

Intact stability calculation

The mass and centre of gravity of the whole system are input for the intact stability calculation. For this tutorial a very simplified stability calculation is used. The only input value that is required is the moment of area inertia of the waterline area.

- Create a new class in the Knowledge Browser alongside the others that you have made so far: Intact stability calculation.
- Create the following parameters in the **Knowledge Browser**:

Parameter name	Dimension	Determined by	Reference	In Class
BM	[m]	USR: User or system/equation	Distance between center of buoyancy and metacenter	Intact stability calculation
GM	[m]	USR: User or system/equation	Metacentric height	Intact stability calculation
KB	[m]	USR: User or system/equation	Distance between keel and center of buoyancy	Intact stability calculation
KG	[m]	USR: User or system/equation	Distance between keel and center of gravity	Intact stability calculation
Moment_of_Inertia	[m^4]	USR: User or system/equation	Moment of inertia of the water plane area, For this tutorial give a rough estimate	Intact stability calculation

- Include the following parameters in entity Intact stability calculation: Loa,Boa,BM, COGX, COGY, COGZ, Displacement, GM, KB, KG, Moment_of_Inertia, Rho, and T_design.
- Create the following relations (either entity relations or normal relations, it does not matter here):

Loa = ENTITY#(xx).Loa where "xx" is the QEntityID value of entity Main Dimensions.

Boa = ENTITY#(xx).Boa where "xx" is the QEntityID value of entity Main Dimensions.

GM = KB + BM - KG

BM = Moment_of_Inertia / (Displacement/Rho)

KG = COGZ

KB = 0.7*T_design

T_design = ENTITY#(xx).T_design where "xx" is the QEntityID value of entity Hydrostatics.

Displacement = ENTITY#(xx).Mass where "xx" is the QEntityID value of entity Mass calculation.

COGX = ENTITY#(xx).COGX where "xx" is the QEntityID value of entity Mass calculation.

COGY = ENTITY#(xx).COGY where "xx" is the QEntityID value of entity Mass calculation.

COGZ = ENTITY#(xx).COGZ where "xx" is the QEntityID value of entity Mass calculation.

Rho = ENTITY#(xx).Rho where "xx" is the QEntityID value of entity Hydrostatics.

- To show computed values set attribute @SHOW on QEntityData.

Workbase

Local (Internal) Name only All Data input Stop input

Dataset[Tutorialt1]

- QTaxonomy
 - Ship configurator
 - Ship design
 - Mass calculation
 - Intact stability calculation**
 - Data to Excel
 - Data to Word report

Parameter	Value	Dimension
Loa	-	m
BM	-	m
Boa	-	m
COGX	-	m
COGY	-	m
COGZ	-	m
Displacement	-	t
GM	-	m
KB	-	m
KG	-	m
Moment_of_Inertia	-	m ⁴
QEntityData	Text/Telitab	Str
QEntityID	4	m
QEntityName	\$Intact stability calculation	Str
Rho	(No value)	t/m ³
T_design	-	m

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