Bi-axial Bending Strength Analysis on Single Hull Bulk Carrier due to Collision

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abstract

The longitudinal strength is the most important issue to ensure the safety of ship not only in the intact but also in the damage condition. In this case, when the collision damaged is appeared, the hull girder cross section is analyzed as a bi-axial bending problem even when only the vertical or horizontal bending moment is applied to the cross section. Therefore, the bi-axial bending is investigated in this study taking the single hull bulk carrier as the object of the ship into account. The full model of the hull girder cross section is modeled to know the influence of the rotation of the neutral axis. The collision damaged is assumed to be located asymmetrically on the side of the single hull bulk carrier. The incremental approach is applied to solve the bi-axial bending problem including the effect of the rotation of the neutral axis. The result is shown in term of the interaction between vertical and horizontal bending moment relationship. It is found that the collision damaged has significant influence toward bi-axial bending behavior, also the effect of the rotation of the neutral axis.

Keywords: Bulk Carrier, hull girder, collision, bi-axial bending