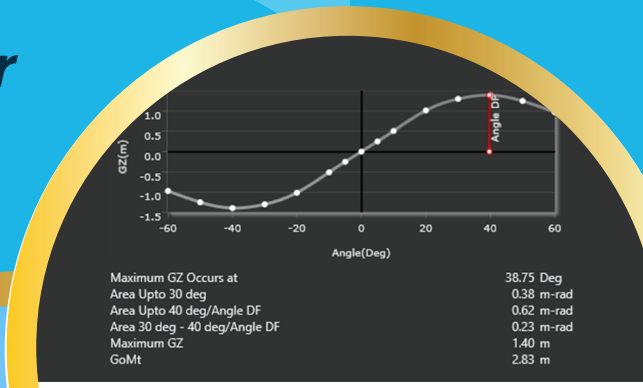
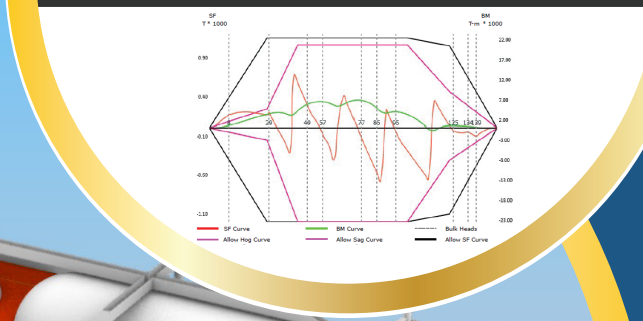
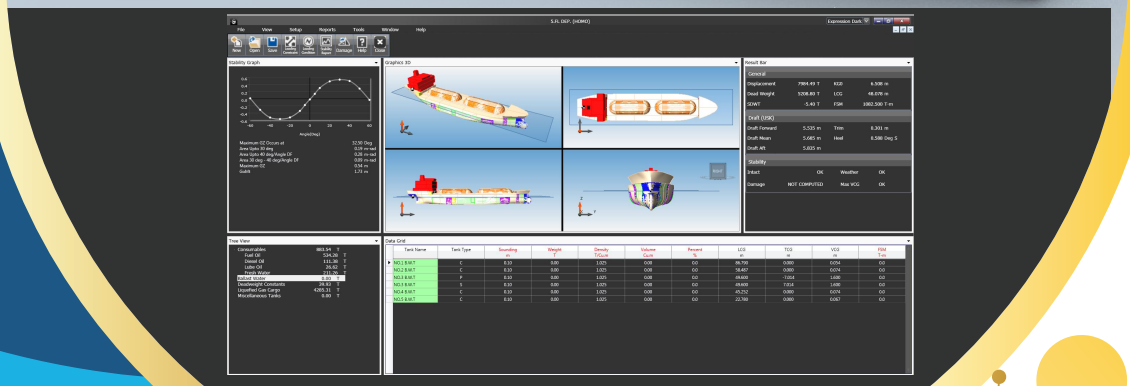
CyberMaster 3D

