



Department

Aviation Safety

800 Independence Ave
Washington, DC 20591

In the matter of the petition of

**ZIPLINE INTERNATIONAL
INC.**

For an exemption from §§ 61.3(a), 61.133, 91.7(a), 91.119(b) and (c), 91.121, 91.151(a), 135.25(a), 135.63(c) and (d), 135.149(a), 135.161(a), 135.203(a), 135.209(a), 135.243(b)(1) through (b)(3), 135.267, 135.337(b)(1), 135.338(b)(1), 135.339(e)(3) and (e)(4), 135.340(e)(3) and (e)(4) of Title 14, Code of Federal Regulations

Exemption No. **19110**
Regulatory Docket No. **FAA-2020-0529**

GRANT OF EXEMPTION

By letter dated May 8, 2020, Mr. Joseph Marshall, Director of Operations, UAS, at Zipline International Inc. (hereinafter referred to as “Zipline”), 333 Corey Way, South San Francisco, CA, 94080, petitioned the Federal Aviation Administration (FAA) for an exemption from §§ 61.3(a), 61.133, 91.7(a), 91.119(b) and (c), 91.121, 91.151(a), 135.25(a), 135.63(c) and (d), 135.149(a), 135.161(a), 135.203(a), 135.209(a), 135.243(b)(1) through (b)(3), 135.267, 135.337(b)(1), 135.338(b)(1), 135.339(e)(3) and (e)(4), 135.340(e)(3) and (e)(4) of Title 14, Code of Federal Regulations. This exemption (the 49 U.S.C. § 44807 exemption) addresses the statutory requirement that a civil aircraft in air commerce operate with an airworthiness certificate and provides relief from the requirements of §§ 91.7(a) and 135.25(a)(1) and (a)(2) that an aircraft conducting operations be in an airworthy condition and hold an appropriate airworthiness certificate for part 135 operations, respectively. With the exception of Zipline’s request for relief from §§ 91.7(a) and 135.25(a)(1) and (2), the FAA will dispose of Zipline’s request for relief from the remaining regulatory sections in a companion exemption (Exemption No. 19110). The FAA further notes that Zipline is simultaneously working with the FAA to receive its part 119 air carrier certificate for part 135 operations.

To analyze Zipline's requests for regulatory relief, the FAA requested information¹ related to the exemption and to its air carrier certification document submittal for further review.

Zipline responded to the FAA's request for information with supporting documentation, which it has marked proprietary. The FAA has identified the supporting documents that Zipline submitted and the FAA considered in its analysis for issuance of this exemption. The FAA titled the list of supporting documents as "Zipline 44807 Exemption No. 19110: Supplemental Documents Considered" and posted this list to the docket.

This exemption is issued under the authority of 49 U.S.C. § 44807 for two purposes. First, it addresses the statutory requirement that a civil aircraft in air commerce operate with an airworthiness certificate.² Second, this exemption provides relief from the requirement of § 135.25(a)(1) and (a)(2) that an aircraft conducting operations in accordance with part 135 hold an appropriate airworthiness certificate.

The relief provided in this 49 U.S.C. § 44807 exemption would enable the Zipline Sparrow unmanned aircraft (UA) and its associated elements (AE), collectively referred to as the Zipline Sparrow unmanned aircraft system (UAS), to operate in cargo delivery operations without an airworthiness certificate. The FAA concludes that Zipline's compliance with the conditions and limitations of this exemption, along with the FAA's safety evaluation of the Zipline Sparrow UAS, will enable Zipline's operations using the Zipline Sparrow UAS without adversely affecting safety. Zipline is currently engaged in the process to receive a type certificate for the Zipline Sparrow UA utilized in its operations. The FAA continues to work with Zipline on the aircraft certification process. The companion operating exemption includes a discussion of that process.

The FAA's analysis is as follows:

By separate action, the Administrator of the FAA, has exercised his authority under 49 U.S.C. 44807 as delegated by the Secretary of Transportation (hereafter the Secretary) and determined that the Zipline Sparrow UAS, which Zipline would use for operations described in this exemption, may operate safely in the national airspace system (NAS).

The Zipline Sparrow UAS does not currently have an airworthiness certificate. Title 49 U.S.C. § 44807 provides the Secretary with authority to determine whether a certificate of waiver, Certificate of Authorization, or a certificate under §§ 44703 or 44704, is required for the operation of certain UAS. Section 44807(b) instructs the Secretary to base this determination on which types of UAS do not create a hazard to users of the NAS or the public. In making this determination, the Secretary must consider the size, weight, speed, operational capability of the UAS, and other aspects of the proposed operation. The Secretary delegated the authority vested by 49 U.S.C. § 44807 to the Administrator. In accordance with the statutory criteria provided in 49 U.S.C. § 44807, and in consideration of the size, weight, speed, and operational capability, proximity to airports and populated areas, and specific operations, the Administrator has determined this aircraft does not create a hazard to users of the NAS or the public.

