DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2024-2442; Special Conditions No. 25-880-SC]

Special Conditions: Gulfstream Aerospace Corporation, Model GVII-G400 Airplane; Automatic Speed Protection for Design Dive Speed (Dive Speed Definition)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Gulfstream Aerospace Corporation (Gulfstream) Model GVII-G400 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 a high-speed protection system. 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: Effective [INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

FOR FURTHER INFORMATION CONTACT: Todd Martin, Technical Policy Branch, Policy and Standards Division, Aircraft Certification Service, AIR-622, Federal Aviation Administration, 2200 South 216th Street, Des Moines, WA 98198; telephone (206) 231-3210; email todd.martin@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

On June 30, 2020, Gulfstream applied for an amendment to Type Certificate No. T00021AT to include the new Model GVII-G400 airplane. The Gulfstream Model GVII-G400 airplane, which is a derivative of the Model GVII-G500 airplane currently approved under Type Certificate No. T00021AT, is a twin-engine, transport-category, business jet, with a maximum seating for 19 passengers, and a maximum take-off weight of 73,500 pounds.

Type Certification Basis

Under the provisions of 14 CFR 21.101, Gulfstream must show that the Model GVII-G400 airplane meets the applicable provisions of the regulations listed in Type Certificate No. T00021AT, or the applicable regulations in effect on the date of application for the change, except for earlier amendments as agreed upon by the FAA.

If the Administrator finds that the applicable airworthiness regulations (e.g.,14 CFR part 25) do not contain adequate or appropriate safety standards for the Gulfstream Model GVII-G400 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 novel or unusual design feature, or should any other model already included on the same type certificate be modified to incorporate the same novel or unusual design feature, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Gulfstream Model GVII-G400 airplane must comply with the exhaust-emission

requirements of 14 CFR part 34, and the noise-certification requirements of 14 CFR part 36.

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 § 21.101.

Novel or Unusual Design Features

The Gulfstream Model GVII-G400 airplane will incorporate the following novel or unusual design feature:

The GVII-G400 is equipped with a high-speed protection system that limits nose down pilot authority at speeds above V_C/M_C and prevents the airplane from actually performing the maneuver required under § 25.335(b)(1). Gulfstream proposes to reduce the margin between V_C and V_D required by § 25.335(b) based on the incorporation of this high-speed protection system in the Gulfstream GVII-G400 flight control laws.

Discussion

Section 25.335(b)(1) is an analytical envelope condition which was originally adopted in part 4b of the Civil Air Regulations in order to provide an acceptable speed margin between design cruise speed and design dive speed. Flutter clearance design speeds and airframe design loads are impacted by the design dive speed. While the initial condition for the upset specified in the rule is 1g level flight, protection is afforded for other inadvertent overspeed conditions as well. Section 25.335(b)(1) is intended as a conservative enveloping condition for potential overspeed conditions, including non-symmetric ones. To establish that potential overspeed conditions are enveloped, the applicant must demonstrate that any reduced speed margin based on the high-speed protection system will not be exceeded in inadvertent or gust induced upsets resulting in initiation of the dive from non-symmetric attitudes; or that the airplane is protected by the flight control laws from getting into non-symmetric upset conditions. The applicant must

conduct a demonstration that includes a comprehensive set of conditions as described below.

A special condition in lieu of § 25.335(b)(1). Section 25.335(b)(2), which also addresses the design dive speed, will be applied for separately. Advisory Circular 25.335-1A, "Design Dive Speed," dated September 29, 2000, provides an acceptable means of compliance to § 25.335(b)(2).

The 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.

Discussion of Comments

The FAA issued Notice of Proposed Special Conditions No. 25-24-06-SC for the Gulfstream Model GVII-G400 airplane, which was published in the *Federal Register* on February 4, 2025 (90 FR 8912).

The FAA received a response from one individual commenter in the form of a question. The comment was outside the scope of these special conditions.

Applicability

As discussed above, these special conditions are applicable to the Gulfstream Model GVII-G400 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 of airplane. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Authority Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(f), 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 the Gulfstream Model GVII-G400 airplane.

(1) In lieu of compliance with § 25.335(b)(1), if the flight control system includes functions that act automatically to initiate recovery before the end of the 20 second period specified in § 25.335(b)(1), V_D/M_D must be determined from the greater of the speeds resulting from conditions (a) and (b) below. The speed increase occurring in these maneuvers may be calculated if the analysis method and the data used are shown to be reliable. If any non-overridable automatic feature is included in the high-speed protection system (e.g., automatic power reduction or automatic application of drag devices), normal operation of these features may be assumed in the maneuvers of (a) and (b).

(a) From an initial condition of stabilized flight at V_C/M_C, the airplane is upset so as to take up a new flight path 7.5 degrees below the initial path. Pilot pitch control application, up to full authority, is made to try to achieve and maintain this new flight path. Twenty seconds after achieving the new flight path at or above V_C/M_C or twenty seconds after reaching full control input at or above V_C/M_C, whichever occurs first, manual recovery is made at a load factor of 1.5 g (0.5 g acceleration increment), or such greater load factor that is automatically applied by the system with the pilot's pitch control neutral. Initial power setting, as specified in § 25.175(b)(1)(iv), is assumed. Pilot reduction of power and/or use of drag devices must be delayed until recovery is initiated.

(b) From any likely level cruise speed up to V_C/M_C, with the longitudinal trim and power set to maintain stabilized level flight at this speed, the airplane is upset so as to

accelerate through V_C/M_C at a flight path 15 degrees below the initial path (or at the steepest nose down attitude that the system will permit with full pitch control input if less than 15 degrees). The pilot's controls may be in the neutral position after reaching V_C/M_C and before recovery is initiated. Recovery may be initiated three seconds after operation of the high-speed warning device or immediately upon reaching V_C/M_C (whichever is higher) by application of a load factor of 1.5 g (0.5 g acceleration increment), or such greater load factor that is automatically applied by the system with the pilot's pitch control neutral; power may be reduced simultaneously if not already automatically reduced by the high-speed protection system. All other means of decelerating the airplane, the use of which are authorized up to the highest speed reached in the maneuver, may be used. The interval between successive pilot actions must not be less than one second.

(2) Any failure of the high-speed protection system that would affect the speed margin determined by paragraph (1) must be improbable (occur at a rate less than 10-5 per flight hour).

(3) Failures of the system must be annunciated to the pilots, and flight manual instructions must be provided to reduce the maximum operating speeds, V_{MO}/M_{MO}. The operating speed must be reduced to a value that maintains a speed margin between the reduced V_{MO}/M_{MO} and the lesser of V_{DF}/M_{DF} or V_D/M_D that is consistent with the margin determined from paragraph (1)(a) and § 25.335(b)(2) without the benefit of the high-speed protection system.

(4) Master minimum equipment list (MMEL) relief for the high-speed protection system may be considered by the FAA Flight Operations Evaluation Board (FOEB) provided that the flight manual instructions indicate reduced maximum operating speeds as described in paragraph (3), and that no additional hazards are introduced with the high-speed protection system inoperative. In addition, the cockpit display of the reduced

operating speeds, as well as the overspeed warning for exceeding those speeds, must be equivalent to that of the normal airplane with the high-speed protection system operative.

Issued in in Kansas City, Missouri, on August 21, 2025.

Patrick R. Mullen,
Manager, Technical Policy Branch,
Policy and Standards Division,
Aircraft Certification Service.
[FR Doc. 2025-16358 Filed: 8/26/2025 8:45 am; Publication Date: 8/27/2025]