SLOVENSKI STANDARD

SIST-TS IEC/TS 62257-1:2006

maj 2006

Priporočila za sisteme malih obnovljivih virov energije in hibridne sisteme za elektrifikacijo podeželja – 1. del: Splošni uvod v elektrifikacijo podeželja

Recommendations for small renewable energy and hybrid systems for rural electrification – Part 1: General introduction to rural electrification

ICS 27.190

Referenčna številka
SIST-TS IEC/TS 62257-1:2006(en)

TECHNICAL SPECIFICATION

IEC TS 62257-1

First edition
2003-08

Recommendations for small renewable energy and hybrid systems for rural electrification –

Part 1: General introduction to rural electrification

Recommandations pour petits systèmes d'énergie renouvelable et pour systèmes hybrides destinés à l'électrification rurale –

Partie 1: Introduction générale à l'électrification rurale

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PRICE CODE L

For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RECOMMENDATIONS FOR SMALL RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

Part 1: General introduction to rural electrification

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- 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 62257-1, which is a technical specification, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It was developed in cooperation with other IEC technical committees and subcommittees dealing with renewable energies and related matters, namely technical committee 21 ("Secondary cells and batteries"), subcommittee 21A ("Secondary cells and batteries containing alkaline or other non-acid electrolytes"), technical committee 64 ("Electrical installations and protection against electric shock"), technical committee 88 ("Wind turbines"), and others.

This document is based on IEC/PAS 62111; it cancels and replaces the relevant parts of IEC/PAS 62111.

This technical specification shall be used in conjunction with the other documents of the IEC 62257 series.

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

Enquiry draft	Report on voting
82/300/DTS	82/318/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 2.

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual edition of this publication may be issued at a later date.

INTRODUCTION

Rural electrification is one of the predominant policy actions designed to increase the well-being of rural populations together with improved healthcare, education, personal advancement and economical development.

The present document introduces general considerations on rural electrification and the IEC 62257 series. This series intends to provide to different players involved in rural electrification projects documents for the setting up of low voltage renewable energy and hybrid systems.

RECOMMENDATIONS FOR SMALL RENEWABLE ENERGY AND HYBRID SYSTEMS FOR RURAL ELECTRIFICATION –

Part 1: General introduction to rural electrification

1 Scope and overview

Rural electrification is one of the predominant policy actions designed to increase the well being of rural populations together with improved healthcare, education, personal advancement and economical development. Rural electrification can be completed through connection to a national or regional electrification grid. This document applies to cases where the grid is too far away (too costly) or the individual demand centres are too small to make grid access economic, where autonomous power systems may be used to supply these services.

This series of documents intends to provide to different players involved in rural electrification projects (such as project developers, project implementers, installers, etc.) documents for the setting up of renewable energy and hybrid systems with AC voltage below 500 V, DC voltage below 50 V and power below 50 kVA.

These documents are recommendations:

a) to choose the right system for the right place,

b) to design the system,

c) to operate and maintain the system.

These documents are focused only on rural electrification concentrating on but not specific to developing countries. They must not be considered as all inclusive to rural electrification. The documents try to promote the use of renewable energies in rural electrification; they do not deal with clean mechanisms development at this time (CO_2 emission, carbon credit, etc.) Further developments in this field could be introduced in future steps.

This consistent set of documents is best considered as a whole with different parts corresponding to items for safety, sustainability of systems and at the lowest life cycle cost as possible. One of the main objectives is to provide the minimum sufficient requirements, relevant to the field of application that is: small renewable energy and hybrid off-grid systems.

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 62257-2, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 2: From requirements of users to a range of electrification systems* [1]

IEC 62257-3, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 3: Project development and management* [2]

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[1] To be published.

[2] Under consideration.

IEC 62257-4, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 4: System selection and design* [3]

IEC 62257-5, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 5: Safety rules* [3]

IEC 62257-6, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 6: Acceptance, operation, maintenance and replacement* [3]

IEC 62257-7, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 7: Technical specifications: generators* [3]

IEC 62257-8, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 8: Technical specifications: batteries and converters* [3]

IEC 62257-9, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 9: Technical specifications: integrated systems* [3]

IEC 62257-10, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 10: Technical specifications: energy manager* [3]

IEC 62257-11, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 11: Technical specifications: considerations for grid connection* [3]

IEC 62257-12, *Recommendations for small renewable energy and hybrid systems for rural electrification – Part 12: Other topics* [3]

3 Terms, definitions and abbreviations

For the purposes of the IEC 62257 series, the following terms, definitions and abbreviations apply.

3.1
REN
renewable energy

3.2
hybrid system
multi-sources system

3.3
dispatchable power system
source, generator, system is dispatchable if delivered power is available at any specified time (for example, a genset is a dispatchable system, REN generator is a non-dispatchable power system)

3.4
non-dispatchable power system
a non dispatchable system is resource dependent; power might not be available at a specified time

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[3] Under consideration.