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. NM371; Notice No. 25–07–07–SC]

Special Conditions: Dassault Aviation Model Falcon 7X Airplane; Sudden Engine Stoppage, Operation Without Normal Electrical Power, and Dive Speed Definition With Speed Protection System

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed special conditions.

SUMMARY: This action proposes special conditions for the Dassault Aviation Model Falcon 7X airplane. This airplane will have novel or unusual design features when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. These design features include engine size and torque load, which affect sudden engine stoppage; electrical and electronic systems which perform critical functions, which affect operation without normal electrical power; and dive speed definition with speed protection system. These proposed special conditions pertain to their effects on the structural performance of the airplane. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for these design features. 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: We must receive your comments by March 21, 2007.

ADDRESSES: You must mail two copies of your comments to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM–113), Docket No. NM371, 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. NM371. You can inspect comments in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Tom Rodriguez, FAA, International Branch, ANM–116, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98057–3356; telephone (425) 227–1503; facsimile (425) 227–1320.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite interested people to participate in this rulemaking by submitting 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 proposed 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 notice between 7:30 a.m. and 4 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 the proposed special conditions in light of the comments we receive.

If you want the FAA to acknowledge receipt of your comments on this proposal, include with your comments a pre-addressed, stamped postcard on which the docket number appears. We will stamp the date on the postcard and mail it back to you.

Background

On June 4, 2002, Dassault Aviation, 9 rond Point des Champs Elysees, 75008, Paris, France, applied for an FAA type certificate for its new Model Falcon 7X airplane. The Dassault Model Falcon 7X airplane is a 19 passenger transport category airplane powered by three aft mounted Pratt & Whitney PW307A high bypass ratio turbofan engines. Maximum takeoff weight will be 63,700 pounds, and maximum certified altitude will be 51,000 feet with a range of 5,700 nautical miles. The airplane is operated using a fly-by-wire (FBW) primary flight control system. This will be the first application of a FBW primary flight control system in a private/corporate use airplane.

The Dassault Aviation Model Falcon 7X design incorporates equipment that was not envisioned when part 25 was created. This equipment affects the sudden engine stoppage, operation without normal electrical power, and dive speed definition with speed protection system. Therefore, special conditions are required that provide the level of safety equivalent to that established by the regulations.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Dassault Aviation must show that the Model Falcon 7X airplane meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25–1 through 25–108.

If the Administrator finds that the applicable airworthiness regulations do not contain adequate or appropriate safety standards for the Model Falcon 7X airplane because of novel or unusual design features, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Dassault Model Falcon 7X 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. In addition, the FAA must issue a finding of regulatory adequacy under section 611 of Public Law 93–574, the ''Noise Control Act of 1972.''

The FAA issues special conditions, as defined in § 11.19, under § 11.38, and they become part of the type certification basis under § 21.17(a)(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, the special conditions would also apply to the other model under § 21.101.

Novel or Unusual Design Features

The Dassault Aviation Model Falcon 7X airplane will incorporate the following novel or unusual design features:

- Sudden engine stoppage.
- Operation without normal electrical power.
- Dive speed definition with speed protection system.

Because of these rapid improvements in airplane technology, the applicable airworthiness regulations do not contain adequate or appropriate safety standards for these design features. These proposed special conditions address equipment which may affect the airplane's structural performance, either directly or as a result of failure or malfunction. These proposed special conditions are identical or nearly identical to those previously required for type certification of other airplane models. Additional special conditions will be issued for other novel or unusual design features of the Dassault Model Falcon 7X airplane. Those additional special conditions will pertain to the following topics:

- Side stick controllers;
- Electronic flight control system: lateral-directional and longitudinal stability, low energy awareness.
- Electronic flight control system: flight control surface position awareness, and
- Electronic flight control system: flight characteristics compliance via the handling qualities rating method (HQRM);
- Flight envelope protection: general limiting requirements,
- Flight envelope protection: high incidence protection function,
- Flight envelope protection: normal load factor (g) limiting,
- Flight envelope protection: pitch, roll, and high speed limiting functions.

Final special conditions have been issued for the Model Falcon 7X with the novel or unusual design feature pertaining to Pilot Compartment View-Hydrophobic Coatings in Lieu of Windshield Wipers (January 10, 2007; 72 FR 1135). Special conditions have been proposed for the Model Falcon 7X with the novel or unusual design features pertaining to Interaction of Systems and Structures, Limit Pilot Forces, and High Intensity Radiated Fields (HIRF) (October 18, 2006; 71 FR 61427).

