Wave induced extreme hull girder loads on containerships - DTU Orbit (30/12/2018)

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This paper provides simple but rational procedures for prediction of extreme wave – induced sectional hull girder forces with reasonable engineering accuracy. The procedures take into account main ship hull characteristics such as: length, breadth, draught, block coefficient, bow flare coefficient, forward speed and hull flexibility. The vertical hull girder loads are evaluated for specific operational profiles. Firstly a quadratic strip theory is presented which can give separate predictions for the hogging and sagging bending moments and shear forces and for hull girder loads. Then this procedure is used as a base to derive semi-analytical formulas such that approximate wave load calculations can be performed by a simple spreadsheet program. Due to the few input parameters this procedure can be used to estimate the wave-induced bending moments at the conceptual design phase. Since the procedure is based on rational methods it can be applied for novel single hull ship types not presently covered by the rules of the classification societies or to account for specific operational profiles.

General information
State: Published
Organisations: Department of Mechanical Engineering, Coastal, Maritime and Structural Engineering, American Bureau of Shipping, University of California at Berkeley
Number of pages: 213
Pages: 128-152
Publication date: 2009

Host publication information
Title of host publication: SNAME Transactions
Volume: 116
Place of publication: New jersey
Publisher: Society of Naval Architects and Marine Engineers
ISBN (Print): 0-939773-70-8
Source: orbit
Source-ID: 222492
Research output: Research - peer-review › Article in proceedings – Annual report year: 2009