Advanced Ship Loading Software

Gas Carrier / L.P.G Carrier



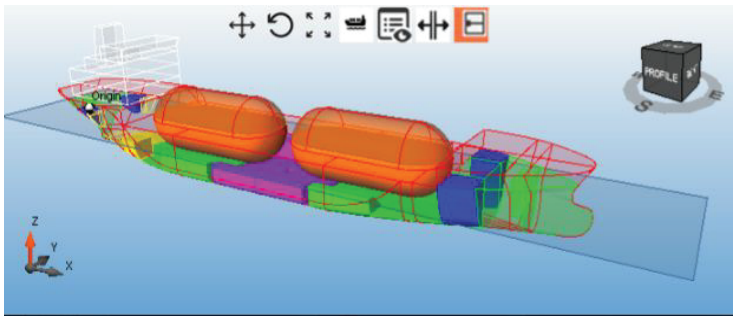
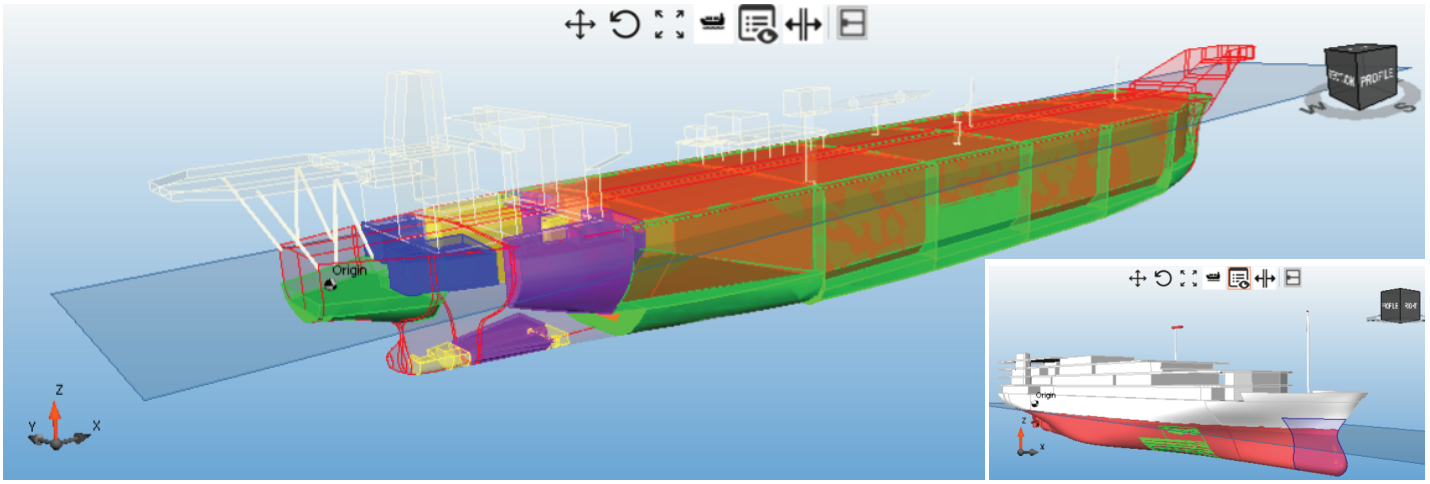


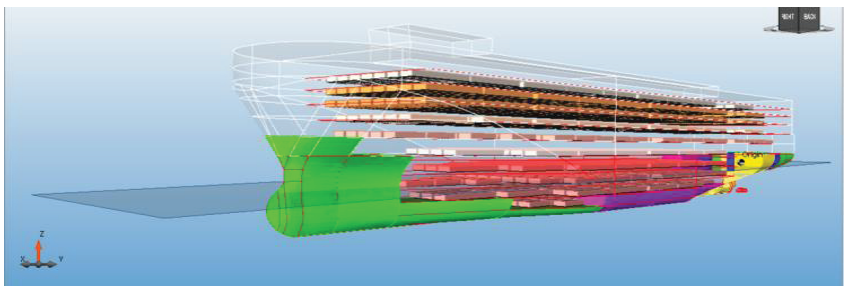
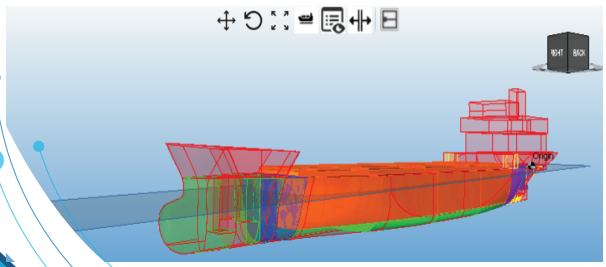
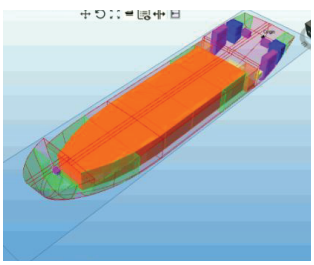
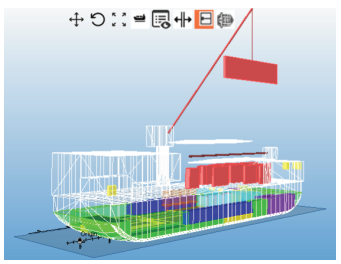


Cybermarine

GENERAL

- CyberMaster 3D - is an advanced Ship Loading software with 3D Technology.
- Software is built to perform all necessary operations pertaining to Gas Carrier / L.P.G Carrier.
- Type Approved by DNV-GL and RINA
- Works on all windows-based Desktops & Laptops.
- The software is available with several superior modules as enumerated below.

