



BUREAU
VERITAS
Marine division

Naval Architecture and Marine Engineering Softwares

TECHNICAL INFORMATION

Information on these softwares is available from Bureau Veritas offices or by sending an E-mail to: marine.software@bureauveritas.com

To download freeware, demonstration version or presentation visit Marine Division web site: <http://www.veristar.com/>

To get the address of nearest Bureau Veritas office, visit our corporate web site: <http://www.bureauveritas.com/>



Naval Architecture and Marine Engineering Softwares

TABLE OF CONTENTS

MARS 2000 (F)	3
RUDDER 2000 (F)	4
MARSPEED (F)	5
BULK (F)	7
BVLASH (F)	8
LIRA (D)	9
STEEL (D)	10
VERISTAR CHEMICALS (D)	12
VERISTAR LASHING (D)	14
VERISTAR STABILITY (D)	15
VERISTAR HULL 2 (P)	17
VERISTAR HULL 5 (D)	19
VERISTAR COMPLETE SHIP MODEL (P)	21

Symbols:

(F): Freeware

(D): Demonstration version available

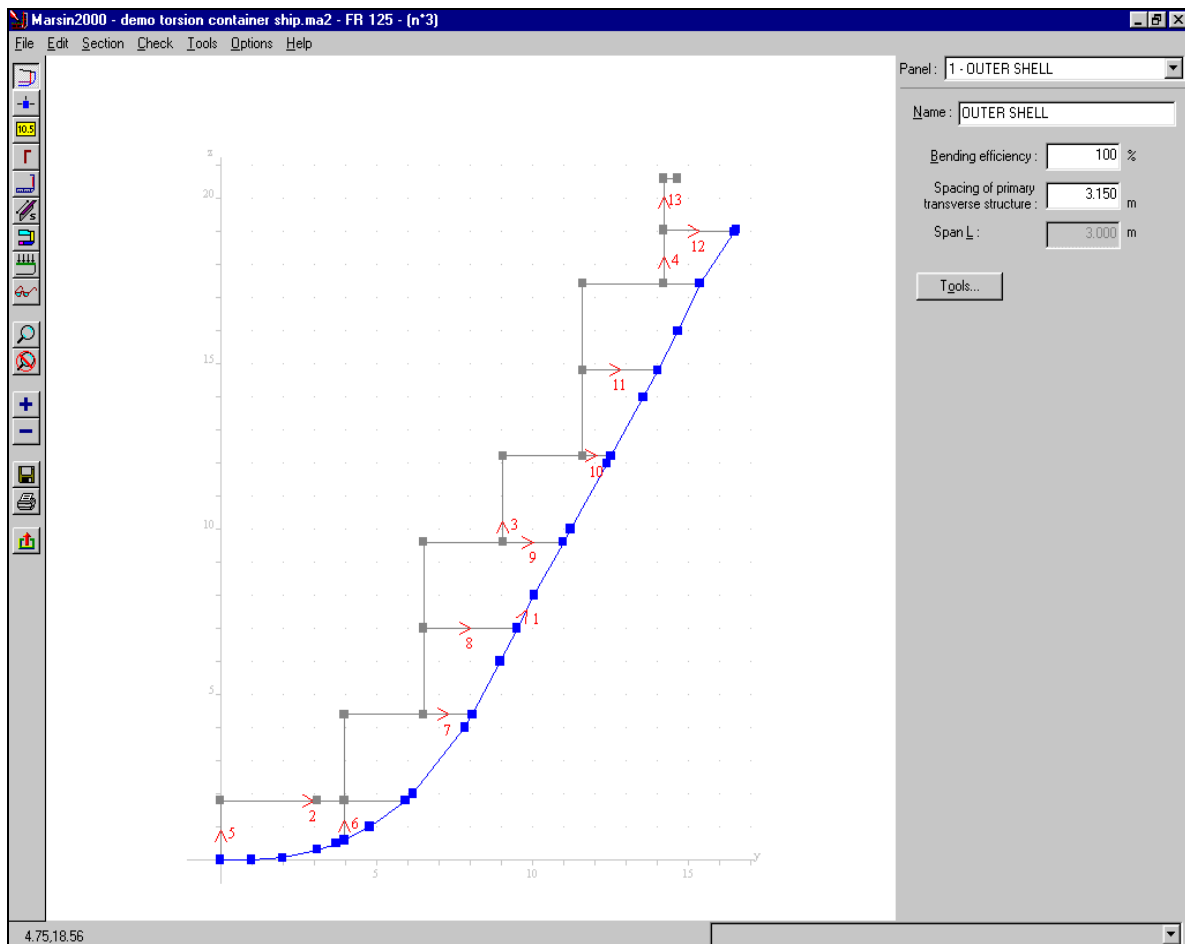
(P): Electronic presentation available



Freewares for classification

MARS 2000 (F)

Scantlings of plating and ordinary stiffeners of any transverse section located all along the ship length according to BUREAU VERITAS Rules for the Classification of Ships.



MARS2000 allows to check the scantling of any transverse sections or any transverse bulkheads all along the ship length. It allows to estimate the distribution of warping stresses by using a beam model with variable inertia (each hold is modelised by a transverse section).

For a transverse section, it calculates:

- The geometric properties (area, inertia and moduli ...)
- The hull girder strength criteria
- The hull girder ultimate strength
- The rule scantling of strakes, longitudinal and transverse stiffeners taking into account:
 - Yielding criteria
 - Minimum thickness criteria
 - Buckling criteria...

and includes fatigue checks of structural details.

Operating system: Windows NT/2000/XP



Freewares for classification

RUDDER 2000 (F)

Calculation of scantlings of rudders, according to BUREAU VERITAS Rules for the Classification of Ships.

Rudder - PR. 981 - rudder calculation

File Edit Rudder Help

Data for Direct calculation

Beam	Length (m)	Inertia (cm ⁴)	Unit
Beam 1	L10: 5.800	Inertia: 3705854	cm ⁴
Beam 2	L20: 7.150	Inertia: 3705854	cm ⁴
Beam 3	L30: 0.825	Inertia: 1125626	cm ⁴
Beam 4	L40: 4.725	Inertia: 1125626	cm ⁴
Horn	Spring: 138944512	N/m	

RUDDER 2000 allows calculating:

- geometric characteristics of rudder blade,
- scantlings of rudder stock, rudder blade (streamlined or single plate), pintles and bearings,
- geometric characteristics and scantlings of rudder horn cross-sections.

