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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 41894.3-2022

**Ships and marine technology - Determination of the shaft
power of ship propulsion systems by measuring the shaft
distortion - Part 3: Elastic vibration method**

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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 is part 3 of GB/T 41894 "Determination of Shaft Power of Ship Propulsion System by Measuring Shaft Deformation in Ships and Offshore Technology"

point. GB/T 41894 has released the following parts.

--- Part 2. Optical reflection method;

--- Part 3. Elastic vibration method.

This document is identical to ISO.20083-3.2019 "Ship and Offshore Technology Determination of Shaft Power of Ship Propulsion System by Measuring Shaft Deformation" Rate Part 3. Elastic Vibration Method.

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

Introduction

Choosing the optimum power for the main engine of the ship is very important for the ship owner as it greatly affects the operation, maintenance and management of the ship cost.

Measuring the output power of a ship's main engine is important to ensure the efficiency of the ship. Methods for measuring host output power include.

a) measure the deformation of the drive shaft;

- b) Determination of fuel consumption;
- c) Observe the host indicators, such as cylinder pressure, etc.

Among these methods, it is a common measurement method to determine the shaft power of ship propulsion system by measuring the shaft deformation. measured by this method
Shaft power is designed to.

- a) Provide measurement data of the output power of the main engine of the ship;
- b) provide relevant information on the best speed of the ship;
- c) select the optimal host operating characteristics;
- d) estimated repair and maintenance costs;
- e) Monitoring the operation of large propellers.

GB/T 41894 "Determination of Shaft Power of Ship Propulsion System by Measuring Shaft Deformation for Ships and Offshore Technology" is intended to consist of the following parts.

--- Part 1.General. The purpose is to establish the general principle of determining the shaft power of the ship's propulsion system by measuring the shaft deformation.

--- Part 2.Optical reflection method. The purpose is to specify the use of optical reflection method to measure shaft deformation to determine the shaft power of ship propulsion system.

rate program.

--- Part 3.Elastic vibration method. The purpose is to stipulate that the elastic vibration method is used to measure the shaft deformation to determine the shaft work of the ship propulsion system.

rate program.

Ship and Offshore Technology by Measuring Shaft Deformation

Determining the shaft power of the ship's propulsion system

Part 3.Elastic vibration method

1 Scope

This document establishes the procedure for determining the shaft power of a ship's propulsion system by measuring shaft deformation with an elastic vibration device. This document gives the measurements

Principle, device composition and calculation method. This document also describes the

determinants of measurement accuracy and specifies equipment onboard documentation.

2 Normative references

There are no normative references in this document.

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1

shaft

The propeller shaft or intermediate shaft that transmits engine power to the propeller and is fitted with a shaft dynamometer measuring element.

3.2

shaft torque

The rotational torque generated by the engine is transmitted to the shaft to drive the propeller in rotation.

Note. expressed in Newton meters (N m).

3.3

shaft power shaftpower

P_s

The power generated by the engine is transferred to the shaft to drive the propeller in rotation.

Note. Expressed in kilowatts (kW).

3.4

sensor sensor

An instrument with elastically vibrating material whose natural frequency changes as the length of the material changes.

4 Measuring principle

Shaft dynamometers are instruments that measure shaft rotational speed and shaft torsional deformation caused by shaft torque. Shaft power (P_s) is calculated according to formula (1).

$P_s =$

$2\pi nQ$

60 x

(1)

where.

N ---shaft speed, the unit is revolution per minute (r/min);

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