PRODUCT DATA SHEET

SACS Marine

Analysis and Design Software for Marine Installations and Motions and Stability Analysis of Offshore Vessels

Bentley offers suites of applications with capabilities covering all aspects of marine installation studies, as well as assessments of offshore vessels such as FPSOs. Users can choose between SACS Marine, with its jacket launch analysis, or the complete SACS Marine Enterprise suite. The full suite has all the functionality of SACS Marine plus integrated hull modeling, intact and damage stability analysis, and six degrees of freedom motions prediction. Together, the additional modules generate inertial loads for downstream structural analysis, code checking, and fatigue calculations.

SACS Marine Enterprise:

The SACS Marine Enterprise Add-on provides modeling of vessel hulls, calculation of stability, and prediction of vessel motions. It can be used for new or existing FPSO and vessel studies, as well as for transportation and installation analysis. It links with TOW for calculation of motions induced loads and downstream code checking and fatigue calculations. The package contains the Hull Modeler, Hull Mesher, Motions, and Stability modules, and requires the use of the Offshore Structure, Offshore Structure Advanced, or Offshore Structure Enterprise package.

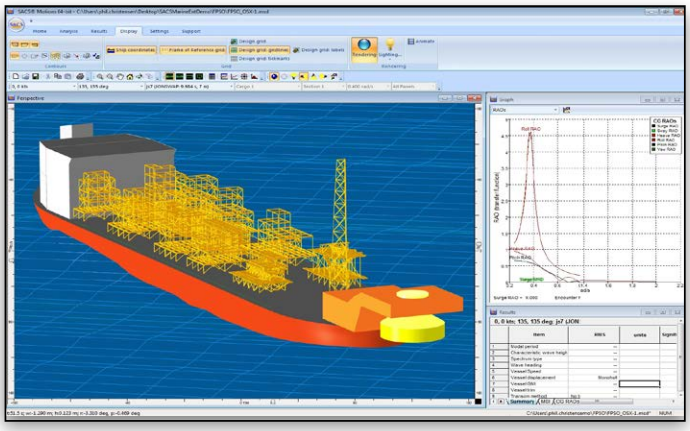
Hull Modeler Module:

SACS Hull Modeler allows you to model any type of vessel hull shape. Using trimmed 3D NURB surface technology, Hull Modeler contains a full range of tools optimized for hull shape creation and modification. It also comes with a comprehensive library of barges and tools for creating hull models from existing offsets or lines plan data.

- Dynamic NURB surface and curve modeling
- Parametric Transformation and proportional model resizing
- Fitting of existing designs from lines or offsets
- Interactive hydrostatics while modeling

Hull Mesher Module:

SACS Hull Mesher provides a range of structural modeling tools optimized for creating stiffened plate structures such as those found in the hulls of vessels and offshore structures. As such it is very complementary to the jacket and topsides modeling functions in Precede. Hull Mesher provides commands for importing dwg and dxf geometry, sketching and generating members, and sketching plate panels. It also includes some smart commands for automatically generating panels on the imported geometry including patches with arbitrary geometries and interior holes.



Motions can compute the RAOs and accelerations of any vessel .

To support stiffened panels, Hull Mesher provides a range of tools for generating stiffeners across a panel, generating stiffening flanges around openings, and offsetting stiffeners to the panel. Reading and writing of model files uses the standard sacinp file format allowing full interoperability with Precede.

Motions Module:

SACS Motions is an integrated seakeeping analysis and motion prediction module, using either standard Strip Theory or panel-based radiation-diffraction methods to predict vessel motions. Significant motions and other statistical data are calculated at the center of gravity and at user-defined positions on the hull for a range of sea spectra, vessel speeds, and vessel headings. Models can be imported as deck cargo and RAOs and accelerations can be saved in SACS Tow files for inertial load and fatigue calculations.

- Strip theory or panel methods
- RAOs and accelerations at CG and remote locations
- Integration with Tow analysis
- Interactive results graphs
- Visualization of motions in irregular waves

Stability Module:

SACS Stability is a powerful intact and damaged stability analysis program with an extensive range of stability criteria. It includes a built in weight and balance spreadsheet, compartment editor, tank calibrations, damage conditions, and a range of hydrostatic analysis modes such as upright hydrostatics, large

System Requirements

Processor:
Core2 or better CPU

Operating System:
Windows 7, Windows 8

RAM:
Minimum 2 GB of RAM

Hard Disk:
Minimum 10 GB of free hard disk space

Display:
Graphics card supporting Open GL

128 MB RAM or greater video card with 1280x1024 or higher video resolution

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angle stability, longitudinal strength, cross curves of stability, limiting KG, and floodable length. Stability book generation is included with user definable templates using Microsoft Word documents.

