European Union Aviation Safety Agency

Safety Information Bulletin

Airworthiness – Operations

SIB No.: 2020-18

Issued: 14 October 2020

Subject: **Nickel-Cadmium Batteries - Risk of Capacity Reduction during Aircraft Parking and Storage**

Ref. Publications:

EASA Guidance: Return to service of aircraft from storage in relation to the COVID-19 pandemic.

Applicability:

All aircraft that have been parked or stored due to the COVID-19 pandemic, Design Approval Holders (DAH) and Continuing Airworthiness Management Organisations (CAMOs).

Description:

The aviation world has been heavily hit by the COVID-19 pandemic and an unprecedented number of aircraft have been grounded. This situation has caused severe financial pressure on air operators, as well as on their service providers. Prior to the restart of operations it is vital that aircraft that were put into storage for weeks or months are restored to an airworthy condition.

Aircraft Maintenance Manual Aircraft Parking Procedures usually require the physical disconnection of the aircraft batteries, and the periodic reconnection to carry out the parking or storage checks. A Type Certificate (TC) holder in conjunction with a battery manufacturer has identified that when a Nickel-Cadmium (Ni-Cd) battery is disconnected from the aircraft loads, it self-discharges due to an electrochemical phenomenon, thus inducing a reduction of battery capacity. When the battery is charged again from the aircraft, the battery does not recover 100% of its initial capacity. Therefore, after each cycle of battery self-discharge, the available battery capacity will decrease progressively.

This reduction of capacity cannot be reversed by the normal aircraft charging system, and the reduction in total capacity cannot be detected without the battery being sent to an approved battery shop for a battery recharge check or overhaul.

As aircraft batteries are the final power source available to aircraft, this reduction in capacity of the Ni-Cd batteries may not meet the minimum battery endurance certification requirements when the aircraft is operated again, which may lead to a premature total electrical power loss in the case the aircraft's main electrical system fails.

EASA is working with the TC holder that reported this issue to alleviate that risk, but as Ni-Cd batteries and the associated aircraft electrical systems technology are commonly used, EASA raises this SIB to recommend other aircraft DAH (TC and Supplementary Type Certificate holders)

to review this phenomenon to determine if any potential unsafe conditions or non-compliances exist on their designs.

At this time, the safety concern described in this SIB is not considered to be a generic unsafe condition affecting multiple products that would warrant Airworthiness Directive (AD) action under Regulation (EU) 748/2012, Part 21.A.3B, or Safety Directive (SD) action under Regulation (EU) 965/2012, Annex II, ARO.GEN.135(c).

Recommendation(s):

It is recommended that aircraft DAH should, in conjunction with advice from the battery manufacturers, review their electrical system designs and their parking and storage instructions to determine, if the battery system can tolerate successive reconnection cycles without suffering from the same phenomenon as described in this SIB.

If it is suspected that a reduction in battery capacity could lead to a non-compliance with the certification basis of the approved design, in particular with the requirements on operation without normal electrical power and battery endurance, the DAH shall report this to EASA.

It is recommended that CAMOs consult with the aircraft DAH to determine, if additional maintenance instructions or recommendations need to be followed to ensure that aircraft returning to service after parking and storage have the required battery capacity.

Contact(s):

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