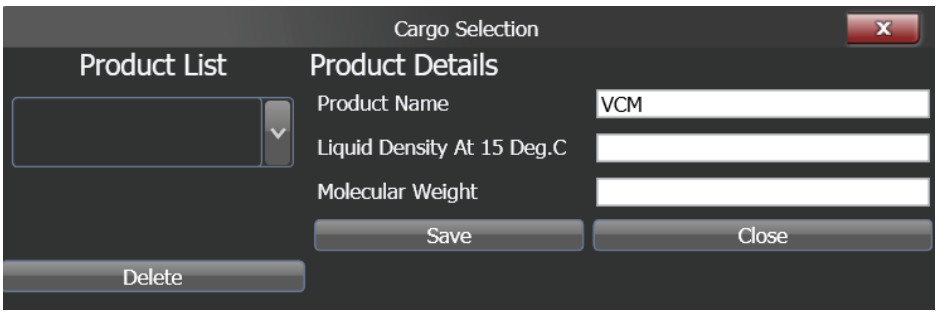





3-D GUI MODULE

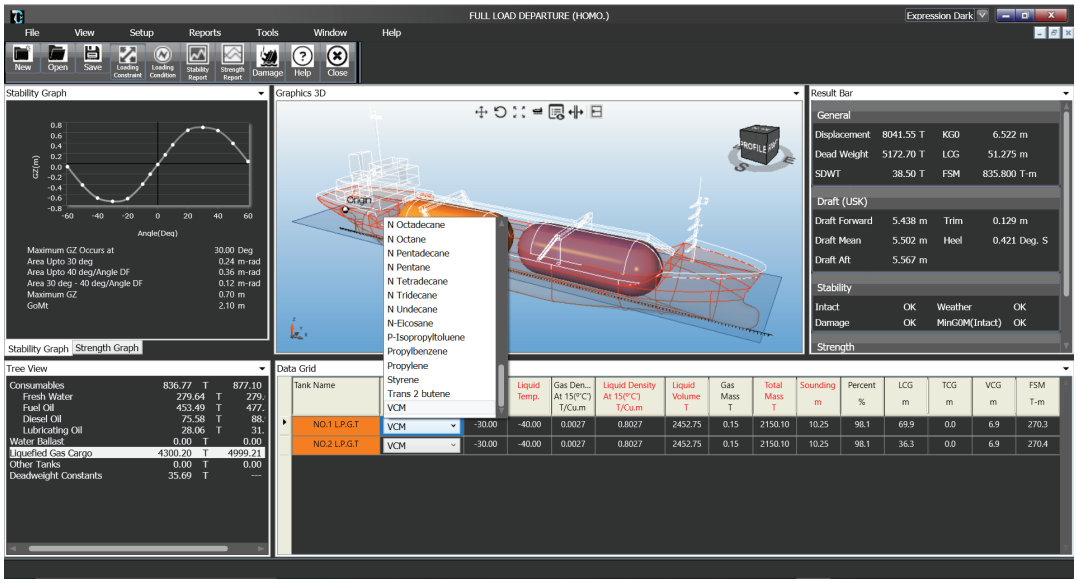
- CyberMaster 3D's graphics facilitate the operator to work on dual monitors.
- Superior GUI enables the operator to view the vessel with its space arrangement in 3-D.
- Enhanced 3D display enables real-time filling of tanks through 3-D GUI.
- Advanced 3-D GUI and Live computation simulates real time vessel behaviour with loading & discharge.

GAS CARGO MODULE

- VCF calculation based on pre-loaded standard ASTM tables.
- Weight in air automatically calculated by WCF based ontable 56



- User can generate Gas cargo summary report.
- Live corrections of tank contents with vessel's equilibrium (heel, trim).
- Enables calculation of tank content volumes for individual tanks by sounding or ullage.
- Option to select cargo from pre-defined product list.



- User can generate sounding and ullage reports.
- Inbuilt warnings for overfilling.