¹ This RFI can be found in the docket for this exemption, Docket No. FAA-2020-0499.

² Title 49 U.S.C. § 44711.

Zipline seeks to operate the Sparrow UAS beyond visual line of sight (BVLOS) of the pilot in command in cargo delivery operations without the appropriate airworthiness certificate that 14 CFR §§ 91.7 and 135.25 require. Zipline contends the reliability of its system achieves a level of safety equivalent to the level of safety provided under the foregoing regulations. Zipline also contends that the requested relief to conduct these operations is in the public interest.

The petitioner's Operational Suitability Demonstration (OSD) consisted of three separate events occurring on May 19, 2021, June 8-10, 2021 and August 27, 2021. The OSD is designed to evaluate the UAS operating in normal, abnormal and emergency conditions. On May 19, 2021, the FAA observed a single flight at Zipline's NC-1 Facility located in Kannapolis, NC. This flight was to demonstrate maximum distance of the Zipline Sparrow UAS. The second suitability event occurred at Zipline's Nest-X Yolo Ranch Facility located in Esparto, CA on June 8-10, 2021. This phase of the demonstration was designed to evaluate the aircraft's performance in accordance with the outlined procedures of Zipline's unmanned flight manual (UFM). The third suitability event occurred at Zipline's Nest-X Yolo Ranch Facility located in Esparto, CA on August 27, 2021. The August 27, 2021 event was a follow up demonstration designed to reevaluate updated loss of Command and Control procedures. In addition to the observed flights, in-depth discussions centered on the observables and system interactions to further analyze and determine outcomes of each flight demonstration. On May 18-19 and June 9-10, 2021 the FAA performed a maintenance validation in accordance with the Zipline Sparrow UAS Maintenance Manual (UMM). The FAA found that Zipline successfully completed all events associated with the OSD.

Based on observations of flight operations, the FAA concludes that permitting the use of the Zipline Sparrow UAS in operations under this exemption would not adversely affect safety, provided all operations occur in accordance with the conditions and limitations of this exemption. As such, the Zipline Sparrow UAS does not create a hazard to users of the NAS when operated under this exemption.

The conditions and limitations provided in this exemption are based on analyses performed by the FAA, as previously described. Zipline's compliance with these conditions and limitations will sufficiently mitigate the risks of Zipline's proposed operations with the Zipline Sparrow UAS.

14 CFR part 91

Section 91.7(a)

Section 91.7(a) provides, in pertinent part, that no person may operate a civil aircraft unless it is in an airworthy condition. Based on the information the FAA reviewed in analyzing the proposed operations and the Administrator's determination under 49 U.S.C. § 44807, the FAA has determined that, subject to the conditions and limitations provided in this exemption, the proposed operations with the Zipline Sparrow UA would not adversely affect safety and relief can be granted to Zipline.

14 CFR part 135

Section 135.25(a)(1) and (a)(2)

Section 135.25(a)(1) and (a)(2) provides in pertinent part that no certificate holder may operate an aircraft under part 135 unless it is registered as a civil aircraft of the United States, carries an appropriate and current airworthiness certificate, and is in an airworthy condition.

The requirement to carry an appropriate and current airworthiness certificate on aircraft conducting air carrier operations is important to ensure that those aircraft have been designed, manufactured, and maintained to the established safety standards. Compliance with this requirement also ensures pilots operating aircraft have consistent information of a sufficient quality that enables them to conduct operations safely.

This exemption permits the use of the Zipline Sparrow UA in part 135 operations without an airworthiness certificate while Zipline is actively pursuing type certification for this aircraft. Based on the analysis of the information submitted in support of this exemption and consistent with the Administrator's determination under 49 U.S.C. § 44807, the FAA concludes that operations conducted in accordance with the conditions and limitations listed below ensure there is no adverse effect on safety. The FAA determined through observations made during the OSD and review of the petitioner's aircraft that the conditions and limitations provide operational mitigations which, in combination with the aircraft's capabilities, provide constraints under which the petitioner's operations can occur until such time as the Zipline Sparrow obtains an appropriate and current airworthiness certificate. In this regard, the 49 U.S.C. § 44807 exemption process is not intended to replace the normal aircraft type certification process. Finally, issuance of this exemption is predicated on Zipline's continued participation in the FAA type certification process for the Zipline Sparrow UA. This relief does not extend to aircraft registration – Zipline is required to register its aircraft under either part 14 CFR part 47 or 48.