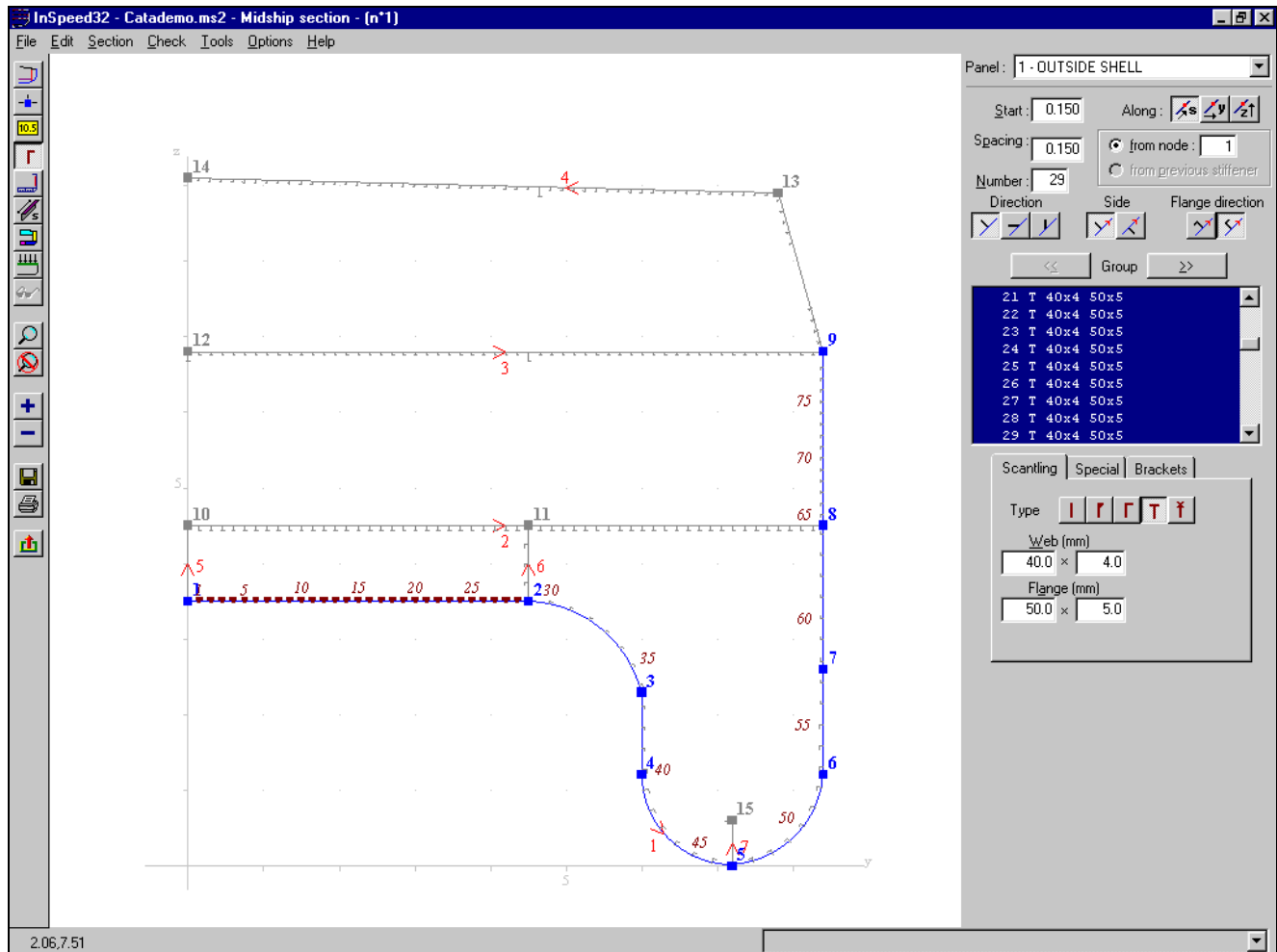
Operating system: Windows NT/2000/XP



Freewares for classification

MARSPEED (F)

MARSPEED is interactive software for the design and verification of High Speed Craft of plating and longitudinal structure, based on the requirements of applicable Rules for the Classification of High Speed Craft – February 2002 (NR 396 - UNITAS R02E).



It applies to monohull or multihull design, and deals with all possible simultaneous combinations of metallic materials (steel, rolled aluminium, extruded aluminium).

A library of transverse sections is described for each vessel, with the following input :
For the ship :

- main particulars,
- operation data (design vertical acceleration, service and navigation notations),
- materials catalogue

For each transverse section :

- main dimension and longitudinal location,
- strakes and stiffeners description (numerical or graphic-assisted input)
- loads description (numerical or graphic-assisted input)



Freewares for classification

The results are as follows:

For the ship : Rules overall longitudinal bending moment

For each transverse section :

- geometric properties and longitudinal strength,
- weight,
- detailed Rules scantlings of each strake and each individual longitudinal
- buckling analysis,
- graphic ratio of strake and stiffener scantlings against Rules scantlings, allowing immediate visual optimisation

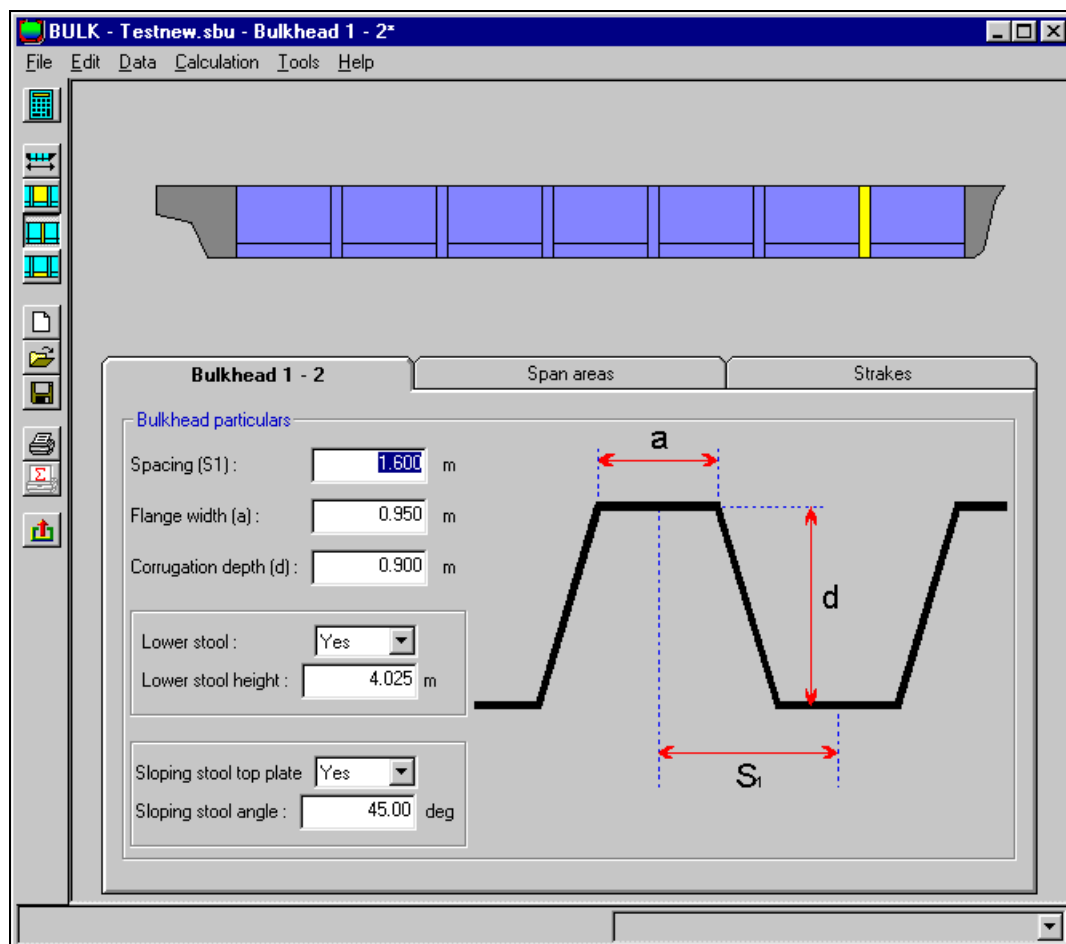
Operating system: Windows NT/2000/XP



Freewares for classification

BULK (F)

Calculation of the structural strength of transverse bulkheads and double bottom of a bulk carrier for any defined loading condition.



