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**[4910-13]**

## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 25**

**[Docket No. FAA-2015-1484; Special Conditions No. 25-617-SC]**

#### **Special Conditions: Gulfstream Aerospace Corporation Model GVII-G500**

#### **Airplanes, Design Roll Maneuver Requirement**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comments.

**SUMMARY:** These special conditions are issued for the Gulfstream Aerospace Corporation (Gulfstream) Model GVII-G500 airplane. This airplane will have a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. This design feature is electronic flight controls that affect maneuvering. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**DATES:** This action is effective on Gulfstream Aerospace Corporation on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. We must receive your comments by **[INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

**ADDRESSES:** Send comments identified by docket number FAA-2015-1484 using any of the following methods:

- *Federal eRegulations Portal:* Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, DC, 20590-0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202-493-2251.

*Privacy:* The FAA will post all comments it receives, without change, to <http://www.regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket Web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the **Federal Register** published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov/>.

*Docket:* Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Walt Sippel, FAA, Airframe and Cabin Safety Branch, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind

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## **SUPPLEMENTARY INFORMATION**

The FAA has determined that notice of, and opportunity for prior public comment on, these special conditions is impracticable because these procedures would significantly delay issuance of the design approval and thus delivery of the affected airplane.

In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon publication in the **Federal Register**.

### **Comments Invited**

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive by the closing date for comments. We may change these special conditions based on the comments we receive.

### **Background**

On March 29, 2012, Gulfstream Aerospace Corporation applied for a type certificate for their new Model GVII-G500 series airplane. The Model GVII-G500 series airplane will be a business jet capable of accommodating up to 19 passengers. It will incorporate a low, swept-wing design with winglets and a T-tail. The powerplant will consist of two aft-fuselage-mounted Pratt & Whitney turbofan engines.

## **Type Certification Basis**

Under Title 14, Code of Federal Regulations (14 CFR) 21.17, Gulfstream must show that the Model GVII-G500 series airplane meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-129.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Model GVII-G500 series airplane because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, Model GVII-G500 series airplanes must comply with the fuel-vent and exhaust-emission requirements of 14 CFR part 34, and the noise-certification requirements of 14 CFR part 36. The FAA must issue a finding of regulatory adequacy under § 611 of Public Law 92-574, the “Noise Control Act of 1972.”

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

## **Novel or Unusual Design Features**

The Model GVII-G500 series airplane will incorporate the following novel or unusual design feature: an electronic flight-control system that provides control of the airplane through pilot inputs to the flight computer.

Current 14 CFR part 25 airworthiness regulations account for control laws for which aileron deflection is proportional to control-stick deflection. The regulations do not address nonlinearities or other effects on aileron actuation that electronic flight controls may cause. Because this type of system may affect flight loads, and therefore the structural capability of the airplane, specific regulations are needed to address these effects.

## **Discussion**

The current design roll maneuver requirement for structural loads in 14 CFR part 25 is inadequate for addressing airplanes with electronic flight controls that affect maneuvering. These special conditions adjust the current roll maneuver requirement, § 25.349(a), to take into account the effects of an electronic flight control system.

These special conditions differ from current requirements in that they require roll maneuvers to result from defined movements of the flightdeck roll control, as opposed to defined aileron deflections. Also, the special conditions require an additional load condition at  $V_A$ , in which the flightdeck roll control is returned to neutral following the initial roll input.

These special conditions are limited to the roll axis only. Special conditions are no longer needed for the yaw axis because § 25.351 was revised at Amendment 25-91 to account for the effects of an electronic flight-control system.

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

## **Applicability**

As discussed above, these special conditions are applicable to the Gulfstream Model GVII-G500 airplane. Should Gulfstream apply at a later date for a change to the type certificate

to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well.

## **Conclusion**

This action affects only a certain novel or unusual design feature on one model series of airplanes. It is not a rule of general applicability.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, because a delay would significantly affect the certification of the airplane, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon publication in the **Federal Register**.

The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

## **List of Subjects in 14 CFR Part 25**

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

## **The Special Conditions**

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Gulfstream Model GVII-G500 airplanes.

The following conditions, speeds, and flightdeck roll control motions (except as the motions may be limited by pilot effort) must be considered in combination with an airplane load factor of zero and of two-thirds of the positive maneuvering factor used in design. In determining the resulting control surface deflections, the torsional flexibility of the wing must be considered in accordance with § 25.301(b):

1. Conditions corresponding to steady rolling velocities must be investigated. In addition, conditions corresponding to maximum angular acceleration must be investigated for airplanes with engines or other weight concentrations outboard of the fuselage. For the angular acceleration conditions, zero rolling velocity may be assumed in the absence of a rational time history investigation of the maneuver.
2. At  $V_A$ , sudden movement of the flightdeck roll control up to the limit is assumed. The position of the flightdeck roll control must be maintained until a steady roll rate is achieved and then must be returned suddenly to the neutral position.
3. At  $V_C$ , the flightdeck roll control must be moved suddenly and maintained so as to achieve a roll rate not less than that obtained in special condition 2.
4. At  $V_D$ , the flightdeck roll control must be moved suddenly and maintained so as to achieve a roll rate not less than one-third of that obtained in special condition 2.

Issued in Renton, Washington, on April 14, 2016.

**Victor Wicklund,**

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*Aircraft Certification Service.*

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