

function is required for safe operation of the airplane.

**Note:** A battery system consists of the battery and any protective, monitoring, and alerting circuitry or hardware inside or outside of the battery. It also includes vents (where necessary) and packaging. For the purpose of these special conditions, a “battery” and “battery system” are referred to as a battery.

Issued in Renton, Washington, on April 24, 2017.

**Michael Kaszycki,**

*Assistant Manager, Transport Airplane Directorate, Aircraft Certification Service.*

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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No. FAA-2017-0360; Special Conditions No. 25-658-SC]

#### Special Conditions: Bombardier Aerospace Inc., Model BD-700-1A11 Airplane; Non-Rechargeable Lithium Battery Installations

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final special conditions; request for comment.

**SUMMARY:** These special conditions are issued for non-rechargeable lithium battery installations on the Bombardier Aerospace Inc. (Bombardier) Model BD-700-1A11 airplane. Non-rechargeable lithium batteries are a novel or unusual design feature when compared to the state of technology envisioned in the airworthiness standards for transport category airplanes. 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 May 1, 2017. We must receive your comments by June 15, 2017.

**ADDRESSES:** Send comments identified by docket number FAA-2017-0360 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 Web site, 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 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:** Nazih Khaouly, Airplane and Flight Crew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington 98057-3356; telephone 425-227-2432; facsimile 425-227-1149.

#### SUPPLEMENTARY INFORMATION:

##### Future Requests for Installation of Non-Rechargeable Lithium Batteries

The FAA anticipates that non-rechargeable lithium batteries will be installed in most makes and models of transport category airplanes. We intend to require special conditions for certification projects involving non-rechargeable lithium battery installations to address certain safety issues until we can revise the airworthiness requirements. Applying special conditions to these installations across the range of transport category airplanes will ensure regulatory consistency.

Typically, the FAA issues special conditions after receiving an application

for type certificate approval of a novel or unusual design feature. However, the FAA has found that the presence of non-rechargeable lithium batteries in certification projects is not always immediately identifiable, since the battery itself may not be the focus of the project. Meanwhile, the inclusion of these batteries has become virtually ubiquitous on in-production transport category airplanes, which shows that there will be a need for these special conditions. Also, delaying the issuance of special conditions until after each design application is received could lead to costly certification delays. Therefore the FAA finds it necessary to issue special conditions applicable to these battery installations on particular makes and models of aircraft.

On April 22, 2016, the FAA published special conditions no. 25-612-SC in the **Federal Register** (81 FR 23573) applicable to Gulfstream Aerospace Corporation for the GVI airplane. Those were the first special conditions the FAA issued for non-rechargeable lithium battery installations. We explained in that document our decision to make those special conditions effective one year after publication in the **Federal Register**, which is April 22, 2017. In those special conditions, the FAA stated its intention to apply non-rechargeable lithium battery special conditions to design changes on other makes and models applied for after this same date.

Section 1205 of the FAA Reauthorization Act of 1996 requires the FAA to consider the extent to which Alaska is not served by transportation modes other than aviation and to establish appropriate regulatory distinctions when modifying airworthiness regulations that affect intrastate aviation in Alaska. In consideration of this requirement and the overall impact on safety, the FAA does not intend to require non-rechargeable lithium battery special conditions for design changes that only replace a 121.5 megahertz (MHz) emergency locator transmitter (ELT) with a 406 MHz ELT that meets Technical Standard Order C126b, or later revision, on transport airplanes operating only in Alaska. This will support our efforts of encouraging operators in Alaska to upgrade to a 406 MHz ELT. These ELTs provide significantly improved accuracy for lifesaving services to locate an accident site in Alaskan terrain. The FAA considers that the safety benefits from upgrading to a 406 MHz ELT for Alaskan operations will outweigh the battery fire risk.

### Comments Invited

The substance of these special conditions has been subjected to the notice and comment period in prior instances and has 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 impracticable, and good cause exists for adopting these special conditions upon publication in the **Federal Register**. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

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

Bombardier holds type certificate no. T00003NY, which provides the certification basis for the BD-700-1A11 airplane. The BD-700-1A11 is a twin engine, transport category airplane with a passenger seating capacity of 19 and a maximum takeoff weight of 87,700 to 92,500 pounds, depending on the specific design.

The FAA is issuing these special conditions for non-rechargeable lithium battery installations on the BD-700-1A11 airplane. The current battery requirements in title 14, Code of Federal Regulations (14 CFR) part 25 are inadequate for addressing an airplane with non-rechargeable lithium batteries.

