

Wind Resistance on a Sea Carrier Transporting Wood Chips

Case Study for Sanoyas Holdings Corporation

SC/Tetra is used to evaluate the wind resistance on a sea carrier transporting wood chips and predict effects caused by fitting-out equipment on the deck

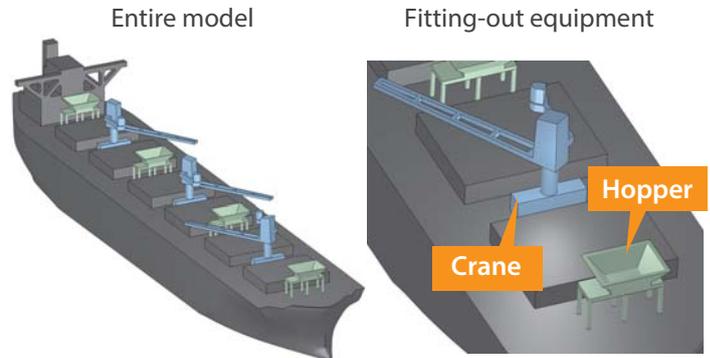
Reducing Wind Resistance on Chip Carriers

One of the problems that sea carriers loaded with lightweight wood chip face is slow vessel speed during stormy weather.

The wind pressure acting on the carriers is known to be strongly affected by the fitting-out equipment on the deck. The shape and appropriate allocation layout of the equipment are critical for minimizing the wind resistance.

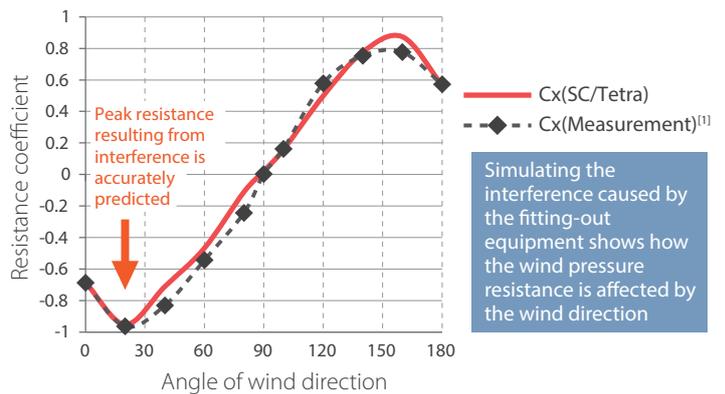
In this case study, CFD was used to calculate the wind pressure resistance acting on a wood chip sea carrier. Evaluations included analyzing the wind resistance due to changes in wind direction, and analyzing how the wind resistance changes with and without fitting-out equipment.

Model of wood chip sea carrier

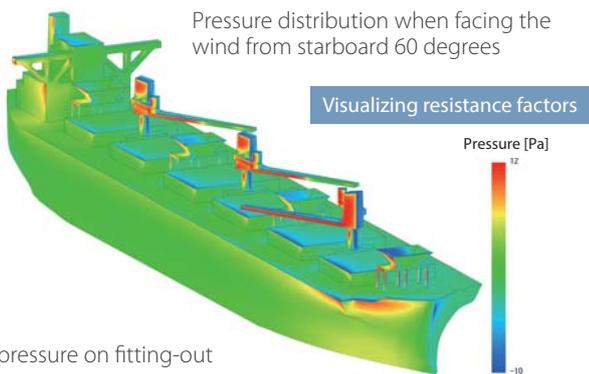


Comparison between analysis results and measurement

Wind pressure resistance affected by changes in wind direction angle

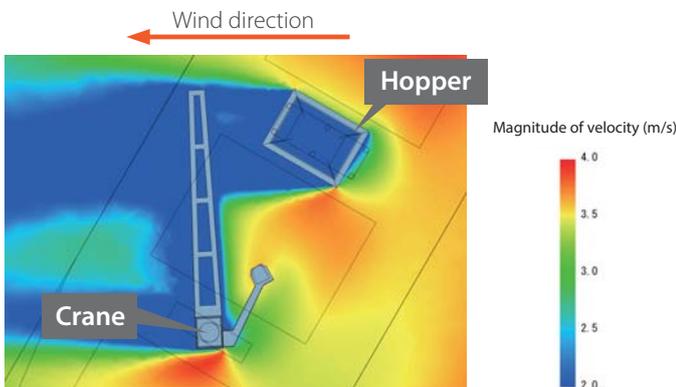


Surface pressure distribution



High pressure on fitting-out equipment creates substantial wind resistance

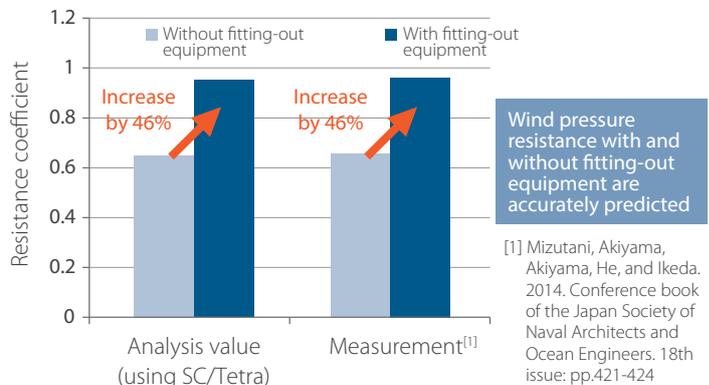
Interference between fitting-out equipment



Wind resistance is reduced by locating the end of the crane downstream of the hopper, where the wind velocity is lower.

Changes in wind pressure resistance

With and without fitting-out equipment
(* wind resistance when wind direction angle is 20 degrees)



Customer Comments

Wind resistance on wood chip sea carriers was analyzed using SC/Tetra. Analysis results agreed extremely well with model test results. CFD can be used to accurately calculate wind pressure resistance and validate the optimal layout and shape of the fitting-out equipment. This will reduce the time and cost of developing more fuel-efficient chip carriers.