

INTERNATIONAL MARITIME ORGANIZATION
4 ALBERT EMBANKMENT
LONDON SE1 7SR

Telephone: 020 7735 7611
Fax: 020 7587 3210



IMO

E

Ref. T1/2.04

MSC.1/Circ.1229
11 January 2007

GUIDELINES FOR THE APPROVAL OF STABILITY INSTRUMENTS

1 The Maritime Safety Committee, at its eighty-second session (29 November to 8 December 2006), approved the Guidelines for the approval of stability instruments, set out in the annex, aiming at providing additional guidance on approval procedures of stability instruments supporting the safe operation of ships.

2 Member Governments are invited to bring the annexed Guidelines for the approval of stability instruments to the attention of interested parties as they deem appropriate.

ANNEX

GUIDELINES FOR THE APPROVAL OF STABILITY INSTRUMENTS

1 Purpose

The aim of this document is to provide additional guidance on approval procedures of stability instruments supporting the safe operation of ships.

2 Definition

A *stability instrument* is an instrument installed on board a particular ship by means of which it can be ascertained that stability requirements specified for the ship in Stability Booklet are met in any operational loading condition. A stability instrument comprises hardware and software.

3 Software approval

The accuracy of the computational results and actual ship data used by the programmes should be verified for the particular ship on which the programmes will be installed. This ship specific approval of on-board loading instruments is required for all ships equipped with a stability instrument.

4 Acceptable tolerances

4.1 Depending on the type and scope of programmes, the acceptable tolerances should be determined differently, according to 4.5 or 4.6. Excess from these tolerances should not be accepted unless the Administration considers that there is a satisfactory explanation for the difference and that there will be no adverse effect on the safety of the ship.

4.2 Examples of pre-programmed input data include the following:

- .1 Hydrostatic data: displacement, LCB, LCF, VCB, KM_t and MCT versus draught.
- .2 Stability data: KN or MS values at appropriate heel/trim angles versus displacement, stability limits.
- .3 Compartment data: volume, LCG, VCG, TCG and FSM/grain heeling moments versus level of the compartment's contents.

4.3 Examples of output data include the following:

- .1 Hydrostatic data: displacement, LCB, LCF, VCB, KM_t and MCT versus draught as well as actual draughts, trim.
- .2 Stability data: FSC (free surface correction), GZ-values, VCG, GM, VCG/GM limits, allowable grain heeling moments, derived stability criteria, e.g. areas under the GZ curve, weather criteria.
- .3 Compartment data: calculated volume, LCG, VCG, TCG and FSM/grain heeling moments versus level of the compartment's contents.

4.4 The computational accuracy of the calculation program results should be within the acceptable tolerances specified in 4.5 or 4.6, of the results using an independent program or the approved stability information with identical input.

4.5 Programmes which use only pre-programmed data from the approved stability information as the basis for stability calculations should have zero tolerances for the printouts of input data. Output data tolerances should be close to zero, however, small differences associated with calculation rounding or abridged input data are acceptable. Additionally differences associated with the use of hydrostatic and stability data for trims that differ from those in the approved stability information are acceptable subject to review by the Administration.

4.6 Programmes which use hull form models as their basis for stability calculations may have tolerances for the printouts of basic calculated data established against either data from the approved stability information or data obtained using the authority's approval model. Acceptable tolerances should be in accordance with the table below.

Hull Form Dependent	
Displacement	2%
Longitudinal center of buoyancy, from AP	1% / 50 cm max
Vertical center of buoyancy	1% / 5 cm max
Transverse center of buoyancy	0.5% of B / 5 cm max
Longitudinal center of flotation, from AP	1% / 50 cm max
Moment to trim 1 cm	2%
Transverse metacentric height	1% / 5 cm max
Longitudinal metacentric height	1% / 50cm max
Cross curves of stability	50mm
Compartment dependent	
Volume or deadweight	2%
Longitudinal center of gravity, from AP	1% / 50 cm max
Vertical centre of gravity	1% / 5 cm max
Transverse center of gravity	0.5% of B / 5 cm max
Free surface moment	2%
Shifting moment	5%
Level of contents	2%
Trim and stability	
Draughts (forward, aft, mean)	1% / 5 cm max
GMt	1% / 5 cm max
GZ values	5% / 5 cm max
FS correction	2%
Downflooding angle	2°
Equilibrium angles	1°
Distance to unprotected openings or margin line from WL, if applicable	+/- 5% / 50 mm
Areas under righting arm curve	5% or 0,0012mrad

Deviation in % = $\{(base\ value - applicant's\ value) / base\ value\} \times 100$

The "base value" may be taken from the approved stability information.