- Intact and damage stability
- Longitudinal strength and limiting KG
- Automated ballasting
- Analysis with waves and grounding
- Integrated weight and compartment editing
- Comprehensive criteria library with user customization

SACS Marine:

Marine Installation Add-on

The SACS Marine Add-On package permits launch and upending analysis. The package includes the Launch and Flotation program modules, and requires the use of the Offshore Structure, Offshore Structure Advanced or Offshore Structure Enterprise package.

Launch:

Jacket Launch Analysis

The Launch program module can be used to analyze the motion of a jacket structure as it is launched from a barge. The analysis includes a time history description of the jacket and barge motion including displacement, velocity and acceleration.

Launch motion and hydrodynamic forces are considered in three dimensions and include the hydrodynamic characteristics of the barge. The program can also be used to generate forces on the jacket typically encountered during Launch.

- Full launch motion time history analysis including hydrodynamic forces in all directions
- Time history of jacket and barge motions
- All phases of launch included
- Unbalanced loads generated for any position
- Launch sequence plot capability including barge and jacket silhouette for designated steps
- Anchor restraints

Flotation:

Jacket Flotation and upending Analysis

The Flotation program can be used to perform a static flooding and upending operation for a floating structure. The program deals with forces and moments due to gravity and buoyancy acting on a structure in calm water.

For each step of the upending sequence, the program finds a stable state of equilibrium between gravity, buoyancy and sling loads such that the sum of the forces equals zero for all three directions. The attitude of the structure is then displayed graphically on the screen along with the structure properties and hydrostatic details for that step.

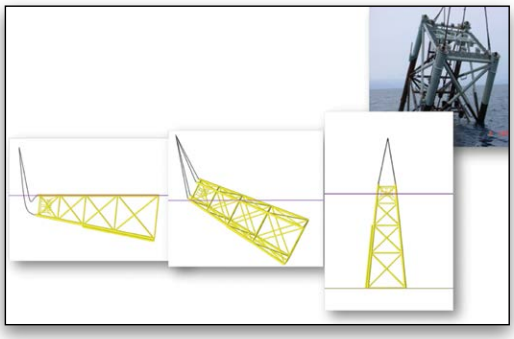
- Color coded snapshots of each upending step
- Stability and upending analyses
- Initial floating and on bottom positions provided
- Upending steps can include multiple commands
- Dual hook capabilities
- Buoyancy tanks, valves, user-specified buoyancy and weights and hydrodynamic overrides
- Properties, forces and positions plotted vs. step
- Upending forces including gravity, sling loads, buoyancy, and buoyancy tank loads generated for any step of the upending sequence
- Upending phase summary reports including pitch, roll, and yaw angles, mud line clearance, etc.

Launch:

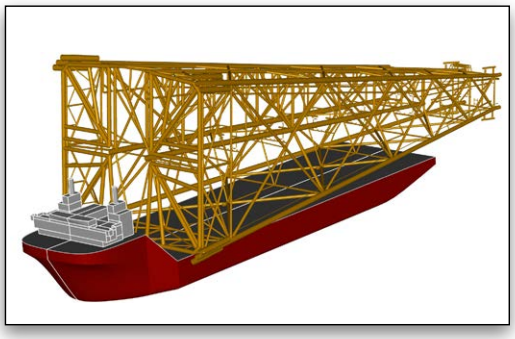
Transportation Inertia Load Generator

The Tow program module is used to generate forces typically encountered during barge transportation of structures.The program generates inertia forces due to acceleration of the structure, in the form of joint concentrated and member distributed loads.

- Input motion for six degrees of freedom
- Output location for selected points
- Automatic weight calculation
- User input member and joint weights
- Generates distributed member and plate loads
- Converts user defined loads into inertias



Flotation and Upending Analysis
• Stability and Upending Analysis
• Dual Hook Capabilities
• Buoyancy Tanks, Valves
• User Defined Buoyancy



Transportation Analysis
• Tow Analysis
• Combine Multiple Common Solution Files
• Static Analysis with Non-linear GAP Elements
• Seafastener Design

SACS®

Bentley® *Sustaining* Infrastructure