This software complies with the corresponding IACS Unified Requirements for new ships and existing ships.

For new ships :

- check of the corrugated transverse bulkheads between cargo holds in accordance with IACS Unified Requirement S18,
- check of the double bottoms in accordance with IACS Unified Requirement S20.

For existing ships :

- check of the corrugated transverse bulkhead between the two foremost cargo holds in accordance with IACS Unified Requirement S19,
- check of the double bottom of the foremost cargo hold in accordance with IACS Unified Requirement S22.

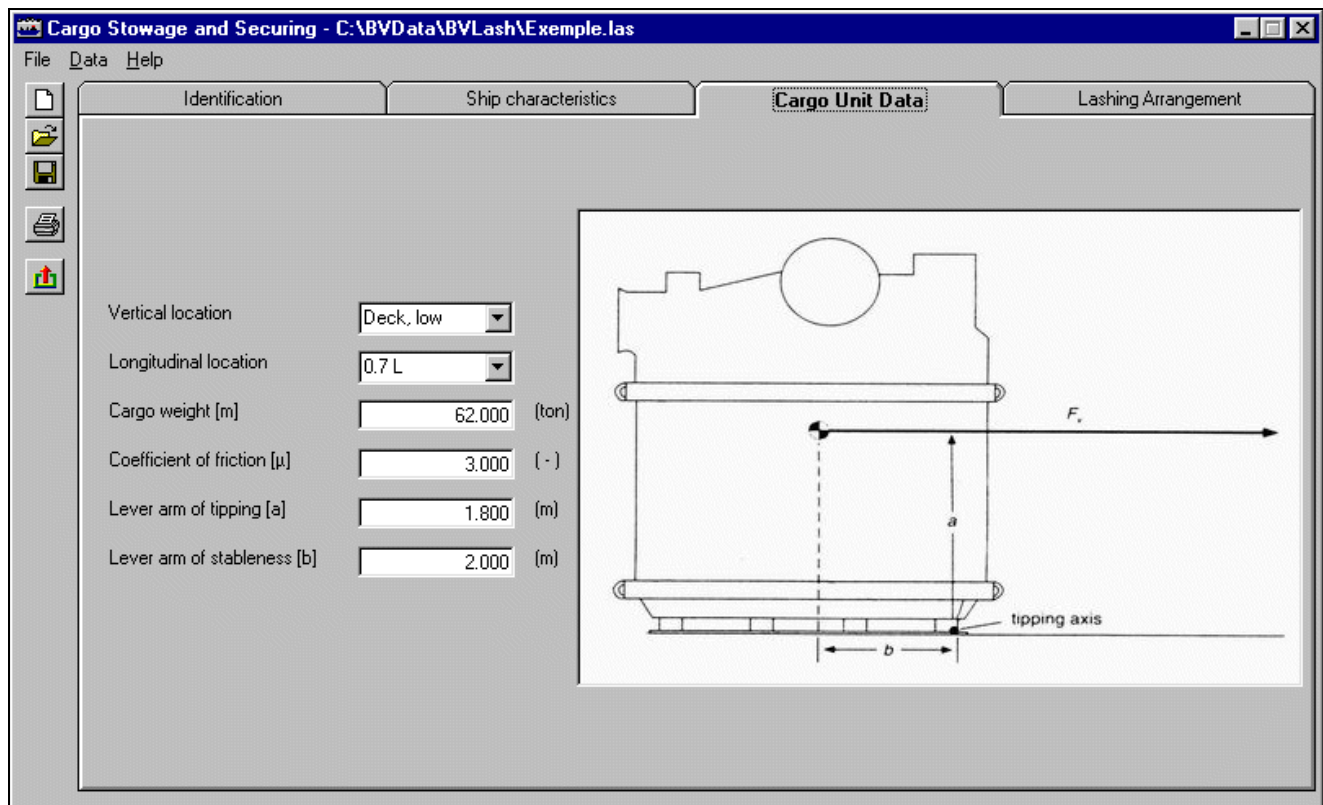
Operating system: Windows NT/2000/XP



Freewares for classification

BVLASH (F)

Preparation of a cargo securing manual according to BUREAU VERITAS 'Guidelines for the Preparation of the Cargo Securing Manual' (Ref. NI 429 DNC R00 E)



The cargo-securing manual can be adapted to particular vessels, cancelling the irrelevant part and completing with ship's particulars.

Operating system: Windows NT/2000/XP

LIRA (D)

Shaft alignment calculation based on the Rational Shaft Alignment method

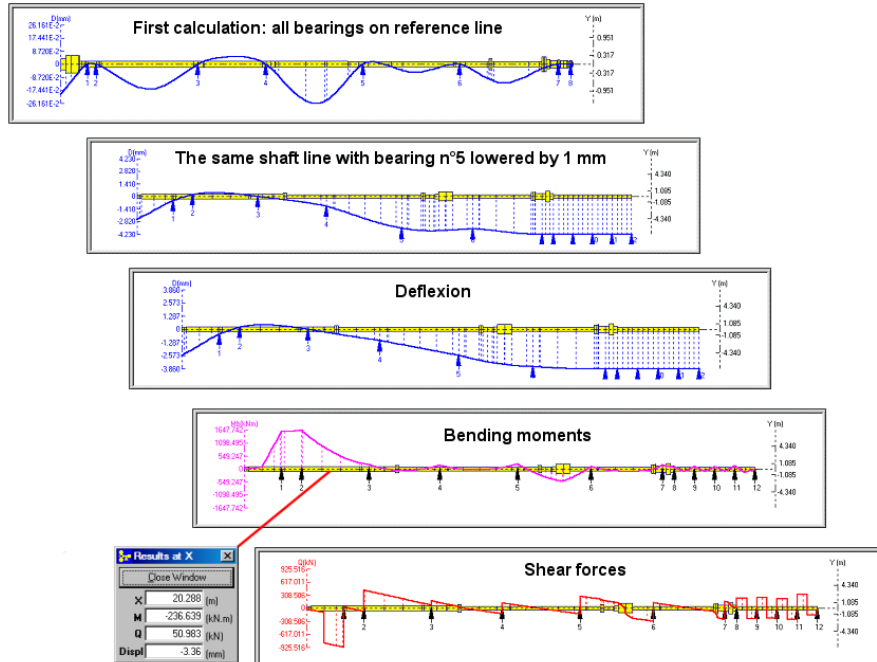
LIRA optimises shaft alignment with following benefits:

- Acceptable and equilibrated reactions on supports
- No local overload
- No loss of contact
- Coupling conditions at crankshaft flange within engine manufacturer limits
- Equilibrium of reactions on gearwheel supports in order to avoid damages on teeth
- Acceptable bending moments and shear forces in the line shaft

The shaft line is modelled by beam elements whose weight, length and diameter (internal and external) are given.

