the shipper and the

security measures of the warehouse would need to be equal to or greater than the measures required of the shipper. While shippers are not directly regulated by the TSA, they are indirectly by the guidelines imposed on air carriers and IAC's.

Shippers are currently divided into categories of "Known Shipper" and "Unknown Shipper." Cargo that is initiated by an unknown shipper is subjected to greater security measures than cargo from a known shipper. The concept is that a company or person that has established itself as "known" over a period of time in business is not an enterprise set up by terrorists in order to place an explosive onto an aircraft. This concept is valid if the shipper maintains an effective ongoing Personnel Security Program and maintains a high level of integrity among its employees that have access to cargo. The requirements that determine whether a shipper is a known shipper or unknown shipper are protected as Sensitive Security Information and are described in the approved security programs of aircraft operators and IAC's. At the current time in the United States, cargo from an unknown shipper is not allowed to be transported on a passenger aircraft. In other portions of the world it is subjected to additional levels of security and inspection.

Trucking Companies and Couriers

Trucking companies and couriers are not directly regulated by the TSA. They are controlled indirectly by the TSA via the regulations and security programs of the air carriers and Indirect Air Carriers. The air carriers and Indirect Air Carriers must ensure that entities acting as their agents (in this case trucking companies and couriers) abide by the conditions placed upon them. In general, violations of security requirements by an agent of a regulated party are the responsibility of the regulated party. Contractual agreements between a regulated party and their agent can shift the monetary penalty to the agent but the regulated party remains responsible.

A substantial amount of air cargo (anecdotal indicators are that as much as 25% of the cargo volumes at an airport) moves on trucks either as origin and destination freight, or as truck-to-truck freight, and goes unreported. Over the past decade, for financial reasons, freight has continued to be diverted to trucking when possible. Nevertheless, the truck/air relationship remains intact if somewhat diminished. It is likely that new security requirements on the cargo industry will involve the implementation of higher levels of screening technology, greater processing costs, and possibly lengthier processing times. From an airport planning perspective, some of these have already translated into a separate screening facility, modifications to an airport's infrastructure to include separation of truck and passenger vehicle traffic to and/or on the airport, further separation of vehicles in the air cargo areas, and modifications of the buildings and surrounding roadways to allow for a smooth flow of vehicles, easy truck parking and minimal potential obstructions caused by queuing.

Added security requirements may affect the flow of cargo to an airport. In some instances, trucks may be required to move to a holding area for more detailed inspection. More typically, additional space may be required for vehicles queuing for routine inspections. Any delays to arriving trucks, particularly if those delays tend to be unpredictable (and of varying lengths) will create additional pressure on local shippers and forwarders to accelerate cut off times and reduce their consolidation potential. Air cargo typically moves in fairly well-defined shipping windows, and most shipments are trucked to the airport as close to that window as possible. At international gateways, several hundred trucks could arrive at the airport over a two-hour period. For these trucks to be screened (even if screening could be accomplished in two minutes per vehicle) the delays could be extensive if the screening efficiency is not addressed. The problem can be exacerbated if the cargo is trucked over a large distance to airports with the specter of unknown screening delays waiting at the destination airport. Ideally, an airport will provide the space necessary to develop (as appropriate) effective central screening facilities that can eliminate much of the uncertainty. This will be a difficult task for some major gateways where land is the scarcest resource and connecting infrastructure is problematic to install. One potential way to help minimize these delays is a cross-referenced electronic identification program that links the driver to a vehicle. This has substantial potential, but given the nature of the industry, would be difficult to implement for all trucking.

The Regulation of Shippers, Trucking Companies, Couriers and Other Entities Not Specifically Identified.

Airports, air carriers, foreign air carriers, and IAC's are generally considered regulated parties in that they are specifically subject to discrete regulations. However, in the recodification and reissuance of aviation security regulations following the 9/11 attacks, a new Part of the regulations was issued which applies to all persons engaged in aviation-related activities. This is 49 CFR 1540. All individuals and companies engaged in aviation-related activities are subject to and must comply with this regulation. This applies to airports, individuals, corporations, organizations, and groups of individuals regardless of nationality.

Examples of regulations in this Part include:

- 1540.103 states "No person may make or cause to be made and fraudulent entry on a document or application required in aviation security."
- 1540.105 states "No person may tamper, interfere with or attempt to circumvent any federally required aviation security measure.

These are just examples. A complete understanding of Part 1540 by all individuals involved in aviation security from the passenger to the airport manager is a prudent and recommended undertaking.

TSA

The TSA has two major roles in the world of aviation security.

- First, they are a screening service provider, they conduct passenger screening, carry-on baggage screening, and checked baggage screening.

- Second, the TSA creates and regulates the security requirements for all parties involved in airport security and air cargo security. The TSA also issues regulations and criteria for security programs to include Security Directives, Emergency Amendments to Security Programs and Information Circulars.

In addition to these two primary roles, the TSA has several other roles supporting aviation and transportation security. TSA manages the Federal Air Marshall Program; and the explosives detection K-9 program (these K-9 teams may be used to screen cargo under approved conditions). Effective November 1, 2018 TSA created the Third-Party Canine-Cargo (3PK9-C) Program, under TSA's regulations for Certified Cargo Screening Programs (CCSP), *see* 49 CFR part 1549, to provide an efficient and effective method for screening air cargo to TSA's standards. Under this program, third-party canine teams trained in explosives detection can be certified by a non-governmental entity, acting under the approval of TSA, as meeting TSA's certification standards. Certified 3PK9-C teams can be deployed to screen air cargo for aircraft operators, foreign air carriers, and other TSA-regulated parties operating under a TSA-approved or accepted security program.

