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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2016–4159; Special Conditions No. 25–735–SC]

Special Conditions: Bombardier Inc. Model BD–700–2A12 and BD–700–2A13 Airplanes; Enhanced Flight Vision System (EFVS)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Bombardier Inc. (Bombardier) Model BD–700–2A12 and BD–700–2A13 airplanes. These airplanes will have a novel or unusual design feature associated with an enhanced flight-vision system. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: This action is effective on Bombardier on November 5, 2018. Send your comments by December 20, 2018.

ADDRESSES: Send comments identified by docket number FAA–2016–4159 using any of the following methods:

- *Federal eRegulations Portal:* Go to *http://www.regulations.gov/* and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M–30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue SE, Room W12–140, West Building Ground Floor, Washington, DC, 20590–0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except federal holidays.
- *Fax:* Fax comments to Docket Operations at 202–493–2251.

Privacy: The FAA will post all comments it receives, without change, to *http://www.regulations.gov/,* including any personal information the commenter provides. Using the search function of the docket website, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the **Federal Register** published on April 11, 2000 (65 FR 19477–19478), as well as at *http://DocketsInfo.dot.gov/.*

Docket: Background documents or comments received may be read at *http://www.regulations.gov/* at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except federal holidays.

FOR FURTHER INFORMATION CONTACT: John Stuber, FAA, Airframe and Cabin Safety Section, AIR–671, Transport Standards Branch, Policy and Innovation Division, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, Washington 98198; telephone and fax 206–231–3164; email *john.stuber@faa.gov.*

SUPPLEMENTARY INFORMATION: The substance of these special conditions previously has been published in the **Federal Register** for public comment. These special conditions have been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, the FAA has determined that prior public notice and comment are unnecessary, and finds that, for the same reason, good cause exists for adopting these special conditions upon publication in the **Federal Register**.

Comments Invited

The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to prior opportunities for comment described above. We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive by the closing date for comments. We may change these special conditions based on the comments we receive.

Background

On May 30, 2012, Bombardier applied for an amendment to type certificate no. T00003NY to include the new Model BD–700–2A12 and BD–700–2A13 airplanes. These airplanes are derivatives of the Model BD–700 series of airplanes and are marketed as the Bombardier Global 7000 (Model BD–700–2A12) and Global 8000 (Model BD–700–2A13). These airplanes are twin-engine, transport-category, executive-interior business jets. The maximum passenger capacity is 19 and the maximum takeoff weights are 106,250 lbs. (Model BD–700–2A12) and 104,800 lbs. (Model BD–700–2A13).

Type Certification Basis

Under the provisions of title 14, Code of Federal Regulations (14 CFR) 21.101, Bombardier must show that the Model BD–700–2A12 and BD–700–2A13 airplanes meet the applicable provisions of the regulations listed in Type Certificate No. T00003NY, or the applicable regulations in effect on the date of application for the change, except for earlier amendments as agreed upon by the FAA.

If the Administrator finds that the applicable airworthiness regulations (*i.e.,* 14 CFR part 25) do not contain adequate or appropriate safety standards for the Model BD–700–2A12 and BD–700–2A13 airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are 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, these special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Model BD–700–2A12 and BD–700–2A13 airplanes must comply with the fuel-vent and exhaust-emission requirements of 14 CFR part 34, and the noise-certification requirements of 14 CFR part 36.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.101.

Novel or Unusual Design Features

The Model BD–700–2A12 and BD–700–2A13 airplanes will incorporate the following novel or unusual design features:

Installation of an enhanced flight-vision system (EFVS).

Discussion

When the FAA began to evaluate the display of enhanced flight-vision system (EFVS) imagery on the head-up display, significant potential to obscure the outside view became apparent, contrary to the requirements of § 25.773. Section 25.773 does not permit distortions and reflections in the pilot-compartment view that can interfere with normal duties, and was not written in anticipation of EFVS technology. The EFVS video image potentially interferes with the pilot's ability to see the natural scene in the center of the forward field of view.

The FAA issued special conditions for such HUD/EFVS installations to ensure that the level of safety required by § 25.773 would be met even when the image might partially obscure the outside view. Unlike the pilot's natural forward vision, the EFVS image is infrared-based, monochrome, 2-dimensional (*i.e.,* providing no depth perception), and of lower resolution. Although the pilot may be able to see around and through small, individual symbols on the HUD, the pilot may not be able to see around or through the image that fills the display without some interference of the outside view. Nevertheless, the EFVS may be capable of meeting the required level of safety when considering the combined view of the image and the outside scene visible to the pilot through the image. It is essential that the pilot can use this combination of image and natural view of the outside scene as safely and effectively as is the pilot-compartment view currently available without the EFVS image.

