

*Office of Inspector General*  
***Audit Report***

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**FAA HAS TAKEN STEPS TO IDENTIFY FLIGHT  
DECK VULNERABILITIES BUT NEEDS TO  
ENHANCE ITS MITIGATION EFFORTS**

*Federal Aviation Administration*

*Report Number: AV2017063*

*Date Issued: June 26, 2017*



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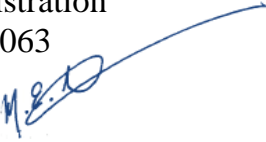


# Memorandum

U.S. Department of  
Transportation  
Office of Inspector General

Subject: **ACTION:** FAA Has Taken Steps To Identify  
Flight Deck Vulnerabilities but Needs To Enhance  
Its Mitigation Efforts  
Federal Aviation Administration  
Report Number AV2017063

Date: June 26, 2017

From: Matthew E. Hampton   
Assistant Inspector General  
for Aviation Audits

Reply to  
Attn. of: JA-10

To: Federal Aviation Administrator

Since the attacks of September 11, 2001, the Federal Aviation Administration (FAA) has taken steps to improve flight deck safety and worked with the Transportation Security Administration (TSA) to enhance overall aircraft safety and security. Both agencies play an important role in reducing the safety and security risks posed to the roughly 27,000 flights carrying approximately 2 million passengers every day in the United States. The safe operation of U.S. passenger aircraft relies on a series of overlapping safety and security controls—the security of the cockpit door is “the last line of defense” in this layered security approach. To counter the threat terrorists pose to in-flight aircraft, FAA and TSA added additional security measures, such as reinforced cockpit doors, armed pilots, enhanced passenger screening, and Federal Air Marshals to commercial passenger aircraft.

Recent incidents have drawn renewed worldwide attention to flight deck safety and security, including securing cockpit doors. On March 24, 2015, Germanwings Flight 9525 crashed in the Alps, killing all 150 people onboard. The crash was determined to have been caused by the deliberate and planned action of the co-pilot. Additionally, in March 2012, JetBlue Airways Flight 191 was diverted after the first officer locked the captain out of the cockpit due to the captain’s erratic behavior. The aircraft landed safely, but the captain had to be subdued by passengers during the incident and was later criminally charged with interference with a flight crew. Since 1994, at least four other incidents worldwide have been

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identified in which a pilot was either suspected or confirmed to have intentionally caused the crash.

After the Germanwings crash, Senator Dianne Feinstein requested that we evaluate FAA's oversight of commercial airline flight deck safety. Specifically, Senator Feinstein requested that we examine how FAA mitigates the risk of intentional pilot actions against the aircraft, aircrew, and passengers; whether current aviation industry cockpit security and hiring standards are sufficient to ensure aviation safety; what steps FAA takes to evaluate the psychological health of pilots; and whether FAA's oversight of commercial airlines is sufficient to ensure cockpit security measures are implemented effectively. Our audit objectives were to assess the effectiveness of FAA's actions to (1) identify vulnerabilities to flight deck security, and (2) mitigate identified flight deck vulnerabilities. Our office will conduct a second audit to address the remaining questions posed by the Senator regarding pilot hiring and psychological assessments.

We conducted this performance audit in accordance with generally accepted Government auditing standards. See exhibit A for a description of our scope and methodology, and exhibit B for a list of the organizations we visited or contacted.

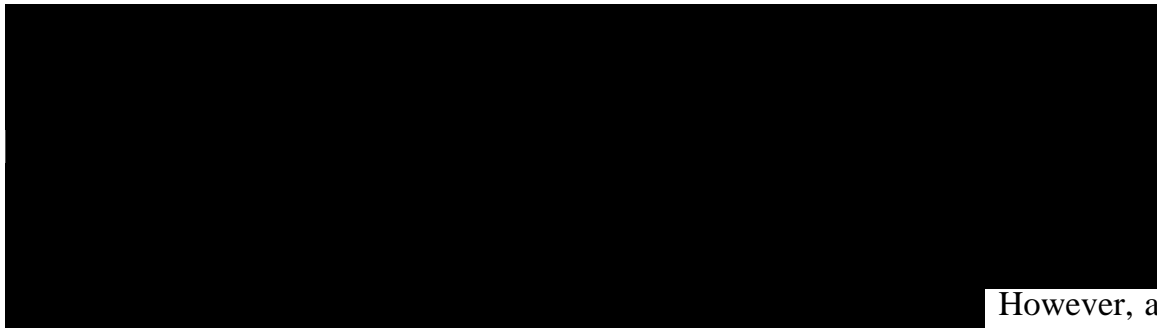
## **RESULTS IN BRIEF**

FAA has taken actions to identify vulnerabilities and improve flight deck security since 9/11, but has opportunities to increase its coordination with TSA on safety and security enhancements for civil aviation. At the headquarters level, FAA has improved its intelligence analysis capability, established a working group to examine flight data vulnerabilities, and modified its process to discreetly notify manufacturers and air carriers of unsafe aircraft conditions that could be exploited by terrorists. However, FAA does not coordinate with TSA at the field office level to identify emerging flight deck security vulnerabilities, such as coordinating on security issues raised during safety surveillance activities. This is because FAA has not clarified inspectors' roles in areas where FAA and TSA regulations converge. For example, while FAA requires air carriers to conduct annual audits of their flight deck access program, TSA verifies that the audits have been completed but does not inform FAA of the results of its review. Consequently, FAA may be missing ways to enhance safety and security through closer collaboration with TSA.

