



Screening and Securing Air Cargo: Background and Issues for Congress

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December 2, 2010

Congressional Research Service

7-5700

www.crs.gov

R41515

Summary

The October 2010 discovery of two explosive devices being prepared for loading on U.S.-bound all-cargo aircraft overseas has heightened concerns over the potential use of air cargo shipments to bomb passenger and all-cargo aircraft. The incidents have renewed policy debate over air cargo security measures and have prompted some policymakers to call for comprehensive screening of all air cargo, including shipments that travel on all-cargo aircraft.

U.S. policies and strategies for protecting air cargo have focused on two main perceived threats: the bombing of a passenger airliner carrying cargo and the hijacking of a large all-cargo aircraft for use as a weapon to attack a ground target such as a major population center, critical infrastructure, or a critical national security asset.

With respect to protecting passenger airliners from explosives placed in cargo, policy debate has focused on whether risk-based targeting strategies and methods should be used to identify those shipments requiring additional scrutiny or whether all or most shipments should be subject to more intensive physical screening. While the air cargo industry and the Transportation Security Administration (TSA) have argued for the implementation of risk-based approaches, Congress mandated 100% screening of all cargo placed on passenger aircraft using approved methods by August 2010 (see P.L. 110-53).

While 100% of domestic air cargo now undergoes physical screening in compliance with this mandate, not all inbound international cargo shipments carried on passenger airplanes are scrutinized in this manner. TSA is working with international air cargo operators to increase the share of cargo placed on passenger flights that is screened, but 100% screening may not be achieved until August 2013. In the interim, TSA, along with Customs and Border Protection (CBP) and international partners, is relying on risk-based targeting to increase screening of air cargo, particularly shipments deemed to be high risk.

Amid renewed congressional interest on air cargo security, a number of policy issues may arise regarding

- the desirability of risk-based strategies as alternatives to 100% cargo screening and inspection;
- the adequacy of off-airport screening under the Certified Cargo Screening Program (CCSP) in conjunction with various supply chain and air cargo facility security measures;
- the costs and benefits of requiring blast resistant cargo containers to protect aircraft from in-flight explosions in cargo holds;
- the desirability of having air cargo screened by employees of private firms rather than TSA and CBP employees; and
- cooperative efforts with international partners and stakeholders to improve the security of international air cargo operations.

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The Air Cargo Industry

The air cargo industry consists of a complex distribution network linking manufacturers and shippers to freight forwarders, off-airport freight consolidators, and airport sorting and cargo handling facilities where shipments are loaded and unloaded from aircraft.¹ Cargo placed on aircraft travels both domestically and internationally and is widely regarded as a vital component of U.S. trade and commerce. While only a small fraction of cargo shipments travels by air, items shipped on aircraft generally consist of time-sensitive and high-value commodities. By weight, air freight comprised only 0.4% of all commercial freight activity in the United States, but accounted for 25.1% of the value of commodities shipped as freight in 2007.²

Common examples of air cargo include high-value machine parts and manufacturing equipment, electronic components for manufactured goods, consumer electronics, jewelry, and perishable items such as flowers, fruits, and fresh fish. Specialized freight that requires specific handling—such as unique scientific instruments, highly specialized tools and equipment, and even thoroughbred horses—is also transported as air cargo. Most outbound air cargo packages are consolidated at off-airport facilities and arrive at airports on bulk pallets or in special containers known as unit load devices. It is estimated that about 75% of all air cargo travels on bulk pallets.³

Typically, shippers have no foreknowledge of the particular route or aircraft by which a package will be transported. Freight forwarders and airlines make such determinations, using logistics software, databases, and computerized flight schedules to optimize the flow of air cargo. Both domestic and international air cargo movements generally rely on a hub-and-spoke network of airports to link origins and destinations. Most international air cargo that enters the United States transits through large hub facilities in Europe and Asia.

Business and consumer demand for the fast and efficient shipment of goods has fueled rapid growth in the air cargo industry over the past 30 years. Although sluggish economic growth has had the effect of reducing air cargo shipments considerably over the past two years, the Federal Aviation Administration (FAA) forecasts a return to annual growth rates in air cargo movements of about 1.3% domestically and 4.7% on international routes over the next 10 years.⁴ According to Boeing Commercial Airplanes, worldwide air cargo traffic has rebounded in 2010 and is forecast to triple over the next 20 years, with 5.9% annual growth anticipated.⁵

¹ Shippers are the owners of air cargo items and may be either individuals or businesses. Freight forwarders are brokers or middlemen that do not operate aircraft, but make arrangements for moving cargo and may operate distribution centers that store incoming shipments and then send them on to final recipients. Since freight forwarders do not operate aircraft, but provide air cargo services, they are referred to in regulation as indirect air carriers (IACs).

² Department of Transportation, Bureau of Transportation Statistics, *Freight Transportation: Global Highlights, 2010*, http://www.bts.gov/publications/freight_transportation/.

³ Andy Pasztor, Keith Johnson, and Daniel Michaels, “Focus on Cargo Security Steps,” *Wall Street Journal*, November 1, 2010.

⁴ Federal Aviation Administration, Aviation Policy and Plans, *FAA Aerospace Forecasts, Fiscal Years 2010-2030*. Projected growth in air cargo movements is based on forecast revenue ton miles (RTMs). An RTM represents the movement of one ton of cargo a distance of one mile in revenue service.

⁵ Boeing Commercial Airplanes, *World Air Cargo Forecast 2010-2011*, Seattle, WA: The Boeing World Air Cargo Forecast Team, Boeing Commercial Airplanes, <http://www.boeing.com/commercial/cargo/>.

Slightly more than 19 billion pounds of cargo were shipped on domestic flights in 2009. Of this, FedEx transported more than 10 billion pounds, while rival UPS carried more than 5.5 billion pounds. Collectively, these two carriers transported about 83% of all domestic air cargo in 2009, and were by far the largest two operators in the U.S. air cargo industry.

Additionally, in 2009, approximately 15.7 billion pounds of international air cargo were transported to and from the United States. While FedEx and UPS were the largest carriers by volume, combined they transported only about 15% of international air cargo to and from the United States. Their comparatively smaller role in the international sector reflects a greater number and diversity of air carriers that transport cargo that originates overseas.

Passenger aircraft play a much greater role in transporting air cargo internationally than within the United States. On international routes, roughly one-third of air cargo by weight is transported on passenger aircraft, compared to only 7% in domestic markets.⁶ This characteristic is of particular interest with respect to potential security vulnerabilities, as cargo shipments could provide a means of placing explosive devices aboard international passenger flights destined for the United States.