On May 18, 2018, TSA published a notice in the **Federal Register** seeking applications from qualified persons interested in becoming an approved 3PK9-C Certifier under the 3PK9-C Program. *See* 83 FR 23287. The CCSP-K9 security program defines the requirements that TSA-regulated canine explosives detection teams must meet when screening cargo for air carriers and screening facilities and will include eligibility requirements for canine explosives detection teams. These eligibility requirements for canine explosives detection teams include, but are not limited to, experience, education, vetting, and citizenship requirements for canine team handlers. These eligibility requirements for canine explosives detection teams are not contained in the 3PK9 Certifier Order. The 3PK9 Security Program and Order are not available to the public as they contain information that cannot be publicly disclosed under 49 CFR part 1520. Individuals that complete the required vetting processes and other agreements necessary for release of Sensitive Security Information (SSI), including documenting a "need to know," will be provided a copy of the Order and Security Program.

Canine explosives detection teams were eligible to seek certification as early as November 1, 2018, but all teams should understand that successful completion of a 3PK9-C certification event is only one of the requirements for explosives detection canine teams under the CCSP-K9 security program. Among other requirements, the CCSP-K9 security program requires canine explosives detection teams to pass a background check before an air carrier may hire them to screen cargo.

The TSA also has a significant R&D organization that is involved in the testing of new technologies that may be implemented within transportation security including the screening technologies for cargo. The TSA has established a program to train pilots in the use of firearms in the cockpit environment. A large number of pilots have been trained and armed as a result of this program. The TSA also has responsibility for surface and rail security and maintains a cadre of inspectors that are tasked with this mission. Since air cargo security most often involves surface transportation this function of the TSA could well have a bearing upon air cargo security.

Finally, as an extension of its regulatory inspection function the TSA conducts security inspections of air carriers, including those that operate from foreign airports into the U.S. In the course of these inspections, which are conducted at all locations in the U.S. where cargo is accepted for air transportation, and at the international airports of departure, air cargo security measures are inspected.

IATA

IATA, the International Air Transport Association, while not strictly a regulatory body, does issue recommended security practices to its air carrier members. Because of its membership, these practices focus mainly upon air carrier practices. Most IATA practices reflect the ICAO (International Civil Aviation Organization) Standards and Recommended Practices and the ICAO guidance material. IATA Recommended Practice 1630 applies to air cargo security.

USPS

The United States Postal Service has developed a set of security procedures for ensuring the security of mail that travels by air. These procedures were established via mutual agreement between USPS and the TSA. As with the approved security programs of airports and air carriers, the specific measures may not be disclosed to outside parties. However, an obvious example of these security measures is the prohibition to drop off mail packages greater than a certain size in unattended mail boxes.

4. THE GENERAL REGULATORY/STATUTORY SCHEME

The TSA is the primary regulatory agency involved in establishing requirements for aviation security in general and air cargo security in particular. Since airports, aircraft operators, all-cargo carriers, IAC's, and shippers are involved in air cargo security a discussion of how requirements are established for any one portion of the aviation security community cannot be made in the absence of understanding how the other members are regulated. The TSA is a sub-organization of the Department of Homeland Security. It was created by the significant legislation following the 9/11 attacks. This legislation had the most visible effect of assigning the responsibility for the conduct of pre-board passenger screening and checked baggage screening to the TSA. This legislation was called the Aviation and Transportation Security Act of 2001 and is often referred to as "the ATSA".

The legislation, once signed into law, formed the basis of the authority or actions taken by the various Federal agencies which are managed based upon what organization or activities they pertain to. Laws granting authority to the TSA are contained in Title 49 of the U.S. Code. This title is concerned with laws on transportation. Reference to the original legislation that gave rise to requirements often sheds lights on the intent and extent of the requirements themselves. It is sometimes the case that authorizing legislation is overlooked in closely examining regulatory requirements.

Since the TSA is a branch of the Federal government it actually derives its power from authority-granting legislation such as the ATSA. It is the job of the TSA and other administrations within the DHS and the Federal government as a whole to execute or perform the responsibilities assigned in legislation. It does so by regulation -- through proposing and establishing Federal regulations. These regulations are organized or codified according to what segment of the public they pertain to. In the case of regulations dealing with the airport, they are contained in Title 49 of the Code of Federal Regulations entitled "transportation" -- specifically in the 1500 series of regulations.

The regulations which contain the requirements for air cargo security are: 1544 which deals with passenger air carriers and large air cargo carriers; 1548 which deals with Indirect Air Carriers, a formal name for air freight forwarders; 1546 which deals with foreign passenger carriers and large foreign cargo carriers; 1542 which sets forth the requirements for airports; and 1540 which contains regulations concerning individuals and other entities not regulated in the other major sections. Finally, any understanding of air cargo security must be undertaken in light of 1520 which deals with Sensitive Security Information. Much of the specific security procedures and requirements of aviation security are considered Sensitive Security Information or SSI. By definition, Federal regulations are not SSI since they are publicly published in the Federal register.

All of the above Federal regulations contain wording similar to "…and the entity (airport, air carrier, IAC) will abide by the conditions of their approved security program." Security programs are an essential element of the regulatory structure that establishes requirements for air cargo security and all other regulated aviation entities. Airports are required to have approved Airport Security Programs. Airlines are required to have approved aircraft operator security programs. Indirect Air Carriers are required to have security programs, as are foreign air carriers. It is within these approved security programs that the specific security measures and requirements are spelled out. These security programs are Sensitive Security Information by definition. The reason for this is that if an adversary knows the details of a security measures it becomes substantially easier to circumvent or subvert that measure. Since adherence to security programs is required by the publicly published regulation, the entire contents of the security programs are made into regulatory requirements by reference, once approved by TSA.

There is another means by which the TSA establishes requirements upon the aviation security and air cargo community. It is the Security Directive. The conditions upon which a Security Directive is issued are identified in the regulations. These state that when the TSA determines that additional security measures are necessary to respond to a threat assessment or to a specific threat against civil aviation, a Security Directive is issued. Compliance with Security Directives is mandatory as it is with regulations or with an approved security program.

