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Emergency Locator Transmitter (ELT) Batteries
Guidance and Recommendations

RTCA DO-188
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Prepared by:
SC-136 ELT
Battery Subcommittee

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F O R E W O R D

This report was prepared in response to a request from the Federal Aviation Administration who had indicated a concern about ELT battery-related problems. A subcommittee of RTCA Special Committee 136 was tasked to investigate these problems as specified in the Statement of Work on page v. The RTCA Executive Committee approved the Report of the ELT Battery Subcommittee on November 13, 1984.

RTCA is an association of aeronautical organizations of the United States from both government and industry. Dedicated to the advancement of aeronautics, RTCA seeks sound technical solutions to problems involving the application of electronics and telecommunications to aeronautical operations. Its objective is the resolution of such problems by mutual agreement of concerned organizations.

The findings of RTCA are in the nature of recommendations to all organizations concerned. As RTCA is not an official agency of the United States Government, its recommendations may not be regarded as statements of official government policy unless so enunciated by the federal government organization or agency having statutory jurisdiction over any matters to which the recommendations relate.

Emergency Beacon Corporation submitted a minority view and requested that it be distributed with the report. Accordingly, the Minority Report by Emergency Beacon Corporation is attached.

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SC-136
STATEMENT OF WORK CONCERNING BATTERY PROBLEMS

SC-136 will establish a subcommittee to review and recommend corrective actions on ELT battery-related problems.

The following items related to ELT batteries have been identified as pertinent to this subject:

1. Types of batteries

   Identify the types of batteries practical for use in ELT applications.

2. Potting of cells into a battery pack

   Identify advantages and adverse consequences of using this construction method and provide recommendations, with rationale, on its continuance or discontinuance.

3. Placing of batteries in cold storage to extend shelf life

   Solicit and assimilate available data on the effectiveness of using cold storage for extending battery shelf life, and recommend the conditions under which such storage may be acceptable and to what extent.

4. Replacement batteries

   Identify all technical parameters that must be met by a battery manufacturer to provide an approved (presume FAA TSO) replacement battery. If special requirements are recommended for inclusion in FAA ELT TSOs or Advisory Circulars, they shall be identified and suitable language recommended.

The subcommittee shall prepare a separate report, keeping in mind its possible use for formal governmental action, such as an FAA Advisory Circular and/or a separate FAA TSO on batteries.

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1.0 Scope

This document contains guidance and recommendations which, if uniformly applied as minimum requirements, provide reasonable assurance that the battery problems existing in the ELT environment will be resolved.

2.0 Types of Batteries 1/

2.1 Performance and Mechanical Considerations

There are many types of batteries (cells) with various characteristics that are available for use in ELT applications depending upon the performance requirements of the ELT. Current drain, storage parameters (temperature and cycling) and physical configuration restrictions determine the actual choice of the basic cell. Mechanical design and marketing objectives also dictate system configuration. The original cell chemistry and mechanical design should be determined jointly by the ELT manufacturer and the cell manufacturer. Replacement batteries should demonstrate performance characteristics equal or superior to the original equipment. These batteries should be approved under the current certification system.

2.1.1 Primary/Secondary Cells

A number of battery types have been identified as practical for use in ELTs; however, they are all primary (non-rechargeable) types. The principal deficiency of the secondary (rechargeable) cell is its inability to provide sufficient capacity over the required range of temperatures that would be competitive with primary cells.

2.1.2 Real-Time Activation Considerations

Some types of cells will cause a time delay for the cell to reach its rated output voltage. This time delay may not be tolerable for ELTs that use electronic latching circuits which must latch during the crashpulse (typically less than 0.1 second). However, if the time delay can be tolerated (e.g., ELTs that use a mechanical latch) then the ELT manufacturer may select a cell that does have a time delay.

1/ Appendix A provides additional information on this subject.