

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER

Issued To: Northern Plains UAS Test Site
Responsible Person: Jakee Stoltz
Waiver Number: 107W-2020-01331A

Address:
4201 James Ray Dr Stop 8392
Grand Forks, ND 58202

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Small unmanned aircraft system (sUAS) operations beyond the visual line of sight of the remote pilot in command (PIC) and Visual Observer (VO), in lieu of visual line of sight (VLOS), and sUAS operations over human beings;

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

**14 CFR § 107.31—Visual line of sight aircraft operation,
§ 107.33(b) and (c)(2)—Visual observer, and § 107.39—Operation over Human Beings**

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached to and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

NOTE—This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions Nos. 1 to 50, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from March 31, 2020, to March 31, 2022, and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.

Office of the Executive Director

Flight Standards Service

**SPECIAL PROVISIONS ISSUED TO
Northern Plains UAS Test Site**

General

This Certificate of Waiver is an amendment which supersedes and replaces Waiver 107W-2020-01331 issued to Northern Plains UAS Test Site for operations under 14 CFR 107. Waiver 107W-2020-01331 is no longer valid.

The FAA's Flight Standards Service has reviewed your application to ensure compliance with the requirements of 14 CFR § 107.200. The Administrator finds that the proposed sUAS operation can be conducted safely under the provisions of this Certificate of Waiver (Waiver) as listed below because you have established adequate mitigations for risks involved with operating your sUAS in the manner you described. Adherence to the provisions of this Waiver establishes the required level of safety within the national airspace system.

This Waiver may be canceled at any time by the Administrator, the person authorized to grant the Waiver, or the representative designated to monitor a specific operation. As a general rule, this Waiver may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with any provision listed below is a violation of the terms of this Waiver and may serve as justification for cancellation.

List of Regulations Waived by Section and Title. The following regulations are waived:

14 CFR § 107.31, Visual line of sight aircraft operation, is waived to allow operation of the small unmanned aircraft (sUA) beyond the direct visual line of sight of the remote pilot in command (PIC) and any visual observer (VO) who is participating in the operation.

14 CFR § 107.33(b) and (c) (2), is waived to the extent necessary to allow operation of the small unmanned aircraft (sUA) when any VO who is participating in the operation may not be able see the unmanned aircraft in the manner specified in §107.31.

14 CFR § 107.39, Operations over human beings is waived to allow sUA operations over human beings who are not direct participants, necessary for the safe operation of the small unmanned aircraft.

No part of this waiver will function as an airspace authorization under 14 CFR § 107.41. The FAA's Air Traffic Organization responds directly to such requests.

Common Special Provisions. The Responsible Person is directly responsible for safety of operations conducted under this Waiver and will ensure the remote PIC, manipulator of the controls, and VO(s)¹ comply with all provisions of this Waiver.

1. The Responsible Person listed on the Waiver is responsible to the FAA for the safe conduct of the operations. Prior to conducting operations that are the subject of this Waiver, the responsible person:
 - a. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed of the terms and provisions of this Waiver and strictly observe the terms and provisions herein;
 - b. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed and familiar with part 107 regulations; and
 - c. Evidence of the above (a and b) must be documented and must be presented for inspection upon request from the Administrator or an authorized representative;
2. This Waiver may be combined with waiver 107W-2018-16129. This Waiver may not be combined with any other waiver(s), authorization(s), or exemption(s) without specific authorization from the FAA;
3. The FAA has the authority to cancel or delay any or all flight operations if the safety of persons or property on the ground or in the air are in jeopardy or there is a violation of the terms of this Waiver;
4. A copy of this Waiver must be accessible and available to the Remote Pilot in Command (remote PIC) at the ground control station during sUAS operations that are the subject of this Waiver;
5. The Responsible Person listed on this Waiver must maintain a current list of pilots by name and remote pilot certificate number used in operations under this Waiver. This list must be presented for inspection upon request from the Administrator or an authorized representative;
6. The Responsible Person listed on this Waiver must maintain a current list of small unmanned aircraft (sUA) by registration number(s), and parachute systems by serial number, used in the Waiver holder's operations. This list must be presented for inspection upon request from the Administrator or an authorized representative;
7. For the purposes of this Waiver, Direct Participants are the remote pilots in command (PICs), persons manipulating the controls, visual observers (VOs), and any persons whose involvement is necessary for safety of the sUAS operation. All other persons are considered non-participants;

¹ Title 14 CFR § 107.3 defines the term "visual observer." Any VO participating in operations conducted under this Waiver must meet the requirements listed in § 107.33 throughout the duration of flight operations.

