Proposed Rules

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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR part 25

[Docket No. NM162; Notice No. 25–99–08–SC]

Special Conditions: Bombardier Model DHC–8–400 Airplane; Automatic Takeoff Thrust Control System

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed special conditions.

SUMMARY: This notice proposes special conditions for the Bombardier Model DHC–8–400 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 proposed 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: Comments must be received on or before September 13, 1999.

ADDRESSES: Comments on this proposal may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM–14), Docket No. NM162, 1601 Lind Avenue SW., Renton, Washington, 98055; or delivered in duplicate to the Transport Airplane Directorate at the above address. Comments must be marked ''Docket No. NM162.'' Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Greg Dunn, FAA, Transport Airplane Directorate, Aircraft Certification Office, Standardization Branch, ANM–113, 1601 Lind Avenue SW., Renton, Washington, telephone (425) 227–2799; facsimile (425) 227–1149.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of these proposed special conditions by submitting 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 on or before the closing date for comments will be considered by the Administrator. The proposals described in this notice 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. Persons wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include with those comments a self-addressed, stamped postcard on which the following statement is made: ''Comments to Docket No. NM162.'' The postcard will be date stamped and returned to the commenter.

Background

On January 31, 1995, Bombardier Regional Aircraft, 123 Garratt Blvd., Downsview, Ontario, France, M3K 1Y5, applied for an amended type certificate to include the new Bombardier Model DHC–8–400 airplane. The Bombardier Model DHC–8–400, which is a derivative of the Bombardier (formerly de Havilland, Inc.) Model DHC 8–300 series airplanes currently under Type Certificate No. A13NM is a medium-sized airplane powered by two Pratt & Whitney Canada PW150A turbopropeller engines mounted on the wings. Each engine is equipped with a Dowty Aerospace Model R408 propeller and is capable of delivering 5071 horsepower at takeoff. The airplane is configured for five flight crewmembers and 78 passengers.

The Bombardier Model DHC–8–400 incorporates an unusual design feature, the Automatic Takeoff Thrust Control System (ATTCS), referred to by Bombardier as uptrim, to show compliance with the approach climb requirements of § 25.121(d). Appendix I to 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 14 CFR 21.101, Bombardier must show that the Model DHC–8–400 meets the applicable provisions of the regulations incorporated by reference in Type Certificate No. A13NM or the applicable regulations in effect on the date of application for the change to the type certificate. 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. A13NM are as follows: part 25, effective February 1, 1965, including Amendments 25–1 through 25–86, and § 25.109 as amended by Amendment 92. The certification basis may also include later amendments to part 25 that are not relevant to these special conditions. In addition, the certification basis for the Model DHC–8–400 includes part 34, effective September 10, 1990, including Amendment 34–3 effective February 3, 1999, plus any amendments in effect at the time of certification; and part 36, effective December 1, 1969, including Amendments 36–1 through 36–21 and any subsequent amendments which will be applicable on the date the type certificate is issued. These special conditions form an additional part of the type certification basis. In addition, the certification basis may include other special conditions that are not relevant to these special conditions.

If the Administrator finds that the applicable airworthiness regulations (i.e., part 25, as amended) do not contain adequate or appropriate safety standards for the Bombardier Model DHC–8–400 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Model DHC–8–400 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.

Special conditions, as appropriate, are issued in accordance with § 11.49 after public notice, as required by §§ 11.28 and 11.29(b), and become part of the type certification basis in accordance with § 21.101(b)(2).

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

The Model DHC–8–400 will incorporate the following novel or unusual design feature: the Automatic Takeoff Thrust Control System (ATTCS), referred to by Bombardier as uptrim, to show compliance with the approach climb requirements of § 25.121(d). The Bombardier Model DHC–8–400 is a medium-sized airplane powered by two Pratt & Whitney Canada PW150A turbopropeller engines equipped with Full Authority Digital Engine Controls (FADEC) that, in part, protect against exceeding engine limits. The Model DHC–8–400 is also equipped with Dowty Aerospace Model R408 propellers as part of the propulsion package. The propellers incorporate a Propeller Electronic Control (PEC) that functions with the FADEC to control the engine/propeller system.