It is supported by bearings groups, i.e. an unit of bearings whose number and abscise are fixed. Within these groups, longitudinal position of each individual bearing may be defined either by giving its absolute position from the starting abscise or with reference to its relative position inside the group. There may be several bearing groups for the same shaft line.

Calculation is based on definition of load cases for each bearings group (for instance “cold conditions”, “hot conditions”...). For each group and load case, user is allowed to define reaction of any individual bearing either by giving a transverse offset or a reaction force.



Calculation allows user to determine whether a straight alignment is sufficient or not. It also displays every result in such way that user may adjust alignment.

Finally, to prepare shaft alignment practical operations, software performs GAP&SAG calculations based on coupling flange conditions.

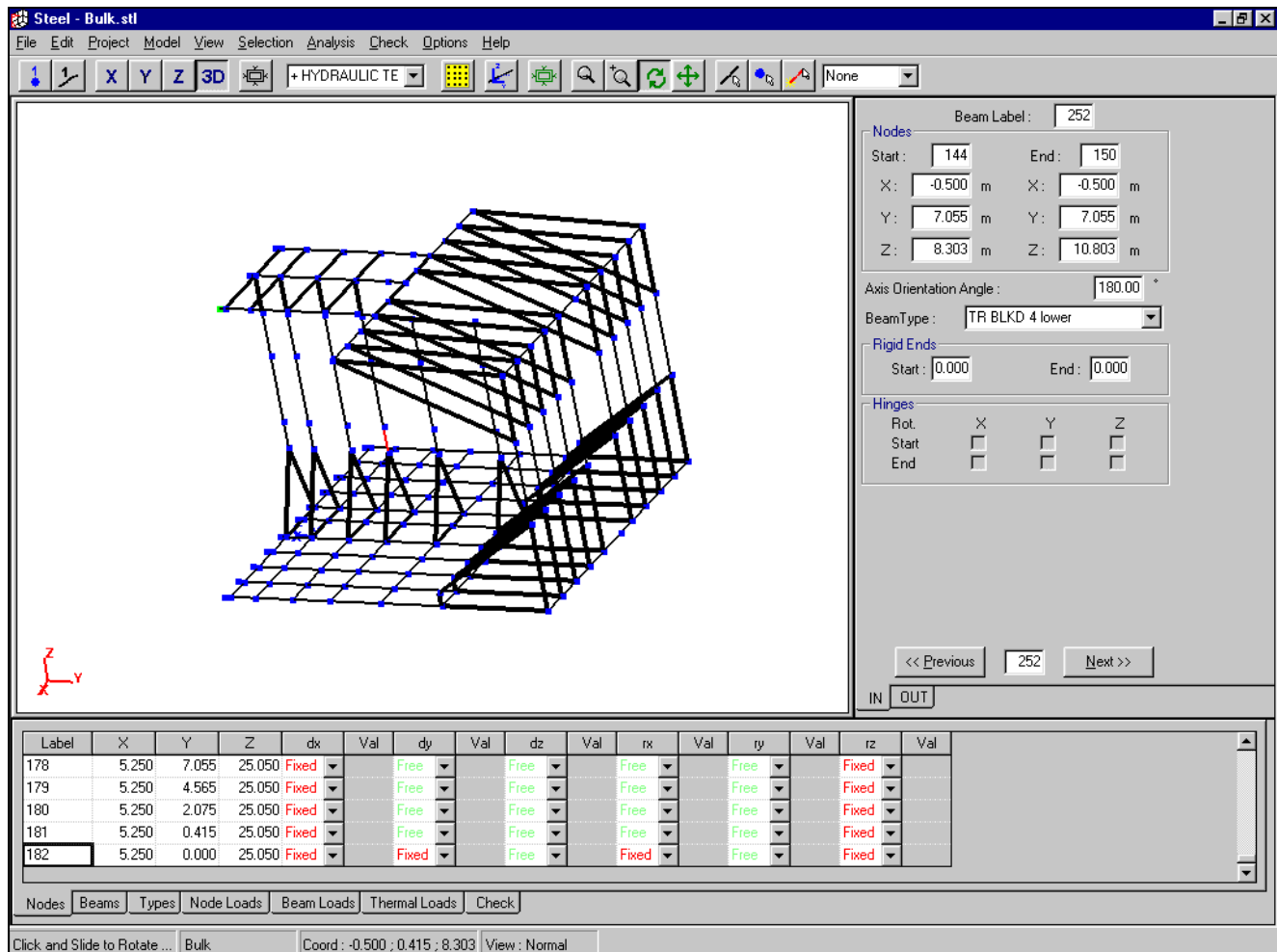
Operating system: Windows NT/2000/XP



Steel

STEEL (3D)

3D-beam analysis program based on the displacement method.



It calculates all deformations, local forces, moments and stresses in 3D frames modelled by beams and submitted to static and thermal loads.

This program includes beam axial and torsional rigidities, additional beam deformations due to shear forces and beams with rigid ends. The centre of shear can be different from the centre of gravity.

It is completely interactive giving printed and graphical data & results outputs:

- Perspective view of the structure and deformations
- Beam-loads, shear-forces & bending-moments diagrams
- Nodes degrees of freedom
- Node loads and reactions
- Final check of accuracy

Many types of standard beam types are provided :

- H, T, I sections
- Rectangular box girder
- U section
- Cylindrical pipe & bar
- Bulb plate
- Corrugation



Steel

Node degrees of freedom can be adjusted :

- Free node
- Fixed support
- Forced deformation
- Elastic support

Possible loads are:

- Structure own weight
- Hydrostatic loads
- Thermal loads
- Concentrated and linear beam loads
- ... or a combination of loading cases

Operating system: Windows NT/2000/XP



VeriSTAR Chemicals

VeriSTAR Chemicals (CD)

Cross-processing of ship characteristics and a chemical product data base which allows identifying the product carriage capabilities of chemical tankers.