5. DEFINITION AND TERMS

There are two sets of definitions which have application to air cargo security. The first set is contained in the U.S. Code of Federal Regulations Titles 14 and 49. A clear understanding of these regulations is necessary in order to understand an airport's regulatory compliance responsibilities. The second set of definitions is provided by ICAO Annex 17. These are the definitions that are used so that terms are commonly understood across national boundaries. The United States is a signatory to ICAO and therefore must, at a minimum, adhere to ICAO requirements unless it files a formal "exception." U.S. requirements often exceed those of ICAO.

U.S. Definitions relating to air cargo security contained in Title 49 U.S. Code of Federal Regulations (49 CFR 1540.5 – not a complete list)

Air Operations Area (AOA)

The portion of an airport, specified in the Airport Security Program (ASP), which includes aircraft movement areas, aircraft parking areas, loading ramps, safety areas and any adjacent areas such as G/A areas that are not separated by adequate security measures. It does not include the Secured Area. (Note: this definition differs from a prior FAA definition of the AOA and should not be confused.)

Airport Security Program

The security program that is approved by the TSA for an airport regulated under 49 CFR 1542.

Airport Tenant

Any person that has an agreement with the airport operator to conduct business on the airport but does not include aircraft operators regulated under 1544 or 1546.

Airport Tenant Security Program

An agreement between the airport and an airport tenant that specifies which security measures the tenant will perform. It must be approved by the TSA.

Cargo

Property tendered for air transportation accounted for on an air waybill. This includes commercial courier consignments whether or not accounted for on an air waybill. Further definition is provided in the aircraft operator standard security program.

Exclusive Area Agreement

An agreement between the airport and an aircraft operator regulated under Part 1544 or 1546, whereby the aircraft operator assumes security responsibilities. It becomes a portion of the ASP and must be approved by the TSA.

Indirect Air Carrier

Any person or entity in the United States that undertakes to engage indirectly in air transportation of property and uses for all or any part of such transportation the services of an air carrier. This does not include any FAA certificated air carrier, the USPS, or representatives acting on behalf of the USPS.

Screening function

The inspection of individuals and property for weapons, explosives and incendiaries.

Secured Area

The portion of an airport, specified in the ASP, where certain security measures identified in Part 1542 are carried out. This includes areas where aircraft operators regulated under 1544 and 1546 enplane and deplane passengers, sort and load baggage and any adjacent areas that are not separated by adequate security measures.

Security Identification Display Area (SIDA)

The portion of the airport, specified in the ASP where specified security measures are carried out. This includes the secured area and may include other areas of the airport. (Note: Any part of the AOA which is used to load and unload cargo from an aircraft of a 1544 or 1546 air carrier or where cargo is present after acceptance by a 1544 or 1546 air carrier must also be classified as a SIDA.)

Sterile Area

The portion of the airport, defined in the ASP that provides passengers access to boarding aircraft and to which access is generally controlled by the screening of passengers and property.

Unescorted Access to Cargo

The authority granted by the aircraft operator or IAC to individuals to have access to air cargo without an escort.

Terms Undefined in 49 CFR 1540 -1550 but subject to frequent usage: Security Threat Assessment This term was introduced through the Air Cargo Final Rule but not specifically defined. It is a background investigation performed by the TSA for those individuals requesting unescorted access to cargo.

***ICAO Definitions with regard to air cargo security, Annex 17 Chapter 1**.*

Airside

The aircraft movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.

Cargo

Any property carried on an aircraft other than mail, stores and accompanied or mishandled baggage.

Regulated Agent

An agent, freight forwarder or any other entity which conducts business with an operator and provides security controls that are accepted or required by the appropriate authority in respect to cargo or mail.

Screening

The application of technical or other means which are intended to identify and/or detect weapons, explosives, or other dangerous devices, articles or substances which may be used to commit an act of unlawful interference.

Security

A combination of measures and human and material resources intended to safeguard civil aviation against acts of unlawful interference.

Security Control

A means by which the introduction of weapons, explosives or other dangerous devices, articles or substances which may be used to commit an act of unlawful interference can be prevented.

Security Restricted Area

Those areas of the airside of an airport which are identified as priority risk areas where in addition to access control other security controls are applied. Such areas will normally include, all commercial aviation passenger departure areas between the screening checkpoint and the aircraft, the ramp, baggage make up areas, including those where aircraft are being brought into service and screened baggage and cargo are present, cargo sheds, mail centers, airside catering and aircraft cleaning premises.

6. ICAO STANDARDS AND RECOMMENDED PRACTICES

The International Civil Aviation Organization (ICAO) is the United Nations organization that is devoted to civil aviation (it does not generally address military aviation). It establishes practices for all areas of international aviation with the aim of standardization and seamless operations between the air space of sovereign states. Just as the U.S. Code of Federal Regulations is organized by subject matter into “Titles,” the ICAO requirements are divided into Annexes according to subject. Annex 17 is devoted to aviation security. Many ICAO requirements called standards bear upon the civil aviation authorities of the member states and indirectly apply to international airports. It is helpful to review these in order to see what is required by ICAO at international airports.

For the purpose of clarification, while a Standard requires compliance, a Recommended Practice is suggested but not required. There are five Standards and one Recommended Practice that are dedicated to air cargo security. (ICAO Annex 17, Amendment 11)

- Standard 4.6.1 Each Contracting State shall ensure that security controls are applied to cargo and mail, prior to their being loaded into an aircraft engaged in passenger commercial air transport operations.

- Standard 4.6.2 Each Contracting State shall ensure that cargo and mail to be carried on a passenger commercial aircraft is protected from unauthorized interference from the point security controls are applied until departure of the aircraft.

- Standard 4.6.3 Each Contracting State shall establish a process for approval of regulated agents, if such agents are involved in implementing security controls.

