

# Proposed Rules

Federal Register

Vol. 73, No. 153

Thursday, August 7, 2008

This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No. NM393; Notice No. 25-08-06-SC]

#### Special Conditions: Airbus A318, A319, A320, and A321 Series Airplanes; Astronautics Electronic Flight Bags With Lithium Battery Installations

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

**ACTION:** Notice of proposed special conditions.

**SUMMARY:** This action proposes special conditions for the Airbus A318, A319, A320, and A321 series airplanes. These airplanes, as modified by L2 Consulting Services, will have a novel or unusual design feature associated with Astronautics electronic flight bags which use lithium battery technology. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These proposed 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:** We must receive your comments by September 22, 2008.

**ADDRESSES:** You must mail two copies of your comments to: Federal Aviation Administration, Transport Airplane Directorate, Attention: Rules Docket (ANM-113), Docket No. NM393, 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. NM393. 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, FAA, Airplane and Flight Crew Interface, 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:

##### 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 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 will consider comments filed late, if it is possible to do so without incurring expense or delay. We may change these special conditions based on the comments we receive.

If you want us to let you know we received your comments on this proposal, send us a pre-addressed, stamped postcard on which the docket number appears. We will stamp the date on the postcard and mail it back to you.

##### Background

On March 12, 2007, L2 Consulting Services of Dripping Springs, Texas, applied for a supplemental type certificate to install Astronautics electronic flight bags on Airbus A318, A319, A320, and A321 series airplanes. In addition to lithium batteries, the Astronautics electronic flight bags contain the following equipment:

- Multiple electronic flight bag display units,
- Multiple electronic units (computer),
- Electronic flight bag power On/Off switches, and
- Mounting arms and mounting brackets.

At present, there is limited experience with use of rechargeable lithium

batteries in applications involving commercial aviation. 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 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 that 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. Finally, 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 flightcrews 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 liquid electrolytes that are flammable. The electrolyte can serve as a source of fuel for an external fire, if there is a breach of the battery container.

These problems experienced by users of lithium batteries raise concern about the use of these batteries in commercial aviation. Accordingly, the proposed use of lithium batteries in Astronautics electronic flight bags on Airbus A318, A319, A320, and A321 series airplanes has prompted the FAA to review the adequacy of existing regulations in Title 14 Code of Federal Regulations (14 CFR) part 25. 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.

The intent of these special conditions is to establish appropriate airworthiness standards for lithium batteries in Airbus A318, A319, A320, and A321 series airplanes modified by L2 Consulting Services, and to ensure, as required by § 25.601, that these battery installations are not hazardous or unreliable. Accordingly, these special conditions include the following requirements:

- Those provisions of § 25.1353 which are applicable to lithium batteries.
  - The flammable fluid fire protection provisions of § 25.863.
- In the past, this regulation was not applied to batteries of transport category airplanes, since the electrolytes used in lead-acid and nickel-cadmium batteries are not flammable.
- New requirements to address the hazards of overcharging and over-discharging that are unique to lithium batteries.
  - New Instructions for Continuous Airworthiness that include maintenance requirements to ensure that batteries used as spares are maintained in an appropriate state of charge.

#### Type Certification Basis

Under the provisions of 14 CFR 21.101, L2 Consulting Services must show that the Airbus A318, A319, A320, and A321 series airplanes, as changed, continue to meet the applicable provisions of the regulations incorporated by reference in Type Certificate No. A28NM 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 certification basis for Airbus A318, A319, A320, and A321 series airplanes includes applicable sections of part 25, effective February 1, 1965, as amended by Amendments 25–1 through 25–56, plus other amendments for each model as indicated in Type Certificate No. A28NM. In addition, the certification basis includes certain special conditions, exemptions, equivalent levels of safety, or later amended sections of the applicable part 25 that are not relevant to these special conditions.

If the Administrator finds that the applicable airworthiness regulations (i.e., part 25, as amended) do not contain adequate or appropriate safety

standards for Airbus A318, A319, A320, and A321 series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of 14 CFR 21.16.

In addition to the applicable airworthiness regulations and special conditions, the Airbus A318, A319, A320, and A321 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.

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

Special conditions are initially applicable to the models for which they are issued. Should L2 Consulting Services apply for a supplemental type certificate to modify any other model included on Type Certificate No. A28NM to incorporate the same or similar novel or unusual design feature, these special conditions would also apply to the other model.

#### Novel or Unusual Design Features

The Airbus A318, A319, A320, and A321 series airplanes, as modified by L2 Consulting Services, to include Astronautics electronic flight bags which use lithium battery technology, will incorporate a novel or unusual design feature. Because of rapid improvements in airplane technology, 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.

The Astronautics electronic flight bags will include lithium battery installations. Large, high capacity, rechargeable lithium batteries are a novel or unusual design feature in transport category airplanes. This type of battery has certain failure, operational, and maintenance characteristics that differ significantly from those of the nickel-cadmium and lead-acid rechargeable batteries currently approved for installation on large transport category airplanes. The FAA issues these special conditions to require that all characteristics of the lithium battery and its installation do not adversely affect the safe operation of the airplane.

