

Rules and Regulations

Federal Register

Vol. 74, No. 66

Wednesday, April 8, 2009

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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM401; Special Conditions No. 25-380-SC]

Special Conditions: Rosemount Aerospace Inc., Modification to Boeing 737-600, -700, -800, and -900 Series Airplanes: Lithium Battery Systems

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Boeing 737-600, -700, -800, and -900 Series airplanes. These airplanes, as modified by Rosemount Aerospace Inc., will have a novel or unusual design feature associated with the installation of lithium batteries. 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 March 30, 2009. We must receive your comments by May 26, 2009.

ADDRESSES: You must mail two copies of your comments to: Federal Aviation Administration, Transport Airplane Directorate, Attn: Rules Docket (ANM-113), Docket No. NM401, 1601 Lind Avenue, SW., Renton, Washington 98057-3356. You may deliver two copies to the Transport Airplane Directorate at the above address. You must mark your comments: Docket No. NM401. You can inspect comments in the Rules Docket weekdays, except

Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Nazih Khaouly, 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 reasons for recommended changes, and include supporting data. We ask that you send us two copies of written comments.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel about these special conditions. You can inspect the docket before and after the comment closing date. If you wish to review the docket in person, go to the address in the **ADDRESSES** section of this preamble between 7:30 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

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.

If you want us to acknowledge receipt of your comments on these special conditions, include with your comments a self-addressed, stamped postcard on which you have written the docket number. We will stamp the date on the postcard and mail it back to you.

Background

On October 4, 2007, Rosemount Aerospace Inc. applied for a supplemental type certificate for the installation of a Rosemount Aerospace Inc., 8700A1-3 Series Electronic Flight Bag (EFB) in Boeing 737-600, -700, -800, and -900 Series airplanes.

Type Certification Basis

Under the provisions of § 21.101, Rosemount Aerospace Inc. must show that the Boeing 737-600, -700, -800, and -900 Series airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A16WE or the applicable regulations in effect on the date of application for the change. The regulations incorporated by reference in the type certificate are commonly referred to as the "original type-certification basis." The regulation incorporated by reference in A16WE is 14 CFR 25.1353 at Amendment 25-38.

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 Rosemount Aerospace Inc. EFB because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Rosemount Aerospace Inc., Boeing 737-600, -700, -800, and -900 Series 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; 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 § 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.101.

Special conditions are initially applicable to the model for which they are issued. Should the applicant apply for a supplemental type certificate to modify any other model included on the same type certificate, to incorporate the same novel or unusual design feature, the special conditions would also apply to the other model.

Novel or Unusual Design Features

The Rosemount Aerospace Inc. modification to Boeing 737–600, –700, –800, and –900 Series airplanes will incorporate the following novel or unusual design feature: a lithium battery system.

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 recodification of CAR 4b that established 14 CFR Part 25 in February 1965. The new battery requirements, 14 CFR 25.1353(c)(1) through (c)(4), basically reworded the CAR requirements.

Increased use of nickel-cadmium 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, the FAA issued 14 CFR 25.1353(c)(5) and (c)(6), respectively, governing nickel-cadmium battery installations on large, transport-category airplanes.

The proposed use of lithium batteries for equipment and systems on Boeing 737–600, –700, –800, and –900 Series airplanes has 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 lithium batteries that could affect the safety and reliability of lithium-battery installations on Boeing 737–600, –700, –800, and –900 Series airplanes.

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

1. Overcharging

In general, lithium 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. This is especially true for overcharging, which causes heating and destabilization of the components of the cell, leading 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 increasing battery capacity due to the higher amount of electrolyte in large batteries.

2. Over-Discharging

Discharge of some types of lithium batteries beyond a certain voltage (typically 2.4 volts) can cause corrosion of the electrodes of 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 crews, as a means of checking battery status—a problem shared with nickel-cadmium batteries.

3. Flammability of Cell Components

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

These data, recorded by users of lithium batteries, raise concerns about the use of these batteries in commercial aviation. The intent of the proposed special condition is to establish appropriate airworthiness standards for lithium-battery installations in Boeing 737–600, –700, –800, and –900 Series airplanes and to ensure, as required by 14 CFR 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 Rosemount Aerospace Inc., 8700A1–3 Series Electronic Flight Bag. Should Rosemount Aerospace Inc. apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A16WE, to incorporate 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 Rosemount Aerospace Inc., 8700A1–3 Series EFBs installed on Boeing 737–600, –700, –800, and –900 Series airplanes. It is not a rule of general applicability and affects only the applicant who applied to the FAA for approval of these features on the airplane.

