



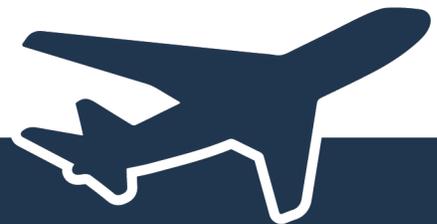
U.S. DEPARTMENT OF TRANSPORTATION
OFFICE OF INSPECTOR GENERAL

**Weaknesses in FAA's Supplemental
Passenger Restraint System Authorization
Process Hinder Improvements to
Open-Door Helicopter Operations**

FAA

Report No. AV2021010

December 8, 2020





Weaknesses in FAA's Supplemental Passenger Restraint System Authorization Process Hinder Improvements to Open-Door Helicopter Operations

Requested by Senators Charles Schumer and Kirsten Gillibrand

Federal Aviation Administration | AV2021010 | December 8, 2020

What We Looked At

On March 11, 2018, a fatal Liberty Helicopters crash in New York, NY took the lives of five passengers who were trapped in their supplemental passenger restraints when the open-door helicopter partially submerged in the East River. In response, Senators Charles Schumer and Kirsten Gillibrand requested that we—in consultation with NTSB—review FAA's oversight of helicopter air tours and how FAA approved the supplemental restraint system used during the tragic crash. Our objectives were to assess FAA's processes for (1) review and approval of supplemental restraints for open-door helicopter operations and (2) oversight of company use of supplemental restraints.

What We Found

FAA did not maintain effective and consistent oversight of open-door helicopter operations to maintain the safety of air tour passengers. FAA lacks an effective process to review, authorize, and ensure the safe use of supplemental restraints for open-door helicopter operations; and FAA inspectors lack sufficient guidance to oversee operator use of supplemental passenger restraints. FAA has made efforts to issue guidance to achieve prompt operator compliance and eliminate safety risks by developing a special authorization for supplemental passenger restraint systems. However, that authorization process is still evolving and important risk information has been overlooked. Also, FAA does not currently provide the guidance inspectors need to ensure operators are using and maintaining the supplemental restraints the Agency has authorized. Overall, we found that FAA has the opportunity to improve its authorization process and oversight regarding supplemental passenger restraint use and increase the safety of helicopter air tour passengers.

Our Recommendations

FAA concurred with four of our five recommendations to improve the effectiveness of its supplemental passenger restraint authorization process, providing appropriate actions and completion dates. FAA partially concurred with recommendation 3 and did not provide an alternative action or completion date. We ask the Agency to reconsider its response to this recommendation and provide us with an alternative action and anticipated completion date.

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Memorandum

Date: December 8, 2020

Subject: ACTION: Final Report—Weaknesses in FAA’s Supplemental Passenger Restraint Systems Approval Process Hinder Improvements to Open-Door Helicopter Operations | Report No. AV2021010

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

To: Federal Aviation Administrator

Each year, thousands of passengers fly on commercial open-door helicopter flights either for work purposes or for leisure travel and air tours. According to the Federal Aviation Administration (FAA), air tours accounted for 10 percent of all helicopter operations in the United States for the last 10 years but make up the fifth largest category for flight hours—behind aerial observation/law enforcement, training, air ambulance, and off-shore flights. The Department of the Interior reported that a total of 47,145 air tours were conducted over the National Park system in 2018—one of the only places where air tour reporting is required.

On March 11, 2018, a fatal Liberty Helicopters crash in New York, NY, took the lives of five passengers who were trapped in their supplemental passenger restraints when the open-door helicopter partially submerged in the East River. These passenger restraints (also referred to as passenger harnesses or safety harnesses) were provided by the tour operator in addition to the installed seatbelts to keep passengers from falling out of the helicopter when flown with the doors open. At the time of the Liberty Helicopters accident, regulations did not prohibit the use of these supplemental restraints during flights for compensation or hire with the doors opened or removed. After this accident, the National Transportation Safety Board (NTSB) issued an urgent safety recommendation on March 19, 2018, to prohibit all open door commercial passenger-carrying aircraft flights that use supplemental passenger harnesses. However, supplemental restraints are allowed if passengers can rapidly release themselves from the harness or the harness from the aircraft with minimal difficulty. Passengers also must be able to remove the harness without cutting or forcefully removing it.

In response to NTSB's urgent safety recommendation, FAA issued an emergency order on March 22, 2018, prohibiting supplemental restraint use during open door flight operations for compensation or hire until users formally requested and were approved to use them. As part of this prohibition, FAA also issued guidance on how operators, pilots, and individuals—such as videographers or other professionals who frequently travel on for-hire open-door helicopters—can obtain a Letter of Authorization to use supplemental restraints on open-door helicopter flights. The Agency issues this authorization after it confirms, through a desk review of a requestor's application, that the restraints do not hinder emergency evacuations. The review also verifies that passengers can quickly release themselves from the restraint without the assistance of others or the use of a cutting tool.

