

ShipWeight™

Tutorial

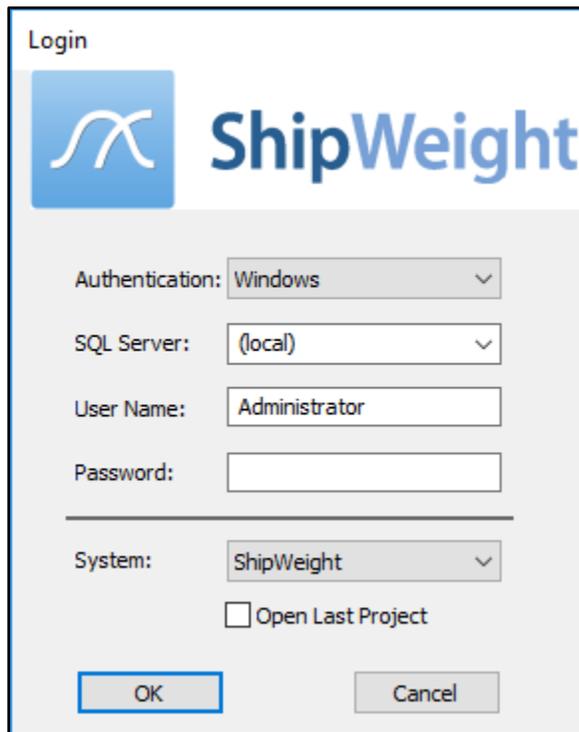
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1. Creating a new project

Double-click the ShipWeight icon from your desktop to launch the program.

The first thing that pops up is the Login dialog:



The screenshot shows a 'Login' dialog box for the 'ShipWeight' application. The dialog has a title bar with the text 'Login' and the 'ShipWeight' logo. Below the logo, there are several input fields and a checkbox. The 'Authentication' dropdown is set to 'Windows'. The 'SQL Server' dropdown is set to '(local)'. The 'User Name' text box contains 'Administrator'. The 'Password' text box is empty. Below these fields, there is a horizontal line. Under the line, the 'System' dropdown is set to 'ShipWeight'. Below the 'System' dropdown is a checkbox labeled 'Open Last Project', which is currently unchecked. At the bottom of the dialog are two buttons: 'OK' and 'Cancel'.

Make sure to select *Windows* **Authentication** method and the *(local)* **SQL Server**.

The **User Name** is not your Windows user name, but is your ShipWeight user name.

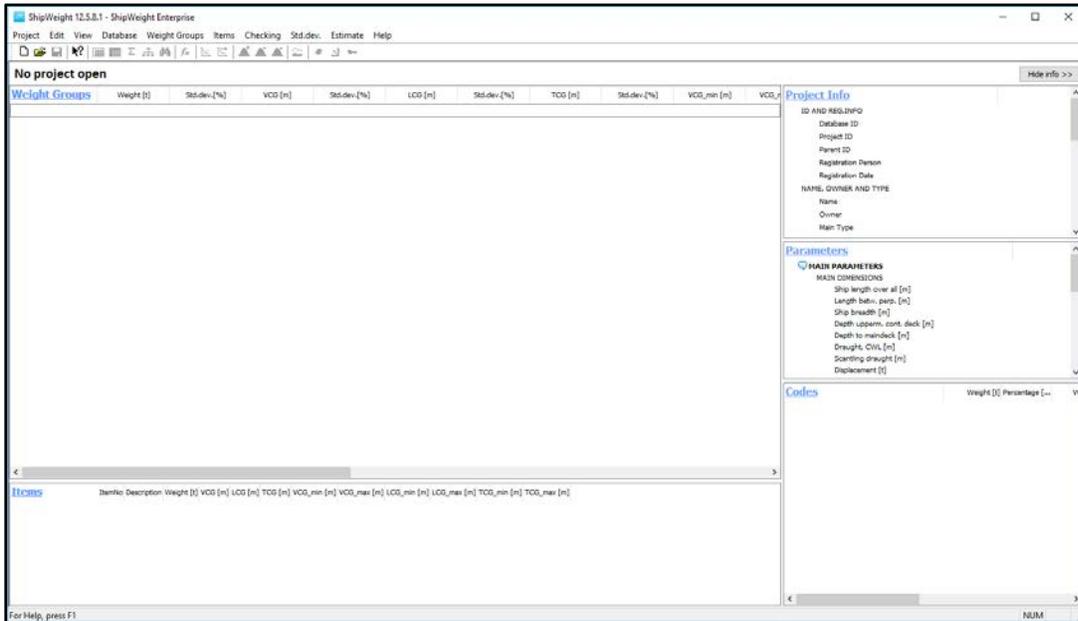
Fill in also the corresponding **Password**.

For **System** select *ShipWeight*, which will determine the main SWBS structure that the software will open.

Open Last Project check box should not be checked.

Click **OK** button to launch ShipWeight.

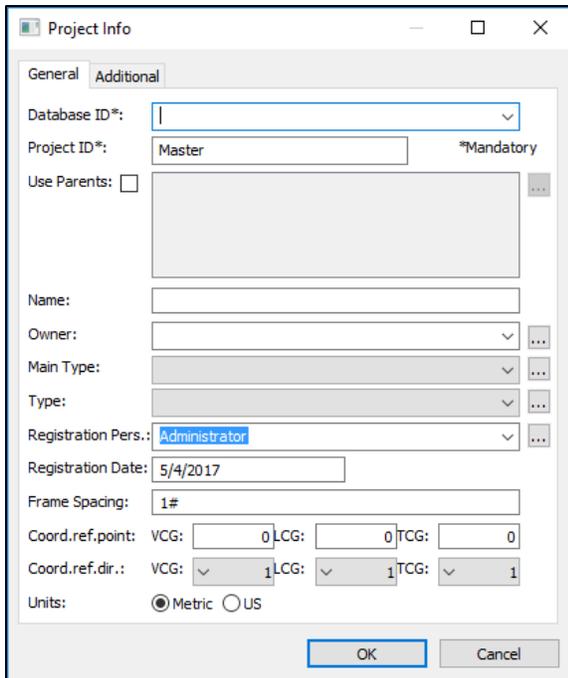
ShipWeight window will open, with no project loaded:



To start a new project:

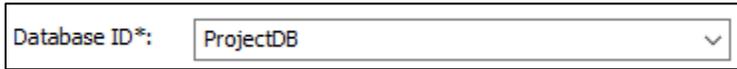
- go to the **Project** menu and select New or
- go to the toolbar and click the new button 

The **Project info** dialog pops up:



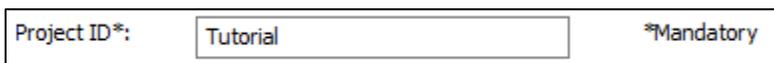
There is two mandatory fields in the Project info dialog that needs to be filled out:

- The project **Database ID*** is the place where to store the new project, so you can select an already existing database from the dropdown list or type in a new database id. For this tutorial, please select *ProjectDB*



Database ID*: ProjectDB

- The **Project ID*** is the id of your project, and the user can type anything as long as it is unique. For this tutorial, please type *Tutorial*



Project ID*: Tutorial *Mandatory

Name field: *MS Breeze*

Main Type field: select *Offshore Vessel* from the dropdown list

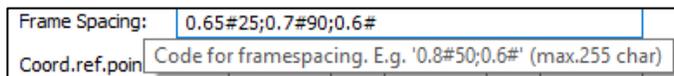
Type field: select *Anchor Handling Tug* from the dropdown list

The **Frame Spacing** field: is a bit important because this will allow to include frame spacing in the input and use frame spacing instead of position, when the user enters the position for location of an item in the X direction.

Example: - for frame spacing of 0.65 meters, simply type *0.65#*

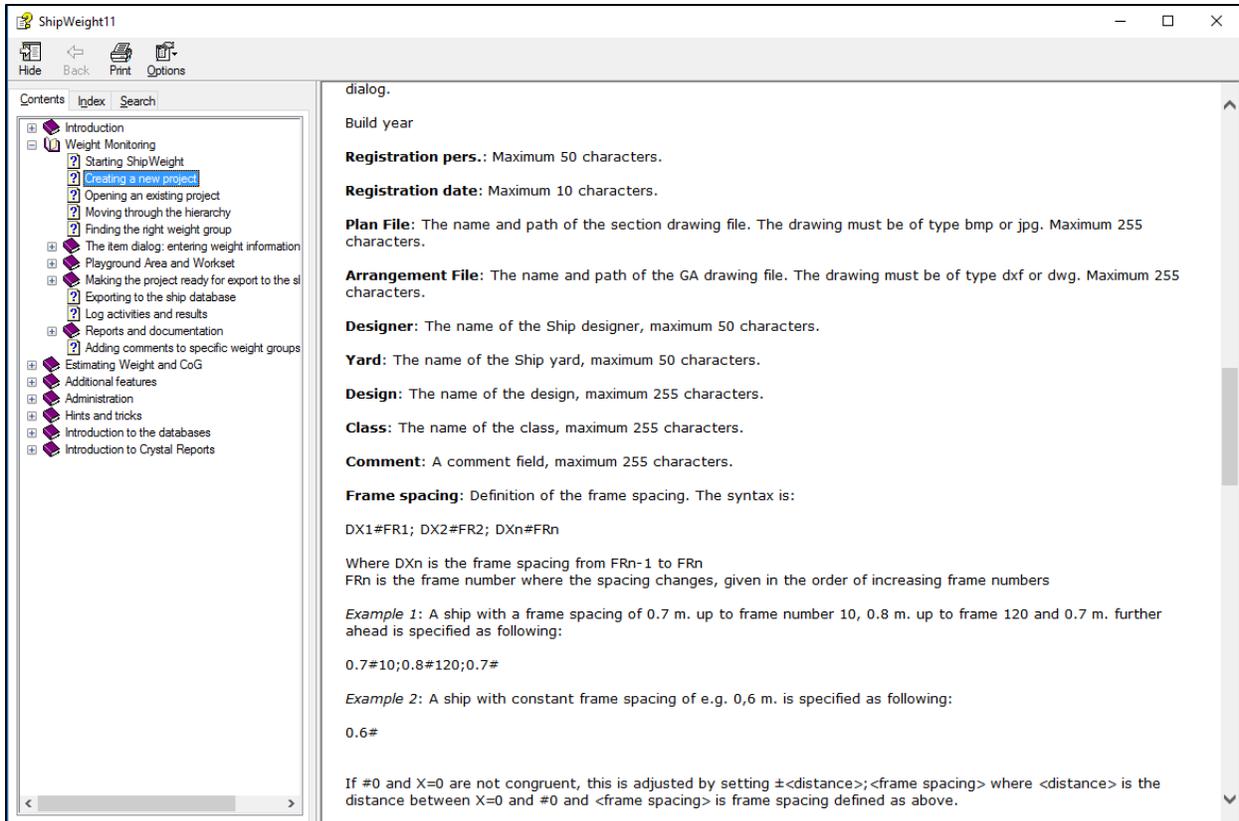
- for dynamic frame spacing, type for example *0.65#25;0.7#90;0.6#*

The tooltip here will show an example of the coding for this dynamic frame spacing:

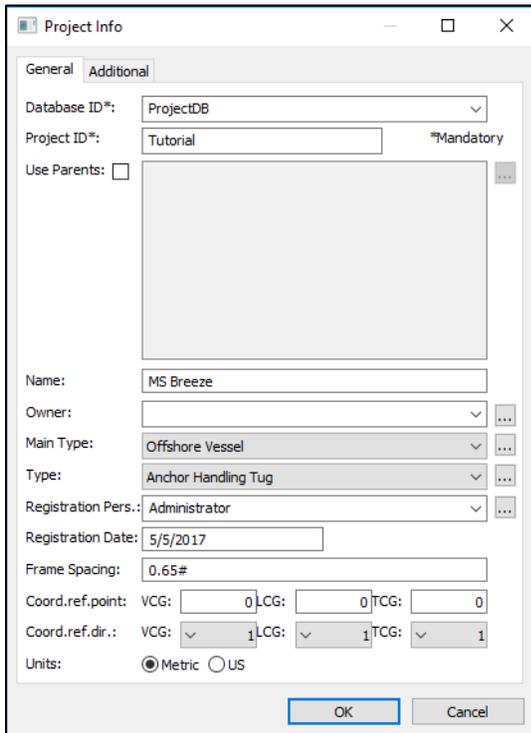


Frame Spacing: 0.65#25;0.7#90;0.6#
Coord.ref.poin Code for framespacing. E.g. '0.8#50;0.6#' (max.255 char)