Waiver Specific Special Provisions. sUAS operations beyond the visual line of sight (BVLOS) of the remote PIC and VO(s) and over human beings may be conducted under this waiver when the operation complies with the following provisions:

OPERATIONAL PROVISIONS

8. Operations under this waiver must use at least 1 VO who is co-located with the RPIC or located as described in the waiver application;
9. If the RPIC and VO are co-located, the RPIC or the VO must be able to observe the airspace surrounding the sUA in flight to detect other aircraft in sufficient time for the RPIC to perform an avoidance maneuver, and maintain a well clear distance from other aircraft;
10. If the RPIC and VO are not co-located, and the operation is occurring as described in the waiver application, the RPIC must be able to observe the airspace surrounding the sUA in flight to detect other aircraft in sufficient time for the RPIC to perform an avoidance maneuver, and maintain a well clear distance from other aircraft;
11. sUAS operations may occur within 1 statute mile of the RPIC when the RPIC is the manipulator of the controls. If other than the RPIC is acting as the manipulator of the controls, sUAS operations may occur within 1 statute mile of the ground control station when the RPIC is located in close physical proximity to the manipulator of the controls;
12. Individuals directly participating in the operation of the sUAS must be easily identifiable visually (e.g., apparel, safety vests);
13. The RPIC may only utilize sUAS and parachute system combinations previously submitted in a waiver application which was reviewed by the FAA and resulted in the issuance of a waiver of § 107.39 Operations Over Human Beings. For operations under this waiver, the FAA is not delegating authority to the Responsible Person or NPUASTS to determine the sufficiency of a safety justification to operate a sUAS over persons. Any sUAS or parachute system not specifically described in this Waiver, will require reapplication to amend this waiver;
14. Prior to operations utilizing sUA equipped with Parazero SafeAir parachute system, the RPIC must provide the ASTM compliance statement submitted for the previously issued 107.39 waiver, and a copy of the issued 107.39 waiver to the Responsible Person listed on this Waiver. The Responsible Person must verify the parachute system being operated is listed by serial number on the ASTM compliance document, and:
 - a. If the sUA has the Parazero SafeAir Mavic parachute system installed is a:
 - DJI Mavic 2 Pro,
 - DJI Mavic 2 Zoom, or a
 - DJI Mavic 2 Enterprise without modular accessories,
 - b. If the sUA has the Parazero SafeAir Phantom parachute system installed is a
 - DJI Phantom 4 Pro;

15. Prior to conducting operations over persons that are the subject of this Waiver, the Responsible Person and Remote PIC must verify the parachute system serial number installed on the sUA to be operated over persons, is listed in the SafeAir Mavic Product Safety & Compliance Document and/or SafeAir Phantom Product Safety & Compliance Document (as applicable for the sUA being operated). This document must be in the remote PIC's physical possession or readily accessible on an electronic device in the remote PIC's physical possession during sUAS operations that are the subject of this Waiver. This document must be presented for inspection upon request by any law enforcement official, Administrator, or an authorized representative;
16. Within the previous 7 calendar days prior to operations over human beings, the responsible person and remote PIC must have verified the ParaZero SafeAir Mavic or Phantom parachute system (as applicable for the sUA being operated) has no known safety defects that would alter the efficacy or safety of the parachute system while operating the sUA over human beings;
17. The Responsible Person must ensure all operations conducted under this Waiver follow the procedures outlined in the operations manual. If a discrepancy exists between the provisions in this Waiver and the procedures outlined in the operations manual, the provisions of this Waiver take precedence and must be followed;
18. The operations manual contains at least the following items:
 - a. Operator name, address, and telephone number,
 - b. Method of manual distribution and revision,
 - c. Certificate of Waiver. The operations manual must include a copy of the current Waiver(s),
 - d. Aircraft description and limitations list by aircraft type and model,
 - e. Method to ensure safety of non-participating persons and aircraft,
 - f. Safety briefing of Direct Participants,
 - g. Direct Participant minimum requirements,
 - h. Method of communications,
 - i. Normal operating procedures,
 - j. Abnormal operating procedures,
 - k. Emergency procedures,
 - l. Crew Resource Management,
 - m. Risk management, and
 - n. Accident Notification. The operations manual must contain procedures for notification and reporting of accidents in accordance with 14 CFR § 107.9 and NTSB 830;
19. Within 72 hours of any parachute deployment or a sUA failure where the parachute did not deploy as designed, an email must be sent to 9-afs-820-Part107Reports@faa.gov . The email must include at least:
 - a. Date, time, and location of parachute deployment or failure to deploy,
 - b. A description of events leading up to the parachute deployment or failure to deploy,
 - c. The serial number of the parachute,
 - d. Name of the remote PIC,
 - e. If the sUA impacted a person, and
 - f. Any injuries caused to a person;
20. For operations conducted under this Waiver, the maximum weight of the sUA, including everything that is on board or otherwise attached to the aircraft, may not exceed 2.53 pounds for DJI Mavic 2 or 3.55 pounds for DJI Phantom 4;