FAA is not effectively mitigating all existing cockpit security vulnerabilities. First, while FAA continues to identify access to the cockpit as a vulnerability, [REDACTED]

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However, a recent flight attendant union survey disclosed that [REDACTED] of flight attendants witnessed crew complacency in protecting the flight deck. Second, FAA has not ensured that carriers have all available information necessary to select and implement procedures that may be more effective at protecting the cockpit when the door is opened in flight, despite an independent assessment which showed that certain security methods did not consistently prevent unauthorized access to the cockpit. Lastly, following the intentional crash of Germanwings Flight 9525, FAA did not fully consider flight attendant concerns and input related to the crash. Air carrier representatives we interviewed stated that flight attendants do not receive [REDACTED]. As a result, FAA may not be taking full advantage of further enhancements that could mitigate safety and security risks and their associated vulnerabilities.

We are making six recommendations to FAA to improve cockpit safety and security.

## **BACKGROUND**

The Aviation and Transportation Security Act of 2001<sup>2</sup> created TSA under the Department of Transportation (DOT), giving the agency important new roles and responsibilities to improve aviation security. The creation of the Department of Homeland Security (DHS) and subsequent realignment of TSA under DHS resulted in the intentional separation of two closely interconnected responsibilities (safety and security).

Since 2001, FAA has promulgated a series of new standards to protect flight decks from intrusion and small arms fire. These standards resulted in the installation of reinforced flight deck doors by U.S. and foreign passenger-carrying air carriers flying to and from the United States. These doors provide protection when they remain closed and locked throughout a flight. Yet, on many flights the flight deck

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<sup>1</sup> On long flights, crewmembers must open the flight deck door to access lavatory facilities, to transfer meals to flight crew members, or to switch crew positions for crew rest purposes.

<sup>2</sup> Public Law 107-71, enacted November 19, 2001.

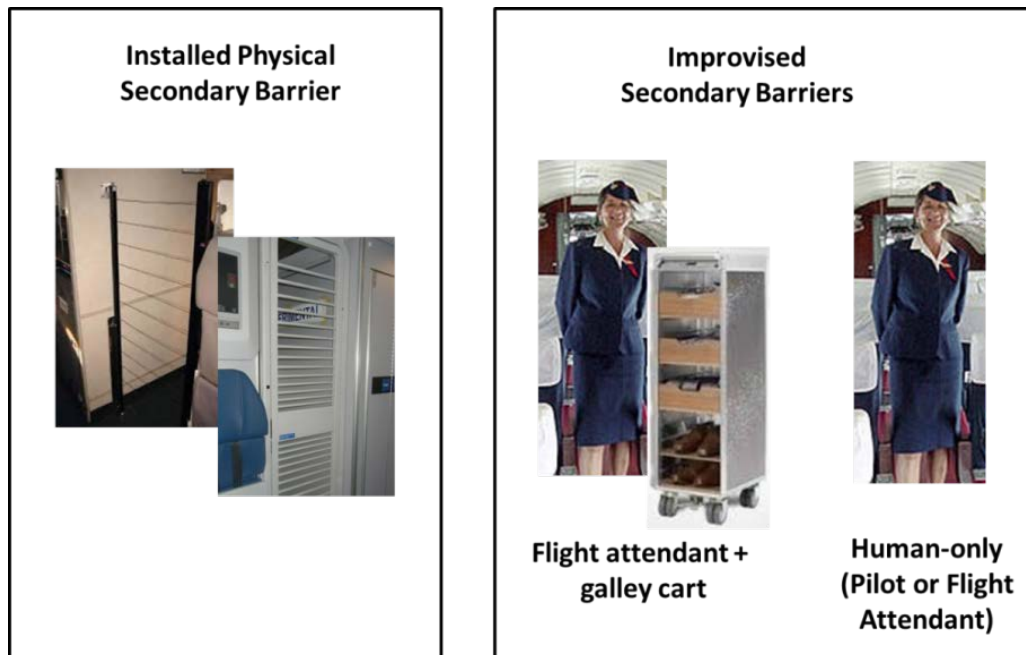
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door cannot remain closed for the entire duration of the flight as crewmembers must have to access lavatory facilities and, on longer flights, switch crew positions for crew rest. During the opening and closing of the cockpit door, the protective benefits of the reinforced door are reduced if established procedures and/or equipment are not properly implemented by crewmembers.

FAA and the International Civil Aviation Organization (ICAO) have recognized this vulnerability, mandating supplemental blocking procedures during the door transition and establishing regulations to address the threat. For example, 14 CFR Section 121.584(a)(1) states that no one may unlock the flight deck door unless “the area outside the flight deck door is secure.” To date, passenger-carrying airlines have used both permanent and improvised secondary barrier methods to support security when the flight deck door is opened. One improvised method employs a combination of procedures, crew members, and equipment (i.e., galley carts) to block access to the flight deck when the door is opened. Another method blocks access to the flight deck through the use of barriers installed on the aircraft (referred to as Installed Physical Secondary Barriers). These barriers are deployed just prior to the opening of the flight deck door. The following figure shows examples of the types of barriers currently used by the commercial airline industry.

**Figure 1. Examples of Current Cockpit Blocking Methods**



Source: OIG analysis

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## **FAA HAS IMPROVED ITS IDENTIFICATION OF FLIGHT DECK VULNERABILITIES, BUT SOME GAPS REMAIN**

Since 2001, FAA has improved its process to identify vulnerabilities to flight deck safety and security, but the Agency has not taken full advantage of opportunities to coordinate with TSA. This coordination is particularly important in areas where FAA's safety responsibilities are closely aligned with TSA security responsibilities.