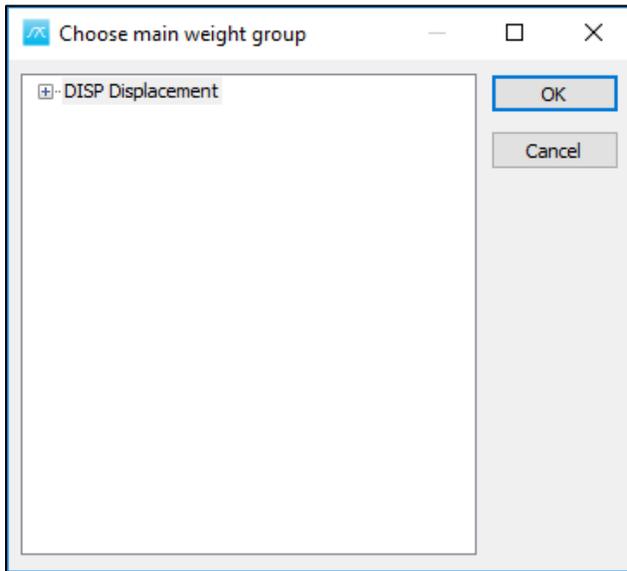
For more information, press the **F1** keyboard button, which will launch the Context-sensitive Help File:



Units field: keep the *Metric* units



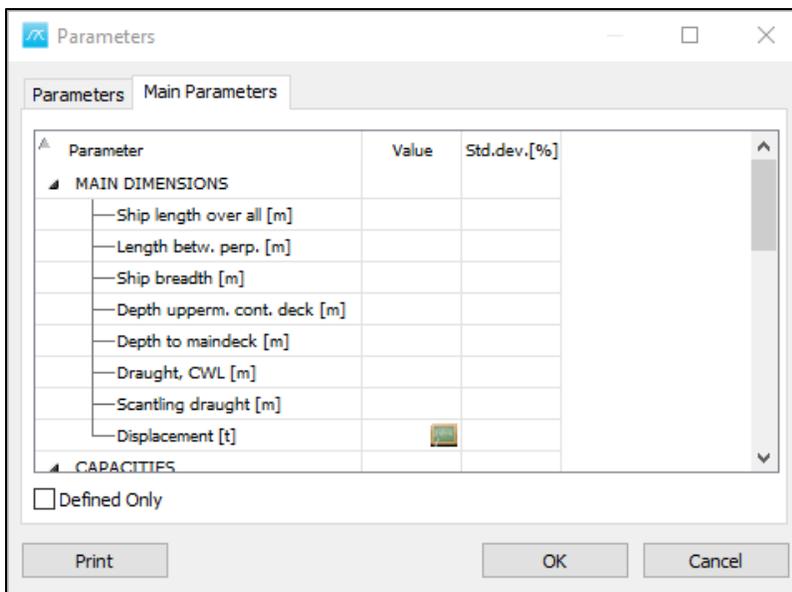
Click **OK** and the new project will start.



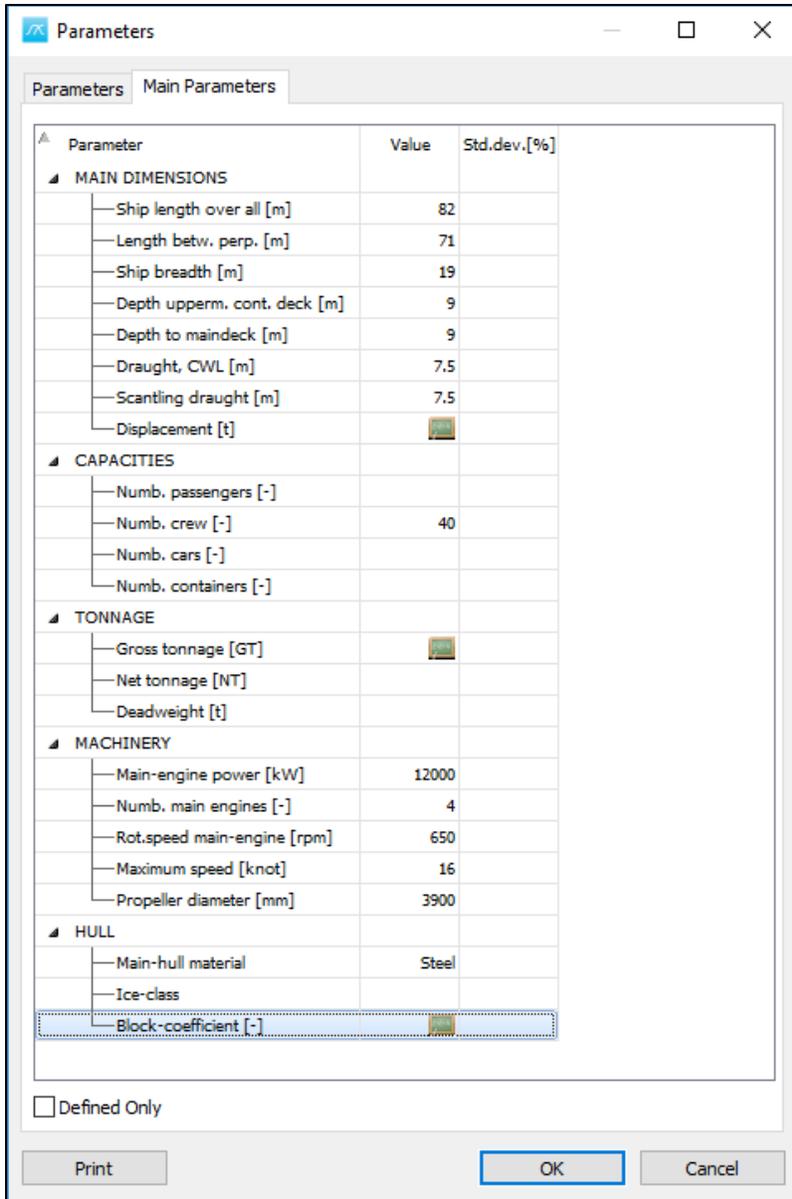
Now, the user will be asked to choose the main weight group for the the new project.

