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Document Title : OQAR Batteries
Equipment Affected : SA108021, Battery Assembly
Part Numbers : D52000-XXXXX (All OQAR versions)
Classification : Information

1. Introduction.

The OQAR includes a backup battery that is formed by a Multi-Cell Nickel Cadmium (NiCAD) pack, attached to the inside of the electronics side panel. The battery pack contains eleven 1.2V cells. These cells are used to support the orderly shut-down of the OQAR when the mains power is interrupted, and are rated for use up to one minute in any 3 hour period.

- WARNING:**
- 1. NICKEL-CADMIUM BATTERIES CONTAIN TOXIC MATERIALS AND SHOULD NOT BE DISMANTLED. ON REPLACEMENT, THE OLD BATTERIES SHOULD BE DISPOSED OF IN ACCORDANCE WITH LOCAL RECOMMENDATIONS.**
 - 2. THE OQAR BATTERY PACK IS NOT A FIELD SERVICEABLE ITEM AND CAN ONLY BE REPLACED AT AN APPROVED MAINTENANCE FACILITY.**

2. Lifed Item.

This battery pack is a lifed item – 10,000 powered hours (see CMM 31-34-00 & 31-34-01, paragraph 4.F.(2)(a)). The battery life will be accumulating all the time that electrical power is applied to the OQAR - regardless of the state of the data recording interfaces, therefore the PSB_ETI is not equal to the number of hours the aircraft has logged. The difference varies between aircraft operators - but PSB_ETI is most likely to be between 10 to 20% greater than aircraft flight hours.

3. Power Supply Battery Elapsed Time Indicator - 01 OPERATOR|PSB_ETI.

The OQAR tracks the number of hours that the power is applied to the OQAR/batteries and stores that data in the PSB_ETI status variable on the 01 OPERATOR menu.

Note 1: This value is reset to zero when the OQAR is subjected to a full test (CMM 31-34-00 or 31-34-01 page 102, paras 3A to 3Q), which will result in the PSB_ETI value indicating less hours than the battery has actually accumulated, unless the battery pack was replaced during that workshop visit. Operators carrying out their own repairs are therefore advised to note the PSB_ETI value before testing, so that battery life can be accurately tracked.

4. Accessing the PSB_ETI.

This variable can be accessed by the operator either by interrogating the variable directly on the OQAR Front Panel, or by reviewing the contents of the '--PGOQAR.CS' file that is stored on every disk that is successfully removed from the OQAR. The CS file contents are viewable

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with a standard text file viewer.

In order to view the OQAR PSB_ETI status variable on the 01 OPERATOR menu, follow this procedure:

- 4.1. Press the EXIT key to display the 01 OPERATOR menu (you may have to press this key more than once to display this menu), then press the ENTER key to access the operator menu.
- 4.2. Press the PLUS and MINUS keys to change to the PSB_ETI menu option, the lower display will show the total number of powered hours accumulated by the Batteries inside the OQAR.
- 4.3. Press the EXIT key to return to the default display (you may have to press this key more than once to display this option).

5. Power Supply Battery Life - 05 SYS_CFG|PSB_LIFE.

The OQAR also monitors the PSB_ETI status variable to establish if the battery life has exceeded that stated in the configuration variable PSB_LIFE on the 05 SYS_CFG menu. When the PSB_ETI value exceeds the PSB_LIFE the OQAR will report the 110C “Battery Life Expired” event code in the event log file.

Using the current battery technology, Penny & Giles have defined the life of the Battery Pack SA108021 as 10,000 powered hours. This is the default value for the PSB_LIFE configuration variable.

6. Maintenance Warning Code – 02 STATUS|MWC.

If the OQAR reports the 110C “Battery Life Expired” event code in the event log file it will also store 110C in the MWC status variable. The maintenance warning code is accessible in the same way as the PSB_ETI variable.

7. Maintenance Light.

If the 05 SYS_CFG|ENA_MAINT configuration variable is set to ENABLED (the default is DISABLED) then the Maintenance Light on the front panel of the OQAR will be illuminated when the PSB_ETI status variable exceeds the PSB_LIFE configuration variable.

8. When to Replace the Batteries.

The OQAR batteries should be replaced when the PSB_ETI value exceeds the PSB_LIFE value – when PSB_ETI is greater than 10,000.

We recommend that when the OQAR has been returned to the maintenance department for service actions, the records are checked for PSB_ETI values recorded during previous repairs (see note 1). Batteries should be replaced if the PSB_ETI (or cumulative recordings of same) exceed 8,500 hours. This is our recommendation and not a mandated action.

The OQAR batteries should also be replaced when:

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- It is apparent that they are unserviceable or
- If the date on the yellow sticker is greater than two years old, or
- If the OQAR fails the 'power fail' testing procedure (as defined in this document) and the relevant battery test section of the OQAR CMM, or
- If there are any signs of leakage, venting, corrosion or damage to the battery pack and cells.

If the battery pack is replaced, record the date (month/year) on a round white or yellow sticky label on the front panel of the OQAR (after removing the old label), and reset the PSB_ETI back to zero hours.

9. Evaluating Battery Failure.

When the OQAR is connected to the OQAR Test Equipment the normal (good battery condition) VDU display when the power is removed should be:

EVT 5 12/10/0 14:39:11 TID=104 ,1207 0 0 0 0 - Power supply dipped
EVT 6 12/10/0 14:39:11 TID=104 ,1208 0 0 0 0 - Power supply failed
Powerfail Count :- 0, Shutdown Flags :- FFFFFFFF
DATA SAFE

NOTE 2: The event numbers, dates and times will be different on your display. The important parts are the event codes – 1207 & 1208, the Power Supply Dipped/Failed text, the Powerfail Count and Shutdown Flags, and DATASAFE on the last line.

If the batteries are weak or unserviceable then after the power has been removed the OQAR operation will not be supported correctly and some of this data may be missing. If the OQAR has been stored for an extended period without any power applied then the Batteries may not have sufficient charge to support this function.

10. Charging Batteries.

If the power is applied to the OQAR for approximately four hours and the VDU display above is not found when the power is removed, then the batteries should be regarded as unserviceable and should be replaced.

11.Storage of OQAR.

Penny & Giles detail storage instructions in the relevant Component Maintenance Manual for this product (CMM 31-34-00 or CMM 31-34-01). In summary assuming that the batteries are fully charged, then the OQAR may be stored for up to 36 months within the temperature range -30°C to +85°C with a relative humidity of 5% to 90%.

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12. Storage of Batteries.

The manufacturer of the Nickel-Cadmium batteries recommends storing the battery assemblies within the temperature range of +5° to +25° in a 65% ±5% relative humidity, and in a discharged state with the cells open circuit.

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