- Standard 4.6.4 Each Contracting State shall ensure that operators do not accept cargo or mail for carriage in an aircraft engaged in passenger commercial air transport operations unless the application of security controls is confirmed and accounted for by a regulated agent, or such consignments are subjected to appropriate security controls.

- Standard 4.6.5 Each Contracting State shall ensure that catering, stores and supplies intended for carriage on passenger commercial flights are subjected to appropriate security controls and thereafter protected until loaded onto the aircraft.

- 4.6.6 Recommendation. – Each Contracting State should ensure that security controls to be applied to cargo and mail for transportation on all cargo aircraft are determined on the basis of a security risk assessment carried out by the relevant national authorities.

7. SPECIFIC REGULATORY REQUIREMENTS OF THE MAJOR PARTIES RE: AIR CARGO SECURITY AT AIRPORTS

Title 49 Code of Federal Regulations, Part 1542 is primarily devoted to Airport Security. The TSA is responsible for issuing these regulations and ensuring compliance with them. They generally do that by conducting audits and inspections. Not all airports fall under the jurisdiction of Part 1542. In a general sense, an airport must comply with 1542 if it has scheduled passenger service with aircraft of 61 seats or more. It also applies if there is public charter service with 61 seats or more. Similarly, if there is scheduled air service of 60 or fewer seats that deplanes into the sterile area of another airport, the airport must comply. The regulations also require that a Part 1542 airport must have an Airport Security Program (ASP) that is approved by the TSA. The approval is currently done by the Federal Security Director.

- 1542.111 allows an airport to delegate responsibility to an air carrier or foreign air carrier by means of a specific kind of contract called an Exclusive Area Agreement. These EAA's can only be established with air carriers or foreign air carriers. An airport may delegate security responsibilities to non-air carriers on the airport by means of an Airport Tenant Security Program.

- Subpart C of 1542 is entitled "Operations." It is a crucial section and full of cross references to other regulations. It says that if your airport has scheduled service by a U.S. or foreign air carrier with an aircraft of 61 seats or greater you must establish a Secured Area of the airport in which the highest level of security measures are performed to protect passengers, aircraft and air cargo. Furthermore, Section 1542.205 says that this Secured Area must include an area where security identification badges are displayed and attendant security practices are performed. These areas are called Security Identification Display Areas, or SIDA's. Areas of the airport which are not included in the Secured Area, but are within the airport perimeter are identified as Air Operations Areas or AOA's. As noted earlier in the Definitions section, it is important that the current definition of AOA be used and not confused with the earlier FAA definition.

- Sections 1542.201 and 1542.207 combine to provide the operational requirements for an airport's access control system. They state that airports must have an access control system that only grants access to authorized individuals and that the airport must prevent and detect the entry, presence and movement of unauthorized persons and vehicles in the Secured Area.

- As described in the initial section of this chapter, before an individual can be granted unescorted access to the Secured Area of an airport, that individual must pass a background investigation. This is called the Criminal History Records Check or CHRC. Section 1542.209 enumerates the procedures and specific standards for the CHRC. This is a highly detailed section that closely reflects the legislation that caused this regulatory section to come into being.

- Once an airport has determined who is allowed unescorted access there must be some method that identifies who has been granted access. Section 1542.211 contains the requirements for these Identification Systems or ID badges. A logical requirement that is implied is that employees who have been granted access and have been given an ID badge must know what to do if they observe an unauthorized person on the ramp. These procedures are set out in 1542.213 entitled Training. Airports often refer to this as SIDA training. Employees are not granted their ID badges until they have successfully completed the SIDA training.

- The final operational requirement of the airport is to supply law enforcement officers to support the security requirements of the airport. These requirements are contained in Sections 1542.217, 1542.219 and 1542.221. Subpart D of 1542 contains the final requirements all of which pertain to crisis management. This subpart basically requires that each airport must have and exercise a contingency plan and establish procedures for managing security incidents. It also requires that airports must comply with Security Directives and must post Public Advisories when directed to.

Regulations, security programs, and security directives provide minimum requirements that must be implemented by regulated parties. The following best practices are recommended for use by regulated and non-regulated parties that deal with cargo.

8. NON-REGULATORY SECURITY BEST PRACTICES FOR AIR CARGO

8.1 Employee Issues:

- Each separate facility, and in many cases, each tenant, should appoint a security officer who will be responsible for interacting with the managing entity of the building and/or appropriate airport staff on all security issues.
- Airport and tenant employees should be trained to question the presence of unidentified persons in the cargo areas.
- Active cargo areas and any areas providing potential access to the aeronautical operating area should restrict entry to authorized employees only.
- Tenants and handling companies should establish policy guidelines and physical checks to ensure that the whereabouts of all employees on each shift is known.
- Tenants and handling companies should have clearly designated individuals responsible for signing freight in and out.
- Tenants should establish controls to record movements in and out of the cargo areas.

8.2 Non-Employee Issues:

These guidelines were designed to address access issues for individuals employed by businesses external to the airport and its cargo tenants.

- Every tenant should ensure that persons not authorized unescorted access to cargo areas are kept away from the cargo areas unless escorted.
- Tenant and airport employees should ensure that there is no parallel parking of trucks in front of cargo bays.
- Tenants should limit the access of Customs Broker runners to the facility and supervise their movements.

- No private vehicles should be allowed to park near loading areas.
- Tenants should ensure that no pickup is made without a valid release order. In the event there are any concerns, clarify any doubts with the consignee.

8.3 Physical/Equipment Issues:

These guidelines were created to focus attention on physical design and equipment issues as they relate to security monitoring devices and planning elements of the building and site.

