A Method for Ship Collision Damage and Energy Absorption Analysis and its Validation

For design evaluation, there is a need for a method which is fast, practical and yet accurate enough to determine the absorbed energy and collision damage extent in ship collision analysis. The most well-known simplified empirical approach to collision analysis was made probably by Minorsky, and its limitation is also well-recognised. The authors have previously developed simple expressions for the relation between the absorbed energy and the damaged material volume which take into account the structural arrangements, the material properties and the damage modes. The purpose of the present paper is to re-examine this method's validity and accuracy for ship collision damage analysis in ship design assessments by comprehensive validations with experimental results from the public domain. In total, 20 experimental tests have been selected, analysed and compared with the results calculated using the proposed method. It can be concluded that the proposed method has a good accuracy with the mean value of 0.988 and standard deviation of 0.042.