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Full Scale Measurement of Stresses and Deflections of a Post-Panamax Container Ships

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Summary: Large container ship has required designers to take account of constraints such as hull girder strength due to torsional, vertical and horizontal bending moment, fatigue strength of hatch corner and hatch opening deflection. On the other hand, rapid enlargement of container ships raises large hatch opening deflection, and accurate estimation of deflection is now more important. Interferences between fittings such as hatch covers, lashing bridges and other container securing instruments need to be addressed when new size of ship is explored. The deflection has three components of torsional deflection, cross deck fore-aft deflection due to container inertia force, and hatch longitudinal deflection due to hull girder bending moment. However, there was no clear method how to combine the deflection from these three components. Therefore, the authors conducted full scale measurement of stresses and deflections of ship B between 2002 and 2004 as well as Ship A between 1998 and 2001, which revealed more accurate correlation among three components. This paper shows result of full scale measurement of Ship B in service and examples of design application are introduced.

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