### **FAA Has Improved Its Identification of Cockpit Vulnerabilities**

FAA has improved its information sharing with other Federal agencies since 9/11, a key aspect of identifying security vulnerabilities and addressing threats to aviation. Information sharing addresses one of the key findings of the 9/11 Commission,<sup>3</sup> which found that the Government had a weak system for processing and using security information it had gathered. FAA has also made organizational changes to help identify security vulnerabilities in civil aviation and to ensure the security information it receives is disseminated to stakeholders. For example, FAA's Intelligence and Threat Analysis Division represents the Agency at interagency intelligence meetings, provides 24-hour incident monitoring, assists with FAA's Crisis Response Working Group, and uses worldwide threat information to generate flight advisories and restrictions (see figure 2). This Division also provides information to airlines and adjusts security measures accordingly to help enhance safety and security.

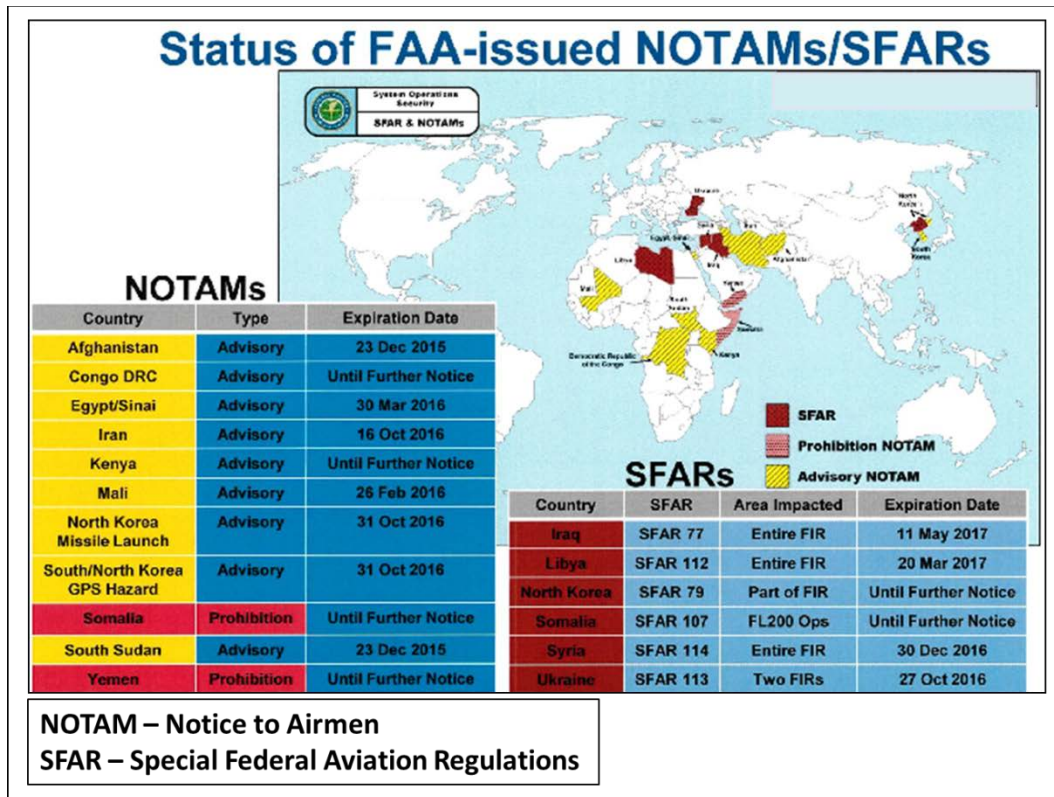
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<sup>3</sup> The National Commission on Terrorist Attacks Upon the United States (also known as the 9/11 Commission), an independent, bipartisan commission created by congressional legislation and the signature of President George W. Bush in late 2002, was chartered to prepare a full and complete account of the circumstances surrounding the September 11, 2001, terrorist attacks, including preparedness for and the immediate response to the attacks. The Commission was also mandated to provide recommendations designed to guard against future attacks.

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**Figure 2. Examples of Flight Advisories Issued by FAA**



Source: FAA

FAA also manages the Domestic Events Network<sup>4</sup> where Federal, State, and participating local governments come together to share information, analyze incidents, and form a collaborative interagency response to manage emergency events. As a result, FAA is better equipped today to mitigate threats to the National Airspace System and communicate those mitigations to civil aviation stakeholders, such as airports and airlines.

FAA has also developed a process to identify and respond to potential vulnerabilities in rapidly changing aircraft technologies. Specifically, FAA’s aircraft certification process includes steps to determine whether vulnerabilities to aircraft flight data, such as unauthorized access to critical aircraft systems or wireless access to pilot flight management devices, are addressed prior to approving new aircraft designs or equipment. This process also allows FAA to ensure that manufacturers have conducted safety assessments to help prevent cybersecurity vulnerabilities from being introduced into aircraft designs.

<sup>4</sup> The Domestic Events Network is a 24/7 interagency unclassified telephonic conference dedicated to real-time coordination of National Airspace System security.

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### **FAA Has Opportunities To Improve Its Safety and Security Synchronization Efforts With TSA**

Although FAA has worked with TSA in many areas related to safety and security, some coordination opportunities remain. At the field inspector level, FAA does not coordinate with TSA on safety programs that also have security implications. This is because FAA inspector guidance does not specifically address how the two agencies should work together to enhance safety. For example, FAA approves air carrier programs used to determine who has authorized access to the cockpit and requires that air carriers perform an annual audit of this information. Air carriers are required to conduct a 100 percent review of their employee database to verify its accuracy (i.e., identifying pilots who are employed at a participating air carrier) and are required to ensure that any pilot whose employment is terminated is removed from the cockpit access database [REDACTED]. Although FAA’s guidance states inspectors may review the audit results upon request, [REDACTED]

[REDACTED] Having different agencies responsible for aspects of this important cockpit access program leads to confusion over program responsibility, gaps in oversight, and missed opportunities to share important security information.

Following the separation of TSA from DOT after 9/11, closely related safety and security regulatory requirements may have unintentionally introduced confusion for FAA inspectors and air carriers regarding which agency has responsibility for certain programs. Examples of similar regulatory responsibilities are shown in table 1 below.

**Table 1. Examples of Similar Regulatory Responsibilities**

<b>FAA—14 CFR (Safety)</b>	<b>TSA—49 CFR (Security)</b>
Admission to flight deck (§121.547)	Flight deck privileges (§1544.237)
Pilot’s requirement to verify credentials (§121.548, 548a, 550)	Approval of credentialing programs (§1544.103)
Means to discreetly notify flight crew (§121.582)	Transportation of Federal Air Marshals (§1544.223)
Crew emergency training (§121.417)	Crew (security) training (§1544.233)

Source: OIG analysis

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FAA field inspectors do not routinely share security issues they identify with their TSA colleagues. This is because FAA lacks a process for communicating security issues to TSA. For example, FAA and TSA field inspectors do not meet regularly, which would provide the opportunity to relay security issues reported through voluntary safety programs, such as crewmember noncompliance with published security procedures. Additionally, FAA inspectors could identify security concerns (such as a need for changes to crewmember security training) during their regular surveillance that could impact TSA programs. As a result, FAA may be missing ways to enhance safety through closer collaboration with TSA.

### **FAA HAS NOT FULLY MITIGATED COMMERCIAL FLIGHT DECK VULNERABILITIES IN CERTAIN AREAS**

FAA has not effectively mitigated certain identified cockpit security vulnerabilities and limitations with existing countermeasures. First, although FAA has determined there is a security vulnerability when the cockpit door is opened during flight, [REDACTED]

[REDACTED] Additionally, FAA's guidance to air carriers and inspectors on selecting the most effective cockpit blocking procedures was delayed, could have been issued in a more direct manner, was not effectively communicated to air carriers and inspectors, and omitted important information identified during a 2011 evaluation of industry practices. Lastly, following the intentional Germanwings crash, FAA focused heavily on pilot mental fitness for duty and may have overlooked additional crewmember training needed in a similar type of emergency.

### **FAA Has Not Mitigated Air Carrier Vulnerabilities of Crew Complacency During Cockpit Door Transitions**

Although FAA recognizes that an open cockpit door presents a security vulnerability, [REDACTED]

[REDACTED]

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<sup>5</sup> FAA's Safety Assurance System Data Collection Tool documents routine air carrier surveillance.

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~~\_\_\_\_\_~~, as illustrated in table 2.

**Table 2. FAA Inspector Observations of Cockpit Door Transitions**

Air Carrier	Inspector Type	Years Overseeing Air Carrier	No. Times Witnessed Cockpit Door Opened in Flight
Carrier A	Flight Operations	9	<del>_____</del>
Carrier A	Flight Operations	7	<del>_____</del>
Carrier A	Flight Operations	2	<del>_____</del>
Carrier B	Cabin Safety	3	<del>_____</del>
Carrier C	Cabin Safety	3.5	<del>_____</del>
Carrier D	Cabin Safety	8	<del>_____</del>

Source: Selected examples of OIG interviews of FAA inspectors



FAA has also not conducted any industry outreach on crew complacency in performing cockpit door transitions. According to FAA, it has not received many voluntary safety reports pertaining to crewmember complacency, and without data showing it as a definitive issue, managers will not focus their resources to address this concern. Yet, three of the four professional organizations we interviewed—representing pilots, flight attendants, and Federal law enforcement officers—stated they were specifically concerned about crewmember complacency. For example, one industry group representing flight attendants surveyed its membership and

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determined that [REDACTED] of respondents witnessed complacency in executing cockpit security procedures by their fellow crewmembers, and [REDACTED] stated their air carrier's procedures were either lax or needed revision.

### **FAA's Guidance Does Not Provide All the Information Carriers Need To Make Informed Decisions on Protecting the Cockpit**

FAA's current flight deck security guidance, Advisory Circular 120-110, contains gaps that limit its effectiveness in mitigating security vulnerabilities. First, FAA did not issue guidance regarding how air carriers can meet the regulatory requirements to block access to the cockpit door until April 2015—nearly 14 years after 9/11 and 4 years after a joint FAA/TSA/Industry evaluation<sup>6</sup> was completed. In 2008, FAA formally requested that RTCA (which serves as an advisory committee for FAA) review procedures and equipment currently used by U.S. air carriers to secure the flight deck, evaluate current guidance on various secondary barrier systems, and develop minimum performance standards for secondary barriers.<sup>7</sup> Based largely on RTCA's findings,<sup>8</sup> FAA developed its Advisory Circular<sup>9</sup> for inspectors and air carriers in April 2015. However, this lengthy process resulted in a significant period of time where air carriers relied on their best judgment about cockpit blocking methods, because they lacked official guidance.

Second, FAA's guidance on this subject could have been issued in a more direct manner, such as within an FAA Notice, to ensure wider dissemination of this important information. Instead, FAA issued its guidance as an Advisory Circular,<sup>10</sup> leading to confusion regarding when, and even whether, the guidance is to be followed. While the guidance discusses how air carriers can comply with pertinent regulatory requirements, it remains unclear on whether it applies to all cockpit blocking methods, methods implemented since 9/11, or only those methods adopted since the guidance was issued. In contrast, FAA's requirements on hardening of cockpit doors after 9/11 were issued as a series of Special Federal Aviation Regulations,<sup>11</sup> which gave a limited implementation period, contained

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<sup>6</sup> Exhibit C lists those organizations involved in RTCA's Special Committee 221.

<sup>7</sup> A secondary barrier system is the method air carriers use to protect the cockpit when the door is opened in flight.

<sup>8</sup> RTCA, "Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures," September 28, 2011.

<sup>9</sup> FAA Advisory Circular (AC) 120-110, Aircraft Secondary Barriers and Alternate Flight Deck Security Procedures, dated 14 April 2015.

<sup>10</sup> FAA Advisory Circulars (AC) transmit information the Agency wants to get out to the aviation community. ACs are used for information only, unless cited as a requirement in an Airworthiness Directive, which then requires compliance with the AC.

<sup>11</sup> In October 2001, Special Federal Aviation Regulation (SFAR) 92 was issued allowing air carriers to make modifications without complying with airworthiness regulations. Compliance with airworthiness regulations was to be restored within 18 months. In January 2002 permanent changes to federal aviation regulations mandated a hardened flight deck door and fleet retrofit by April 2003.

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specific standards to achieve effectiveness, and applied to *all* door designs, not just doors installed *after* the requirements were issued. [REDACTED]

Third, FAA has not effectively communicated the guidance to air carriers and inspectors. Despite the important recommendations from the RTCA report, only 5 of 63 air carrier representatives and none of the 34 FAA inspectors we interviewed were aware of either the RTCA study or FAA's guidance. According to FAA, this is because none of the airlines we interviewed had requested new blocking procedures, and inspectors were under the impression the guidance only applied to new procedures. As a result, critical information contained in the study was ineffectively communicated to the field to address safety risks as called for in FAA's Safety Management System.<sup>12</sup>

Lastly, FAA's guidance omits some key information. While FAA's guidance mentions the RTCA report, it does not highlight important conclusions from the report needed to select a door protection method. As an example, the report concluded that some improvised secondary barriers, such as a flight attendant with a galley cart, were ineffective "as tested," and additional enhancements were required to raise the effectiveness of certain barrier methods to an acceptable level.<sup>13</sup> Figure 3 illustrates additional enhancements recommended by the RTCA report.

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<sup>12</sup> FAA Order 8000.369B, Safety Management System, dated March 18, 2016.

<sup>13</sup> [REDACTED]

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**Figure 3. Recommended Cockpit Security Enhancements**

- For Human Secondary Barriers:**
- Enhanced self-defense training for flight attendants should be required; training programs should address mitigations to the increased risk of injury to flight attendants who are required to defend the flight deck.
  - Enhanced training should include the use of force, defensive tactics, the psychology of survival, threat recognition, and behavior observation and analysis techniques.
  - Human secondary barrier[s] require the highest level of training due to the reliance exclusively on crewmembers without the aid of a physical device to delay an attacker for the time necessary to adhere to minimum time requirements.
  - Any proposed additional training should be demonstrated as effective.
  - Human factors considerations, such as the effects of fatigue, stress vigilance task, age, etc., have a larger impact on a human-only barrier system and must be taken into account when developing operating standards and training.
  - In airplanes staffed with multiple flight attendants, a minimum of two attendants must be used in a procedural-based barrier system.

Source: RTCA Report DO-329, September 28, 2011, "Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures"

The Advisory Circular also does not highlight that there was important information redacted from the study due to security concerns that must be requested separately from the actual RTCA report.<sup>14</sup> For example, the redacted information shows that air carriers would need to ensure

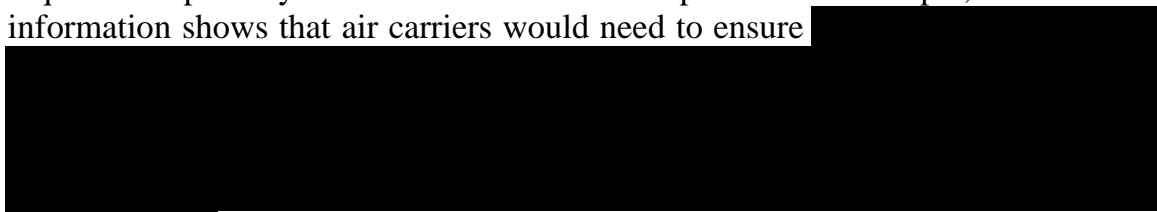


Table 3 illustrates examples of information redacted from the RTCA report.

<sup>14</sup> The RTCA report directs readers who wish to read the redacted information to contact FAA's Flight Standards Service.

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**Table 3. Examples of Redacted Research Results From RTCA Report**

Research Topic	Result
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

Source: Example SSI redacted results from RTCA’s DO-329, “Aircraft Secondary Barriers and Alternative Flight Deck Procedures”

The RTCA report also concluded that “the most serious credible threat to crewmembers [...] is posed by a team of highly trained, armed, athletic individuals who are intent on using deadly force to defeat all security measures [...] to infiltrate the flight deck.” Knowledge of the RTCA report’s findings, including redacted information, could be critical for assessing possible risks posed by current secondary barrier methods and development of air carrier policies and procedures needed to ensure the safety and security of the flight deck.