- The tenant should create a high security, limited access vault area for high-value goods.
- When possible, tenants or the landlord should install a silent alarm system, connecting cargo areas with the airport security desk or a 24-hour alarm monitoring organization if the airport security desk is not staffed on a 24-hour basis.
- Loaded mobile equipment should be kept secure at all times.
- Key-operated positive locking devices should be installed in all mobile equipment.
- All cargo containers whether empty or loaded should be secured and access limited.
- The contents of cargo tug trains should be covered to prevent open viewing both to and from the aircraft.
- Forklifts and other related equipment that could be used to force access to the cargo areas should be secured and access controlled.
- The gates and doors of all trucks containing cargo should be locked when not in the process of loading or unloading.
- Physical planning configurations should eliminate employee vehicle parking immediately next to the cargo building.
- Segregate trucking from both employee parking areas and any parking facilities reserved for airlines.

9. IMPLICATIONS OF SECURITY FOR FACILITIES AND INFRASTRUCTURE

9.1 Airside/Landside Demarcation

An air cargo operation is intermodal. While traditional security applications have tended to focus heavily on the airside, there are three aspects of an air cargo leasehold that must be considered when addressing security issues.

- The aeronautical component to include taxiways and ramp, including setbacks;
- The building as it pertains to the dimensions, configuration, and operating characteristics of the internal space allocated to warehouse, office, and other related uses, and. the concentration of truck and airside doors;
- The landside component to include building frontage, queuing capacity, parking for customers and employees, and roadway access.

Aeronautical Component:

The movement area includes aircraft parking apron that is usually adjacent to the cargo building, as well as the taxiways and taxi lanes that provide access, and any restricted service roads (RSR) that enable belly cargo tugs to move on non-public roads to and from the passenger terminals. Direct aeronautical access to aircraft apron is not necessary for every tenant. Passenger-only carriers and handling companies that deal with belly cargo need only be connected to the movement area via a restricted service road. However, most carriers flying freighters, or handling companies dealing with freighters, need to have ramp access, and most appropriately, ramp directly adjacent to the cargo building to minimize operating costs.

Building Component:

The dimensions of a building directly impact the number of access points on both the airside and landside, and the resultant complexity of access control. Buildings must be designed with throughput, operating efficiencies, and leasing costs in mind. In leasing cargo facilities, rental rates are typically based on the leasehold square footage and the footprint of the building, while the tenant's operating efficiencies, in many cases, may be substantially enhanced by the height of the facility. The design and installation of security systems will add costs and may impact throughput capabilities. Other critical elements in building design are the number, dimensions, and spacing of cargo doors on the aeronautical and landsides, the use of floor versus mezzanine office, and storage for equipment.

Landside Component:

Typically, the landside element of an air cargo facility must have sufficient space for truck turning and queuing, acceptable proximate roadway geometry, and acceptable overall access to the leasehold. In many airports, older cargo facilities were not designed to accommodate the larger trucks that are typically used today for long-haul trucking. This is true of the areas surrounding the cargo buildings, as well as the access roads to the cargo areas in general. Ensuing problems usually result in diminished traffic flows, random off-site truck parking, and a negative impact on air quality.

Another critical element of landside planning is the automobile parking requirements for the facility. Typically, a freight operation does not require extensive parking; however, on an airport the needs can vary. Employees and customers must both have proximate parking that is physically separated from the trucking operations. In instances where automobile parking is limited, employee parking is usually shifted to a remote area, shuttles are set up, and operating costs are increased.

9.2 Site Fencing/Gate Security

The most obvious manifestation of airport security is fencing. In cargo areas it serves the dual purpose of keeping intruders out and freight in. Typical perimeter fencing around a site is eight feet, heavy gauge chain link. It is likely that future site design will require separation of automobile parking areas from trucking with fencing and security gates. It is also recommended that access points to the AOA from the cargo facilities be reduced and manned checkpoints be established. Similarly access points to the cargo facilities from the roadway should be minimized and manned gates created. The result will be additional staffing requirements and the potential for further delays.

9.3 Single-Tenant Facilities

Single tenant facilities, whether carrier or handling company controlled, are easier to secure than multi-tenant buildings. There are no concerns over the integration of individual tenant security systems and technology, fewer access points, direct accountability, and lower installation costs. The building system should be linked to airport security, and local law enforcement as necessary and appropriate. The interior design should allow for the control of visitors in a single area without impacting efficiency or effectiveness. As compared to a multi-tenant facility it has the benefits of more visible and known staffing, and an interior that is more open to observation of the cargo areas. At most airports, however, single tenant buildings are not the predominant facility.

9.4 Multi-Tenant Facilities

Multi-tenant facilities represent challenges from a number of perspectives. Unless the facility has been developed or is managed by a third party, the most problematic issue is accountability for day-to-day security in common building areas and within the vehicle areas. Historically, airports have had difficulty with tenants failing to perform even routine maintenance or policing of such areas. Insurance issues associated with security accountability may create a major obstacle. These facilities typically have multiple access points in order to serve the tenants: this will add impediments and additional costs to access control. A more complex issue is the introduction of security technology into the building. With a single tenant with uniform operating equipment and procedures the design and implementation of security technology to include such items as physical characteristic verification devices, CCTV, screening devices, etc., is less expensive and easier to maintain. In new facility development, the building design should incorporate

security systems and technology enabling amortization of the investment over a longer period of time and minimizing the impacts on tenants. The addition of individual tenant systems after leasing typically will be more costly to the tenants and more difficult to monitor and maintain.

9.5 Landside Access:

Roadways:

In an ideal environment, trucking activity, beginning with entry onto the airport grounds, should be separated from automotive/passenger traffic. A system of readers and transponders will allow a central control to track the vehicle from the airport entry as it moves to a central screening area, and eventually, the cargo facility. Electronically cross-referencing the driver with the truck should also be included at the screening facility. Roadways should be wide enough and appropriate to allow for easy unrestricted movement, and the ability to avoid a blockage. The problem is that many airports do not have roadway systems that currently provide for an optimum vehicle separation, nor do they have the physical capacity to make modifications. In other instances, the capacity to develop a truck screening facility with appropriate queuing areas may also be lacking. For those airports with the space to accommodate potential changes to trucking movements, the cost of creating new screening facilities and potentially miles of road, may be prohibitive.