ENHANCED GAS CARRIER FEATURES

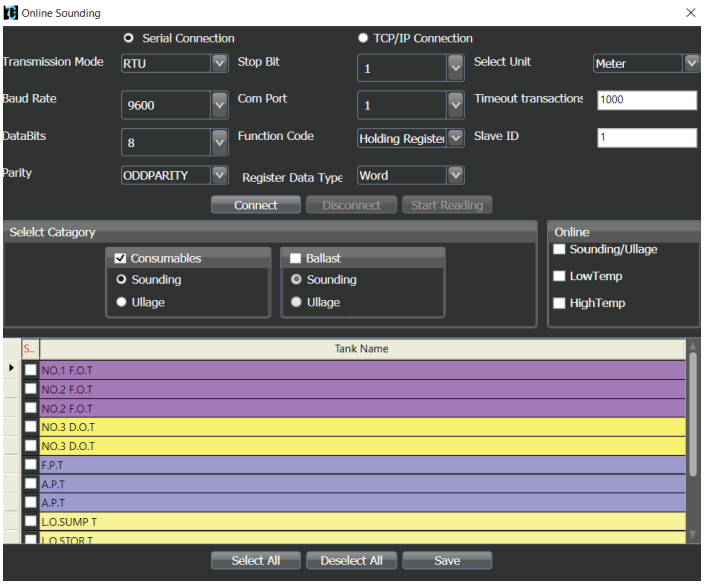
- Advanced correction modules available in CyberMaster3D are:

1. Heel/Trim Correction module
2. Density Correction
3. Temperature Correction
4. Correction for Thermal Shrinkage
5. Correction for Shrinkage of Tank
6. Volumetric Construction Factor
7. Gauge Dip Correction
8. Sounding pipe correction

Sounding/Ullage before Correction (m)
Density Correction
Temperature Correction
Correction for Thermal Shrinkage
Gauge Dip Correction
Sounding/Ullage After Correction (m)

- These modules are incorporated based on the information from approved booklets.

ONLINE SOUNDING MODULE



- Online sounding integrated with tank gauging system measures the tank levels in real time and updates the loading program automatically.
- Enables live stability and strength assessment of the vessel.
- Real time monitoring of the tanks.
- **Interface Required:**