In this case keep the *DISP Displacement* selection and then press **OK**.

The next dialog that pops up is the Parameters dialog:

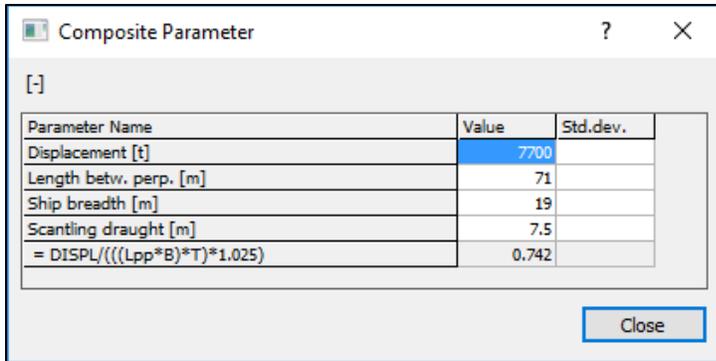


Expand the window and enter the main parameters that are currently available for the project:

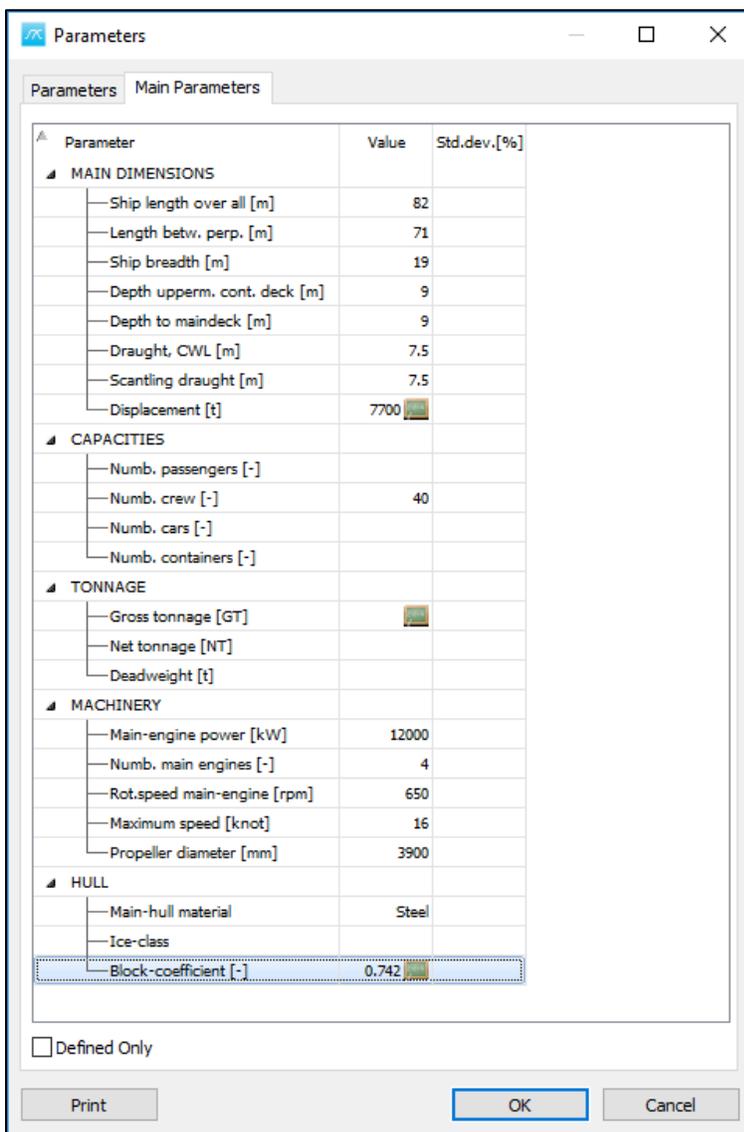


Notice that some of the parameters have a green icon to the right of the Value cell. For example the **Block-coefficient**. If the user knows the block-coefficient value, he can just type in directly.

If the block-coefficient is unknown, the green icon will open the **Composite Parameter** dialog, which will allow the user to enter other parameters to help calculate the block-coefficient value. Input 7700 for Displacement [t] field, and then let the rest of the parameters as they are. The Block-coefficient will instantly be calculated:

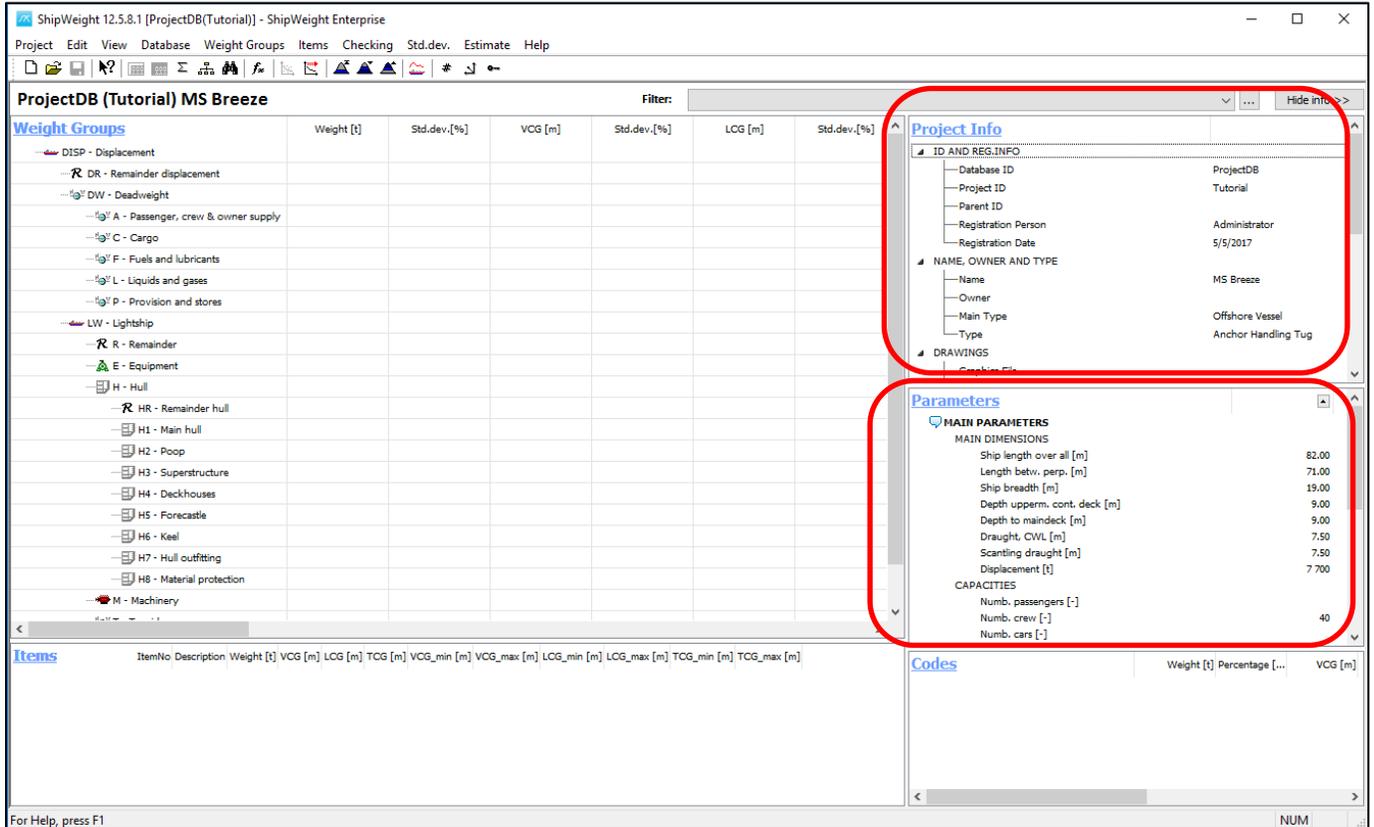


Press the Close button.



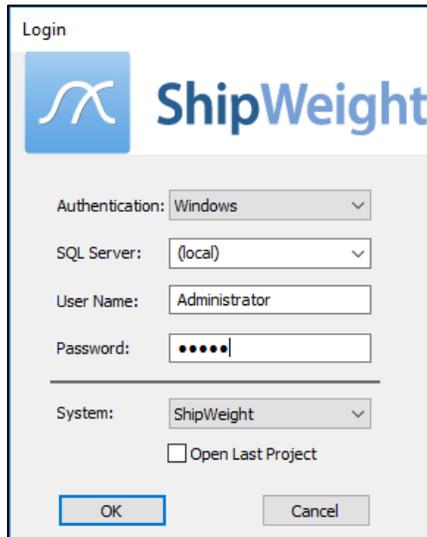
Now click **OK** to close this dialog.

The Project Info can be found on the top right side of ShipWeight window and the Parameters info on the lower right side. The information can be changed anytime when working with the project, by clicking on the **Project Info** and on the **Parameters** headers.



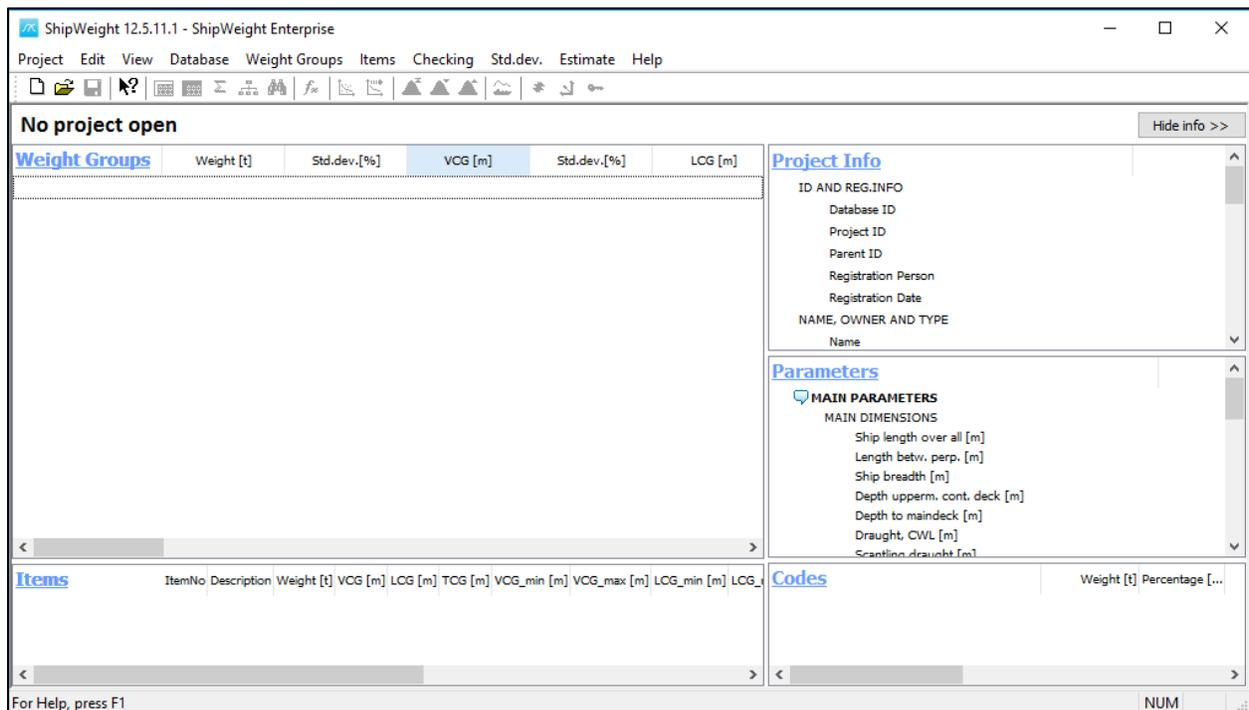
2. Project Administration

The first thing is to start again ShipWeight and login:



The login dialog box for ShipWeight. It features the ShipWeight logo at the top left. Below the logo, there are several input fields and dropdown menus: 'Authentication' set to 'Windows', 'SQL Server' set to '(local)', 'User Name' set to 'Administrator', and 'Password' with masked characters. At the bottom, there is a 'System' dropdown set to 'ShipWeight' and an unchecked checkbox for 'Open Last Project'. 'OK' and 'Cancel' buttons are at the bottom.

