

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. CE254; Special Conditions No. 23-194-SC]

Special Conditions: Aviation Technology Group (ATG), Inc.; Javelin Model 100 Series Airplane; Acrobatic Spins.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Aviation Technology Group (ATG) Javelin Model 100 Series airplane. This airplane will have a novel or unusual design feature(s) associated with acrobatic spin recovery requirements. 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.

EFFECTIVE DATE: May 29, 2007

FOR FURTHER INFORMATION CONTACT: Lowell Foster, Federal Aviation Administration, Aircraft Certification Service, Small Airplane Directorate, ACE-111, 901 Locust, Room 301, Kansas City, Missouri, 816-329-4125, fax 816- 329-4090.

SUPPLEMENTARY INFORMATION:

Background

On February 15, 2005, Aviation Technology Group (ATG); 8001 South InterPort Boulevard, Suite 310; Englewood, Colorado 80112-5951, applied for a type certificate for their new Model

100 airplane. ATG seeks certification of the Javelin in both utility and acrobatic categories. The preliminary design includes the following features:

- Two-place, tandem configuration
- Maximum takeoff weight of approximately 6,900 pounds
- Design cruise speed of 500 knots calibrated airspeed
- Two Williams FJ33-4A-18M turbofan engines with dual channel FADEC controls
- Major airframe components constructed of carbon fiber composite materials
- Hydraulically boosted flight control system with floor-mounted control sticks
- Integrated avionics including electronic displays, autopilot, and flight management system

Title 14 CFR part 23, § 23.221 contains spin requirements for normal, utility, and acrobatic category airplanes. When part 3 of the Civil Air Regulations was recodified in 1965 as 14 CFR part 23, spin requirements for acrobatic category airplanes were presented in § 23.221(c). Since 1965, the spin requirements in § 23.221(c) have been amended three times.

The original version of § 23.221(c) required an acrobatic category airplane to perform spins of at least six turns and recover without exceeding an airspeed limit or positive load factor limit. Spins were required for flaps-up configuration and flaps-down configuration. In addition, the airplane could not enter an uncontrollable spin with any use of the controls.

Amendment 23-7 revised the presentation of the acrobatic category spin requirements and revised the minimum turn requirement to six turns or three seconds, whichever takes longer. Amendment 23-42 revised § 23.221(c)(3) and clarified the term “controls” in the previous version of the rule by identifying flight controls and engine controls. It also clarified that the use

of the controls could be at spin entry or during the spin. Neither of these two amendments changed the basic acrobatic category spin requirements.

In July 1994, the FAA proposed changes to the flight airworthiness standards for normal, utility, acrobatic, and commuter category airplanes. The proposals arose from the joint effort of the FAA and the European Joint Aviation Authorities (JAA) to harmonize 14 CFR regulations and the Joint Aviation Requirements (JAR). The proposed changes were intended to provide nearly uniform flight airworthiness standards for airplanes certificated in the United States under 14 CFR part 23 and in the JAA countries under JAR 23.

Proposed changes to the introductory paragraph of § 23.221(c) required acrobatic category airplanes to meet the one-turn spin requirements of § 23.221(a) as well as the emergency egress requirements of § 23.807, and to meet the spin requirements of §§ 23.221(c)(1) through (4) in each configuration approved for spins. The addition of normal category spin requirements was necessary because acrobatic category airplanes should have sufficient controllability to recover from the developing one-turn spin under the same conditions as normal category airplanes. The configuration requirement was added to recognize the common practice of approving intentional spins only for a specific configuration (e.g, gear and flaps up). The proposed changes were incorporated into the rule by Amendment 23-50.

The FAA did not intend to approve an acrobatic category airplane that met only the normal category spin requirements. The assumption has always been that an inadvertent spin could result during the performance of a variety of acrobatic maneuvers.

Type Certification Basis

Under the provisions of 14 CFR part 21, § 21.17, ATG must show that the Model 100 meets the applicable provisions of part 23, as amended by Amendment 23-1 through 23-55 thereto. If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 23) do not contain adequate or appropriate safety standards for the ATG Model 100 series because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions, as appropriate, as defined in § 11.19, are issued in accordance with § 11.38, and become part of the type certification basis in accordance with § 21.17.

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, the special conditions would also apply to the other model under the provisions of § 21.101.

Novel or Unusual Design Features

The ATG Model 100 will incorporate the following novel or unusual design features: High thrust-to-weight ratio, military training jet configuration with a higher fuselage mass compared to typical part 23 acrobatic airplanes.

