

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM435; Special Conditions No. 25-413-SC]

Special Conditions: Bombardier Inc. Model CL-600-2E25 airplane, Operation Without Normal Electrical Power.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Bombardier Inc. Model CL-600-2E25 airplane. This airplane will have a novel or unusual design feature associated with a command-by-wire (CBW) rudder-control system, which requires a source of continuous electrical power to operate the control system. The current 14 CFR part 25.1351(d), "Operation without normal electrical power," requires safe operation in VFR conditions for at least five minutes with inoperative normal electrical power. 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: The effective date of these special conditions is November 5, 2010. We must receive your comments by January 3, 2011.

ADDRESSES: You must mail two copies of your comments to: Federal Aviation Administration, Transport Airplane Directorate, Attn: Rules Docket (ANM-113), Docket No. NM435, 1601 Lind Avenue SW., Renton, Washington, 98057-3356. You may deliver two copies

to the Transport Airplane Directorate at the above address. You must mark your comments :
Docket No. NM435 You can inspect comments in the Rules Docket weekdays, except Federal
holidays, between 7:30 a.m. and 4:00 p.m.

FOR FURTHER INFORMATION CONTACT: Steve Slotte, ANM-111, Transport Airplane
Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98057-
3356; telephone (425) 227-2315; facsimile (425) 227-1149.

SUPPLEMENTARY INFORMATION:

The FAA has determined that notice of, and opportunity for prior public comment on,
these special conditions are impracticable because these procedures would significantly delay
issuance of the design approval and thus delivery of the affected aircraft. In addition, the
substance of these special conditions has been subject to the public-comment process in several
prior instances with no substantive comments received. The FAA therefore finds that good cause
exists for making these special conditions effective upon issuance.

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments,
data, or views. The most helpful comments reference a specific portion of the special conditions,
explain the reason for any recommended change, and include supporting data. We ask that you
send us two copies of written comments.

We will file in the docket all comments we receive, as well as a report summarizing each
substantive public contact with FAA personnel concerning these special conditions. You can
inspect the docket before and after the comment closing date. If you wish to review the docket in
person, go to the address in the ADDRESSES section of this preamble between 7:30 a.m. and
4:00 p.m., Monday through Friday, except Federal holidays.

We will consider all comments we receive on or before the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change these special conditions based on the comments we receive.

If you want us to acknowledge receipt of your comments on these special conditions, include with your comments a self-addressed, stamped postcard on which you have written the docket number. We will stamp the date on the postcard and mail it back to you.

Background

On February 28, 2007, Bombardier Inc. applied for an amendment to Type Certificate No. A21EA, through Transport Canada, to include the new Model CL-600-2E25 airplane. The CL-600-2E25, which is a derivative of the CL-600-2D24 currently approved under Type Certificate No. A21EA, is to be certified for a maximum occupancy of 110 people, including 5 crewmembers. The CL-600-2E25 has increased gross weight, extended wing tip, and increased fuselage length to accommodate the additional passengers as compared to the CL-600-2D24.

The CL-600-2E25 will have a CBW rudder-control system that will affect the performance of the airplane. This system requires a continuous source of electrical power to maintain an operable control system.

Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.101, Bombardier Inc. must show that the Model CL-600-2E25 airplane meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-119, except for earlier amendments as agreed upon by the FAA. These regulations will be incorporated into Type Certificate No. A21EA after type-certification approval of the Model CL-600-2E25. The regulations incorporated by reference in the type certificate are commonly referred to as the

“original type-certification basis.” The regulations incorporated by reference in Type Certificate No. A21EA are as follows:

The original type-certification basis for the Model CL-600-2D24 (CRJ 900), shown on TCDS A21EA, Revision 25, and reprinted below.

Model CL-600-2D15/CL-600-2D24

Part 25, including Amendments 25-1 through 25-86, Amendments 25-88 through Amendments 25-90, and Amendments 25-92 through 25-98 with the following exceptions:

- Section 25.783(f) at Amendment 25-23 shall replace § 25.783(f) at Amendment 25-88 for the Aft Cargo Compartment and Main Avionics Bay Doors only (common doors with CL- 600-2C10 (CRJ-700));
- Section 25.807(d)(6) at Amendment 25-72 shall replace § 25.807(h) at Amendment 25-94;
- Sections 25.365, 25.831(a), and 25.1447(c) at Amendment 25-87. Part 25, Amendment 25-91, is not included in the type-certification basis.