Discussion

Because of these rapid improvements in airplane technology, the applicable airworthiness regulations do not contain adequate or appropriate safety standards for these design features. Therefore, in addition to the requirements of part 25, subparts C and D, the following special conditions apply.

Proposed Special Conditions for Sudden Engine Stoppage

The Dassault Model Falcon 7X will have high-bypass ratio turbofan engines. Engines of this size were not envisioned when § 25.361, pertaining to loads imposed by engine seizure, was adopted in 1965. Worst case engine seizure events become increasingly more severe with increasing engine size because of the higher inertia of the rotating components.

Section 25.361(b)(1) requires that for turbine engine installations, the engine mounts and the supporting structures must be designed to withstand a ''limit engine torque load imposed by sudden engine stoppage due to malfunction or structural failure.'' Limit loads are expected to occur about once in the lifetime of any airplane. Section 25.305 requires that supporting structures be able to support limit loads without detrimental permanent deformation, meaning that supporting structures should remain serviceable after a limit load event.

Since adoption of § 25.361(b)(1), the size, configuration, and failure modes of jet engines have changed considerably. Current engines are much larger and are designed with large bypass fans. In the event of a structural failure, these engines are capable of producing much higher transient loads on the engine mounts and supporting structures.

As a result, modern high bypass engines are subject to certain rare-but-severe engine seizure events. Service history shows that such events occur far less frequently than limit load events. Although it is important for the airplane to be able to support such rare loads safely without failure, it is unrealistic to expect that no permanent deformation will occur.

Given this situation, Aviation Rulemaking Advisory Committee (ARAC) has proposed a design standard for today's large engines. For the commonly-occurring deceleration events, the proposed standard would require engine mounts and structures to support maximum torques without detrimental permanent deformation. For the rare-but-severe engine seizure events such as loss of any fan, compressor, or turbine blade, the proposed standard would require engine mounts and structures to support maximum torques without failure, but allows for some deformation in the structure.

The FAA concludes that modern large engines, including those on the Model Falcon 7X, are novel and unusual compared to those envisioned when § 25.361(b)(1) was adopted and thus warrant a special condition. The proposed special condition contains design criteria recommended by ARAC. The ARAC proposal would revise the wording of § 25.361(b), including §§ 25.361(b)(1) and (b)(2), removing language pertaining to structural failures and moving it to a separate requirement that discusses the reduced factors of safety that apply to these failures.

Proposed Special Conditions for Operation Without Normal Electrical Power

The Dassault Aviation Model Falcon 7X airplane will have electrical and electronic systems which perform critical functions. The Model Falcon 7X airplane is a fly-by-wire control system that requires a continuous source of electrical power for the flight control system to remain operable, since the loss of all electrical power may be catastrophic to the airplane. The airworthiness standards of part 25 do not contain adequate or appropriate standards for the protection of the Electronic Flight Control System from the adverse effects of operations without normal electrical power.

Section 25.1351(d), ''Operation without normal electrical power,'' requires safe operation in visual flight rule (VFR) conditions for at least five minutes with inoperative normal power. This rule was structured around a traditional design utilizing mechanical control cables for flight control surfaces and the pilot controls. Such traditional designs enable the flightcrew to maintain control of the airplane, while providing time to sort out the electrical failure, re-start the engines if necessary, and re-establish some of the electrical power generation capability.

The Dassault Aviation Model Falcon 7X airplane, however, will utilize an Electronic Flight Control System for the pitch and yaw control (elevator, stabilizer, and rudder). There is no mechanical linkage between the pilot controls and these flight control surfaces. Pilot control inputs are converted to electrical signals, which are processed and then transmitted via wires to the control surface actuators. At the control surface actuators, the electrical signals are converted to an actuator command, which moves the control surface.

To maintain the same level of safety as that associated with traditional designs, the Dassault Model 7X airplanes with electronic flight controls must not be time limited in its operation, including being without the normal source of electrical power generated by the engine or the Auxiliary Power Unit (APU) generated electrical power.

Service experience has shown that the loss of all electrical power generated by the airplane's engine generators or APU is not extremely improbable. Thus, it must be demonstrated that the airplane can continue safe flight and landing—including steering and braking on ground for airplanes using steer/brake-by-wire—after total loss of normal electrical power 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.

Proposed Special Conditions for Dive Speed Definition With Speed Protection System

Dassault Aviation proposes to reduce the speed margin between V_C and V_D required by § 25.335(b), based on the incorporation of a high speed protection system in the Model Falcon 7X flight control laws. The Falcon 7X is equipped with a high speed protection system which limits nose down pilot authority at speeds above V_C /M_C and prevents the airplane from actually performing the maneuver required under § 25.335(b)(1).

Section 25.335(b)(1) is an analytical envelope condition which was originally adopted in Part 4b of the Civil Air Regulations to provide an acceptable speed margin between design cruise speed and design dive speed. Freedom from flutter and airframe design loads is affected by the design dive speed. While the initial condition for the upset specified in the rule is 1g level flight, protection is afforded for other inadvertent overspeed conditions as well. Section 25.335(b)(1) is intended as a conservative enveloping condition for all potential overspeed conditions, including non-symmetric ones.

To establish that all potential overspeed conditions are enveloped, the applicant would demonstrate that the dive speed will not be exceeded during pilot-induced or gust-induced upsets in non-symmetric attitudes.

In addition, the high speed protection system in the Falcon 7X must have a high level of reliability.

Applicability

As discussed above, these special conditions are applicable to the Dassault Aviation Model Falcon 7X airplane. Should Dassault Aviation apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design features, these special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features of the Dassault Aviation Model Falcon 7X airplane. It is not a rule of general applicability, and it affects only the applicant which 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 special conditions is as follows:

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

The Proposed 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 Dassault Aviation Model Falcon 7X airplane.

1. Sudden Engine Stoppage

In lieu of the requirements of § 25.361(b) the following special condition applies:

(a) *For turbine engine installations,* the engine mounts, pylons and adjacent supporting airframe structure must be designed to withstand 1g level flight loads acting simultaneously with the maximum limit torque loads imposed by each of the following:

(1) Sudden engine deceleration due to a malfunction which could result in a temporary loss of power or thrust; and

(2) The maximum acceleration of the engine.

(b) *For auxiliary power unit installations,* the power unit mounts and adjacent supporting airframe structure must be designed to withstand 1g level flight loads acting simultaneously with the maximum limit torque loads imposed by each of the following:

(1) Sudden auxiliary power unit deceleration due to malfunction or structural failure; and

(2) The maximum acceleration of the power unit.

(c) *For engine supporting structures,* an ultimate loading condition must be considered that combines 1g flight loads with the transient dynamic loads resulting from:

(1) The loss of any fan, compressor, or turbine blade; and separately

(2) where applicable to a specific engine design, any other engine structural failure that results in higher loads.

(d) The ultimate loads developed from the conditions specified in paragraphs (c)(1) and (2) above are to be multiplied by a factor of 1.0 when applied to engine mounts and pylons and multiplied by a factor of 1.25 when applied to adjacent supporting airframe structure. In addition, the airplane must be capable of continued safe flight considering the aerodynamic effects on controllability due to any permanent deformation that results from the conditions specified in paragraph (c), above.

2. Operation Without Normal Electrical Power

In lieu of the requirements of 14 CFR 25.1351(d), the following special condition applies:

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 generator electrical power (i.e., electrical power sources, excluding 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.

3. Dive Speed Definition With Speed Protection System

In lieu of the requirements of § 25.335(b)(1)—if the flight control system includes functions which act automatically to initiate recovery before the end of the 20 second period specified in § 25.335(b)(1)—the following special condition applies.

The greater of the speeds resulting from the conditions of paragraphs (a) and (b), below, must be used.

(a) From an initial condition of stabilized flight at V_C/M_C, the airplane is upset so as to take up a new flight path 7.5 degrees below the initial path. Control application, up to full authority, is made to try and maintain this new flight path. Twenty seconds after initiating the upset, manual recovery is made at a load factor of 1.5 g (0.5 acceleration increment) or such greater load factor that is automatically applied by the system with the pilot's pitch control neutral. The speed increase occurring in this maneuver may be

calculated, if reliable or conservative aerodynamic data is used. Power, as specified in § 25.175(b)(1)(iv), is assumed until recovery is made, at which time power reduction and the use of pilot controlled drag devices may be used.

(b) From a speed below V_C/M_C with power to maintain stabilized level flight at this speed, the airplane is upset so as to accelerate through V_C/M_C at a flight path 15 degrees below the initial path—or at the steepest nose down attitude that the system will permit with full control authority if less than 15 degrees.

Note: The pilot's controls may be in the neutral position after reaching V_C/M_C and before recovery is initiated.

(c) Recovery may be initiated three seconds after operation of high speed warning system by application of a load of 1.5g (0.5 acceleration increment) or such greater load factor that is automatically applied by the system with the pilot's pitch control neutral. Power may be reduced simultaneously. All other means of decelerating the airplane, the use of which is authorized up to the highest speed reached in the maneuver, may be used. The interval between successive pilot actions must not be less than one second.

(d) The applicant must also demonstrate that the design dive speed, established above, will not be exceeded during pilot-induced or gust-induced upsets in non-symmetric attitudes.

(e) The occurrence of any failure condition that would reduce the capability of the overspeed protection system must be improbable (less than 10^{-5} per flight hour).

Issued in Renton, Washington, on February 23, 2007.

Ali Bahrami,

Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E7–3582 Filed 2–28–07; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2005–23072; Directorate Identifier 2005–NE–38–AD]

RIN 2120–AA64

Airworthiness Directives; Pratt & Whitney JT9D–7R4 Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to supersede an existing airworthiness directive (AD) for Pratt & Whitney (PW) JT9D–7R4 turbofan engines. That AD currently requires inspection of the blade root thickness of 1st stage fan blades identified by part number (P/N) and serial number (SN) in the AD. This proposed AD would require the same actions but would correct 12 P/Ns, add 10 part SNs, and add the definition of next fan blade exposure to the compliance section. This proposed AD results from the discovery of inaccurate part quantity, part numbers, and serial numbers used in AD 2005–26–09. We are proposing this AD to prevent 1st stage fan blade fracture and uncontained engine failure, resulting in possible damage to the airplane.

DATES: We must receive any comments on this proposed AD by April 30, 2007.

ADDRESSES: Use one of the following addresses to comment on this proposed AD.

- *DOT Docket Web site:* Go to *http://dms.dot.gov* and follow the instructions for sending your comments electronically.
- *Government-wide rulemaking Web site:* Go to *http://www.regulations.gov* and follow the instructions for sending your comments electronically.
- *Mail:* Docket Management Facility; U.S. Department of Transportation, 400 Seventh Street, SW., Nassif Building, Room PL–401, Washington, DC 20590–0001.
- *Fax:* (202) 493–2251.
- *Hand Delivery:* Room PL–401 on the plaza level of the Nassif Building, 400 Seventh Street, SW., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Kevin Donovan, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803–5299; telephone (781) 238–7743, fax (781) 238–7199.

SUPPLEMENTARY INFORMATION:

Comments Invited

We invite you to send any written relevant data, views, or arguments regarding this proposal. Send your comments to an address listed under **ADDRESSES**. Include ''Docket No. FAA–2005–23072; Directorate Identifier 2005–NE–38–AD'' in the subject line of your comments. We specifically invite comments on the overall regulatory, economic, environmental, and energy aspects of the proposed AD. We will consider all comments received by the closing date and may amend the proposed AD in light of those comments.

We will post all comments we receive, without change, to *http://dms.dot.gov*, including any personal information you provide. We will also post a report summarizing each substantive verbal contact with FAA personnel concerning this proposed AD. Using the search function of the DMS Web site, anyone can find and read the comments in any of our dockets, including the name of the individual who sent the comment (or signed the comment on behalf of an association, business, labor union, etc.). You may review the DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (65 FR 19477–78) or you may visit *http://dms.dot.gov*.

Examining the AD Docket

You may examine the docket that contains the proposal, any comments received and any final disposition in person at the Docket Management Facility between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The Docket Office (telephone (800) 647–5227) is located on the plaza level of the Department of Transportation Nassif Building at the street address stated in **ADDRESSES**. Comments will be available in the AD docket shortly after the DMS receives them.

Discussion

On December 16, 2005, the FAA issued AD 2005–26–09, Amendment 39–14430 (70 FR 76381, December 27, 2005). That AD requires inspection of the blade root thickness of 1st stage fan blades identified by P/N and SN. That AD was the result of a report of a repair station that created an unapproved repair on 1st stage fan blades. That condition, if not corrected, could result in 1st stage fan blade fracture and uncontained engine failure, resulting in possible damage to the airplane.

Actions Since AD 2005–26–09 Was Issued

Since AD 2005–26–09 was issued, we received comments on the AD requesting clarification. We considered those requests and have changed the compliance section in this proposed AD for clarification. We also found and corrected 12 incorrect P/Ns, and added 10 part SNs of affected 1st stage fan blades to Table 1 of this proposed AD. The comments and affected P/Ns and SNs are also discussed below.