Security Threats to Air Cargo

Despite concern over the potential use of air cargo to introduce an explosive device aboard a passenger aircraft, no such attack has ever occurred. The concern is largely predicated on the belief that more stringent measures to screen passengers and baggage may cause terrorists to consider that explosive devices in air cargo are less likely to be detected. In 1994, after a plot to place bombs in passenger cabins aboard multiple trans-Pacific flights—the so-called “Bojinka plot”—unraveled following a fire at a terrorist bomb-making site in the Philippines, Ramzi Yousef and Khalid Sheikh Mohammed allegedly pursued a plot to bomb U.S.-bound cargo planes.⁷ In February 2005, Yousef was arrested in Pakistan before the plot was carried out.

The air cargo system is not particularly suitable for terrorists seeking to bomb a specific flight or even to generate attention by bombing a passenger flight, as shippers typically lack control or foreknowledge of how or when a shipment will travel. Reflecting this thinking, TSA’s air cargo security strategy focuses on two primary security threats: (1) the introduction of an explosive device on a passenger aircraft, and (2) the hijacking of an all-cargo aircraft in order to use it as a weapon of mass destruction.⁸

The potential use of a hijacked all-cargo aircraft as a weapon of mass destruction was illustrated in a dramatic incident that occurred on April 7, 1994, several years prior to the 9/11 attacks. In that incident, an off-duty Federal Express flight engineer attempted to hijack a FedEx DC-10 aircraft and crash it into the company’s Memphis, TN, headquarters. The hijacker boarded the airplane in Memphis under the guise of seeking free transportation (a practice known in the industry as deadheading) to San Jose, CA. His only luggage was a guitar case that concealed

⁶ All statistics are based on CRS analysis of calendar year 2009 air carrier T-100 domestic and international market data reported to and maintained by the U.S. Department of Transportation, Bureau of Transportation Statistics.

⁷ Mark Clayton, “Yemen Packages: Air Cargo Was a Target Before. Why Is It Still Vulnerable?,” *Christian Science Monitor*, November 2, 2010.

⁸ Transportation Security Administration, *Fiscal Year 2011 Congressional Justification, Aviation Security*.

hammers, mallets, a knife, and a spear gun. At the time, there was no federal requirement or company procedure to screen personnel or personal baggage carried aboard cargo aircraft. The three flight crew members thwarted the hijacker's attempt to take over the airplane and made a successful emergency landing in Memphis despite sustaining serious injuries.⁹

While TSA strategies for all-cargo operations have focused most intensely on the hijacking threat, recent events suggest that terrorists may again be seeking to target U.S.-bound air cargo shipments by exploiting weaknesses in air cargo security overseas. On October 29, 2010, intelligence and law enforcement agencies in Dubai, United Arab Emirates, and in the United Kingdom discovered explosive devices concealed in packages shipped as air cargo bound for the United States. According to media reports, the explosives were not detected by initial screening, but were discovered upon reexamination after authorities received a tipoff from a member of the al Qaeda terrorist organization who had turned himself over to officials in Saudi Arabia prior to the incident. One of the devices had traveled on two passenger flights, from Yemen to Qatar and then from Qatar to Dubai, before being prepared for loading on a U.S.-bound all-cargo aircraft.¹⁰ Authorities in the United Kingdom surmised that the explosives, concealed in printer cartridges, were probably intended to detonate in flight and were capable of bringing down the aircraft.¹¹

The devices originated in Yemen and are believed to be the work of al Qaeda in the Arabian Peninsula, a terrorist group that is also believed to have been responsible for the attempted bombing of a Detroit-bound passenger airliner on December 25, 2009. The group has also claimed responsibility for the crash of a UPS cargo airplane near Dubai on September 3, 2010, although the initial investigation of that crash did not uncover any evidence of a bomb.¹² The devices found in the October incidents and used in the December 2009 attempt contained pentaerythritol tetranitrate (PETN), a powerful explosive, in quantities considered sufficient by explosives experts to cause catastrophic damage to a large airliner if detonated during flight.¹³

Following the discovery of these explosive devices shipped as air cargo, the United States temporarily suspended air cargo shipments from Yemen, and has indicated that it will work closely with Yemeni authorities to improve their cargo screening procedures and security measures.¹⁴ Some European countries have taken additional steps to prohibit cargo shipments from Somalia as well as the carriage of large printer cartridges in the cabins of passenger aircraft. Also, Germany took further action suspending all inbound passenger flights from Yemen soon after the incident.¹⁵ A week after the incident, the United States prohibited cargo shipments from Somalia as well. TSA also banned the shipment of printer cartridges weighing more than one pound in cargo or checked baggage, and implemented additional screening requirements for cargo

⁹ Dave Hirschman. *Hijacked: The True Story of the Heroes of Flight 705*. (New York: William Morrow & Co, 1997).

¹⁰ Joseph Berger and Robert F. Worth, "Bombs Were Set to Explode Inflight; Officials in Washington Weigh Their Options for Response to Failed Attack," *International Herald Tribune*, November 1, 2010.

¹¹ "Air Freight from Yemen and Somalia Banned," *BBC News*, November 1, 2010.

¹² Lolita C. Baldor, "Al-Qaida Claims It Caused UPS Plane Crash in Dubai," *Washington Post*, November 5, 2010.

¹³ "Cargo Bombs Were Powerful Enough to Bring Down Plane, Say Experts," *Daily Post* (Liverpool, UK), November 2, 2010.

¹⁴ Transportation Security Administration, *Remarks As Prepared by TSA Administrator John Pistole to AVSEC World 2010*, November 2, 2010.