### Type Certification Basis

Under the provisions of 14 CFR 21.101, Bombardier must show that the BD-700-1A11 airplane meets 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. In addition, the certification basis includes certain special conditions, exemptions, or later amended sections that are not relevant to these special conditions.

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 BD-700-1A11 airplane because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the airplane 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 BD-700-1A11 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 Feature

The novel or unusual design feature is the installation of non-rechargeable lithium batteries.

For the purpose of these special conditions, we refer to a battery and battery system as a battery. A battery system consists of the battery and any protective, monitoring, and alerting circuitry or hardware inside or outside of the battery. It also includes vents (where necessary) and packaging.

### Discussion

The FAA derived the current regulations governing installation of batteries in transport category airplanes from Civil Air Regulations (CAR) 4b.625(d) as part of the recodification of CAR 4b that established 14 CFR part 25 in February 1965. This recodification basically reworded the CAR 4b battery requirements, which are currently in § 25.1353(b)(1) through (4). Non-rechargeable lithium batteries are novel and unusual with respect to the state of technology considered when these requirements were codified. These batteries introduce higher energy levels into airplane systems through new chemical compositions in various battery cell sizes and construction. Interconnection of these cells in battery packs introduces failure modes that require unique design considerations, such as provisions for thermal management.

Recent events involving rechargeable and non-rechargeable lithium batteries prompted the FAA to initiate a broad evaluation of these energy storage technologies. In January 2013, two independent events involving rechargeable lithium-ion batteries revealed unanticipated failure modes. A National Transportation Safety Board (NTSB) letter to the FAA, dated May 22, 2014, which is available at <http://www.nts.gov>, filename A-14-032-036.pdf, describes these events.

On July 12, 2013, an event involving a non-rechargeable lithium battery in an emergency locator transmitter installation demonstrated unanticipated failure modes. The United Kingdom's Air Accidents Investigation Branch Bulletin S5/2013 describes this event.

Some known uses of rechargeable and non-rechargeable lithium batteries on airplanes include:

- Flight deck and avionics systems such as displays, global positioning systems, cockpit voice recorders, flight data recorders, underwater locator beacons, navigation computers, integrated avionics computers, satellite network and communication systems, communication management units, and remote-monitor electronic line-replaceable units;
- Cabin safety, entertainment, and communications equipment, including emergency locator transmitters, life rafts, escape slides, seatbelt air bags, cabin management systems, Ethernet switches, routers and media servers, wireless systems, internet and in-flight entertainment systems, satellite televisions, remotes, and handsets;
- Systems in cargo areas including door controls, sensors, video surveillance equipment, and security systems.

Some known potential hazards and failure modes associated with non-rechargeable lithium batteries are:

- *Internal failures*: In general, these batteries are significantly more susceptible to internal failures that can result in self-sustaining increases in temperature and pressure (*i.e.*, thermal runaway) than their nickel-cadmium or lead-acid counterparts. The metallic lithium can ignite, resulting in a self-sustaining fire or explosion.
- *Fast or imbalanced discharging*: Fast discharging or an imbalanced discharge of one cell of a multi-cell battery may create an overheating condition that results in an uncontrollable venting condition, which in turn leads to a thermal event or an explosion.
- *Flammability*: Unlike nickel-cadmium and lead-acid batteries, lithium batteries use higher energy and

current in an electrochemical system that can be configured to maximize energy storage of lithium. They also use liquid electrolytes that can be extremely flammable. The electrolyte, as well as the electrodes, can serve as a source of fuel for an external fire if the battery casing is breached.

Special condition no. 1 of these special conditions requires that each individual cell within a non-rechargeable lithium battery be designed to maintain safe temperatures and pressures. Special condition no. 2 addresses these same issues but for the entire battery. Special condition no. 2 requires the battery be designed to prevent propagation of a thermal event, such as self-sustained, uncontrollable increases in temperature or pressure from one cell to adjacent cells.

Special conditions nos. 1 and 2 are intended to ensure that the non-rechargeable lithium battery and its cells are designed to eliminate the potential for uncontrollable failures. However, a certain number of failures will occur due to various factors beyond the control of the battery designer. Therefore, other special conditions are intended to protect the airplane and its occupants if failure occurs.

Special conditions 3, 7, and 8 are self-explanatory.