#### Applicability

As discussed above, these special conditions are applicable to the Airbus

A318, A319, A320, and A321 series airplanes as modified by L2 Consulting Services. Should L2 Consulting Services apply at a later date for a supplemental type certificate to modify any other model included on Type Certificate No. A28NM to incorporate the same novel or unusual design feature, these special conditions would apply to that model as well.

#### Conclusion

This action affects only certain novel or unusual design features of the Airbus A318, A319, A320, and A321 series airplanes as modified by L2 Consulting Services. It is not a rule of general applicability and affects only the applicant which applied to the FAA for approval of these features on the airplane.

#### 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 Proposed Special Conditions

Accordingly, the Federal Aviation Administration (FAA) proposes the following special conditions as part of the type certification basis for the Airbus A318, A319, A320, and A321 series airplanes modified by L2 Consulting Services in lieu of the requirements of § 25.1353(c)(1) through (c)(4), Amendment 25–113.

Lithium batteries and battery installations on Airbus A318, A319, A320, and A321 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 § 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 § 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 control the charging rate of the battery automatically, so as 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 whose function 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 must contain maintenance requirements to assure that the lithium battery is sufficiently charged at appropriate intervals specified by the battery manufacturer to ensure that batteries whose function is required for safe operation of the airplane will not degrade below specified ampere-hour levels sufficient to power the electronic flight bag applications that are required for continued safe flight and landing. The Instructions for Continued Airworthiness must also contain procedures for the maintenance 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. Precautions should be included in the Instructions for Continued Airworthiness maintenance instructions to prevent mishandling of the lithium

battery which could result in short-circuit or other unintentional damage that could result in personal injury or property damage.

**Note 1:** The term "sufficiently charged" means a charge that is above a minimum level, expressed in ampere-hours, below which the battery will reduce its capacity to be fully charged and/or the ability to retain a complete charge. This reduction in charging and retaining a full charge capacity is below the original design capacity that may result from normal operational degradation.

**Note 2:** These special conditions are not intended to replace § 25.1353(c), Amendment 25-113 in the certification basis of the L2 Consulting Services supplemental type certificate. These special conditions apply only to lithium batteries and their installations. The requirements of § 25.1353(c), Amendment 25-113 remain in effect for batteries and battery installations on the L2 Consulting Services supplemental type certificate that do not use lithium batteries.

Compliance with the requirements of these special conditions must be shown by test or analysis, with the concurrence of the Fort Worth Special Certification Office.

Issued in Renton, Washington, on July 29, 2008.

**Ali Bahrami,**

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

[FR Doc. E8-18139 Filed 8-6-08; 8:45 am]

**BILLING CODE 4910-13-P**

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 39

[Docket No. FAA-2008-0848; Directorate Identifier 2008-NM-082-AD]

**RIN 2120-AA64**

#### **Airworthiness Directives; Saab Model SAAB 2000 Airplanes**

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

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** We propose to adopt a new airworthiness directive (AD) for the products listed above. This proposed AD results from mandatory continuing airworthiness information (MCAI) originated by an aviation authority of another country to identify and correct an unsafe condition on an aviation product. The MCAI describes the unsafe condition as:

Subsequent to accidents involving Fuel Tank System explosions in flight \* \* \*

on ground, \* \* \* Special Federal Aviation Regulation 88 (SFAR88) \* \* \* required \* \* \* a design review against explosion risks.

\* \* \* \* \*

The unsafe condition is the potential of ignition sources inside fuel tanks, which, in combination with flammable fuel vapors, could result in fuel tank explosions and consequent loss of the airplane. The proposed AD would require actions that are intended to address the unsafe condition described in the MCAI.

**DATES:** We must receive comments on this proposed AD by September 8, 2008.

**ADDRESSES:** You may send comments by any of the following methods:

- **Federal eRulemaking Portal:** Go to <http://www.regulations.gov>. Follow the instructions for submitting comments.

- **Fax:** (202) 493-2251.

- **Mail:** U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue, SE., Washington, DC 20590.

- **Hand Delivery:** U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-40, 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

#### **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Operations office (telephone (800) 647-5527) is in the **ADDRESSES** section. Comments will be available in the AD docket shortly after receipt.

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

Shahram Daneshmandi, Aerospace Engineer, International Branch, ANM-116, Transport Airplane Directorate, FAA, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 227-1112; fax (425) 227-1149.

#### **SUPPLEMENTARY INFORMATION:**

##### **Comments Invited**

We invite you to send any written relevant data, views, or arguments about this proposed AD. Send your comments to an address listed under the **ADDRESSES** section. Include "Docket No. FAA-2008-0848; Directorate Identifier 2008-NM-082-AD" at the beginning of your comments. We specifically invite