¹⁵ Michael Savage and Nigel Morris, "New Restrictions Follow Bomb Attempt," *Independent (UK)*, November 2, 2010; Tony Czuczka and Patrick Donahue, "Germany Bans Yemen Flights, Considers Further Security Measures," *Bloomberg Businessweek*, November 4, 2010.

deemed to be high risk.¹⁶ Following an unrelated incident in early November 2010 involving three packages containing explosives that were addressed to European heads of state, Greece temporarily suspended all outbound international parcel shipments by air and airmail.¹⁷

The discovery of the explosives shipped from Yemen apparently intended to detonate in flight aboard all-cargo aircraft may require a rethinking of the generally accepted belief that bombing an all-cargo aircraft is less attractive to terrorists than bombing a passenger plane. Much remains unknown about the motives and objectives behind these incidents. The possibility that the terrorists intended to bring about more restrictive regulations and thus cause widespread economic damage to the air cargo industry cannot be excluded.¹⁸

Regardless of motive, the policy response to these incidents has raised anew the debate between advocates of a risk-based strategy that relies heavily on characteristics of a shipment to identify packages for increased scrutiny and supporters of approaches in which all or most shipments are subject to some form of physical inspection. Proponents of comprehensive physical screening argue that it is the only way to ensure adequate security, while advocates of risk-based approaches argue that comprehensive screening is too costly, too time consuming, and given the current state of technology, potentially no better than well designed targeting strategies. At present, the United States requires more extensive physical screening for shipments placed on passenger aircraft than for shipments aboard cargo planes, in accordance with a statutory mandate for 100% screening of all such cargo. However, TSA has stated it may not reach full compliance with the mandate to screen all cargo aboard inbound international passenger flights until August 2013.¹⁹

Current Legislative Issues

Following the October 2010 discovery of explosives in cargo originating in Yemen, there has been renewed interest in requiring that all air cargo, not just that placed on passenger aircraft, be subject to physical screening. On November 16, 2010, Representative Markey introduced the Air Cargo Security Act (H.R. 6410, 111th Congress), to require screening of all cargo transported on all-cargo aircraft, including U.S.-bound international shipments, in a manner commensurate with the screening requirements for passenger checked baggage. The legislation also includes provisions requiring inspections of foreign air cargo shipping facilities that handle U.S.-bound flights and formal security training programs for cargo handlers. On November 17, 2010, Senator Casey introduced a similar measure (S. 3954, 111th Congress) in the Senate.

¹⁶ Derek Kravitz and Ashley Halsey III, "U.S. Tightening Air Cargo Security," *Washington Post*, November 9, 2010.

¹⁷ "Greece Halts Air Cargo after Bombs Target European Leaders," *Voice of America VOA News*, November 3, 2010; "Greece Suspends International Parcels After Further Explosive Devices Found," *CEP-Research*, November 3, 2010.

¹⁸ Robert W. Poole, Jr., "Fighting the Last War on Air Cargo," *Airport Policy News*, Issue 62, November 2010, Los Angeles, CA: The Reason Foundation.

¹⁹ Thomas Frank, Alan Levin, and Kevin Johnson, "Bomb Plot Shows Gaps in Screening of Air Cargo," *USA Today*, November 1, 2010.

Potential Challenges for All-Cargo Screening

TSA lacks the direct authority to define screening requirements at foreign airports for U.S.-bound cargo. TSA could impose regulations on foreign carriers, as well as U.S. carriers, stipulating minimum air cargo security standards and requirements, including 100% screening using certain approved methods. However, enforcement overseas would be up to authorities in other countries. If they do not concur with the U.S. approach, disagreement over security standards could complicate U.S. foreign relations and could potentially impact foreign trade.

The impact of 100% screening on the air cargo industry could be considerable as associated costs may be difficult to fully pass on to shipping costumers. The Congressional Budget Office estimated a cost of \$250 million in the first year and \$650 million per year for the following five years, for a total of \$3.5 billion over six years, to implement the mandate for 100% baggage screening on passenger aircraft.²⁰ Previous CRS estimates concluded that the cost may be somewhat lower, totaling about \$3.75 billion over the first 10 years of implementation.²¹ However, more recent estimates suggest that industry-wide compliance with the 100% screening mandate may cost more than \$700 million in the first year.²²

Given that these estimates cover only shipments placed on passenger aircraft, which make up about 10% of all cargo shipped to and within the United States by air, the projected cost of physically screening all air cargo could conceivably total several billion dollars annually. The logistical challenges of screening all air cargo may also be significant, as demonstrated by the complexities of meeting the 100% screening mandate for cargo aboard domestic passenger flights and the continuing difficulties in screening all inbound international cargo placed on passenger flights. In addition, there is potential for full physical screening of all air cargo to lead to shipping delays and other inefficiencies.

With respect to the federal budget, air cargo may become an issue of increasing focus following the October 2010 explosives incidents. The President's request for FY2011 sought a slight decrease in funding for air cargo security measures, seeking \$118 million compared to \$123 million appropriated in FY2010. The Senate-reported FY2011 appropriations bill (S. 3607, 111th Congress) specified \$122 million, with the additional funds above the requested level to accelerate hiring of additional inspectors and expanding canine cooperative programs with state and local law enforcement in order to support current cargo screening mandates.²³ This funding increase has not been enacted.

²⁰ Congressional Budget Office, *H.R. 1 - Implementing the 9/11 Commission Recommendations Act of 2007*, February 2, 2007.

²¹ See CRS Report RL34390, *Aviation Security: Background and Policy Options for Screening and Securing Air Cargo*, by Bart Elias.

²² Katie Johnston Chase, "Push On for Cargo Screening," *Boston Globe*, November 2, 2010.

²³ See CRS Report R41189, *Homeland Security Department: FY2011 Appropriations*, coordinated by Chad C. Haddal.

International Cooperation

With regard to all-cargo operations, there is no statutory or regulatory requirement for screening, and according to industry estimates, the overall percentage of international shipments screened prior to transit to the United States may be as low as 50%.²⁴ TSA concedes that screening international cargo poses unique challenges and constraints due to shippers' limited control over their foreign supply chains, the scale and diversity of worldwide supply chains, and diplomatic considerations.²⁵

To address these challenges, TSA's International Air Cargo Workgroup has developed a risk-based rating system and scheduling tool to prioritize air cargo facility inspections overseas. In 2008, the TSA entered into a bilateral agreement with the European Union as well as a quadrilateral agreement on air cargo security with the European Union, Canada, and Australia.²⁶ More broadly, it is working closely with the International Civil Aviation Organization (ICAO) to draft worldwide standards for all-cargo security, which will probably entail a lengthy period of implementation.²⁷

TSA has 10 international cargo transportation security inspectors deployed to field offices in Los Angeles, Dallas-Fort Worth, Miami, and Frankfurt, Germany. The role of these inspectors is to examine cargo operations at the last points of departure to the United States and assess compliance with screening and security requirements. Additionally, TSA has eight international industrial representatives who work with about 240 foreign passenger and all-cargo air carriers that operate flights to the United States. These individuals have responsibility for ensuring foreign air carrier compliance with TSA regulations, including those pertaining to the screening and security of air cargo.²⁸ Given the volume of international air cargo, the potential threat posed by international shipments, and the extensive reliance on passenger aircraft to haul cargo from overseas, the size of the TSA's international inspector and industrial representative workforce may be an area of particular interest to Congress.

