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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA–2012–0015; Special Conditions No. 25–455–SC]

Special Conditions: Gulfstream Aerospace Corporation, Model GVI Airplane; Rechargeable Lithium Batteries and Rechargeable Lithium-Battery Systems

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Gulfstream Aerospace Corporation (GAC) Model GVI airplane. This airplane will have a novel or unusual design feature associated with the installation of rechargeable lithium batteries and rechargeable lithium-battery systems. 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: The effective date of these special conditions is January 9, 2012. We must receive your comments by March 5, 2012.

ADDRESSES: Send comments identified by docket number FAA–2012–0015 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, Wahsington, 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 8 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://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 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: 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) 227–1320.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice of, and opportunity for prior public comment on, these special conditions are impracticable because these procedures would significantly delay issuance of the design approval and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

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 March 29, 2005, GAC applied for an FAA type certificate for its new Model GVI passenger airplane (hereafter referred to as ''the GVI''). On September 28, 2006, GAC re-applied for the GVI type certificate to adhere to the application effectivity established by Title 14, Code of Federal Regulations (14 CFR) 21.17(c), and on July 31, 2011, GAC requested an extension of application in accordance with § 21.17(d)(2). The FAA concurred with this request and established a new effective application date of September 18, 2007. The GVI airplane will be an all-new, two-engine jet transport airplane. The maximum takeoff weight will be 99,600 pounds, with a maximum passenger count of 19 passengers.

Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.17, GAC must show that the GVI meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25–1 through 25–120, 25–122, 25–124, and 25–132 thereto. 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 GVI 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 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.

In addition to the applicable airworthiness regulations and special conditions, the GVI 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; and the FAA must issue a finding of regulatory adequacy under § 611 of Public Law 92–574, the ''Noise Control Act of 1972.''

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 § 21.17(a)(2).

Novel or Unusual Design Features

The GVI will incorporate the following novel or unusual design features: Rechargeable lithium batteries and rechargeable lithium-battery systems.

Discussion

The current regulations governing installation of batteries in large, transport-category airplanes were derived from Civil Air Regulations (CAR) Part 4b.625(d) as part of the re-codification of CAR 4b that established 14 CFR part 25 in February 1965. The new battery requirements, § 25.1353(c)(1) through (c)(4), basically reworded the CAR requirements.

Increased use of nickel-cadmium (Ni-Cd) batteries in small airplanes resulted in increased incidents of battery fires and failures, which led to additional rulemaking affecting large, transport-category airplanes as well as small airplanes. On September 1, 1977, and March 1, 1978, respectively, the FAA issued § 25.1353(c)(5) and (c)(6), governing Ni-Cd battery installations on large, transport-category airplanes.

The proposed use of rechargeable lithium batteries and rechargeable lithium-battery systems for equipment and systems on the GVI have prompted the FAA to review the adequacy of these existing regulations. Our review indicates that the existing regulations do not adequately address several failure, operational, and maintenance characteristics of rechargeable lithium batteries and rechargeable lithium-battery systems that could affect the safety and reliability of the GVI rechargeable lithium batteries and rechargeable lithium-battery-system installations.

At present, commercial aviation has limited experience with the use of rechargeable lithium batteries and rechargeable lithium-battery systems in aviation applications. However, other users of this technology, ranging from wireless telephone manufacturers to the electric vehicle industry, have noted safety problems with lithium batteries. These problems include overcharging, over-discharging, and cell-component flammability.

1. Overcharging

In general, lithium batteries are significantly more susceptible than their Ni-Cd or lead-acid counterparts to internal failures that can result in self-sustaining increases in temperature and pressure (*i.e.,* thermal runaway). This is especially true for overcharging, which causes heating and destabilization of the components of the lithium-battery cell, which can lead to the formation, by plating, of highly unstable metallic lithium. The metallic lithium can ignite, resulting in a self-sustaining fire or explosion. The severity of thermal runaway due to overcharging increases with increased battery capacity due to the higher amount of electrolyte in large batteries.

2. Over-Discharging

Discharge of some versions of the lithium-battery cell, beyond a certain voltage (typically 2.4 volts), can cause corrosion of the electrodes in the cell, resulting in loss of battery capacity that cannot be reversed by recharging. This loss of capacity may not be detected by the simple voltage measurements commonly available to flight crewmembers as a means of checking battery status, a problem shared with Ni-Cd batteries.

3. Flammability of Cell Components

Unlike Ni-Cd and lead-acid cells, some types of lithium-battery cells use flammable liquid electrolytes. The electrolyte can serve as a source of fuel for an external fire if the cell container is breached.

The problems that lithium-battery users experience raise concerns about the use of these batteries in commercial aviation. The intent of these special conditions is to establish appropriate airworthiness standards for lithium-battery installations in the GVI, and to ensure, as required by §§ 25.601 and 25.1309, that these battery installations will not result in an unsafe condition.

To address these concerns, these special conditions adopt the following requirements:

- Those sections of § 25.1353 that are applicable to lithium batteries.
- The flammable-fluid fire-protection requirements of § 25.863. In the past, this rule was not applied to batteries in transport-category airplanes because the electrolytes in lead-acid and Ni-Cd batteries are not considered flammable.
- New requirements to address hazards of overcharging and over-discharging that are unique to rechargeable lithium batteries.
- Section 25.1529, Instructions for Continued Airworthiness, must include maintenance requirements to ensure that batteries used as spares are maintained in an appropriate state of charge, and installed lithium batteries are sufficiently charged at appropriate intervals. These instructions must also describe proper repairs, if allowed, and battery part-number configuration control.