Following the accident, Senators Charles Schumer and Kirsten Gillibrand requested that we—in consultation with NTSB—review FAA's oversight of helicopter air tours and how FAA approved the supplemental restraint system used during the tragic crash. Specifically, they requested that we address how FAA reviewed, tested, and authorized the restraint system and determine FAA's role in ensuring that helicopters in use today meet modern safety standards. While NTSB's focus has been on the cause of the Liberty Helicopters accident, our audit objectives were to assess FAA's processes for (1) review and approval of supplemental restraints for open-door helicopter operations and (2) oversight of company use of supplemental restraints.

We conducted this audit in accordance with generally accepted Government auditing standards. Exhibit A details our scope and methodology, and exhibit B lists the organizations we visited or contacted.

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

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

Results in Brief

FAA lacks an effective process to review, authorize, and ensure the safe use of supplemental restraints for open-door helicopter operations.

Although FAA approves supplemental restraints for certain types of helicopter operations, the Agency did not have a process for authorizing restraints for passengers on helicopter air tours prior to the Liberty Helicopters accident. FAA did implement a process to review and authorize applications to use supplemental restraints after this tragic accident, but several factors hinder the effectiveness of FAA's process. First, FAA has not completed the rulemaking outlined in its emergency order regarding the prohibition of supplemental restraints. Second, FAA authorized 54 of 56 applications to use supplemental restraints with several of the 54 applications containing missing or incomplete risk-related information, such as the type of flight being conducted. This is because FAA did not provide clear guidance on what information could be omitted on the application forms. Instead, it focused on ensuring the harness system was easy to release, rather than validating the certification standard or whether the application was missing harness components. Third, FAA authorized supplemental restraints not typically used in aircraft-specific operations because FAA's order did not establish a minimum certification standard for supplemental restraints. Finally, FAA inspectors in local inspection offices—who are responsible for overseeing the safety of helicopter operators and surveilling supplemental passenger restraint systems—were not leveraged to validate important application information that could indicate elevated operational risk. This was due to FAA's decision to centralize application processing at the Headquarters level. As a result, FAA may lack a full understanding of the risks posed by passenger restraints it has authorized.

FAA inspectors lack sufficient guidance to oversee operator use of supplemental passenger restraints.

While FAA normally issues guidance for inspection of safety equipment installed on commercial aircraft, it did not issue such guidance regarding supplemental passenger restraints, which are not permanently installed. Therefore, FAA's oversight of the use of supplemental restraints on open-door helicopter operations is limited. While the Government Accountability Office requires management to provide effective documentation that establishes and communicates internal control execution to personnel, FAA has not issued comprehensive guidance to Agency inspectors on how to inspect operators authorized to use supplemental restraints and what these inspections should include. As a result, FAA may not know how safe the supplemental restraints it has authorized are.

We are making recommendations to improve FAA’s processes for authorizing and overseeing the use of supplemental passenger restraints on helicopter air tours.

Background

Helicopter air tours can be conducted with the aircraft doors closed or open, depending on the season and type of helicopter used. For some open-door flights, operators for compensation and hire or an individual may purchase and use commercially available supplemental restraints to ensure nobody falls from the helicopter during flight. These flights may be operated by FAA-certificated operators¹ or general aviation operators² with a letter of authorization.



Source: Tuckamore Aviation

Federal flight regulations only require that passengers use the installed FAA-approved seatbelts during takeoff, landing, and surface movement. Prior to FAA’s emergency order, these regulations did not require passengers to use any type of supplemental passenger restraints during open-door helicopter flights nor did the Agency have a requirement to authorize air tour operators’ use of supplemental passenger restraints. This allowed air tour operators to determine whether they required supplemental restraints for their passengers and to