Because § 25.773, at the applicable amendment level, does not provide for any alternatives or considerations for a novel or unusual design feature, the FAA establishes safety requirements that assure an equivalent level of safety and effectiveness of the pilot-compartment view as intended by that rule. The purpose of these special conditions is to provide the unique pilot-compartment-view requirements for the EFVS installation.

Compliance with these special conditions is required for the EFVS to be found acceptable, for the following intended functions, in accordance with § 91.176(b):

1. Presenting an image that would aid the pilot during a straight-in instrument approach.

2. Enable the pilot to determine the ''enhanced flight visibility,'' as required by § 91.176(b)(3), for descent and operation below MDA/DH.

3. Enable the pilot to use the EFVS imagery to detect and identify the ''visual references for the intended runway,'' required by § 91.176(b)(3), to continue the approach with vertical guidance to 100 feet height above touchdown-zone elevation.

Note: The term ''Enhanced Vision System,'' or EVS, commonly refers to a system comprising a HUD, imaging sensor(s), and avionics interface(s) that displays the sensor imagery on the HUD and overlays it with alpha-numeric and symbolic flight information. However, the term has also been used to refer to systems that display the sensor imagery, with or without other flight information, on a head-down display. Therefore, to avoid confusion, the FAA has defined the term ''Enhanced Flight Vision System'' (EFVS) to refer to certain EVS that meet the requirements of § 91.176(b), in particular the requirement for a HUD and specified flight information, and the ability to determine ''enhanced flight visibility.'' Accordingly, an EFVS can be considered a subset of systems otherwise labeled EVS.

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.

Applicability

As discussed above, these special conditions are applicable to Bombardier Inc. Model BD–700–2A12 and BD–700–2A13 airplanes. Should Bombardier Inc. apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on two models of airplanes. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

Authority Citation

The authority citation for these special conditions is as follows:

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

The Special Conditions

■ Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Bombardier Inc. Model BD–700–2A12 and BD–700–2A13 airplanes.

1. EFVS imagery on the HUD must not degrade the safety of flight, nor interfere with the effective use of outside visual references for required pilot tasks, during any phase of flight in which it is to be used.

2. To avoid unacceptable interference with the safe and effective use of the pilot-compartment view, the EFVS device must meet the following requirements:

a. EFVS design must minimize unacceptable display characteristics or artifacts (*e.g.* noise, ''burlap'' overlay, running water droplets) that obscure the desired image of the scene, impair the pilot's ability to detect and identify visual references, mask flight hazards, distract the pilot, or otherwise degrade task performance or safety.

b. Control of EFVS display brightness must be sufficiently effective, in dynamically changing background (ambient) lighting conditions, to prevent full or partial blooming of the display that would distract the pilot, impair the pilot's ability to detect and identify visual references, mask flight hazards, or otherwise degrade task performance or safety. If automatic control for image brightness is not provided, it must be shown that a single manual setting is satisfactory for the range of lighting conditions encountered during a time-critical, high-workload phase of flight (*e.g.,* low-visibility instrument approach).

c. A readily accessible control must be provided that permits the pilot to immediately deactivate and reactivate display of the EFVS image on demand, without removing the pilot's hands from the primary flight controls (yoke or equivalent) or thrust control.

d. The EFVS image on the HUD must not impair the pilot's use of guidance

information, or degrade the presentation and pilot awareness of essential flight information displayed on the HUD, such as alerts, airspeed, attitude, altitude and direction, approach guidance, wind-shear guidance, TCAS resolution advisories, and unusual-attitude recovery cues.

e. The EFVS image and the HUD symbols, which are spatially referenced to the pitch scale, outside view, and image, must be scaled and aligned (*i.e.,* conformal) to the external scene and, when considered singly or in combination, must not be misleading, cause pilot confusion, or increase workload. Airplane attitudes or cross-wind conditions may cause certain symbols, such as the zero-pitch line or flight-path vector, to reach field-of-view limits such that they cannot be positioned conformably with the image and external scene. In such cases, these symbols may be displayed, but with an altered appearance (*e.g.,* ''ghosting'') which makes the pilot aware that they are no longer displayed conformally.

f. A HUD system that displays EFVS images must, if previously certified, continue to meet all of the requirements of the original approval.

