

not included in Class A. DOE is conducting a separate determination analysis rulemaking for these products, but intends to invite public comment on the scope of coverage for non-Class A external power supplies at the end of the public meeting, if time permits.

DOE invites all interested parties, whether they participate in the public meeting, to submit in writing by July 20, 2009, comments and information on matters addressed in the Framework Document and on other matters relevant to assessment of energy conservation standards for battery chargers and external power supplies.

After the public meeting and the close of the comment period on the Framework Document, DOE will begin collecting data, conducting the analyses as discussed in the Framework Document and at the public meeting, and reviewing the comments received.

DOE considers public participation to be a very important part of the process for setting energy conservation standards. DOE encourages the participation and interaction of the public during the comment period in each stage of the rulemaking process. Beginning with the Framework Document, and during each subsequent public meeting and comment period, interactions with and among members of the public provide a balanced discussion of the issues that assists DOE in the standards rulemaking process. Accordingly, anyone who would like to participate in the public meeting, receive meeting materials, or be added to the DOE mailing list to receive future notices and information regarding this and related rulemakings on battery chargers and external power supplies should contact Ms. Brenda Edwards at (202) 586-2945, or via e-mail at [Brenda.Edwards@ee.doe.gov](mailto:Brenda.Edwards@ee.doe.gov).

Issued in Washington, DC, on May 26, 2009.

**Steven Chalk,**

*Principal Deputy Assistant Secretary, Energy Efficiency and Renewable Energy.*

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**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 23**

[Docket No. CE296; Notice No. 23-09-02SC]

**Special Conditions: Cessna Aircraft Company, Model 525C (CJ4); Lithium Ion Battery Installation**

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

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

**SUMMARY:** This action proposes special conditions for the Cessna Aircraft Company, model 525C (CJ4) airplane. This airplane will have a novel or unusual design feature associated with the installation of lithium ion (Li-ion) batteries. Cessna Aircraft Company proposes to use a lithium-ion main battery on the new model 525C (CJ4) commuter category airplane for main battery applications, and is also considering the use of this technology in several other auxiliary battery applications in this airplane. This type of battery possesses certain failure, operational characteristics, and maintenance requirements that differ significantly from that of the nickel cadmium and lead acid rechargeable batteries currently approved in other normal, utility, acrobatic, and commuter category airplanes. 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 July 6, 2009.

**ADDRESSES:** Mail two copies of your comments to Federal Aviation Administration, Regional Counsel, ACE-7, Attention: Rules Docket Clerk, Docket No. CE296, Room 506, 901 Locust, Kansas City, Missouri 64106. You may deliver two copies to the Small Airplane Directorate at the above address. Mark your comments: Docket No. CE296. You may inspect comments in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

**FOR FURTHER INFORMATION CONTACT:**

Ervin Dvorak, Aerospace Engineer, Standards Office (ACE-111), Small Airplane Directorate, Aircraft Certification Service, Federal Aviation Administration, 901 Locust, Room 301,

Kansas City, Missouri 64106; telephone (816) 329-4123.

**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 concerning these special conditions. You may 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 on or before 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 the FAA to acknowledge receipt of your comments on this proposal, include with your comments 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 August 9, 2006, Cessna Aircraft Company applied for an amendment to Type Certificate Number A1WI to include the new model 525C (CJ4). The model 525C (CJ4), which is a derivative of the model 525B (CJ3) currently approved under Type Certificate Number A1WI, is a commuter category, low-winged monoplane with "T" tailed vertical and horizontal stabilizers, retractable tricycle type landing gear and twin turbofan engines mounted on the aircraft fuselage. The maximum takeoff weight is 16,950 pounds, the VMO/MMO is 305 KIAS/M 0.77 and maximum altitude is 45,000 feet. Cessna Aircraft Company proposes to utilize lithium Ion (Li-ion) batteries for main battery applications, and is considering the use of this technology in several other auxiliary battery applications in this airplane.

**Type Certification Basis**

Under the provisions of 14 CFR part 21, § 21.101, Cessna Aircraft Company must show that the model 525C (CJ4)

meets the applicable provisions of the requirements incorporated by reference in Type Certificate No. A1W1 or 14 CFR part 23, as amended by Amendments 23-1 through 23-57 thereto. The regulations incorporated by reference in the type certificate are commonly referred to as the original type certificate basis.

In addition, the certification basis includes certain special conditions, and exemptions that are not relevant to these proposed special conditions.

