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 7–24–14; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2013–0904; Special Conditions No. 25–542–SC]

Special Conditions: Airbus Model A350–900 Series Airplane; Electronic Flight-Control System: Lateral-Directional and Longitudinal Stability, and Low-Energy Awareness

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for Airbus Model A350–900 series airplanes. These airplanes will

have a novel or unusual design feature associated with lateral-directional and longitudinal stability, and low-energy awareness. 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 Date:* August 25, 2014.

FOR FURTHER INFORMATION CONTACT: Joe Jacobsen, FAA, Airplane and Flightcrew Interface Branch, ANM–111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98057–3356; telephone (425) 227–2011; facsimile (425) 227–1320.

SUPPLEMENTARY INFORMATION:

Background

On August 25, 2008, Airbus applied for a type certificate for their new Model A350–900 series airplane. Later, Airbus requested, and the FAA approved, an extension to the application for FAA type certification to November 15, 2009. The Model A350–900 series airplane has a conventional layout with twin wing-mounted Rolls-Royce Trent XWB engines. It features a twin-aisle, 9-abreast, economy-class layout, and accommodates side-by-side placement of LD–3 containers in the cargo compartment. The basic Model A350–900 airplane configuration accommodates 315 passengers in a standard two-class arrangement. The design cruise speed is Mach 0.85 with a maximum take-off weight of 602,000 lbs.

Lateral-Directional Static Stability

The electronic flight-control system (EFCS) on the A350 airplane, like its predecessors the A320, A330, A340, and A380 airplanes, contains fly-by-wire control laws that can result in neutral lateral-directional static stability; therefore, the conventional requirements in the regulations are not met.

Positive static directional stability is defined as the tendency to recover from a skid with the rudder free. Positive static lateral stability is defined as the tendency to raise the low wing in a sideslip with the aileron controls free. These control criteria are intended to accomplish the following:

1. Provide additional cues of inadvertent sideslips and skids through control-force changes.
2. Ensure that short periods of unattended operation do not result in any significant changes in yaw or bank angle.
3. Provide predictable roll and yaw response.
4. Provide an acceptable level of pilot attention (workload) to attain and maintain a coordinated turn.

The Flight Test Harmonization Working Group has recommended a rule and advisory-material change for § 25.177, static lateral-directional stability. This harmonized text will form the basis for these special conditions.

Longitudinal Static Stability

Static longitudinal stability on airplanes with mechanical links to the pitch-control surface means that a pull force on the controller will result in a reduction in speed relative to the trim speed, and a push force will result in a higher speed than the trim speed. Longitudinal stability is required by the regulations for the following reasons:

1. Speed-change cues are provided to the pilot through increased and decreased forces on the controller.
2. Short periods of unattended control of the airplane do not result in significant changes in attitude, airspeed, or load factor.
3. A predictable pitch response is provided to the pilot.
4. An acceptable level of pilot attention (workload) to attain and maintain trim speed and altitude is provided to the pilot.
5. Longitudinal stability provides gust stability.

The pitch-control movement of the sidestick on the A350 airplane is designed to be a normal load factor or ''g'' command that results in an initial movement of the elevator surface to attain the commanded load factor, which is then followed by integrated movement of the stabilizer and elevator to automatically trim the airplane to a neutral, 1g, stick-free stability. The flight path commanded by the initial sidestick input will remain stick-free until the pilot provides another command. This control function is applied during ''normal'' control law within the speed range from initiation of the angle-of-attack protection limit, $V_{\alpha prot}$, to V_{MO}/M_{MO}. Once outside this speed range, the control laws introduce the conventional longitudinal static stability as described above.

As a result of neutral static stability, the A350 airplane does not meet the requirements of 14 CFR part 25 for static longitudinal stability.

Low Energy Awareness

Past experience on airplanes fitted with a flight-control system providing neutral longitudinal stability shows insufficient feedback cues to the pilot of excursion below normal operational speeds. The maximum-angle-of-attack protection system limits the airplane angle of attack and prevents stall during normal operating speeds, but this system is not sufficient to prevent stall at low-speed excursions below normal operational speeds. Until intervention, the pilot has no stability cues because the aircraft remains trimmed. Additionally, feedback from the pitching moment, due to thrust variation, is reduced by the flight-control laws. Recovery from a low-speed excursion may become hazardous when the low-speed situation is associated with a low altitude, and with the engines at low thrust or with performance-limiting conditions.