Discussion of Comments

The FAA published a summary of the petition in the Federal Register on May 11, 2020 (Docket No. FAA-2020-0499). In response to the publication, the FAA received and considered 6 comments, from one individual and five aviation-related organizations. Novant Health, Commercial Drone Alliance (CDA), and the Small UAV Coalition (SUAVC) generally supported the petition, expressing support for the safe and efficient integration and expansion of the role of UAS operations in the NAS. The Air Line Pilots Association (ALPA), Airlines for America (A4A) and the individual commenter do not support the petitioner's request, citing concerns for case-by-case exemptions, general safety concerns, and inflight emergencies. All six comments received in response to the petition are addressed in the operational exemption (Exemption No. 19110) that accompanies this exemption.

Public Interest

The 2018 FAA Reauthorization Act (Public Law 114-254) requires the FAA to “update existing regulations to authorize the carriage of property by operators of small unmanned aircraft systems

for compensation or hire within the United States” within a year of the date of enactment. (Sec. 348; 49 U.S.C. 44808). Section 44808 also authorizes the petitioner to seek relief from current processes while the FAA updates its regulations. As part of the FAA’s efforts towards integrating unmanned aircraft into the NAS, including enabling UAS commercial package delivery operations, the FAA is gathering data through the issuance of exemptions from current regulations. With this exemption, the FAA can authorize operations that allow the FAA to obtain practical experience and data that it would not otherwise obtain. Through observing these operations, the FAA anticipates gaining significant practical experience and data regarding UAS air carrier operations. Such information will assist the FAA in understanding the risks and appropriate risk mitigation measures, which will further the FAA’s policy decisions that could result in rulemaking decisions.³ Based on the foregoing, this grant of relief from §§ 91.7(a) and 135.25(a)(1) and (a)(2) is in the public interest.

Additionally, this exemption is issued in connection with the FAA BEYOND program. The BEYOND program builds off of the former UAS Integration Pilot Project that expired on October 25, 2020. The policy objectives for BEYOND align with those of the UAS IPP, includes “promoting innovation and economic development.” Assessment of scalable operations, using technology that falls outside of the current regulatory framework, is necessary to collect appropriate data to further evaluate the viability of this technology. Accordingly, granting this exemption further helps FAA and industry adapt for scalable and sustainable operations to advance the future of UAS commercial package delivery operations and the safe and efficient integration of UAS into the NAS.

The FAA’s Decision:

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 106(f), 40113, 44701, and 44807 delegated to me by the Administrator, Zipline International, Inc. is granted an exemption from 14 CFR §§ 91.7(a) and 135.25(a)(1) and (a)(2) to the extent necessary to allow Zipline to conduct part 135 air carrier operations for commercial package delivery or validation flights conducted in conjunction with the FAA review of an application for a part 135 operating certificate using its Sparrow UA, subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, Zipline International Inc. is hereafter referred to as the operator.

1. Operations authorized by this grant of exemption are limited to the Zipline Sparrow Unmanned Aircraft (UA) and the Associated Elements (AE). Operations under this exemption may only be conducted in conjunction with the conditions and limitations issued in the companion operating exemption (Exemption No. 19110 or later issuance of that exemption) or for validation flights conducted in conjunction with the FAA review of an

³ See section 348 of the FAA Reauthorization Act (Public Law 115-254) requiring the FAA to “update existing regulations to authorize the carriage of property by operators of small unmanned aircraft systems for compensation or hire within the United States.”

application for a part 135 operating certificate.

2. The operator may conduct part 135 operations within the United States in areas specified in OpSpec B050 using Zipline Sparrow UA listed in the operator's FAA-issued operations specifications without an airworthiness certificate or a type design approved under a U.S. type certificate with the understanding that Zipline International Inc. is working with the FAA on the application for and issuance of a U.S. type certificate.
3. The operator must maintain and adhere to the following manuals at the latest revision level approved by the FAA.

Zipline Sparrow:

- a. Zipline Sparrow UAS Flight Manual
 - b. Zipline Sparrow UAS Maintenance Manual
4. If a discrepancy exists between this exemption and any associated manual required under 14 CFR part 135, or associated Certificate of Waiver or Authorization (COA), the operator must comply with the most restrictive provision.
 5. The operator must maintain a configuration control document that is approved by the FAA that lists the following:
 - a. Each major component of the UA (e.g. primary structural elements, motors, propellers, servos, batteries, primary electronic systems, navigation equipment, communication equipment, antennas, parachute systems, visual systems, and onboard software, etc.). The UA component list must contain the part numbers and modification levels of the components, as applicable.
 - b. Each associated element required to operate the UA in normal, abnormal, and emergency operations (e.g. ground station hardware, ground station software, ground station peripherals, offboard software, launch and recovery systems, launch pad, base stations, targets, GPS source provider, data links to include data link providers, handheld communication devices or systems, etc.). The associated elements list must identify the specific elements or minimum specifications for the elements necessary for operation of the UA.