Risk-Based Evaluations of Shipments

Under the current air cargo security system, a number of risk-based strategies are being employed to evaluate the security risk of air cargo shipments.

The Known Shipper Program

The principal means for pre-screening or profiling cargo has been through the use of air carrier and freight forwarder "known shipper" programs. In May 2006, TSA issued a final rule

²⁴ Andy Pasztor, Keith Johnson, and Daniel Michaels, "Focus on Cargo Security Steps," *Wall Street Journal*, November 1, 2010.

²⁵ Transportation Security Administration, *Fiscal Year 2011 Congressional Justification, Aviation Security*.

²⁶ Transportation Security Administration, *Programs and Initiatives: Air Cargo*, http://www.tsa.gov/what_we_do/tsnm/air_cargo/programs.shtm.

²⁷ Transportation Security Administration, *Fiscal Year 2011 Congressional Justification, Aviation Security*.

²⁸ Transportation Security Administration, *Fiscal Year 2011 Congressional Justification, Aviation Security*.

establishing an industry-wide known shipper database (KSDB) for vetting all shipments placed on passenger aircraft.²⁹ According to TSA, the database lists millions of known shippers that are approved to ship cargo on passenger aircraft.³⁰ Shipments from parties that do not appear in the database may not be placed aboard passenger aircraft, even if they are screened or inspected physically. This applies to inbound international flights as well as domestic flights.

Before the industry-wide KSDB was created, some air carriers and freight forwarders had voluntarily participated in a system using a central database of known shippers to vet cargo destined for passenger aircraft as required under the Aviation and Transportation Security Act of 2001 (ATSA, P.L. 107-71). Other air carriers and freight forwarders relied on internal databases and security protocols approved by TSA for determining whether shipments bound for a passenger airplane originated from known sources applying approved security measures to protect the integrity of those shipments.

The development of known shipper programs in the mid-1990s was prompted by industry experts and Congress. Key concerns included the need for increased compliance with guidelines for the shipment of hazardous materials and the need to deter terrorists from using cargo as a means to place explosives or incendiary devices on aircraft. In addition, congressional hearings regarding the 1996 ValuJet crash in Miami that resulted from a cargo hold fire concluded that air cargo safety could be achieved only through a comprehensive inspection program encompassing all components of the air cargo network.³¹

In December 1996, FAA's Aviation Security Advisory Committee Security Baseline Working Group issued a series of recommendations that formed the basis for FAA's effort to strengthen air cargo safety and security. The White House Commission on Aviation Safety and Security, formed after the 1996 crash of TWA Flight 800 and commonly referred to as the Gore Commission, urged adoption of the recommendations of the Baseline Working Group regarding the profiling of "known" and "unknown" shippers.³² FAA subsequently established a known shipper program, outlining procedures for freight forwarders and air carriers to review the security practices of known frequent customers and establish a cargo security plan for handling cargo from known and unknown shippers. With the passage of ATSA in 2001, oversight of cargo security measures was transferred from FAA to TSA. TSA has continued to rely on known shipper programs as a principal means for pre-screening air cargo.

A central issue regarding the post-9/11 implementation of known shipper programs was the creation of a consolidated database. TSA initially instituted a voluntary industry-wide database. This initiative poised TSA to address congressional interest in establishing a mandatory industry-wide known shipper database, as urged by the Senate during the 108th Congress (see S. 165, S. 2845 as passed by the Senate). The administration's subsequent regulatory action to require an industry-wide known shipper database led Congress to ultimately drop a Senate-passed statutory requirement from the Intelligence Reform Act of 2004 (P.L. 108-458). Congress instead settled on

²⁹ Department of Homeland Security, Transportation Security Administration. "Air Cargo Security Requirements; Proposed Rule." *Federal Register*, (69) 217, 65258-65291.

³⁰ Transportation Security Administration, *Air Cargo, Transportation Sector Network Management*.

³¹ Department of Transportation, Office of the Inspector General. *Aviation Security: Federal Aviation Administration* (Report No. AV-1998-134, May 27, 1998).

³² White House Commission on Aviation Safety and Security. *Final Report to President Clinton*. Vice President Al Gore, Chairman. February 12, 1997. Washington, DC: The White House.

language directing TSA to issue final rules on air cargo security, including an industry-wide known shipper database, by September 2005. The final rules were announced in May 2006.

Vulnerability Assessments and Risk-Based Targeting

Reflecting concerns over the logistics and costs associated with mandatory cargo screening, air cargo industry stakeholders have voiced considerable opposition to requiring 100% screening of passenger air cargo, urging Congress instead to “focus on realistic solutions based on a framework that identifies and prioritizes risks, works methodically to apply effective and practical security programs, and makes optimal use of federal and industry resources.”³³ The industry has continually advocated for a risk-based screening system that incorporates threat assessment and targeting capabilities, provides incentives for shippers to strengthen supply chain measures, and focuses increased inspections on cargo determined to be of elevated risk through risk assessment and targeting capabilities.

These arguments roughly parallel TSA’s former strategic plan for air cargo security, which, prior to congressional mandates for 100% screening of cargo placed on passenger aircraft, focused on risk-based targeted screening of cargo. The industry specifically recommended increased use of canine explosives detection teams; enhanced supply chain security; enhanced targeting of shipments based on CBP experience with the Automated Targeting System (ATS); expanded use of explosive trace detection technology for targeted screening; and accelerated research and development of technologies that can more efficiently inspect elevated-risk cargo.³⁴

While all domestic air cargo placed on passenger airplanes now undergoes physical screening, TSA employs random and risk-based assessments of inbound international shipments or domestic shipments carried on all-cargo aircraft. In these cases, it uses a combination of risk-based targeting strategies and vulnerability assessments of airports and operators to focus screening efforts on suspicious “high risk” cargo. TSA is continuing to work with international partners to apply risk-based strategies until 100% screening of cargo placed on inbound international passenger flights can be achieved. Additionally, TSA and CBP have jointly developed a risk assessment process using CBP’s ATS and TSA’s vulnerability assessment methodology.³⁵

Under CBP’s “advance manifest rule,” carriers operating inbound international flights must forward cargo manifest information to CBP four hours prior to arrival in the United States. The four-hour requirement is relevant in carrying out CBP’s mission of screening items as they enter the United States, but may be inadequate for use in targeting shipments from an aviation security standpoint. In many cases, aircraft may have departed for the United States before CBP receives the manifest information and analyzes it using ATS to identify high risk cargo. This concern does not apply to flights originating in Canada, Mexico, and the Caribbean, for which CBP requires the manifest information before wheels up.