21. During sUAS operations subject to this Waiver, the only payload that may be carried by, or attached to the sUA in flight, is a camera, other optical sensor or anti-collision light. The sUA may not operate with any other payload or object attached to or contained within the sUA;
22. The Responsible Person may update or revise its operations manual. The Responsible Person must track such revisions and present revised documents to the Administrator or an authorized representative upon request. The Responsible Person must also present revised documents when applying for extension of or amendment to this Waiver. If any revision to the manual would be contrary to the information provided in the waiver application or obviate a condition or limitation of this waiver, then the Responsible Person must apply for an amendment to this Waiver;
23. The Responsible Person must ensure a copy of the operations manual is available to the remote PIC and all other direct participants prior to and during sUAS operations that are the subject of this Waiver;
24. The Responsible Person listed on this Waiver must ensure each remote PIC who will conduct operations under this Waiver is trained in a manner that addresses the items listed in § 107.49(a)-(e) and in a manner that is consistent with how the sUAS will be operated under this Waiver. All training and demonstration for all remote PICs and VO(s) must be documented and made available upon request by the Administrator or an authorized representative. Training operations may only be conducted under the standard requirements of part 107 (without waiver). The training must include:
 - a. sUA limitations,
 - b. sUA programming,
 - c. sUA operational procedures,
 - d. Abnormal procedures,
 - e. Air traffic avoidance procedures,
 - f. Crew Resource Management,
 - g. sUA flight training, and
 - h. Demonstration of sUA ground and flight skills;
25. Prior to operations under this Waiver, all direct participants must attend a safety briefing that addresses at minimum, the following items:
 - a. Designated positions, physical locations, responsibilities, and Crew Resource Management,
 - b. Planned flight operating area,
 - c. Designated launch and recovery areas,
 - d. Verification of geo-fence boundaries,
 - e. Verification of flight profile, and course,
 - f. Procedures for avoidance of other aircraft,
 - g. Procedures for operating under this Waiver;
26. Communication between the remote PIC and VO must occur to facilitate, when necessary, the remote PIC taking action to maneuver the sUA with sufficient time to:
 - a. Give way to all other aircraft in accordance with § 107.37,
 - b. React to any unforeseen operational or mechanical failure without creating a hazard to other people, other aircraft, or property in the event of a loss of control of the sUA, and
 - c. Maintain compliance with this Waiver and the requirements of part 107;

27. Operations subject to this waiver must cease if, at any time:
 - a. Safety of human beings or property on the ground or in the air is in jeopardy,
 - b. Any failure to comply with the provisions of this Waiver exists,
 - c. Full-duplex communications cannot be maintained between the remote PIC and any VO participating in the operation,
 - d. sUA control link is lost,
 - e. GPS signal is lost, or
 - f. sUA GPS location information is degraded;
28. The Responsible Person must establish and maintain a Safety Management System (SMS) appropriate for the size, scope, and complexity of operations that occur under this Waiver. Guidance on establishing and maintaining an SMS is available in FAA Advisory Circular 120-92B (or current revision). This program must be made available upon request by the Administrator;
29. No sUA flight that occurs under this waiver may carry the property of another for compensation or hire;
30. sUAS operations conducted in accordance with this Waiver must adhere to all manufacturer guidelines, recommendations and limitations for the sUAS and ParaZero SafeAir Mavic parachute system or ParaZero Phantom parachute system (as applicable for the sUA being operated);
31. Operations conducted under this Waiver may occur when the ParaZero SafeAir Mavic system is installed on a DJI Mavic 2 Pro, Mavic 2 Zoom or Mavic 2 Enterprise series sUA (without modular accessories) or ParaZero SafeAir Phantom system installed on a DJI Phantom 4 sUA in accordance with the instructions provided by the ParaZero SafeAir Mavic user manual or ParaZero SafeAir Phantom user manual (as applicable for the sUA being operated). Proposed operations of any other manufacturer, model of sUA, or parachute system will require a new waiver application or a request to amend this Waiver;

