

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Loading Computer System**

with type designation(s)

"CargoMax for Windows" Version 2.xx

Issued to

**Herbert -ABS Software Solutions, LLC
ALAMEDA CA, United States**

is found to comply with

DNV GL rules for classification – Ships and offshore units**Application :****Type approved for calculation and control of loading conditions with the following functions:****Check of shear force and bending moments against limit curves * Correction of shear force *
Check of intact stability, damage stability and grain stability by direct calculation * Check of
intact and damage stability against limit curve**This Certificate is valid until **2020-12-31**.Issued at **Høvik** on **2016-12-14**DNV GL local station: **San Francisco**for **DNV GL**Approval Engineer: **Nils Heimvik**

**Inge Seglem
Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

Available Options of the Software:

Based on the stored characteristic data and stored 3D model and loading data given by the user, the following functions are performed onboard monohull vessels:

Hull Strength:

For prepared loading conditions;

1. Calculation of still water bending moment and shear force including torsional moments, and control against limit values.
2. Correction of still water shear force for bulk carriers.
3. Correction of still water shear force for tankers (applicable for pre 2006 DNV Rules only).
4. Check of longitudinal strength of the hull girder for flooded cargo holds (previous IACS UR S17).
5. Check of allowable mass in holds as function of draft

Stability:

For prepared loading conditions;

1. Calculation and check of compliance with pre-stored limit curves for intact and damage stability
2. Calculation and check of the intact stability criteria of 2008 IS Code Part A Ch.2.2 and 2.3
3. Calculation and check according to the damage stability criteria of MARPOL 73/78 Annex I Regulation 28, IMO IBC Code Ch.2, and IMO IGC Code Ch.2
4. Calculation and check of the grain stability requirements of SOLAS-74 Reg. VI/Part C and MSC 23(59), (International Grain Code) including A.10.3

Approval conditions

1. The loading computer is considered as supplementary to the approved stability booklet and/or loading manual onboard.
2. Specific approval and certification is required for each vessel at which the program is installed. Documentation to be submitted for approval is listed in DNV GL Rules for Ships Pt.6 Ch.4 Sec. 7. The identification of software will be recorded in the certificate.
3. The program is either to be installed on one approved hardware (type approved or case-by-case approved), or it is to be installed on two nominated computers. If two nominated computers are available, approval of hardware may be waived (Ref. DNV GL Rules Pt.6 Ch.4 Sec.7).

Job Id:
Certificate No: **TAA00000Y9**

Type Approval documentation

The approval is based on documentation reviewed for the following selected test ships, initially for version 1, then for the later vessels for version 2.

- Ankerløykken Verft Bno. 9 "M/T Stolt Victor" DNV GL Id.No. 10431,
- Ankerløykken Verft Bno. 10 "M/T Stolt Viking" DNV GL Id.No. 10432,
- Danyard B.No. 730, "M/T Stolt Innovation" DNV GL Id.No. 18500
- Jiangnan Shipyard B.No. 2214, "Ferral St. Laurent" DNV GL Id.No. 18597
- Nantong Mingde MD016, DNV GL Id.No. 28359: Grain Stability and Strength ISCS UR S17
- "Stolt Breland" DNV GL Id.No. 27656: Direct damage stability
- "Petroleo Nautipa" DNV GL Id.No.09355: Direct damage check and shear force corr. tanker
- "Matsun Maunalei" DNV GL Id.No. G111520: Torsional moment check
- "Genco Warrior" DNV GL Id.No. 28836: Check of allowable masses in hold

Typical documentation for some of these vessels

- Test Conditions
- Basic Data
- User's manual
- Program Description

Type approval is given based on a review and acceptance of design, calculation methods and documented test results for the above vessels.

Limitation

The type approval is valid only for the calculation results. I.e. the type approval is a confirmation that the software is able to give correct results provided that the stored characteristic data of the vessel and the user's input is correct.

Renewal assessment

The scope of the retention/renewal assessment is to verify that the conditions stipulated for the type approval is complied with and that no alterations are made to the product or software design.

The main elements of the assessment to be dealt with:

- Ensure that documentation for the type approval is available.
- Ensure that the type approved software complies with the referenced documents and specifications.
- Review of possible changes in design and performance of the type approved software version.
- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

The assessment is to be performed only upon renewal, and by the unit issuing the type approval certificate.