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 Boeing 737–600, –700, –800, –900 Series airplanes modified by Rosemount Aerospace Inc. Lithium batteries and battery installations on Boeing 737–600, –700, –800, and –900 Series airplanes must be designed and installed as follows:

1. Safe cell temperatures and pressures must be maintained during any foreseeable charging or discharging condition, and during any failure of the 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 the 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 system, 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, in accordance with 14 CFR 25.1309(b) and applicable regulatory guidance.

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 automatically control the charging rate of the battery, to prevent battery overheating or overcharging, and,

a. A battery-temperature-sensing and over-temperature-warning system with a means for automatically disconnecting the battery from its charging source in the event of an over-temperature condition, or,

b. A battery-failure-sensing-and-warning system with a means for automatically disconnecting 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 provides an indication to the appropriate flight-crew members when 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 14 CFR 25.1529 (and 26.11), must contain maintenance steps to:

a. Assure that the lithium battery is sufficiently charged at appropriate intervals specified by the battery manufacturer.

b. Ensure the integrity of lithium batteries in spares-storage to prevent the replacement of batteries, whose function is 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.

The Instructions for Continued Airworthiness maintenance procedures must contain precautions to prevent mishandling of the lithium battery, which could result in short-circuit or other unintentional damage that, in turn, could result in personal injury or property damage.

Note 1: The term "sufficiently charged" means that the battery will retain enough of a charge, expressed in ampere-hours, to ensure that the battery cells will not be damaged. A battery cell may be damaged by

lowering the charge below a point where the battery's ability to charge and retain a full charge is reduced. This reduction would be greater than the reduction that may result from normal, operational degradation.

Note 2: These special conditions are not intended to replace 14 CFR 25.1353(b) in the certification basis of the Boeing 737-600, -700, -800, and -900 Series airplanes. These special conditions apply only to lithium batteries and their installations. The requirements of 14 CFR 25.1353(b) remain in effect for batteries and battery installations in Boeing 737-600, -700, -800, and -900 Series airplanes that do not use lithium batteries.

Compliance with the requirements of these special conditions must be shown by test, or analysis by the Aircraft Certification Office, or its designees, with the concurrence of the FAA Transport Airplane Directorate.

Issued in Renton, Washington, on March 30, 2009.

Stephen P. Boyd,

Acting Manager, Transport Airplane Directorate, Aircraft Certification Service.
[FR Doc. E9-7907 Filed 4-7-09; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM402; Special Conditions No. 25-381-SC]

Special Conditions: TTF Aerospace, LLC, Modification to Boeing Model 767-400 Series Airplanes; Aft Lower-Lobe Crew-Rest Module (CRM)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for Boeing Model 767-400 series airplanes. These airplanes, modified by TTF Aerospace, LLC (TTF), will have a novel or unusual design feature associated with an aft, lower-lobe, crew-rest module (CRM). 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 for these special conditions is March 31, 2009. We must receive comments by May 26, 2009.

ADDRESSES: Please mail two copies of your comments to: Federal Aviation

Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM-113), Docket No. NM402, 1601 Lind Avenue, SW., Renton, Washington 98057-3356. You may deliver two copies to the Transport Airplane Directorate at the same address. You must mark your comments: Docket No. NM402. You can inspect comments in the Rules Docket weekdays, except federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: John Sheldon, FAA, Airframe/Cabin Safety Branch, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington, 98057-3356; telephone (425) 227-2785; facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION: The FAA has determined that notice and opportunity for prior public comment is 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 ask that you send us two copies of written comments.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel about these special conditions. You can inspect the docket before and after the comment closing date. If you wish to review the docket in person, go to the address in the **ADDRESSES** section of the preamble between 7:30 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

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.

If you want us to acknowledge receipt of your comments on these special conditions, include with your comments a self-addressed, stamped postcard on which you have written the docket number. We will stamp the date on the postcard and mail it back to you.