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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR part 25

[Docket No. NM178; Special Conditions No. 25–167–SC]

Special Conditions: Bombardier Model CL–600–2C10 Airplane; Automatic Takeoff Thrust Control System

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Bombardier Model CL–600–2C10 series airplanes. This new airplane will have a novel or unusual design feature associated with an Automatic Takeoff Thrust Control System (ATTCS). The applicable airworthiness regulations do not contain appropriate safety standards for approach climb performance using an ATTCS. These special conditions contain the additional safety standards 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 October 24, 2000.

Send your comments on or before December 18, 2000.

ADDRESSES: Mail your comments on these special conditions in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM–114), Docket No. NM178, 1601 Lind Avenue SW., Renton, Washington 98055–4056; or deliver them to the Transport Airplane Directorate at that address. You must mark your comments: Docket No. NM178. You may inspect all comments at that address on weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Gerry Lakin, FAA, Transport Airplane Directorate, Aircraft Certification Office, Standardization Branch, ANM–113, 1601 Lind Avenue SW., Renton, Washington, telephone (425) 227–1187; fax (425) 227–1149.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice and opportunity for prior public comment hereon are impracticable because those procedures would significantly delay issuance of the approval design 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

Interested persons are invited to submit such written data, views, or arguments, as they may desire. Communications should identify the regulatory docket or notice number and be submitted in duplicate to the address specified above. All communications received by the closing date for comments will be considered by the Administrator. These special conditions may be changed in light of the comments received. All comments received will be available in the Rules Docket for examination by interested persons, both before and after the closing date for comments. A report summarizing each substantive public contact with FAA personnel concerning this rulemaking will be filed in the docket. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a self-addressed, stamped postcard on which the following statement is made: ''Comments to Docket No. NM178.'' The postcard will be date stamped and returned to the commenter.

Background

On May 6, 1996, Bombardier Aerospace applied for an amendment to U.S. Type Certificate (TC) A21EA, through Transport Canada, to include the Bombardier Model CL600–2C10 series airplane (Regional Jet Series 700). The Model CL600–2C10 is a medium-sized transport category airplane powered by two General Electric Aircraft Engines (GEAE) CF34–8C1 turbofan engines mounted on the aft fuselage. Each engine can deliver up to 13,790 pounds of thrust at takeoff. The airplane will be capable of operating with 5 flight crewmembers and up to 78 passengers.

The Model CL600–2C10 will incorporate an unusual design feature to show compliance with the approach climb requirements of § 25.121(d) (''Climb: One-engine-inoperative''). This design feature is the Automatic Takeoff Thrust Control System (ATTCS), referred to by Bombardier as Automatic Power Reserve (APR). Appendix I to Title 14, Code of Federal Regulations (CFR), part 25, limits the application of performance credit for ATTCS to takeoff only. Since the airworthiness regulations do not contain appropriate safety standards for approach climb performance using ATTCS, special conditions are required to ensure a level of safety equivalent to that established in the regulations.

Type Certification Basis

Under the provisions of § 21.17 (''Designation of applicable regulations''), Bombardier must show that the Model CL600–2C10 meets the applicable provisions of:

- 14 CFR part 25, effective February 1, 1965, including amendments 25–1 through 25–86; and
- § 25.109 (''Accelerate-stop distance''), as amended by amendment 25–92.

The certification basis also may include later amendments to part 25 that are not relevant to these special conditions. In addition, the certification basis for the Model CL600–2C10 includes:

- 14 CFR part 34, effective September 10, 1990, including amendment 34–3, effective February 3, 1999, as well as any amendments in effect at the time of certification; and
- 14 CFR part 36, effective December 1, 1969, including amendments 36–1 through 36–22, and any following amendments that will be applicable on the date the type certificate is issued.

These special conditions form an additional part of the type certification basis. The certification basis also may include other special conditions that are not relevant to these specific special conditions.

If the Administrator finds that the applicable airworthiness regulations (in this case, part 25) do not contain adequate or appropriate safety standards for the Bombardier Model CL600–2C10 because of a novel or unusual design feature, the FAA may prescribe special conditions under the provisions of § 21.16 (''Special conditions''). The special conditions become part of the type certification basis in accordance with § 21.101(b)(2) (''Designation of applicable regulations'').

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, the special conditions would also apply to the other model under the provisions of § 21.101(a)(1).

Novel or Unusual Design Features

As stated previously, the Model CL600–2C10 will incorporate an unusual design feature, the ATTCS (referred to by Bombardier as APR), to show compliance with the approach climb requirements of § 25.121(d). The Model CL600–2C10 is powered by two GEAE CF34–8C1 turbofan engines mounted on the aft fuselage of the airplane, and equipped with Full Authority Digital Engine Controls (FADEC) that, in part, protect against exceeding engine limits. Further, the airplane incorporates a non-moving throttle system that functions by placing the throttle levers in detents for the takeoff and climb phases of flight; this allows the FADEC to schedule the power setting based on the phase of flight. With the APR and associated systems functioning normally as designed, all applicable requirements of part 25 will be met without requiring any action by the flight crew to increase power.

Automatic takeoff power control on the Model CL600–2C10 involves uptrimming the operating engine to maximum takeoff power (APR). These actions will be controlled by the FADEC. At takeoff, when the power levers are set to the Takeoff Go-Around (TOGA) detent, if there are no FADEC fault or failure messages displayed, the system is armed and APR will occur without any further action by the crew if an engine fails. During go-around, the uptrim is automatically armed.

Engine power is set to TOGA to initiate the takeoff roll. The value of TOGA for the current ambient conditions will be calculated and set by the FADEC. Following an engine failure during takeoff or go-around, the ATTCS will change the power reference on the operating engine to achieve the maximum takeoff power rating if the engine power was originally set to normal takeoff power. If the reduced power takeoff option is being used, the ATTCS will increase the power of the operating engine to the maximum takeoff rating, although the aircraft performance will be based on a 10% power increase only.

The engine operating limits (turbine temperature and N_1) for TOGA are set and displayed to the pilot when that rating is selected. These limits are set in such a way that the engine redline limits are not exceeded when an APR is engaged. When the maximum takeoff power rating is selected or triggered, the engine limits are reset automatically to reflect the engine redline limits.

The system is armed during all phases of the flight. The power levers will continue to function normally if the ATTCS should fail. Full takeoff power is available if the pilot elects to push the power levers past the takeoff power detent into the overtravel range.

Operations of all systems and equipment will be designed to function within the engine power range. Thrust increase from the initial to the maximum approved takeoff power level will be free of hazardous engine response characteristics.

The APR function, as described above, is part of the powerplant control system. The APR is always armed whenever power levers are above the idle detent. The system is verified before each flight via the FADEC built-in test feature. When the APR is triggered following an engine failure, an ''APR'' message will appear on the engine display.

The FADEC installed on the Model CL600–2C10 will ensure that inherent flight characteristics of the airplane do provide adequate warning if an engine failure occurs during takeoff. The natural yawing tendency of the airplane, coupled with flashing master warning and master caution lights, will provide the pilot with a clear indication of any engine failure during takeoff.

The part 25 standards for ATTCS, contained in § 25.904 (Automatic takeoff thrust control system (ATTCS)'') and Appendix I, specifically restrict performance credit for ATTCS to takeoff only. Expanding the scope of the standards to include other phases of flight, such as go-around, was considered at the time the standards were issued, but flight crew workload issues precluded further consideration. As stated in the preamble to amendment 25–62:

> ''In regard to ATTCS credit for approach climb and go-around maneuvers, current regulations preclude a higher thrust for the approach climb [§ 25.121(d)] than for the landing climb (§ 25.119). The workload required for the flightcrew to monitor and select from multiple in-flight thrust settings in the event of an engine failure during a critical point in the approach, landing, or go-around operations is excessive. Therefore, the FAA does not agree that the scope of the amendment should be changed to include the use of ATTCS for anything except the takeoff phase.'' (Refer to 52 FR 43153, November 9, 1987.)

The ATTCS incorporated on the Model CL600–2C10 allows the pilot to use the same power setting procedure during a go-around, regardless of whether or not an engine fails. In either case, the pilot obtains go-around power by moving the throttles into the forward (takeoff/go-around) throttle detent. Since the ATTCS is permanently armed, it will function automatically following an engine failure, and advance the remaining engine to the ATTCS thrust level. Therefore, this design adequately addresses the pilot workload concerns identified in the preamble to amendment 25–62.

Accordingly, these special conditions would require a showing of compliance with those provisions of § 25.904 and Appendix I that are applicable to the approach climb and go-around maneuvers.