  a) Protocol: MODBUS

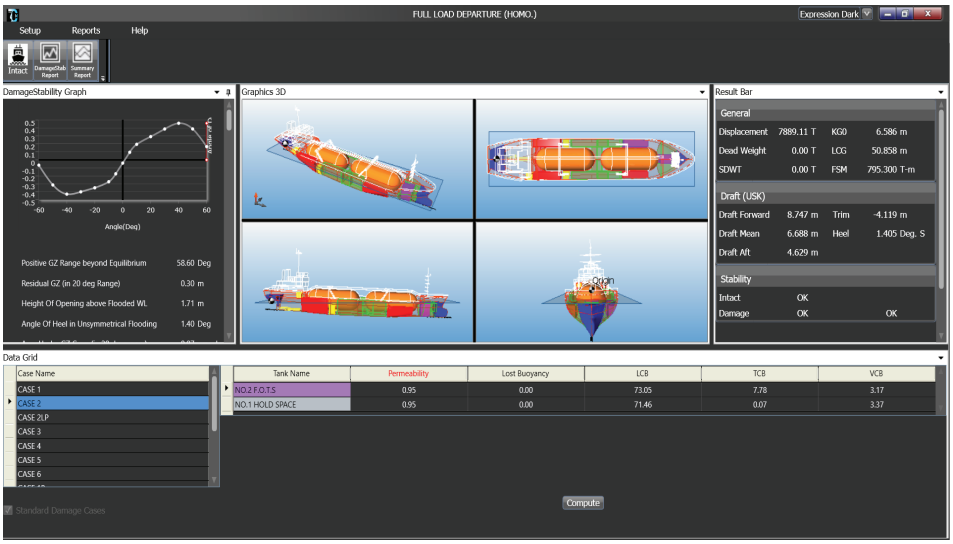
  b) Transmission Mode: RTU/ASCII

  c) Transmission Cable: RS-485

  d) PLC Addresses of Tanks

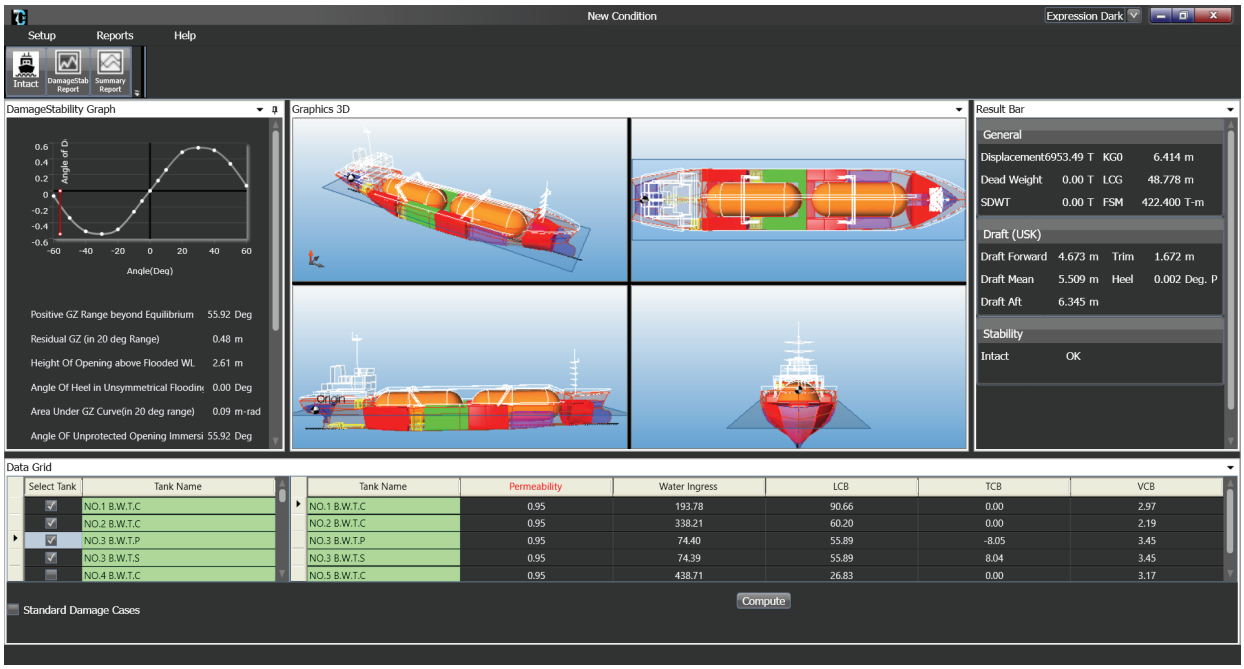
IACS TYPE 3 DAMAGE STABILITY MODULE

- Enables the software to check the damage stability for a set of pre-loaded Damage cases as per the approved damage stability information.
- Damage stability computation as per IGC Code.
- The vessel's equilibrium position in damaged condition can be seen in GUI.
- Damage stability Report showing status of the vessel before & after damage.
- Evaluation of stability during intermediate stages of flooding.
- Equalization of tanks post damage.
- Progressive Flooding through hull openings



IACS TYPE4 DAMAGE STABILITY MODULE

- Facilitates EMERGENCY RESPONSE by real-time simulation of damage stability.
- Provision to choose any number of compartments across the hull to evaluate damage.
- A graphical view of real time floating position of th e vessel post damage.
- Flexibility to change the default PERMEABILITY of the compartments.
- User Defined Damage Stability calculation of real case flooding scenario providing information regarding safe return to port.



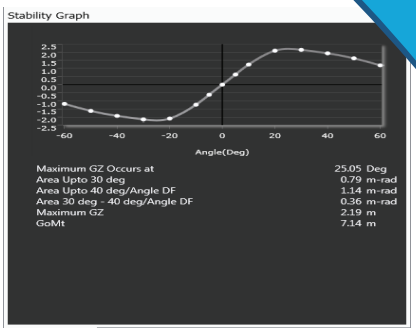
BASIC MODULE

Methodology of Computation

- Innovative mathematical modelling with high accuracy & computing speed.
- A Novel 'discretised hull form concept' mapping the volumetric properties on a 3-D grid with draft, trim and heel as the axes.
- Equilibrium is computed from the 3-D grid by solving the force (vertical) and moment (longitudinal and transverse) balance.
- Free surface effects accounted by either virtual free surface moments or real wedge shift moments.

