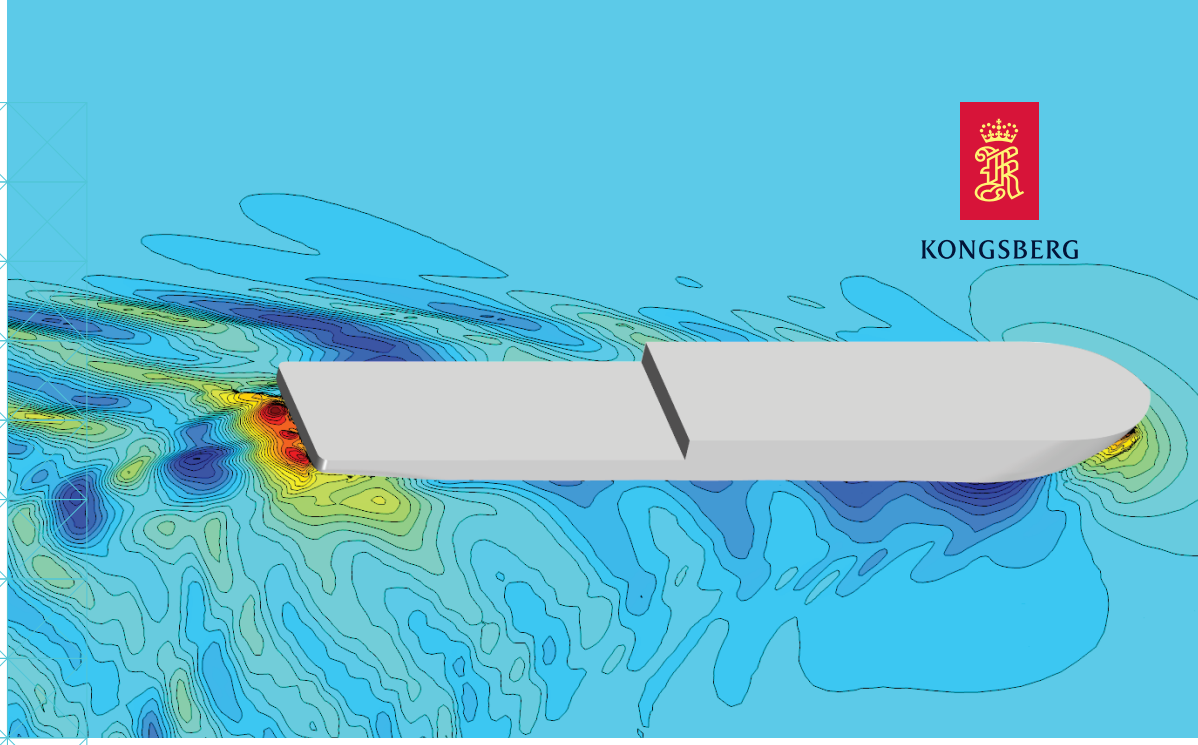
HYDRODYNAMIC SERVICES



KONGSBERG

KONGSBERG ENGINEERING SERVICES

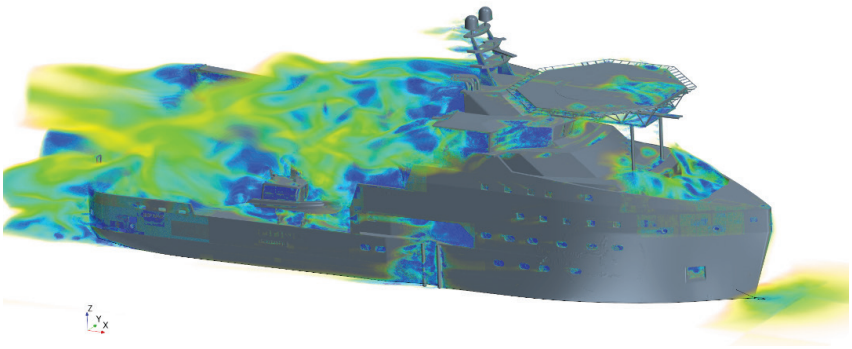
Manoeuvring and vessel response simulations

Estimation of environmental loads are important when designing ships having manoeuvring and operational criterions.
KONGSBERG have capability to combine CFD and time-domain analysis tools for simulation of ships both in calm water and seaways with variable heading and speed.