In issuing these special conditions, the FAA requires that:

(1) All characteristics of the lithium batteries and their installation that could affect safe operation of the GVI are addressed, and

(2) Appropriate Instructions for Continued Airworthiness, which include maintenance requirements, are established to ensure the availability of electrical power from the batteries when needed.

The intent of these proposed special conditions is to establish appropriate airworthiness standards for rechargeable lithium-battery and rechargeable lithium-battery system installations in the GVI and to ensure, as required by §§ 25.1309 and 25.601, that these battery installations are not hazardous or unreliable.

Applicability

As discussed above, these special conditions are applicable to the GVI. Should GAC 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 the GVI. It is not a rule of general applicability.

The substance of these special conditions has been subjected to the notice and comment period in several 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, because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. 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 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 the GVI.

In lieu of the requirements of § 25.1353(c)(1) through (c)(4) at amendment 25–42, lithium batteries and battery installations on the GVI must be designed and installed as follows:

(1) Safe lithium battery-cell temperatures and pressures must be maintained during any charging or discharging condition, and during any failure of the battery-charging or battery-monitoring system not shown to be extremely remote. The lithium-battery installation must preclude explosion in the event of those failures.

(2) Design of lithium batteries must preclude the occurrence of self-sustaining, uncontrolled increases in temperature or pressure.

(3) No explosive or toxic gases emitted by any lithium battery in normal operation, or as the result of any failure of the battery-charging or battery-monitoring system, or battery installation which is not shown to be extremely remote, may accumulate in hazardous quantities within the airplane.

(4) Installations of lithium batteries must meet the requirements of 14 CFR 25.863(a) through (d).

(5) No corrosive fluids or gases that may escape from any lithium battery may damage surrounding structure or any adjacent systems, equipment, or electrical wiring of the airplane in such a way as to cause a major or more-severe failure condition, as determined in accordance with 14 CFR 25.1309(b).

(6) Each lithium-battery installation must have provisions to prevent any hazardous effect on structure or essential systems caused by the maximum amount of heat the battery can generate during a short circuit of the battery or of its individual cells.

(7) Lithium-battery installations must have a system to control automatically the charging rate of the battery to prevent battery overheating or overcharging, and

(i) A battery-temperature-sensing and over-temperature-warning system with a means to automatically disconnect the battery from its charging source in the event of an over-temperature condition or,

(ii) A battery-failure sensing-and-warning system with a means to automatically disconnect the battery from its charging source in the event of battery failure.

(8) Any lithium-battery installation, the function of which is required for safe operation of the airplane, must incorporate a monitoring-and-warning feature that will provide an indication to the appropriate flight crewmembers whenever the state-of-charge of the batteries has fallen below levels considered acceptable for dispatch of the airplane.

(9) The instructions for continued airworthiness required by § 25.1529 (and § 26.11) must contain maintenance steps to assure that the lithium batteries are sufficiently charged at appropriate intervals specified by the battery manufacturer. The instructions for continued airworthiness must also contain procedures to ensure the integrity of lithium batteries in spares storage to prevent the replacement of batteries, the function of which are required for safe operation of the airplane, with batteries that have experienced degraded charge-retention ability or other damage due to prolonged storage at a low state-of-charge. Precautions should be included in the continued-airworthiness maintenance instructions to prevent mishandling of lithium batteries, which could result in a short circuit or other unintentional damage that could result in personal injury or property damage.

GAC must show compliance with the requirements of these special conditions by test and/or analysis. The aircraft certification office, or its designees, will find compliance in coordination with the FAA Transport Standards Staff.

Note 1: The term ''sufficiently charged'' means that the battery retains enough of a charge, expressed in ampere-hours, to ensure that the battery cells are not damaged. A battery cell may be damaged by reducing the battery's charge below a point where the battery's ability to charge and retain a full charge is reduced. This reduced charging and charge-retention capability would be greater than the reduction that may result from normal operational degradation.

Note 2: These special conditions are not intended to replace § 25.1353(c) in the certification basis of the GVI. These special conditions apply only to lithium batteries and rechargeable lithium-battery-system installations. The requirements of § 25.1353(c) remain in effect for batteries and battery installations on the GVI that do not use lithium batteries.

Issued in Renton, Washington, on January 9, 2012.

K.C. Yanamura,

Assistant Manager, Transport Airplane Directorate, Aircraft Certification Service.

[FR Doc. 2012–798 Filed 1–17–12; 8:45 am]

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2012–0014; Directorate Identifier 2011–CE–044–AD; Amendment 39–16915; AD 2011–27–51]

RIN 2120–AA64

Airworthiness Directives; Hawker Beechcraft Corporation Models 1900, 1900C, and 1900D Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule; request for comments.

SUMMARY: We are adopting a new airworthiness directive (AD) for certain Hawker Beechcraft Corporation Models 1900, 1900C, and 1900D airplanes. This emergency AD was sent previously to all known U.S. owners and operators of these airplanes. This AD requires inspecting the elevator bob-weight and attaching linkage for correct installation and for damage or deformation to the weight and/or weight bracket with corrective action as necessary. This AD was prompted by reports of the elevator bob-weight (stabilizer weight) traveling past its stop bolt, which allowed the attaching linkage to move over-center, resulting in reduced nose down elevator control, which could result in loss of control of the airplane. We are issuing this AD to detect and correct conditions that could result in reduced nose down elevator control and loss of control of the airplane.

DATES: This AD is effective January 18, 2012 to all persons except those persons to whom it was made immediately effective by Emergency AD 2011–27–51, issued on December 23, 2011, which contained the requirements of this amendment.

The Director of the Federal Register approved the incorporation by reference of a certain publication identified in the AD as of January 18, 2012.

We must receive comments on this AD by March 5, 2012.

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods: