THE CARGO AIRLINE ASSOCIATION
The Voice of the Air Cargo Industry

March 20, 2020

Mr. Brandon Roberts
Office of Rulemaking
Acting Designated Federal Official, Aviation Rulemaking Advisory Committee
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

RE: Flightdeck Secondary Barrier Working Group Recommendation Report

Dear Mr. Roberts,

On March 19, 2019, the Aviation Rulemaking Advisory Committee (ARAC) voted unanimously to accept the Recommendation Report submitted by the Flightdeck Secondary Barrier Working Group dated February 27, 2020. I'd also like to note that in accordance with the ARAC's processes, the report was approved by the Transport Airplane and Engine (TAE) Subcommittee.

On behalf of the ARAC members, please accept the Recommendation Report of the Flightdeck Secondary Barrier Working Group and please submit to the relevant program offices for consideration and implementation.

We greatly appreciate the hard work by the members and Chairs of the Working Group, as well as the TAE Subcommittee to ensure this report was submitted as expeditiously as possible. Please do not hesitate to contact me with any questions. Thank you very much.

Sincerely yours,

Yvette A. Rose
Senior Vice President
ARAC Chair

cc: Brad Brown, Southwest Airlines, Flightdeck Secondary Barrier WG Co-Chair
Wolfgang Koch, Air Line Pilots Association, Flightdeck Secondary Barrier WG Co-Chair
Keith Morgan, Pratt & Whitney, TAE Chair
Thuy Cooper, FAA

Recommendation Report to Aviation Rulemaking Advisory Committee for Implementation of Section 336 of P.L. 115-254

Flightdeck Secondary Barrier Working Group | February 27, 2020

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1 EXECUTIVE SUMMARY

1.1 SUMMARY

The Aviation Rulemaking Advisory Committee (ARAC) created the Flightdeck Secondary Barrier Working Group in September 2019. The tasking order to this group was addressed in a letter to the ARAC, dated June 20, 2019. This document can be found by clicking here. This group was comprised of representatives from the aviation industry, including aircraft manufacturers and operators.

This group was asked to provide advice and recommendations on the most effective means of implementing section 336 of the FAA Reauthorization Act of 2018 (Public Law 115-254). This law requires that the FAA issue an order for the installation of Secondary Cockpit Barriers on each new aircraft that is manufactured for delivery to a passenger air carrier in the United States operating under 14 Code of Federal Regulations (CFR) 121.

The tasking notice asked for five areas to be examined. These tasks included:

1. Identifying a full range of options to achieve the objectives of section 336 of P.L. 115-254 with key considerations to implement each option. This activity should include but not be limited to a review of existing secondary barrier methods.
2. Determining if the FAA's order should apply to airplanes produced for operations under parts in addition to 14 CFR part 121 (for example 14 CFR 129).
3. Providing initial qualitative and quantitative costs and benefits for recommended actions and alternative actions.
4. Providing implementation steps for the recommended options.
5. Developing a report containing recommendations on the findings and results of the tasks explained above.
    a. The recommendation report should document both majority and, if applicable, any dissenting positions on the findings and the rationale for each position.
    b. The recommendation report should document any disagreements, including the rationale for each position and the reasons for the disagreement.

In establishing a format to address these tasks, the working group was further divided into three sub-working groups. These groups consisted of the Technical, Operations, Implementation groups, with Implementation group also having taken on the task of gathering costing. Each of the groups chose a Lead to address their respective expertise for completion of the assignment. The Technical group was represented by aircraft and component manufacturers, the Operations group was represented by airlines, federal advisory committee and flight crew associations, and the Implementation group was represented by airlines, air carrier associations, and aircraft manufacturers.

In formulating assignments for the task, each of the individual sub-groups had internal discussions on their own requirements for installing secondary barriers onboard an

aircraft. The working group convened two separate face-to-face meetings, one in November 2019 and the second in January 2020. These meetings were hosted by Airlines for America (A4A) and the Air Line Pilots Association Int'l (ALPA). Each of the meetings were preceded by separate conference calls and in some cases scheduled meetings with the separate sub-working group members.

The basis of many areas addressed by the group was born from previous work done on behalf of RTCA Special Committee 221 (SC-221), reported to the FAA in RTCA Document 329 (DO-329) in September 2011, and an OEM white paper submitted to the FAA in June of 2019 that identified a range of options to achieve the objectives of section 336 of P.L. 115-254. As a result of this group's efforts, the group produced 18 recommended consensus areas, 3 recommendations without consensus areas and a costing sheet with 13 separate costing categories for this report.

2 BACKGROUND INFORMATION

2.1 SECTION 336 OF P.L. 115-254

On October 5, 2018, Congress enacted P.L 115-254. Section 336 of P.L. 115-254 requires *the FAA to issue an order requiring installation of a secondary cockpit barrier on each new aircraft that is manufactured for delivery to a passenger air carrier in the United States operating under the provisions of part 121 of title 14, Code of Federal Regulations.*

2.2 ARAC ASSIGNMENT

On June 20, 2019, the FAA assigned this task to ARAC, which ARAC designated to the Transport Airplane and Engine (TAE) Subcommittee Flightdeck Secondary Barrier Working Group.

2.3 WORKING GROUP SOLICITATION AND SELECTION

On June 20, 2019, the ARAC sent notice of the new task and a solicitation of members. All candidates were required to submit, in full, the following material to be considered for membership.

1. A résumé or curriculum vitae.
2. A statement describing the candidate's interest in the task and the expertise the candidate would bring to the working group.

All nominations were submitted electronically by July 4, 2019 for ARAC and FAA review. Working group member were selected and notified by September 9, 2019. As a part of this selection process, two members accepted the role as working group co-chairs. The working group members are contained in section 2.3.1 below.

2.3.1 Working Group Members

Primary Member	Alternate Member	Organization
Bill Cason	Maryanne DeMarco	Coalition of Airline Pilots Associations
Brad Brown (Co-Chair)		Southwest Airlines
Brad Christensen		Safran Cabin
Cari Smith Allen		Alaska Airlines
Cesar Alberto	Eduardo Iramina	Embraer
Daniella Constantin	Nelson Afonso	DeHavilland
Doug Lavin		International Air Transport Association
Drew Jacoby Lemos		Regional Airlines Association
Ed Folsom		RTCA SC-221
Gary Cason		Southwest Airlines Pilot's Association
Gary Tomasulo		American Airlines
George Paul	Wayne Goolia	National Air Carrier Association
John Black	Chris Witkowski	Association of Flight Attendants
John Weigand		United Airlines
Kevin Woodward	Julie Brightwell	Boeing
Leslie Riegle		Aerospace Industries Association
Luize Avrigeanu	Patrice Taillefer	Mitsubishi Aircraft Corporation
Marie-Laure Moulard	Thierry Leger	Airbus
Paul McGraw	Bill McDonald	Airlines for America
Wolfgang Koch (Co-Chair)	Randy Williams	Airline Pilots Association

Bill Petrak (observer)	Dan Jacquet (observer)	Federal Aviation Administration
Jeff Gardlin (observer)	DK Deaderick (observer)	Federal Aviation Administration
Lowell Dimoff (observer)	Koi Hallonquist (observer)	Transportation Security Administration - Federal Air Marshal Service
Rose Tancredi (observer)		Transportation Security Administration - Federal Air Marshal Service
Zhang Zhuguo (observer)		Civil Aviation Administration of China

2.4 SUB-WORKING GROUP FORMATION

As stated in the summary, in order to accomplish the large amount of required work in a compressed timeline the working group decided that creation of sub-working groups would be required. Therefore, a survey was distributed to the working group members in order to solicit interest and ensure equal distribution amongst three sub-working groups: Implementation, Operations and Technical. Each sub-working group was assigned a Lead in order to facilitate coordination and completion of tasks. Both primary and alternate working group member participated in the sub-working group work. The sub-working groups and primary members are contained in section 2.4.1 below.

2.4.1 Sub-working Group Members

Implementation Sub-working Group

Doug Lavin (Lead)
Brad Brown
Drew Jacoby Lemos
Gary Tomasulo
George Paul
Luize Avrigeanu
Paul McGraw

Operations Sub-working Group

Ed Folsom (Lead)
Bill Cason
Cari Smith Allen
Gary Cason
John Black
John Weigand
Wolfgang Koch

Technical Sub-working Group

Kevin Woodward (Lead)
Brad Christensen
Cesar Alberto
Daniella Constantin
Leslie Riegle
Marie-Laure Moulard

2.5 WORKING GROUP MEETINGS

The working group convened two separate face-to-face meetings, one in November 2019 and the second in January 2020. These meetings were hosted by Airlines for America (A4A) and the Air Line Pilots Association Int'l (ALPA). Each of the meetings were preceded by separate conference calls and in some cases scheduled meetings with the separate sub-working group members.

3 RESEARCH INFORMATION

The Working Group utilized many publications for research and background for this report. The following is not intended to be a complete listing; however, it is a listing and discussion of the major publications utilized by the Working Group.

3.1 ADVISORY CIRCULAR 120-110 AIRCRAFT SECONDARY BARRIERS AND ALTERNATE FLIGHT DECK SECURITY PROCEDURES

Advisory Circular (AC) 120-110 was released by the FAA on April 14, 2015. This AC was released to call attention to RTCA Document (RTCA/DO-329) Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures, as guidance to achieve effective protection of the flight deck as required by Title 14 of the Code of Federal Regulations (14 CFR) part 121 § 121.584(1)(a).

Note: This Advisory Circular, as with all Advisory Circulars, is not mandatory and does not constitute a regulation. It describes an acceptable means, but not the only means, to comply with pertinent regulatory requirements.

3.2 RTCA / DO 329 AIRCRAFT SECONDARY BARRIERS AND ALTERNATIVE FLIGHT DECK SECURITY PROCEDURES

DO-329 was released by RTCA on September 28, 2011. This document provides guidance for use of various Secondary Barrier Systems (SBS) as acceptable means of compliance with US regulations, as well as an evaluation of best practices, and other considerations to be taken into account when determining compliance with those regulations. DO-329 contains performance guidelines on how air carriers can comply with current regulations such as 121.584(a).

3.3 POSITION ON PROPOSED SECONDARY BARRIERS INSTALLATION FOR CFR 14 PART 121 AIRCRAFTS

Position on Proposed Secondary Barriers Installation for CFR 14 PART 121 Aircrafts was released by the Secondary Cockpit Barriers OEM Working Group on June 13, 2019. This white paper was developed to identify the range of options and provide technical recommendations to achieve objectives of Section 336 of P.L. 115-254. Key considerations were given with respect to the implementation possibilities, taking into account the existing requirements and methods of compliance.

4 TASK GROUP ASSIGNMENTS AND FINDINGS

The task delivered to the Working Group is stated as such in the ARAC Task Notice:

THE TASK: The Flightdeck Secondary Barrier Working Group will provide advice and recommendations to the ARAC on the most effective ways to implement section 336 of P.L. 115-254. The Group should review any relevant materials to assist in achieving their objective.

The Working Group is tasked with making recommendations on the following:

1. Identifying a full range of options to achieve the objectives of section 336 of P.L. 115-254 with key considerations to implement each option. This activity should include but not be limited to a review of existing secondary barrier methods.
2. Determining if the FAA's order should apply to airplanes produced for operations under parts in addition to 14 CFR part 121 (for example 14 CFR 129).
3. Providing initial qualitative and quantitative costs and benefits for recommended actions and alternative actions.
4. Providing implementation steps for the recommended options.
5. Developing a report containing recommendations on the findings and results of the tasks explained above.

a. The recommendation report should document both majority and, if applicable, any dissenting positions on the findings and the rationale for each position.
b. The recommendation report should document any disagreements, including the rationale for each position and the reasons for the disagreement.

This section of the report will detail task group assignments and findings of items 1, 2, 3 and 4 above. Item 5 above is fulfilled through the delivery of this report.

4.1 Full Range of Options to Include Review of Existing Methods

Section 7 of this report contains 21 recommendations in which the working group provides a full range of options for the FAA to consider while drafting the new rule. Recommendation 19 offers two proposals with methods specific to review of existing methods and procedures.

4.2 Determination of Rule Applicability to Airplanes Operating Under Parts Other Than 14 CFR 121

The working group did not recommend extending applicability of the new rule to any airplanes operating under parts other than 14 CFR 121. Section 7 of this report contains Recommendation 13 in which the working group provides the specific recommendation that 14 CFR 129 aircraft should be excluded from the new regulation. Rationale for this recommendation can be found in Appendix A.

4.3 Cost and Benefit Analysis

The working group has addressed both cost and benefit through the following analysis.

4.3.1 Benefit Analysis

Report No. 285.11.2019 Security Risk and Cost-Benefit Assessment of Secondary Flight Deck Barriers dated November 2019 was sent to the FAA's Office of Aviation Policy & Plans in November 2019. This report contains details regarding potential benefits for Installed Physical Secondary Barrier (IPSB) that will assist the FAA in their cost and benefit analysis.

4.3.2 Cost Analysis

The costs of the proposed rule are anticipated to be engineering, production, weight penalty, training and maintenance compliance costs for new production of currently-produced part 25 airplanes used in part 121 operations.

Below is a table that contains potential cost categories, cost estimates and related notes for each cost category. The Cost Estimates notate whether it is to be a onetime, non-recurring cost, per aircraft cost or per hour cost.

Cost category	Cost Estimate	Notes
Nonrecurring Engineering	$9M (one-time)	• Includes non-recurring Certification/Testing • Estimate includes total for Airbus, Boeing, Embraer and De Havilland. • Assumes each OEM has higher up front cost for initial a/c design, then partial design reuse for remaining models, and unique installations for each a/c41 model. • Assumed FAA requirements are aligned with ARAC Secondary Barrier WG recommended requirements.
Recurring Production (Hardware, Installation & Engineering)	$35K per aircraft	• Includes recurring Certification/Testing • Assumed FAA requirements are aligned with ARAC Secondary Barrier WG recommended requirements.
Non-recurring Aircraft Manual / Instructions for Continued Airworthiness (ICA)	N/A	• Development and cost of manuals and ICA's expected to be minimal • Current cost estimate is N/A due to this cost being included in Nonrecurring Engineering estimates.
Non-recurring Training Development	$2K per 1 hour course development per operator	• For pilots, flight attendants, maintenance • Passenger and some cargo charter airlines included • Dependent on operator costs for training development • $50 per hour for development / 40 hours to develop 1 hour instructor lead course
Pilot Training	60 min initial 30 min recurrent	• Dependent on number of pilots trained • Dependent on cost per hour of training at each operator • Dependent on type of training (classroom, hands on, remote)
Flight Attendant Training	60 min initial 30 min recurrent	• Dependent on number of flight attendants trained • Dependent on cost per hour of training at each operator • Type of training (classroom, hands on, remote)
Maintenance Training	N/A	• Current cost estimate is N/A as a relatively simple design is expected and clear instructions for continued airworthiness should be delivered. • If the above assumptions are correct dedicated maintenance training will not be necessary
Supply Chain/Spares	$10K per unit	• Recommended Spares Listing provided from IPSB OEM will help operators determine how to forecast necessary spare part use and stocking locations
Maintenance	Routine check (2 hrs): $170	• Based on OEM Maintenance Planning Data (MPD) • Based on both routine and non-routine maintenance • Average $85 per hour of maintenance

	Non-routine for replacement (8 hours): $680	
Weight Penalty	30 lbs	• Weight penalty will equate to added fuel burn requirements
Reconfiguration of Seats/Galleys (if required)	N/A	• Current cost estimate is N/A as reconfiguration is not expected. However cost will need to be assessed if reconfiguration is required due to design requirements
Out of Service/Deferral Process	Time to Deferral: (1 hour): $85 Delay cost: $4,800 per 1 hour	• Based on MMEL Category C deferral taking 1 hour to complete causing 1 hour delay • Delay cost based on industry average of $80 per delay minute
Increase in # of flight crew (if required)	1 additional FA for aircraft with currently only 1 FA	• Will depend on implementation decision by FAA. • Staffing requirement increases could result in loss of seat revenue.

4.4 IMPLEMENTATION STEPS FOR RECOMMENDED OPTIONS

Section 7 of this report contains recommendations with references to technical design, operations and implementation requirements. Based on these recommendations, and in order to meet the mandate of Section 336 of P.L. 115-254, the FAA should accomplish the following implementation steps:

- Adopt a new section or new sections of 14 CFR 25 to ensure there are clear airworthiness standards of new transport category airplanes that are manufactured for delivery to a passenger air carrier in the United States operating under 14 CFR 121.
- Address any existing sections of 14 CFR 25 to ensure harmony with the new and existing regulations.
- Adopt a new section or new sections of 14 CFR 121 to ensure clear operating requirements for new transport category airplanes in which a secondary cockpit barrier was delivered to a passenger air carrier in the United States operating under 14 CFR 121.
- Address any existing sections of 14 CFR 121 to ensure harmony with the new and existing regulations.
- Publish Advisory Circulars as guidance to manufacturers and air carriers describing acceptable means, but not the only means, to comply with the new regulations.

5 ISSUES AS A RESULT OF THE FINDINGS

Due to P.L. 115-254 requiring issuance of an order by October 5, 2019, the timeline for this project was very short. The working group requested and was granted one extension to this timeline and therefore the final report was completed on February 20, 2020. Although the working group completed its tasking on this very compressed timeline, we feel that all areas of the task were completed. Any lack of clarity within each recommendation and tasking is the result of shortness of time and not shortness of effort on the part of the working group. The following two items were necessary to provide clarity outside of Section 7 Recommendations from this report.

1. It is important to note that recommendations contained in this report are for interior features whose sole purpose is to function as an installed secondary barrier system. Interior features that may serve other functions in addition to that of an installed secondary barrier, e.g., privacy door, lavatory door is not covered by this report, and may have other requirements to satisfy, in addition to those discussed in this recommendation.
2. It was also noted that recommendations in this report are for performance minimums, e.g., Recommendation 18 for a simplified 5 second delay verification method be utilized for the IPSB design compliance. These minimums should not exclude OEMs from designing barriers that meet requirements above the minimum standards.

6 CONSENSUS, INCLUDING MAJORITY AND DISSENTING POSITIONS

6.1 PROCESS FOR DOCUMENTING OF FULL CONSENSUS, MAJORITY OF GENERAL CONSENSUS WITH DISSENT AND RECOMMENDATIONS WITHOUT CONSENSUS

Throughout the process the working group collaboratively brought forth and discussed all aspects of the tasking. The result of the collaboration is a cost and benefit analysis (Section 4.3) and 21 Recommendations (Section 7).

All parties participated to construct the cost and benefit analysis without any formal documenting of consensus or dissent.

The 21 Recommendations were discussed as a plenary during the January 2020 meeting at the Air Line Pilots Association Int'l (ALPA) facility. Subsequent to that meeting the recommendations were distributed multiple times via e-mail for comment and refinement. The final, formal documenting of the group's full consensus, general consensus with dissent and recommendations without consensus was captured via an

online survey tool in February 2020. The results of this survey are documented in the following sections. The full recommendations are found in Section 7 of this report.

6.2 RECOMMENDATIONS WITH FULL CONSENSUS

Recommendations 1, 3 – 14 and 16 – 18 had full consensus from the working group members.

Note: Some working group member abstained from the above recommendations; however, there were no dissents from any working group members.

6.3 RECOMMENDATIONS WITH A MAJORITY OF GENERAL CONSENSUS WITH DISSENT

Recommendation 2 had a majority of general consensus from the working group with one dissent. This dissent is found in section 7.2.1.

Recommendation 15 had a majority of general consensus from the working group with three dissents. These dissents are found in section 7.15.1.

6.4 RECOMMENDATIONS WITHOUT CONSENSUS

Recommendations 19, 20 and 21 did not have full or general consensus amongst the working group members. Each recommendation had two proposals with the working group members endorsing one or the other.

6.4.1 Recommendation 19 – Review of Existing Methods and Procedures

Proposal 1 of Recommendation 19 recommends Air Carriers and the FAA conduct a fresh Safety Risk Assessment of current Secondary Barrier Systems (SBS) in use (IPSB, INSB or Human Barrier) with demonstrated compliance to the performance goals from AC 120-110 and RTCA DO-329. The large majority of the Operations sub-working Group advocated for this proposal.

Proposal 2 of Recommendation 19 recommends that Air Carriers should continually evaluate existing secondary barrier methods through the use of 14 CFR Part 5 Safety Management Systems. All members of the Implementation sub-working group, half of the Technical sub-working group and a small minority of the Operations sub-working group advocated for this proposal.

Half of the Technical team members abstained from advocating for either proposal.

6.4.2 Recommendation 20 – Required Flight Attendant Staffing Levels

Proposal 1 of Recommendation 20 recommends that in order to be fully effective in operation, the IPSB requires two flight attendants onboard the aircraft. The large majority of the Operations sub-working Group advocated for this proposal.

Proposal 2 of Recommendation 20 recommends that effectiveness of the IPSB should be based on procedure development and implementation. All members of the

Implementation sub-working group, the large majority of the Technical sub-working group and a small minority of the Operations sub-working group advocated for this proposal.

A small minority of the Technical sub-working group abstained from advocating for either proposal

6.4.3 Recommendation 21 – Implementation Timeline for the New Rule

Proposal 1 of Recommendation 21 recommends that an implementation timeline of the secondary barrier should be issued no later than 36 months after the final rule is published in the Federal Register and relevant advisory circulars issued by the FAA. All members of the Implementation and Technical sub-working groups and a small minority of the Operations sub-working group advocated for this proposal.

Proposal 2 of Recommendation 21 recommends that an implementation timeline of the secondary barrier should be issued no later than 18 months after the final rule is published in the Federal Register. The large majority of the Operations sub-working Group advocated for this proposal.

7 RECOMMENDATIONS

This section contains the twenty-one recommendations brought forth and discussed as a working group. Consensus, including majority and dissent positions is documented in section 6 of this report.

Each recommendation is supported by rationale developed by the working group. Due to Recommendations 1 – 18 having consensus or a majority of general consensus with dissent(s), the rationale for those recommendations is documented in Appendix A of this report. Due to Recommendations 19 – 21 not having consensus, but rather varying proposals, the rationale for those recommendations is documented in this section in order to illustrate thought process and differences between each proposal.

Appendix A contains all Recommendations with rationale for completeness.

7.1 RECOMMENDATION 1

Installed Physical Secondary Barrier (IPSB) should be certified to static load rather than dynamic load requirements.

Proposed Requirement:

- 600 lb push load; 250 lb pull load (same as 14 CFR 25.795(a)(2) for flight deck door)
- Point load(s) applied at the following location(s):
    - Barrier center plus barrier latch area (similar to the existing FAA AC 25.795-1A), or
    - critical assessment of where a barrier design weakness could best be exploited for quick opening

7.2 RECOMMENDATION 2

IPSB should be designed such that it is not possible for a 50% male to reach through and grab an open flight deck door with consideration to prevent being able to climb and reach over the IPSB to grab the flight deck door.

Note: In the event that the manufacturer designs an IPSB in which a 50% male can reach through and grab an open flight deck door, it will be necessary for the operator to have approved procedures which will further inhibit a perpetrator from grabbing this door, holding it open, and fully penetrating the IPSB before the FA/Pilots could shut the flight deck door.

7.2.1 Dissent to Recommendation 2

AFA agrees with the stated goal of Recommendation #2 that the "IPSB should be designed such that it is not possible for a 50% male to reach through and grab an open flight deck door with consideration to prevent being able to climb and reach over the IPSB to grab the flight deck door." However, the "Note" in this recommendation is broadly worded so that it appears to accept procedures to substitute for achievement of the design goal. Such procedures identified in the recommendation's rationale, in addition to effective training against attacks, should be required even when the design goal is met, in the event that an attacker below the equivalent physical dimensions of a 50% male reaches through the IPSB. Reach through of the IPSB by those of dimensions at or greater than a 50% male should be prevented by design as stated in the recommendation. If, despite good faith efforts, a manufacturer fails to meet this design standard, then the FAA, might reject the design or consider what additional design conditions would need to be met in order to mitigate the deficiencies of a design that does not prevent reach through of the IPSB by a 50% male.

7.3 RECOMMENDATION 3

IPSB shall be transparent such that situational awareness can be maintained between the passenger cabin and the vestibule area. The transparency could be accomplished via a transparent material or open space in the IPSB. If a transparent material, consideration should be given to allow materials to not adversely impact the ballistic effects from FAMS protection. Consideration should also be given to maximize the transparency to non-transparent material ratio to maximize the visibility and to enhance situational awareness.

7.4 RECOMMENDATION 4

Flight deck door jamming requirements of 14 CFR 25.772 are not applicable to IPSB.

7.5 RECOMMENDATION 5

Pressurized compartment loads are only applicable to IPSB in open/stowed position.

7.6 RECOMMENDATION 6

Design of the IPSB will take into consideration Human Factors for space required for crew activities (e.g. crew change outs, restroom breaks, meal service, etc.).

7.7 RECOMMENDATION 7

Operating instructions will not be placarded to the IPSB. If required, placarding should be kept to the minimum (e.g. crew use only, stow while not in use, etc.).

7.8 RECOMMENDATION 8

Overriding (without tools) of the IPSB should not be obvious, but should be compatible to allow emergency access (e.g. emergency equipment access, air marshal intervention, etc.) and not in contrary to verification method of compliance (e.g. 5 second delay).

7.9 RECOMMENDATION 9

Part 121 requirement/advisory material limiting the closing/deploying of IPSB to promptly prior to and after the transition period of flight deck door opening. IPSB to be open/stowed during Taxi, Takeoff and Landing (TT&L) and the majority of flight thus allowing compliance methods to assume IPSB is generally in open/stowed position.

7.10 RECOMMENDATION 10

Regulatory guidance will be provided to clarify any conflicts with existing regulations while IPSB is closed/deployed. This includes, but is not limited to guidance on rapid decompression, emergency evacuation, width of aisle, accessibility to the emergency equipment (14 CFR 25.365, 25.803, 25.813, 25.815, 25.1411 and 25.1447)

7.11 RECOMMENDATION 11

Training for operation of Secondary Barrier System (SBS) to be scaled to meet operational requirements of various designs. Non-prescriptive examples of procedures found in Appendix B of this report.

7.12 RECOMMENDATION 12

Crew training applicable to the SBS will include human factors and defensive tactics commensurate to the type of SBS being employed on each type of aircraft.

7.13 RECOMMENDATION 13

Part 129 aircraft excluded from new regulation.

7.14 RECOMMENDATION 14

All cargo carriers excluded from regulation due to not being passenger aircraft. While all WG members agreed cargo aircraft are out of scope, some WG members encourage all-

cargo airlines to study the work product and conclusions from this group as possible additional layer of security.

7.15 RECOMMENDATION 15

Limit(s) to rule applicability should be established taking into consideration the following:

- Flight duration / stage length
- Location of lavatory on aircraft as related to operational complexities
- Potential loss of passenger seats due to IPSB design
- Necessary flight attendant staffing for IPSB operation
- Operational complexities
- Minimum dimension requirements
- Etc.

7.15.1 Dissents to Recommendation 15

CAPA: While the bullets listed in this recommendation accurately capture the broad range of topics discussed which may impact applicability, no agreement was reached on what, if any, limits should be applied. Therefore, we object to the directive nature of this recommendation which could be interpreted as a mandate from the committee. The FAA may or may not take into consideration one or more of these factors (or other factors not listed) when assessing scope.

SWAPA: The bullets listed in this recommendation do capture the topics discussed in the working group. However, the working group's many discussions on this topic focused specifically on single flight attendant, and some smaller two-flight attendant aircraft only for possible applicability exceptions. Ultimately the working group could not come up with any rationale that would support exceptions. We therefore object to the open-ended wording of this recommendation as it could lead FAA decisions on applicability to include any variety of aircraft types and sizes.

AFA: While the bullets listed in this recommendation accurately captures the broad range of topics discussed which may impact applicability, no agreement was reached on what, if any, limits should be applied. Therefore, we object to the directive nature of this recommendation which could be interpreted as a mandate from the committee. The FAA may or may not take into consideration one or more of these factors (or other factors not listed) when assessing scope.

7.16 RECOMMENDATION 16

Deferral of IPSB must be evaluated by Aircraft Evaluation Group (AEG) similar to any Minimum Equipment List (MEL) items. Deferral should be Category C (10 days).

7.17 RECOMMENDATION 17

In the case of the IPSB deferral, secondary or tertiary procedures in place will comply with performance standards outlined in current 121 regulations (e.g. 121.584, etc.).

7.18 RECOMMENDATION 18

Simplified 5 second delay verification method for the IPSB design compliance. The aspect of this recommendation specifically addresses the reasoning why 5 seconds is adequate and the 5 seconds does not need to be increased to a longer duration.

7.19 RECOMMENDATION 19

The following recommendation has two proposals.

7.19.1 Proposal 1 for Recommendation 19

The ARAC Working Group recommends Air Carriers and the FAA conduct a fresh Safety Risk Assessment of current Secondary Barrier Systems (SBS) in use (IPSB, INSB or Human Barrier). The FAA should publish an FAA Notice to inspectors to accomplish this review. This Safety Risk Assessment should include but is not limited to demonstrating how the selected SBS (IPSB, INSB or Human Barrier) complies with the performance goals from AC 120-110 and RTCA DO-329.

Rationale

- In the years since the 9/11/01 terror attacks, the procedures, training and equipment used by air carriers to comply with various FARs (121.584(1)(a), etc.) was not evaluated until the FAA commissioned RTCA Special Committee 221 in 2008. On September 28, 2011, RTCA published DO-329, Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures.
- RTCA/DO-329 represents the most authoritative body of data, evidence and analysis which was used to provide recommendations on secondary barrier system (SBS) performance standards (including the IPSB). RTCA/DO-329 also provides data-driven evidence and analysis of the vulnerability of current FAA-approved SBS procedures, training and equipment.
- The FAA accepted and approved RTCA/DO-329 in September 2011, citing this study and document in its own advisory circular, AC 120-110 (Aircraft Secondary Barriers and Alternate Flight Deck Security Procedures), which was published on April 14, 2015.
- FAA AC 120-110 calls attention to RTCA Document (RTCA/DO-329) as guidance to achieve effective protection of the flight deck as required by Title 14 of the Code of Federal Regulations (14 CFR) part 121 § 121.584(1)(a).
- No other regulatory or industry group has conducted a similar vulnerability assessment of current SBS aboard commercial passenger aircraft. Because of this undisputed fact, it would be advisable for the FAA, TSA and Air Carriers to avail themselves of this valuable body of data, assessment of this data, and resulting conclusions and recommendations.
- The FAA Office of Inspector General submitted an Audit Report titled, "FAA HAS TAKEN STEPS TO IDENTIFY FLIGHT DECK VULNERABILITIES BUT NEEDS TO ENHANCE ITS MITIGATION EFFORTS", which was issued on June 26, 2017. This report criticized the FAA for a number of things, including:
    - The FAA is not effectively mitigating all existing cockpit security vulnerabilities.

    - Complacency is cited by both flight attendant and pilot association representatives, yet the FAA has not addressed or even studied this vulnerability.
    - The 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.
    - The FAA may not be taking full advantage of further enhancements that could mitigate safety and security risks and their associated vulnerabilities.
    - The FAA failed to highlight that there was important information redacted from the RTCA/DO-329, available to carriers in an SSI addendum, which the FAA controlled.
- The FAA IG report made 6 recommendations to the FAA. Of these 6, the FAA did not concur with the following 3 IG report recommendations, including:
    - 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.
    - 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.
- It should be noted that key portions of the IG report were redacted from public view as SSI, including justification for why they did not concur with recommendations 2, 3, and 4. The ARAC Secondary Barrier WG was unable to discuss these IG recommendations and FAA justification for not complying with the IG recommendations because the ARAC Secondary Barrier WG was not able to gain approval in a timely manner from those who were responsible for SSI disclosure requirements.
- Air Carriers security measures have not been updated in some time. Flight deck transition protocols require prompt review by the FAA in accordance with the FAA's own Inspector General report.
- The FAA needs to restore public confidence, ensuring a Secondary Barrier System review is a necessary step in the right direction.

7.19.2 Proposal 2 for Recommendation 19

Air Carriers should continually evaluate existing secondary barrier methods through the use of 14 CFR Part 5 Safety Management Systems.

Rationale

- Airlines today install/utilize different methods to ensure an additional security layer to the area immediately behind the reinforced cockpit door in order to comply with 14 CFR 121.584(a)(1).
- The different methods utilized by air carriers have been deemed acceptable to the Regulator, therefore in compliance with 14 CFR 121.584(a)(1).

- The AC 120-110 – published in 2015 as guidance for meeting the requirements of CFR part 121, 121.584(a)(1), directs to the use (as appropriate) the methods described in RTCA document DO-329. As all advisory material, the AC120-110 is a means but not the only means to show compliance, and it is not meant to be the rule.
- Air Carriers routinely work with the FAA offices to develop and review current training and compliance to regulations, 14 CFR 121.584 included.
- Air Carriers are required to comply with 14 CFR Part 5 Safety Management Systems. 14 CFR 5.71, 5.73 and 5.75 require Air Carriers to utilize a continuous cycle of routine audits (including operational processes), capture findings to identify any systemic issues, apply safety risk management to new hazards and ineffective controls and employ continuous improvement to correct any deficiencies, in order to ensure compliance to the regulations.

7.20 RECOMMENDATION 20

The following recommendation has two proposals.

7.20.1 Proposal 1 for Recommendation 20

In order to be fully effective in operation, the IPSB requires two flight attendants onboard the aircraft.

Rationale

- An Installed Physical Secondary Barrier (IPSB) is part of a system that relies on people, procedures and the equipment. In order for it to be fully effective a minimum of two flight Attendants are needed.
- Training and drilling is necessary for crewmembers to gain the appropriate intellectual, physical, and emotional responses needed to protect oneself, the flight deck, fellow crewmembers, passengers and the aircraft from acts of terrorism such as hijack or sabotage, as well as from any violent occupants acting out on board; basic tactics, techniques and procedures require the time necessary to become appropriate and effective, followed by live situational exercises designed to test crewmembers' learned knowledge, skills and abilities.
- It should be noted, that the IPSB also serves to protect the flight deck from attempted unauthorized entry to the cockpit for any reason, not just an attempted hijacking. Disturbed passengers or mentally impaired passengers also provide a threat to the flight deck when the door is opened inflight.
- Currently, a regional aircraft with 20 to 50 passenger seats is only required to have one flight attendant. If a pilot needs to leave the flight deck for the lavatory, the cabin is left without any flight attendant. This is due to the current U.S. requirement that two authorized persons must always be in the flight deck. This usually means that the flight attendant must replace that pilot on the flight deck. During door transition, the flight deck is now more vulnerable because there is no flight attendant aft of the flight deck door to complete the requirement of the SBS (Human Barrier). It leaves the secondary barrier system unmanned and the flight deck door unprotected by a crewmember. This clearly cannot be done with only one flight attendant.

- Furthermore, a flight attendant should always be present in the cabin in case a safety issue arises that would require immediate action. These potential situations include fire or smoke in the cabin, a Personal Electronic Device (PED) battery fire or thermal runaway, a hazardous material spill, a bomb threat or suspicious item, a medical emergency requiring immediate attention including the life-saving use of an automated external defibrillator (AED)
- In short, the only way to be sure that there is a flight attendant available to monitor the IPSB while a pilot is in the lavatory is to require that a second flight attendant be on the plane. This would ensure that the benefits of the IPSB are fully realized.
- The installation of the IPSB MAY partially remedy the current problem of a single flight attendant-staffed RJ during door transition. If the IPSB is designed with enough robustness, including preventing reach through to an open flight deck door and unauthorized lock opening, It would serve as a deterrent to breach of the flight deck, one of the roles currently dependent on the second flight attendant. This can at least partially mitigate the current vulnerability.
- Additionally, Design, Performance Guidelines, and Procedures for the IPSB should consider recommendations from RTCA/DO-329, Section 2.3:
    - RTCA/DO-329 offers a robust set of recommendations, based on the data collected from formal testing under the direction of RTCA Special Committee 221 from December 2008 to September 2011.
    - RTCA/DO-329's recommendations were also informed by one carrier (United Airlines), who had previously conducted (2005) design and operational testing which resulted in their own version of the IPSB. This IPSB, along with procedures and training, was evaluated and tested over time to validate the effectiveness of its protective goals, and lessons learned were incorporated into their own procedures. This operational experience provided valuable insight for the later work of RTCA SC-221 and its final document, DO-329.
    - RTCA/DO-329 was tasked specifically with providing design and performance guidelines, not performance standards, as well as recommendations for procedures and training. As such, this document does not replicate or contradict the work of the ARAC Secondary Barrier WG Technical sub-working group's document.

7.20.2 Proposal 2 for Recommendation 20

Effectiveness of the IPSB should be based on procedure development and implementation

Rationale

- Carriers currently have approved procedures that comply with 14 CFR 121.547 – Admission to flight deck, 121.584 – Requirement to view the area outside the flight deck door and 121.587 – Closing and locking of flight crew compartment door. The IPSB should serve to supplement and improve those current approved procedures.
- Per 14 CFR Part 5 Safety Management Systems the Air Carrier's system assessment, hazard identification and safety risk assessment will dictate needed controls for the introduction of the IPSB. Reference 5.51, 5.53 and 5.55.

- Post IPSB implementation the Air Carrier's safety performance monitoring/measurement and safety performance assessments will identify deficiencies that are to be corrected through continuous improvement. Reference 14 CFR 5.71, 5.73 and 5.75.
- The FAA has approved procedures for aircraft types at all flight attendant staffing levels, which demonstrates that compliance is not contingent on flight attendant staffing levels.

7.21 RECOMMENDATION 21

The following recommendation has two proposals.

7.21.1 Proposal 1 for Recommendation 21

Installed Physical Secondary Barrier (IPSB) must be installed on each new aircraft that is manufactured for delivery to a passenger air carrier in the United States operating under the provisions of Part 121 of Title 14, Code of Federal Regulations no later than 36 months after the final rule is published in the Federal Register and relevant advisory circulars from the FAA. During the 3-year period, airlines should continue to comply with Part 121 requirements to ensure the security of the flight deck door during pilot movements.

Rationale

- As with all regulations that require new features for commercial aircraft, the impacted design holders and airlines are not able to initiate the certification and compliance process until the final regulation is published with clearly defined performance-based requirements. Regulated parties cannot be expected to guess what part of any draft rule will be incorporated into a final rule. Further, in the case of an installation of an IPSB, we anticipate that the FAA will need to issue advisory circulars to guide all parties in meeting the intent of the regulation. Again, regulated parties cannot be required to initiate regulatory compliance until those circulars clearly define their responsibilities under the regulation
- We anticipate that the regulation will not dictate the exact IPSB that should be installed on 121 aircraft. Instead, it will likely set forth performance standards that design holders and airlines need to meet when designing and installing the IPSB. Once the regulation and circulars are in place, the design holders and airlines could proceed with the following steps, all of which will take time:
    - Development: the IPSB will need to be designed and developed
    - Certification: the FAA will need to certify the IPSB. This certification may vary in type and length depending on what aircraft on which the IPSB is to be installed
    - Testing: the manufacturer and possibly the airline will need to test the IPSB both in mock-up and flight tests
    - Manufacturer: once the IPSB passes all of its tests, the manufacturer will need manufacturer enough IPSBs to install on each of the impacted aircraft
    - Installation: the newly manufactured IPSB will need to be installed on each aircraft.
    - Training: each airline will need to train their flight crews and their maintenance staff on how to manage the IPSB

    - Supply chain: each impacted airline will need to establish a supply chain with spare parts for IPSB
- Clearly, the time needed to complete all of these steps could be reduced if a single or similar solution is identified to meet the performance standards in a future regulation. However, the working group does not anticipate that there will be one IPSB that fits all aircraft. For example, smaller regional jets are likely to require a IPSB that is significantly different that the IPSB that will be installed on a A380 or B787. Some aircraft may also require changes to their existing structures to support these IPSBs, which in turn may require a more comprehensive certification process.
- The working group carefully reviewed the studies that have been completed in the past by various subject matter expert groups, including the RTCA document "Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures (September 28, 2011)(hereinafter "RTCA study") and "Secondary Cockpit Barriers OEM Working Group – Position on Proposed Secondary Barriers Installation for CFR 14 Part 121 Aircrafts (June 13, 2019) (hereinafter "OEM study"). The OEM study predicted that "a minimum of 3 years will be required to achieve the related design, testing, certification and operational activities and implement the barrier on newly manufactured aircraft." The Working Group has seen no evidence that suggest that this OEM prediction is incorrect.
- The US Department of Transportation recognizes the time it takes for airlines and airline manufacturers to make required changes to the interior of their aircraft and get the appropriate regulatory approvals for those changes. For example, on January 2, 2020, DOT issued a Notice of Proposed Rulemaking (NPRM) requiring carriers flying single aisle aircraft to make changes to their lavatory on new aircraft to better accommodate the needs of disabled passengers. These changes included such additions as grab bars, lavatory faucets with tactile information on temperature, attendant call buttons, and a modification to the lavatory door – all changes that are similar in complexity as the installation of a IPSB. The NPRM proposes to mandate these changes be completed three years after the date of the publication of the final rule.
- The Working Group acknowledges that it does not have the security clearance to allow it access to up-to-date threat assessments that may suggest that a more aggressive timeline be put in place for the installation of an IPSB. We defer to the FAA to make this SMS based risk assessment. However, any FAA mandated shortened timeline based on their threat assessment must include, at a minimum, expedited certification processes on the part of the FAA.

