SESAM HydroD

Advanced stability and hydrodynamic analysis made easy

Sesam™ HydroD is the premier choice for stability and hydrodynamic analyses of ships and offshore structures. It has gained status as the market leader due to renowned efficiency and accuracy, based on decades of experience in the industry. DNV GL has developed Sesam™ HydroD to help naval architects and engineers become more productive, while simultaneously delivering even higher quality analyses.
Sesam™ HydroD - a market leader

DNV GL has offered this type of software to the market for more than 40 years, so users can rely on proven solutions.

We are constantly developing and improving the software according to customer need. Both DNV GL and external customers have specific analysis projects that demand further development to the highest standards. New functionality and timesaving features based on user feedback are included in each new release.

HydroD integrates the processes, with modelling, analysis and results processing all performed in the same graphical user environment, saving time, resources and training. It is renowned for its method of transfer of loads to strength assessment. Together with other Sesam programs it is easy to include hydrodynamic results in structural analyses in order, for example, to perform fatigue analysis as well as an ultimate load analysis.

**Improved productivity and quality**

Sesam HydroD improves the naval architect's productivity as well as the quality of the design. The user interface has been developed in close dialogue with the market. Sesam HydroD combines concept modelling techniques with the capabilities for conducting stability or hydrodynamic analysis. Sesam HydroD gives flexibility in performing design analyses and gives users advanced analysis options for fine-tuning the design. Some main benefits include:

- Sesam HydroD saves significant man-hours compared with previous data entry methods.
- Sesam HydroD facilitates easy and efficient graphic modelling and verification of data.
- Sesam HydroD is unique in its ability to offer a complete package including hydrostatic analysis, frequency domain analysis and time domain analysis, all based on one common model.

**More efficient concept modelling**

Concept modelling has proven to be a cost saver when performing sea-keeping analysis, evaluating a vessel's performance and comparing various designs.

Sesam HydroD saves significant man-hours compared with previous data entry methods. Sesam HydroD facilitates easy and efficient graphic modelling and verification of data. For example, it is not necessary to know and specify all the details of the model - it is sufficient to graphically select an object in order to modify it.

Hydrodynamic models can be created within Sesam HydroD or by importing them from Sesam GeniE. If Sesam GeniE is used, the same model can be the basis for hydrodynamic as well as structural analysis. It is also possible to import models and result files from other systems (typically offset tables and 2D DXF).

**Comprehensive package**

Sesam HydroD is used for ballasting, hydrostatic and hydrodynamic analyses of large fixed and floating structures. Typically these may be gravity-based platforms, barges, ships, semi-submersibles, tension leg platforms, floating production storage units or spar buoys.

Sesam HydroD is unique in its ability to offer a complete package including hydrostatic analysis, frequency domain analysis and time domain analysis, all based on one common model. Users use this as the basis for all analyses and for all different loading conditions. Updates to the common model give automatically updated input in all analyses. A strong benefit of the Sesam system is the ability to make a sub-model and analyse it independently of the global model.

Brevik FE model of Frigstad D90 Semi
**Full range of analyses**

Sesam HydroD is exceptional in its offering of both stability analysis, frequency domain analysis and time domain analysis. For analysis in frequency domain at zero speed Sesam HydroD uses Wadam. For time domain analysis or frequency domain analysis with a steady forward motion Sesam HydroD uses Wasim. The hydrodynamic results are used to determine short and long-term statistics, a design wave or can be automatically used in a structural analysis.

**Advanced non-linear analysis**

There is a growing need for more advanced hydrodynamic analysis of offshore structures. A non-linear analysis with a well-selected input will always give better results than a linear analysis. DNV GL has enhanced its computational engine to include such nonlinearities. A combined structure, such as a plate and frame structure, can be analyzed both static and in motion - and for both intact and damaged conditions. This makes Sesam HydroD the premier software for analysis of all kinds of floating structures.

“The foremost advantage we see is the seamless integration of work processes. For example, we could have the hydrodynamic loads transfer back to the structure model for global strength analysis, local strength analysis, fatigue analysis etc. You do not find that in other software.”

Anis Hussain, General Manager, Keppel Offshore & Marine Deepwater Technology Group
Multibody analysis
For multi-body analysis in frequency domain it is possible to run up to 15 different bodies, including full hydrodynamic interaction between the bodies. We have made such analysis even more powerful by allowing the user to specify an additional coupled damping and restoring matrix for the bodies.

Equilibrium, hydrostatic and sea-keeping
Sesam HydroD provides optimal functionality to compute the key decision results for longitudinal strength and stability data for ships and floaters. The stability computations may be run for both intact and damaged conditions including flooded compartments and wind heeling moments. Sesam HydroD also offers hydrostatic analysis and stability code checks of floating structures according to offshore rules in addition to sea-keeping analysis.

Post-processing
Statistical post-processing is done to find typical result attributes like global response data (e.g. RAQs) and detailed results for selected panels/points. This may also be used directly as input to a mooring or coupled motion analysis (DeepC). General post-processing may be done to visualise and animate motions and responses such as pressures and diffracted waves.

"We have to improve our knowledge continuously to deliver successful projects and using Sesam helps us achieve this."
Sasha Mandic, Engineering Manager at Frigstad Engineering

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<thead>
<tr>
<th>10 GOOD REASONS FOR CHOOSING SESAM HydroD</th>
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