period of time appropriate to the maneuvers.

(4) It must always be possible to reduce incidence by conventional use of the controller.

(5) The rate at which the airplane can be maneuvered from trim speeds associated with scheduled operating speeds, such as V_2 and V_{REF}, up to alpha-limit must not be unduly damped or significantly slower than can be achieved on conventionally controlled transport airplanes.

g. *Atmospheric Disturbances.* Operation of the high incidence protection function must not adversely affect aircraft control during expected levels of atmospheric disturbances or impede the application of recovery procedures in case of windshear. Simulator tests and analysis may be used to evaluate such conditions but must be validated by limited flight testing to confirm handling qualities at critical loading conditions.

h. *[Reserved]*

i. *Proof of Compliance.* In addition to the requirements of § 25.21, the following special conditions apply:

The flying qualities must be evaluated at the most unfavorable center of gravity position.

j. *Longitudinal Control:*

(1) In lieu of the requirements of § 25.145(a) and (a)(1), the following special conditions apply:

It must be possible—at any point between the trim speed for straight flight and V_{min}—to pitch the nose downward, so that the acceleration to this selected trim speed is prompt, with:

The airplane trimmed for straight flight at the speed achievable by the automatic trim system and at the most unfavorable center of gravity;

(2) In lieu of the requirements of § 25.145(b)(6), the following special conditions apply:

With power off, flaps extended and the airplane trimmed at 1.3 V_{SR1}, obtain and maintain airspeeds between V_{min} and either 1.6 V_{SR1} or V_{FE}, whichever is lower.

k. *Airspeed Indicating System.* (1) In lieu of the requirements of § 25.1323(c)(1), the following special conditions apply: V_{MO} to V_{min} with the flaps retracted.

(2) In lieu of the requirements of § 25.1323(c)(2), the following special conditions apply: V_{min} to V_{FE} with flaps in the landing position.

7. Flight Envelope Protection: Normal Load Factor (g) Limiting

In addition to the requirements of § 25.143(a)—and in the absence of other limiting factors—the following special conditions apply:

a. The positive limiting load factor must not be less than:

(1) 2.5g for the Electronic Flight Control System (EFCS) normal state.

(2) 2.0g for the EFCS normal state with the high lift devices extended.

b. The negative limiting load factor must be equal to or more negative than:

(1) Minus 1.0g for the EFCS normal state.

(2) 0.0g for the EFCS normal state with high lift devices extended.

Note: This special condition does not impose an upper bound for the normal load factor limit, nor does it require that the limit exist. If the limit is set at a value beyond the structural design limit maneuvering load factor ''n,'' indicated in §§ 25.333(b) and 25.337(b) and (c), there should be a very positive tactile feel built into the controller and obvious to the pilot that serves as a deterrent to inadvertently exceeding the structural limit.

8. Flight Envelope Protection: Pitch, Roll, and High Speed Limiting Functions

In addition to § 25.143, the following special conditions apply:

a. Operation of the high speed limiter during all routine and descent procedure flight must not impede normal attainment of speeds up to the overspeed warning.

b. The pitch limiting function must not impede airplane maneuvering, including an all-engines operating takeoff, for pitch angles up to the maximum required for normal operations plus a suitable margin in the pitch axis to allow for satisfactory speed control.

c. The high speed limiting function must not impede normal attainment of speeds up to V_{MO}/M_{MO} during all routine and descent procedure flight conditions.

d. The pitch and roll limiting functions must not restrict nor prevent attaining bank angles up to 65 degrees and pitch attitudes necessary for emergency maneuvering. Positive spiral stability, which is introduced above 35 degrees bank angle, must not require excessive pilot strength on the side stick controller to achieve bank angles up to 65 degrees. Stick force at bank angles greater than 35 degrees must not be so light that over-control would lead to pilot-induced oscillations.

Issued in Renton, Washington, on April 4, 2007.

Stephen P. Boyd,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E7–6888 Filed 4–11–07; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM371; Special Conditions No. 25–350–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: Final special conditions.

SUMMARY: These special conditions are issued for the Dassault Aviation Model Falcon 7X Airplane; Sudden Engine Stoppage, Operation Without Normal Electrical Power, and Dive Speed Definition with Speed Protection System. This airplane will have novel or unusual design features that 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 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 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.

EFFECTIVE DATE: April 4, 2007.

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:

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 an airplane primarily intended for private/corporate use.

The Dassault Aviation Model Falcon 7X design incorporates equipment that was not envisioned when part 25 was created. This equipment affects 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.