In addition to the applicable airworthiness regulations and special conditions, the model 525C (CJ4) 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."

If the Administrator finds that the applicable airworthiness regulations (*i.e.*, 14 CFR part 23) do not contain adequate or appropriate safety standards for the model 525C (CJ4) because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

The FAA issues special conditions, as defined in § 11.19, under § 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 type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

#### Novel or Unusual Design Features

Cessna Aircraft Company, model 525C (CJ4) will incorporate the following novel or unusual design features:

Cessna Aircraft Company proposes to use lithium ion (Li-ion) batteries for main battery applications, and is considering the use of this technology in several other auxiliary battery applications on the Cessna Aircraft Company, model 525C (CJ4) airplane. This type of battery possesses certain failure and operational characteristics, and maintenance requirements that differ significantly from that of the nickel cadmium (Ni-Cd) and lead acid rechargeable batteries currently approved for installation in small airplanes. Current regulations in 14 CFR part 23 do not address installation of Li-ion batteries. This special condition is being proposed to require that all characteristics of the Li-ion battery and

its installation that could affect safe operation of the Cessna Aircraft Company, model 525C (CJ4) airplane are addressed, along with establishing that appropriate maintenance requirements must be provided to ensure electrical power is available from the batteries when needed.

#### Discussion

The applicable part 21 and part 23 airworthiness regulations governing the installation of batteries in general aviation airplanes, including part 23, § 23.1353 were derived from Civil Air Regulations (CAR 3) as part of the recodification that established Federal Aviation Regulation 14 CFR part 23. The battery requirements, which were identified as 14 CFR part 23, § 23.1353, were basically a rewording of the CAR requirements that did not add any substantive technical requirements. An increase in incidents involving battery fires and failures that accompanied the increased use of Nickel-Cadmium (Ni-Cd) batteries in airplanes resulted in rulemaking activities on the battery requirements for business jet and commuter category airplanes. These regulations were incorporated into 14 CFR part 23, § 23.1353(f) and (g), which apply only to Ni-Cd battery installations.

The proposed use of Li-ion batteries on the Cessna Aircraft Company, model 525C (CJ4) airplane has prompted the FAA to review the adequacy of the existing battery regulations with respect to that chemistry. As the result of this review, the FAA has determined that the existing regulations do not adequately address several failure, operational, and maintenance characteristics of Li-ion batteries that could affect safety of the battery installation and the reliability of the Cessna Aircraft Company, model 525C (CJ4) airplane electrical power supply.

Li-ion batteries in general are significantly more susceptible to internal failures that can result in self-sustaining increases in temperature and pressure (*i.e.*, thermal runaway) than their Ni-Cd and lead-acid counterparts. This is especially true for overcharging a Li-ion, which will likely result in explosion, fire, or both. Certain types of Li-ion batteries pose a potential safety problem because of the instability and flammability of the organic electrolyte employed by the cells of those batteries. The severity of thermal runaway increases with increasing battery capacity due to the higher amount of electrolyte in large batteries.

Discharge of some versions of the Li-Poly cell beyond a certain voltage below 3.0 volts will subsequently no longer

accept a charge. 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 Ni-Cd batteries.

Unlike Ni-Cd and lead-acid cells, some types of Li-ion cells employ electrolytes that are known to be flammable. This material can serve as a source of fuel for an external fire in the event of a breach of the cell container.

The intent of the proposed special condition is to establish appropriate airworthiness standards for Li-ion battery installations in the Cessna Aircraft Company, model 525C (CJ4) airplane, and to ensure, as required by 14 CFR part 23, § 23.601, that these battery installations do not possess hazardous or unreliable design characteristics. The proposed special condition adopts the following requirements as a means of addressing these concerns:

- Inclusion of those sections of 14 CFR part 23, § 23.1353 that are applicable to Li-ion batteries.
- Inclusion of the flammable fluid fire protection requirements of 14 CFR part 23, § 23.863. In the past, this rule was not applied to the batteries of business jet or commuter category airplanes since the electrolytes utilized in lead-acid and Ni-CD batteries are not considered to be flammable.
- Addition of new requirements to address the potential hazards of overcharging and overdischarging that are unique to Li-ion battery designs.

Addition of maintenance requirements to ensure that batteries used as spares are maintained in an appropriate state of charge (SOC).

#### Applicability

As discussed above, these special conditions are applicable to the Cessna model 525C (CJ4). Should Cessna Aircraft Company 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 one model of airplane. It is not a rule of general applicability.

