



U.S. Department
of Transportation

**Federal Aviation
Administration**

Aviation Safety

800 Independence Ave
Washington, DC 20591

In the matter of the petition of

**GENERAL ATOMICS
AERONAUTICAL SYSTEMS,
INCORPORATED**

For an exemption from § 91.109(a)
of Title 14, Code of Federal
Regulations

Exemption No. **18739**
Regulatory Docket No. **FAA-2020-0984**

GRANT OF EXEMPTION

By letter dated October 7, 2020, Mr. Stephan R. Dupourque, Senior Program Manager, General Atomics Aeronautical Systems, Incorporated (GA-ASI), 14200 Kirkham Way, Poway, CA 92064, petitioned the Federal Aviation Administration (FAA) on behalf of GA-ASI for an exemption from Title 14, Code of Federal Regulations (14 CFR) § 91.109(a). The proposed exemption, if granted, would grant relief for GA-ASI to conduct customer crew flight training in an aircraft that does not have dual flight controls. GA-ASI would utilize this relief only when the aircraft is operated above 2,500 feet above ground level (AGL) with a company-owned unmanned aircraft system (UAS) that has been issued a Special Airworthiness Certificate – Experimental Category (SAC-EC) and an Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA).

The petitioner requests relief from the following regulations:

Section 91.109(a) prescribes that –

- (a) No person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls.

The petitioner supports its request with the following information:

In order to support national security objectives, the petitioner requests limited relief from § 91.109(a). The petitioner explains that GA-ASI's objective is to conduct customer crew flight training for individuals who have not been issued an FAA pilot certificate (14 CFR Part 61) when operating a company-owned, Predator series unmanned aircraft system (UAS) aircraft above 2,500 feet AGL that has been issued a Special Airworthiness Certificate – Experimental Category. The Petitioner explains these unmanned aircraft do not have fully functioning dual controls but do have an alternative means for the Instructor Pilot (IP), who is the Pilot in Command (PIC), to immediately establish positive control and maintain safety of flight.

The petitioner describes operating the Predator series UAS over unpopulated, remote areas, and in low-density airspace. The petitioner explains that these UAS aircraft are registered with the FAA and possess a Special Airworthiness Certificate – Experimental Category issued under 14 CFR §§ 21.191 and 21.195. The petitioner states that it has a Certificate of Waiver or Authorization (COA) that includes operating limitations that allows GA-ASI to use the UAS for customer crew flight training operations. These operations support United States government customers conducting sensitive missions for national defense, homeland security, and law enforcement purposes.

The petitioner contends that granting the exemption would not adversely affect safety because the UAS training operations will be supervised by an IP who holds a current FAA Certificated Flight Instructor (CFI) rating. The petitioner explains that the IP will act as the PIC and sit next to the trainee. The IP will have the ability to immediately establish positive control of the UAS. GA-ASI indicates that the scope of the exemption request is only for crew training during the mission-control element (MCE) phase of operations above 2,500 ft. AGL. The petition for exemption will not involve training during the launch and recovery element (LRE) of operations that include take-off, departure, approach, and landing. The petitioner states that, if necessary, the IP can quickly and easily reach the control stick, thrust control lever, and other keyboard-based control inputs of the UAS.¹ Additionally, the petitioner asserts that the adjacent seating position is more effective and safer than dual controls because the PIC has instant access to the stick and throttle and can closely monitor the trainees' flight controls and keyboard-based inputs. The petitioner states that before and after each training session, the GA-ASI PIC² would be seated at the pilot operator station of the ground control station and maintain sole manipulation of the controls below 2,500 feet AGL to perform all takeoffs and landings.

¹ Petitioner notes that rudder pedal inputs by the pilot are not required above 2,500 feet AGL because the Flight Control System, aided by the yaw Stability Augmentation System (SAS), coordinates flight automatically without pilot input.

² The FAA interprets that GA-ASI PIC referenced in the petition is also the person providing the training above 2,500 feet AGL.

The petitioner also asserts that the United States Air Force and Department of Homeland Security have been using this method to provide training in UAS aircraft safely for over 25 years. They also note that, as these are unmanned aircraft, they do not carry persons on board, are operated only in remote areas, and fly within low-density airspace to avoid congested airways.

The petitioner states that granting this exemption would be in the public interest because it would permit GA-ASI to continue supporting government customers' training objectives by leveraging this class of UAS operational capability (advanced flight controls and long endurance). GA-ASI further states that these operations will benefit the public by supporting training for sensitive national defense, homeland security, and law enforcement missions, thereby supporting national security.

Discussion of Public Comments:

A summary of the petition was published in the Federal Register on December 31, 2020 (85 FR 86976). One comment was received.

The Small UAV Coalition, noting the very low ground risk for the particular operating environment, supported granting the petition. The commenter cited GA-ASI's past experience conducting crew training and Air Force's long history of providing training with the same method proposed by GA-ASI.

The FAA's analysis is as follows:

For the reasons stated below, the FAA finds that permitting GA-ASI to provide crew flight training utilizing a ground control station with a single set of controls will not adversely affect safety and is in the public interest.