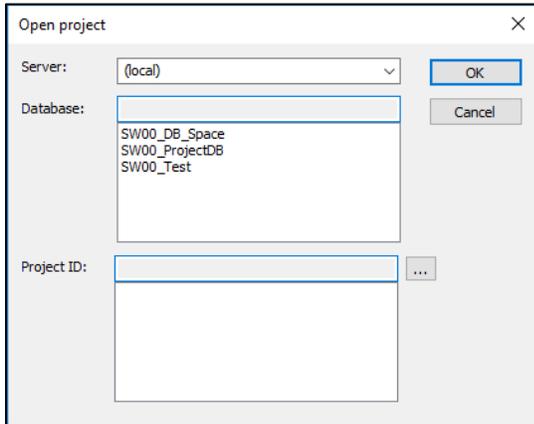
to open up the main window:



The main window of ShipWeight Enterprise. The title bar reads 'ShipWeight 12.5.11.1 - ShipWeight Enterprise'. The menu bar includes 'Project', 'Edit', 'View', 'Database', 'Weight Groups', 'Items', 'Checking', 'Std.dev.', 'Estimate', and 'Help'. The toolbar contains various icons for file operations and data management. The main area is divided into several panes: 'No project open' at the top left, 'Weight Groups' table below it, 'Project Info' on the right, 'Parameters' on the right, 'Items' table at the bottom left, and 'Codes' table at the bottom right. The 'Weight Groups' table has columns: Weight [t], Std.dev.[%], VCG [m], Std.dev.[%], LCG [m]. The 'Items' table has columns: ItemNo, Description, Weight [t], VCG [m], LCG [m], TCG [m], VCG_min [m], VCG_max [m], LCG_min [m], LCG_max [m]. The 'Parameters' pane shows 'MAIN DIMENSIONS' with values for Ship length over all [m], Length betw. perp. [m], Ship breadth [m], Depth upperm. cont. deck [m], Depth to maindeck [m], Draught, CWL [m], and Scantling draught [m]. The 'Codes' pane has columns: Weight [t] and Percentage [...]. The status bar at the bottom left says 'For Help, press F1' and at the bottom right says 'NUM'.

Right now ShipWeight opens without any project loaded into the main window.

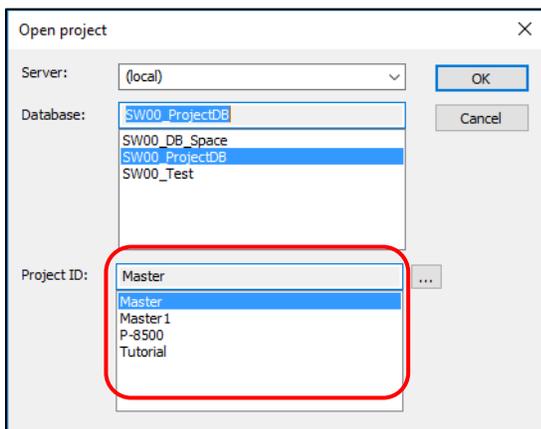
So, to load a project into the main window you can either open a project from the menu, going on Project -> Open or you can go to the toolbar and find the Open Project button . Either way you choose, the Open Project dialog will pop up:



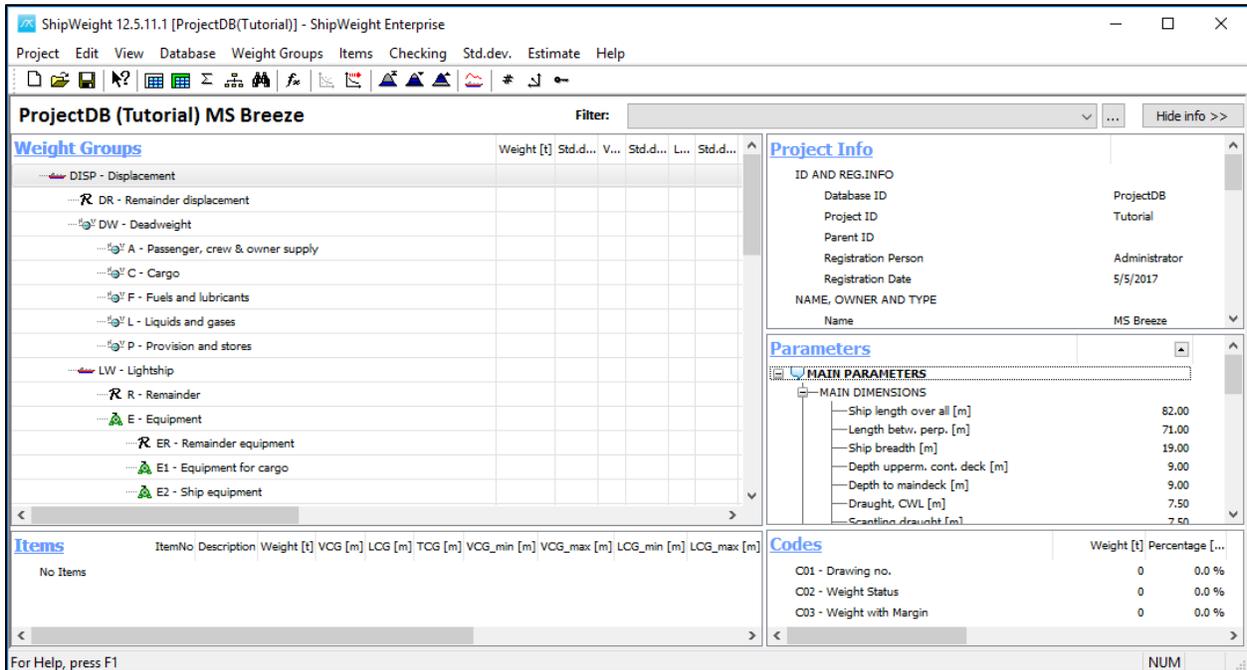
The upper part shows the name of the **Server**, which usually stays the same, you rarely change the server name.

The next part will show the **Database**, the project databases that are on your server. You need to have at least one project Database. Each project database can contain any number of projects.