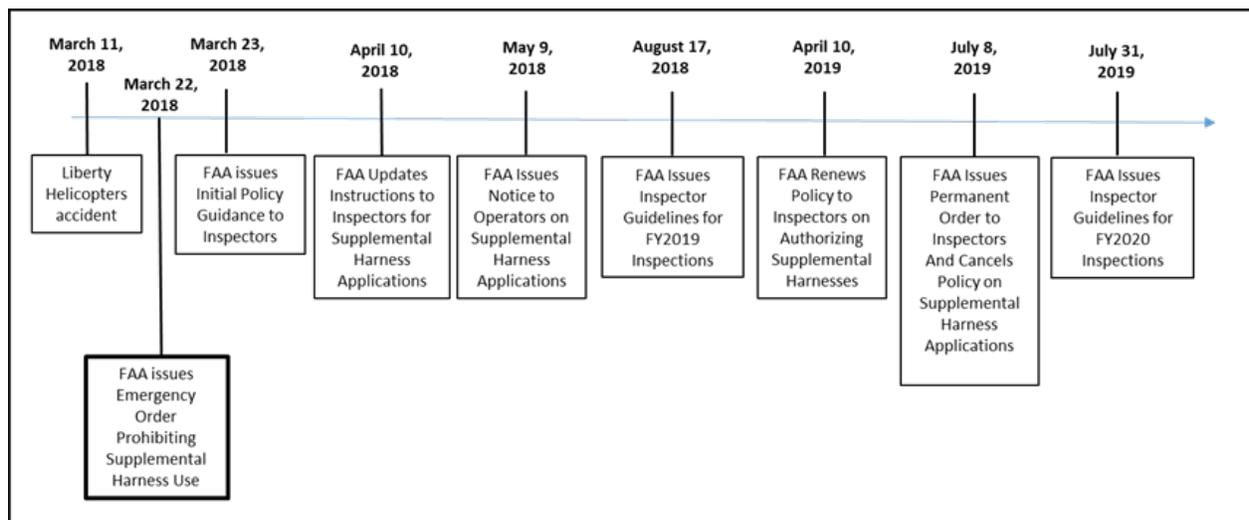
¹ Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft, 14 CFR Part 135.

² General Operating and Flight Rules, 14 CFR Part 91.

evaluate the suitability of various commercially available products to secure them during flight. Moreover, FAA has never tracked the frequency of supplemental restraint use during helicopter air tours.

After the Liberty Helicopters accident and FAA’s initial emergency order in March 2018, FAA issued a series of notices and orders regarding supplemental restraints. These documents prohibited the use of supplemental harnesses. This authorization process required helicopter operators to request and receive permission to use supplemental harnesses from FAA before they were allowed to carry passengers for hire during open-door flights. The Agency then updated its guidance twice before it finalized an order on its new supplemental harness submission process in July 2019. This authorization process differs from the Agency’s approval of supplemental harnesses for crew members involved in flights carrying an external load or using a hoist to lift passengers under the helicopter.³ FAA also issued two inspection-related guidance documents in 2018 and 2019. See figure 1 below for a timeline of the FAA notices and orders related to supplemental harnesses.

Figure 1. Timeline of FAA Notices and Orders



Source: OIG analysis of FAA information

³ FAA Advisory Circular 133-1B cites the requirement for FAA to approve restraints for aircrew (such as hoist operators) who must move inside the cabin during external load operations in accordance with 14 CFR § 133.47(c)(3).

FAA Lacks an Effective Process To Review, Authorize, and Ensure the Safe Use of Supplemental Restraints for Open-Door Helicopter Operations

While FAA has implemented a process to review and authorize submissions for the use of supplemental restraints, weaknesses in that process remain. First, FAA has not completed the rulemaking outlined in its emergency order regarding the prohibition of supplemental restraints. Second, FAA received supplemental passenger restraint applications with missing or incomplete information and then authorized applicants to use those restraints without requiring documentation that could have identified safety risks. Third, FAA did not establish its own minimum standard for supplemental restraints and subsequently authorized some requests for restraints such as those used in the construction industry. Finally, FAA did not leverage local inspection offices to validate key supplemental restraint application information that could identify increased risk to passengers.

FAA Has Not Completed the Anticipated Rulemaking on Supplemental Restraint Use

FAA outlined its supplemental passenger restraint authorization process in orders and notices following the Liberty Helicopters accident. However, FAA has not formalized in regulations its requirement that operators use supplemental restraints that can be quickly released with minimal effort during an emergency situation. According to FAA's Emergency Order, the Agency will initiate a rulemaking that addresses operations using supplemental passenger restraint systems that have not been approved by FAA. The Agency issued guidance in 2018 and 2019⁴ requiring inspectors to validate that helicopter operators have implemented procedures to ensure that all open-door flight operations for compensation or hire are prohibited—unless the passengers are properly secured at all times using FAA-approved restraints. This guidance also directs inspectors to convey the information contained in the 2018 emergency order to operators and pilots. FAA incorporated these notices into a permanent order in

⁴ FAA, Emergency Order of Prohibition Pertaining to "Doors-Off" Flight Operations for Compensation or Hire, Notice N8900.456, March 23, 2018, Notice N8900.457, April 10, 2018, and Notice N8900.506, April 10, 2019.

July 2019⁵ but has not updated Federal Aviation Regulations to require that operators use supplemental restraints during these types of operations or issued a notice of proposed rulemaking to allow the public to comment on any proposed rule change. According to FAA officials, the Agency is currently drafting its initial rulemaking regarding the safe use of supplemental restraints and plans to publish its initial rulemaking in February 2021. Incorporating public comments into a final rulemaking, where appropriate, could further enhance FAA's authorization process.