VeriSTAR Chemicals - 2.3

Ships Products Materials Chemical Tanker Demo

Ship Type 1 - MARPOL cat. B - Duplex

New Modify Print Duplicate Delete View criteria

generals SR

Generals Venting and environmental control Materials of construction Electrical equipment / Fire fighting system

Tank Group A Ship Type 1 - MARPOL cat. B - Duplex (Summary)

Location / Capacity

Location Underdeck

Distance from side shell plating lower than minimum of B/5 and 11.5m but higher than 760mm

Distance from the moulded line of bottom shell plating at center line higher than minimum of B/15 and 6 m

Capacity of greatest tank 1200 m³

Scantling Density 1.5 T/m³

IBC Code Standard of Design

Type of Ship (resulting from Service Notation, Standard of damage and distances from shell plating) 2

Cargo containment 2G: Integral Gravity Tank

MARPOL Data

Type of Discharge under waterline

Stripping Capacity X<=100I

Reference of Stripping Test Test report 456576521 du 19/07/2001

Marpol Category A, B, C, D, III

Management Data

Input date 25.11.1999 18:17:03 Modification date 02.01.2001 13:58:01 Last modification by Bureau Veritas - DEV / admin

BSD Ship particulars Tank groups Lists One product in one tank Capacity diagram Reverse engineering

Its main purpose is to create lists of transportable products based on a crosschecking between ship equipment and applicable rules and regulations:

- IBC Code 1998 edition
- BUREAU VERITAS Rules for the Classification of Ships
- MARPOL 73/78, Consolidated Edition, 2002
- IMO Resolution MSC.4 (48) as amended (including proposal amendments MSC 66/13)
- MEPC.2/Circulars

To assist ship owners and shipyard in rapid definition of ship characteristics, it also includes a reverse engineering function that defines a vessel based on a list of products to transport.

User can defines new products without interference with officials one and attaches their own synonym to any product. They also get possibility to create new materials of construction or linings.



A complete ship definition is made of:

- General ship characteristics
- Tanks group definition with specific technical characteristics like vent type, fire-extinguishing equipment, materials of construction or linings, a.s.o.
- An interactive diagrammatic tank plan.

Additional facilities include:

- Export and import of ship, product, material or manufacturer data in a compressed form.
- Management of user with specific privilege for administrator, regular user or guest
- Creation and management of archive file to save ship data at various times during process and take inactive ships out of current database.
- Checking of cargo compatibility according to USCG regulation CFR46, part150

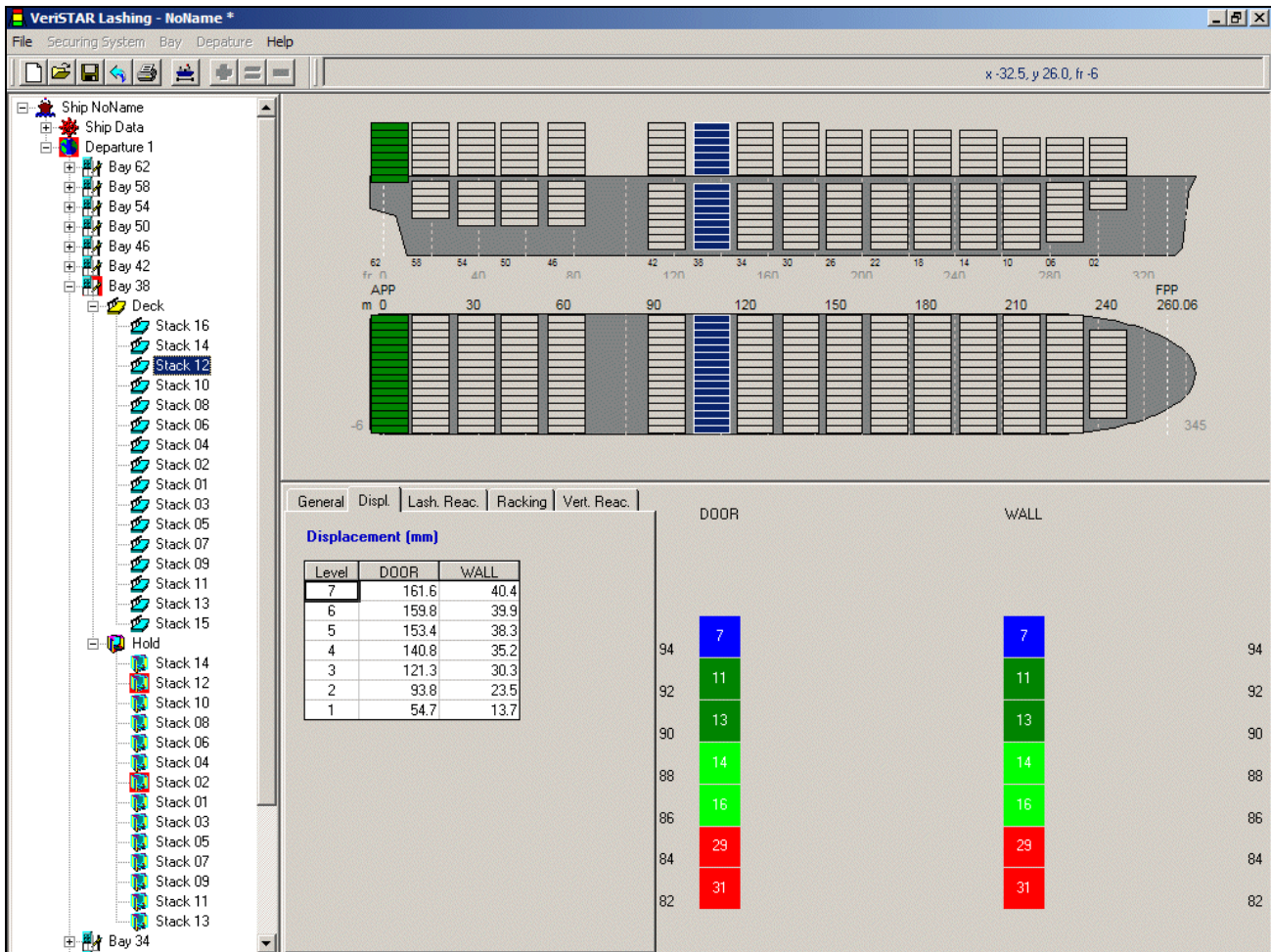
Operating system: Windows NT/2000/XP



VeriSTAR Lashing

VeriSTAR Lashing (D)

Analysis of the stability of container stacks on board ships with their lashing.



Both for design office and on-board, this software analyses container stack stability and calculates

- the transverse forces applied to the container side walls
- the vertical reactions at the bottom of container stacks
- the forces transmitted by the lashing units to the ship structure

For a given loading condition, the software immediately checks:

- Container transverse & longitudinal racking
- Container transverse & vertical compression
- Container transverse & vertical tension
- Loads in container fittings
- Lashing rods & wires Safe Working Load (SWL)
- Twistlock tensile & shear load

This programme is in conformity with BUREAU VERITAS Rules for the Classification of Ships.