The definition of a critical time interval for the approach climb case, during which time it must be extremely improbable to violate a flight path based on the gradient requirement of § 25.121(d), is of primary importance. That gradient requirement implies a minimum one-engine-inoperative flight path capability with the airplane in the approach configuration. The engine may have been inoperative before initiating the go-around, or it may become inoperative during the go-around. The definition of the critical time interval must consider both possibilities.

Applicability

As discussed above, these special conditions would be applicable to the Bombardier Model CL600–2C10. Should Bombardier 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 under the provisions of § 21.101(a)(1).

Conclusion

This action affects only certain novel or unusual design features on the

Bombardier Model CL600–2C10 airplane. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of these special conditions has been subjected to the notice and public comment process in several prior instances, and has been derived without substantive change from those special conditions previously issued. It is unlikely that prior public comment on this action would result in a significant change from the substance contained in this document. For this reason, and because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

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 the Bombardier Model CL600–2C10 airplane.

1. *General.* An Automatic Takeoff Thrust Control System (ATTCS) is defined as the entire automatic system, including all devices, both mechanical and electrical that sense engine failure, transmit signals, actuate fuel controls or power levers, or increase engine power by other means on operating engines to achieve scheduled thrust or power increases and furnish cockpit information on system operation.

2. *ATTCS.* The engine power control system that automatically resets the power or thrust on the operating engine (following engine failure during the approach for landing) must comply with the following requirements stated in paragraphs 2.a, 2.b, and 2.c:

a. *Performance and System Reliability Requirements.* The probability analysis must include consideration of ATTCS failure occurring after the time at which the flightcrew last verifies that the ATTCS is in a condition to operate until the beginning of the critical time interval.

b. *Thrust or Power Setting.*

(1) The initial thrust or power setting on each engine at the beginning of the takeoff roll or go-around may not be less than any of the following:

(i) That required to permit normal operation of all safety-related systems and equipment dependent upon engine thrust or power lever position; or

(ii) That shown to be free of hazardous engine response characteristics and not to result in any unsafe aircraft operating or handling characteristics when thrust or power is increased from the initial takeoff or go-around thrust or power to the maximum approved takeoff thrust or power.

(2) For approval of an ATTCS system for go-around, the thrust or power setting procedure must be the same for go-arounds initiated with all engines operating as for go-arounds initiated with one engine inoperative.

c. *Powerplant Controls.* In addition to the requirements of § 25.1141, no single failure or malfunction, or probable combination thereof, of the ATTCS, including associated systems, may cause the failure of any powerplant function necessary for safety. The ATTCS must be designed to:

(1) Apply thrust or power on the operating engine(s), following any one engine failure during takeoff or go-around, to achieve the maximum approved takeoff thrust or power without exceeding engine operating limits; and

(2) Provide a means to verify to the flightcrew before takeoff and before beginning an approach for landing that the ATTCS is in a condition to operate.

3. *Critical Time Interval.* The definition of the Critical Time Interval in appendix I, § I25.2(b) shall be expanded to include the following:

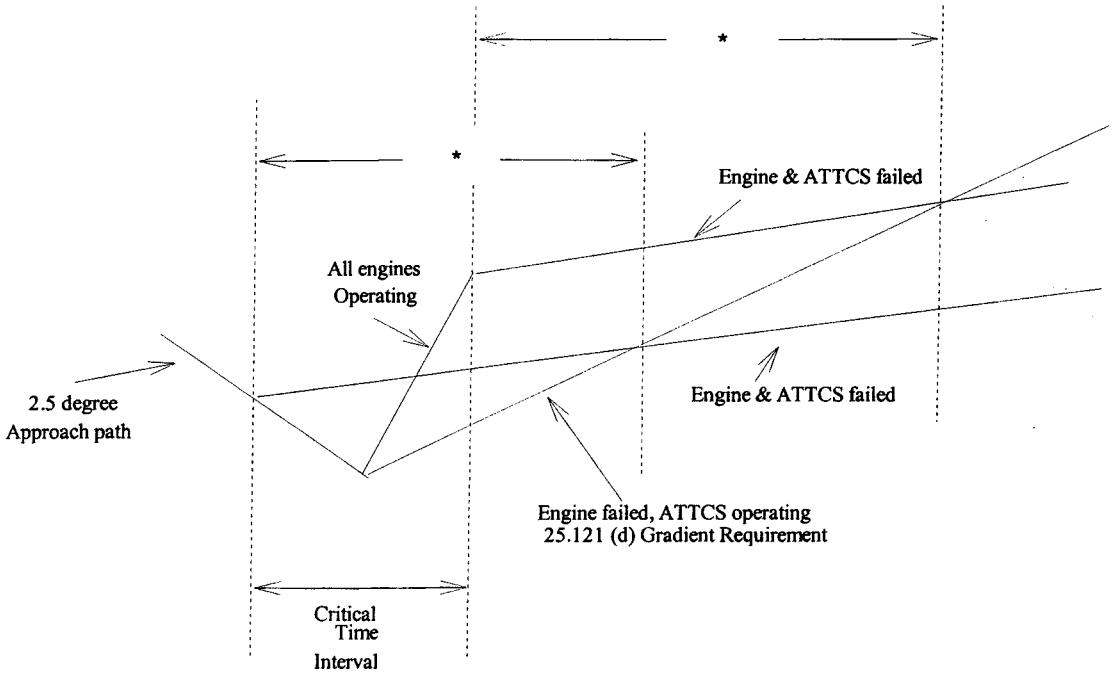
a. When conducting an approach for landing using ATTCS, the critical time interval is defined as follows:

(1) The critical time interval *begins* at a point on a 2.5 degree approach glide path from which, assuming a simultaneous engine and ATTCS failure, the resulting approach climb flight path intersects a flight path originating at a later point on the same approach path corresponding to the part 25 one-engine-inoperative approach climb gradient. The period of time from the point of simultaneous engine and ATTCS failure to the intersection of these flight paths must be no shorter than the time interval used in evaluating the critical time interval for takeoff beginning from the point of simultaneous engine and ATTCS failure and ending upon reaching a height of 400 feet.

(2) The critical time interval *ends* at the point on a minimum performance, all-engines-operating go-around flight path from which, assuming a simultaneous engine and ATTCS failure, the resulting minimum approach climb flight path intersects a flight path corresponding to the part 25 minimum one-engine-inoperative approach climb gradient. The all-engines-operating go-around flight path and the part 25 one-engine-inoperative approach climb gradient flight path originate from a common point on a 2.5 degree approach path. The period of time from the point of simultaneous engine and ATTCS failure to the intersection of these flight paths must be no shorter than the time interval used in evaluating the critical time interval for the takeoff beginning from the point of simultaneous engine and ATTCS failure and ending upon reaching a height of 400 feet.

b. The critical time interval must be determined at the altitude resulting in the longest critical time interval for which one-engine-inoperative approach climb performance data are presented in the Airplane Flight Manual (AFM).

c. The critical time interval is illustrated in the following figure:



* The engine and ATTCS failed time interval must be no shorter than the time interval from the point of simultaneous engine and ATTCS failure to a height of 400 feet used to comply with I25.2(b) for ATTCS use during takeoff.

Issued in Renton, Washington, on October 24, 2000.

D. L. Riggin,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 00–28294 Filed 11–2–00; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Airspace Docket No. 2000–ASW–17]

Revision of Class E Airspace, Fayetteville, AR

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Direct final rule; confirmation of effective date.

SUMMARY: This notice confirms the effective date of a direct final rule which revises the Class E Airspace at Fayetteville, AR.

EFFECTIVE DATE: The direct final rule published at 65 FR 54953 is effective 0901 UTC, November 30, 2000.

FOR FURTHER INFORMATION CONTACT: Donald J. Day, Airspace Branch, Air Traffic Division, Southwest Region, Federal Aviation Administration, Fort Worth, TX 76193–0520, telephone: 817–222–5593.

SUPPLEMENTARY INFORMATION: The FAA published this direct final rule with a request for comments in the **Federal Register** on September 12, 2000, (65 FR 54953). The FAA uses the direct final rulemaking procedure for a noncontroversial rule where the FAA believes that there will be no adverse public comment. This direct final rule advised the public that no adverse comments were anticipated, and that unless a written adverse comment, or a written notice of intent to submit such an adverse comment, were received within the comment period, the regulation would become effective on November 30, 2000. No adverse comments were received, and, thus, this action confirms that this direct final rule will be effective on that date.

Issued in Fort Worth, TX, on October 27, 2000.

Robert N. Stevens,

Acting Manager, Air Traffic Division, Southwest Region.

[FR Doc. 00–28292 Filed 11–2–00; 8:45 am]

BILLING CODE 4910–13–M

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Airspace Docket No. 2000–ASW–18]

Revision of Class D Airspace, Robert Gray Army Airfield, TX; and Revocation of Class D Airspace, Hood Army Airfield, TX

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Direct final rule; confirmation of effective date.