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 novel or unusual design features that will affect:

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

These special conditions address equipment which may affect the airplane's structural performance, either directly or as a result of failure or malfunction. These special conditions are identical or nearly identical to those previously required for type certification of other airplane models.

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.

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, the Aviation Rulemaking Advisory Committee (ARAC) proposed a design standard for today's large engines. For the commonly-occurring deceleration events, the proposed standard requires 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 requires 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 special condition contains design criteria recommended by ARAC. The ARAC proposal was to 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.

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 their 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.

Special Conditions for Dive Speed Definition With Speed Protection System

Dassault Aviation proposed 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 will 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.

Discussion of Comments

Notice of proposed special conditions No. 25–07–07–SC for the Dassault Aviation Model Falcon 7X airplanes was published in the **Federal Register** on March 1, 2007 (72 FR 9273). No comments were received, and the special conditions are adopted as proposed.

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 on the same type certificate incorporating the same novel or unusual design features, these special conditions would apply to that model as well.

For Final Special Conditions Effective Upon Issuance

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 Dassault Model Falcon 7X is imminent, the FAA finds that good cause exists to make these special conditions effective upon issuance.

Conclusion

This action affects only certain novel or unusual design features on model Falcon 7X 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 Dassault Aviation Model Falcon 7X airplanes.

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 1 g 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 1 g 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 1 g 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 1.5 g (0.5 acceleration increment) or such greater load factor that is automatically applied by the system with the pilot's pitch control neutral. 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 April 4, 2007.

Stephen P. Boyd,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. E7–6889 Filed 4–11–07; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2007–27552; Directorate Identifier 2007–NE–11–AD; Amendment 39–15019; AD 2007–08–02]

RIN 2120–AA64

Airworthiness Directives; Hartzell Propeller Inc. Model HC–E4A–3( )/ E10950( ) Propellers

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

ACTION: Final rule; request for comments.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for Hartzell Propeller Inc. model HC–E4A–3( )/ E10950( ) propellers. This AD requires initial and repetitive inspections and rework of the propeller blade retention radius, and replacement of the propeller blade thrust bearing, for each blade. This AD results from reports of excessive propeller vibration and of damaged or broken propeller blade thrust bearings found during routine and investigative propeller disassembly. We are issuing this AD to prevent propeller blade separation, damage to the airplane, and possible loss of airplane control.

DATES: This AD becomes effective April 27, 2007. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of April 27, 2007.

We must receive any comments on this AD by June 11, 2007.

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

Contact Hartzell Propeller Inc. Technical Publications Department, One Propeller Place, Piqua, OH 45356; telephone (937) 778–4200; fax (937) 778–4391, for the service information identified in this AD.

FOR FURTHER INFORMATION CONTACT: Tim Smyth, Aerospace Engineer, Chicago Aircraft Certification Office, FAA, Small Airplane Directorate, 2300 East Devon Avenue, Des Plaines, IL 60018; e-mail: *tim.smyth@faa.gov; telephone:* (847) 294–7132; fax: (847) 294–7834.

SUPPLEMENTARY INFORMATION: We have received reports of excessive propeller vibration, and of damaged or broken propeller blade thrust bearings on Hartzell Propeller Inc. model HC–E4A–3( )/E10950( ) propellers found during routine and investigative propeller disassembly. At least 15 propellers have been reported with broken propeller blade thrust bearings. During teardowns, instances of bearing failures have been progressively more severe, with more internal damage to the hub noted. Service history shows the propellers can safely accumulate 2,000 operating hours time-since-overhaul (TSO) before the unsafe conditions start to appear. A broken thrust bearing can lead to damage to the propeller hub and blade shank, and blade separation from the hub. These damaged or broken parts can also lead to damage to the internal propeller pitch change mechanism, resulting in loss of propeller pitch control or in difficulty in feathering the propeller. This condition, if not corrected, could result in propeller blade separation, damage to the airplane, and possible loss of airplane control. Repairing the propeller blade retention radius using the instructions cited in Hartzell Propeller Inc. Service Bulletin (SB) No. HC–SB–61–287, Revision 2, dated October 24, 2006, allows the propeller to safely operate for 3,000 hours before requiring bearing replacement.

Relevant Service Information

We reviewed and approved the technical contents of Hartzell Propeller Inc. SB No. HC–SB–61–287, Revision 2, dated October 24, 2006. That SB describes procedures for initial and repetitive propeller blade inspection, rework, and thrust bearing replacement, for each blade.