

## The Sesam™ 2008 December release focuses efficient design iterations

DNV Software is proud to release an updated version of Sesam including new versions of the industry-leading software tools GeniE, HydroD and DeepC. “The new enhancements focuses statutory compliance, advanced hydrodynamics, efficient design iterations and reporting,” says Ole Jan Nekstad, Product Manager of Sesam.

GeniE, HydroD and DeepC make up a state-of-the art complete toolbox for the engineering of fixed and floating structures. Enhancements have now been implemented with a focus on supporting the most recent code check standards of framed structures as well as documenting compliance with offshore hydrostatic stability code checks. Furthermore, there has also been a high focus on immediate graphic response and computational time as models have become larger and more complex. Finally, it is also possible to do conventional riser design much more efficiently than before. “Sesam continues and strengthen its position to be a complete and modern tool for efficient engineering of offshore structures” explains Ole Jan Nekstad.

The Sesam 2008 December release contains many and significant improvements to several Sesam programs. For each program there is a detailed description of new features available in the updates section of the [Sesam downloads and update site](#) - contact us if you require a password to access these pages. This release contains both new program versions and updated user manuals. The major improvements that will help our users become more productive in their daily work are described in the following.

Please contact your focal point in DNV Software if you would like access to or test out the new features if they are not already covered by your maintenance agreement with us. Also, our [training schedule and catalogue](#) on our website lists where and when you can learn the new features.

### 1. Installation and hardware recommendations

Installing the Sesam 2008 December release will create an icon for starting Sesam (from the Brix Explorer for Sesam) on your desktop. Individual Sesam programs can be started from your Start menu or from your Windows explorer (default installation directory is C:\Program Files\DNVS\Sesam) – from here you can make your own desktop icons.



We have made MSI packages for the various components on the Sesam 2008 December DVD. This is Microsoft's recommended technology for software deployment and it will ease the installation if you do remote-controlled deployment within your organisation.

Furthermore, the installation will be done based on the so-called "All users" profile, i.e. the Sesam 2008 December DVD will install all the programs for “All Users”. This means that an administrator may perform the installation, while a user with more limited privileges (but minimum "Power User") can execute. It also means that an engineer may log on to any computer having the program installed and run it without the need for having administrative user rights.

If you have not done the installation yourself there is one important thing to notice. In Brix Explorer for Sesam the user must be registered in the database. This is done by starting Brix Explorer for Sesam and then selecting the Ongoing Jobs entry from the Navigation bar.

All programs will run with existing passwords provided that the expiration date has not been passed. The exception is if you want to use the Sestra 64 bit version; in this case new passwords are required. Please contact us if you need an updated license key.

Prior to installing the new Sesam release you should take the right steps to ensure a safe data transfer from previous to new releases of DeepC, GeniE and HydroD. For more details, please consult the details at the end of this release note.

### ***Operating systems supported***

The Sesam 2008 December release has been tested on Win 2000 Professional (32 bit), XP Professional SP2 (32 bit), XP Professional SP2 (64 bit) and XP Professional SP3 (32 bit). For the XP Professional SP2 (64 bit) all programs will run with 32 bit technology except for Sestra that also supports 64 bit technology.

### ***Minimum hardware recommendation***

This configuration is typical for tasks normally limited to frame space jacket and topside design analyses including wave and pile/soil analysis. The configuration is also applicable when making superelements built up of shell and beams. Furthermore, hydrostatic and hydrodynamic analysis (frequency domain) can also be carried out.

- Graphic card: Open GL compatible. May be integrated with PC
- Memory: 2 GB
- Processor: 1.75 GHz (dual processor advised)
- Storage: 100 GB
- Display: 17" supporting 1280x1024, alternatively laptop supporting 1280x1024
- Efficient reporting requires Microsoft Office 2003 (Excel and Word), Internet Explorer 6.0 and Adobe Reader 8.1 or later versions

### ***Preferred hardware recommendation***

This configuration should be used for all other tasks than mentioned above.

- Graphic card: Separate Open GL compatible graphics card (NVIDIA or ATI) with 512MB graphics memory
- Memory: 4 GB
- Processor: 3.0 GHz (multi or dual processor recommended)
- Storage: 250 GB
- Display: 24" supporting 1900x1200, alternatively laptop supporting 1900x1200
- Efficient reporting requires Microsoft Office 2003 (Excel and Word), Internet Explorer 6.0 and Adobe Reader 8.1 or later versions

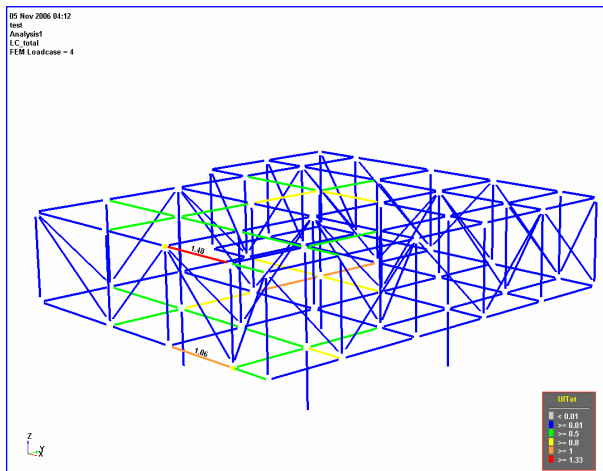


### 3. GeniE

#### 3.1 GeniE for fixed structures

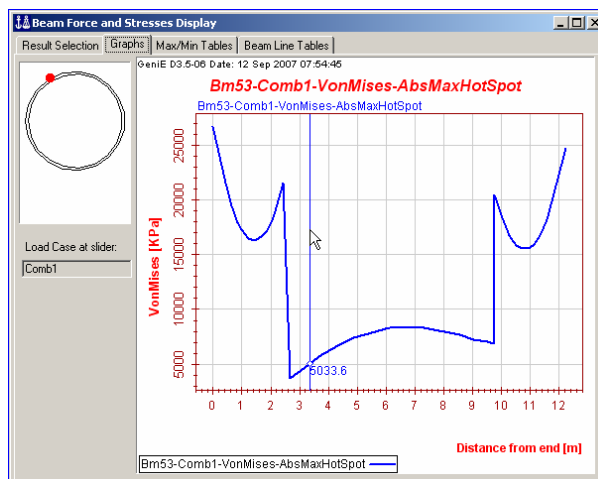
Code checking of beams has traditionally been performed in Framework. We have now completed the implementation of all the relevant code checks into GeniE. The new release allows for code checking according to

- API WSD 2002
- API WSD 2005
- API LRFD 2003
- NORSOK 2004
- ISO 19902 2007
- AISC 2005
- Eurocode 2005

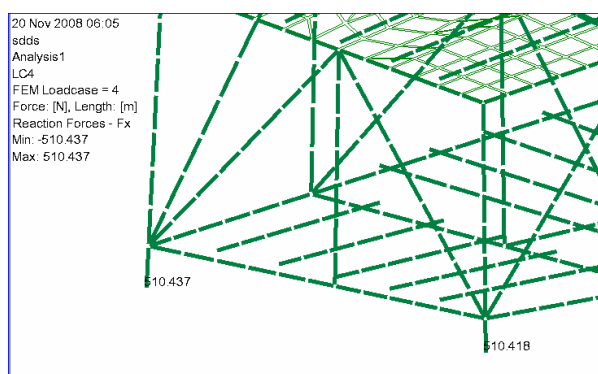


It is also possible to present beam force and stress diagrams using a 2D tool. It is easy to include envelopes, peak values or values at user defined positions. The results may also be exported to e.g. MSWord or MSExcel.

The report functionality has also been extended so that it is possible to view all load or reaction components for a loadcase (applied loads, analysis loads, reaction loads) without the need to consult the details of a Sestra print out. Furthermore, the report now includes details for masses, a material take off section and derived section properties. Finally, reaction forces and displacements per support and joint may be added to the report.

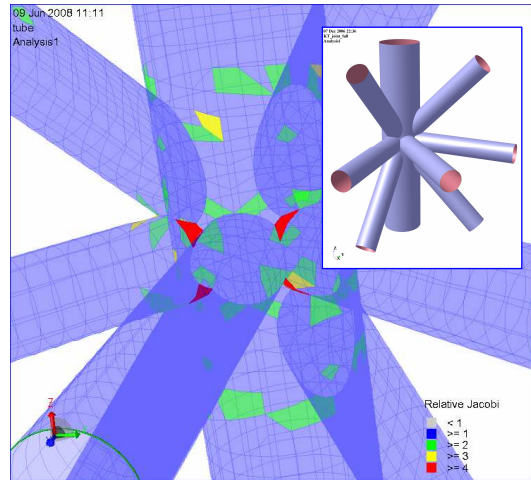


Improvements related to results processing functionality include visualisation of reaction forces (for single supports as well as for a support curve), user control of the number format (e.g. fixed format and 3 significant digits) and presenting maximum and minimum values depending on the structural parts that are shown.



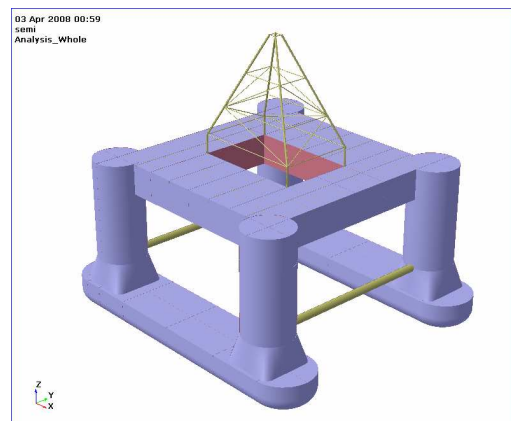
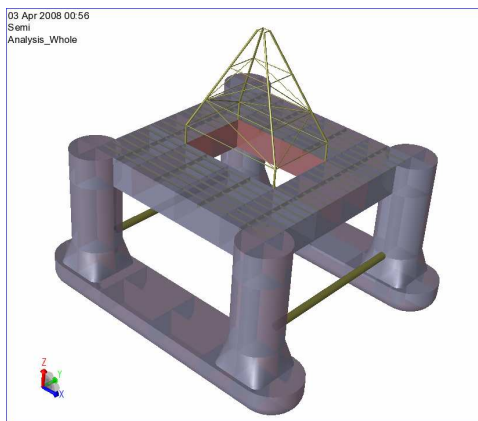
This version of GeniE allows for multiple analyses where structural parts and load cases can differ for the various analyses. If you want to also vary the boundary conditions and mass contribution for individual analysis, please contact us for guidance in how to do it.

Automatic meshing using the new paver meshing functionality (the “Advancing front quad mesher”) and the linear edge mesh option (to control the length of a mesh transition zone) leads to a much better quality of the mesh typically close to cut-outs and other details. This could also be achieved in previous GeniE versions, but this required more user intervention with the mesh settings. In other words, better quality with less effort. The original meshing algorithm (the “Sesam quad mesher”) is very efficient and gives high mesh quality for long and slender structures like e.g. a tube modelled with shell elements.

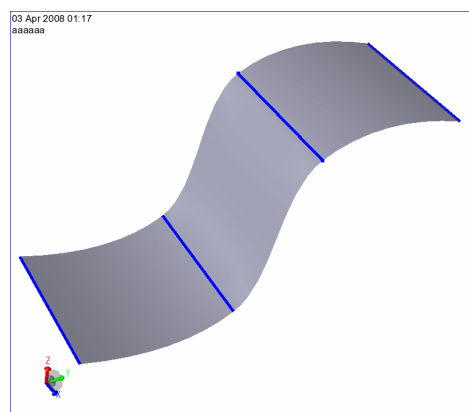
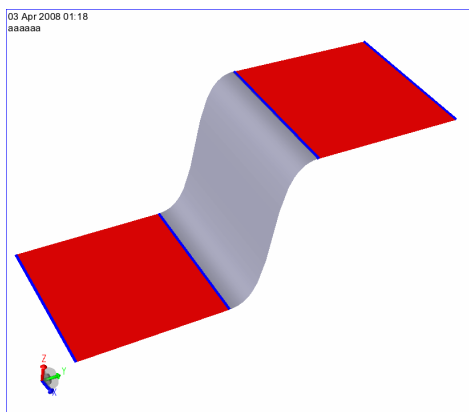


### 3.2 GeniE for floating structures

GeniE is now used for modelling of large and complex structures. As a consequence it was necessary to use a new graphics module to ensure faster graphics performance. The new version of GeniE is significantly faster for large models and there are new ways of viewing a model like for example transparency views. The pictures below show some of the differences between the previous version of GeniE (version 3.5-20 to the right) and the new one.



It is also possible to do lofting operations, i.e. taking advantage of coinciding plates. The example below shows skinning between 4 curves; the picture to the left shows the effect of lofting.



Code checking of plates according to the CSR Bulk standard has also been implemented. This is aimed towards efficient statutory checks of bulk ships. For offshore usage the yield check can be used to perform a simplified yield capacity check.

The database units can now safely be set to e.g. millimetres or inches. Furthermore, the new feature to label free plate edges can help you to detect if plates or shells are not properly aligned.

The content of the neutral xml concept model file has also been extended to ensure a more safe data storage of the complete model. Notice that for jacket analysis where wave loads and pile/soil analysis are included, the *File/Export/GeniE journal file (JS file)* should be used instead.

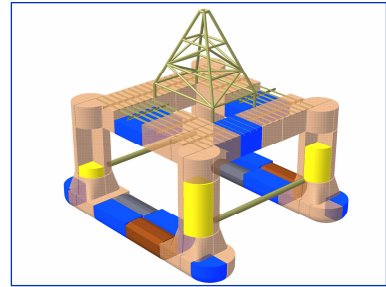
The help system has been re-written and includes new user documentation as well as tutorials.

- User documentation
  - Volume 3 – Plate/shell structures (new)
  - Volume 4 – Code check of beams (updated)
  - Volume 5 – Code check of plates (new)
  - Volume 6 – Menu description (new)
- Tutorials
  - New file structure for examples (with alphanumeric indexing)
  - Panel code check according to CSR Bulk
  - SemiSub modelling to create hydrodynamic and structural models

#### 4. HydroD for stability analysis and advanced hydrodynamic analysis

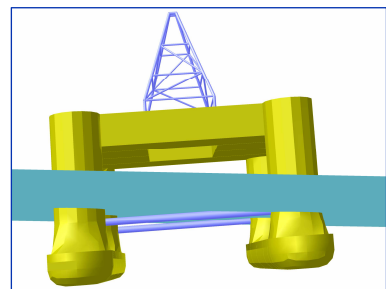
The new HydroD version allows our users to do hydrostatic and hydrodynamic analysis both in frequency and time domain from one unique program. HydroD uses our programs Wadam and Wasim to do the computations, while other operations like graphical modelling is done from HydroD.

Multi-body analysis can also be carried out from HydroD in the frequency domain.

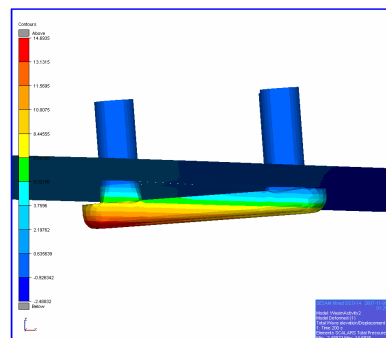


This version completes the implementation of functionality of stability analysis of offshore floaters. Among the new features as compared with the previous version are:

- Easy generation of multiple loading conditions
- Improved automatic balancing handling multiple loading conditions
- Balancing vessel and maximizing GM by filling of (n) tanks
- Compute allowable vertical centre of gravity (AVCG)
- New code checks
  - ABS mobile offshore drilling units intact and damage condition
  - User defined
- Include thrusters in computation of heeling moment



HydroD now supports modelling and analysis in both frequency domain (Wadam) and time domain (Wasim). This means that one and the same program can be used to perform hydro-stability analysis and hydrodynamic analysis (frequency and time domain) based on the same panel model. For offshore floaters it will then be easy to include non-linear effects like e.g. green water by using Wasim instead of Wadam.



Multi body analysis can now be performed with ease since it is possible to include modelling of the positions as well as the connections between several bodies. We now consider all functionality of Prewad to be included in HydroD.

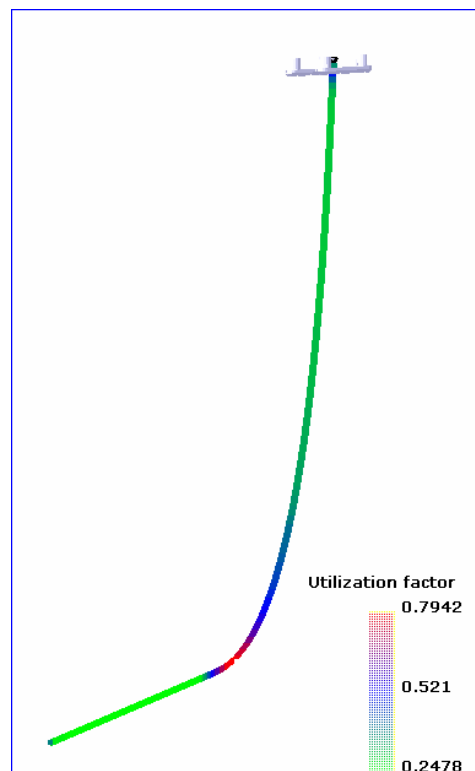
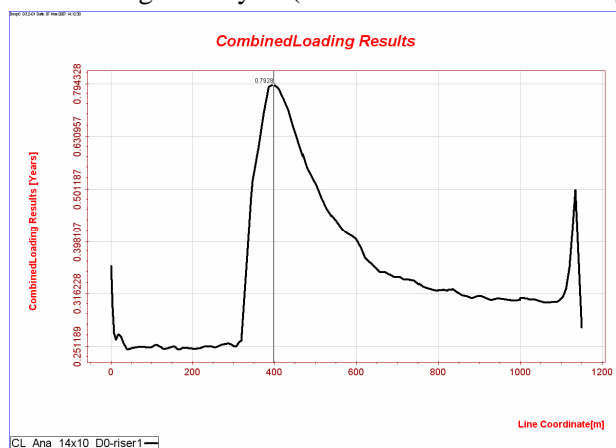
There are also new user documentation and tutorials:

- User documentation
  - New stability rule reference documents
- Tutorials
  - A new tutorial describing how to make a panel model in HydroD (to make a pln file)
  - A new Wadam tutorial comparing a panel model with damping matrix with a composite model
  - A Wasim tutorial of a container ship

## 5. DeepC for riser design

The new DeepC version enables our users to do riser design including fatigue and code checking according to relevant standards from ISO and DNV. The new functionality includes:

- A customized user interface for riser design (i.e. hiding functionality used for full coupled analysis)
- Regular waves in addition to irregular sea
- Design checks for combined loading according to DNV OS F201, ISO 13628-7 and a VonMises stress check.
- Fatigue analysis (based on rain-flow counting)



## 6. Sestra

The main new feature is the 64 bit version of Sestra. It will significantly reduce the elapsed analysis time for large models. In one reference case, 6 million degrees of freedom, elapsed time was reduced from 14 hours to 4 hours. Identical PC's were used, only operating systems differed.

The new version exports both loads and reaction forces to the result file. This is needed to make a complete load report in GeniE. The Lanczos eigenvalue solver has also been improved.

## 7. Framework

Framework now includes the ISSC wave spectrum. Furthermore, it is now possible to define the reference Young's modulus for code check. Both AISC and Eurocode refer to modulus of elasticity defined in ksi and MPa respectively. In previous versions these built in reference values have been set to 30458 ksi and 2.1E5 MPa. For models using Young's modulus equal to 29000 ksi (corresponding to 2.0E5 MPa) some deviations in results could occur in code checks according to Eurocode and AISC.

In the new version the user may select between three coherence models: GENERAL, GUSTO and NPD. The GENERAL coherence model is new model implemented and may be assigned to all wind spectra except the NPD spectrum.

The GUSTO coherence model is the original model of the program. The NPD coherence model may now be assigned to all wind spectra. The NPD coherence model is always applied together with the NPD wind spectrum even if the GENERAL or GUSTO model is selected.

## 8. Postresp

The ISSC wave spectrum is now made available in Postresp for print and display. The purpose of this is to visualize and print characteristic parameters of the spectrum. The spectrum is generated by significant wave height and mean period parameters ( $H_s, T_1$ ). The ISSC wave spectrum may be applied in short term and long term statistics

## 9. Stofat

The recommended sea spectrum from ISSC (International Ship and Offshore Structure Congress) has been implemented in Stofat and called the ISSC wave spectrum. The spectrum is recommended for open sea conditions and fully developed sea by the 15th ITTC (International Towing Tank Conference). The parameters of the wave spectrum are significant wave height ( $H_s$ ) and mean wave period ( $T_1$ ).

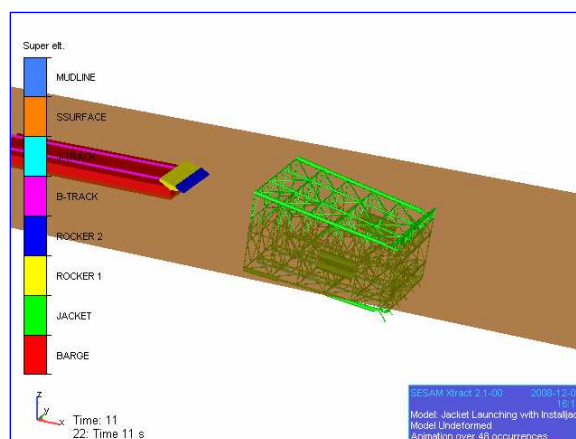
Also, long term stress ranges may be calculated for user defined probabilities. A maximum of 5 probabilities may be specified. Table print of stress ranges, return periods, exceedance and Weibull parameter for the defined probabilities is possible as well as print to the VTF file for graphic presentation in Xtract.

## 10. Installjac

Graphic visualization of the performance of the rocker arms 2 and 3 is made possible in Xtract during the launching process. The visualization includes opening of the rocker arms and closing after the jacket has separated from the barge.

Launching may be executed by a series of restart 2 runs. The end position of the previous run is taken as the start position of the current restart 2 run.

The load file L1.FEM generated from a so-called LDOP run is now augmented to a new complete model file (T-file) to simplify the process to execute a structural strength analysis. This file includes one user defined loadcase.



## 11. Xtract

It is now possible to export model and results data to the VTF format for presentation in GLView3D plug-in component and GLView Express. This means that anyone receiving a VTF-file through freeware from our subcontractor Ceetron can present 3D-models and results in a separate application or embedded in MSPowerPoint. The plug-in component can be installed by using the installation script in the *Xtract\_extras* as found in under *Programs* on the [Sesam downloads and update site](#).

Principal stresses based on membrane stresses only may now be computed for first and second order shell elements. The user can also change units in the results presentation as compared to the units on the results file, typically from  $N/m^2$  to  $N/mm^2$ .

## 12. Simo

The latest release of Simo includes import of Moses data (frequency added mass and damping, first order wave force transfer functions and second order wave drift coefficients), ballast tanks and lift line coupling. Furthermore, the frequency dependent wave drift damping has been completed based on the Newman's method.

## 13. Reflex

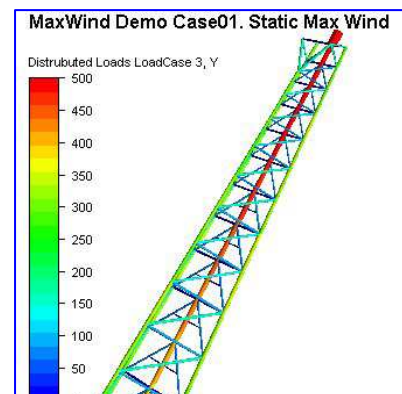
Some of the new functionality in Reflex encompasses

- Flex-joint connectors. This component can be used to model ball joints, hinges and universal joints with specified rotational stiffness.
- Tubular contact formulation. The component is available in connection with elastic contact surface description.
- Pipe-in-pipe contact formulation. This option enables the user to model pipe-in-pipe contact effects where each of the pipes is defined as a single line
- Winch specification. This option enables the user to model pipe-in-pipe contact effects where each of the pipes is defined as a single line
- A double peaked Torsethaugen wave spectrum has also been implemented.

## 14. Usfos

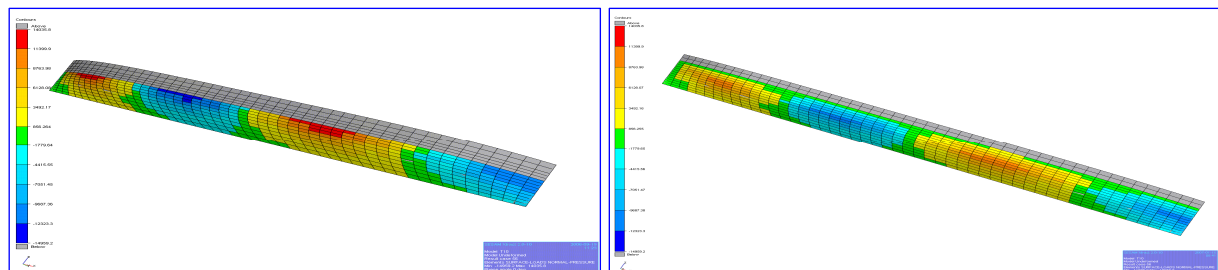
The new version of Usfos includes member code checking in the linear elastic stage based on the API LRFD and API WSD. It is also possible to do a stress ratio check.

Furthermore the graphic verification of hydrodynamic attributes has been enhanced and the computation of aerodynamic loads has been improved to cover wind fields and static load calculation.



## 14. Wadam

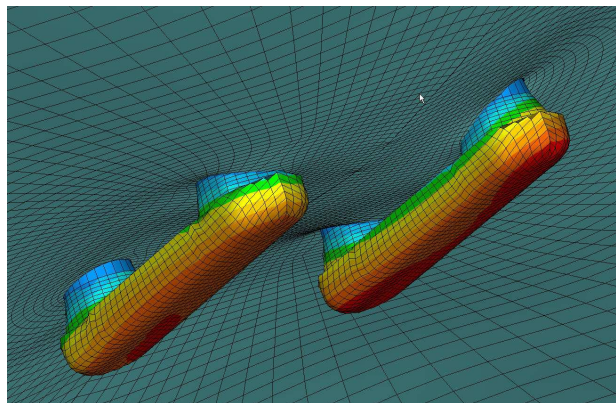
The new release of Wadam includes a much more efficient computation of global and sectional mass matrices for structures with many internal components. In addition the program now supports the DNV Class Note 30.7 by having an option for pressure reduction (i.e. pressure modification around waterline) for frequency domain analysis. The size of the domain for pressure reduction is defined by the user.



## 14. Wasim

Wasim includes several new features. The most important is that the previous Wasim Manager has been replaced with HydroD. This leads to several benefits as compared to the previous modelling functionality like for example scripting and logging of input data. Some of the other new features are:

- Mesh density on the free water surface can be independent of the mesh density of the hull
- Option for switching the Kutta conditions on or off
- A deck panel is no longer automatically created
- Hull patched can be turned on or off in the graphical user interface
- The maximum number of load sections has been increased to 100
- User control duration of the smooth start-up phase.



## 15 Ensuring a safe data migration

Prior to installing the new Sesam release you should take the right steps to ensure a safe data transfer from previous to new releases of DeepC, GeniE and HydroD:

### 15.1 DeepC

Before you upgrade, please make sure you have relevant data of journal files to be used when regenerating your models in the new DeepC version.

For DeepC you can import the journal file (js-file) created from your modelling sessions. Alternatively you can export a condensed journal file (the so-called clean journal file) and import in the new program version. These actions are available from File|Save Clean JS and File|Read Journal File. The data transfer is complete, but you need to re-run your analyses.

Prior to installing DeepC you should un-install the previous versions. Make sure you have done the necessary preparation of migration data prior to removing the older versions. We have seen a few examples that the folder structure where you installed the previous program versions is not completely removed. You should therefore check the folders to see if all files have been removed (the default is C:\Program Files\DNVS\DeepC\). You do not need to delete your previous DeepC workspaces, if these are in the old default subfolder C:\Program Files\DNVS\DeepC\Workspaces\.... ).

The new DeepC version comes with a customized set-up for the graphical user interface. This is possible by use of passwords; hence the new DeepC version requires a new license file. You will receive a new license file in due course, but if you need it now please contact us.

## 15.2 GeniE

Before you upgrade, please make sure you have relevant data of journal files or xml files to be used when regenerating your models in the new GeniE version.

There are three alternatives for migrating data from a previous version of GeniE. For a full description about data transfer capabilities and limitations, please consult Section 9.2 in Volume III of the revised User Manual. You can download the user manual from <https://projects.dnv.com/sesam/manuals/manuals.html> before installing the programs.

- The first one is by using the journal file – make sure that it runs safely (File|Read Journal File) in the previous GeniE version before importing to the new version. The journal file is complete and may also contain analysis runs, the code checks and the report generation.
- The other alternative is by use of the condensed journal file (the so-called clean js-file). This file is complete for jackets and topsides where there is no curved structure. The environment as well as analysis set-up is also included, but please note that capacity checks are not part of the clean js-file.
- The final option is by use of the XML import and export feature. The XML file contains a neutral definition of the workspace – it is complete except for environment, analysis, code check details and reporting. The functionality is available from File|Export XML and File|Import XML.

Prior to installing GeniE you should un-install the previous versions. Make sure you have done the necessary preparation of migration data prior to removing the older versions. We have seen a few examples that the folder structure where you installed the previous program versions is not completely removed. You should therefore check the folder to see if all files have been removed (the default is C:\Program Files\DNVS\GeniE\). You do not need to delete your previous GeniE workspaces, if these are in the old default subfolder C:\Program Files\DNVS\GeniE\Workspaces\....).

The license file for GeniE is the same as before. Notice that there are features in GeniE (typically code checking and modelling of curved structure) that require additional passwords in addition to the basic program versions.

## 15.3 HydroD

Before you upgrade, please make sure you have copies of HydroD journal files (js files) to be used when regenerating your models in the new HydroD version. Importing the data to a new version will be more efficient if you have used the feature to export a so-called clean journal file. HydroD can also import old Prewad input files in case you have not used HydroD before. The previous version of Wasim (Wasim Manager) did not have scripting – this means that for those who want to re-run old Wasim models must use the previous Wasim manager to do this or convert manually to the new HydroD user interface.

The new HydroD version requires a new license file. You should by now have received an updated license file from us enabling you to run the same type of hydrodynamic analysis as before. In case you have not received it, please contact us.

You should un-install your current HydroD version prior to installing the new HydroD version.

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