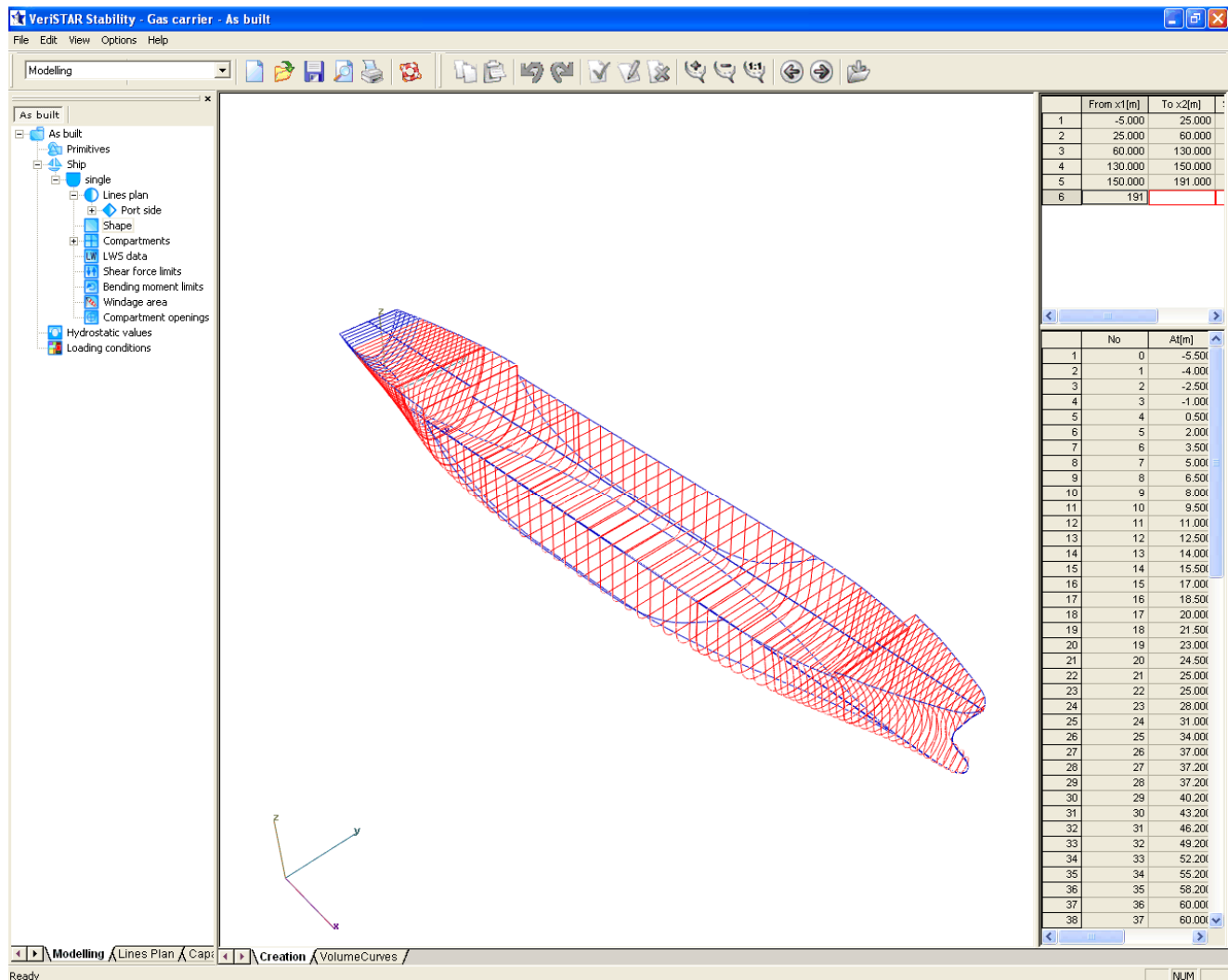
Operating system: Windows NT/2000/XP



VeriSTAR Stability

VeriSTAR Stability (D)

VeriSTAR Stability is a three dimensional program intended to calculate intact and damage stability together with longitudinal strength. Its “users friendly” interface uses the most advanced graphic interactive methods.



Data are organised on a ship by ship basis and each ship may have many different state defined by user.

Appendages are created from a large range of geometric primitive shape and may be compounded with hull using Boolean logic.

For a maximum flexibility, input of complementary data and appraisal of criterions is piloted by scripts which may be predefined or user defined.



Standard package

The standard package includes data input for creation of 3D model and intact stability processing :

Data Input :

- Basic Ship Data
- Lines Plan
- Part Definition
- Reference Points - Down-flooding Angles
- Capacity Plan
- Light Ship Distribution
- Loading Condition
- Import tool from Argos data base

Intact Stability :

- Hydrostatics Particulars
- Righting Levers KN
- Calculation of GZ Curves
- Weighing Test - Inclining Experiment
- Maximum Permissible KG
- Maximum Permissible Grain Shifting Moment
- Intact Strength Distribution

Additional modules

Damage Stability :

- Calculation of GZ Curves (including calculation of water trapped on deck for Ro-Ro passenger vessels)
- Damage Strength Distribution

Subdivision and Damage Stability of Passenger Vessel & Dry Cargo Ships (probabilistic approach according to SOLAS 2009)

Grain Shifting Moment calculation (trimmed, untrimmed, and slack)¹

NB: A digitizer is recommended for the input of the lines plan sections.

