

Platform Development

Services for Optimisation and Analysis of Sub-division and Layout

SafetyatSea provides advanced analysis and design support in the development of vessel platforms at the concept stage.

New Methods in Layout Design

By building on its extensive experience and involvement with a number of concept designs **SafetyatSea** has developed a unique methodology and set of analysis tools which offer significant savings to both the vessel owner and the production yard.

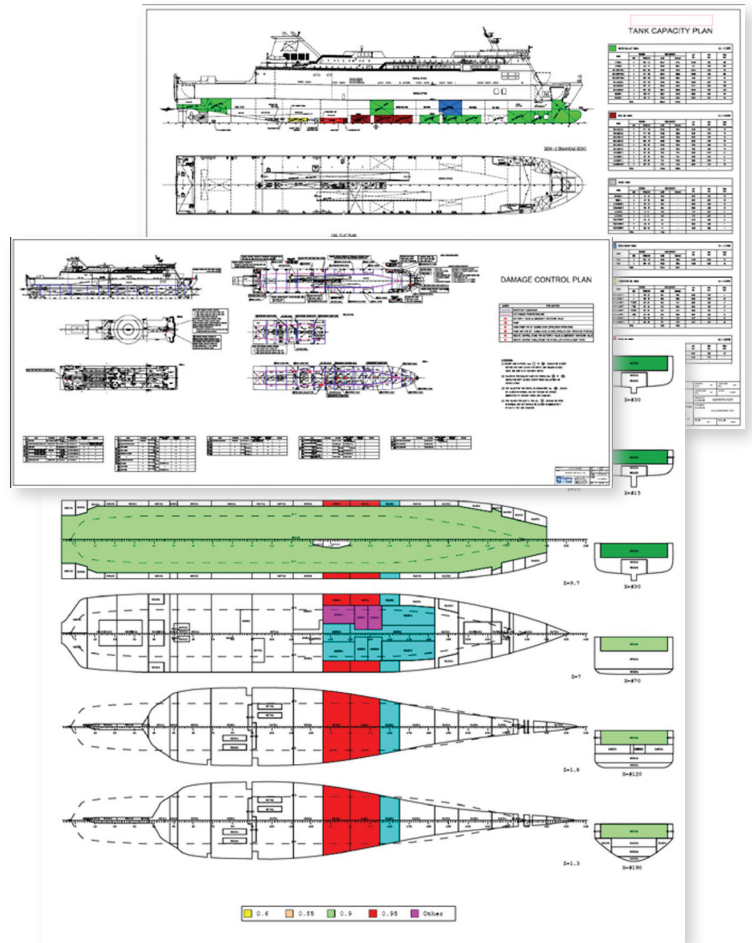
As one of the first organisations to pioneer the use of advanced optimisation techniques and parametric models of the vessels geometry, **SafetyatSea** has been able to produce and refine existing designs to produce vessel layouts which not only promote higher levels of safety but also reduce the overall production cost of the design. By using software based on genetic algorithms, parametric models of the desired vessel type are automatically developed and hundreds of solutions to design objectives such as operability, build cost and safety level are produced in a matter of days to allow a set of optimum designs to be selected for further study.

The following parameters can be addressed when undertaking a platform optimisation:

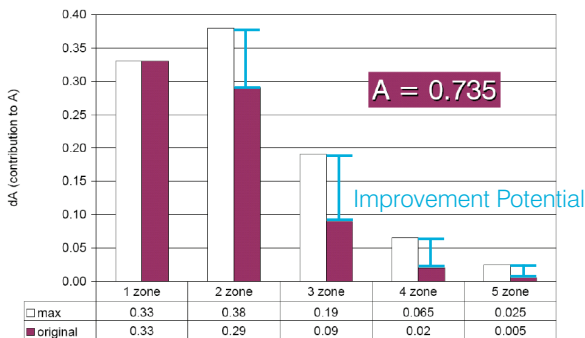
- Number and position of transverse and longitudinal watertight bulkheads (this will affect building cost and escape routes arrangements)
- Size of lower decks watertight spaces (typically associated with crew service areas in cruise vessels)
- Double hull arrangements in the machinery spaces, if applicable
- Height of double bottom and decks (e.g. twin deck, upper limits of machinery spaces)
- Tanks and void space arrangements, location and number
- Deck heights and location and extent of areas for routing of key systems.

Better Ship Design, Cheaper

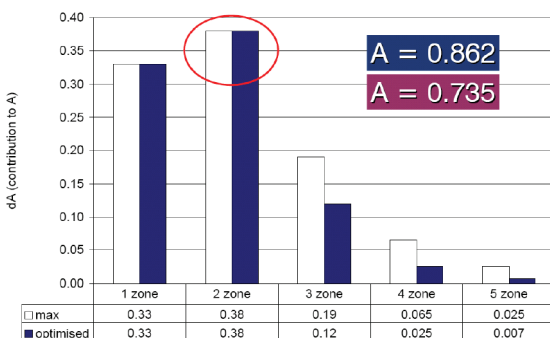
The detailed analysis of each design solution can be based on objectives such as reducing the overall steel area to reduce production costs to both the owner and the yard. Safety level can be evaluated by using standard rule compliance checks e.g. $A > R$ in SOLAS'2009, or if the owner or yard wish to address safety in more detail, the overall time to capsize can be evaluated using our unique analysis techniques for each design solution. A more complex optimisation can involve aspects such as pipe length and valve number minimisation by considering pipe routes and tank numbers in the parametric model. Operability can be integrated into the optimisation process by evaluating the service deck arrangements and considering service/crew flows and the impact the watertight subdivision of the design has on these areas i.e. number of SWT and WT doors and access routing.



Traditional Design Approach



Optimise Design



Alternative Design

This approach to concept development is well suited to the current prescriptive regulations but it also lends itself to the alternative risk based design approaches. By developing more complex parametric models it is possible to allow the optimisation routines within the software to experiment with more innovative arrangements and thereby provide unique solutions to the design requirements which may not have been considered if the standard concept design procedures had been followed.

Once a number of possible design solutions have been selected these are further analysed using techniques such as Monte Carlo time to capsize simulations to compare the overall survivability level of the designs and the results are then used to aid in the selection process when considering which platform layout to take forward to the contract stage.

Further Information

For further information please contact:
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