

TECHNICAL SPECIFICATION



**Marine energy – Wave, tidal and other water current converters –
Part 2: Design requirements for marine energy systems**



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TECHNICAL SPECIFICATION



**Marine energy – Wave, tidal and other water current converters –
Part 2: Design requirements for marine energy systems**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MARINE ENERGY – WAVE, TIDAL AND
OTHER WATER CURRENT CONVERTERS –****Part 2: Design requirements for marine energy systems**

FOREWORD

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

IEC TS 62600-2, 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
114/168/DTS	114/176A/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.

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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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.

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INTRODUCTION

This part of IEC 62600 outlines minimum design requirements for marine energy converters and is not intended for use as a complete design specification or instruction manual.

Several different parties may be responsible for undertaking the various elements of the design, manufacture, assembly, installation, erection, commissioning, operation and maintenance of a marine energy system and for ensuring that the requirements of this document are met. The division of responsibility between these parties is a contractual matter and is outside the scope of this document.

Any of the requirements of this document may be altered if it can be suitably demonstrated that the safety of the system is not compromised. Compliance with this document does not relieve any person, organization, or corporation from the responsibility of observing other applicable regulations.

Withdrawal

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

Part 2: Design requirements for marine energy systems

1 Scope

1.1 General

This part of IEC 62600 provides the essential design requirements to ensure the engineering integrity of wave, tidal and other water current energy converters, referred to as marine energy converters (MECs), for a specified design life. Its purpose is to provide an appropriate level of protection against damage from all hazards that may lead to failure of the primary structure, defined as the collective system comprising the structural elements, foundation, mooring and anchors, piles, and device buoyancy designed to resist global loads.

This document includes requirements for subsystems of MECs such as control and protection mechanisms, internal electrical systems, mechanical systems and mooring systems as they pertain to the structural viability of the device under site-specific external environmental conditions. This document applies to wave, tidal and other water current converters and to structures that are either floating or fixed to the seafloor or shore. This document applies to structures that are unmanned during operational periods.

This document addresses site-specific conditions, safety factors for critical structures and structural interfaces, external load cases (including extreme load magnitude, duration, and frequency), failure probability and failure consequences for critical structures and structural interfaces (overall risk assessment), and failsafe design practices (demonstration of adequate redundancy). The effect of subsystem failure on the primary structure is also addressed.

This document does not address the effects of MECs on the physical or biological environment (unless noted by exception). This document is used in conjunction with the appropriate IEC and ISO standards, as well as regional regulations that have jurisdiction over the installation site.

1.2 Applications

This document is applicable to MEC systems designed to operate from ocean, tidal and river current energy sources, but not systems associated with hydroelectric impoundments or barrages. This document is also applicable to wave energy converters. It is not applicable to ocean thermal energy conversion (OTEC) systems or salinity gradient systems.

Although important to the overall objectives of the IEC 62600 series, this document does not address all aspects of the engineering process that are taken into account during the full system design of MEC systems. Specifically, this document does not address energy production, performance efficiency, environmental impacts, electric generation and transmission, ergonomics, or power quality.

This document, to the extent possible, adapts the principles of existing applicable standards already in use throughout the marine industry (structure, moorings, anchors, corrosion protection, etc.) and by reference, defers to the appropriate international documents. This document adheres to a Load Resistance Factor Design (LRFD) approach and the principles of limit state design as described in ISO 2394.

MECs designed to convert hydrokinetic energy from significant hydrodynamic forces into other forms of usable energy, such as electrical, hydraulic, or pneumatic may be different from