FAA Authorized Supplemental Restraint Applications With Missing or Incomplete Information

FAA authorized applications for supplemental restraint use that did not contain necessary information. This is because FAA did not provide clear guidance to applicants or inspectors on what information could be omitted on the application forms. Instead, the inspectors who reviewed the applications focused more on ensuring the harness system was easy to release, rather than validating the certification standard or whether the application was missing harness components. For example, FAA authorized applications not knowing specific risk information, such as the type of aircraft used. As a result, FAA authorized operators to use supplemental restraints without applicants providing all of the information needed for FAA approvers to make an informed decision.

From March 2018 to the end of calendar year 2019, FAA authorized 54 applications it received from both helicopter operators and individuals. The application consists of two forms: (1) FAA Form 7711-2, Certificate of Waiver or Authorization Application and (2) Attachment A, Request for FAA Letter of Authorization, Supplemental Passenger Restraint System—Supporting Information. The application requests the information shown in table 1.

⁵ FAA, Order 8900.4 Emergency Order of Prohibition Pertaining to "Doors-Off" Flight Operations for Compensation or Hire, July 8, 2019.

Table 1. Information Requested in Supplemental Restraint Applications

Type of Information
Submitter name, organization, mailing address, email address, certificate number
Harness system components, including manufacturer’s make and model
Certification standard for each component (e.g., Occupational Safety and Health Administration Standard 1926.502)
Text of preflight briefing or step-by-step instructions to harness user regarding release from attachment point on the aircraft in preparation for egress
Link to 8-second video of an occupant demonstrating method of release of harness and/or lanyard from attachment point on the aircraft in preparation for egress
Detailed description of proposed operation
Area of operation (location, altitudes, etc.)
Aircraft make and model, pilot’s name, pilot certificate number, and rating.

Source: FAA Form 7711-2, Certificate of Waiver or Authorization Application and Attachment A, Required Information

FAA requires the application to be submitted with *all items* above completed but did not specify all non-applicable information in its guidance.⁶ We found that FAA authorized applications without important information it needed to understand the risks of each restraint system or the operations in which it would be used. This is because FAA did not specify in its guidance which information was required or could be omitted on the application form and subsequently authorized some of these requests without the risk information being reviewed. While FAA’s permanent order states that “some information requested [in the application]...may not be applicable to all submissions,” the Agency did not specify which information was optional or required. Specifically, we found the following issues:

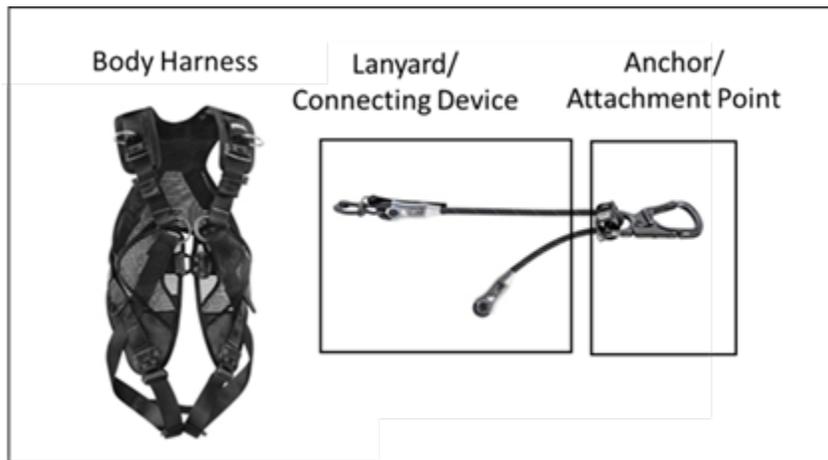
- 18 applications did not list the specific aircraft in which the harness would be used;

⁶ FAA’s instructions for Form 7711-2, Application for Certificate of Waiver or Authorization.

- 11 applications did not list the specific type of operation in which the harness would be used;
- 15 applications did not list the specific geographic area of operations for the flights; and
- 28 of the applications did not list the specific pilots authorized to operate the aircraft and brief passengers on the use of the supplemental restraints.

While this information is part of FAA’s standard application form for authorizing activities such as aviation events, which includes airshows, FAA authorized supplemental restraint applications without this information. For example, we identified 12 applications that did not include all 3 components—a harness, a lanyard and attachment point to the aircraft—of the requested restraint system (see figure 2 below). Eight of these 12 applications did not include the harness, but did have the lanyard.

Figure 2. Components of a Supplemental Passenger Restraint System



Source: FAA

Further, FAA required applicants to list the certification standard for all of the harness system components. This mirrors the documentation FAA requires for the approval of other safety harnesses, such as those used when carrying an external load. However, FAA approved 37 of the 54 applications that did not have all of the necessary supporting documentation—such as testing documents or manuals—for the certification standard cited in the request. This lack of documentation was due to FAA not requiring supporting documentation for the certification standards cited by applicants or documenting when staff had conducted their own research on the certification standards when not provided

by the applicant. Although FAA included whether the restraint system components met one or more credible certification standards as a review item on the Agency's application checklist (see exhibit C), it did not include a review item regarding supporting documentation for the certification standard. Therefore, FAA staff reviewed and approved some applications that had supporting documentation and some that did not.