³³ Air Carrier Association of America, Airforwarders Association, Air Transport Association, Cargo Network Services Corporation (CNS), High Tech Shippers Coalition, International Warehouse Logistics Association, National Air Carrier Association (NACA), National Customs Brokers and Forwarders Association of America, Inc., National Fisheries Institute, Regional Airline Association, Society of American Florists, and the U.S. Chamber of Commerce, *Letter to The Honorable Daniel Inouye and The Honorable Ted Stevens*, January 8, 2007, p. 1.

³⁴ *Ibid.*

³⁵ Transportation Security Administration, *Fiscal Year 2011 Congressional Justification, Aviation Security*.

Whereas CBP's mission is focused on detecting threats to the United States arriving at points of entry, including U.S. airports, TSA's aviation security mission considers threats to airborne aircraft before they enter U.S. airspace. A considerable policy question arising from the October 2010 incidents is the adequacy of current manifest screening requirements and targeting procedures for detecting potential threats to U.S.-bound flights. Congress may want to gain a better understanding of whether earlier transmittal of manifest information could improve targeting capabilities aimed at identifying high risk cargo and, if so, what potential impacts such requirements may have on international air cargo shipments.

Prior to the October 2010 incidents in which explosives were discovered in U.S.-bound air cargo shipments, efforts to expand risk-based targeting of shipments in the all-cargo sector had reportedly languished over concerns regarding potential operational impacts. For example, the *Wall Street Journal* reported that efforts to develop more sophisticated risk profiles for vetting overnight packages had apparently stalled over concerns that thresholds for inspections may be set too low, causing potential delays in the delivery of time-sensitive shipments.³⁶

Following the October 2010 incidents, TSA applied additional screening measures to inbound international air cargo assessed to be high risk.³⁷ While the specific details of how TSA assesses risk are regarded as sensitive security information, factors may include country of origin and possibly risk scores based on data regarding the sender, the recipient, and other characteristics of the shipment. For example, cash payment of shipping costs may be considered an indicator of risk in certain markets, although this characteristic, by itself, may not raise suspicion in all cases.

Cargo Screening Procedures

Whereas the air cargo industry has favored risk-based approaches for both cargo planes and cargo aboard passenger aircraft, some policymakers have argued that more comprehensive screening of cargo is needed to make cargo security comparable to that of passengers and baggage. Congress responded to these arguments in a series of enactments since the 9/11 terrorist attacks.

The first of these laws, ATSA, established a requirement for screening and inspection of all individuals, goods, property, vehicles, and other equipment entering a secured area of a passenger airport. The law mandated that other areas of airports have the same level of protection as passenger terminals, but did not require the use of any specific screening technologies or techniques.

ATSA required TSA to provide for the screening of cargo placed on passenger aircraft, but did not specify how such screening was to be carried out. ATSA also directed that a system to screen, inspect, or otherwise ensure the security of all-cargo aircraft be established as soon as practicable, but set no specific deadlines. Additionally, aircraft operators were required to establish controls over cargo shipments to prevent the carriage of unauthorized explosive or incendiary devices aboard passenger aircraft and access by unauthorized individuals.

³⁶ Andy Pasztor, Keith Johnson, and Daniel Michaels, "Focus on Cargo Security Steps," *Wall Street Journal*, November 1, 2010.

³⁷ Derek Kravitz and Ashley Halsey III, "U.S. Tightening Air Cargo Security," *Washington Post*, November 9, 2010.

The Homeland Security Appropriations Act of 2005 (P.L. 108-334) called for tripling the proportion of cargo on passenger airplanes that is screened or inspected. FY2006 appropriations language (P.L. 109-90) directed TSA to take all possible measures—including the certification, procurement, and deployment of screening systems—to inspect and screen air cargo on passenger aircraft and increase the percentage of cargo inspected beyond the level mandated in the FY2005 appropriations measure. A year later, FY2007 appropriations language (P.L. 109-295) directed TSA to work with industry stakeholders to develop standards and protocols to increase the use of explosives detection equipment for screening air cargo. Similarly, the FY2008 Omnibus Appropriations Act (P.L. 110-161) directed the parent agency of both TSA and CBP, the Department of Homeland Security (DHS), to research, develop, and procure new technologies to screen air cargo, and, in the interim, to utilize checked baggage explosives detection equipment to the maximum extent practicable to screen air cargo placed on passenger aircraft.

The Implementing the 9/11 Commission Recommendations Act of 2007 (P.L. 110-53), enacted in August 2007, required 100% physical screening and inspection of all cargo placed on passenger aircraft by August 2010, with an interim requirement to screen 50% of such cargo by February 2009. The act specified screening methods acceptable in meeting this requirement, including X-ray systems, explosives detection systems, explosives trace detection, TSA-certified explosives detection canine teams, and physical searches conducted in conjunction with manifest verifications. Additional methods may be approved by TSA. However, the act specifies that cargo documents and known shipper verification, by themselves, are not acceptable screening methods.

The act, however, did not specify who is to conduct the screening. TSA has interpreted the language to allow airlines, freight forwarders, or, in some cases, shippers, manufacturers, and third party screening facilities to conduct screening at off-airport locations, so long as they can assure the security of a shipment until it is loaded onto an aircraft.³⁸ TSA maintains that this is the only viable means for meeting the mandate for 100% physical screening, as it lacks the resources to screen the volume of cargo placed on passenger aircraft using TSA employees.³⁹ TSA's approach, implemented through its voluntary Certified Cargo Screening Program (CCSP), has pushed much of the operational cost associated with cargo screening and inspection on to the airlines, freight forwarders, and shippers. The extent to which air carriers and freight forwarders have been able to pass along these costs to shippers and consumers may be an issue of particular interest to Congress.

Mandatory screening requirements for cargo on passenger flights may place passenger airlines at a competitive disadvantage against all-cargo airlines, so long as all-cargo carriers face less stringent requirements. In addition, if security screening requirements discourage shipments on passenger flights, some routes may no longer be profitable for airlines.⁴⁰ Given that most large passenger airlines have failed to achieve consistent profitability in recent years, the direct and indirect costs associated with a mandate to screen all cargo may present particular financial challenges to the airlines. While estimated cargo revenues of about \$4.7 billion⁴¹ annually make

³⁸ "TSA Says It Will Adhere to Cargo Screening Deadlines." *World Trade*, 20(12), December 2007, p. 10.

³⁹ *Ibid.*

⁴⁰ Thomas Frank, "Bill Would Order All Air Cargo Screened," *USA Today*, January 8, 2007.

