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Electrical installations for lighting and beaconing of aerodromes – Aeronautical ground lighting systems – Guidelines for the development of a safety lifecycle methodology

Installations électriques pour l'éclairage et le balisage des aérodromes – Systèmes de balisage aéronautique au sol – Lignes directrices pour l'établissement d'une méthodologie pour le cycle de vie de sécurité

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES – AERONAUTICAL GROUND LIGHTING SYSTEMS – GUIDELINES FOR THE DEVELOPMENT OF A SAFETY LIFECYCLE METHODOLOGY

FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62143, which is a technical specification, has been prepared by IEC technical committee 97: Electrical installations for the lighting and beaconing of aerodromes.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
97/72/CDV	97/83/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

The committee has decided that the contents of this publication will remain unchanged until 2005-11. At this date, the publication will be

- reconfirmed;
- withdrawn, or
- replaced by an international standard.

INTRODUCTION

Aeronautical ground lighting (AGL) at an aerodrome or heliport provides the pilots of aircraft on approach to or take-off from an aerodrome, and pilots of aircraft or drivers of vehicles moving on the aerodrome surface, with location, orientation and alignment information. An AGL system therefore provides a safety-related service and functions. In order to assure that the safety of the service and functions provided by the AGL system is adequately addressed, specific safety assessments should be performed at various instances during the lifecycle of the system. This technical specification provides a methodology whereby this may be done.

This technical specification is primarily concerned with the safety lifecycle of aeronautical ground lighting (AGL) systems. To conform to this technical specification it should be demonstrated to the relevant bodies that the requirements have been satisfied and therefore that the clause objective(s) has been met.

NOTE 1 Examples of relevant bodies would include the following:

- aerodrome management;
- certification and licensing authorities;
- safety regulators;
- notified bodies for international or European directives;
- national standards bodies.

NOTE 2 This technical specification is based on the system and safety lifecycle methodology described in IEC 61508-1. IEC 61508, in all seven parts, provides a methodology to address the safety of safety-related systems and contains an abundance of guidance material, which may be applicable to an AGL system or may be of use to the reader of this technical specification. IEC 61508 contains requirements that are particularly relevant to risk reduction in a software-based AGL system.

ELECTRICAL INSTALLATIONS FOR LIGHTING AND BEACONING OF AERODROMES – AERONAUTICAL GROUND LIGHTING SYSTEMS – GUIDELINES FOR THE DEVELOPMENT OF A SAFETY LIFECYCLE METHODOLOGY

1 Scope

This technical specification:

– outlines a methodology to address the safety at all lifecycle phases of an AGL system, including the evaluation, design, procurement, manufacture, installation, commissioning, operational use, maintenance, modification, and decommissioning of the AGL system;

NOTE 1 This document contains guidelines of a high-level, objective-based, and non-prescriptive nature. This is intended to permit a flexible approach to meeting the requirements.

– applies to an AGL system at an aerodrome or heliport which provides visual guidance to a pilot and is provided, operated and maintained by the aerodrome authority;

NOTE 2 This document may apply to all or a part of an AGL system as required by the aerodrome authority. The equipment covered shall be defined and listed in the AGL safety case (see 5.6). Any subsequent addition or modification to the AGL system shall be notified as directed in 7.7.3.

– applies primarily to a new AGL system;

NOTE It may also be applied to an existing AGL system or to an existing AGL system that is being modified; however, the relevant documentation for the project phases may not be available. Therefore, retrospective action to cover the applicable lifecycle phases could be carried out or alternative means of providing safety information should be developed, e.g. historical data.

– covers all aspects of safety, including:

- operational (functional) safety of the AGL system;
- electrical safety for the installation, maintenance and decommissioning of the AGL system;
- environmental safety and electromagnetic compatibility (EMC);
- health and safety at work.

– supports a regulatory regime based on the auditing of a safety management system at an aerodrome, where the safety management system provides documented evidence that safety has been or is being addressed at all phases of the lifecycle. This applies equally to a project to install AGL or the routine operational use and maintenance of the AGL.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60300-3-9, *Dependability management – Part 3: Application guide – Section 9: Risk analysis of technological systems*

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 61508-1, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 1: General requirements*

IEC 61508-7, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 7: Overview of techniques and measures*

IEC 61821, *Electrical installations for lighting and beaconing of aerodromes – Maintenance of aeronautical ground lighting constant current series circuits*