Parking Lot Access:

To mitigate theft, a well-designed cargo facility requires that automobiles and trucks be segregated with regard to both access and egress to the complex, as well as parking for the vehicles. This separation should be physical with employee and visitor lots positioned away from the building and secured with a single manned pedestrian access gate. All employees and visitors should be checked and be subject to local security and administrative processes. No employee vehicle parking should be adjacent to the building. Parking for key management staff or for persons with disabilities, should be provided as appropriate, however even this parking should be designed away from cargo bay doors. Truck and driver identification should again be verified at the entrance to the cargo facility. After admittance, trucks should queue in an area away from, but easily accessible to the cargo bays. All drivers whose trucks are not loading should be either in their vehicles, in a rest area if one is available, or in a secure area in the facility handling their paperwork.

Building Access:

Facility access must be tightly controlled. Cargo facilities with their extensive truck bays offer a number of access opportunities that must be controlled by observation and physical barriers. These can be as basic as keeping the bay doors closed until a truck is in the dock, or monitoring and enforcement of the “yellow line”. The “yellow line” can be an actual line that is painted on the floor of cargo facilities parallel to the front of the building. Usually it is 20 feet from the bay doors and defines the point beyond which unauthorized personnel may not pass. This concept is recognized by the trucking industry whose drivers need to be inside the cargo building to load and unload the vehicles.

Part of the difficulty in securing a cargo facility is the diversity of the population who need to access it, and the differences in the levels of access that each require. Office space should be physically separated and secured from the warehouse, but provide easy access for customers at the ground level. Access to mezzanine offices should not allow non-employees to enter warehouse space.

9.6 Facility Design Considerations to Accommodate Air Cargo Screening

When approaching the subject of facility design for air cargo screening it is important to take a step back and reflect upon a couple of basic differences between passengers and cargo with regard to screening. Aircraft passengers generally range from about 30-40 pounds for children to an upper range of about 300-400 pounds for the largest adults. They may bring to the airport both hold baggage and carry-on. In either case, the baggage must be carried by individuals. This puts a significant limitation on both size and weight. This is not the case with air cargo. A single piece of air cargo may range from one or two ounces to several

tons. This extreme diversity of size and weight is replicated by diversity in density and a broader diversity in the items themselves.

The point is that the challenge of screening cargo effectively is daunting. The numerous elements of diversity require that numerous methods are employed to screen cargo. The screening approach must be adequate to handle the size, weight, density, and material that is being examined. In turn, the approach (and related technology) can have significant and different implications with regard to cargo facility design. Some cargo is subject to physical inspection and hand search. The space/facility requirements for this type of screening are minimal. Cargo that is screened using the Electronic Trace Detection (ETD) technology has a greater but similarly minor requirement for space. ETD's typically have a 3-4 sq. ft. footprint and weigh less than 100 pounds. At the opposite end of the technology spectrum are the automated Explosive Detection Systems such as the CTX 9000 which weigh several tons, have the footprint the size of an automobile, require air conditioning and heating, and often require handling equipment to get the cargo into and out of the system.

Space requirements for cargo screening operations can reflect the type of technology being employed and the type of cargo being screened. It is envisioned that the use of consolidated cargo screening facilities will continue to increase. Worldwide, a range of technologies are being employed to screen cargo. Not all technologies are necessarily approved methods in all countries or by the TSA, but these technologies provide the widest possible view of what is available. Representatives of the appropriate authority (TSA, CAA etc.) should be consulted prior to serious consideration of any particular technology. As previously stated, the airport has no direct role in the screening of cargo.

9.7 Recommended Security Guidelines for Airport Planning, Design and Construction

The TSA released the above titled document on May, 2011. The Aviation Security Advisory Committee Working Group which was composed of experts from industry and government contributed to this comprehensive reference for airport security construction. Section D Part 3 directly addresses air cargo facilities and screening. Much of what is contained under the other headings of this volume can be applied to air cargo security. It is recommended that airports maintain a copy for frequent reference. An electronic version of this document which has links to related documents can be obtained from ACI-NA.

9.8 Other Important Considerations and a Look Ahead

Airport Capacity

- Airports measure capacity in different ways.

- The most obvious is air space, the ability of the region to sustain certain levels of air traffic. This is not typically an issue for cargo since it can and frequently does move at times other than passenger peaks.

- A second aspect of capacity is airside i.e. the aeronautical infrastructure. This is the ability of the runways, taxiways, and aircraft apron to accommodate the safe movement and parking of aircraft. If there is a shift to freighters, many airports maybe unable to meet the resultant demand for parking positions.

- The third aspect of capacity is terminal capacity. This pertains to passengers and would not typically be an issue for cargo. Instances, however, may occur where carriers who operate both passenger and freighter operations opt to change their route structure to fit with constraints arising out of cargo constraints thereby impacting terminal capacity.

- The fourth aspect of capacity is cargo facility capacity. Any major policy changes impacting how cargo is moved (belly versus freighter) could create serious mismatches in the compatibility of facility design and location with recommended revised operating guidelines. The cost implications could be substantial for many airports,

- The last aspect is landside access. All the major gateways and most large airports are fairly well constrained geographically. Requirements to create new roadway access points or screening facilities with large queuing requirements will cause enormous problems – many of which may not be resolvable – for these landlocked airports.

At airports where there is a lack of capacity for expansion, the airport may need to explore the availability of off-airport property that can be utilized for cargo screening and or handling. This may require the formation of public/private partnerships to include the use of third-party developers and the use of private funds.

