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An Alternative Approach for Assessment of the Weather Factor in EEDI Formulation Using Statistical Ranking Theory

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Back in 2012, in its attempt to limit excess fuel consumption and green gas emissions respectively, IMO distributed MEPC.212(63) Resolution for calculation of the attained Energy Efficiency Design Index (EEDI) for new ships, which became mandatory since 2013. Attention has been paid to the account of the environment caused speed reduction, as directly related to the real operational conditions. The guidelines for calculating the speed reduction coefficient fw have been outlined in MEPC.1-Circ.796. The recommended procedure, however, has some deficiencies, among which: • The speed reduction coefficient fw is to be evaluated at one only (representative) sea condition, which could not be one and the same for ships of various sizes and types • The allowed approaches for estimating the coefficient fw are varying broadly, including rigorous theoretical methods, linearized methods, model tests utilizing various experimental methodologies, and even simple empirics, thus giving non-commensurable basis for the estimation In the paper, a balanced alternative solution of the problem is suggested, based on extensive data for speed loss of variety of ships at seas taken both by experiments or series calculations and using statistical averaging of data over operational range in a form of some generalized rank criterion which match to a great extend the weather factor. The method is thoroughly validated by available full scale data.

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