

**DEPARTMENT OF TRANSPORTATION****Federal Aviation Administration****14 CFR Part 25**

[Docket No. NM441; Special Conditions No. 25-433-SC]

**Special Conditions: Gulfstream Model GVI Airplane; Design Roll Maneuver Requirement for Electronic Flight Controls**

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

**ACTION:** Final special conditions.

**SUMMARY:** These special conditions are issued for the Gulfstream GVI airplane. This airplane will have a novel or unusual design feature associated with an electronic flight control system that provides roll control of the airplane through pilot inputs to the flight computers. 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:** *Effective Date:* July 25, 2011.

**FOR FURTHER INFORMATION CONTACT:** Carl Niedermeyer, FAA, Airframe/Cabin Safety Branch, ANM-115, Transport Standards Staff, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 227-2279; electronic mail [carl.niedermeyer@faa.gov](mailto:carl.niedermeyer@faa.gov).

**SUPPLEMENTARY INFORMATION:****Background**

On March 29, 2005, Gulfstream Aerospace Corporation (hereafter referred to as "Gulfstream") applied for an FAA type certificate for its new Gulfstream Model GVI passenger airplane. Gulfstream later applied for, and was granted, an extension of time for the type certificate, which changed the effective application date to September 28, 2006. The Gulfstream Model GVI airplane will be an all-new, two-engine jet transport airplane. The maximum takeoff weight will be 99,600 pounds, with a maximum passenger count of 19 passengers.

**Type Certification Basis**

Under provisions of Title 14, Code of Federal Regulations (14 CFR) 21.17, Gulfstream must show that the Gulfstream Model GVI airplane (hereafter referred to as "the GVI") meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-119, 25-122, and 25-124. 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 GVI because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to complying with the applicable airworthiness regulations and special conditions, the GVI 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 also issue a finding of regulatory adequacy pursuant to section 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).

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 novel or unusual design features, the special conditions would also apply to the other model under provisions of § 21.101.

**Novel or Unusual Design Features**

The Gulfstream Model GVI airplane is equipped with an electronic flight control system that provides roll control of the airplane through pilot inputs to the flight computers. The current design roll maneuver requirement for structural loads in 14 CFR part 25 is inadequate for addressing an airplane with electronic flight controls that affect maneuvering. Special conditions are needed to take into account the effects of an electronic flight control system.

**Discussion**

The GVI is equipped with an electronic flight control system that provides roll control of the airplane through pilot inputs to the flight computers. Current part 25 airworthiness regulations account for "control laws" for which aileron deflection is proportional to control wheel deflection. They do not address any nonlinearities<sup>1</sup> or other effects on aileron and spoiler actuation that may be caused by electronic flight controls. Therefore, the FAA considers the flight control system to be a novel and unusual feature compared to those envisioned when the current regulations were adopted. Since this type of system may affect flight loads, and therefore the

<sup>1</sup> A nonlinearity is a situation where output does not change in the same proportion as input.

structural capability of the airplane, special conditions are needed to address these effects.

These special conditions differ from current requirements in that the special conditions require that the roll maneuver result from defined movements of the cockpit roll control as opposed to defined aileron deflections. Also, these special conditions require an additional load condition at design maneuvering speed ( $V_A$ ), in which the cockpit roll control is returned to neutral following the initial roll input.

**Discussion of Comments**

Notice of proposed special conditions No. 25-11-01-SC for Gulfstream GVI airplanes was published in the **Federal Register** on February 14, 2011 (76 FR 8319). Only one comment was received, which was supportive, so these special conditions are adopted as proposed.

**Applicability**

As discussed above, these special conditions are applicable to the Gulfstream Model GVI 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 features, these special conditions would apply to that model as well.

**Conclusion**

This action affects only certain novel or unusual design features of the GVI. It is not a rule of general applicability.

**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 GVI airplanes.

In lieu of compliance with § 25.349(a), Gulfstream must comply with the following special conditions.

The following conditions, speeds, and cockpit 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 cockpit roll control up to the limit is assumed. The position of the cockpit 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 cockpit roll control must be moved suddenly and maintained so as to achieve a roll rate not less than that obtained in paragraph 2.

4. At  $V_D$ , the cockpit roll control must be moved suddenly and maintained so as to achieve a roll rate not less than one third of that obtained in paragraph 2.

Issued in Renton, Washington, on June 13, 2011.

Ali Bahrami,

Manager, Transport Airplane Directorate,  
Aircraft Certification Service.

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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 73

[Docket No. FAA-2008-0110; Airspace  
Docket No. 07-ASW-8]

RIN 2120-AA66

#### Modification of Restricted Areas R-4401A, R-4401B, and R-4401C; Camp Shelby, MS

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

**ACTION:** Final rule.

**SUMMARY:** This action modifies restricted areas R-4401A, R-4401B, and R-4401C, at Camp Shelby, MS, to ensure that aircraft remain within the confines of restricted airspace during high altitude munitions delivery and to enhance the efficient use of airspace in the vicinity of Camp Shelby, MS.