Type Certification Basis

Under Title 14, Code of Federal Regulations (14 CFR) 21.17, Airbus must show that the Model A350–900 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 A350–900 series airplane because of a novel or unusual design feature, special conditions are prescribed under § 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 A350–900 series 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. 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, under § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The Airbus Model A350–900 series airplane will incorporate the following novel or unusual design features: A flight-control design feature within the normal operational envelope in which sidestick deflection in the roll axis commands roll rate; an operational design that does not comply with the static longitudinal stability requirements of §§ 25.171, 25.173, and 25.175; and a low-energy state where recovery may become hazardous when associated with both a low altitude and performance-limiting conditions.

Discussion

In the absence of positive lateral stability, the curve of lateral control-surface deflections against sideslip angle should be in a conventional sense, and reasonably in harmony with rudder deflection during steady-heading sideslip maneuvers.

Since conventional relationships between stick forces and control-surface displacements do not apply to the ''load-factor command'' flight-control system on the A350 airplane, longitudinal stability characteristics should be evaluated by assessing the airplane's handling qualities during simulator and flight-test maneuvers appropriate to operation of the airplane. Airbus may accomplish this by using the Handling Qualities Rating Method presented in Appendix 5 of the *Flight Test Guide,* AC 25–7C, or an acceptable alternative method. Important considerations are as follows:

a. Adequate speed control without excessive pilot workload,

b. Acceptable high- and low-speed protection, and

c. Provision for adequate cues to the pilot of significant speed excursions beyond V_{MO}/M_{MO}, and low-speed-awareness flight conditions.

The airplane should provide adequate awareness cues to the pilot of a low-energy (low speed/low thrust/low height) state to ensure that the airplane retains sufficient energy to recover when flight-control laws provide neutral longitudinal stability significantly below the normal operating speeds. This may be accomplished as follows:

a. Adequate low-speed/low-thrust cues at low altitude may be provided by a strong, positive, static, stability force gradient (1 pound per 6 knots applied through the sidestick), or

b. The low-energy awareness may be provided by an appropriate warning with the following characteristics:

i. It should be unique, unambiguous, and unmistakable.

ii. It should be active at appropriate altitudes and in appropriate configurations (i.e., at low altitude, in the approach and landing configurations).

iii. It should be sufficiently timely to allow recovery to a stabilized flight condition inside the normal flight envelope, while maintaining the desired flight path and without entering the flight controls angle-of-attack protection mode.

iv. It should not be triggered during normal operation, including operation in moderate turbulence for recommended maneuvers at recommended speeds.

v. It should not be cancelable by the pilot other than by achieving a higher-energy state.

vi. There should be an adequate hierarchy among the various warnings so that the pilot is not confused and led to take inappropriate recovery action if multiple warnings occur.

Global energy awareness and non-nuisance of low-energy cues should be evaluated by simulator and flight tests in the whole take-off and landing altitude range for which certification is requested. This would include all relevant combinations of weight, center-of-gravity position, configuration, airbrakes position, and available thrust, including reduced and de-rated take-off thrust operations and engine-failure cases. A sufficient number of tests should be conducted, allowing the level of energy awareness and the effects of energy-management errors to be assessed.

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. 25–13–14–SC for Airbus Model A350–900 series airplanes was published in the **Federal Register** on January 14, 2014 (79 FR 2384). No comments were received, and the special conditions are adopted as proposed.

Applicability

As discussed above, these special conditions apply to Airbus Model A350–900 series airplanes. Should Airbus apply later 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 the Airbus Model A350–900 series 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 Airbus Model A350–900 series airplanes.

(1) Electronic Flight-Control System: Lateral-Directional and Longitudinal Stability, and Low-Energy Awareness. In lieu of the requirements of §§ 25.171, 25.173, 25.175 and 25.177, the following special conditions apply:

(a) The airplane must be shown to have suitable static lateral, directional, and longitudinal stability in any condition normally encountered in service, including the effects of atmospheric disturbance. The showing of suitable static lateral, directional, and longitudinal stability must be based on the airplane handling qualities, including pilot workload and pilot compensation, for specific test procedures during the flight-test evaluations.

(b) The airplane must provide adequate awareness to the pilot of a low-energy (low speed/low thrust/low height) state when fitted with flight-control laws presenting neutral longitudinal stability significantly below the normal operating speeds. ''Adequate awareness'' means warning information must be provided to alert the crew of unsafe operating conditions and to enable them to take appropriate corrective action.

(c) The static directional stability (as shown by the tendency to recover from a skid with the rudder free) must be positive for any landing gear and flap position, and symmetrical power condition, at speeds from 1.13 V_{SR1}, up to V_{FE}, V_{LE}, or V_{FC}/M_{FC} (as appropriate).