Overall, FAA has relied on applicants to determine whether a particular restraint is appropriate for the passengers on the flight and subsequently approved applications for restraints with unverified certification standards. Therefore, FAA may lack a full understanding of the risks posed by supplemental passenger restraints it has authorized.

FAA Authorized Supplemental Restraints Not Normally Used in Aircraft-Specific Operations

FAA authorized supplemental passenger restraints with industry certification standards that may not meet design specifications for use in aircraft-specific operations. FAA's guidance states that the Agency would consider the design, manufacture, installation, and operation of the supplemental restraint when applications were submitted. Yet, FAA did not require applicants to submit any background engineering data on harness, lanyard, or attachment point tolerances—such as passenger load/weight limits or wear factors—which may be needed to evaluate and authorize restraint requests. Further, FAA did not evaluate the appropriateness of a particular standard to an aviation environment. Rather, FAA relied on the operators and individuals requesting a specific supplemental restraint to provide their opinions on which certification standard was appropriate for their open-door operation.

When we asked about inspector technical qualifications to assess requested standards, FAA stated that the Headquarters inspectors reviewing the applications did not have any specific technical background to evaluate the appropriateness of the certification standard used by the harness applicant. Inspectors relied on their operational experience in aircraft safety to evaluate operational procedures—not the certification itself—to determine the safety of the harness when exiting the aircraft in an emergency. FAA authorized restraints under many different certification standards (see table 2 below).

Table 2. Examples of Varying Supplemental Restraint Certification Standards Authorized by FAA

Certification Standard	Type of Certification
OSHA ANSI Z359.1	American National Standards Institute/American Society of Safety Engineers (ANSI/ASSE) Z359.1 - American National Standard Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
OSHA 1926.502	Occupational Safety and Health Administration Safety and Health Regulations for Construction - Fall protection systems criteria and practices
SAE 8043A	SAE Aerospace Standard specifies laboratory test procedures and minimum requirements for the manufacturer of restraint systems for use in small fixed wing aircraft and rotorcraft.
EN 361	European Standard EN 361 - Personal protective equipment against falls from a height – Full body harnesses
AS9100C	SAE Quality Management Systems Standards for Aviation, Space and Defense Organizations
ARS ISO 9001	Air Rescue Systems International Organization for Standardization
FAA TSO-C167	Federal Aviation Administration Technical Standard Order for manufacturers of personnel carrying device systems

Source: Operator supplemental restraint requests approved by FAA and respective industry certification websites

For example, FAA approved restraints under an Occupational Safety and Health Administration (OSHA) standard, which certifies restraints that protect the user from falling during construction work. This standard does not allow a body belt to be used as part of a fall arrest system. Yet, we found two instances where FAA authorized the use of a body belt under this OSHA standard. By authorizing use of supplemental restraints—which were not designed for the aviation environment—without fully evaluating the associated risks, such as inappropriate use of certain disallowed components, FAA may have allowed unsafe restraints to be used on helicopter air tours.

FAA Inspectors in Local Inspection Offices Are Not Included in the Authorization Process for Supplemental Restraints

FAA inspectors in local inspection offices are responsible for overseeing the safety of helicopter operators and surveilling supplemental passenger restraint systems, but they were not included in the associated authorization process. Instead, the process was centralized at FAA Headquarters and did not require routing applications through local FAA inspection offices.⁷ This centralization meant that FAA personnel most familiar with the operations of supplemental restraint applicants were not consulted prior to authorizing the application.

Additionally, in bypassing local inspection offices during both the review and authorization process, Headquarters left inspectors unaware about whether the operators they were responsible for overseeing had requested or been authorized to use supplemental restraints. Local inspectors need this information because these types of operations—specifically during open-door flights—likely pose a greater safety risk and could warrant enhanced surveillance. To underscore this elevated risk, the leading trade group for helicopter operators urged operators to halt all open-door tours shortly after the Liberty Helicopters accident. A representative stated that the organization believed “helicopter tours should be flown with doors closed...to create the safest possible flight for the public,” indicating that any open-door flight is a safety risk.

Further, 8 of the 10 inspectors we asked about increased risk in air tour operations stated that there was more risk associated with conducting open-door flights versus standard doors-on flights. Five of them stated that there is more risk in general. Also, three inspectors stated that there is more risk associated with flights carrying commercial passengers, who might not be aware of the unique dangers involved in open-door helicopter operations. For instance, passengers who have never flown on a helicopter might inadvertently release their installed seatbelt without the pilot’s approval. This is less likely to occur with a passenger who is trained on and frequently operates in helicopters.

