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Design requirements for marine energy systems

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foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for Standardization Work Part 1.Structure and Drafting Rules of Standardization Documents"

drafted.

This document uses the translation method equivalent to IEC TS62600-2.2019 "Ocean energy wave energy, tidal current energy and other current energy conversion equipment

Set up Part 2.Design Requirements for Ocean Energy Systems.

The Chinese documents that have a consistent correspondence with the international documents normatively cited in this document are as follows.

---GB/T 3956-2008 Conductor of cables (IEC 60228.2004, IDT);

---GB/T 7826-2012 System reliability analysis techniques Failure Mode and Effects Analysis (FMEA) procedures (IEC 60812.

2006,IDT);

---GB/T 16895.3-2017 Low-voltage electrical installations Part 5-54.Selection and installation of electrical equipment, grounding configuration and protection

Protective conductor (IEC 60364-5-54.2011, IDT);

---GB/T 18802.11-2020 Low-voltage surge protector (SPD) Part 11.Surge protector for low-voltage power systems

Performance requirements and test methods (IEC 61643-11.2011, MOD);

---GB/T 20637-2006 General structure and test requirements of marine electrical installations for marine power cables (IEC 60092-350.

2001, IDT);

---GB/T 21714.3-2015 Lightning Protection Part 3.Physical Damage to Buildings and Danger to Life (IEC 62305-3.

2010, IDT);

---GB/T 21714.4-2015 Lightning Protection Part 4.Electrical and Electronic Systems in Buildings (IEC 62305-4.2010,

IDT);

---GB/T 23511-2009 General requirements for offshore structures in the oil and gas industry (ISO.19900.2002, IDT);

---GB/T 31316-2014 Seawater cathodic protection general rules (ISO 12473.2006, IDT);

---GB/T 35320-2017 Hazard and Operability Analysis (HAZOP Analysis) Application Guidelines (IEC 61882.2001, IDT);

---GB/T 35712-2017 Generators and Electric Motors for Marine Electrical Equipment (IEC 60092-301.1980, IDT);

---GB/T 37551-2019 Terms for ocean energy wave energy, tidal current energy and other current energy conversion devices (IEC /T S62600-1.

2011,MOD);

---GB/T 39569-2020 Power flow energy resource assessment and characterization (IEC TS62600-201.2015, MOD).

The following editorial changes have been made to this document.

--- In order to coordinate with existing standards, the name of the standard is changed to "Design Requirements for Ocean Energy Systems";

---This document fixes several errors in IEC TS62600-2.2019.

* Deleted the symbols S, sigmaU, sigmaU, c, and omega not covered in this article in Chapter 4 Symbols and Abbreviations; added U1, U5, U50, u'; revised

Changed the description of gamma, and corrected the damping rate to the peak shape parameter;

* Corrected the error in formula (7) in 6.2.3.3, that is, {(1 z)/20} in the formula is corrected to (1 z/20);

* Corrected the corresponding abbreviation errors in the waves in 2.1, 3.1, 4.1, and 5.1 in Table 7, and corrected the original NWH to OWH;

* Corrected the abbreviation error in 6.1a, 6.1b, 8.2 corresponding to the current in Table 8, and corrected it from the original ECM to ETM; corresponding to the wave

The abbreviations in 2.1, 2.2, 2.3, 3.1, 3.2, 4.1, 4.2, 5.1, and 7.2 are wrong, and the original NWH is corrected to EWH; the water level corresponds to

The abbreviation error in 1.1~5.1 was corrected by MTL/-MeanRange to NWLR;

* Deleted the abbreviations ETM, EWH, NTM not mentioned in Table 7 and the document and the abbreviations not mentioned in Table 8 respectively.

Write EWM, OWH;

* Added the abbreviation DLC in Table 7 and Table 8, and added the abbreviation OCM in Table 7;

* Corrected the error in the article numbering mentioned in 7.3.7.1, from (7.3.9.2~7.3.9.13) to (7.3.7.2~7.3.7.13);

* In Table 13, when the designed operating temperature is between 0°C and 25°C, the thermal deformation temperature of the resin is greater than 80°C, and the long-term load environment

Factor value corrected from 2.2 to 2.5;

* Corrected the error in the formula (C.1) in Appendix C, which was corrected by Hmb to Hm0; the error in the formula (C.2) and formula (C.3),

Corrected by gammainfinity to gammaalpha; errors in formula (C.5) and formula (C.7) are corrected by HS to Hm0, and in formula (C.5) when

gamma=1, the formula is corrected to

TP

Hm0

>5;

* Corrected the error of one spectral curve in Figure C.2, and corrected it to two different spectral comparison curves;

* Corrected the error of the abscissa in Figure D.3, from H0/gT2 to Hb/gT2.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

Introduction

This document outlines minimum requirements for the design of ocean energy conversion plant systems, but is not a complete design specification.

The requirements of this document may be modified as long as it can be reasonably demonstrated that the security of the system is not affected. Compliance with this document is accompanied by

Comply with other applicable local regulations.

Design requirements for marine energy systems

1 Scope

This document specifies the requirements for the system design of wave energy, tidal energy and other current energy conversion devices (collectively referred to as ocean energy conversion devices) to

ensure its engineering integrity. Its purpose is to provide an appropriate level of protection against a variety of structural, mechanical,

Damage caused by all dangers of serious failure of electrical or control systems. Figure 1 illustrates the scope of application of this document and the

Key interfaces to other elements.

Figure 1 Boundaries and interfaces of ocean energy conversion device systems

This document specifies the design requirements for the main structure, ancillary equipment, subsea connections, mechanical systems and electrical systems of ocean energy conversion devices to

To ensure the survivability of this unit under specific site environmental conditions. This document applies to floating, fixed or shore unattended during operation

Base type ocean energy conversion device.

Note. Mooring design guidelines for floating ocean energy conversion devices, see IEC TS62600-10.

In addition to environmental conditions, this document also describes design conditions (operation, operation with faults, shutdown, etc.), design type (normal conditions, extreme conditions, etc.)

conditions, abnormal conditions, and transport conditions) and limit states determined using limit state design methods (operational limit states, extreme limit states