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Ships and marine technology — Model test method for propeller cavitation noise evaluation in ship design —

Part 2: Noise source localization

Navires et technologie maritime — Méthode d'essai sur modèle pour évaluer le bruit de cavitation des hélices dans la conception des navires —

Partie 2: Localisation de la source de bruits

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 8, *Ship design*.

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Introduction

Propeller cavitation is the major noise source in commercial ships. The propeller cavitation noise can be assessed by experimental and/or numerical methods in propeller design stage. The numerical methods, such as computational fluid dynamics (CFD) or empirical formulae, might be a good alternative to propeller cavitation noise evaluations. However, the model tests are still used widely for research on propeller cavitation noise.

The objective of the model test is to reduce the propeller noise in ship design by evaluating propeller cavitation noise characteristics at the design phase. Localizing the noise sources in the design stage, as well as predicting its noise levels, might be very helpful. ISO 20233-1 addresses the prediction of propeller noise levels. In order to specify the location of noise source, visual observation of cavitation is the most practical way in view of spatial resolution and efficiency, as the main source of hydrodynamic noise in merchant ship is cavitation. In addition to this observation, noise source localization technique using hydrophone array is under development for verifying the observed noise source location[1]. Thus this document devotes to the source localization method as a new part of a model test method for propeller cavitation noise evaluation in ship design.

The estimation methods of the propeller noise via model tests were widely studied for a long time and can be used in the shipbuilding industry nowadays. However, the noise source localization is easily accomplished by cavitation observation. This document also serves to provide an example of protocols for acoustic localization which is a relatively new research area.