

## SimFlex4 fast-time simulations



Identification of problematic areas or conditions in the early design phase can reduce the cost significantly when constructing or changing berthing facilities, waterways or port layout. FORCE Technology's SimFlex4 FastTime tool offers the user this ability.

Fast-time simulation offers a cost-effective approach to gaining clarity when evaluating port layout as well as when placing navigational aids.

FORCE Technology has developed the add-on tool SimFlex4 FastTime, that assist the consultant with performing fast-time simulations of different designs and layouts within maritime engineering.

FORCE Technology's fast-time simulator is based on the SimFlex4 software used in all our simulator products.

This means that the mathematical models for vessels and environment are the same as used in the real-time simulators.

This ensures that the responses of the ship, due to impacts from wind, waves, etc. are exactly the same as on our full-mission simulators.

Fast-time simulations are carried out in order to focus on alternative channel layouts. The simulations provide an objective quantification of the conditions and are therefore ideal for comparing different layouts.

### Numerical navigator

In the fast-time simulation, a numerical navigator is used. The navigator is designed to behave as human-like as possible.

It follows a pre-defined track plan, and human error or misjudgements are included as a random function with a given standard deviation to obtain a number of different tracks as well as a track envelope.

The actual sailing plan is devised in close collaboration with the Pilots navigating the channel in order to ensure that the various scenarios reflect reality.

By utilizing fast-time simulations, a significant number of runs are provided, thus quantifying the findings. Hence, the fast-time simulations are especially suited for relative comparisons of various harbour and navigational channel layouts. Thus, providing a solid basis for selection of final design.

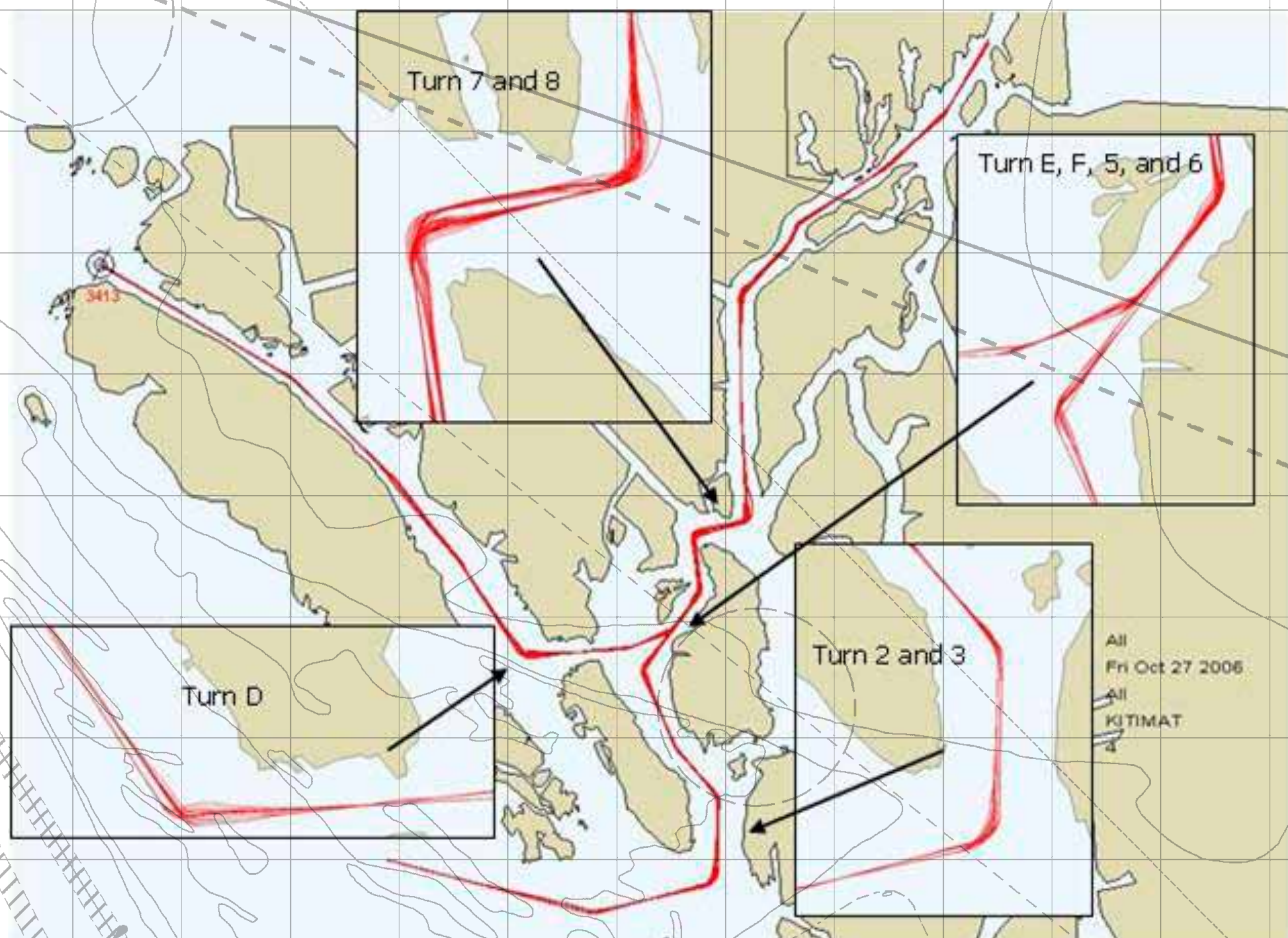
The controllability of the vessel is also investigated by use of fast-time simulations to determine whether the ship is able to pass a channel under various environmental conditions.

As an example, the ship may be forced to limit its speed due to squat. This might cause problems with keeping the ship in the channel because the reduced propeller thrust may not provide power to maintain steering even with full rudder. If that is the case, fast-time simulations will reveal this and the proper precautions can be taken.

### Replay

The time series logged during the simulations are afterwards analyzed statistically with FORCE Technology's own software program 'Replay'. The statistical analysis provides information on e.g. controllability of the vessel, use of rudder and distances to certain structures. This is valuable for decision-making.

Presently, more than 400 companies have bought licenses to the SimFlex4 engineering tools.



Fast time simulation of VLCC tankers sailing from open sea to Kitimat

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