DIGITAL SOLUTIONS

SESAM GeniE

innovative offshore engineering made easy
DNV GL is the world-leading provider of software for a safer, smarter and greener future in the energy, process and maritime industries. Our solutions support a variety of business critical activities including design and engineering, risk assessment, asset integrity and optimization, QHSE, and ship management. Our worldwide presence facilitates a strong customer focus and efficient sharing of industry best practice and standards.

Nearly 50 years of developing quality software
In providing your business with the best software solutions we are always striving to live up to our values: • We build trust and confidence • We never compromise on quality or integrity • We care for our customers and each other • We are committed to teamwork and innovation • We embrace change and deliver results.

Enabling tomorrow’s solutions
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Fixed structures

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ENABLING TOMORROW’S SOLUTIONS

At DNV GL - Digital Solutions, our ambition is to fully support our customers in all stages, from design to decommissioning. Over the years our close working relationships with our customers have led to continuous improvements and ever-expanding functionality.

Sesam GeniE, our complete, user-friendly and cost-efficient offshore engineering suite is unique in its ability to handle frequent and significant changes in the design process quickly and efficiently. One common software tool for engineering of floating and fixed structures, including environmental load calculations, increases return on investment through cost efficient design and engineering. The same engineering platform used across disciplines enables flexibility and collaboration in engineering staff, including training and concurrent engineering.

The same model can be used from the initial design phase through final design to modifications and repair, life-extension, re-analysis and requalification to increase the return on asset for operators and asset owners. Sesam GeniE is designed to integrate data, making it easy to re-use existing data from other FEA or CAD systems.

An easy-to-use, appealing and modern user interface is crucial for understanding and appreciating the details of a model, for example when re-assessing an old model with limited documentation, or when a third party is performing a verification task. It is important to have ownership and control of the data and be able to share it when needed. Since all model data in Sesam GeniE is stored in one location this becomes easy, and the solution excels at design documentation and ensures that owners and operators have constant access to their own data - a matter of increasing importance in the years to come.

Sesam has been on the market for more than 40 years, and it continues to be one of our most important products. We have never held back on the investments in its development, and we will continue these investments in Sesam in the coming years.

We are proud to be able to say that we are enabling the best solutions of tomorrow!

Are Føllesdal Tjønn, Managing Director, DNV GL - Digital Solutions.
SESAM GeniE – A WORLD-LEADING TOOL

Sesam™ GeniE is a tool for designing and analysing offshore and maritime structures made of beams and plates - integrating stability, loading, strength assessment and CAD exchange. It is part of the Sesam suite, covering the entire lifecycle of fixed and floating structures from design, structural re-analysis systems, modifications and repair, and input to the operational phase, emergency response and decommissioning.

While Sesam has evolved as a market-driven modular system enabling users to invest in a package of selected modules, integrated packages have also been developed to cover specific needs. This allows for tailor-made Sesam installations to features in a cost-efficient way. All packages cover in-place, installation, transportation, accidental conditions and operational aspects.

The Sesam suite of software provides seamless import of data between modules, allowing our users to easily integrate the use of solutions such as Sesam HydroD for hydrodynamic and hydrostatic analysis, Sesam DeepC for mooring and riser design, Sesam Marine for simulating, testing and evaluating marine operations, Sesam Pipeline for offshore pipelines and Sesam Wind for ultimate strength and fatigue analysis of offshore wind turbine substructures.

10 GOOD REASONS FOR CHOOSING SESAM GENIE
1. One common model can be used from initial design phase through final design
2. One finite element tool for engineering of both floating and fixed structures
3. Unique ability to handle frequent, significant changes in design process
4. Appealing and modern user interface
5. Renowned speed and accuracy of calculations
6. Easy to re-use existing data in other FE or CAD systems
7. Owners and operators have constant access to and ownership of their own data
8. 24-hour support services from experienced support staff across the globe
9. DNV GL has unique combined expertise in both software and engineering
10. Modelling, finite element analysis and results processing are performed in the same graphical user interface

“Sesam does things for us that other programs couldn’t do. It lets us expand what we do in terms of the ease at which we can model these systems.”

