

Open Deck Comfort

Realising the Potential of Outdoor Spaces

SafetyatSea leads the way in passenger comfort prediction methods on board cruise vessels using state-of-the-art knowledge and engineering tools, aiming to optimise your passengers' experiences onboard.

Providing passenger comfort prediction for designers, ship owners and operators of cruise vessels and cruise ferries

Passenger Comfort

In order to provide the highest standards of passenger comfort on cruise vessels, open deck spaces are now being considered as areas where vast improvements can be made to the passengers' comfort level.

Through detailed modelling of a ship's superstructure, temperatures and wind speeds at any location can be predicted. The flexibility of the techniques used to predict the wind speed allows an experienced engineer to locate the source of any high wind speeds, and give critical advice on the most efficient solutions to improve conditions on open deck spaces. Areas of high temperature and still air can be located allowing engineers to arrive at an optimal solution to improve air flow. By reducing wind speeds and regulating temperatures on open deck spaces passengers will get the maximum enjoyment out of their cruise experience.

Similar modelling of the exhaust gases from the main funnels can allow early optimisation of exhaust gas flow around the vessel. The experience gained from using these modelling techniques allows our engineers to quickly observe flow patterns near and around the vessel's superstructure at multiple locations. Various scenarios can be analysed and rapidly refined without the need for extensive model testing.

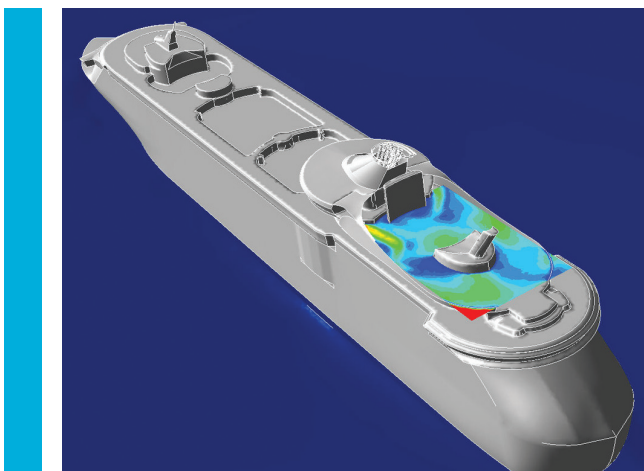
SafetyatSea, with a proven track record of providing specialist knowledge and advanced analysis, is one of the first companies to perform in-depth state of the art studies into wind, temperature and exhaust flow analysis for cruise vessels and cruise ferries. This includes an extensive design and analysis study on RCI's Oasis of the Seas which has been responsible for the success of many of the novel outdoor spaces on that vessel.

Benefits

- Improved passenger comfort
- Reduced wind speeds in open spaces
- Detailed evaluation of air flows around superstructure spaces
- Simulation of smoke patterns, and significant reduction of smoke or fumes on deck
- At an early design stage can provide detailed information that allows optimal solutions to be implemented
- Rapid design analysis for different design options and optimisation of designs
- At later stages can be used to identify features of existing issues and how they can be solved in the most efficient manner

Example Analysis – Wind

A forward space on a modern cruise vessel normally has high wind unless the surrounding structure is very enclosed. This design has wind protection from an open overhead roof structure. The modelling performed allowed an overview of conditions of the whole space, which showed that, if incorrectly designed, this type of structure creates strong jets of wind, which may not be identified as easily using traditional modelling techniques. The ability to examine multiple aspects of the flow, such as path lines of flow and velocity vectors, allowed the source of the problem to be identified and examined and an excellent solution to be designed quickly, leaving a very open yet calm forward space.



This technique can be applied to all spaces on a vessel to identify draughts or strong winds, or conversely to identify areas of stagnant air. In this manner, open deck wind protection, or ventilation arrangements for internal or atrium spaces can be optimised.

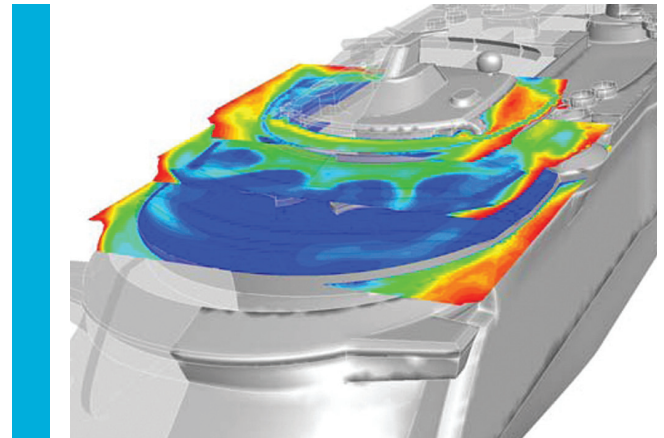
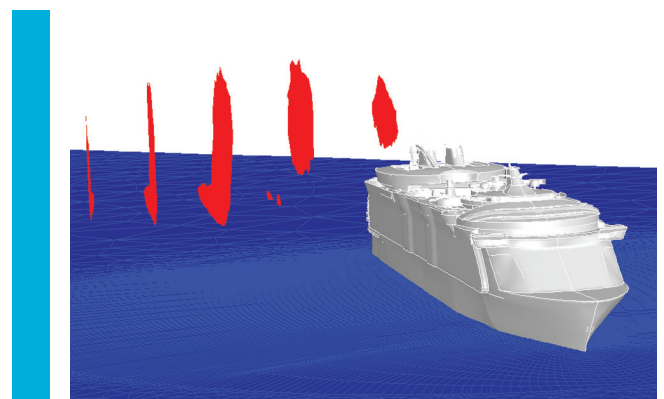


Figure shows comfortable wind speeds from blue being comfortable to red being uncomfortable

Example Analysis – Smoke Plume

Smoke plumes from exhaust vents and funnels can be modelled and the shape of the plume shown for different concentrations. Flow patterns that govern how the smoke plume is formed can be analysed in greater depth than with conventional modelling techniques, which allows for quicker, more efficient optimisation of improvements as potential areas for efficiency gains can be identified at an earlier stage and in more detail.



Further Information

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