Now click on the lower part of the project Database, for example click on **SW00_ProjectDB**. You will see in the lower part of the **Project ID** all the existing projects from the selected Database:

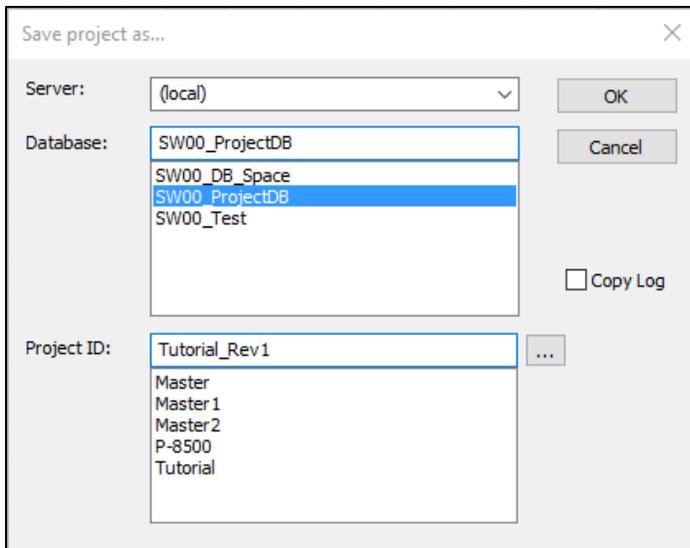


Now, select from the Project ID list the **Tutorial** project and then click **OK** to open up this project, and then after few seconds the project is loaded into ShipWeight:



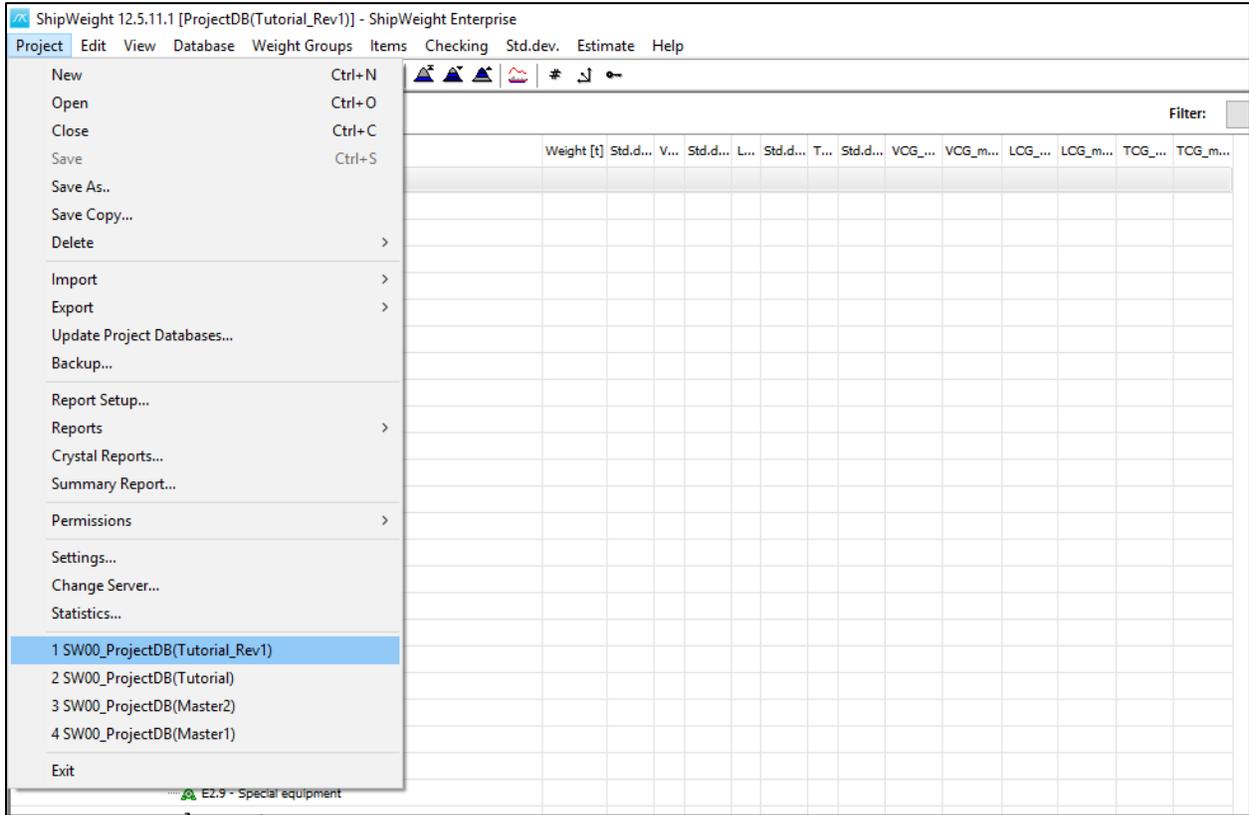
To make a copy of this project, go to **Project** menu, then select **Save As...**

Choose the Database you want to save it in (ProjectDB) and then type the Project ID to be used for the copy of the existing project:



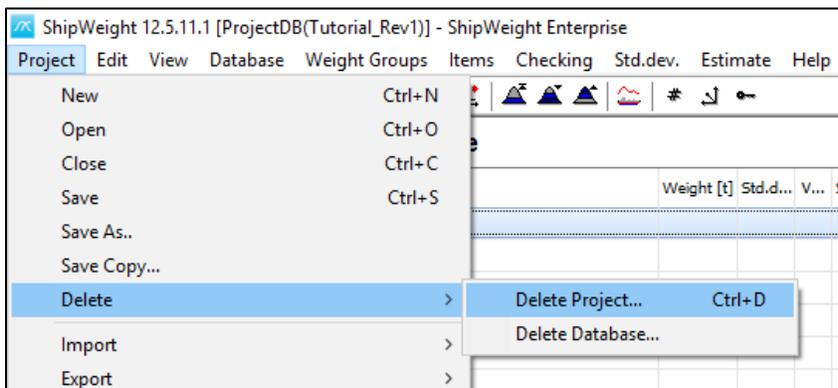
Now hit the OK button and a copy of **Tutorial** project is stored as **Tutorial_Rev1**.