Ian Childs, Senior Consultant, Frazer-Nash Consultancy
AREAS OF USAGE

- Construction
- Lifting
- In-place
- Transportation
- Launching
- Modification and repair
- Life extension
- Decommissioning
- Marine operations
- Design of all stages
- Structural re-analysis systems
- Input to the operational phase
- Emergency response
- Design optimization
CONCEPT MODELLING IN SESAM GeniE

Improved productivity and quality
Sesam GeniE has many time-saving features for design of simple and advanced structures. The same model can be used when growing the complexity. Design changes are done efficiently, as the concept model is independent of the analysis model. From the same concept model, analysis models are created for hydrostatic, hydrodynamic and structural analyses.

Structure modelling
Modelling in 3D graphics increases productivity and eases the understanding by other disciplines, such as quality verification. Sesam GeniE allows for mixed models of beams and plates, easy generation of shell models, and has powerful features for segmented beam modelling. Wizards for generation of jackets and topsides simplify the design process. Graphic modelling is supported by scripting language that allows easy sharing, re-use and modification of models created for hydrostatic, hydrodynamic or structural analyses.

Improved flexibility
Loads are applied independently of the analysis model, as the load mapping is done automatically. The loads and the finite element mesh density can be altered independently, ensuring flexibility. Many processes are automated, such as calculation of loads and mass from structure, equipment or weight lists and recalculation when moving equipment or changing the supporting structure.

What is concept modelling?
Sesam GeniE is the only software on the market that offers concept modelling, which is an immense time saver for engineers. Concept modelling in Sesam GeniE maintains the dynamic connectivity between structural components such as beams and plates. This means that whenever the user inserts or moves a structural component, the connectivity to other plates or beams is automatically updated. Design optimization is often characterized by many and large changes - concept modelling is therefore the most time-efficient method of design.
Import from other CAD/CAE systems
Sesam GeniE can import data from software providers such as Sacs, StruCad3D, Ansys, StaadPro, NAPA and Nastran, and automatically convert the data to a concept model, benefiting from the flexibility of Sesam GeniE. Models may be made based on data created in CAD systems and can import lines (guiding geometry) PDMS, PDS, DXF and Rhino and surfaces in SAT format.

Structural analysis, modification and requalification
Sesam GeniE automatically creates the analysis model using program defaults or user settings. The analysis itself is performed using an efficient and robust solver, enabling the use of standard hardware for large problems. It is possible to make multiple analyses using different structure loads or boundary conditions.

A Structural Reanalysis System (SRS) is necessary for safe and efficient platform operation. The main purposes of SRS are emergency preparedness, to adapt to changes in external conditions that may not be optimal for the original design (i.e. seabed subsidence), modification projects and lifetime extension. Sesam GeniE is ideal for a reanalysis system, since the as-built model can easily be used to reassess modifications. The workflow allows changes without requiring users to manually establish connections.

Sesam GeniE supports four types of fatigue analysis for beams (simplified, deterministic, stochastic and time domain). Similarly, stochastic fatigue for surface and solid finite element models is supported. Non-linear analysis of beam is often used when assessing accident, exploitations, fire, contact analysis and P-Delta analysis. Furthermore, such analyses are also often used when there are large and structural deformations and for life extension purposes. Sesam GeniE handles this by re-using the linear with a minimum of additional definitions related to non-linear characteristics.

Results processing and redesign
By integrating the evaluation and documentation of results with modelling in the same user interface, Sesam GeniE speeds up the iterative engineering process. The results, including displacements, stresses or beam moment diagrams, may be presented for the complete model or for selected concepts or sets.

The ability to modify structure, properties and loads makes redesign virtually automatic. In addition, for code checking of beams, results are instantaneous when altering for example section properties or buckling lengths.

Seams GeniE supports code checking of beams according to API (WSD & LRFD), AISC, NORSOK, ISO, EUROCODE3 and DS. It also supports code check of plates according to CSR (Common Structural Rules), PULS and DNV Rules.

Finally, earthquake analysis of beams is also possible.

Reporting
Sesam GeniE offers integrated analysis, rule-based capacity checking (including redesign) and results processing. It is easy to make customized reports supporting MS Excel or MS Word, including 3D images.

SnackPack boosts performance
Sesam GeniE SnackPack, offered as an add-on to GeniE, brings cutting edge functionality with numerous utilities and special functions. Timesaving features include the ability to change the variables in a parameteric model and automatically generate alternative models, which can alone easily save a full day of design work.

Interaction with DNV Rules
Sesam GeniE interacts with Nauticus Hull (a software package for strength assessment of ship structures covering a wide range of analyses), using the 2D information as a starting point for generating midship sections for cargo hold analysis. The loads, boundary conditions and corrosion addition from Nauticus Hull are automatically re-used in Sesam GeniE.
With Sesam, design engineers can use a single model from the initial design phase through to the final design, which is not possible with competing software systems. The same model data is used continuously in a re-analysis system that typically addresses accident, modification and re-qualification.

Sesam users work in an integrated environment for structural modelling, environmental load calculations, structural response analysis and engineering evaluation and redesign, in a consistent user interface. A typical example of such is connections between pile and leg as well as disconnection of beams and plates. The data model may be made by Sesam GeniE only or by importing from several systems into Sesam GeniE. This is a major timesaver in for example life extension analysis for customers who use supporting programs. Sesam’s one-model structural analysis solution is unique.

"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
One-stop data storage
A unique data storage offers the ability to store all data in one location. The owner requires the data set for regenerating the as-built condition. Such data storage makes regeneration easy by the owner or a contractor. There is no need for setting up complex workflows as all data for structure, loads, environment, analysis set-up and code check can be re-used as is. The simplicity of the data exchange allows the owner to retain full ownership of the data. Furthermore, Sesam GeniE’s capabilities within graphical reporting make it easy to understand and appreciate a model.

Re-analysis
Most operators have set up structural re-analysis systems (SRS) of their assets in order to quickly assess the consequences of changes, including modifications, loss of strength, accidents and new environmental criteria. Minor modifications may be handled by a new in-place analysis while a major modification often requires a full design loop including construction, transportation, installation and in-place analysis. The re-analysis system can re-use the as-built data model and any changes can be saved as a new revision of the data set for later use. It is also possible to import the data models from other systems to make an SRS system based on Sesam GeniE.

Life extension
Many structures have already passed or will pass their initial design lifetime. When the requalification process will fail based on a traditional linear in-place analysis it may be necessary to do a collapse analysis based on non-linear methodology where the residual material strength is taken into effect. This may also be the case if inspections show that there has been corrosion or cracks. The data model created by Sesam GeniE forms the basis of such collapse analysis. Non-linear analysis is also performed to assess the consequences of events such as accidents, dropped objects, fire, explosion, large deformations and extreme wave loads.

The data model can be completely made inside Sesam GeniE or made re-using existing data created in other FE or CAD systems to build a complete Sesam GeniE model.

Sesam GeniE is part of the Sesam suite of solutions and the data exchange between these is seamless. This means that the model created by Sesam GeniE is directly used in the hydrodynamic part of the e.g. transportation analysis or jack-up in floating condition and the load effects are automatically used by Sesam GeniE in the analysis. In other words, the result assessments are done based on hydrodynamic results and not only a set of prescribed accelerations.
SHIPS AND OFFSHORE FLOATERS

As for fixed structures, Sesam GeniE represents the latest generation of design and analysis software for ships and offshore floaters. This has been motivated and driven by end-user needs for solutions offering faster modelling speeds, closely integrated with advanced strength assessment tools. By offering design, modelling, analysis and result evaluation features within the same user interface, Sesam GeniE supports engineers’ need for fast design iterations.

Sesam GeniE is a flexible software tool that can model all types of floaters such as simple barges, box-shaped FPSOs, semi-submersibles, TLPs, spar buoys, bulk carriers, cargo ships and container ships. It handles small local models up to large, global models for nominal strength check.

Together with Nauticus Hull for ship structure analysis, Sesam GeniE forms a complete software package for direct strength analysis of ships and FPSOs, including hull import into Sesam GeniE. The 3D modelling and analysis provide full support for cargo hold analysis with automatic import of rule load conditions and corrosion additions.

The benefits of concept modelling
By introducing concept modelling techniques, Sesam GeniE allows engineers to focus on real structural parts, loads and environmental conditions instead of nodes and elements. Combined with strong features for 3D visualization, this significantly reduces the time spent on modelling and documentation and provides efficient verification. The model refinement from global/cargo models to detailed fatigue models gives unequaled efficiency. It is easy to create a local model, and to change the FE mesh at any stage. Sesam GeniE provides sub-modelling functionality, load modelling, and easy import from hydrodynamic analyses.

Integration with hydrodynamics and Common Structural Rules
For hydrodynamic analysis, Sesam GeniE works seamlessly with Sesam HydroD and Sesam DeepC for analysis of risers and moorings and for providing hydrodynamic models. The load effects computed by Sesam HydroD may be automatically used by Sesam GeniE for the purpose of supporting fatigue and code checks.

This means that the software supports fatigue check, code checks, integrated buckling check and strength checks according to ship rules and offshore standards. Rule load cases, boundary conditions and corrosion additions are automatically created from Nauticus Hull with integrated code checks, saving time spent on the evaluation to satisfy the requirements set forth by Common Structural Rules.

“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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THE MODULES

Sesam GeniE offers a package of software tools that are part of the Sesam suite of programs. GeniE is the main modeller and is supported by the following modelling tools. You can select the necessary functionality made available according to your needs. Below you will find a short description of the main features of each software tool. For more details, please visit our website www.dnvgl.com/software

MODELLING TOOLS

GeniE
GeniE is the main modeller. Its functionality is described earlier in the brochure.

Patran-Pre
The Patran-Pre module is an alternative modeller to Sesam GeniE. Patran-Pre lets you model, develop and test a product using computer-based simulation and thereby reducing or eliminating costly prototyping and testing. The modelling is done based on geometry or finite element modelling directly. Patran-Pre also supports solid (volume) finite elements. Major design companies around the world use Patran-Pre in their product improvement process.

- Advanced and easy-to-use features for geometry import, creation and modifications
“The demands are growing. We need software that is flexible in combining beams and plates.”

Gerard Bakker, Senior Expert Engineer, Topsides, SBM Offshore

ANALYSIS TOOLS

Wajac
The Wajac module computes hydrostatic and hydrodynamic forces on fixed offshore frame structures due to wave and current, together with static or gust wind loads.

- Calculated distributed member loads may be displayed in Sesam GeniE, making it easy to verify the location of peak loads.
- Automatic transfer of loads to structural analysis or statistical post-processing.
- Finds the position of waves giving maximum base shear and overturning moment, creating the corresponding load cases automatically.
- Integrated analysis when used inside Sesam GeniE.
- Transfer of loads to Sestra for linear strength analysis, or Usfos for pushover analysis.

Splice
The Splice module is a soil and pile structure interaction analysis for design of safe and solid foundations, using the model as created by Sesam GeniE. All types of linear structures on piles, with all kinds of static loads, may be analysed using Sestra and Splice. The piles, soil and environment are defined in Sesam GeniE.

- Creates real load cases for use in the non-linear pile-soil analysis.
- Solves the displacements at the pile-structure interface points for a linear elastic superstructure modelled with non-linear pile foundations.

Sestra
The Sestra module is a general-purpose FE program for linear structural analysis. It uses models as created by Sesam GeniE, Patran-Pre or Presel as input and generates results for use by the various post-processing tools. Tension/compression analysis can also be performed when Sestra is started from GeniE.

Sestra is known for handling large analyses and today the structure complexity and number of load cases is limited by hardware storage capacity. Sestra has
features for splitting working files on several disks. For large analyses this may make the difference between getting the analysis done in time or not at all.

- The most rapid and robust of finite-element solvers
- Extensively used and tested in maritime and offshore industries for more than 20 years, leading to continuous improvements
- Ongoing developments within equation solving and dynamics prepare Sestra for future demands on solution speed and accuracy

**Usfors**
The Usfors module is a special purpose non-linear program for progressive collapse and accident analysis of jackets, topsides, floaters and other frame type structures. These structures are often subject to extreme loads. Accidental damage such as that caused by explosion, fire, dropped objects, extreme environment events, or from ship collision, poses a major threat to the safety and operation of offshore structures.

- Reads the model from GeniE
- Performs static collapse analysis, non-linear time series dynamic analysis and eigenvalue analysis
- Predicts both resistance of structures subject to accidental loads and the residual strength of damaged structures
- Plastic limit state design allows taking advantage of reserve capacity in the structure

**Installjac**
The Installjac module is a time domain program that performs an accurate simulation of the installation process of an offshore steel piled jacket. Both the launch and up-ending scenarios are accounted for.

- Analysis of jacket operations such as launching from barge, floating stability and up-ending
- Comprehensive assessment of the hydrostatic and hydrodynamic properties of jacket during installation
- Parameters are easy to change, saving time and providing more accurate results

**POST-PROCESSING**

**Code checking beams**

**Code checking plates**
Code check of plates according to CSR Bulk and PULS (DNV RP-C201.2) standards. Plate code checks according to API, DNV (RP-C201.1) and NPD may also be carried out.

**Xtract**
The Xtract module is a FE results presentation post-processor - a high-performance general purpose model and results visualization program. It presents results for nodal positions, result point positions and average values over elements.

- Displays, animates and presents results of hydrodynamic and static/dynamic structural analyses
- Used for examining models at any level of detail with or without analysis results
- Interactive zooming, rotating, panning and cutting for best view of model

**Cutres**
The Cutres module is an interactive postprocessor for presenting forces and stress distribution in user-defined cross sections (cuts). It can handle large general superelement analyses with a large number of superelements organized in a multi-level super-element hierarchy.

- Arbitrary global cross-sections through a structure, completely independent of superelement or basic element boundaries

“Keppel chose Sesam software for its user-friendliness and technical reliability as well as cost-effectiveness.”
Paul Liang, Section Manager, Engineering Division Keppel O&M, Singapore
Integration of force distribution in a cross section to form total axial force, shear forces, bending moments and torsional moment
- Handle static and complex loads
- Graphic presentations and display

Profast
The Profast module is designed for planning of cost-efficient inspection of offshore jacket structures and re-qualification of existing structures. Profast can also be used for other types of structures where fatigue crack growth is considered.

- Compute reliability (or the failure probability) with fatigue failure as a function of time, based on either an S-N fatigue model or a Paris-Erdogan crack growth model
- Reliability as function of time updated on basis of inspection findings and optionally repair
- Prescribed inspection time: for a given inspection quality, inspection and repair history, predefined inspection intervals and reliability threshold, the joints necessary to inspect are identified
- Optimised inspection time: for a given inspection quality, inspection and repair history and a predefined reliability threshold, the optimised time to next inspection is computed for a joint or a group of joints

Framework
The Framework module is an interactive postprocessor for code checking, fatigue and earthquake analysis of frame models. Framework is used for deterministic, spectral (stochastic) or time domain (rainflow counting) fatigue of beams. The loads are based on hydrodynamic analysis either in Wajac or in Sesam HydroD, in frequency or time domain.

- Automatically generated command log files that may be modified and used as input
- Code checking according to the most used standards within offshore industry. This is applicable for models made in the old Sesam format
- Fatigue analysis based on non-hydrodynamic loads also possible with a Sesam utility tool
- Calculation of fatigue damage of a wind loaded tower
- Gust wind fatigue, with loads from wind load analysis in Wajac
- Earthquake analysis of fixed frame structures

Platework
The Platework module is an interactive program for code checking of plane stiffened steel plate structures based on results from FE analysis. The program has features for manual input of code check data and extensive automatic features for extraction of such data from FE analyses. It may also be used as a design tool independently of an FE analysis.

- Features for manual input of code check data and extensive automatic features for extraction of such data from FE analyses
- Stresses can be automatically extracted from an FE analysis
- User control of how moments should be accounted for in code checking of stiffeners and girders
- A load combination may be specified as a combination of FE analysis results and manually defined loads

Stofat
The Stofat module is a postprocessor for stochastic fatigue of welded plates and shells for wave fatigue loading. The loads are normally based on a Sesam HydroD analysis in frequency domain. Stofat is capable of fatigue screening of a large structure as well as refined fatigue on smaller parts, often in conjunction with Submod.

- Helps avoid local structural failure due to repeated environmental loads
- Performs stochastic fatigue analysis on structures modelled by shell and solid elements

“As the oil and gas fields get deeper, the installations of deepwater platforms become more challenging. The coupling effects between a floater and its moorings become more pronounced and more important. Sesam is an excellent tool for analysing the interaction between hull, moorings and risers.”
Andy Kyriakides, Project Manager, MODEC International LLC
Almost 300 DNV GL offices in 100 countries enable us to be close to our customers and to share best practices and quality standards throughout the world. Sesam GeniE is used worldwide, and we are proud to have some of the biggest names in industry and leading research and educational institutions on our list of users. The reasons they have chosen Sesam GeniE are numerous, and not only limited to the renowned speed and accuracy of calculations, the single data model, or the ease of use.

“We use Sesam as the basis for all structural re-analysis models.”
Simen Moxnes, Leading Advisor Structural Analysis, Marine Structures and Risers, Statoil
WE ARE YOUR KNOWLEDGE PARTNER

DNV GL is continuously focusing on our customers’ potential for increased efficiency, accelerated growth and well-managed risk.

Our team of IT and integrity management experts has many years of experience in making Sesam work for the specific circumstances and environments of each client. We can take care of everything from implementation and installation to configuration, support and assistance. We take pride in delivering professional service and in giving you access to the domain knowledge and experience of DNV GL.

Customer Portal and support
The Customer Portal provides you with access to tools and information for better use of DNV GL – Software’s range of products. You can find product downloads, frequently asked questions and a wide range of supporting documents including all historical user conference presentations and monthly status notes. You can also submit technical support cases directly to the DNV GL Software helpdesk and have access to our FAQ knowledge base.

Service level agreement
A service level agreement provides easy access to our global technical support helpdesk, new product releases and domain knowledge. As a global organization with professional, regional support centres, we can ensure expert support when you most critically need it, so that you can complete and meet your project demands.

Sesam Assistance
Our Sesam Assistance program, offering tailor-made onsite consulting services to your business, covers every aspect of offshore engineering including fixed structures, floaters, SURF, and offshore wind turbine analyses. Taking advantage of our Sesam Assistance experts, who have extensive engineering and software experience, will significantly accelerate your time to value using a set of best practices utilized for your specific design and analytical requirements.

Training, conferences, seminars and workshops
DNV GL – Software organizes user conferences, seminars and workshops worldwide, providing a unique opportunity to communicate with our users and receive valuable feedback.

Our training catalogue includes open courses in all regions, and customers can request customized training. Many of the courses are held jointly by our own software support team and by engineers from DNV GL, who bring essential domain expertise.