Special condition no. 4 makes it clear that the flammable fluid fire protection requirements of § 25.863 apply to non-rechargeable lithium battery installations. Section 25.863 is applicable to areas of the airplane that could be exposed to flammable fluid leakage from airplane systems. Non-rechargeable lithium batteries contain an electrolyte that is a flammable fluid.

Special condition no. 5 requires that each non-rechargeable lithium battery installation not damage surrounding structure or adjacent systems, equipment, or electrical wiring from corrosive fluids or gases that may escape in such a way as to cause a major or more severe failure condition.

While special condition no. 5 addresses corrosive fluids and gases, special condition no. 6 addresses heat. Special condition no. 6 requires that each non-rechargeable lithium battery installation have provisions to prevent any hazardous effect on airplane structure or systems caused by the maximum amount of heat the battery installation can generate due to any failure of it or its individual cells. The means of meeting special conditions nos. 5 and 6 may be the same, but the requirements are independent and address different hazards.

These special conditions apply to all non-rechargeable lithium battery

installations in lieu of § 25.1353(b)(1) through (4) at Amendment 25–123 or § 25.1353(c)(1) through (4) at earlier amendments. Those regulations remain in effect for other battery installations.

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

These special conditions are applicable to the BD–700–1A11 airplane. 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.

These special conditions are only applicable to design changes applied for after the effective date.

These special conditions are not applicable to changes to previously certified non-rechargeable lithium battery installations where the only change is either cosmetic or to relocate the installation to improve the safety of the airplane and occupants. Previously certified non-rechargeable lithium battery installations, as used in this paragraph, are those installations approved for certification projects applied for on or before the effective date of these special conditions. A cosmetic change is a change in appearance only, and does not change any function or safety characteristic of the battery installation. These special conditions are also not applicable to unchanged, previously certified non-rechargeable lithium battery installations that are affected by a change in a manner that improves the safety of its installation. The FAA determined that these exclusions are in the public interest because the need to meet all of the special conditions might otherwise deter these design changes that improve safety.

#### Conclusion

This action affects only a certain novel or unusual design feature on one model of airplane. It is not a rule of general applicability.

The substance of these special conditions has been subjected to the notice and comment period in prior instances and has 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

impracticable, and good cause exists for adopting these special conditions upon publication in the **Federal Register**. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

#### List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and record keeping requirements.

The authority citation for these special conditions is as follows:

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

#### The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for the Bombardier Model BD–700–1A11 airplane.

#### Non-Rechargeable Lithium Battery Installations

In lieu of § 25.1353(b)(1) through (4) at Amendment 25–123 or § 25.1353(c)(1) through (4) at earlier amendments, each non-rechargeable lithium battery installation must:

1. Be designed to maintain safe cell temperatures and pressures under all foreseeable operating conditions to prevent fire and explosion.
2. Be designed to prevent the occurrence of self-sustaining, uncontrollable increases in temperature or pressure.
3. Not emit explosive or toxic gases, either in normal operation or as a result of its failure, that may accumulate in hazardous quantities within the airplane.
4. Meet the requirements of § 25.863.
5. Not damage surrounding structure or adjacent systems, equipment, or electrical wiring from corrosive fluids or gases that may escape in such a way as to cause a major or more severe failure condition.
6. Have provisions to prevent any hazardous effect on airplane structure or systems caused by the maximum amount of heat it can generate due to any failure of it or its individual cells.
7. Have a failure sensing and warning system to alert the flightcrew if its failure affects safe operation of the airplane.
8. Have a means for the flightcrew or maintenance personnel to determine the battery charge state if the battery's function is required for safe operation of the airplane.

**Note:** A battery system consists of the battery and any protective, monitoring, and

alerting circuitry or hardware inside or outside of the battery. It also includes vents (where necessary) and packaging. For the purpose of these special conditions, a “battery” and “battery system” are referred to as a battery.

Issued in Renton, Washington, on April 24, 2017.

**Michael Kaszycki,**

*Assistant Manager, Transport Airplane Directorate, Aircraft Certification Service.*

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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 71

[Docket No. FAA-2016-9151; Airspace Docket No. 16-ASW-15]

### Revocation of Class E Airspace and Establishment of Class E Airspace; Ruston, LA

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** This action removes Class E airspace extending upward from 700 feet above the surface at Ruston Municipal Airport, Ruston, LA, as the airport has closed and controlled airspace is no longer required, and establishes Class E airspace extending upward from 700 feet above the surface at the new Ruston Regional Airport, Ruston, LA. This final rule is necessary to ensure the safety and management of instrument flight rules (IFR) operations at the new airport.