#### List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

#### Citation

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(g), 40113, and 44701; 14 CFR 21.16 and 21.17; 14 CFR 11.38 and 11.19.

### The Proposed Special Conditions

Accordingly, the Federal Aviation Administration (FAA) proposes the following special conditions as part of the type certification basis for Cessna Aircraft Company, model 525C (CJ4) airplanes.

#### *Cessna Aircraft Company, Model 525C (CJ4) Lithium Ion Battery Installation*

In lieu of the requirements of 14 CFR part 23, § 23.1353(a) through (e), lithium ion batteries and battery installations on the Cessna Aircraft Company, model 525C (CJ4) airplane must be designed and installed as follows:

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

(2) Li-ion batteries must be designed to preclude the occurrence of self-sustaining, uncontrolled increases in temperature or pressure.

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

(4) Li-ion batteries that contain flammable fluids must comply with the flammable fluid fire protection requirements of 14 CFR part 23, § 23.863(a) through (d).

(5) No corrosive fluids or gasses that may escape from any Li-ion battery may damage surrounding airplane structure or adjacent essential equipment.

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

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

(i) 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,

(ii) 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 Li-ion 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 capacity and SOC of the batteries have fallen below levels considered acceptable for dispatch of the airplane.

(9) The Instructions for Continued Airworthiness (ICAW) must contain recommended manufacturers maintenance and inspection requirements to ensure that batteries, including single cells, meet a safety function level essential to the aircraft's continued airworthiness.

(i) The ICAW must contain operating instructions and equipment limitations in an installation maintenance manual.

(ii) The ICAW must contain installation procedures and limitation in a maintenance manual, sufficient to ensure that cells or batteries, when installed according to the installation procedures, still meet safety functional levels, essential to the aircraft's continued airworthiness. The limitation must identify any unique aspects of the installation.

(iii) The ICAW must contain corrective maintenance procedures to functionally check battery capacity at manufacturers recommended inspection intervals.

(iv) The ICAW must contain scheduled servicing information to replace batteries at manufacturers recommended replacement time.

(v) The ICAW must contain maintenance inspection requirements to visually check for a battery and/or charger degradation.

(10) Batteries in a rotating stock (spares) that have experienced degraded charge retention capability or other damage due to prolonged storage must be functionally checked at manufacturers recommended inspection intervals.

(11) System Safety Assessment process should address the software and complex hardware levels for the sensing, monitoring and warning systems, if these systems contain complex devices. The functional hazard assessment (FHA) for the system is required based on the intended functions described. The criticality of the specific functions will be determined by the safety assessment process for compliance with 14 CFR part 23, § 23.1309, and Advisory

Circular 23.1309-1D contains acceptable means for accomplishing this requirement. For determining the failure condition, the criticality of a function will include the mitigating factors. The failure conditions must address the loss of function and improper operations.

These special conditions are not intended to replace 14 CFR part 23, § 23.1353 in the certification basis of the Cessna Aircraft Company, model 525C (CJ4) airplanes. The proposed special conditions would apply only to Li-ion batteries and battery installations. The battery requirements of 14 CFR part 23, § 23.1353 would remain in effect for batteries and battery installations on the Cessna Aircraft Company, model 525C (CJ4) airplane that do not use Li-ion chemistry.

Issued in Kansas City, Missouri on May 27, 2009.

**John Colomy,**

*Acting Manager, Small Airplane Directorate, Aircraft Certification Service.*

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## DEPARTMENT OF HOMELAND SECURITY

### Coast Guard

#### 33 CFR Part 117

[USCG-2009-0249]

RIN 1625-AA09

#### **Drawbridge Operation Regulations; CSX Railroad, Trout River, Mile 0.9, Jacksonville, FL**

**AGENCY:** Coast Guard, DHS.

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** The Coast Guard proposes to change the regulations governing the operation of the CSX Railroad Bridge across the Trout River, mile 0.9, Jacksonville, Florida. This proposed rule would allow the bridge to operate using an automated system, without an onsite bridge tender. Currently, the bridge is required to open on signal from 6 a.m. until 10 p.m.; and from 10 p.m. until 6 a.m. The draw shall open on signal if at least 12 hours notice is given.

**DATES:** Comments and related material must be received by the Coast Guard on or before August 3, 2009.

**ADDRESSES:** You may submit comments identified by docket number USCG-2009-0249 using any one of the following methods:

(1) *Federal eRulemaking Portal:*  
<http://www.regulations.gov>.