(d) The static lateral stability (as shown by the tendency to raise the low wing in a sideslip with the aileron controls free) for any landing gear and wing-flap position, and symmetric power condition, may not be negative at any airspeed (except that speeds higher than V_{FE} need not be considered for wing-flaps-extended configurations, nor speeds higher than V_{LE} for landing-gear-extended configurations) in the following airspeed ranges:

(i) From 1.13 V_{SR1} to V_{MO}/M_{MO}.

(ii) From V_{MO}/M_{MO} to V_{FC}/M_{FC}, unless the divergence is –

(1) Gradual;

(2) Easily recognizable by the pilot; and

(3) Easily controllable by the pilot.

(e) In straight, steady sideslips over the range of sideslip angles appropriate to the operation of the airplane, but not less than those obtained with one-half of the available rudder-control movement (but not exceeding a rudder-control force of 180 pounds), rudder-control movements and forces must be substantially proportional to the angle of sideslip in a stable sense; and the factor of proportionality must lie between limits found necessary for safe operation. This requirement must be met for the configurations and speeds specified in paragraph (c) of this section.

(f) For sideslip angles greater than those prescribed by paragraph (e) of this section, up to the angle at which full rudder control is used or a rudder-control force of 180 pounds is obtained, the rudder-control forces may not reverse, and increased rudder deflection must be needed for increased angles of sideslip. Compliance with this requirement must be shown using straight, steady sideslips, unless full lateral-control input is achieved before reaching either full rudder-control input or a rudder-control force of 180 pounds; a straight, steady sideslip need not be maintained after achieving full lateral-control input.

This requirement must be met at all approved landing-gear and wing-flap positions for the range of operating speeds and power conditions appropriate to each landing-gear and wing-flap position with all engines operating.

Issued in Renton, Washington, on July 9, 2014.

Jeffrey E. Duven,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 2014–17575 Filed 7–24–14; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2013–0911; Special Conditions No. 25–539–SC]

Special Conditions: Airbus Model A350–900 Airplanes; Lateral-Trim Function Through Differential Flap Setting

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for Airbus Model A350–900 airplanes. These airplanes will have a novel or unusual design feature associated with a lateral-trim function that deploys flaps asymmetrically for airplane lateral-trim control. This function replaces the traditional method of providing airplane lateral trim over a small range through flap and aileron mechanical rigging. 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 Date:* August 25, 2014.

FOR FURTHER INFORMATION CONTACT: Robert C. Jones, FAA, Propulsion and Mechanical Systems, ANM–112, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98057–3356; telephone (425) 227–1234; facsimile (425) 227–1320.

SUPPLEMENTARY INFORMATION:

Background

On August 25, 2008, Airbus applied for a type certificate for their new Model A350–900 airplane. Later, Airbus requested, and the FAA approved, an extension to the application for FAA type certification to November 15, 2009. The Model A350–900 airplane has a conventional layout with twin wing-mounted Rolls-Royce Trent XWB engines. It features a twin-aisle, 9-abreast, economy-class layout, and accommodates side-by-side placement of LD–3 containers in the cargo compartment. The basic Model A350–900 airplane configuration accommodates 315 passengers in a standard two-class arrangement. The design cruise speed is Mach 0.85 with a maximum take-off weight of 602,000 lbs.

On conventional airplanes, small, lateral, airplane asymmetries typically have been addressed through flap and aileron rigging (e.g., using shims). On Model A350–900 airplanes, an order for asymmetric flap deployment will be computed by the primary flight-control system as a function of the aileron position. The current airworthiness standards do not contain adequate safety standards for asymmetric use of the flaps for Airbus Model A350–900 airplanes. Special conditions are needed to account for the aspects of a function used to command an intended flap asymmetry. The lateral-trim function is intended to be performed once during climb and once during cruise to compensate for airplane small lateral asymmetries.

The lateral-trim function is not a trim-control system in the conventional sense as it has no pilot interface and is not governed by Title 14, Code of Federal Regulations (14 CFR) 25.677. Some fly-by-wire airplanes have no pilot-operated lateral trim at all. The lateral-trim function is simply an additional fly-by-wire flight-control function that nulls small roll asymmetries in certain flight phases with small, asymmetric flap deployments. Although the function operates under normal conditions within the small range of the traditional rigging, failure cases may result in a significant out-of-range asymmetric flap condition. An asymmetry threshold protects the system against excessive flap asymmetry.

Type Certification Basis

Under 14 CFR 21.17, Airbus must show that the Model A350–900 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 A350–900 airplane because of a novel or unusual design feature, special conditions are prescribed under § 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, 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 A350–900 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. 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, under § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The Airbus Model A350–900 airplane incorporates the following novel or unusual design features: The asymmetric use of flaps to address lateral trim, which is not adequately addressed by § 25.701.