Section 91.109(a) requires that no person may operate a civil aircraft (except a manned free balloon or an unmanned aircraft) that is being used for flight instruction unless that aircraft has fully functioning dual controls. However, this requirement to have dual physical flight controls is often impractical for unmanned aircraft that are operated from a control station located on the ground. The Predator control station is an open area with easy access to the aircraft controls from the side and rear of the control station seat. The FAA agrees that it would be impractical to require compliance with § 91.109(a) when a level of safety equivalent to that provided by the regulation can be achieved. The lack of physical barriers and easy access of the aircraft controls provides for an easy transfer of the controls during training and therefore provides an equivalent level of safety. The FAA agrees that an equivalent level of safety can be achieved with the IP sitting or standing next to the control station and the trainee, where the IP can quickly and safely assume control of the unmanned aircraft. In

addition, restricting the transfer of the controls during critical phases of flight such as takeoff and landing and only permitting training and the transfer of the controls in the other phases of flight will not adversely affect safety. The FAA is requiring in Condition and Limitation No. 3 that the designated PIC remain unchanged for the total duration of the flight to avoid any confusion or disruption that could affect the continuity of the flight operations.

Relief from § 91.109(a) is granted subject to the compliance with the petitioner's FAA issued special airworthiness certificate-experimental category (SAC-EC), air traffic control certificate of authorization (COA), and the conditions and limitations stated below. Although similar relief has been provided to other UAS operators,³ the size of the GA-ASI aircraft, the type of operation being conducted, and the aircraft certification held makes this exemption request unique and necessitates additional conditions and limitations because these aircraft are larger, operate in multiple classes of airspace, and are turbine powered.

The FAA agrees with the petitioner's assertion that a grant of exemption is in the public interest. The grant of exemption would permit the petitioner to continue their role in national defense, homeland security, and law enforcement missions, thereby supporting national security.

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, and 44701, delegated to me by the Administrator, General Atomics Aeronautical Systems, Incorporated is granted an exemption from 14 CFR 91.109(a) to the extent necessary to allow GA-ASI to conduct customer training on unmanned aircraft without fully functioning dual controls, subject to the conditions and limitations listed below.

Conditions and Limitations

1. Crew flight training with a single set of controls authorized by this grant of exemption is limited to the GA-ASI Predator series of unmanned aircraft systems (UAS) owned and operated by GA-ASI possessing a special airworthiness certificate-experimental certificate (SAC-EC). All other operating limitations provided by the SAC-EC remain valid and must be complied with.
2. All training operations must be conducted in accordance with an ATO-issued COA. GA-ASI must apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the COA. If a conflict exists between the COA and this condition, the more restrictive provision will apply.

³ See Exemptions No. 18596 and Exemption No. 17790.

3. The pilot in command (PIC) providing training must be designated before the flight and cannot transfer his or her designation for the total duration of the flight. In all situations, the PIC is responsible for the safety of the operation and the associated flight training. The PIC must possess a valid FAA issued Flight Instructor certificate. The PIC is also responsible for meeting all applicable conditions and limitations as prescribed in this exemption and ATO-issued COA, and operating in accordance with the SAC-EC.
4. The PIC IP may provide crew flight training on no more than one unmanned aircraft at a time. Proposed operation of more than one unmanned aircraft at one time (by one PIC) requires a new petition or a petition to amend this exemption.
5. The PIC IP must hold a valid FAA-issued Flight Instructor Certificate appropriate to the category and class of aircraft operated under the authority of this grant of this exemption.
6. The Predator series aircraft Operations and Procedures Manual, Emergency Procedures, Maintenance Procedures Manual, all Preflight Checklists, and this exemption and any ATO-issued COA that applies to operations under this exemption must be available to the PIC during all UAS training operations that occur under this exemption and made available to the Administrator upon request. If questions arise regarding updates or revisions to the operating documents, the operator may contact the FAA's Flight Standards Service, General Aviation and Commercial Division (AFS-800), Telephone number: 202-267-1100, Email: 9-AFS-800-Correspondence@faa.gov.
7. Any aircraft used for training that has undergone maintenance or alterations that affect the UAS operation or flight characteristics (e.g., replacement of a flight-critical component) must undergo a functional test flight prior to conducting training operations under this exemption.
8. The operator is responsible for maintaining and inspecting the UAS and the control station to ensure that it is in a condition for safe training operations.
9. Prior to each training flight, the PIC must conduct a pre-flight inspection and determine the aircraft is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, such as inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the aircraft is found to be in a condition for safe flight.
10. The PIC IP must hold a current FAA airman medical certificate. The PIC may not conduct the operation if he or she knows or has reason to know of any medical condition that would make him or her unable to meet the requirements for at least a second-class medical certificate, or is taking medication or receiving treatment for a medical condition that

results in the PIC being unable to meet the requirements for at least a second-class medical certificate. No trainee may participate in the operation if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of the aircraft.

11. All training operations must be conducted during planned and dedicated training sessions and only above 2,500 feet AGL. The IP must be seated at the pilot operator station of the ground control station and be the sole manipulator of the controls below 2,500 feet AGL and perform all takeoffs and landings. All training flights must be accomplished only in remote areas avoiding populated areas and fly only within low-density airspace to avoid congested airways.
12. The PIC must abort the flight training operation if unexpected circumstances or emergencies arise that could potentially degrade the safety of persons, property or other aircraft. The PIC must terminate flight operations without causing undue hazard to persons or property in the air or on the ground.
13. All training operations shall be conducted over a predetermined course and briefed in advance of the flight. A post flight briefing must be conducted to ensure that the trainee understands what tasks were accomplished successfully and what tasks need improvement. The instructor must maintain a record of the training provided and retain that record for 3 years.

If you request an extension or amendment to this exemption, please submit your request by using the Regulatory Docket FAA-2020-0984 (<http://www.regulations.gov>). In addition, you should submit your request no later than 120 days prior to the exemption's expiration date listed below, or the date you need the amendment.

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

This exemption terminates on March 31, 2023, unless sooner superseded or rescinded.

Issued in Washington, D.C., on