Discussion

Title 14 CFR part 23, § 23.221(c), as amended by Amendment 23-50, presents acrobatic category airplane spin requirements. As the rule is currently written, the acrobatic category airplane must comply with normal category spin requirements, acrobatic category emergency egress requirements in § 23.807, and acrobatic spin requirements for each configuration requested for spin approval.

ATG proposes to prohibit intentional spins and requests that no configuration be approved for spins. This proposal appears to allow an acrobatic category airplane that meets only normal category spin requirements. This proposal is unacceptable since the FAA has always maintained that an acrobatic category airplane must comply with acrobatic category spin requirements.

Discussion of Comments

A notice of proposed special conditions No. 23-06-06-SC for the Aviation Technology Group (ATG), Inc.; Javelin Model 100 series airplanes was published in the Federal Register on February 1, 2007 (72 FR 4661). No comments were received, and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Aviation Technology Group (ATG), Inc.; Javelin Model 100 Series airplane. Should Aviation Technology Group apply at a later date for a change to the type certificate to include another model on the same type certificate incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

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

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704; 14 CFR 21.16 and 21.17 and 14 CFR 11.38 and 11.19.

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 ATG Model 100 airplanes.

Title 14 CFR part 23, § 23.221(c) as amended by Amendment 23-50, presents acrobatic category airplane spin requirements. As the rule is currently written, the acrobatic category airplane must comply with normal category spin requirements, acrobatic category emergency egress requirements in § 23.807, and acrobatic spin requirements for each configuration requested for spin approval.

ATG proposes to prohibit intentional spins and requests that no configuration be approved for spins. This proposal leads to an acrobatic category airplane that meets only normal category spin requirements. This proposal is unacceptable since the FAA has always maintained that an acrobatic category airplane must comply with acrobatic category spin requirements despite the wording in the current rule. The rule's history coupled with preamble information for Amendment 23-50 reveals that the rule was changed to add the normal category spin requirements and to accommodate an applicant's desire to comply with the acrobatic spin requirements for at least one configuration, but not necessarily all configurations.

Since the wording of the current rule combined with ATG's proposal does not provide the level of safety envisioned for an acrobatic category airplane, the FAA adopts the following

special condition under the authority of 14 CFR part 21, § 21.16 to replace § 23.221(c) in its entirety:

SC 23.221 Spinning.

(c) *Acrobatic category airplanes.* An acrobatic category airplane must meet the spin requirements of paragraph (a) of this section and § 23.807(b)(6). In addition, the following requirements must be met in an applicant-designated acrobatic configuration, and in each other configuration for which approval for spinning is requested:

(1) The airplane must recover from any point in a spin up to and including six turns, or any greater number of turns for which certification is requested, in not more than one and one-half additional turns after initiation of the first control action for recovery. However, beyond three turns, the spin may be discontinued if spiral characteristics appear.

(2) The applicable airspeed limits and limit maneuvering load factors must not be exceeded. For flaps extended configurations for which approval is requested, the flaps must not be retracted during the recovery.

(3) It must be impossible to obtain unrecoverable spins with any use of the flight or engine power controls either at the entry into or during the spin.

(4) There must be no characteristics during the spin (such as excessive rates of rotation or extreme oscillatory motion) that might prevent a successful recovery due to disorientation or incapacitation of the pilot.

(5) If the applicant demonstrates that it is impossible for the airplane in the applicant-designated acrobatic configuration, and in each other configuration for which approval for

spinning is requested, to enter a spin with any use of the flight or engine power controls, either at or after entry into the stall maneuver, the airplane is considered to meet the requirements of paragraph (c)(1) of this SC. The demonstration must be conducted in accordance with the following—

(i) Reduce the airplane speed using pitch control at a rate of approximately 1 knot per second until the pitch control reaches the stop; then, with the pitch control pulled back and held against the stop, apply full rudder control in a manner to promote spin entry for a period of 7 seconds or through a 360 degree heading change, whichever occurs first. If the 360 degree heading change is reached first, it must have taken no fewer than 4 seconds. This maneuver must be performed first with the ailerons in the neutral position, and then with the ailerons deflected opposite the direction of turn in the most adverse manner.

(ii) Power must be set in accordance with § 23.201(e)(4) without change during the maneuver. At the end of 7 seconds or a 360 degree heading change, the airplane must respond immediately and normally to primary flight controls applied to regain coordinated, unstalled flight without reversal of control effect and without exceeding the temporary control forces specified by § 23.143(c).

We believe that the above special condition, which replaces § 23.221(c) in its entirety, provides the level of safety established for a part 23 airplane certificated in the acrobatic category.

Issued in Kansas City, Missouri on May 29, 2007

s/

David R. Showers
Acting Manager, Small Airplane Directorate
Aircraft Certification Service