9.9 Inbound Freight:

Many aspects of air cargo shipments do not impact airports directly, but are critical to improving air cargo security. They involve expedited clearance to minimize the length of time inbound international freight remains in the warehouse facility. This will involve a broader and more effective application of electronic clearance mechanisms. By inference this will involve increased compatibility between the requirements of the relevant government inspection agencies at the origin and destination of a shipment. This compatibility must be supplemented by enhanced communications that will facilitate data transmission within and between countries of origin. If goods can be cleared electronically, particularly shipments such as perishables, live animals, personal effects, and low-value goods, then targeted dwell times can and should be reduced to less than four hours. The system for clearing goods must be simplified as well as standardized. Entries into the system must however remain sufficiently clear to enable Customs and other facilitation organizations or other governmental entities, to identify information relevant to expedited pre-clearance. In a similar vein, partial shipments when possible should also be released as soon as possible rather than be held until the entire shipment is ready for release.

9.10 All-Cargo Airports:

The major forecasting agencies are calling for the world's air cargo volumes to double over the next 20 years. Given the constraints facing established airports, and the very real need to provide levels of assurance to the industry and the public, in certain geographic regions, it may become necessary to consider the redevelopment of existing underutilized airports, or the creation of new all-cargo airports to meet the industry's needs. Obviously, the costs for a new facility and the potential for economic disruption to other regions are substantial. Beyond that, a new airport (or airports) would create the need to totally reexamine how goods are moving throughout the country. A hub and spoke system of all-cargo airports strategically located throughout the country and linked to a massive trucking system could be an ideal solution to the cargo security issue. The reality of it is that an all-cargo airport may in isolated instances work, and bring benefit to the region in which it is located. However, the creation of a network would have major implications for existing regional economies, create substantial local job losses for existing airports, and foster the loss of additional jobs through the relocation of manufacturers. The financial impacts on carriers and airports could be substantial, and the higher costs of goods movement to sustain the new infrastructure would be challenging.

9.11 Implications of Cargo Security Costs:

Airports essentially have very limited resources to dedicate to cargo security. With most airports facing revenue challenges, and increased costs associated with the implementation of passenger security enhancements and related operational modifications, little funding is typically available for cargo. This however, is not a new situation. Despite the importance of cargo, many airports (and carriers) historically have placed their primary emphasis on the passenger segment that has been their principal source of revenue.

Air freight typically costs about eight times as much as trucking. Nevertheless, success in the cargo industry is predicated upon high volumes and small margins. Raising the cost of shipping by air will push additional domestic freight and possibly some international freight to other modes. The resultant loss of business could create a cycle of escalating costs and freight diversion. It is difficult to envision the diverse firms in the industry having the capacity to absorb the costs of the infrastructure improvements that could evolve

out of new security requirements, and airports have no unique mechanisms to raise funds that could be dedicated to security infrastructure modifications.

10. CERTIFIED CARGO SCREENING FACILITIY (CCSF)

Because of the belly cargo screening requirement, and the intent of the TSA to push cargo screening back down the logistics chain, smaller cargo support functions have sought out Certified Cargo Screening Facilities ("CCSF") for operating assistance and financial relief. There are a number of such operations located off airport in forwarder and trucking facilities. As security protocols mature, there is increased interest in having a CCSF (or several) located on the airport. This would reduce operating costs substantially if the facility can be located such that it will have airside access via restricted service road. This would eliminate the need to reload inspected cargo onto a truck for movement to the carrier. A CCSF would be an ideal element in an on-airport cargo village. A typical such facility allowing for truck circulation would require approximately 50,000 square feet.

11. CARGO SCREENING TECHNOLOGIES

Cargo screening technologies are as diverse as the items of cargo carried aboard aircraft. This presents a challenge for the airport manager who is planning for cargo screening facilities. Although it is the aircraft operator that retains the responsibility for cargo screening, it is the government authority (TSA, CAA, etc.) who determines which technologies and which particular equipment will be authorized to be used for cargo screening. So, while screening equipment manufacturers may advertise a particular piece of equipment as a "cargo screening unit" it is essential to know whether or not that particular piece of equipment is authorized for use in a given country; while a piece of equipment is acceptable for the screening of cargo in one country it may not be acceptable in a second or third country.

While the FAA, and now the TSA, established a certification standard for Explosive Detection Systems (EDS) for all passenger checked baggage and subsequently certified specific equipment, the extreme diversity of air cargo works against any such single "certified cargo screening system." It may become the case that certain systems are certified to screen only certain types of cargo while others systems are certified to screen entirely different types of cargo.

The simplest form of cargo screening device is the human being. A trained individual can effectively screen certain types of cargo. Following this, explosive detection dogs have been used to screen cargo for explosives. Again, the caveat - a given cargo screening method may only be applied if it is approved by the appropriate government authority. In recent times, the recognition of the need for harmonization of requirements between countries bodes well for more acceptance of "equivalent" cargo screening.

Some of the screening technologies that are employed at the passenger screening checkpoints have also been employed to screen cargo. They are the X-ray, the Advanced Technology (AT) X-ray, and the Explosive Trace Detector (ETD). This equipment, and their parent companies, have evolved over the last several years. Their size, weight and power requirements are relatively familiar. Further specifics can be obtained via a general internet search of the subjects. Similarly, requirements and dimensions of ETD technology can be obtained by referring to the website of GE Security or Smiths Detection. Bear in mind that this is an evolving technology that is constantly changing. Any discussion of specific devices or technology will likely be out of date before the ink dries. For that reason the following is a general discussion that should not be taken as authoritative.

High Energy X-ray Cargo Screening Devices

Several companies produce high energy X-ray imaging systems that are designed for the screening of cargo.