Additional FAA Requirements for Model CL-600-2D15/CL-600-2D24

1. 14 CFR part 36, effective September 10, 1990, and including all amendments effective on the date of type certification.
2. 14 CFR part 34, effective September 10, 1990, and including all amendments effective on the date of type certification.
3. Special Conditions:
 - a) *High Intensity Radiated Fields*, No. 25-ANM-109, dated October 31, 1995.
 - b) *Go-around Performance Credit for Use of Automatic Power Reserve (APR)*, No. 25-167-SC, dated October 24, 2000 (same as CL-600-2C10).

- c) *Sudden Engine Stoppage*, No. 25-217-SC, dated October 04, 2002.
- d) *Passenger Seats with Non-traditional, Large, Non-metallic Panels*, No. 25-384-SC, dated August 12, 2009.

4. Exemptions: Exemption No. 7447, hydraulic-systems testing per 14 CFR 25.1435(b)(1).

Equivalent safety has been established for the following requirements:

CL-600-2D15/CL-600-2D24

- 1. Section 25.103 and others, *Reduced Minimum Operating Speed Factors*.
- 2. Section 25.811(d)(2), *Main Door Exit Marking Sign*.
- 3. Section 25.813(c)(2)(i), *Emergency Exit Access*.
- 4. Section 25.904, *Performance Credit for Use of APR During Reduced Thrust Takeoff*.
- 5. Section 25.933(a)(1)(ii), *Thrust Reverser System*.
- 6. Section 25, appendix I, § 25.5(b)(4), *Lack of On/Off Switch for Automatic Takeoff Thrust Control System (ATTCS)*.
- 7. Section 25.841(b)(6), *High Altitude Takeoff and Landing Operations* documented in Transport Airplane Directorate ELOS Memo AT2587NY-T, dated January 31, 2007.

In addition, the certification basis includes other regulations, special conditions, and exemptions that are not relevant to these special conditions. Type Certificate No. A21EA will be updated to include a complete description of the certification basis for this airplane model.

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 CL-600-2E25 because of a novel or unusual design feature, special conditions are prescribed under the provisions of

14 CFR 21.16.

In addition to the applicable airworthiness regulations and special conditions, the CL-600-2E25 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 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 14 CFR 21.101.

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, or should any other model already included on the same type certificate be modified to incorporate the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

Novel or Unusual Design Features

The Bombardier Model CL-600-2E25 airplane will incorporate the following novel or unusual design features:

The CL-600-2E25 airplane will have a CBW rudder-control system that requires a continuous source of electrical power to maintain operability of the control system.

Discussion

The current 14 CFR 25.1351(d), “Operation without normal electrical power,” requires safe operation in VFR conditions for at least five minutes with inoperative normal power. This rule was premised on a traditional design utilizing mechanical control cables for flight control while the crew took time to sort out the electrical failure, start engine(s) if necessary, and re-establish some of the electrical-power-generation capability.

To maintain the same level of safety associated with traditional designs, the Bombardier

CL-600-2E25 design must not be time limited in its operation, including being without the normal source of engine- or Auxiliary Power Unit (APU)-generated electrical power. Service experience on other airplane models with similar electrical-power systems has shown that the loss of all electrical power, which is generated by the airplane's engine generators or APU, is not extremely improbable. Thus, it must be demonstrated that the airplane can continue through safe flight and landing (including steering and braking on ground for airplanes using steer/brake-by-wire) with the use of its emergency electrical-power systems. These emergency electrical-power systems must be able to power loads that are essential for continued safe flight and landing.

Applicability

As discussed above, these special conditions are applicable to the Model CL-600-2E25. Should Bombardier 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, these special conditions would apply to that model as well.

Conclusion

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

Under standard practice, the effective date of final special conditions would be 30 days after the date of publication in the Federal Register; however, as the certification date for the Model CL-600-2E25 airplane is imminent, the FAA finds that good cause exists to make these special conditions effective upon issuance.

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 Bombardier Model CL-600-2E25 airplanes modified according to DCA 0145-000-00020-2008/FAA (latest revision approved by the FAA).

To ensure that the total loss of electrical power is extremely improbable, and because the loss of all electrical power may be catastrophic to airplanes utilizing an Electronic Flight Control System, the following Special Condition is issued in lieu of § 25.1351(d):

It must be demonstrated by test, or combination of test and analysis, that the airplane can continue safe flight and landing with inoperative normal engine- and APU-generated electrical power (for example, without electrical power from any source, except for the battery and any other standby electrical sources). The airplane operation should be considered at the critical phase of flight and include the ability to restart the engines and maintain flight for the maximum diversion time capability being certified.

Issued in Renton, Washington, on November 5, 2010.

/s/

Jeffrey Duven
Acting Manager, Transport Airplane Directorate
Aircraft Certification Service