

Effect of Hull-to-Bulkhead Flexible Connection on Blast Resistance of Double Hulled Ships

by

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ABSTRACT

The use of double hull construction is commonplace within the shipping industry though it is largely unexploited within naval vessels. The Impact and Crashworthiness Lab at MIT has proposed the use of adaptive sandwich structures to improve the blast resistance of naval hulls. This project will address two main areas of investigation through the use of simplified analytical models: the integration of hardening and softening plastic core responses in the crushing of a rigidly supported sandwich panel; and the deformation analysis of a sandwich panel supported by non-rigid connections. The analytical solutions were utilized to perform a series of parametric studies to evaluate both the useable range of the models as well as to investigate the general behavior of a sandwich panel under a uniform load when supported by crushable connections. This initial investigation provides the simplified tools to begin and to validate a more detailed, numerical analysis.

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