Despite these potential risks, FAA Headquarters did not include local FAA inspectors in the decision to authorize the use of supplemental restraints or routinely inform inspectors when an operator or individual had been authorized to use them. For example, some certificated operators that conduct open-door

⁷ FAA, Emergency Order of Prohibition Pertaining to “Doors-Off” Flight Operations for Compensation or Hire, Notice N8900.457, April 10, 2018.

flights over water or hazardous terrain, and had been approved to use a supplemental harness, did not have any documented surveillance in the most recent 4-year period we reviewed. Without information about the authorization process, local inspectors will remain unaware of which open-door flights are a greater safety risk than others and thus require enhance surveillance.

FAA Inspectors Lack Sufficient Guidance To Oversee Operator Use of Supplemental Passenger Restraints

FAA inspectors did not effectively oversee operators using authorized supplemental passenger restraints. However, FAA has not issued specific inspection criteria for inspectors⁸ conducting surveillance of operators using supplemental restraints. For example, inspectors do not have inspection criteria on how often inspections should occur, whether the restraint system being used is the same one authorized by FAA, or whether the components of the system are being maintained as recommended by the manufacturer. Also, FAA has not issued specific inspection guidance for oversight of supplemental harnesses used by commercial operators.

Additionally, FAA has not developed a way for inspectors to document when they inspect supplemental passenger restraint use. FAA guidance only requires inspectors to validate that operators have put procedures in place to ensure that passenger-carrying open-door flights are prohibited unless passengers are secured. This can be achieved by either using FAA-approved restraints (seatbelts) or FAA-authorized supplemental restraints.⁹ However, in our review of 3,448 inspection records—for the 13 helicopter companies we interviewed or visited—only one FAA inspector documented that he verified the type of harness used by an operator was the same type as was identified in the FAA authorization.

Further, inspectors did not evaluate operators' maintenance programs regarding the condition of supplemental passenger restraints. This is because FAA has not added any inspection criteria pertaining to the restraint maintenance. For the 13 operators we visited, we could not find evidence of such maintenance inspections in FAA's inspection records. Also, none of the FAA inspectors we

⁸ FAA uses its Safety Assurance System for Part 135 commercial operators and Program Tracking and Reporting Subsystem for Part 91 for general aviation operators.

⁹ FAA, Order 8900.4, Emergency Order of Prohibition Pertaining to "Doors-Off" Flight Operations for Compensation or Hire, July 8, 2019.

interviewed indicated that they had evaluated the maintenance of supplemental restraints.

Finally, FAA's guidance does not address how inspectors should oversee the use of supplemental restraints for different types of operators. For example, many helicopter operators using supplemental harnesses operate under less stringent general aviation operating requirements. Therefore, they are not inspected by FAA as frequently as their counterparts who operate under certificated commercial operations regulations. Although FAA has increased general aviation air tour surveillance from 10 to 30 percent for fiscal year 2020, the Agency has not similarly increased surveillance of passenger restraints for commercial air tours.

Overall, FAA's limited guidance may not ensure inspectors are overseeing operators' safe use of the supplemental harnesses it has authorized. This is because the Agency has not issued clear instructions on how or whether inspectors should adjust their oversight in this area.

Conclusion

It is critical for FAA to have effective and consistent oversight of open-door helicopter operations to maintain the safety of air tour passengers. FAA has made efforts to provide temporary guidance to achieve prompt operator compliance and eliminate safety risks by developing a special authorization for supplemental passenger restraint systems. However, FAA's authorization process is still evolving, and important risk information has been overlooked. Also, FAA does not currently provide the guidance inspectors need to ensure operators are using and maintaining the supplemental restraints the Agency has authorized. Moving forward, FAA has the opportunity to improve its authorization process and oversight regarding supplemental passenger restraint use and increase the safety of open-door helicopter air tour passengers.

Recommendations

To improve FAA's authorization process and oversight of the use of supplemental passenger restraint systems during commercial open-door helicopter operations, we recommend that the Federal Aviation Administrator:

1. Issue a Notice of Proposed Rulemaking and a final rule, if found to be in the public interest, that address operations using supplemental passenger restraint systems.

2. Require all supplemental passenger restraint system applications to be reviewed using a standardized evaluation checklist that defines which information must be included on the request form for authorization.
3. Define minimum certification standards that meet aviation-specific load factors for supplemental passenger restraint systems.
4. Revise the supplemental passenger restraint system authorization procedures so applications are routed through local oversight offices to notify inspectors which operators are requesting and subsequently authorized for supplemental restraint use.
5. Develop and incorporate supplemental passenger restraint inspection criteria—such as frequency of inspections, review of harness authorization documentation, and maintenance of harnesses into inspector guidance for both Part 135 and Part 91 surveillance.