### **FAA Can Do More To Prepare Crewmembers Facing an Ill-Intentioned Pilot**

Following the Germanwings crash, FAA undertook two initiatives to better evaluate and address issues of pilot mental health. However, FAA has not yet addressed potential crew training improvements related to this internal threat. According to FAA, the Agency did not focus on crew safety enhancements because domestic air carrier guidance requiring two personnel in the cockpit at all times<sup>17</sup> (unlike several foreign carriers that did not have that requirement at the time of the crash) would prevent a similar tragedy from occurring in the United States. FAA did charter a Pilot Fitness Aviation Rulemaking Committee<sup>18</sup> and conducted a review of air carrier flight deck access procedures to address these issues. Yet, these steps focused heavily on pilot concerns and not on flight

<sup>15</sup> Flight attendant role carried out by physically fit males trained in law enforcement or military defensive tactics and using protective equipment.

<sup>16</sup> An improvised non-installed secondary barrier means a crew member using a galley cart.

<sup>17</sup> FAA and media commonly referred to the “Two Person Rule” as the reason why a crash similar to Germanwings Flight 9525 could not occur in the United States. This “rule” is actually FAA guidance requiring air carriers to include procedures in their air carrier manuals requiring a person on the flight deck to physically look through the cockpit door peep hole to validate that someone requesting access to the cockpit is authorized to enter and not under duress.

<sup>18</sup> FAA chartered the Pilot Fitness Aviation Rulemaking Committee (ARC) on May 11, 2015, to consider specific objectives and tasks in a forum for the U.S. aviation community to discuss and provide recommendations to FAA on pilot mental fitness for duty.

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attendants who can also assist in these types of emergencies if given additional training. As a result, FAA may have overlooked potential safety enhancements for this type of event.

Further, FAA did not conduct comprehensive industry outreach following the Germanwings crash, so the Agency was unaware of concerns that flight attendants had or suggestions they could provide on potential solutions should this type of event happen again. Four industry groups told us that FAA's outreach to industry for input after the crash did not ask for flight attendant concerns or inputs. For example, no outreach was conducted to determine whether additional training was needed. All of the air carrier representatives we interviewed indicated flight attendants [REDACTED]

While air carriers are mandated to provide specific emergency training to crewmembers, additional hands-on self-defense training provided by TSA continues to be voluntary. Industry data show there are over 193,000 commercial pilots and flight attendants currently employed in the United States, [REDACTED]

[REDACTED] Without reaching out to identify and assess crewmember concerns, FAA cannot determine whether enabling crewmembers to assist in these types of emergencies, regardless of their potential frequency, could enhance FAA's commitment to crew and passenger safety and security.

## CONCLUSION


Following the terrorist acts against the United States on September 11, 2001, FAA implemented many improvements to commercial passenger aircraft safety and security, such as hardened cockpit doors and enhanced crewmember training. However, the terrorist threat continues to evolve, and FAA must take proactive steps to protect the traveling public, aircraft, and flight crews. The Agency must coordinate its safety efforts with TSA, increase its surveillance of crewmember procedures, ensure air carriers have all the information needed to make flight deck security decisions, and assess whether more can be done to assist crewmembers in responding to an intentional malicious act of a pilot. Until then, U.S. air carrier cockpits could remain vulnerable to potential insider threats and attacks.

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**REDACTED FOR DISCLOSURE**

## RECOMMENDATIONS

To ensure that any potential vulnerability to passenger aircraft cockpits is minimized, we recommend that the FAA Administrator:

1. Develop and implement a process for field level inspectors to coordinate with TSA on programs with closely related safety and security responsibilities, such as results of air carrier cockpit access program audits.
2. Modify the current Safety Assurance System Data Collection Tool to ensure  

3. Publish an FAA Notice to inspectors that communicates the existence of AC 120-110 and RTCA Report DO-329, highlights the blocking methods orchestrated by the Special Committee, and directs inspectors to communicate this information to the carriers they oversee.
4. Require air carriers to conduct a Safety Risk Assessment (under FAA's Safety Management System) of their current secondary barrier methods using all information from the 2011 RTCA report on secondary barriers, either as a stand-alone Notice or incorporated into another Notice recommended above.
5. Meet with air carriers and TSA to discuss best practices that may be used to enhance cockpit security and reduce crew complacency.
6. Conduct outreach to industry and DHS to assess flight attendant concerns on additional training needed to better prepare for emergency situations, such as a crewmember lockout from the cockpit.

## AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FAA with our draft report on April 6, 2017, and received its formal response on May 23, 2017, which is included as an appendix to this report. FAA concurred with recommendations 1, 5, and 6 as written and provided appropriate planned actions and completion dates. FAA partially concurred with recommendation 3 and did not concur with recommendations 2 and 4, as detailed below.

FAA did not concur with recommendation 2, stating it does not agree that the current Safety Assurance System Data Collection Tool should be modified to

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ensure [REDACTED]

[REDACTED] As illustrated by the recent American Airlines incident in which a passenger tried to breach the cockpit door, security of the aircraft in flight remains vital. Moreover, as noted in our report, air carrier crewmembers told us that complacency is occurring during door transitions. Our recommendation is aimed at ensuring that [REDACTED]

[REDACTED] As a result, we are requesting that FAA reconsider its response to this recommendation.