⁴¹ Air Transport Association, ATA Issue Brief: Air Cargo Security—The Airlines' View, Washington, DC: Air Transport Association.

up only about 5% of total industry-wide operating revenues among U.S. passenger air carriers, these additional revenues can make the difference between profit or loss for passenger airlines.⁴²

Beyond the economic impact, the prospect of screening 100% of air cargo placed on passenger aircraft has raised a number of challenges due to a lack of suitable bulk screening technologies. TSA and industry experts concluded that the only viable means of meeting the August 2010 deadline was to conduct screening at the piece level at various points in the supply chain and then to impose a variety of measures to secure cargo after screening it at off-airport locations. In order to address these complexities, TSA established the voluntary CCSP, allowing shippers, manufacturers, warehouses, and off-airport cargo consolidation facilities to screen cargo destined for passenger aircraft.

The Certified Cargo Screening Program (CCSP)

Screening pallets and containers can be complex, potentially requiring that the shipments be broken down so that individual items can be examined. CCSP is intended to minimize these logistical complexities by allowing screening to occur at factories, warehouses, third party logistics providers, and off-airport cargo consolidation facilities, so long as the operator of the facility tenders cargo to either an air carrier or a freight forwarder.⁴³ TSA must approve the screening procedures as well as supply chain security measures to prevent tampering with shipments once they have been screened, and it audits participants' performance. The CCSP program is voluntary, but widespread industry participation reflects considerable perceived benefits.⁴⁴

To participate in CCSP, employers must allow TSA to conduct security threat assessments to check the names of workers with access to air cargo against government terrorist watchlists. The cost of doing so, currently a one-time fee of \$19 per worker, is fully recovered from fees charged to CCSP participants. In FY2011, TSA anticipates collecting \$5.2 million in fees to vet almost 275,000 cargo handlers and other supply-chain employees covered under CCSP. This is in addition to about 200,000 employees at CCSP facilities that completed security threat assessments in FY2010. By late August 2010, just after the 100% screening mandate went into effect, over 1,000 facilities—including more than 500 indirect air carrier facilities, almost 100 independent cargo screening facilities, and almost 400 shippers—had been certified under the CCSP program. As these totals represent only a fraction of the domestic air cargo industry, considerable expansion of the program is anticipated during FY2011.

Cargo Screening Technologies

TSA reported in August 2010 that 100% of cargo placed on domestic passenger flights undergoes approved physical screening in compliance with statutory requirements set forth in the Implementing Recommendations of the 9/11 Commission Act of 2007 (P.L. 110-53).⁴⁵ However,

⁴² CRS analysis of airline industry economic data presented in: Air Transport Association, *Smart Skies: A Blueprint for the Future, 2007 Economic Report*, Washington, DC: Air Transport Association.

⁴³ Transportation Security Administration, *CCSP Overview—9/11 Act Screening Requirement*.

⁴⁴ Transportation Security Administration, *Fiscal Year 2011 Congressional Justification, Aviation Security*.

⁴⁵ Transportation Security Administration, *TSA Announces Key Milestone in Cargo Screening on Passenger Aircraft* (continued...)

TSA recently indicated that 100% screening of all inbound international air cargo transported on passenger aircraft may not be achieved until August 2013.⁴⁶

TSA has approved a number of x-ray, bulk explosives detection systems and explosives trace detection machines for screening air cargo to meet the requirements of the screening mandate.⁴⁷ Essentially, these are adaptations of technologies used extensively for screening checked baggage and carry-on items. However, none of these devices is approved for the screening of palletized or containerized cargo. Procedures stipulate that screening must instead be done on individual cargo items since available technologies, especially explosives detection systems, impose considerable limits on the size of the object that can be screened. Currently available systems can only accommodate objects slightly more than 3 feet wide and about 8 feet long, far too small for large cargo items, much less cargo containers and pallets. The limitations of explosives detection systems in the air cargo environment have led to extensive reliance on explosives trace detection, particularly at airport screening locations, coupled with canine teams.

TSA has trained over 500 law enforcement canine teams at 78 airports. Under cooperative agreements, TSA pays for the training, certification, and maintenance of the dogs and partially reimburses law enforcement agencies for handler salaries and other costs. These teams devote about 25% of their time to air cargo screening. In addition, TSA has about 150 of its own canine teams that screen cargo at the 20 busiest airports in terms of cargo shipments aboard passenger planes. These teams focus on screening large bulk cargo configurations that cannot be efficiently screened using currently available technologies.⁴⁸

In FY2010, TSA carried out a pilot program at 18 locations to evaluate the effectiveness of selected screening technologies and chain-of-custody procedures.⁴⁹ Participating facilities were reimbursed up to \$375,000 each for acquisition of a mix of security screening technologies. In exchange, these sites were required to provide TSA with detailed reports of cargo volumes and the effectiveness and efficiency of screening technologies used. The study concluded in August 2010. TSA is now assessing the performance of the various screening technologies and methods employed. To date, however, the only approved technologies for cargo screening require examination of individual items. It is estimated that palletized cargo makes up 75% of all cargo carried on passenger planes.⁵⁰ The lack of an approved technology for screening pallets leaves the industry dependent on work-around solutions, largely involving the off-airport screening of cargo coupled with approved supply-chain security measures to prevent tampering after the item is screened under CCSP procedures.

Imaging systems are employed at seaports and border crossings to scrutinize entire trucks and multimodal containers. These systems, which use a variety of gamma-ray, x-ray, x-ray

(...continued)

(*Press Release*). August 2, 2010, <http://www.tsa.gov/press/releases/2010/0802.shtm>.

⁴⁶ Thomas Frank, Alan Levin, and Kevin Johnson, "Bomb Plot Shows Gaps in Screening of Air Cargo," *USA Today*, November 1, 2010.

⁴⁷ Transportation Security Administration. *NON-Sensitive Security Information (SSI) Version of the TSA Air Cargo Screening Technology List (ACSTL)*. July 16, 2010.

⁴⁸ Transportation Security Administration, *Fiscal Year 2011 Congressional Justification, Aviation Security*.

⁴⁹ Transportation Security Administration, *Fiscal Year 2010 Congressional Justification, Aviation Security*.

⁵⁰ Andy Pasztor, Keith Johnson, and Daniel Michaels, "Focus on Cargo Security Steps," *Wall Street Journal*, November 1, 2010.

backscatter, and millimeter wave imaging technologies, are generally not considered suitable in the air cargo domain because they require intensive human observation to detect potential threats. They generally do not offer adequate image resolution or automated or assisted threat detection capabilities for identifying relatively small explosive devices capable of destroying an airliner.

