

Abstract

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Design of Y stiffened panels in double hull tanker under axial compressive loads

In typical tanker ship structures, deck and bottom panels are reinforced by longitudinals (stiffeners) in the longitudinal direction and transversely supported by widely spaced transverse structures (such as transverse bulkheads, deck beams and bottom floors). The conventional longitudinals are usually Tee, angle, bulb flat bar profiles, while the transverses are typically T-beam sections. The objective of the present work is to replace the longitudinal conventional stiffener profiles with new longitudinal Y (Hat + Tee/Angle) stiffener profiles in order to obtain more strength/safety margin to weight ratio based on the advantage of using Hat section (closed section) to give more effective plate allowing an increase of the stiffener spacing, hence a reduction of the number of stiffeners. The weight of the stiffened deck and bottom panels and the unstiffened panel width using the new Y stiffener profiles are less than those panels with the as-built conventional stiffener profiles. The section modulus of the new Y stiffener profiles with the effective plate and the safety margin ultimate strength minus applied compression stress) of deck and bottom panels with the new Y stiffener profiles are larger than for panels with the as-built conventional stiffener profiles.