FAA partially concurred with recommendation 3, stating that it did not agree to publish an *FAA Notice* to inspectors that communicates Advisory Circular 120-110 because Advisory Circulars are disseminated to all aviation safety inspectors. However, the Agency agreed to evaluate the need for further dissemination of the information to the aviation community by January 31, 2018. While the Agency's proposed alternative actions partially meet the intent of recommendation 3, we reiterate that none of the 34 inspectors and only 5 of 63 air carrier representatives we interviewed were aware of the RTCA report or FAA's Advisory Circular pertaining to this important security issue. We request that FAA strengthen its planned actions so that its evaluation does not focus solely on whether there is a need to further disseminate this information but rather on the most effective way to ensure that the entire aviation community—not just the FAA inspector workforce—is aware of the findings in the RTCA report and FAA's Advisory Circular.

Lastly, FAA did not concur with recommendation 4, [REDACTED]

[REDACTED]

FAA also stated that since it did not agree with all findings in the RTCA report, the Agency does not agree that air carriers should use all information from the report in their assessments. We were surprised that FAA's response stated its disagreement with the RTCA report as FAA had a Designated Federal Official assigned to the special committee and made explicit reference to the report

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14 times in its Advisory Circular. Additionally, the Agency gave no indication either in comments to the RTCA report or in its Advisory Circular that it disagreed with any of RTCA's findings. Requiring air carriers to conduct a Safety Risk Assessment (under FAA's Safety Management System), as we recommend, would help FAA correct any inaccuracies that may be impeding efforts to mitigate this critical security vulnerability. Accordingly, we request that FAA reconsider its response to this recommendation.

## **ACTIONS REQUIRED**

We consider recommendations 1, 5, and 6 resolved but open pending completion of planned actions. We are requesting that FAA reconsider its response for recommendations 2, 3, and 4, as detailed above, and request that FAA provide us with its revised response within 30 days of this report in accordance with DOT Order 8000.1C.

We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-0500 or Tina Nysted, Program Director, at (404) 562-3770.

#

cc: The Secretary  
DOT Audit Liaison, M-1  
FAA Audit Liaison, AAE-100

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## **EXHIBIT A. SCOPE AND METHODOLOGY**

We conducted this review between September 2015 and April 2017 in accordance with generally accepted Government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. Our audit objectives were to assess the effectiveness of FAA's actions to (1) identify vulnerabilities to flight deck security, and (2) mitigate identified flight deck vulnerabilities.

To assess these objectives, we reviewed FAA's program documentation and interviewed FAA headquarters representatives responsible for program oversight of flight deck safety and security for commercial airlines to obtain information on how FAA uses threat and vulnerability information for the purposes of aircraft safety, how the Agency coordinates with other external agencies in this topic area, how flight deck safety and security is evaluated, and how FAA representatives carry out their oversight responsibilities. We selected 9 out of 67 current Part 121 air carriers (both large and smaller operators) that use various secondary barrier methods to understand how and when these methods were employed, the training provided to crew members on these methods, and how these methods were selected and approved by FAA. These nine carriers are representative of the cockpit blocking methods currently in use by the airline industry. We interviewed 47 FAA field level inspectors and managers responsible for evaluating air carrier cockpit security procedures within the nine offices that oversee the selected air carriers. To understand FAA's involvement in the RTCA Special Committee 221 and subsequent report issued in 2011, we obtained and reviewed the report and interviewed key personnel involved with the Special Committee. We also interviewed four industry groups to determine whether FAA's actions appropriately identified and mitigated vulnerabilities to flight deck safety and security. We used survey results provided by one industry association representing 142 flight attendants who responded to an open survey request by the association. Lastly, we interviewed TSA representatives to understand their roles and responsibilities related to aircraft security and coordinated our findings with DHS Office of Inspector General.

There were no FAA internal controls tested during the course of this audit.

### **Exhibit A. Scope and Methodology**

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**EXHIBIT B. ORGANIZATIONS VISITED OR CONTACTED****Federal Aviation Administration (FAA) Headquarters**

Flight Standards Service	Washington, DC
Air Traffic Organization	Washington, DC
Office of National Security Programs and Incident Response	Washington, DC

**FAA Aircraft Certification Service Offices**

Aircraft Certification Service, Transport Airplane Directorate	Renton, WA
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**FAA Certificate Management Offices (CMO)**

Delta Air Lines CMO	Hapeville, GA
United Airlines CMO	Des Plaines, IL
Southwest Airlines CMO	Irving, TX

**FAA Certificate Management Units (CMU)**

ExpressJet Airlines CMU	Hapeville, GA
Compass Airlines CMU	Minneapolis, MN
Endeavor Airlines CMU	Minneapolis, MN
Envoy Airlines CMU	Irving, TX
GoJet Airlines CMU	St. Ann, MO
TransStates Airlines CMU	St. Ann, MO

**Air Carriers**

Delta Air Lines	Atlanta, GA
United Airlines	Chicago, IL
ExpressJet Airlines	Atlanta, GA
Compass Airlines	Minneapolis, MN
Endeavor Airlines	Minneapolis, MN
Southwest Airlines	Dallas, TX
Envoy Airlines	Irving, TX
GoJet Airlines	Bridgeton, MO
TransStates Airlines	Bridgeton, MO

**Exhibit B. Organizations Visited or Contacted**

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**Industry Groups**

Air Line Pilots Association, International	Washington, DC
Coalition of Airline Pilots Associations	Washington, DC
Association of Flight Attendants-CWA	Washington, DC
Federal Law Enforcement Officers Association	Washington, DC

**Other Organizations**

Transportation Security Administration	Herndon, VA
The Boeing Company	Everett, WA
RTCA, INC.	Washington, DC

