[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2014-0067; Special Conditions No. 25-556-SC]

Special Conditions: Learjet Inc., Model LJ-200-1A10 Airplane; Composite Fuselage In-Flight Fire/Flammability Resistance

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the Learjet Inc. Model LJ-200-1A10 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. The fuselage of the Model LJ-200-1A10 will be made of composite materials rather than conventional aluminum, which may affect fire propagation during an in-flight fire. 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: [Insert date 30 days after date of publication in the Federal Register].

FOR FURTHER INFORMATION CONTACT: Alan Sinclair, FAA, Airframe and Cabin Safety Branch, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98057-3356; telephone 425-227-2195; facsimile 425-227-1232.

SUPPLEMENTARY INFORMATION:

Background

On February 9, 2009, Learjet Inc. applied for a type certificate for their new Model LJ-200-1A10 airplane (hereafter referred to as the "Model LJ-200"). The Model LJ-200 is a business class airplane powered by two high-bypass turbine engines with an estimated maximum takeoff weight of 35,550 pounds and an interior configuration for up to 10 passengers.

The Model LJ-200 is the first composite fuselage airplane design manufactured by Learjet Inc. A fuselage manufactured from composite material is considered a novel or unusual design with respect to existing regulations for this type of aircraft. The performance of aircraft consisting of a conventional aluminum fuselage in an inaccessible in-flight fire scenario is understood based on service history and extensive intermediate and large-scale fire testing. The fuselage itself does not contribute to in-flight fire propagation. This may not be the case for an all-composite fuselage. The existing regulations do not adequately address protection against an in-flight fire for an all-composite fuselage. These special conditions are necessary to ensure a level of safety equivalent to that provided by existing regulations.

Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.17, Learjet Inc. must show that the Model LJ-200 airplane meets the applicable provisions of part 25, as amended by Amendments 25-1 through 25-127, and 14 CFR part 26, as amended by Amendment 26-1 through 26-2.

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 LJ-200 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, the Model LJ-200 airplane 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, and 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 LJ-200 airplane will incorporate the following novel or unusual design features: The fuselage will be fabricated using composite materials instead of conventional aluminum.

Discussion

The Model LJ-200 airplane will make extensive use of composite materials in the fabrication of the majority of the wing, fuselage skin, stringers, spars, and most other structural elements of all major sub-assemblies of the airplane. Despite the major change from aluminum to composite material for the fuselage, the Model LJ-200 airplane must have in-flight

survivability such that the composite fuselage does not propagate a fire. A methodology for assessing the in-flight fire survivability of an all-composite fuselage is therefore needed.

The FAA believes that one way to assess the survivability within the cabin of the Model LJ-200 airplane is to conduct large-scale tests. These large-scale tests would use a mock-up of a Model LJ-200 airplane fuselage skin/structure section of sufficient size to assess any tendency for fire propagation. The fire threat used to represent the realistic ignition source in the airplane would consist of a 4″ x 4″ x 9″ polyurethane foam block and 10 ml of Heptane. This ignition source provides approximately three minutes of flame time and would be positioned at various points and orientations within the mocked up installation to impinge on those areas of the fuselage considered to be most crucial.

This fire threat was established based on an assessment of a range of potential ignition sources, coupled with possible contamination of materials. The FAA considers this a severe fire threat, encompassing a variety of scenarios. However, should ignition or fire sources of a greater severity be identified, these special conditions or the method of compliance would need to be modified in order to take the more severe threat into account.

Despite the major change from aluminum to composite material for the fuselage, the Model LJ-200 must have in-flight fire survivability such that the composite fuselage is no worse than that of a similar aluminum structure.

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.

Discussion of Comments

Notice of proposed special conditions No. 25-14-01-SC for the Learjet Inc. Model LJ-200-1A10 airplane was published in the Federal Register on February 7, 2014 (79 FR 7406). No comments were received, and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions are applicable to the Model LJ-200 airplane. Should Learjet Inc. apply at a later date for a change to the type certificate to include another model 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 of airplanes. 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 Learjet Inc. Model LJ-200-1A10 airplane.

Composite Fuselage In-Flight Fire/Flammability Resistance. The Learjet Inc. Model LJ-200 composite fuselage structure must be shown to be resistant to flame propagation under

the fire threat used to develop § 25.856(a). If products of combustion are observed beyond the test heat source, they must be evaluated and found acceptable.

Issued in Renton, Washington, on June 6, 2014.

Jeffrey E. Duven
Manager, Transport Airplane Directorate
Aircraft Certification Service

[FR Doc. 2014-17518 Filed 07/24/2014 at 8:45 am; Publication Date: 07/25/2014]