Neutron beam technologies offer a potential solution, allowing automated explosives detection capabilities of containerized and palletized cargo. Under a pilot program, a pulsed fast neutron analysis scanner was installed at Houston's George Bush Intercontinental Airport in 2005, at a cost of \$8 million. The unit was touted as a potential means to automatically screen large containers and bulk cargo shipments for explosives as well as for hazardous chemicals, radiological and nuclear materials, and other potential threats based on sub-atomic properties. In 2007, the pilot program was suspended, reportedly for financial reasons, despite high detection rates and low false alarm rates across a wide range of threat types and container sizes.⁵¹ The technology is being used to screen cargo and baggage in Singapore and Hong Kong, and to screen truck containers at a border checkpoint in El Paso, TX.⁵² However, the high cost and large footprint of the machines have been significant deterrents to their use in the air cargo industry.

Absent a suitable technology for screening palletized and containerized cargo at airport facilities, the reliance on off-airport cargo screening under CCSP and the logistic demands of the air cargo industry pose unique challenges for maintaining security throughout the supply chain.

Supply Chain Security Measures

A variety of supply chain security measures provides options for preventing and detecting tampering and maintaining the integrity of cargo shipments. These measures include tamper-evident and tamper-resistant packaging, cargo tracking technologies, and identifiers to designate screened cargo.

Tamper-Evident and Tamper-Resistant Packaging

Various technologies exist for sealing cargo shipments and cargo containers to prevent tampering. Relatively low cost solutions such as tamper-evident tapes that provide visual indications of tampering are readily available and could easily be implemented during packaging. Such technology could be used in combination with "known shipper" protocols to insure that known shippers provide sufficient security in their packaging facilities and to deter tampering and theft during shipping and handling. Tamper-evident tape may also be an effective tool to deter cargo theft and the introduction of contraband, counterfeit, and pirated goods during shipment.

At cargo handling facilities, tamper-evident seals and locks can be utilized on cargo containers to prevent theft and the introduction of contraband or threat objects. Electronic seals may serve as an additional deterrent by providing more immediate detection of tampering. Electronic seals have alarms, some triggered by fiber optic cable loops, that transmit a signal when tampered with.⁵³

⁵¹ Dan A. Strellis, Tsahi Gozani, and John Stevenson, "Air Cargo Inspection Using Pulsed Fast Neutron Analysis," *International Topical Meeting on Nuclear Research Applications and Utilization of Accelerators, 4-8 May 2009 Vienna Austria*. International Atomic Energy Agency: Vienna, Austria.

⁵² Derek Kravitz and Ashley Halsey III, "U.S. Tightening Air Cargo Security," *Washington Post*, November 9, 2010.

⁵³ "Electronic cargo security seals" *Frontline Solutions*, 3(6), 42 (June 2002).

Electronic seals cost about \$2,500 per unit, but are reusable. However, currently available seals have a limited transmission range, which may make it difficult to detect tampering. In addition, there is concern that the signals may interfere with aircraft electronic systems.⁵⁴

Tracking Technologies

The air cargo industry, particularly the express package sector, relies on tracking technologies such as global positioning systems and radio-frequency identification to process, sort, and track shipments. The technology also has potential security applications. Tracking technologies could identify suspicious origins or unexplained delays or detours in transit.

Screened Cargo Identifiers

TSA relies primarily on a system of identifiers to designate that a piece of cargo has been properly screened and is eligible for shipment on passenger aircraft. TSA approves a variety of stickers, stamps, and tags to be used as screened cargo identifiers.⁵⁵ The security and integrity of these identifiers is a key element of CCSP, as stolen or counterfeit identifiers could be used to pass off unscreened cargo as screened. Measures to account for all identifiers appear to be vital components of supply chain security. However, given the highly diverse and geographically distributed nature of the supply chain, it may be difficult to detect falsified or counterfeit stamps beyond the point of screening. The effectiveness of CCSP in maintaining package integrity beyond the point of screening may be an issue of particular interest to Congress.

Security of Air Cargo Facilities and Operations

Air cargo operators and freight forwarders in the United States and at overseas locations that handle U.S.-bound shipments must apply TSA-approved security programs. TSA has not publicly released the specific requirements of these programs. Broadly, these programs include access control measures, site surveillance and physical security, mandatory background checks and security threat assessments of air cargo workers, and employee security training and awareness.

- Major passenger airlines must implement TSA's Aircraft Operator Standard Security Program, including detailed security measures for transported cargo.
- All-cargo operators that operate any aircraft weighing roughly 100,000 pounds (45,000 kg) or more, such as FedEx, UPS, and operators of large freight aircraft, are covered under the Full All-Cargo Aircraft Operator Standard Security Program.
- Cargo operators and charter operators that also consign cargo shipments aboard aircraft that are larger than 12,500 pounds but less than roughly 100,000 pounds must implement a TSA-approved Twelve-Five Standard Security Program.

⁵⁴ U.S. Government Accountability Office. *Aviation Security: Federal Action Needed to Strengthen Domestic Air Cargo Security*, October 2005, GAO-06-76.

⁵⁵ Transportation Security Administration, *Certified Cargo Screening Program Participant Newsletter*, August 20, 2010.

- Domestic freight forwarders must implement an Indirect Air Carrier Standard Security Program (IACSSP).
- Other components of the air cargo network, such as shippers, third party logistics companies, and independent air cargo consolidation and screening facilities, may voluntarily participate in the CCSP.

In-Flight Security Measures

In-flight air cargo security options address the primary perceived vulnerabilities of a potential hijacking of an all-cargo flight or the bombing of a passenger aircraft using an explosive device carried in a cargo shipment. Protecting access to the cockpit and arming all-cargo pilots have been viewed as the primary in-flight options to reduce the vulnerability of all-cargo aircraft to potential hijackings. Blast-resistant cargo containers are being considered as an option to protect passenger airliners from explosives.

Hardened Cockpit Doors and Protective Barriers

While ATSA required the installation of hardened cockpit doors, FAA regulations exempted all-cargo aircraft from the requirement after the FY2003 appropriations act (see P.L. 108-7) limited federal funding to doors on passenger aircraft. While some cargo aircraft have hardened cockpit doors to thwart potential stowaway hijackers, many do not.