TECHNICAL PROVISIONS

32. Any modification to the sUAS or ParaZero SafeAir Mavic parachute or ParaZero Phantom parachute is prohibited. Repair and replacement of damaged sUA components is allowed with a replacement part that is exactly the same as the original. No substitutions are allowed unless a new waiver application is submitted;
33. If deployed for any reason, prior to a flight conducted under the terms and conditions of this Waiver, the ParaZero SafeAir Mavic parachute or ParaZero SafeAir Phantom parachute must be repacked by the manufacturer or a designated representative;

34. The Responsible Person must maintain each sUAS and its components in accordance with manufacturer's instructions and recommendations. sUAS maintenance includes scheduled and unscheduled overhaul, repair, inspection, modification, replacement, and system software upgrades of the sUAS and its components necessary for flight. A log of all maintenance performed must be kept for each aircraft operated under this waiver. This log must be available to the remote PIC for review prior to conducting operations that are the subject of this waiver. Each sUAS maintenance log must be presented to the Administrator when requested. The log must contain the following information for each maintenance activity:
 - a. A description (or reference data acceptable to the Administrator) of work performed,
 - b. The date of completion of the work performed,
 - c. The name of the person who performed the work, and
 - d. The signature of the person who performed the work;
35. A functional test flight may only be conducted under the standard requirements of part 107 (without waiver);
36. The sUA must be equipped with high visibility markings and lighting to increase the conspicuity of the sUA;
37. As described in the waiver application, sUAS ground control station must display in real time the following information: sUA altitude, sUA position, sUA direction of flight, and sUAS flight mode. This information must be available at all times to the remote PIC;
38. The sUAS must audibly and visually alert the remote PIC of degraded system performance, sUAS malfunction, or loss of Command and Control (C2) link between the ground control station and the sUA;
39. Launch or recovery areas must be pre-designated and monitored to keep any human being who is not directly participating in the operation out of the areas prior to, during, and immediately following flight operations;
40. Prior to conducting operations under this Waiver, the remote PIC must determine all control links the used in the sUAS, will work properly at the maximum planned distance for the proposed operation. At all times during operations that are the subject of this Waiver, the remote PIC must maintain the ability to direct the sUA to ensure compliance with the applicable provisions of this chapter;
41. If the remote PIC loses command or control link with the sUA, the sUA must follow a predetermined route to either reestablish link or immediately recover/land at a predesignated location;
42. If communication between the VO and the remote PIC will occur by electronic device:
 - a. The device must be continuous full-duplex,
 - b. The remote PIC must be able to use the device hands-free, and
 - c. There must be a reliable back-up communication method;
43. ADS-B out (1090/978 MHz) may not be transmitted from the sUAS when operating pursuant to this Waiver;
44. All emitters used in sUAS must be in compliance with all applicable FCC regulations and all provisions of the FCC authorization granted for the emitter. A FCC experimental authorization may not be used for sUAS operations under this Waiver;

ENVIRONMENTAL PROVISIONS

45. During sUA operations over non-participants, the ParaZero SafeAir Mavic parachute system or ParaZero SafeAir Phantom system (as applicable for the sUA operated) must be operational and comply with the ASTM 3322-18 standard as described in the waiver application;
46. The sUA may not be operated lower than 63 feet over any non-participant or moving vehicle;
47. The sUA may not sustain flight operations over moving vehicles;
48. Operations over open air assemblies of persons is prohibited;
49. Operations may only occur in Class G airspace; and
50. sUAS operations subject to this Waiver are limited to the State of North Dakota or within 1 statute mile of the Red River.