Operating system: Windows 2000 / XP / XP 64b / Vista 32b

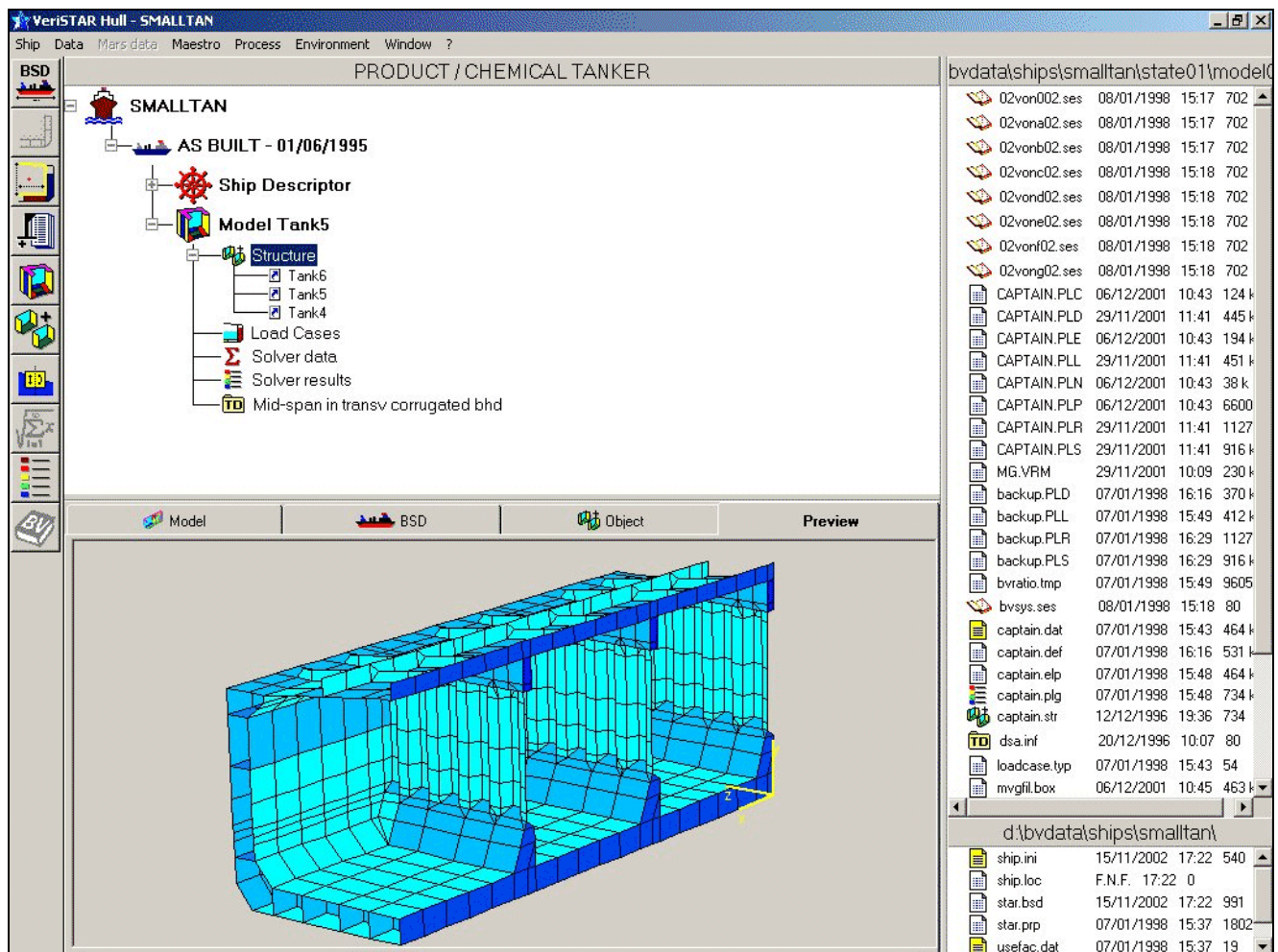
¹ Available in September 2009



VeriSTAR Hull 2

VeriSTAR Hull 2 (P)

Ship structure assessment tool that integrates Bureau Veritas rules standard calculations, finite element analysis and fatigue life time computations under a common user interface



It is intended for the following types of ships:

- ships carrying liquid cargo in bulk
- ships carrying dry bulk cargo

VeriSTAR Hull is based on a 3D finite element model of the ship structure. This model can include the whole cargo area or it can be limited to the midship area, depending on the scope of the study. Calculation models are automatically derived from this description model, allowing multiple calculations of the different parts of the structure without duplication of the information.

The calculations are performed on partial finite element models using a quick, efficient and user-friendly method. The model and all the input data are based on naval architecture notions, the loads and boundary conditions for the calculation are automatically applied in accordance with Bureau Veritas requirements. The output includes a powerful automatic tool for rules checking with colour coded BV Stress Ratios.



VeriSTAR Hull 2

VeriSTAR Hull presents several advantages for new buildings (during the design specifications and the design phase), for ships in service as well as for older ships.

New buildings:

- the quick assessment of the design for any customised hull,
- the determination of the hot spots areas from the early design stage,
- the optimisation of the various details of connection for fatigue limitation.

Ships in Service:

- the assessment of the Hull condition for survey and dry dock planning,
- the optimisation of the structural repairs.

Older Ships:

- the optimisation of the steel renewal,
- the extension of the ship's life.

Operating system: Windows NT/2000/XP

HARDWARE REQUIREMENTS

- 32 Mb available RAM memory,
- 500 Mb available hard disc space,
- a 8x CD-ROM drive,
- a Pentium processor.



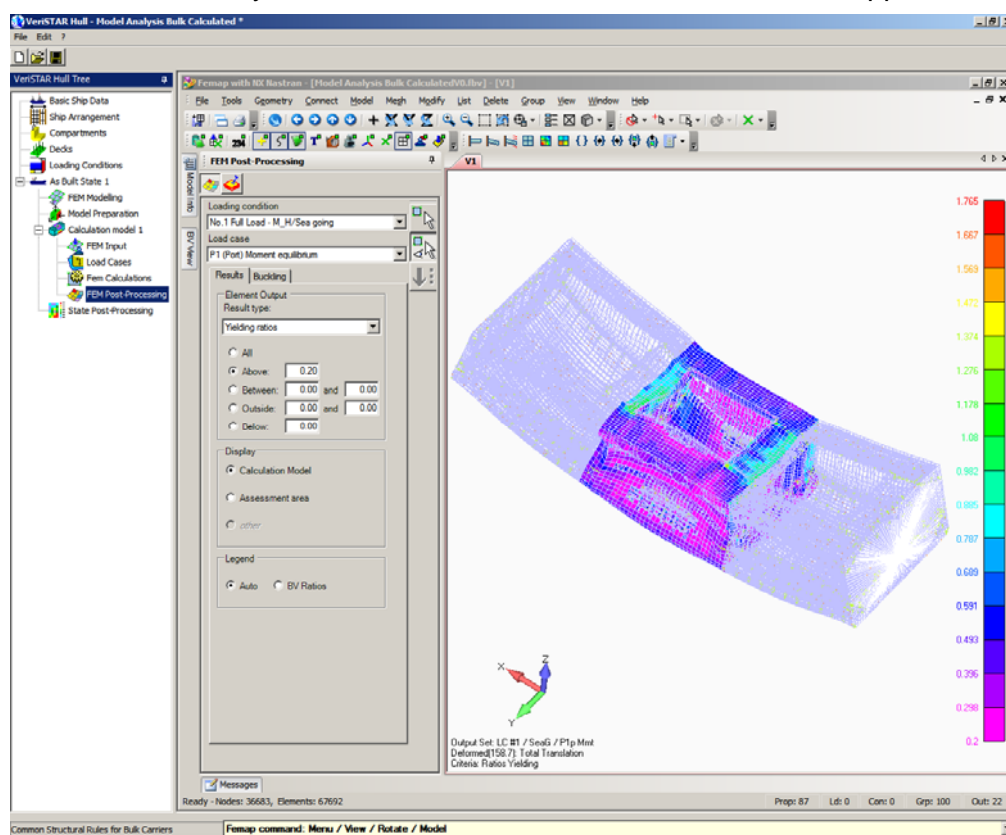
VeriSTAR Hull 5

VeriSTAR Hull 5 (📄)

This new generation of VeriSTAR Hull software has been developed to enhance the ship structure assessment by reducing the time for modelling and providing more flexibility with a modern interface.

VeriSTAR Hull 5 is based on a customization of the very popular general finite element tool [FEMAP](#). FEMAP is used as a pre- and post- processor for all finite element operations. Consequently the user can have access to all functionalities for geometry modelling which are available through the standard FEMAP interface.

To run the Finite Element Analysis, both NX Nastran and MSC Nastran are supported.



VeriSTAR Hull uses a 3D finite element model of the ship structure. This model can include the whole cargo area or it can be limited to the midship area, depending on the scope of the study. Partial calculation models are automatically derived from this description model, allowing multiple calculations of the different parts of the structure without duplication of the information.

