
题 目	航空蓄电池电源容错与均衡
	管理系统设计
	<u>电池电源容错与均衡管理系统</u>

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摘 要

当今社会蓄电池已成为人们生活中不可缺少的一种能源，并且蓄电池在航空领域发展尤为重要。由于电池默认规定的电压一般都较低，为了满足各种不同的电压要求，不得不始终把多个电池放在一起，然而随着电池多次反复的充电和再充电，蓄电池或多或少的都会出现一些问题，电池容量的下降，电池寿命的缩短以及电池失效等等。如果在使用中电池出现问题那么后果就无法设想。所以，研究航空蓄电池电源容错与均衡管理技术将会为现代社会做出巨大贡献。

本文以镍镉蓄电池为例，研究其电源容错与均衡管理技术。主要工作作为设计一套可以隔离故障电池的系统，并且在充电时可以单独的对每一个电池充电，直至充满；放电时，根据电压大小，让性能好的电池优先工作。

本文首先了解了镍镉蓄电池的结构，其次设计了一套由二十二节小镍镉蓄电池组成的一个大的镍镉蓄电池电源系统，通过相应的开关，可以很好的隔离失效电池。其次通过 MCU 电路实时监测电池的电压，让电压高的电池优先工作，从而实现蓄电池的均衡管理。

关键词: 航空蓄电池, 容错控制, 均衡

Design Of Fault Tolerance And Balance Management System For Aviation Battery Power Supply

Abstract

Nowadays, battery has become an indispensable energy in people's life, and the development of battery is particularly important in the field of aviation. Because the default voltage of the battery is generally low, in order to meet different voltage requirements, we have to always put multiple batteries together. However, with the repeated charging and recharging of the battery for many times, more or less the battery will have some problems, such as the decline of battery capacity, the shortening of battery life and battery failure. If there is a problem with the battery in use, the consequences cannot be imagined. Therefore, the research on fault tolerance and balanced management technology of aviation battery power supply will make great contribution to modern society.

This paper takes nickel cadmium battery as an example to study its power supply fault tolerance and balance management technology. The main work is to design a set of system that can isolate the faulty battery, and charge each battery separately until it is full when charging; when discharging, let the battery with good performance work first according to the voltage.

In this paper, the structure of Ni Cd battery is first understood, and a large Ni Cd battery power supply system composed of 22 small Ni Cd batteries is designed. Through the corresponding switch, the failure battery can be well isolated. Secondly, through the MCU circuit to monitor the battery voltage in

real time, the battery with high voltage will work first, so as to realize the balanced management of the battery.

Keywords: aviation battery, fault tolerant control, equalization

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