7.21.2 Proposal 2 for Recommendation 21

An implementation timeline of the secondary barrier should be issued for no later than 18 months after regulation issuance.

Rationale

- Major aircraft manufacturers Boeing and Airbus have past experience with design of secondary barriers and have worked with third parties to install them onboard currently flying aircraft as part of a supplemental type certification process. Although exact specifications or performance requirements will not be known

prior to the issuance of the final rule by the FAA, aircraft manufacturers should have ample information to begin basic design and engineering activities based on discussions had as part of the Aviation Rulemaking Advisory Committee's (ARAC) Secondary barrier Working Group. This pre-rule activity will allow manufacturers the additional time to implement specific design criteria for newly manufactured aircraft.

- Details include:
    - As pointed out in the "National Strategy for Aviation Security" (NSAS) document published in December 2018, the aviation eco-system remains a key target for our adversaries internally from the insider threat and abroad from terrorist to hostile nation states.
    - PL115-254 signed into law on October 2018 mandated the FAA to implement this law October 5, 2019.
    - FAA has not acted in a timely fashion to implementing the law, and has since only asked the Aviation Rulemaking Advisory Committee to help implement the law.
    - ARAC's creation date was only put into existence 1 month prior to congress's implementation date deadline (October 5, 2019). The delay in getting the ARAC group's guidance for implementing the law is just another delay as well.
    - Due to the ARAC's compressed timeframe, currently Installed Physical Secondary Barrier (IPSB) designs were not studied.
    - Supplemental type certificates (STC) are presently used for IPSBs onboard the A380, A330, B787, B757 models. These barriers have been installed on aircraft prior to revenue service.
    - It is unknown how long the FAA will take to issue a final rule once the ARAC Secondary Barrier Working Group final report is submitted
    - In a good faith effort, the ARAC should minimize any further delay in creating a standard design for the secondary barrier system.

8 GLOSSARY OF TERMS

Dissent: A differing in opinions about the specific course of action. There may be times when one, some, or all members do not agree with the recommendation or cannot reach agreement on a recommendation.

Human Barriers: The combination use of cabin and/or flight deck crews.

Improvised Non-Installed Secondary Barriers (INSB): A secondary barrier system that accounts for the use of crew and galley carts as an example to protect the flight deck area during a door transition.

Installed Physical Secondary Barrier (IPSB): A secondary barrier that is installed as a physical feature of the aircraft.

Instructions for Continued Airworthiness (ICA): The methods, techniques and practices for performing maintenance, preventative maintenance and alterations provided by the design approval holder or its component manufacturers.

Large Majority: All members of a sub-working group or working group with the exception of one to three members.

Maintenance Planning Data (MPD): Document provided by design approval holder which contains maintenance planning information necessary for each operator to develop a scheduled maintenance program.

Master Minimum Equipment List (MMEL): A document which lists the equipment that may temporarily be inoperative, subject to certain conditions, while maintaining airworthiness of the aircraft.

Recommendation with Full Consensus: A recommendation in which all working group members agree fully in context and principle and fully support the specific course of action.

Recommendation with General Consensus: A recommendation in which although there may be disagreement, the group has heard, recognized, acknowledged, and reconciled the concerns or objections to the general acceptance of the group. Although not every member fully agrees in context and principle, all members support the overall position and agree not to object to the proposed recommendation report.

Recommendation with a Majority of General Consensus with Dissent: A recommendation with a majority of general consensus, however, one or more members dissent in their opinions about the specific course of action. Such member(s) do not agree with the recommendation or cannot reach agreement on a recommendation.

Recommendation without Consensus: A recommendation without full or general consensus among the working group members.

Sensitive Security Information (SSI): Information that, if publicly released, would be detrimental to transportation security, as defined by Federal regulation 49 CFR part 1520.

Secondary Barrier: A barrier as a means to delay unauthorized access to the area behind the flight deck door during flight deck door transitions.

Secondary Barrier in Closed/Deployed Position: The secondary barrier is in the closed/deployed position when in use, during the time needed for cockpit door transitions.

Secondary Barrier in Open/Stowed Position: The secondary barrier is in the open/stowed position when not in use.

Secondary Barrier System (SBS): A combination of people, procedures and/or equipment onboard the aircraft that provide for the space and time needed behind the flight deck door to secure the flight deck environment during door transition.

Small Minority: One or two members of a sub-working group or working group.

9 REFERENCES

FAA. (June 20, 2019). *Section 336 Secondary Barrier Aviation Rulemaking Advisory Committee Task Notice*

FAA. (April 14, 2015). *Aircraft Secondary Barriers and Alternate Flight Deck Security Procedures* (Advisory Circular 120-110).

RTCA SC-221. (September 28, 2011). *Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures* (DO-329).

Secondary Cockpit Barriers OEM Working Group. (June 13, 2019). *Position on Proposed Secondary Barriers Installations for CFR 14 PART 121 Aircrafts.*

Office of Inspector General. (June 26, 2017). *FAA Has Taken Steps to Identify Flight Deck Vulnerabilities but Needs to Enhance Its Mitigation Efforts* (AV2017063).

Stewart, Mark G. and Mueller, John. (November 2019). *Security Risk and Cost-Benefit Assessment of Secondary Flight Deck Barriers* (Report No. 285.11.2019).

FAA. (October 24, 2008). *Flightdeck Intrusion* Resistance (AC 25.795-1A).

10 APPENDIX A – RECOMMENDATIONS OF THE WORKING GROUP WITH RATIONALE

Appendix A contains all recommendations from the Working Group with the rationale for each recommendation.

Recommendation 1 with Rationale

Installed Physical Secondary Barrier (IPSB) should be certified to static load rather than dynamic load requirements.

Proposed Requirement:

- 600 lb push load; 250 lb pull load (same as 14 CFR 25.795(a)(2) for flight deck door)
- Point load(s) applied at the following location(s):
    - Barrier center plus barrier latch area (similar to the existing FAA AC 25.795-1A), or
    - critical assessment of where a barrier design weakness could best be exploited for quick opening

Rationale

- Given that the IPSB is a delaying rather than a preventative measure, it is our position that the value for a high-precision, high cost compliance testing/methodology is marginal. It is recommended that the proficient, but cost-efficient compliance methodology of static testing/analysis be utilized for the IPSB.
- There is no direct translation of dynamic loads into static loads.
- Dynamic loads per NILECJ/AC25.795-1A are intended to prevent access rather than to delay access.
- Static load testing/analysis would be more reasonably applied to soft IPSB designs than swinging ram dynamic test. 300 lb abuse loads are a standard static design load.
- In the case of revised retention mechanisms on seats under AC25.562-1B Appendix B, a 24g static load is accepted (24G/16G = 1.5 dynamic factor). A dynamic factor of 2.0 is suggested for the IPSB application (300 lbs x 2.0 = 600 lbs).
- Highest dynamic pulse load is higher than 600 lbs, but is for only 0.045 – 0.055 seconds. This load multiplied by this time is the "impulse". The static load (600 lbs x 3 seconds) and this impulse is 10-15 times higher than the dynamic test impulse.

Recommendation 2 with Rationale

IPSB should be designed such that it is not possible for a 50% male to reach through and grab an open flight deck door with consideration to prevent being able to climb and reach over the IPSB to grab the flight deck door.

Note: In the event that the manufacturer designs an IPSB in which a 50% male can reach through and grab an open flight deck door, it will be necessary for the operator to have approved procedures which will further inhibit a perpetrator from grabbing this door, holding it open, and fully penetrating the IPSB before the FA/Pilots could shut the flight deck door.

Rationale

- The IPSB is one additional layer of security, not the sole layer of security.
- The flight attendant procedure should instruct the flight attendant to ensure no one is approaching the IPSB when the flight deck door is being opened. Likewise, if someone does approach the IPSB when the flight deck door is open, the flight attendant/pilot should be instructed to shut the flight deck door immediately.
- In the event a nefarious person(s) does grab the open flight deck door, the IPSB still inhibits them from entering, and it is reasonable to expect that the flight attendant will take all measures to aggressively close the flight deck door before the assailant(s) could penetrate the IPSB. Additionally, the flight attendant in the vestibule would have much better leverage to close the door than an assailant(s) reaching through the IPSB while also trying to open/penetrate the IPSB.

Dissent to Recommendation 2 is contained in Section 7.2.1 of this report.

Recommendation 3 with Rationale

IPSB shall be transparent such that situational awareness can be maintained between the passenger cabin and the vestibule area. The transparency could be accomplished via a transparent material or open space in the IPSB. If a transparent material, consideration should be given to allow materials to not adversely impact the ballistic effects from FAMS protection. Consideration should also be given to maximize the transparency to non-transparent material ratio to maximize the visibility and to enhance situational awareness.

Rationale

- Provide situational awareness for FAMS, as needed.
- Provides situational awareness to the flight attendant in the vestibule area with respect to anyone approaching the IPSB while the flight deck door is being opened.

Recommendation 4 with Rationale

Flight deck door jamming requirements of 14 CFR 25.772 are not applicable to IPSB.

Rationale

- This condition resulting in a hazardous/catastrophic event is extremely unlikely given that:
    - IPSB is required to be open/stowed during Taxi, Takeoff and Landing (TT&L)
    - IPSB would be open/stowed during TT&L and therefore not at risk of being jammed during a hard landing.
    - Considerable time to unjam if occurs during flight prior to landing
    - Infrequency of emergency landing/evacuations
    - Flight deck secondary exits are available for evacuation

Recommendation 5 with Rationale

Pressurized compartment loads are only applicable to IPSB in open/stowed position.