The FAA will determine through an evaluation and/or demonstration if the UA components and/or associated elements identified in the configuration control document are suitable for operations. This condition and limitation will no longer apply to the associated elements when the operator is in compliance with Condition and Limitation No. 26 in exemption No. 19110.

The configuration control document must be maintained to represent the latest UAS configuration. The operator must retain all records related to the configuration control document at least until this exemption expires and provide them to the FAA upon request.

6. All Zipline Sparrow UAS must conform to the latest revision of the following configuration control document as approved by the FAA.

Zipline Sparrow:

- a. Zipline Sparrow UAS Configuration Control Document
7. The operator must incorporate the manufacturer's inspections, servicing, life limit requirements and safety bulletins into its maintenance and inspection programs, unless the FAA accepts the operator's proposal to include them elsewhere.
 8. The operator may not operate the UA with known inoperable instruments or equipment installed except in accordance with a minimum equipment list (MEL) that has been prepared in accordance with 14 CFR § 135.179 and approved by the FAA. If the operator desires to utilize a MEL, the operator must develop its own proposed MEL and submit it to the FAA for approval.
 9. The operator must comply with 14 CFR part 43 with respect to any maintenance, rebuilding and alterations of the Zipline Sparrow UA as if the aircraft has a standard airworthiness certificate, and of the associated elements. This condition and limitation will no longer apply to the associated elements when the operator is in compliance with Condition and Limitation No. 32 in exemption No. 19110. For purposes of this exemption, including compliance with this condition and limitation:
 - a. Zipline International Inc. is considered the aircraft manufacturer.
 - b. For the purpose of compliance with this exemption, "airworthy" means the UA is in a condition that meets the FAA-approved configuration described in the Zipline Sparrow Configuration Control Document and is in a condition for safe operation.
 10. Any design change or alteration that affects the UA or associated elements or that requires a change to the flight manual, maintenance manual or checklists must be submitted in a manner acceptable to the FAA and approved prior to operating the UAS under the air carrier certificate. This condition and limitation will no longer apply to the associated elements when the operator is in compliance with Condition and Limitation No. 30 in exemption No. 19110.
 11. The pilot interface must display at least all of the following information from the UA in real time: altitude, position, direction of flight information, and flight mode. All of the information identified in this condition and limitation must be available at all times to the remote pilot in command (RPIC) when conducting flight operations.
 12. The pilot interface must provide an audible and visual alert of any degraded system performance, UA malfunction, or loss of Command and Control link with the UA that may impact continued safe flight. This information must be available at all times to the RPIC when conducting flight operations.
 13. The UA must include a direct means and associated procedures for the UA to detect propulsion system failures and allow the RPIC or the UA to respond to associated failures.

14. The operator is authorized to conduct operations at a UA-to-pilot ratio of 1 to 1 or at a ratio otherwise approved by the FAA.
15. Any maintenance, alterations, or system changes of the UAS that could affect the operation or flight characteristics (e.g. replacement of a flight critical component) of the UA must be validated by a functional test flight in accordance with the procedures set forth in the operator's manual prior to conducting further operations under this exemption. Functional test flights must remain at least 500 feet from all non-participating people. The functional test flight must not pose undue hazards to persons and property.
16. In addition to standard FAA reporting requirements, the operator must report any incident, accident, or occurrence related to the Zipline Sparrow UAS to the Administrator at AFS-UAV-ONLY-FED@faa.gov for each event, and also upon any request.
17. This exemption is not valid for operations conducted outside the United States.

The Effect of Our Decision

This exemption terminates on May 31, 2024, unless sooner superseded or rescinded. Failure to comply with any of the above conditions and limitations may result in the immediate suspension or rescission of this exemption.

To request an extension or amendment to this exemption, please submit your request by using the Regulatory Docket No. FAA-2020-0529 (<http://www.regulations.gov>). In addition, you should submit your request for extension or amendment no later than 120 days prior to the expiration listed above, or the date you need the amendment, respectively.

Any extension or amendment request must meet the requirements of 14 CFR § 11.81.

Sincerely,

DAVID
BOULTER

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by DAVID
BOULTER
Date: 2022.05.09
16:25:21 -04'00'

David H. Boulter
Acting Executive Director, Flight Standards Service