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**Electrical power quality requirement of marine energy
converters**

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Foreword

This document complies with the provisions of GB/T 1:1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents"

Drafting:

This document is equivalent to IEC TS62600-30:2018 "Ocean energy wave energy, tidal energy and other current energy conversion devices No: 30

Part: Power Quality Requirements", the document type was adjusted from IEC 's technical specifications to my country's national standardization guiding technical documents:

This document has made the following minimal editorial changes:

---In order to coordinate with existing standards, the name of the standard is changed to "Power Quality Requirements for Ocean Energy Conversion Devices":

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

As a viable power source for utility and community applications, ocean energy conversion devices require close attention to the power quality of their output: inferior electricity

may have a negative impact on the power supply and load: Therefore, there is a need to develop guidelines to reduce the burden on manufacturers, research designers, and users on device design,

Power quality issues during use: Electrical system planners also need to determine the grid connection requirements for such variable intermittent energy sources while maintaining

Maintaining its high reliability and high power quality standards:

In other renewable energy and traditional energy power generation fields, power quality is a mature topic and relevant standards already exist: But the ocean energy power generation system

There are no standards or technical specifications for power quality and grid connection requirements: Therefore, it is necessary to gradually and collaboratively develop detailed standards to solve this problem:

This document is intended to:

---Identify single-phase/three-phase, grid-connected/off-grid (including microgrid) power based on wave, tidal current and other water flow energy conversion devices

System power quality issues and parameters (including non-equipment specific parameters and non-normative parameters);

---Establish guidelines for measurement methods, application techniques and result interpretation:

In addition to containing relevant definitions, normative references, symbols and units, tables, appendices and other supporting material, the core content of this document is

Will include the following main contents:

---Identify characteristic parameters, define and clearly characterize the parameter values required to characterize the power quality impact of ocean energy conversion devices;

---Develop measurement procedures related to ocean energy conversion devices;

--- Develop standardized procedures for measuring characteristic parameters, including test and measurement conditions and test equipment requirements:

This document will provide device developers and applied researchers with guidance for

assessing the power quality of ocean energy conversion devices:

Power quality requirements for ocean energy conversion devices

1 Scope

This document specifies the definition and measurement procedures of power quality characteristic parameters of ocean energy (wave energy, tidal energy and other current energy) conversion devices:

and assessment methods: content include:

- a) Definition and quantitative description of the power quality characteristic parameters of ocean energy (wave energy, tidal energy and other water flow energy) conversion device units;
- b) Measurement procedures to quantify the characteristic parameters of ocean energy (wave energy, tidal energy and other current energy) conversion devices:

The measurement procedure is suitable for single ocean energy conversion devices or power plants with three-phase grid-connected or off-grid connections: This document only requires that it can be transferred in the ocean

Test at the common coupling point of the medium voltage or high voltage system of the switching device and evaluate it in accordance with the provisions of this document: The measurement procedures are applicable to marine vessels of any capacity:

Foreign energy conversion device:

This document describes simple measurement and reporting procedures for ocean energy conversion devices connected to the low voltage grid: Design of medium voltage and low voltage connections

is defined as:

- a) Medium-voltage connected units usually refer to parallel three-phase ocean energy converters operating in offshore power plants and transmitting power through high-voltage or medium-voltage grids:

Replace device;

- b) Low-voltage connected units usually refer to single-phase or three-phase marine energy transformers that supply small-scale loads in grid-connected, off-grid or microgrid systems:

Replace the device:

Considering that ocean energy is an emerging energy source, this document still has the following limitations:

- a) Only the voltage fluctuation under continuous operation is considered, and the voltage

fluctuation during switching operation is not considered yet;

b) For the specific classification of measured flicker values, the different resource categories given in this document should be used as guidance and suggestions, and users should use them with caution

These resource categories:

Measurement procedures need to increase the possibility of designing according to non-site-specific requirements to ensure that the same ocean energy conversion device is used:

Under the conditions of configuration and operation mode (such as control parameters), the power quality characteristics of a certain test site are also applicable to other sites: If it matches

If any changes in settings or operating modes cause changes in the power quality of the ocean energy conversion device, it will be evaluated separately:

This document is applicable to the measurement of wave energy, tidal energy and other water flow energy conversion devices, and includes the electrical energy of ocean energy conversion device power plants:

Useful information for quality testing:

This document does not apply to Ocean Thermoelectric Energy Conversion Devices (OTEC):

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document:

GB/T 17626:7-2017 Electromagnetic compatibility testing and measurement technology, measurement and analysis of harmonics and interharmonics of power supply systems and connected equipment

Guidelines for measuring instruments (IEC 61000-4-7:2009, IDT)

IEC TR61000-3-6:2008 Electromagnetic Compatibility (EMC) Part 3-6: Limit value deformation devices for MV, HV and EHV

Note: GB /Z 17625:4-2000 Electromagnetic compatibility limits Evaluation of distortion load