Rationale

- IPSB will be in closed/deployed position for very limited portions of a given flight.
- As stated in FAA memo 01-115-11, dated Dec. 3, 2002, "the FAA considers the probability of a decompression event to occur during flight to be much less than 1E-4". This number has been further refined during secure flight deck doors safety assessments and accepted by the FAA Seattle ACO to be on the order of 1E-8 per flight.
- In evaluating the effects of the IPSB, one also needs to consider design usage. AC 25.1309-1A in Section 10, subparagraph b, where the guidance states, "…for a function which is used only during a specific flight operation the acceptable probability should be based on, and expressed in terms of, the flight operation's actual duration."
- Given Recommendation #9 that IPSB is to be closed/deployed for the minimum amount of time needed for the flight deck door transitions, and within Sec. 3.1.8 of

"Secondary Cockpit Barriers OEM Working Group Position on Proposed Secondary Barriers Installation for CFR 14 PART 121 Aircrafts", it would be expected that the duration of a closed/deployed IPSB would be significantly less than 10% of the flight. This would result in a likelihood of a decompression event in conjunction with a closed IPSB would be less than 1E-9.

Recommendation 6 with Rationale

Design of the IPSB will take into consideration Human Factors for space required for crew activities (e.g. crew change outs, restroom breaks, meal service, etc.).

Rationale

- Reference Section 3.1.3 SPACE REQUIRED FOR CREW TRANSITIONS of "Secondary Cockpit Barriers OEM Working Group Position on Proposed Secondary Barriers Installation for CFR 14 PART 121 Aircrafts"

Recommendation 7 with Rationale

Operating instructions will not be placarded to the IPSB. If required, placarding should be kept to the minimum (e.g. crew use only, stow while not in use, etc.).

Rationale

- Reference Section 3.1.10 NEW PLACARDS REQUIREMENT of "Secondary Cockpit Barriers OEM Working Group Position on Proposed Secondary Barriers Installation for CFR 14 PART 121 Aircrafts"

Recommendation 8 with Rationale

Overriding (without tools) of the IPSB should not be obvious, but should be compatible to allow emergency access (e.g. emergency equipment access, air marshal intervention, etc.) and not in contrary to verification method of compliance (e.g. 5 second delay).

Rationale

- Reference Section 3.1.11 OPERATION OF THE SB of "Secondary Cockpit Barriers OEM Working Group Position on Proposed Secondary Barriers Installation for CFR 14 PART 121 Aircrafts"

Recommendation 9 with Rationale

Part 121 requirement/advisory material limiting the closing/deploying of IPSB to promptly prior to and after the transition period of flight deck door opening. IPSB to be open/stowed during Taxi, Takeoff and Landing (TT&L) and the majority of flight thus allowing compliance methods to assume IPSB is generally in open/stowed position.

Rationale

- By limiting the closure of the IPSB to the transition periods immediately preceding and following the opening/closing of the primary flight deck door (IPSB open/stowed during TT&L and majority of flight), this supports the less onerous compliance recommendations supporting depressurization, door jamming, emergency evacuation, accessibility to emergency equipment, etc.

Recommendation 10 with Rationale

Regulatory guidance will be provided to clarify any conflicts with existing regulations while IPSB is closed/deployed. This includes, but is not limited to guidance on rapid decompression, emergency evacuation, width of aisle, accessibility to the emergency equipment (14 CFR 25.365, 25.803, 25.813, 25.815, 25.1411 and 25.1447)

Rationale

- Reference Section 4.3 Summary of "Secondary Cockpit Barriers OEM Working Group Position on Proposed Secondary Barriers Installation for CFR 14 PART 121 Aircrafts"

Recommendation 11 with Rationale

Training for operation of Secondary Barrier System (SBS) to be scaled to meet operational requirements of various designs. Non-prescriptive examples of procedures found in Appendix B.

Rationale

- Any change to the aircraft configuration requires training (scenario-based, differences training) addressed in specific programs (e.g. AQP, recurrent training, etc.)

Recommendation 12 with Rationale

Crew training applicable to the SBS will include human factors and defensive tactics commensurate to the type of SBS being employed on each type of aircraft.

Rationale

- Any change to the aircraft configuration requires training (scenario-based, differences training) addressed in specific programs (e.g. AQP, recurrent training, etc.)

Recommendation 13 with Rationale

Part 129 aircraft excluded from new regulation.

Rationale

- Part 129 not included in Section 336 of P.L. 115-254

- The US Government has extraordinary measures in place to ensure that flights into the United States from 275 "Last Points of Departure" are screened at the highest level of security possible, thereby significantly reducing the risk of an attempted cockpit breach.
- Requiring carriers to install barriers only on planes schedule to fly to the US would raise operational issues that would impact the efficiency of the global commercial aviation system.
- Neither ICAO nor any regulator in the world has identified secondary barriers as a security priority makes it difficult to justify extending this to foreign carriers at this time. This potential extension could be considered in the future if other regulators decide to undertake their own regulatory action in this area.

Recommendation 14 with Rationale

All cargo carriers excluded from regulation due to not being passenger aircraft. While all WG members agreed cargo aircraft are out of scope, some WG members encourage all-cargo airlines to study the work product and conclusions from this group as possible additional layer of security.

Rationale

- Section 336 of P.L. 115-254 is specific to "passenger air carriers".

Recommendation 15 with Rationale

Limit(s) to rule applicability should be established taking into consideration the following:

- Flight duration / stage length
- Location of lavatory on aircraft as related to operational complexities
- Potential loss of passenger seats due to IPSB design
- Necessary flight attendant staffing for IPSB operation
- Operational complexities
- Minimum dimension requirements
- Etc.

Rationale

- Section 336 of P.L. 115-254 did not provide for any exceptions to the applicability of the rule
- Due to limited time of the Working Group, rationalization for exempting specific aircraft types or size is not possible

Dissents to Recommendation 15 are contained in Section 7.15.1 of this report.

Recommendation 16 with Rationale

Deferral of IPSB must be evaluated by Aircraft Evaluation Group (AEG) similar to any Minimum Equipment List (MEL) items. Deferral should be Category C (10 days).

Rationale

- Similar approved MEL's of the IPSB are Category C (10 days) MEL.
    - Boeing 737 – MEL 25-29
    - Boing 757 – MEL 25-24-01
    - Boeing 787 – MEL 25-10-01

Recommendation 17 with Rationale

In the case of the IPSB deferral, secondary or tertiary procedures in place will comply with performance standards outlined in current 121 regulations (e.g. 121.584, etc.).

Rationale

- Requirement of similar approved MEL's of the IPSB are Category C (10 days) MEL.
    - Boeing 737 – MEL 25-29
    - Boing 757 – MEL 25-24-01
    - Boeing 787 – MEL 25-10-01

Recommendation 18 with Rationale

Simplified 5 second delay verification method for the IPSB design compliance. The aspect of this recommendation specifically addresses the reasoning why 5 seconds is adequate and the 5 seconds does not need to be increased to a longer duration.

Rationale

- It has been stated by members of the RTCA DO-329 document committee, that there is an operational goal to complete the flight deck transition within 3 seconds – or to start the transition and if there is an assailant attempting to approach, then for the flight attendant and/or pilot to get the flight deck door closed within 3 seconds – even if the transition is not completed. Given the training to crew members to have positive control of the flight deck door during this transition and to maintain situational awareness, this 3 second goal should be consistently attainable.
- The committee that created the RTCA DO-329 document conclusively agreed that a minimum of a 5 second threat mitigation (time starts when the threat contacts the door) is sufficient as a proposed requirement to prevent an assailant from defeating the IPSB. This would provide a margin of at least 2 seconds between the flight deck transition goal and the actual requirement. There is an additional time factor of the threat approaching the IPSB. Accounting for this would result in further margin.
- The Secondary Barrier working group agreed there needs to be a requirement to ensure the IPSB can be overridden by a federal marshal or flight attendant from outside of the vestibule in a reasonable amount of time. Any increase in the minimum requirement of 5 seconds could tend to challenge the design efficacy required to meet this separate FAMS/FA requirement.
- In summary, the IPSB is intended to be used for delay rather than preventing access into the vestibule area. As a result, 5 seconds will provide the flight crew or

cabin crew enough time to react to any threats and deploy SOPs to close the flight deck door. Furthermore, a 5 second requirement does not unnecessarily infringe on the FAMs ability to breach the IPSB in a timely manner.

Recommendation 19 with Rationale

The following recommendation has two proposals.

Proposal 1 for Recommendation 19

The ARAC Working Group recommends Air Carriers and the FAA conduct a fresh Safety Risk Assessment of current Secondary Barrier Systems (SBS) in use (IPSB, INSB or Human Barrier). The FAA should publish an FAA Notice to inspectors to accomplish this review. This Safety Risk Assessment should include but is not limited to demonstrating how the selected SBS (IPSB, INSB or Human Barrier) complies with the performance goals from AC 120-110 and RTCA DO-329.

Rationale

- In the years since the 9/11/01 terror attacks, the procedures, training and equipment used by air carriers to comply with various FARs (121.584(1)(a), etc.) was not evaluated until the FAA commissioned RTCA Special Committee 221 in 2008. On September 28, 2011, RTCA published DO-329, Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures.
- RTCA/DO-329 represents the most authoritative body of data, evidence and analysis which was used to provide recommendations on secondary barrier system (SBS) performance standards (including the IPSB). RTCA/DO-329 also provides data-driven evidence and analysis of the vulnerability of current FAA-approved SBS procedures, training and equipment.
- The FAA accepted and approved RTCA/DO-329 in September 2011, citing this study and document in its own advisory circular, AC 120-110 (Aircraft Secondary Barriers and Alternate Flight Deck Security Procedures), which was published on April 14, 2015.
- FAA AC 120-110 calls attention to RTCA Document (RTCA/DO-329) as guidance to achieve effective protection of the flight deck as required by Title 14 of the Code of Federal Regulations (14 CFR) part 121 § 121.584(1)(a).
- No other regulatory or industry group has conducted a similar vulnerability assessment of current SBS aboard commercial passenger aircraft. Because of this undisputed fact, it would be advisable for the FAA, TSA and Air Carriers to avail themselves of this valuable body of data, assessment of this data, and resulting conclusions and recommendations.
- The FAA Office of Inspector General submitted an Audit Report titled, "FAA HAS TAKEN STEPS TO IDENTIFY FLIGHT DECK VULNERABILITIES BUT NEEDS TO ENHANCE ITS MITIGATION EFFORTS", which was issued on June 26, 2017. This report criticized the FAA for a number of things, including:
    - The FAA is not effectively mitigating all existing cockpit security vulnerabilities.