3. The safety and performance of the pilot tasks associated with the use of the pilot-compartment view must be not be degraded by the display of the EFVS image. Pilot tasks, which must not be degraded by the EFVS image, include:

a. Detection, accurate identification, and maneuvering, as necessary, to avoid traffic, terrain, obstacles, and other hazards of flight.

b. Accurate identification and utilization of visual references required for every task relevant to the phase of flight.

4. Use of EFVS for instrument approach operations must be in accordance with the provisions of the applicable § 91.176 operational rule. Appropriate limitations must be stated in the Operating Limitations section of the Airplane Flight Manual to prohibit the use of the EFVS for functions that have not been found to be acceptable.

Issued in Des Moines, Washington, on October 29, 2018.

Victor Wicklund,

Manager, Transport Standards Branch, Policy and Innovation Division, Aircraft Certification Service.

[FR Doc. 2018–24104 Filed 11–2–18; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2018–0585; Product Identifier 2018–NM–070–AD; Amendment 39–19481; AD 2018–22–08]

RIN 2120–AA64

Airworthiness Directives; Bombardier, Inc., Airplanes

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

ACTION: Final rule.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain Bombardier, Inc., Model BD–700–1A10 and BD–700–1A11 airplanes. This AD was prompted by reports that non-conforming FIREX squib wire harness connectors may have been installed, which could result in FIREX squib wire harness connectors being connected to the wrong FIREX bottle connectors on affected aircraft. This AD requires a visual inspection of the connections between the FIREX squib wire harness connectors and FIREX bottle connectors, installation of split ring lanyards on the FIREX squib wire harness connectors, and corrective actions if necessary. We are issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective December 10, 2018.

The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of December 10, 2018.

ADDRESSES: For service information identified in this final rule, contact Bombardier, Inc., 400 Côte-Vertu Road West, Dorval, Québec H4S 1Y9, Canada; telephone 514–855–5000; fax 514–855–7401; email *thd.crj@aero.bombardier.com;* internet *http://www.bombardier.com.* You may view this service information at the FAA, Transport Standards Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195. It is also available on the internet at *http://www.regulations.gov* by searching for and locating Docket No. FAA–2018–0585.

Examining the AD Docket

You may examine the AD docket on the internet at *http://www.regulations.gov* by searching for and locating Docket No. FAA–2018–0585; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, the regulatory evaluation, any comments received, and other information. The address for Docket Operations (phone: 800–647–5527) is U.S. Department of Transportation, Docket Operations, M–30, West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: John DeLuca, Aerospace Engineer, Avionics and Electrical Systems Services Section, FAA, New York ACO Branch, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; telephone 516–228–7369; fax 516–794–5531; email *9-avs-nyaco-cos@faa.gov.*

SUPPLEMENTARY INFORMATION:

Discussion

We issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain Bombardier, Inc., Model BD–700–1A10 and BD–700–1A11 airplanes. The NPRM published in the **Federal Register** on July 6, 2018 (83 FR 31491). The NPRM was prompted by reports that non-conforming FIREX squib wire harness connectors may have been installed, which could result in FIREX squib wire harness connectors being connected to the wrong FIREX bottle connectors on affected aircraft. The NPRM proposed to require a visual inspection of the connections between the FIREX squib wire harness connectors and FIREX bottle connectors, installation of split ring lanyards on the FIREX squib wire harness connectors, and corrective actions if necessary.

We are issuing this AD to address this wiring discrepancy, which, in the event of an engine fire, could result in misrouting the supply of fire extinguishing agent to the wrong engine, or limit the supply from both FIREX bottles to only one engine, which could result in the inability to extinguish an engine fire.

Transport Canada Civil Aviation (TCCA), which is the aviation authority for Canada, has issued Canadian AD CF–2018–08R1, dated March 2, 2018 (referred to after this as the Mandatory Continuing Airworthiness Information, or ''the MCAI''), to correct an unsafe condition for certain Bombardier, Inc., Model BD–700–1A10 and BD–700–1A11 airplanes. The MCAI states:

Bombardier Inc. has been made aware that non-conforming squib connector wire harnesses may have been installed on one of the two engine FIREX bottle installations on some of the affected aeroplanes. The subject non conformity of squib connector wire