“Sesam Assistance provided Mustang with a valuable opportunity to use Sesam in a more efficient and time-saving manner.”
Farrel Zwemman, Civil/Structural Engineering Offshore, Wood Group Mustang
Sesam GeniE
Sesam GeniE is a software tool for designing and analysing offshore and maritime structures made of beams and plates. Modelling, analysis and results processing are performed in the same graphical user interface. The use of concept modelling makes the Sesam GeniE software highly efficient for integrating stability, loading, strength assessment and CAD exchange. All data are persistent, enabling the engineers to do efficient iterative redesign of a structure.

Sesam GeniE Lite
Sesam GeniE Lite is a tool for design of regular steel structures made up of beams and plates. It is based upon the use of concepts to represent the physical structure and loads that it supports. Sesam GeniE Lite software is for designing small and regular structures quickly and efficiently, with high quality.

Sesam HydroD
Sesam HydroD is a tool for hydrostatic and hydrodynamic analysis. By integrating these tasks, significant cost savings may be achieved in the engineering phase, since the same panel model may be used by one tool. Sesam HydroD software will perform compliance checks against statutory rules for stability including the importance of integrity of the deck tanks. Floating positions may be determined as a result of actual mass and buoyancy or from an automatic compartment filling to satisfy specified position.

Sesam DeepC
Sesam DeepC is a tool for mooring and riser design as well marine operations of offshore floating structures. It will perform mooring analysis separately or when including the coupled effects of risers and vessels. Furthermore, Sesam DeepC software may be used for riser design where the risers are analysed separately or when considering coupling effects. Marine operations may be simulated in the time domain for a study of motions and station-keeping of multi-body systems.

Sesam Marine
Sesam Marine lets you visually simulate, test and evaluate marine operations ahead of offshore handling, significantly reducing risk. The ability to visualize the operations in 3D and run multiple ‘what-if’ scenarios showing the results of all known factors, including dynamic positioning, reduces risk significantly for transportation, installation and lifting of fixed and floating structures and installation of subsea equipment. The simulations in Sesam Marine can be used during real-time execution of marine operations, including installation of SURF structures such as templates, flexible risers, umbilicals and pipelines.

Sesam Pipeline
Sesam Pipeline offers ultimate strength and fatigue analysis of offshore pipelines. Its modules include FatFree, StableLines, DNV-OS-F101, SimBuck and PET (Pipeline Engineering Tool). FatFree is for engineering analysis of free spanning pipelines according to the DNV Recommended Practice, RP-F105. StableLines is a professional engineering analysis software for pipelines, based on DNV Recommended Practice DNV-RP-F109. Pipeline Engineering Tool is a calculation tool for early phase pipeline assessment covering different aspects of pipeline design. SimBuck is used to document compliance with DNV RP-110. In addition, we offer DNV-OS-F101 Code Compliance.

Sesam Probability
Sesam Probability is a general purpose program for probabilistic, reliability and sensitivity analysis. By supplementing the hydrodynamic and structural analysis features, Sesam Probability software forms a part of the powerful suite of Sesam programs for maritime and offshore engineering analysis.

Sesam CAESES
Sesam CAESES is the only available software today that makes simulation-driven design easily applicable in both hydrodynamic and aerodynamic design. Sesam CAESES drives the simulation process and creates hundreds of design variants instead of three to five, as is now typical for exploring design space in a very early status or to optimize a specific design. It can be coupled with existing CFD codes or other evaluation codes and acts as a flexible CAE environment for the integration of many different tools.
DNV GL
DNV GL is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. Operating in more than 100 countries, our professionals are dedicated to helping customers in the maritime, oil & gas, power and renewables and other industries to make the world safer, smarter and greener.

DIGITAL SOLUTIONS
DNV GL is a world-leading provider of digital solutions for managing risk and improving safety and asset performance for ships, pipelines, processing plants, offshore structures, electric grids, smart cities and more. Our open industry platform Veracity, cyber security and software solutions support business-critical activities across many industries, including maritime, energy and healthcare.

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