CFD is used to calculate environmental loads from wind and current and linear potential theory codes are used to calculate wave forces and vessel motions. Results can be used for vessel response, seakeeping, station keeping and DP analysis.

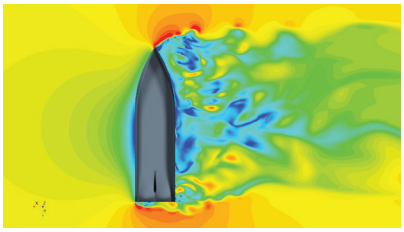
These capabilities can support:

- Selection and sizing of propulsor configurations in order to fulfil a certain station keeping and/or manoeuvring criteria's.
- Comparing manoeuvrability of conventional shaft lines to azimuthing thrusters and other propulsion configurations.
- How many tunnel thrusters and how much power are required for a certain station keeping/low speed capability in given environmental conditions.



MANOEUVRING AND VESSEL RESPONSE SIMULATIONS

- Analysis of wind, current and waves
- Station keeping / low speed manoeuvring analysis
- Time domain vessel response simulations in calm water and waves



Analysis of wind, current and waves

Analysis of wind, current and waves

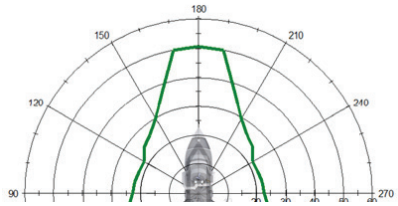
Estimation of environmental loads are important when designing vessels having manoeuvring and operational criterions.

WIND AND CURRENT FORCES

CFD is used to calculate environmental loads from wind and current. Detailed geometries are solved by efficient geometry handling, meshing and CFD procedures and reliable results could be achieved within a few hours. Insights into thruster losses, shallow water effects and hull to hull interactions.

WAVE FORCES AND WAVE INDUCED VESSEL MOTIONS

Linear potential theory codes are used to calculate wave forces and vessel motions. Results can be used for vessel response, seakeeping and station keeping / DP analysis.



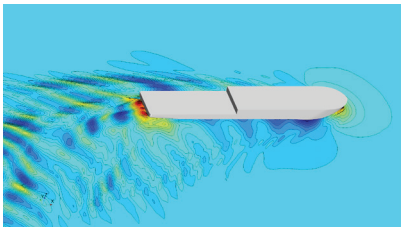
Station keeping / low speed manoeuvring analysis

Station keeping / low speed manoeuvring analysis

Support in selection and sizing of propulsor configurations in order to fulfil a certain station keeping/low speed manoeuvring criterion.

Examples are requests where conventional shaft lines are compared to azimuthing thrusters, how many tunnel thrusters and how much power is required for a certain station keeping/low speed capability in given environmental conditions.

This can be analysed by combining wind, current and wave forces with thrust and power data of KONGSBERG propellers, rudders and thrusters. Thrust losses and interaction effects can also be considered.



Time domain vessel response simulations in calm water and waves

Time domain vessel response simulations in calm water and waves

Vessel response simulations of ships including propulsors with variable heading and speed (6 degrees of freedom) in both calm water and in a seaway where the ships are exposed to waves, wind and ocean currents.

A unified formulation of the hydrodynamics that links seakeeping and manoeuvring into one simulation code.

CFD is used to analyse free running manoeuvres like zigzag and turning circle manoeuvres defined by IMO.

With realistic inflow conditions to the propeller, rudder the hull interaction effects can be studied. Different propulsion configurations could be compared and benchmarked.

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