The calculations are performed on the finite element models using a quick, efficient and user-friendly method. The loads and the boundary conditions for the calculation are automatically applied in accordance with the rules requirements. The output includes a powerful automatic tool for rules checking with colour coded BV Stress Ratios.

VeriSTAR Hull is able to deal with the following [IACS](#) Common Structural Rules :

- CSR for Bulk Carriers



VeriSTAR Hull 5

- CSR for Double Hull Oil Tankers

For each Common Structural Rules, VeriSTAR Hull can carry out :

- Global strength assessment of cargo hold structures (yielding and buckling criteria)
- Stress assessment of structural details (local refinement)
- Fatigue strength assessment (life time computation)

VeriSTAR Hull presents several advantages for new buildings, during the design specifications and the design phase, for ships in service as well as for older ships.

New buildings:

- the quick assessment of the design for any customised hull,
- the determination of the hot spots areas from the early design stage,
- the optimisation of the various details of connection for fatigue limitation.

Ships in Service:

- the assessment of the Hull condition for survey and dry dock planning,
- the optimisation of the structural repairs.

Older Ships:

- the optimisation of the steel renewal,
- the extension of the ship's life.

Operating system: Windows XP 32b / XP 64b

SYSTEM REQUIREMENTS :

- .NET Framework 2.0 or later
- FEMAP 9.31,
- NX Nastran 5.

HARDWARE REQUIREMENTS :

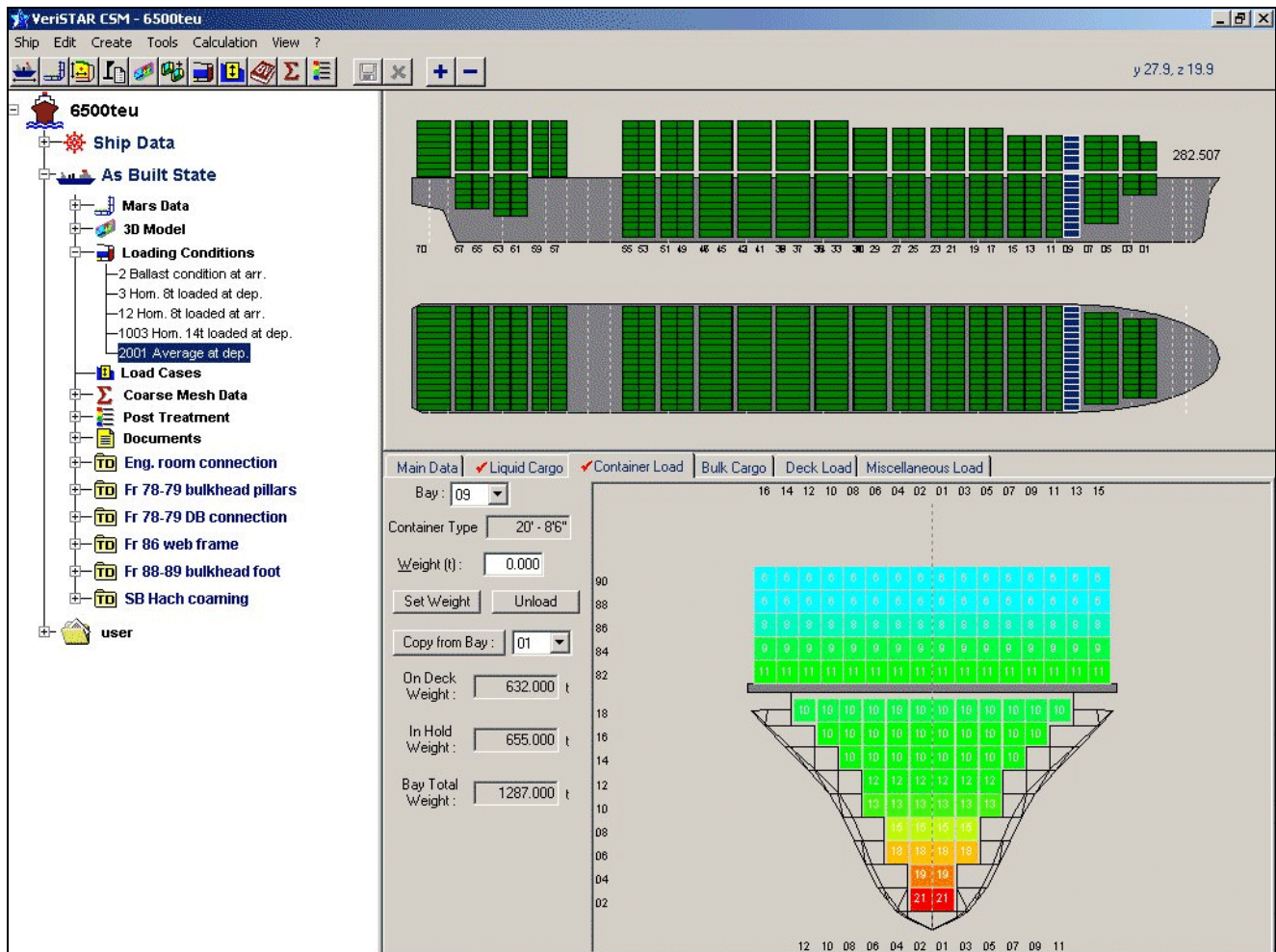
- 2 Gb available RAM memory,
- 10 Gb available hard disc space,
- a 8x CD-ROM drive,
- a Dual Core processor,
- a Graphic Board that meet the FEMAP requirements.



VeriSTAR CSM

VeriSTAR Complete Ship Model (CSMP)

Ship structure assessment tool, based on a complete description of the ship, that integrates Bureau Veritas rules standard calculations and finite element analysis under a common user interface.



It is mostly intended for vessels of the following types:

- Container vessels
- RoRo vessels.

All the calculated and collected data are stored into a persistent repository, allowing the hull condition monitoring information to be easily accessible throughout the entire lifetime of the ship.

VeriSTAR CSM fully integrated design offers you significant benefits over traditional approaches using multiple independent tools. The calculations are valid for both new buildings and existing ships.

Each Vessel has its own dedicated database starting from the design stage. It can be installed at any time during an existing ship's life.



MAIN FEATURES

Consistency

Each information needed to define the structure of the ship is entered only once, in a consistent and logical order, from general characteristics of the ship, definition of the section and geometrical description of the primary structure to load cases. VeriSTAR CSM completely eliminates the problems associated with maintaining multiple data sets for different calculations of the same ship. Any input that is entered becomes a part of the vessel's database.

Usability

The program makes use of well-understood naval architecture notions, like plate panel, cross-section and vessel's state. It is developed for a naval architect or structural engineer.

Ease-of-Use

VeriSTAR CSM lets you visualise the results of the finite element calculations as percentage of the Bureau Veritas rules permissible stresses and buckling strength criteria. These results can be displayed for each load case in colour-coded form or synthesised in a unique plot giving the maximum loads for all load cases "Hot Spot Map". This latter information is of an immediate use for the designer or the owner's technical agent.

Operating system: Windows NT/2000/XP