The Model DHC–8–400 incorporates a non-moving throttle system that functions by placing the throttle levers in detents for the takeoff and climb phases of flight, allowing the FADEC to schedule power settings based on flight phase. With the uptrim and associated systems functioning normally as designed, all applicable requirements of part 25 of the Federal Aviation Regulations (FAR) and paragraph 25 of the Joint Aviation Requirements (JAR), will be met without requiring any action by the crew to increase power.

Automatic takeoff power control on the Model DHC–8–400 involves uptrimming the remaining engine to Maximum Takeoff Power (MTOP) and autofeathering the propeller on the failed engine. These actions will be controlled by the PEC. At takeoff when AUTOFEATHER (A/F) is selected and the power levers are set to Normal Takeoff Power (NTOP), an ''A/F ARM'' message on the engine display will confirm to the pilot that the system is armed and autofeather and uptrim will occur without any further action by the crew if an engine fails. During go-around the uptrim will be automatically armed as soon as the control (power) levers are set to the takeoff (go-around) configuration.

Engine power is set to NTOP, which is 90 percent of MTOP, to initiate the takeoff roll. The value of NTOP 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 MTOP rating if the engine power was originally set to NTOP. If the reduced power takeoff option is being used the ATTCS will increase the power of the operating engine from 90 percent to 100 percent of the corresponding set power.

The engine operating limits (turbine temperature and RPM) for NTOP are set and displayed to the pilot when that rating is selected. These limits are set such that the engine red line limits are not exceeded when an uptrim is applied. When MTOP rating is selected or triggered, the engine limits are reset automatically to reflect the engine red line limits.

When both Power Lever Angles (PLA) are high and both the Condition Lever Angles (CLA) are at maximum position (MAX), the system is armed. If the torque on one engine drops below 25 percent, the PEC on the failed engine sends an uptrim signal to the remaining engine. Other conditions that will trigger the uptrim are the reduction of prop speed (Np) below 80 percent or the automatic feathering of the prop. The power levers will continue to function normally should the ATTCS fail. The MTOP can also be selected by pressing the ''MTOP'' switch on the engine control panel. The full MTOP is available if the pilot elects to push the PLA past the takeoff power detent into the over travel range.

To deactivate the uptrim, the PLA's should be moved out of the rating detent to a position less than 60 degrees (PLA not high) or the CLA of the active engine should be moved out of the MAX/1020 takeoff detent.

The part 25 standards for ATTCS, contained in § 25.904 and Appendix I, specifically restrict performance credit for ATTCS to takeoff. Expanding the scope of the standards to include other phases of flight, including go-around, was considered at the time the standards were issued, but flightcrew 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'' (52 FR 43153, November 9, 1987).

The ATTCS incorporated on the Model DHC–8–400 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 proposed 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 § 25.121(d) gradient requirement, is of primary importance. The § 25.121(d) 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 proposed special conditions would be applicable to the Bombardier Model DHC–8–400. 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 design features on the Bombardier Model DHC–8–400 airplane. It is not a rule of general applicability and affects only the manufacturer who applied to the FAA for approval of these features on the airplane.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these proposed special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

The Proposed Special Conditions

Accordingly, the Federal Aviation Administration (FAA) proposes the following special conditions as part of the type certification basis for the Bombardier Regional Aircraft Model DHC–8–400 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:

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 Setting.* The initial takeoff thrust set on each engine at the beginning of the takeoff roll or go-around may not be less than:

(1) Ninety (90) percent of the thrust level set by the ATTCS (the maximum takeoff thrust or power approved for the airplane under existing ambient conditions);

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

(3) That shown to be free of hazardous engine response characteristics when thrust is advanced from the initial takeoff thrust or power to the maximum approved takeoff thrust or power.

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, Section I25.2(b) shall be expanded to include the following:

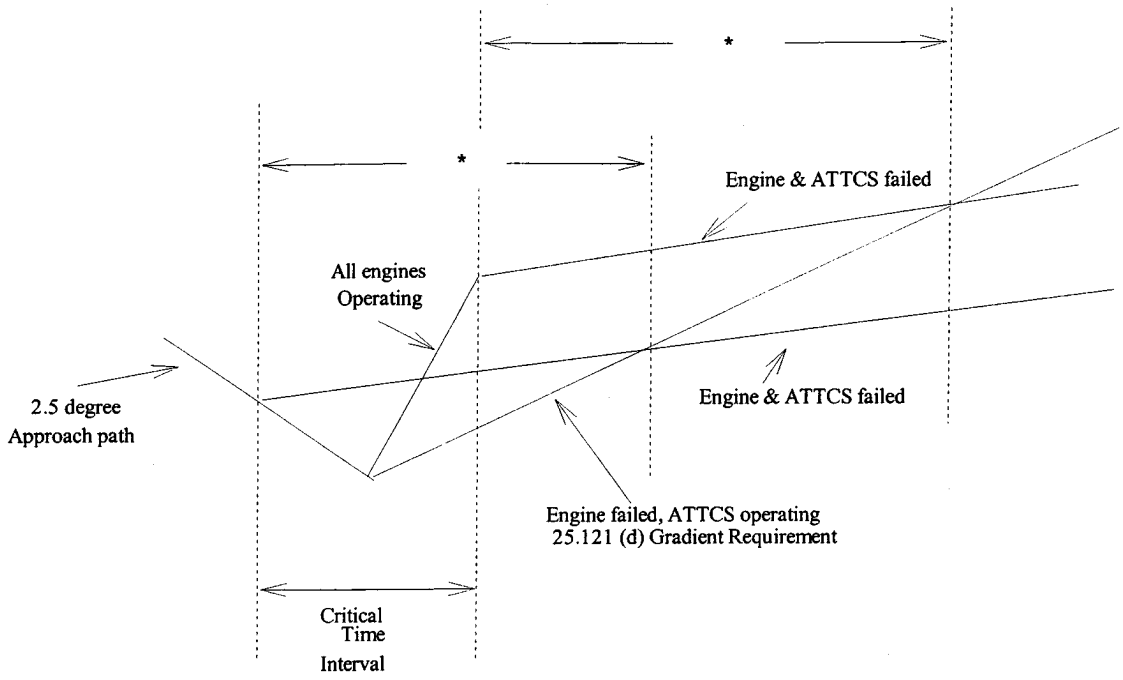
a. When conducting an approach for landing using ATTCS, the critical time interval is defined as follows:

(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.

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 August 4, 1999.

Donald L. Riggin,

Acting Manager, Transport Airplane Directorate Aircraft Certification Service, ANM–100.

[FR Doc. 99–20857 Filed 8–11–99; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR part 25

[Docket No. NM160, Notice No. 25–99–07–SC]

Special Conditions: Dassault Aviation Falcon Model 20–C5/–D5/–E5/–F5 Airplanes; High Intensity Radiated Fields (HIRF)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed special conditions.

SUMMARY: This notice proposes special conditions for the Dassault Aviation Falcon Model 20–C5/–D5/–E5/–F5 airplanes as modified by Garrett Aviation Services. The Model 20–C5/–D5/–E5/–F5 airplanes are equipped with a high-technology digital avionics system that performs critical functions. The applicable type certification regulations do not contain adequate or appropriate safety standards for the protection of this system from the effects of high-intensity radiated fields (HIRF). These special conditions provide the additional safety standards that the Administrator considers necessary to ensure that the critical functions that this system performs are maintained when the airplane is exposed to HIRF.

DATES: Comments must be received on or before September 13, 1999.

ADDRESSES: Comments on this proposal may be mailed in duplicate to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM–114), Docket No. NM160, 1601 Lind Avenue SW., Renton, Washington, 98055–4056; or delivered in duplicate to the Transport Airplane Directorate at the above address. Comments must be marked: Docket No. NM160. Comments may be inspected in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Connie Beane, FAA, Transport Airplane Directorate, Aircraft Certification Service, Standardization Branch, ANM–113, 1601 Lind Avenue SW., Renton, Washington, 98055–4056; telephone (425) 227–2796; facsimile (425) 227–1149.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of these proposed special conditions by submitting 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 on or before the closing date for comments will be considered by the Administrator. The proposals described in this notice 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. Persons wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include with those comments a self-addressed, stamped postcard on which the following statement is made: ''Comments to Docket No. NM160.'' The postcard will be date stamped and returned to the commenter.

Background

On November 8, 1998, Garrett Aviation Services applied for a supplemental type certificate (STC) to modify Dassault Aviation Falcon Model 20–C5/–D5/–E5/–F5 airplanes listed on Type Certificate A7EU.

The Model 20–C5/–D5/–E5/–F5 series of low wing airplanes are pressurized