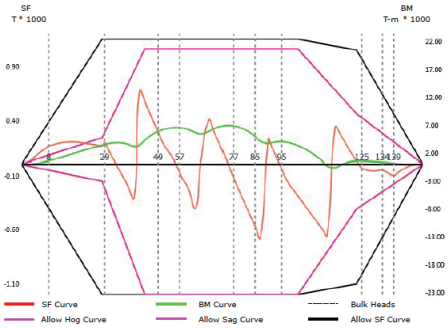
Loading Conditions & Intact Stability Computation

- Preparation of Loading Conditions via percentage filling, volume, weight or sounding/ullage depth.
- Use of accurate tank soundings from 3-D models.
- Computation of Draft, Trim & Heel
- Displacement & Deadweight Calculation
- GM & GoM Calculation
- Intact Stability computation as per I.S Code 2008 & compliance comparison



Longitudinal Strength Computation

- SF/BM Computations
- Graphical Representation throughout length of vessel.
- Option to input allowable values for SF & BM as per service restriction.
- Printable Reports with SF/BM values against Permissible allowable.
- Warnings for violation.



Generation of Reports

- Loading Condition Reports
- Detailed Intact Stability, Longitudinal Strength & Damage Stability Reports
- Damage Summary Report to quickly assess the results.
- Option to print functional reports such as Ullage Report, Gas cargo summary report etc.
- Units choice-British units/SI units, American Barrels

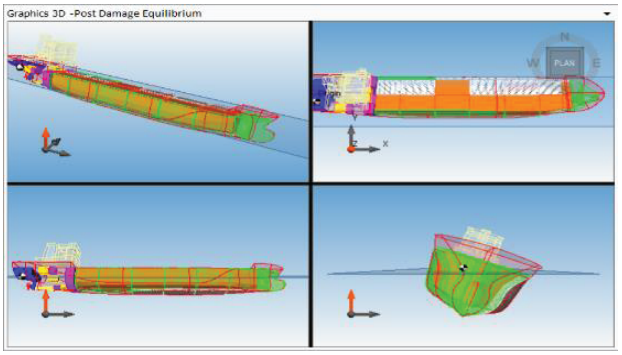
Gas Cargo Summary Report

Condition Name: New Condition
Description:
Date : 31-Mar-21

Parameters	NO.1 L.P.G.T	NO.2 L.P.G.T
Liquid Temperature	-40.00	-40.00
Vapour Temperature	-30.00	-30.00
Vapour Pressure	0.03	0.03
Total Volume	2,499.60	2,499.60
Liquid Volume	2,419.81	2,419.81
Liq. Dens. At 15 Deg. C	0.6001	0.6001
Table 54 Factor	1.1065	1.1065
Liq. Dens. @ Curr. Temp	0.6640	0.6640
Vapour Density	0.0029	0.0029
Vapour Volume	79.79	79.79
Vapour Mass	0.23	0.23
Liquid Mass	1,606.77	1,606.77
Total Mass	1,607.00	1,607.00
Table 56	0.9983	0.9983
Table Weight	1,604.34	1,604.34

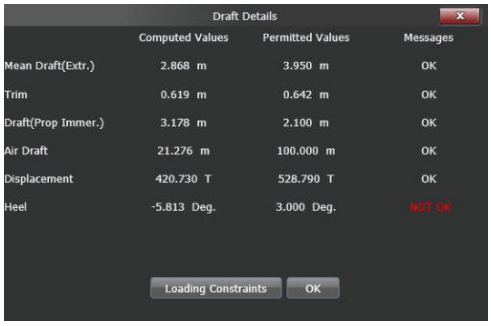
Damage Stability Module

- Graphical view of equilibrium in damaged condition of the vessel.
- Flexibility to choose from various pre-loaded Damage cases.
- Report showing equilibrium of the vessel before & after damage.
- All required significant criteria – MARPOL, IGC, IBC, OSV and SPS
- Stability during intermediate stages of flooding.
- Capability to specify actual user defined damage cases
- Progressive Flooding through hull openings



User Defined Parameters

- Enables master to provide operational constraints.
- User defined limits for Trim, Heel, Air Draft and Bow Thruster Draft.
- Warnings if violation is observed



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www.cybermarine.net www.cybermaster.sg cybermaster@cybermarine.net

10 Bukit Batok Crescent
12-01 The Spire
Singapore - 658 079