    - Complacency is cited by both flight attendant and pilot association representatives, yet the FAA has not addressed or even studied this vulnerability.
    - The 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.
    - The FAA may not be taking full advantage of further enhancements that could mitigate safety and security risks and their associated vulnerabilities.
    - The FAA failed to highlight that there was important information redacted from the RTCA/DO-329, available to carriers in an SSI addendum, which the FAA controlled.
- The FAA IG report made 6 recommendations to the FAA. Of these 6, the FAA did not concur with the following 3 IG report recommendations, including:
    - 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.
    - 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.
- It should be noted that key portions of the IG report were redacted from public view as SSI, including justification for why they did not concur with recommendations 2, 3, and 4. The ARAC Secondary Barrier WG was unable to discuss these IG recommendations and FAA justification for not complying with the IG recommendations because the ARAC Secondary Barrier WG was not able to gain approval in a timely manner from those who were responsible for SSI disclosure requirements.
- Air Carriers security measures have not been updated in some time. Flight deck transition protocols require prompt review by the FAA in accordance with the FAA's own Inspector General report.
- The FAA needs to restore public confidence, ensuring a Secondary Barrier System review is a necessary step in the right direction.

Proposal 2 for Recommendation 19

Air Carriers should continually evaluate existing secondary barrier methods through the use of 14 CFR Part 5 Safety Management Systems.

Rationale

- Airlines today install/utilize different methods to ensure an additional security layer to the area immediately behind the reinforced cockpit door in order to comply with 14 CFR 121.584(a)(1).

- The different methods utilized by air carriers have been deemed acceptable to the Regulator, therefore in compliance with 14 CFR 121.584(a)(1).
- The AC 120-110 – published in 2015 as guidance for meeting the requirements of CFR part 121, 121.584(a)(1), directs to the use (as appropriate) the methods described in RTCA document DO-329. As all advisory material, the AC120-110 is a means but not the only means to show compliance, and it is not meant to be the rule.
- Air Carriers routinely work with the FAA offices to develop and review current training and compliance to regulations, 14 CFR 121.584 included.
- Air Carriers are required to comply with 14 CFR Part 5 Safety Management Systems. 14 CFR 5.71, 5.73 and 5.75 require Air Carriers to utilize a continuous cycle of routine audits (including operational processes), capture findings to identify any systemic issues, apply safety risk management to new hazards and ineffective controls and employ continuous improvement to correct any deficiencies, in order to ensure compliance to the regulations.

Recommendation 20 with Rationale

The following recommendation has two proposals.

Proposal 1 for Recommendation 20

In order to be fully effective in operation, the IPSB requires two flight attendants onboard the aircraft.

Rationale

- An Installed Physical Secondary Barrier (IPSB) is part of a system that relies on people, procedures and the equipment. In order for it to be fully effective a minimum of two flight Attendants are needed.
- Training and drilling is necessary for crewmembers to gain the appropriate intellectual, physical, and emotional responses needed to protect oneself, the flight deck, fellow crewmembers, passengers and the aircraft from acts of terrorism such as hijack or sabotage, as well as from any violent occupants acting out on board; basic tactics, techniques and procedures require the time necessary to become appropriate and effective, followed by live situational exercises designed to test crewmembers' learned knowledge, skills and abilities.
- It should be noted, that the IPSB also serves to protect the flight deck from attempted unauthorized entry to the cockpit for any reason, not just an attempted hijacking. Disturbed passengers or mentally impaired passengers also provide a threat to the flight deck when the door is opened inflight.
- Currently, a regional aircraft with 20 to 50 passenger seats is only required to have one flight attendant. If a pilot needs to leave the flight deck for the lavatory, the cabin is left without any flight attendant. This is due to the current U.S. requirement that two authorized persons must always be in the flight deck. This usually means that the flight attendant must replace that pilot on the flight deck. During door transition, the flight deck is now more vulnerable because there is no flight attendant aft of the flight deck door to complete the requirement of the SBS (Human Barrier). It leaves the secondary barrier system unmanned and the flight

deck door unprotected by a crewmember. This clearly cannot be done with only one flight attendant.

- Furthermore, a flight attendant should always be present in the cabin in case a safety issue arises that would require immediate action. These potential situations include fire or smoke in the cabin, a PED battery fire or thermal runaway, a hazardous material spill, a bomb threat or suspicious item, a medical emergency requiring immediate attention including the life-saving use of an automated external defibrillator (AED)
- In short, the only way to be sure that there is a flight attendant available to monitor the IPSB while a pilot is in the lavatory is to require that a second flight attendant be on the plane. This would ensure that the benefits of the IPSB are fully realized.
- The installation of the IPSB MAY partially remedy the current problem of a single flight attendant-staffed RJ during door transition. If the IPSB is designed with enough robustness, including preventing reach through to an open flight deck door and unauthorized lock opening, it would serve as a deterrent to breach of the flight deck, one of the roles currently dependent on the second flight attendant. This can at least partially mitigate the current vulnerability.
- Additionally, Design, Performance Guidelines, and Procedures for the IPSB should consider recommendations from RTCA/DO-329, Section 2.3:
    - RTCA/DO-329 offers a robust set of recommendations, based on the data collected from formal testing under the direction of RTCA Special Committee 221 from December 2008 to September 2011.
    - RTCA/DO-329's recommendations were also informed by one carrier (United Airlines), who had previously conducted (2005) design and operational testing which resulted in their own version of the IPSB. This IPSB, along with procedures and training, was evaluated and tested over time to validate the effectiveness of its protective goals, and lessons learned were incorporated into their own procedures. This operational experience provided valuable insight for the later work of RTCA SC-221 and its final document, DO-329.
    - RTCA/DO-329 was tasked specifically with providing design and performance guidelines, not performance standards, as well as recommendations for procedures and training. As such, this document does not replicate or contradict the work of the ARAC Secondary Barrier WG Technical sub-working group's document.

Proposal 2 for Recommendation 20

Effectiveness of the IPSB should be based on procedure development and implementation

Rationale

- Carriers currently have approved procedures that comply with 14 CFR 121.547 – Admission to flight deck, 121.584 – Requirement to view the area outside the flight deck door and 121.587 – Closing and locking of flight crew compartment door. The IPSB should serve to supplement and improve those current approved procedures.

- Per 14 CFR Part 5 Safety Management Systems the Air Carrier's system assessment, hazard identification and safety risk assessment will dictate needed controls for the introduction of the IPSB. Reference 5.51, 5.53 and 5.55.
- Post IPSB implementation the Air Carrier's safety performance monitoring/measurement and safety performance assessments will identify deficiencies that are to be corrected through continuous improvement. Reference 14 CFR 5.71, 5.73 and 5.75.
- The FAA has approved procedures for aircraft types at all flight attendant staffing levels, which demonstrates that compliance is not contingent on flight attendant staffing levels.

Recommendation 21 with Rationale

The following recommendation has two proposals.

Proposal 1 for Recommendation 21

Installed Physical Secondary Barrier (IPSB) must be installed on each new aircraft that is manufactured for delivery to a passenger air carrier in the United States operating under the provisions of Part 121 of Title 14, Code of Federal Regulations no later than 36 months after the final rule is published in the Federal Register and relevant advisory circulars from the FAA. During the 3-year period, airlines should continue to comply with Part 121 requirements to ensure the security of the flight deck door during pilot movements.

Rationale

- As with all regulations that require new features for commercial aircraft, the impacted design holders and airlines are not able to initiate the certification and compliance process until the final regulation is published with clearly defined performance-based requirements. Regulated parties cannot be expected to guess what part of any draft rule will be incorporated into a final rule. Further, in the case of an installation of an IPSB, we anticipate that the FAA will need to issue advisory circulars to guide all parties in meeting the intent of the regulation. Again, regulated parties cannot be required to initiate regulatory compliance until those circulars clearly define their responsibilities under the regulation
- We anticipate that the regulation will not dictate the exact IPSB that should be installed on 121 aircraft. Instead, it will likely set forth performance standards that design holders and airlines need to meet when designing and installing the IPSB. Once the regulation and circulars are in place, the design holders and airlines could proceed with the following steps, all of which will take time:
    - Development: the IPSB will need to be designed and developed
    - Certification: the FAA will need to certify the IPSB. This certification may vary in type and length depending on what aircraft on which the IPSB is to be installed
    - Testing: the manufacturer and possibly the airline will need to test the IPSB both in mock-up and flight tests
    - Manufacturer: once the IPSB passes all of its tests, the manufacturer will need manufacturer enough IPSBs to install on each of the impacted aircraft

    - Installation: the newly manufactured IPSB will need to be installed on each aircraft.
    - Training: each airline will need to train their flight crews and their maintenance staff on how to manage the IPSB
    - Supply chain: each impacted airline will need to establish a supply chain with spare parts for IPSB
- Clearly, the time needed to complete all of these steps could be reduced if a single or similar solution is identified to meet the performance standards in a future regulation. However, the working group does not anticipate that there will be one IPSB that fits all aircraft. For example, smaller regional jets are likely to require a IPSB that is significantly different that the IPSB that will be installed on a A380 or B787. Some aircraft may also require changes to their existing structures to support these IPSBs, which in turn may require a more comprehensive certification process.
- The working group carefully reviewed the studies that have been completed in the past by various subject matter expert groups, including the RTCA document "Aircraft Secondary Barriers and Alternative Flight Deck Security Procedures (September 28, 2011)(hereinafter "RTCA study") and "Secondary Cockpit Barriers OEM Working Group – Position on Proposed Secondary Barriers Installation for CFR 14 Part 121 Aircrafts (June 13, 2019) (hereinafter "OEM study"). The OEM study predicted that "a minimum of 3 years will be required to achieve the related design, testing, certification and operational activities and implement the barrier on newly manufactured aircraft." The Working Group has seen no evidence that suggest that this OEM prediction is incorrect.
- The US Department of Transportation recognizes the time it takes for airlines and airline manufacturers to make required changes to the interior of their aircraft and get the appropriate regulatory approvals for those changes. For example, on January 2, 2020, DOT issued a Notice of Proposed Rulemaking (NPRM) requiring carriers flying single aisle aircraft to make changes to their lavatory on new aircraft to better accommodate the needs of disabled passengers. These changes included such additions as grab bars, lavatory faucets with tactile information on temperature, attendant call buttons, and a modification to the lavatory door – all changes that are similar in complexity as the installation of a IPSB. The NPRM proposes to mandate these changes be completed three years after the date of the publication of the final rule.
- The Working Group acknowledges that it does not have the security clearance to allow it access to up-to-date threat assessments that may suggest that a more aggressive timeline be put in place for the installation of an IPSB. We defer to the FAA to make this SMS based risk assessment. However, any FAA mandated shortened timeline based on their threat assessment must include, at a minimum, expedited certification processes on the part of the FAA.