Agency Comments and OIG Response

We provided FAA with our draft report on October 14, 2020, and received its formal response on November 10, 2020, which is included as an appendix to this report. In its response, FAA concurred with four of our five recommendations and provided appropriate actions and completion dates. However, for recommendation 3, FAA partially concurred but did not provide an alternative action or completion date. We ask that the Agency reconsider its response to this recommendation and provide us with an alternative action and anticipated completion date.

Actions Required

We consider recommendations 1, 2, 4 and 5 to be resolved but open pending completion of FAA's planned actions. We consider recommendation 3 open and unresolved and request that FAA provide an alternative action and target completion date within 30 days of the date of this report in accordance with DOT Order 8000.1C.

Exhibit A. Scope and Methodology

We conducted this performance audit between July 2019 and October 2020 as prescribed by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Our audit objectives were to assess FAA's processes for (1) review and approval of supplemental restraints for open-door helicopter operations and (2) oversight of company use of supplemental restraints.

To evaluate FAA's processes for review and approval of supplemental restraints, we interviewed FAA Headquarters staff. We obtained and reviewed key Agency guidance documents, supplemental passenger restraint requests, and FAA authorizations for calendar years 2018 and 2019. We reviewed and compared how FAA processed similar types of requests prior to implementation of the Agency's authorization process it established in April 2018. Last, we reviewed how FAA processes requests for harness use for external load operations.

To evaluate FAA's oversight of company use of supplemental restraints, we interviewed office managers and inspectors in six FAA Flight Standards District Offices that oversee helicopter air tour companies. We interviewed 13 companies that conduct open-door commercial helicopter flights or had requested use of supplemental restraints for their business. For the 13 companies we interviewed or visited, we reviewed 3,448 inspection records. This number was comprised of 2,712 commercial operator inspection records and 736 general aviation inspections during the period January 2015 to October 2019. We also reviewed a subjective sample of operators, which included companies of varying sizes and differing geographic locations. Each of these operators currently conducts or has previously conducted commercial helicopter air tours.

Exhibit B. Organizations Visited or Contacted

Federal Aviation Administration

FAA Boston Flight Standards District Office
FAA Farmingdale Flight Standards District Office
FAA Headquarters
FAA Las Vegas Flight Standards District Office
FAA South Florida Flight Standards District Office
FAA Teterboro Flight Standards District Office
FAA Van Nuys Flight Standards District Office

Other Organizations

Awesome Flight, LLC
Fly Sin City, LLC
Group 3 Aviation, Inc.
Guardian Helicopters, Inc.
Helicopter Flight Services
HeliNet Aviation
HeloAir, Inc.
Miami Helicopters, dba New York Helicopters, LLC
NYONair/FlyNYON
Platinum Helicopters, LLC
Tuckamore Aviation Corporation
Wings Air, LLC
Zip Aviation

Exhibit C. FAA Supplemental Passenger Restraint System Evaluation Checklist

Supplemental Passenger Restraint System (SPRS) Evaluation Checklist v5-14-19	
<ul style="list-style-type: none"> • The SPRS is a “system” with three general components (harness, lanyard, and attachment point on aircraft). • The FAA will consider the design, manufacture, installation, and operation of the SPRS when reviewing all applications for an LOA as it pertains to the desired outcome. • The desired outcome is that in an aircraft emergency if an SPRS is used for open door operations, it allows for rapid egress from the aircraft in the event of an emergency. Specifically, <ol style="list-style-type: none"> (1) the user is able to quickly accomplish certain actions (in an environment that may include smoke, fire or water), (2) without the assistance of others or the use of a knife or a cutting tool, (3) to ensure they are not tethered to the aircraft and egress is not impeded. 	
Checklist Item Name of Submitter	Yes or No
(1) 7711-2 and Attachment A have been submitted with all required information.	
(2) If MP/TF request: 7711-1 has been submitted.	
(3) A link has been provided to a video that is “viewable.”	
(4) Components (Harness and lanyard meet one or more credible certification standards (e.g. FAA TSO-167, Personnel Carrying Device Systems (PCDS), also known as Human Harnesses, OSHA, ANSI, CAA, NFPA, etc)).	
(5) The ability of a passenger to quickly release the restraint with minimal difficulty must be inherent to the SPRS.	
(6) Preflight briefing or step-by-step instructions must be clear, understandable, and easy to comprehend.	
(7) Submitted briefing/step-by-step instructions and submitted video must clearly and convincingly demonstrate that the SPRS can be quickly released by a passenger with minimal difficulty and without impeding egress from the aircraft in an emergency. Specifically (any one or more of the following): <ol style="list-style-type: none"> 1) Ability of the user to quickly release themselves from the harness with no assistance. 2) Ability of the user to quickly release the lanyard from the harness attachment point (on the front or side of harness) with no assistance. 3) Ability of the user to quickly release the lanyard from the attachment point on the aircraft with no assistance. Note: The lanyard attachment point to the aircraft should be 3 feet or less from the user’s harness when the lanyard is fully extended, so a user could run their hand down the lanyard from the attachment point on their harness to detach from aircraft attachment point in a low visibility environment (e.g. smoke, fire, water). 	