The use of protective barriers, such as metal gates and thick cable fences that are less costly than hardened cockpit doors, has been considered as a means to secure the cockpits of all-cargo aircraft. In 2007, Representative Israel introduced legislation (H.R. 3925, 110th Congress) to require installation of such barriers on all air carrier aircraft, including all-cargo aircraft. For all-cargo aircraft, the proposal left the use of the protective barrier to the pilot's discretion. The legislation won the praise of the Air Line Pilots Association (ALPA), which has advocated the installation of protective barriers on both passenger and all-cargo aircraft, but it was not adopted. In 2004, United Airlines took the initiative of installing protective barriers in addition to the required hardened cockpit doors on some of its passenger aircraft. Other airlines have not followed suit and the issue has received little attention among policymakers. A renewed focus on cargo security may revive discussion of the possible use of these barriers on all-cargo aircraft.

Arming All-Cargo Pilots

Since the 9/11 attacks the issue of arming pilots to deter hijacking and protect the cockpit in the event of hijacking attempts has been controversial, opposed by airlines and several industry experts but broadly supported by Congress. Provisions allowing pilots of passenger airliners to receive firearms training and fly armed were included in the Homeland Security Act of 2002 (P.L. 107-296). The act, however, did not allow for all-cargo pilots to participate in the program, despite concern about the risk of hijackings by stowaways.

During the 108th Congress, proponents of arming all-cargo pilots urged Congress to allow all-cargo pilots to join the ranks of passenger airline pilots who can volunteer for selection and training in the Federal Flight Deck Officers (FFDO) program. This program, established by the Homeland Security Act of 2002 (P.L. 107-296), trains and deputizes qualified pilots to carry

firearms and use deadly force to protect the flight deck against terrorist attacks (see CRS Report RL31674, *Arming Pilots Against Terrorism: Implementation Issues for the Federal Flight Deck Officer Program*, by Bart Elias). While the plan was originally limited to pilots of passenger airliners, Vision 100 (P.L. 108-176) expanded the program to allow all-cargo pilots and flight engineers to participate. Air carriers, in general, have been hesitant about the program because of liability concerns, even though the Homeland Security Act extended specific liability protections to the airlines and pilot participants. Cargo airlines had opposed allowing their pilots to join the FFDO program. In any event, the program is largely limited to domestic operations due to a lack of international agreements regarding the carriage of firearms by pilots.

The FFDO program, along with other flight crew security training initiatives, has received annual appropriations of about \$25 million since it was fully implemented in FY2004. Few, if any, changes to the program are expected in the near term. Nonetheless, Congress may at some point address lingering concerns such as the convenience of training and requalification sites, the carriage of firearms outside the cockpit (which is presently highly restricted), and program liability surrounding the role of the federal flight deck officer as both an airline pilot and a deputized federal officer. While the TSA has recently opened additional retraining and requalification sites in Texas and New Jersey, other aspects of the program remain unchanged.

Blast-Resistant Cargo Containers

The use of blast-resistant cargo containers has long been considered a possible option for mitigating the consequences of an in-flight explosion. The 9/11 Commission recommended the deployment of at least one hardened container on every passenger aircraft that carries cargo.⁵⁶ Stemming from this recommendation, the National Intelligence Reform Act of 2004 (P.L. 108-458) required the TSA to establish a pilot program to explore the feasibility of this concept and authorized the use of incentives to airlines to offset added fuel, maintenance, and other operational costs associated with using hardened cargo containers in an effort to encourage voluntary participation. The act authorized \$2 million for the pilot program.

The Implementing the 9/11 Commission Recommendations Act of 2007 (P.L. 110-53) directed the TSA to evaluate the pilot program and, based on its findings, to implement a program to pay for, provide, and maintain blast-resistant cargo containers for use by air carriers on a risk-managed basis. However, no such program has been initiated. The airline industry and aviation experts have been skeptical of the approach because of both its direct and indirect costs, with indirect costs mostly related to additional fuel consumption and decreased payload capacity because of the additional weight of the hardened containers.

The 9/11 Commission recommended that any suspicious packages going aboard a passenger aircraft be placed in the hardened cargo container. This recommendation implies that a cargo pre-screening or risk evaluation process would be used to determine what cargo should be loaded into the hardened container. A means for identifying elevated risk cargo through pre-screening would likely be needed to assess risk and determine what cargo should be placed in a hardened container. A key policy question is whether suspicious cargo should be allowed to travel on passenger aircraft even if it is secured in hardened containers. Congress may wish to debate the

⁵⁶ National Commission on Terrorist Attacks Upon the United States. *The 9/11 Commission Report*.

risks and benefits of shipping suspicious cargo in hardened containers aboard passenger airplanes compared to the alternative of offloading such shipments to all-cargo aircraft.

If only one hardened cargo container is deployed per aircraft, a relatively small fraction of available cargo space will be reinforced. For example, a Boeing 747-400 passenger jet is capable of holding up to 13 full-width, or 26 half-width containers.⁵⁷ Since one hardened container could house only a small fraction of transported air cargo, careful consideration must be given in deciding what cargo is placed inside these hardened cargo containers.

TSA Inspection and Oversight of Air Cargo Operations

TSA is responsible for conducting regulatory compliance inspections of air carriers and freight forwarders. Additionally, manufacturers, freight consolidators, and other entities that voluntarily participate in the CCSP allow TSA to inspect and audit their security practices to ensure they meet TSA minimum standards.

TSA has regulatory oversight with regard to air cargo security matters of about 4,400 freight forwarders and about 300 air carriers.⁵⁸ Additionally, more than 1,000 facilities are participating in the CCSP. TSA has about 500 transportation security inspectors overseeing the air cargo sector.⁵⁹ While this is more than double the cargo inspector workforce in FY2006, it may still be strained by the size and complexity of the air cargo industry and the number of regulated entities. Moreover, the TSA has noted that cargo inspectors have, on occasion, participated in Visible Intermodal Prevention and Response (VIPR) teams to assist with response to elevated threat conditions. These additional duties that pull inspectors away from air cargo responsibilities could detract from TSA's ability to conduct adequate oversight of cargo security.

TSA reports that it conducts almost 3,000 random security inspections each month. Teams of TSA air cargo inspectors have also completed cargo vulnerability assessments at major cargo airports as well as assessments of other selected airports. While these accomplishments are considerable, the scope and depth of random site inspections and audits of air cargo security may be an issue of particular interest to Congress as it assesses the degree to which deficiencies in regulatory compliance are being identified and corrected.

⁵⁷ Boeing Commercial Airplanes. *747-400 Airplane Characteristics for Airport Handling*. D6-58326-1, December 2002.

⁵⁸ Transportation Security Administration, *Air Cargo Transportation Sector Network Management*.

⁵⁹ Transportation Security Administration, *Air Cargo Security Programs*.

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