Proposal 2 for Recommendation 21

An implementation timeline of the secondary barrier should be issued for no later than 18 months after regulation issuance.

Rationale

- Major aircraft manufacturers Boeing and Airbus have past experience with design of secondary barriers and have worked with third parties to install them onboard currently flying aircraft as part of a supplemental type certification process. Although exact specifications or performance requirements will not be known prior to the issuance of the final rule by the FAA, aircraft manufacturers should have ample information to begin basic design and engineering activities based on discussions had as part of the Aviation Rulemaking Advisory Committee's (ARAC) Secondary barrier Working Group. This pre-rule activity will allow manufacturers the additional time to implement specific design criteria for newly manufactured aircraft.
- Details include:
    - As pointed out in the "National Strategy for Aviation Security" (NSAS) document published in December 2018, the aviation eco-system remains a key target for our adversaries internally from the insider threat and abroad from terrorist to hostile nation states.
    - PL115-254 signed into law on October 2018 mandated the FAA to implement this law October 5, 2019.
    - FAA has not acted in a timely fashion to implementing the law, and has since only asked the Aviation Rulemaking Advisory Committee to help implement the law.
    - ARAC's creation date was only put into existence 1 month prior to congress's implementation date deadline (October 5, 2019). The delay in getting the ARAC group's guidance for implementing the law is just another delay as well.
    - Due to the ARAC's compressed timeframe, currently Installed Physical Secondary Barrier (IPSB) designs were not studied.
    - Supplemental type certificates (STC) are presently used for IPSBs onboard the A380, A330, B787, B757 models. These barriers have been installed on aircraft prior to revenue service.
    - It is unknown how long the FAA will take to issue a final rule once the ARAC Secondary Barrier Working Group final report is submitted
    - In a good faith effort, the ARAC should minimize any further delay in creating a standard design for the secondary barrier system.

11 APPENDIX B - NON-PRESCRIPTIVE EXAMPLES OF SECONDARY BARRIER SYSTEM (SBS) PROCEDURES

Recommendation 11 states that training for operation of Secondary Barrier System (SBS) to be scaled to meet operational requirements of various designs. This appendix contains examples only of procedures intended to aid air carriers in developing their own training procedures, which should be scaled to meet operational requirements of various designs. This appendix is non-prescriptive in nature and is not intended to contradict any parts of the main body of the final report.

There are four principles that must be adhered to diligently in order for flightdeck Secondary Barrier System (SBS) procedures to be effective: POSITIVE CONTROL, THREE SECONDS, EMERGENCY COMMAND, AND TWO-PERSON RULE.

POSITIVE CONTROL

Crewmembers should have positive (physical hands on) control of the flightdeck door at all times and maintain a clear field of view outside the door to ascertain an attempt to breach the flightdeck. The crewmember exiting or entering the flightdeck must ensure the door is closed and locked by physically pulling or pushing on the door. After a door transition, a pilot must check the flightdeck lock failure annunciations (if aircraft is equipped) to ensure the door is locked.

THREE SECONDS

Research has shown it is possible to breach the flightdeck in less than 3 seconds. Because the vulnerability to the flightdeck increases substantially the longer the door is open, the goal for all door transitions is 3 seconds or less. Multiple opening cycles are preferred over leaving the door open for an extended period. In order to achieve this goal, crewmembers must keep positive (physical hands on) control of the door, by using a brisk pace, and segment tasks. For example, during meal transfers, accept one meal at a time, closing the door after receiving each meal.

EMERGENCY COMMAND

An emergency command is used by crewmembers any time there is a perceived threat to the flightdeck while the door is open. During door transitions, it is imperative to keep a high level of vigilance for any indication of an attempted breach. The command approved by the carrier alerts crewmembers to **immediately close and secure the door**. After the door is secure, the pilots will establish communication with the flight attendants to ascertain the situation. If there is an attempted breach the pilots will lock down the flightdeck, communicate with Dispatch as soon as possible.

TWO-PERSON RULE

Note: *Only pilots current and qualified in aircraft type may occupy a primary flying seat.* While in flight or with an engine running off the gate, there must be at least two people with flightdeck access authority on the flightdeck and the flightdeck door must be closed. If a pilot must leave the flightdeck, a second person with flightdeck access authority must be present on the flightdeck. An approved flightdeck jumpseater satisfies this requirement; however, a jumpseating flight attendant is not allowed to fulfill the two-person rule on the flightdeck.

Exceptions to the two-person rule are:

- A flight with only pilot crew on board (e.g., ferry flight with no passengers).

FLIGHTDECK ACCESS PROCEDURES

PREPARATION

- Crewmembers in the cabin will ensure the secured area (including lavatories and areas forward of passenger seats) outside of the flightdeck door is clear prior to door opening. (FAR 121.584)
- If lavatories are on the flight deck side of the SBS, ensure lavatories are not occupied. Lavatories can be locked open or closed depending on lavatory door design and/or to increase lighting of the SBS protected space. (FAR 121.584)
- Flight attendants must remain situationally aware of the secured area and prohibit passengers from approaching. Any attempt to breach the secured area must be communicated to the flightdeck immediately.

Installed Physical Secondary Barrier (IPSB)

- If installed and operational, the IPSB must be used in flight anytime the flightdeck door is in "Transition."
- The IPSB must be stowed for all taxi, take-off, and landing operations.
- The IPSB *must be deployed or retracted from the flightdeck side of the IPSB* by a working crewmember (flight attendant or pilot) only.
- At the Captain's discretion the IPSB may be deployed during door transitions while on the ground during extended ground delays.
- The IPSB should not be left in the deployed position for extended periods of time. If the pilot expects to be in the cabin for an extended period of time, the Captain may elect to have the IPSB stowed until the other pilot is ready to return to the flight deck. While deployed, the IPSB should be attended by a crewmember.
- A second flight attendant must remain situationally aware of the secure area while the barrier is deployed.
- Assuming the flight deck has adequate space, the preferred flight deck crew transition procedure is "one person in, then one person out".
- In order to minimize the amount of time the door is open, close the door immediately after "one person in" is complete. When ready for "one person out", re-accomplish door transition SOP.
- For aircraft with inadequate space on the flight deck for three persons, the door transition will be "one person out, then one person in". This method requires more security space between the flight deck door and the IPSB, and typically takes more time. Strict adherence to SOP is required to minimize the time the door is open, and to prevent errors in the flight deck door transition.

Improvised Not Installed Secondary Barrier (INSB)

- Flight attendants must position an INSB (galley cart or other equipment, if available) across the aisle. The INSB must remain attended anytime the flightdeck door is being opened or closed. The flight attendant at the INSB should maintain a clear view of the cabin. A second flight attendant is required to be in the flightdeck access area to pass meals, drinks, etc., or to enter the flightdeck to fulfill the two-person rule.

- The spacing requirements for the secure space between the door and INSB are the same as for the IPSB.
- The INSB cannot be used on aircraft staffed with a single flight attendant, since an INSB requires a second flight attendant.
- If available, an INSB will be used in lieu of a human barrier.

Note: *Only when safety of flight dictates (e.g., turbulence), may the Captain modify this procedure to prevent flight attendant injury.*

No INSB or IPSB in place (Using Human Barrier)

- A flight attendant must stand at the cabin side of the flightdeck access area facing the cabin to prohibit passenger entry. A second flight attendant is required to be on the flightdeck access area to pass meals, drinks, etc., or to enter the flightdeck to fulfill the two-person rule.
- The Human Barrier cannot be used on aircraft staffed with a single flight attendant, since the Human Barrier requires a second flight attendant.

Alternate Procedures if the Forward Cabin Interphone is Inop

If the forward most cabin interphone handset is inoperative, follow inoperative interphone procedures.

VIDEO MONITORING

If a video monitoring system is installed, it may be used in increase situational awareness for the flightdeck crew, and to survey the area outside of the flightdeck door if the following conditions are met:

- The video monitor on the same side as a seated pilot is functional.
- The video quality is sufficient to determine the identity of the individual requesting entry.
- Using video monitoring equipment does not remove flightdeck crews from the responsibility to have a crewmember stand at the door and maintain positive (physical hands on) control of the door at all times during door transition. Positive control is necessary to ensure the door is not opened for a prolonged period (over three seconds), or to be able to respond to the emergency command by immediately closing and locking the flightdeck door.

FLIGHTDECK DOOR

Note: *If a situation arises while airborne where there is only one person on the flightdeck, do not leave the control seat to open the door.*

Normal Access

Use the interphone to coordinate the preparation steps to allow for access to or from the flightdeck. Once the preparation steps have been completed, the interphone is no longer required and the crewmember on the cabin side of the door will use the normal flightdeck

access procedures All operational concepts described in this section apply (e.g., positive control, three seconds).

Emergency Access

If personnel on the cabin side of the flightdeck door need emergency access to the flightdeck, they will use the Emergency Access procedure described below.

INTERPHONE DURESS SIGNAL

When a crewmember under duress calls the flightdeck via the interphone, follow company procedures for flight attendant duress. If this occurs, the pilots are to take appropriate precautions and investigate to determine if action is required (i.e. Threat Level 4), or if it was a possible false alarm.

GROUND OPERATIONS

- Prior to beginning a flight, a pilot must conduct a security inspection of the flightdeck for any unauthorized items. When staying with the same aircraft (i.e., multiple legs) the inspection on the first flight suffices for the remaining legs.
- When the flightdeck is unattended, the flightdeck door must remain open.