Exhibit D. List of Acronyms

CFR	Code of Federal Regulations
DOT	Department of Transportation
FAA	Federal Aviation Administration
INC	Incorporated
LLC	Limited Liability Corporation
NTSB	National Transportation Safety Board
OIG	Office of Inspector General

Exhibit E. Major Contributors to This Report

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MANUEL RAMOS	AUDITOR
EBONI NOLAND	AUDITOR
SUSAN CROOK-WILSON	WRITER-EDITOR
SETH KAUFMAN	DEPUTY CHIEF COUNSEL

Appendix. Agency Comments



Federal Aviation Administration

Memorandum

Date: November 10, 2020

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

From: H. Clayton Foushee, Director, Office of Audit and Evaluation, AAE-1 

Subject: Federal Aviation Administration's (FAA) Response to Office of Inspector General (OIG) Draft Report: Weaknesses in FAA's Supplemental Passenger Restraint System Authorization Process Hinders Improvements to Open-Door Helicopter Operations Project No. 19A3003A000

The Federal Aviation Administration (FAA) is committed to improving passenger safety during open-door helicopter operations conducted for compensation or hire. The Liberty Helicopters accident in March 2018 took the lives of five passengers trapped in their safety harnesses when the open-door helicopter partially submerged in the East River. In response, the FAA took the following steps:

- Published the Emergency Order of Prohibition (83 FR 12856 (Mar. 26, 2018)), prohibiting the use of supplemental restraints that cannot be released quickly in an emergency during flight operations. The Order was in response to National Transportation Safety Board urgent safety recommendation (A-18-012 (Mar. 19, 2018)).
- Initiated a rulemaking project, *Civil Aircraft Operations Conducted with Use of Supplemental Restraints, Including with Doors Opened or Removed*.
- In April 2018, we developed a process to evaluate and approve supplemental passenger restraint systems (SPRS) through issuing Letters of Authorization (LOA). Thus far, the FAA has issued 54 such LOAs. Additionally, the FAA issued guidance on the SPRS LOA process to FAA inspectors, operators, pilots, and individuals.

- Increased the requirement for surveillance of operators to which the Emergency Order applies from 10 percent to 30 percent in fiscal year 2020, and increasing surveillance to 50 percent in fiscal year 2021.
- Addressed the specifics of the accident by working with the manufacturer of the float system, which issued Service Bulletin SB-2018-07, Revision D, dated November 25, 2019, pertaining to proper inflation and rigging.

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- Issued an Airworthiness Directive that requires repetitive inspections and corrective action, if necessary, of the pull cables on the emergency float kits installed on certain Airbus Helicopters models, including that of the accident helicopter (85 FR 8150 (Feb. 13, 2020)).

Regarding the FAA’s authorization process and application of standards, the OIG determined some supplemental passenger restraint applications were missing information or were otherwise incomplete. In conjunction with applicants, the FAA has rectified this issue and the FAA provided the missing or incomplete information to OIG staff. In addition:

- In developing its submission and evaluation processes for SPRS, the FAA recognized that acceptable and established minimum standards for supplemental restraints already exist. The FAA uses these standards in other FAA evaluation scenarios and leverages this expertise when reviewing submission packages for use of SPRS during doors-open or -removed operations conducted for compensation or hire.
- The FAA considered only utilizing existing industry standards from established organizations such as National Fire Protection Association, Occupational Safety and Health Administration, and American Society for Testing and Materials.

The FAA concurs with recommendations 1, 2, 4 and 5, as written. As stated above, we are implementing recommendation 1 and have initiated the rulemaking project. The regulatory unified agenda projects that the Notice of Proposed Rulemaking will be published in February 2021. We will implement recommendations 2, 4 and 5 by October 31, 2021.

The FAA partially concurs with recommendation 3, as “minimum certification standards” are not appropriate for the submission process. When developing its submission and evaluation processes for non-required SPRS, the FAA recognized that acceptable and established minimum standards for supplemental restraints already exist and are in use in other FAA evaluation scenarios and in many occupations. The FAA considers these existing standards when reviewing submission packages. Additionally, FAA recognizes that SPRS are carry-on devices; as a result, the FAA does not certify them. In this regard, SPRS are not subject to the high aviation load factors the FAA applies when evaluating and approving seats and seatbelts. This distinction is appropriate, as SPRS are designed to keep an individual inside the helicopter, while approved seats and seatbelts are designed for emergency landing conditions.

We appreciate this opportunity to offer additional perspective on the OIG draft report. Please contact H. Clayton Foushee at Clay.Foushee@faa.gov if you have any questions or require additional information about these comments.

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