**Exhibit B. Organizations Visited or Contacted**

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**EXHIBIT C. RTCA SPECIAL COMMITTEE REPRESENTATION**

**Co-Chairs:** United Airlines, Inc., The Boeing Company

**Designated Federal Official:** Federal Aviation Administration

**Members (as Listed in RTCA Report DO-329):**

**Federal Government Agencies**

Transportation Security Administration (TSA)  
TSA Federal Air Marshals Service  
Federal Bureau of Investigation  
National Counterterrorism Center

**Airlines/Manufacturers/Non-Airline Groups**

Airbus Americas, Inc.,	Air Line Pilots Association
Airbus Industries	Airbus Deutschland
Continental Airlines	Association of Flight Attendants
Air France	Air Canada Pilots Association
ExpressJet Airlines	Allied Pilots Association
Africa West, Tunisair	Coalition of Airline Pilots Association
Delta Air Lines, Inc.	International Federation Airline Pilots' Association
US Airways	SEPLA
Air New Zealand	Cimber Sterling
Japan Airlines	CARERI
South African Airways	General Aviation Manufacturers Association
United Parcel Service	TranSecure, Inc.
Southwest Airlines	Air Transport Association of America
Air Jamaica	British Air Line Pilots' Association
Alaska Airlines	RTCA, Inc.
American Airlines, Inc.	TESTCORP
Lufthansa	The Spectrum Group
	Cargo Airline Association
	CRUPAX
	Dutch Air Line Pilots Association
	Australian and International Pilots Association (APA)
	Mark Weiss Security Consulting, Inc.

**Exhibit C. RTCA Special Committee SC-221 Representation**

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**EXHIBIT D. MAJOR CONTRIBUTORS TO THIS REPORT**

<u>Name</u>	<u>Title</u>
Tina Nysted	Program Director
William Leary	Project Manager
Mark Perrill	Senior Analyst
Curt Boettcher	Senior Analyst
Manuel Ramos	Auditor
Audre Azuolas	Writer/Editor
Petra Swartzlander	Senior Statistician

**Exhibit D. Major Contributors to This Report**

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## APPENDIX. AGENCY COMMENTS

Federal Aviation  
Administration


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**Memorandum**

Date: May 23, 2017

To: Matthew E. Hampton, Assistant Inspector General for Aviation

From: H. Clayton Foushee, Director, Office of Audit and Evaluation, AAE-I 

Subject: Federal Aviation Administration's (FAA) Response to Office of Inspector General (OIG) Draft Report: FAA Has Taken Steps To Identify Flight Deck Vulnerabilities But Needs To Enhance Its Mitigation Efforts

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Immediately after the tragic events of September 11, 2001, the FAA, along with the Transportation Security Administration (TSA), enacted a series of rules, procedures, and equipment requirements to improve flight deck security and to prevent similar incidents. Since then, there have been zero breaches of the flight deck. The FAA, in partnership with the TSA, continues to assess safety/security vulnerabilities to ensure the safety of the flying public.

The FAA has reviewed the draft report and offers the following comments in response to the OIG's findings:

- Regarding security vulnerabilities when the flight deck door is opened, the FAA has mitigated this issue through 14 Code of Federal Regulations (CFR) § 121.584.<sup>1</sup>
- With regard to OIG concerns regarding crew complacency during cockpit door transitions, in calendar year 2016, the FAA conducted over 37,000 en-route inspections, and no complacency issues were noted.
- The FAA disagrees with the statement that "FAA has not ensured that carriers have all available information necessary" to protect the cockpit during flight. All carriers have the information at their disposal as air carriers were made aware of the information through participation in the Radio Technical Commission for Aeronautics (RTCA) study and through Advisory Circular (AC) 120-110.<sup>2</sup>
- The FAA does not agree with all the findings published in RTCA DO-329, and we formally notified industry of the report through AC 120-110.
- The FAA does not believe that the provision of enhanced self-defense training to flight attendants is the most effective solution to preventing an incident like the 2015 Germanwings Flight 9525 crash, but we will examine the issue.

<sup>1</sup> 14 CFR § 121.584, Requirement to View the Area Outside the Flightdeck Door

<sup>2</sup> AC 120-110, Aircraft Secondary Barriers and Alternate Flight Deck Security Procedures

**Appendix. Agency Comments**

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- The OIG is incorrect in stating that FAA inspectors [REDACTED]
- The FAA disagrees there is a need for the FAA to highlight the redacted information in the RTCA report. The report shows who to contact to request the information.

The FAA concurs with recommendations 1, 5 and 6 as written. We plan to implement recommendation 1 by January 31, 2018 and recommendations 5 and 6 by May 31, 2018. We partially concur with recommendation 3 and non-concur with recommendations 2 and 4.

The FAA partially concurs with recommendation 3 and provides an alternate course of action. We do not agree to publish an *FAA Notice* to inspectors that communicates Advisory Circular (AC) 120-110 because, as a standard practice, ACs are disseminated to all aviation safety inspectors. As an alternate action, we will evaluate by January 31, 2018 the need for further dissemination of the information and notice to the aviation community.

We non-concur with recommendation 2. We do not agree to “modify the current Safety Assurance system Data Collection Tool to ensure [REDACTED]

The FAA non-concurs with recommendation 4. Air carriers have conducted a safety risk assessment as it is covered by their safety management system to comply with 14 CFR § 121.584. In addition and as stated above, we do not agree with all the findings in the RTCA report and therefore, we do not agree to use “*all information from the 2011 RTCA report.*”

We appreciate this opportunity to offer additional perspective on the OIG draft report. Please contact H. Clayton Foushee at (202) 267-9000 if you have any questions or required additional information about these comments.

### Appendix. Agency Comments

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