TSA Certified Explosive Detection Systems (EDS)

There are many devices that can detect explosives and several that are advertised as explosive detection systems. The FAA developed detection performance standards for the certification of Explosive Detection Systems. These performance standards identified the types, configurations and amounts of explosive that must be detected. The first such system that met these standards was certified in November, 1994. Since that time the TSA has continued these certification standards and currently there are multiple systems that are TSA certified Explosive Detection Systems.

X-ray Diffraction Technology

These are designed to be used downstream of an EDS system for the purpose of providing more definitive screening of items that have been identified as suspect items. These systems are not advertised as stand-alone systems but rather an additional feature to be added to an EDS system.

Gamma Ray Technology

Gamma ray technology is designed for screening cargo carried in trucks. Gamma rays are much more powerful and have greater penetrating power than X-rays so they have the ability to see through much denser material than X-ray technology. For this reason, they require greater shielding and attendant safety measures. The gamma ray devices are high-power imagers. They are not specifically designed to detect explosives as an EDS or ETD. Their ideal use is to scan a truckload of cargo to see if the material on the manifest is what appears on the image.

Pulsed Fast Neutron Technology

Pulsed Fast Neutron technology is being tested for application to cargo screening. It is a system whereby a pulsed beam of high-energy neutrons is scanned up and down in a raster (grid) pattern while the object under inspection is conveyed through the beam; characteristic gamma rays emitted by materials in the object are detected in order to analyze and image these materials with the help of time-of-flight measurements.

Appendix - Air Cargo Field Guide for Airport Operators

Four Steps to a Common Sense Understanding of Air Cargo Security at Your Airport

The four following steps are designed to provide a real-life understanding of the basics of air cargo security operations and responsibilities of the airport. There are many other parties involved - each with their own set of security responsibilities and regulations. But for an airport manager reporting to a new airport, or a manager assuming air cargo responsibilities these are four questions which if followed will result in a basic understanding of the airport's air cargo security responsibilities.

The First Question: **Where is (or are) the air cargo operations on the airport?** Find the cargo operations on the airport layout plan map. Next, find out how this area is depicted in the Airport Security Program (ASP). Then ask, "What does the ASP say about these areas? And "What does the ASP say our responsibility is for this area?" The answer will likely be that the airport is responsible for the perimeter fence surrounding the cargo area and that the airport has responsibility for access control measures at and around the cargo areas to include such things as doors, pedestrian gates and vehicle gates. Finally, one should ask "Are there any Security Directives or Emergency Amendments which modify what our ASP requires us to do?" Answering the above question will establish a firm foothold of understanding with regard to your responsibilities for air cargo security. You have two options at this point. Option 1: go out and observe this cargo area in person. See if the measures that are described in the ASP are really in place and if they make sense. Option 2: go on to ask the next question, but in no case going on to Question 2 before going onto the airport to see for yourself.

The Second Question: **How does cargo get to the aircraft?** In addition to cargo being introduced into the system through the on-airport cargo facility, there are often secondary ways that cargo gets on aircraft. Your first job is to identify all of them. Talk with air carrier cargo personnel. Talk with both managers and cargo ramp workers. They will know all the different means by which cargo gets on their aircraft. As an example, a courier for a medical lab could bring blood samples to an air carrier ticket counter each night for shipment to another blood lab. Another example might be a cargo airline that has a consolidation center located off-airport that brings in a truckload of cargo through a vehicle gate and loads the airplane from the truck. After identifying all these secondary air cargo venues, you proceed upon the same line of questioning as before. "What does the ASP say about these procedures?" What is your responsibility for the security of this operation?" Are there any Security Directives or Emergency Amendments which expand your responsibility for this? At this point, assign operations staff officers to observe what has been described to you. Take a notebook and make notes. Remember, you know what the ASP says and what the formal requirements say. Ask yourself, "Is this what I am seeing? Does this make sense?" Take notes.

The Third Question: **What is the airport's responsibility for badging the air cargo employees?** You will probably have found in the course of answering the first two questions that the airport bears the primary responsibility for issuing airport access badges as well as vehicle access authorization. Again, start with the formal requirements. Ask, "What does the ASP say about the airport's responsibility for issuing airport access badges to individuals involved in air cargo?" Make sure you read the ASP section yourself. Often, the ASP does not actually say what the individuals who deal with it on a day-to-day basis think it says. You will find that the issue of granting airport access badges requires that the airport perform a background investigation for most areas of the airport. Identify which areas of the airport require a background investigation. Identify what is required of those individuals involved in air cargo operations identified in Questions #1 & #2. Ask the question "Is there more than one kind of background investigation that the airport is involved in?"

Finally, follow Question #3 with a field trip. This will be a two-part field observation. First, go to the office where the airport's access badges are granted. Observe the process. Where are the background investigations performed? What causes an individual to fail a background investigation? Second go to the air cargo areas and observe how the airport access badges are being used. Keep in mind what the ASP says must be done. Is this actually what you are seeing? Does it make sense? Will it actually result in good security for the cargo? Take notes.

The Fourth Question: **What is the airport's responsibility when something goes wrong?** For example, what happens if cargo is suspected of containing a bomb, or a stowaway? What happens if cargo catches on fire on or off the aircraft? What happens if an intruder is found in the cargo area? These questions focus on the fact that the airport has a great deal of responsibility for emergency response both for security and police issues as well as for rescue and firefighting.

Follow up with: What does the ASP say we must do when an incident occurs? Review the section yourself. Does it say what everyone thinks it says? Do the responding organizations know what they are supposed to do? Is there a Memorandum of Understanding between the police department and/or the fire department that articulates what their responsibilities are? Finally, visit the responder organizations and find out what they understand their responsibilities to be. Having answered the preceding four questions, the new airport manager has established a solid understanding of the air cargo security responsibilities for a particular airport. Nevertheless, cargo is diverse and the attendant issues that could arise can be unanticipated and challenging. The key to successful management of a cargo function is maintaining awareness of industry best practices, and the implications for your airport.