QSHIP Hydrodynamic Suite

**Seakeeping and Workability Analysis software**

QSHIP offers a hydrodynamic suite for seakeeping calculations and workability analysis of ships in waves. The hydrodynamic suite contains (depending on the selected version) two potential flow methods; the strip theory code SHIPMO and the panel code PRECAL. QSHIP calculates motions like ship motions, velocity accelerations and relative wave elevation of the ship in waves. Based on this QSHIP can calculate the uptime based on exceedance of defined criteria like illness rating or local accelerations.

Process steps within the QSHIP workflow:

- Import hull description;
- Add appendages;
- Define loading conditions;
- Define environmental conditions;
- Run strip theory and/or 3D potential flow calculation;
- Post processing; make figures of transfer functions;
- Define workability criteria;
- Run downtime/uptime analysis.

- QSHIP automates data exchange between all analysis programs and process steps. It enables an easy comparison of the hydro-dynamic performance between different ship configurations, loading and environmental conditions.
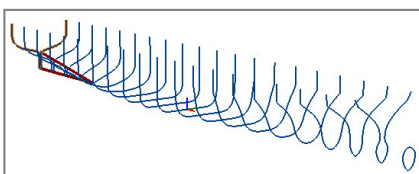

ConvertHullForm tool

Integrated approach

The workflow of QSHIP provides guidance for and easy use of complete chains of pre-processing, calculations and post-processing.
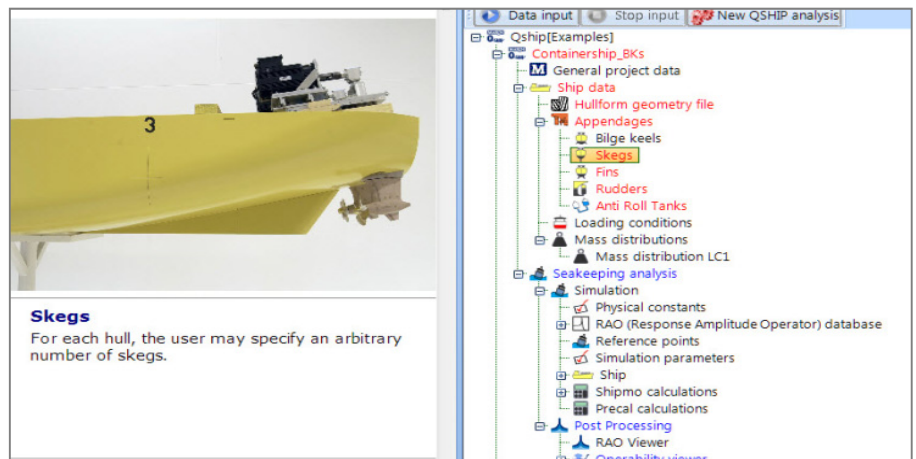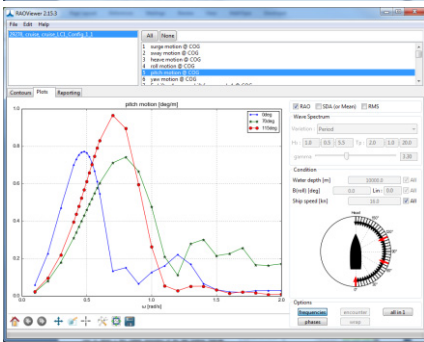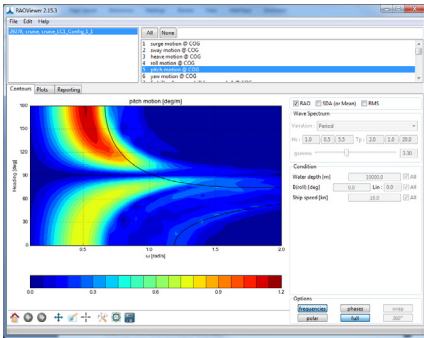

ConvertHullForm

Calculations start with a description of the ships hull, either by panels or strips. The included ConvertHullForm tool converts a wide range of file formats into the appropriate QSHIP format.
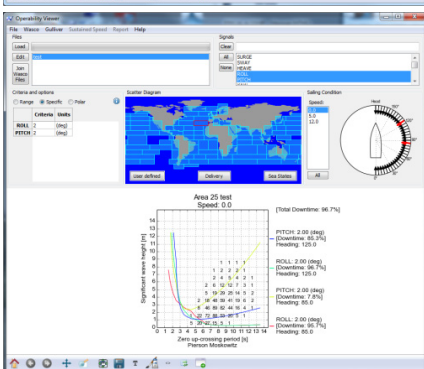
SHIPMO
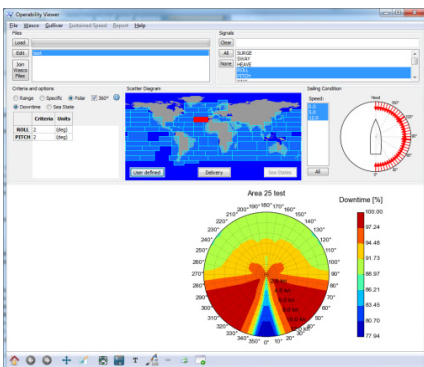
SHIPMO is the MARIN implementation of strip theory. It is the fastest way to obtain a first reliable impression of the ship motions. SHIPMO gives an answer in a few minutes, depending on the number of headings, speeds, frequencies and hull lines.

SHIPMO provides the transfer function in all 6 degrees of motions and has different methods to include the viscous roll damping (e.g. IKEDA, FDS, Nobel Denton). It can include damping contributions like fins, rudders, skegs and anti roll tanks. Because of the strip theory assumptions, SHIPMO is limited to slender ship types.

PRECAL

The PRECAL code is being developed by the MARIN Cooperative Research Ships (CRS) and includes a 3-dimensional potential code. Since panel codes use a more detailed description of the hull, the diffracted and radiated waves can be accounted for in all directions. Therefore, PRECAL is not limited to the slender ships only, but can also be used for more full ships. Detailed calculations provide improved results of the relative wave height and added resistance in waves. All options on roll damping and appendages are taken care of by the user interface and are equal to those from SHIMPO. Calculations take only a short period of time since all computer cores are being used. More detailed methods of panel codes will of course take several hours depending on the number of panels, headings, speeds and wave frequencies.

For leaflets on SHIPMO, PRECAL and WASCO see www.marin.nl/software-sales

Uptime/downtime analysis

In the WASCO code of QSHIP the significant numbers for a range of signals can be calculated for any sea state. In the operability viewer, these are combined with actual wave statistics to evaluate the time that a criterion is exceeded in that specific location. This includes the calculation of comfort indicators such as MII, MSI and local accelerations but also relative wave elevation. When SHIPMO is used, these relative wave elevations are based on the undisturbed waves, however, with PRECAL these also include the radiated and diffracted wave components.

RAO-viewer

The RAO-viewer tool provides easy access to the calculated results by SHIPMO and PRECAL. It provides figures for reporting and enables an easy comparison between different calculations.

Operability viewer

Operability viewer gives easy access to the operability data, showing downtime/uptime in polar plots or lines in wave scatter diagrams showing the limiting wave height.

QSHIP user group meetings

QSHIP has an active user group which meets once a year. In this meeting the QSHIP users receive first hand information on new features and code improvements by our QSHIP developers and domain experts. At the same time QSHIP users can give their feedback and express future wishes for QSHIP.

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