

SPECIAL CONDITION
Lithium battery installations

Doc. No. : **SC-ELA.2015-01**

Rel : 2
Date : 12-10-2018

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SUBJECT : **Lithium battery installations**
CERTIFICATION SPECIFICATION : (VLA.1353, VLA.601) (22.1353, 22.863, 22.601) (LSA – ASTM F2245-12d (6.1, 6.5, 8.4.4, 8.6.2))
PRIMARY GROUP / PANEL : Panel 5 (electrical)
SECONDARY GROUPE / PANEL : none
NATURE : SCE

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Useful Standards

RTCA DO 311, DO 347, UL 1642, UL 2054

Scope

This special condition covers the installation of new technology type battery as storage battery in sailplanes, powered sailplanes, light sport aeroplanes or very light aeroplanes, except batteries used for electrical or hybrid propulsion.

The special condition does not cover or replace applicable regulations for handling, storage, transport and disposal of batteries.

Definitions and Terminology

- The following terms and definitions are used in the context of this special condition:
- Battery cell - electrochemical cells used to store electrical energy
- Battery – assembly of (rechargeable or non-rechargeable) battery cells and associated components e.g. control unit, sensors, connectors, circuit breaker, containment.
- Storage Battery – rechargeable battery to provide energy for engine and/or avionic or other equipment.
- Li batteries – rechargeable Lithium battery of various types
- GM - guidance material

In addition to the requirements established in the applicable Certification Specifications, these additional requirements shall be met:

SC-ELA.2015-01.02 Storage battery design and installation

(a) No explosive or toxic gases emitted by any battery in normal operation, or as the result of any probable malfunction in the charging system or battery installation, may accumulate in hazardous

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quantities within the aircraft. If it has not been proved that neither vapours nor fluids may separate out from the storage battery, its compartment must be ventilated and drained.

(b) A protection against overcharge and critical discharge of the batteries shall be provided including deep or unbalanced discharge if necessary for the type of battery.

GM: Control Units and Battery Management Systems should be designed and manufactured following good engineering practice with consideration of electric magnetic interference, environmental and software aspects.

(c) The suitability and reliability of batteries shall be proved due to experience or tests.

GM: Tests performed by the manufacturer of battery or battery cells according applicable standards (e.g. RTCA DO 311, DO 347, UL 1642) can be accepted upon agreement with the Agency.

(d) Characteristics of the storage batteries, including failure modes (e.g. thermal runaway, expansion, explosion, toxic emission) should be identified. Batteries cells and other subcomponents of the system should be assembled and installed minimizing the effects of failures.

GM: Possible design precautions depending on the identified risks might include:

- Providing the crew with the relevant information allowing to take proper actions (e.g. temperature or pressure monitoring),
- Mitigating the effect of thermal runaway or fire, and ensuring the surrounding structure is able to withstand the thermal loads,
- Designing the containment or compartment for the battery in order to cope with overpressure or expansion.

(e) No corrosive fluids or gases that may escape from the battery may damage adjacent essential structures or equipment.

CHANGE RECORD

Release	Date	Changes
1		Initial Issue
2	12-10-2018	Removed reference to standard UN T 38.3.