**DATES:** Effective 0901 UTC, August 17, 2017. The Director of the Federal Register approves this incorporation by reference action under Title 1, Code of Federal Regulations, part 51, subject to the annual revision of FAA Order 7400.11 and publication of conforming amendments.

**ADDRESSES:** FAA Order 7400.11A, Airspace Designations and Reporting Points, and subsequent amendments can be viewed online at [http://www.faa.gov/air\\_traffic/publications/](http://www.faa.gov/air_traffic/publications/). For further information, you can contact the Airspace Policy Group, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone: 202-267-8783. The Order is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of FAA Order 7400.11A at NARA, call 202-741-6030, or go to <http://www.archives.gov/>

*federal\_register/code\_of\_federal\_regulations/ibr\_locations.html.*

FAA Order 7400.11, Airspace Designations and Reporting Points, is published yearly and effective on September 15.

#### **FOR FURTHER INFORMATION CONTACT:**

Jeffrey Claypool, Federal Aviation Administration, Operations Support Group, Central Service Center, 10101 Hillwood Parkway, Fort Worth, TX 76177; telephone (817) 222-5711.

#### **SUPPLEMENTARY INFORMATION:**

##### **Authority for This Rulemaking**

The FAA’s authority to issue rules regarding aviation safety is found in Title 49 of the United States Code. Subtitle I, Section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency’s authority. This rulemaking is promulgated under the authority described in Subtitle VII, Part A, Subpart I, Section 40103. Under that section, the FAA is charged with prescribing regulations to assign the use of airspace necessary to ensure the safety of aircraft and the efficient use of airspace. This regulation is within the scope of that authority as it modifies Class E airspace extending upward from 700 feet above the surface in the airspace near Ruston, LA, to accommodate IFR procedures at the new Ruston Regional Airport.

##### **History**

On October 12, 2016, the FAA published in the **Federal Register** (81 FR 70372) Docket No. FAA-2016-9151, a notice of proposed rulemaking (NPRM) to remove Class E airspace extending upward from 700 feet above the surface at Ruston Municipal Airport, Ruston, LA. The FAA also proposed to establish Class E airspace extending upward from 700 feet above the surface within a 6.5 mile radius of the new Ruston Regional Airport, Ruston, LA. Interested parties were invited to participate in this rulemaking effort by submitting written comments on the proposal to the FAA. One comment was received stating, “This would open up airspace because there would not be controlled airspace as the airport has shut down.” While this comment is factually correct, the new airport and associated airspace has been established approximately 2.5 NM from the location of the closed airport so the change in the airspace footprint is minimal.

Class E airspace designations are published in paragraph 6005 of FAA Order 7400.11A, dated August 3, 2016, and effective September 15, 2016, which

is incorporated by reference in 14 CFR 71.1. The Class E airspace designations listed in this document will be published subsequently in the Order.

#### **Availability and Summary of Documents for Incorporation by Reference**

This document amends FAA Order 7400.11A, Airspace Designations and Reporting Points, dated August 3, 2016, and effective September 15, 2016. FAA Order 7400.11A is publicly available as listed in the **ADDRESSES** section of this document. FAA Order 7400.11A lists Class A, B, C, D, and E airspace areas, air traffic service routes, and reporting points.

#### **The Rule**

This amendment to Title 14, Code of Federal Regulations (14 CFR) part 71 removes Class E airspace at Ruston Municipal Airport, Ruston, LA, as the airport has closed; therefore, controlled airspace is no longer needed. Class E airspace extending upward from 700 feet above the surface within a 6.5-mile radius of the new Ruston Regional Airport, Ruston, LA is established for the safety and management of standard instrument approach procedures for IFR operations at the new airport.

#### **Regulatory Notices and Analyses**

The FAA has determined that this regulation only involves an established body of technical regulations for which frequent and routine amendments are necessary to keep them operationally current, is non-controversial and unlikely to result in adverse or negative comments. It, therefore: (1) Is not a “significant regulatory action” under Executive Order 12866; (2) is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) does not warrant preparation of a regulatory evaluation as the anticipated impact is so minimal. Since this is a routine matter that only affects air traffic procedures and air navigation, it is certified that this rule, when promulgated, does not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

#### **Environmental Review**

The FAA has determined that this action qualifies for categorical exclusion under the National Environmental Policy Act in accordance with FAA Order 1050.1F, “Environmental Impacts: Policies and Procedures,” paragraph 5-6.5.a. This airspace action is not expected to cause any potentially significant environmental impacts, and