**DATES:** Effective date 0901 UTC, August 25, 2011.

**FOR FURTHER INFORMATION CONTACT:** Paul Gallant, Airspace, Regulations and ATC Procedures Group, Office of Airspace Services, Federal Aviation

Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone: (202) 267-8783.

#### SUPPLEMENTARY INFORMATION:

##### Background

Special Use Airspace (SUA) at Camp Shelby, MS, currently consists of three restricted areas that are layered from the surface up to 29,000 feet MSL. Restricted area R-4401A extends from the surface up to 4,000 feet MSL; R-4401B overlies R-4401A and extends from 4,000 feet MSL up to 18,000 feet MSL; R-4401C overlies A and B and extends from 18,000 feet MSL up to 29,000 feet MSL. Adjacent to the restricted areas are two military operations areas (MOA). The De Soto 1 MOA abuts the north, east and south sides of the restricted areas and extends from 500 feet AGL up to 10,000 feet MSL. The De Soto 2 MOA lies adjacent to the east and south sides of De Soto 1 MOA and extends from 100 feet AGL up to 5,000 feet MSL.

##### Military Operations Areas (MOA)

MOAs are nonregulatory airspace areas that are established administratively and published in the National Flight Data Digest (NFDD) rather than through rulemaking procedures. MOAs are established to separate or segregate non-hazardous military flight activities from aircraft operating in accordance with instrument flight rules (IFR), and to advise pilots flying under visual flight rules (VFR) where these activities are conducted. IFR aircraft may be routed through an active MOA only by agreement with the using agency and only when air traffic control can provide approved separation from the MOA activity. VFR pilots are not restricted from flying in an active MOA, but they are advised to exercise caution while doing so. Although MOAs are not regulatory airspace actions, the De Soto MOAs are described in this rule because they form an integral part of the Camp Shelby Range airspace area. The MOA changes will be published separately in the NFDD.

##### History

On Wednesday, February 20, 2008, the FAA published in the **Federal Register** a notice of proposed rulemaking (NPRM) to modify Restricted Areas R-4401A, R-4401B and R-4401C at Camp Shelby, MS, by moving the southeastern corner of the restricted areas approximately 2 nautical miles (NM) to the east of the present alignment (73 FR 9241). The FAA proposed this change to “square off” the corner to ensure that aircraft

conducting high altitude munitions delivery training remain within the confines of restricted airspace. Interested parties were invited to participate in this rulemaking proceeding by submitting written comments on the proposal to the FAA.

In a separate action, on February 11, 2008, the FAA distributed a nonrulemaking circular soliciting public comment on a proposal to modify the De Soto 1 and De Soto 2 MOAs and to establish two new MOAs in order to raise the upper altitude limit of the MOA airspace at the Camp Shelby Range up to but not including FL 180 (Airspace Study No. 08-ASW-09NR). In the circular, the FAA proposed to modify the De Soto 1 MOA boundary to match the amended R-4401A/R-4401B boundary and to change the De Soto 1 MOA ceiling to read “to but not including 10,000 feet MSL.” The De Soto 2 MOA altitude ceiling would be changed to read “to but not including 5,000 feet MSL,” but the De Soto 2 boundary would not be changed.

In addition, two new MOAs were proposed. The De Soto 3 MOA would overlie De Soto 1 and would extend from 10,000 feet MSL to but not including FL 180; and the De Soto 4 would overlie De Soto 2 with altitudes extending from 5,000 feet MSL to but not including FL 180. The Air National Guard (ANG) requested this change because the current MOAs do not provide sufficient altitudes to accommodate aircrew training in long-range set-up and stand-off tactics.

Seven comments were received in response to the NPRM and the circular.

##### Discussion of Comments

All of the commenters opposed the proposed rulemaking. Most commenters argued that the proposed airspace expansions would adversely impact civil aircraft operations in the area; and, in particular, those aircraft transiting the area via VOR Federal airways V-11 and V-70. Since this is a small boundary adjustment, with the expansion extending into existing MOA airspace, the FAA concluded the restricted area boundary change is not expected to impact air traffic in the area. Airways V-11 and V-70 do extend through the proposed expanded MOA airspace.

However, in response to the comments, the configuration and altitude structure of the MOAs have been revised. Instead of one large MOA (De Soto 4) overlying the entire Desoto 2 MOA, the proposed De Soto 4 MOA airspace is split into two separate MOAs (i.e., De Soto 4 and De Soto 5). The Desoto 4 MOA will extend from 5,000 feet MSL to but not including FL 180