



TECHNICAL SPECIFICATION



**Marine energy – Wave, tidal and other water current converters –
Part 101: Wave energy resource assessment and characterization**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARINE ENERGY –
WAVE, TIDAL AND OTHER WATER CURRENT CONVERTERS –****Part 101: Wave energy resource
assessment and characterization**

FOREWORD

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- 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 TS 62600-101, which is a technical specification, has been prepared by IEC technical committee 114: Marine energy – Wave, tidal and other water current converters.

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

Enquiry draft	Report on voting
114/145/DTS	114/154A/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.

A list of all parts in the IEC 62600 series, published under the general title *Marine energy – Wave, tidal and other water current converters*, can be found on the IEC website.

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 the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This Technical Specification provides a uniform methodology that will ensure consistency and accuracy in the estimation, measurement, and analysis of the wave energy resource at sites that could be suitable for the installation of Wave Energy Converters (WECs), together with defining a standardised methodology with which this resource can be described. The wave energy resource is primarily defined using hydrodynamic models that are successfully validated against measured data. This Technical Specification deals directly with the theoretical resource and the main focus of the defined methodology is to generate the resource information required to estimate energy production. Practical energy production can then be estimated in conjunction with other Technical Specifications in this series (IEC TS 62600), and by considering available technology and external constraints.

This Technical Specification provides guidance relating to the measurement, modelling, analysis and reporting of the wave energy resource, and the linkages between these activities. A framework for estimating the uncertainty of the wave energy resource estimates is also provided. Application by all parties of the methodologies recommended in this document will ensure that continuing resource assessment of potential development sites is undertaken in a consistent and accurate manner. This Technical Specification presents techniques that are expected to provide fair and suitably accurate results that can be replicated by others.

The development of the wave power industry is at an early stage and the significance of particular wave energy resource characteristics is poorly understood. Because of this, the present document is designated as a Technical Specification and will be subject to change as more data is collected and experience with Wave Energy Converters develops.

This Technical Specification, when used in conjunction with other Technical Specifications in this series (IEC TS 62600), is intended for several types of users, including but not limited to the following:

- Project developers – income, return on investment
- Device developers – performance of device
- Utilities/investors – reliability/predictability of supply, return on investment,
- Policy-makers/Planners – usage of seascape, optimisation of resource, power supply issues
- Consultants to produce resource data/due diligence – compatible/readable data format

The report required by this Technical Specification is highly technical and may be difficult to understand for some intended users. It is recommended that a short (2 to 4 pages) summary of the key findings of the resource assessment is also produced, converting some of the more technical language into information that could be readily understood by a non-technical user.

MARINE ENERGY – WAVE, TIDAL AND OTHER WATER CURRENT CONVERTERS –

Part 101: Wave energy resource assessment and characterization

1 Scope

This part of IEC 62600, which is a Technical Specification, establishes a system for estimating, analysing and reporting the wave energy resource at sites potentially suitable for the installation of Wave Energy Converters (WECs). This Technical Specification is to be applied at all stages of site assessment (from initial investigations to detailed project design) and in conjunction with the IEC Technical Specification on WEC performance (IEC TS 62600-100) enables an estimate of the annual energy production of a WEC or WEC array to be calculated. This Technical Specification is not intended for estimation of extreme wave conditions.

The wave energy resource is primarily defined using hydrodynamic models that are successfully validated against measurements. The framework and methodologies prescribed in this Technical Specification are intended to ensure that only adequate models are used, and that they are applied in an appropriate manner to ensure confidence and consistency in the reported results. Moreover, the document prescribes methods for analysing metocean data (including the data generated by modelling) in order to properly quantify and characterize the temporal and spatial attributes of the wave energy resource, and for reporting the results of a resource assessment in a comprehensive and consistent manner.

2 Normative references

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

IEC TS 61600-100, *Marine energy – Wave, tidal and other water current converters – Part 100: Electricity producing wave energy converters – Power performance assessment*

ISO/IEC Guide 98-3:2008, *Guide to the expression of uncertainty of measurement*

ASME 20-2009, *Standard for Verification and Validation in Computational Fluid Dynamics and Heat Transfer*

IHO (International Hydrographic Organisation), 2008, *Standards for Hydrographic Surveys*, Special Publication No. 44, 5th Edition