To get back to Tutorial project, you can open it from the Open dialog, but also on the project menu there are some shortcuts that shows the last four projects:

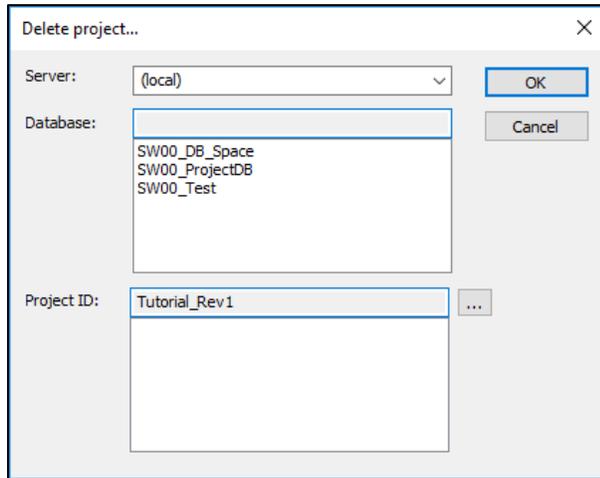


So this is how you can open and save projects on ShipWeight.

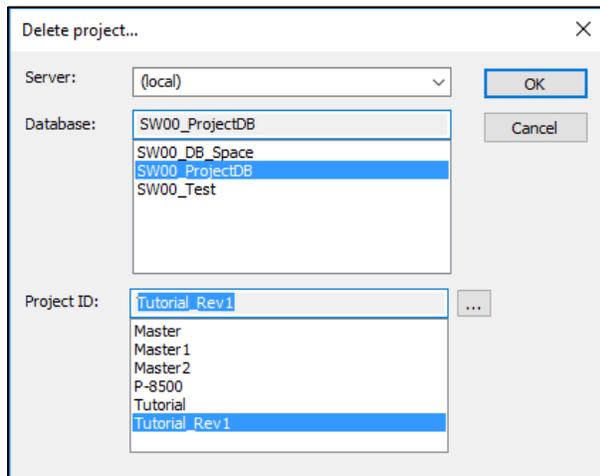
To delete a project, navigate to Project menu, select Delete, then Delete Project:



The Delete project... dialog will appear, which contains the same, the Server, Database and Project ID.

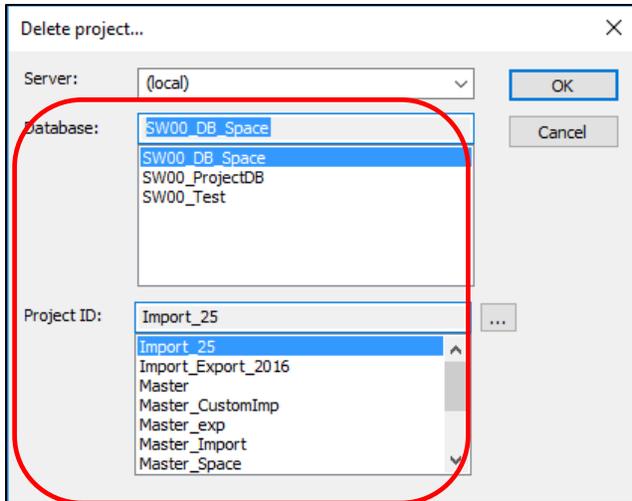


Now select the Database SW00_ProjectDB, and the Project ID Tutorial_Rev1:



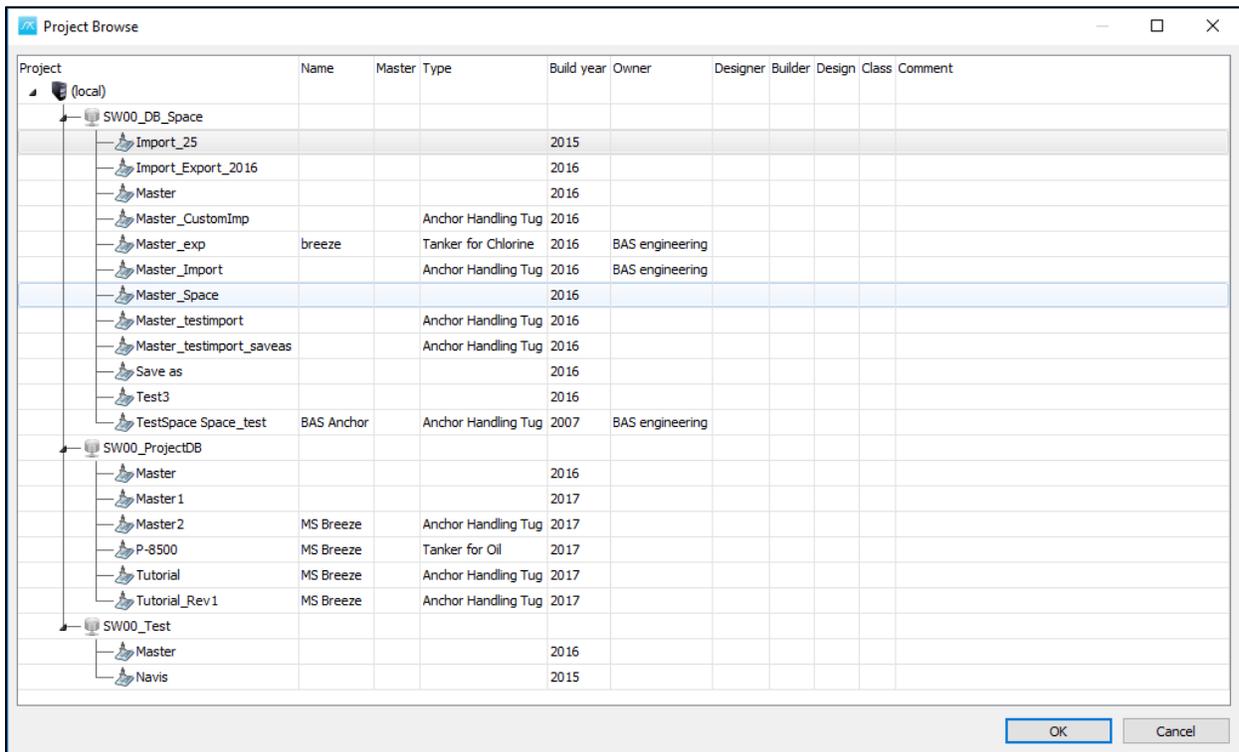
And then click OK to delete it.

Now, when you go to open a project, you may find that some of the project Database can contain a lot of Project, as in the following database (SW00_DB_Space):



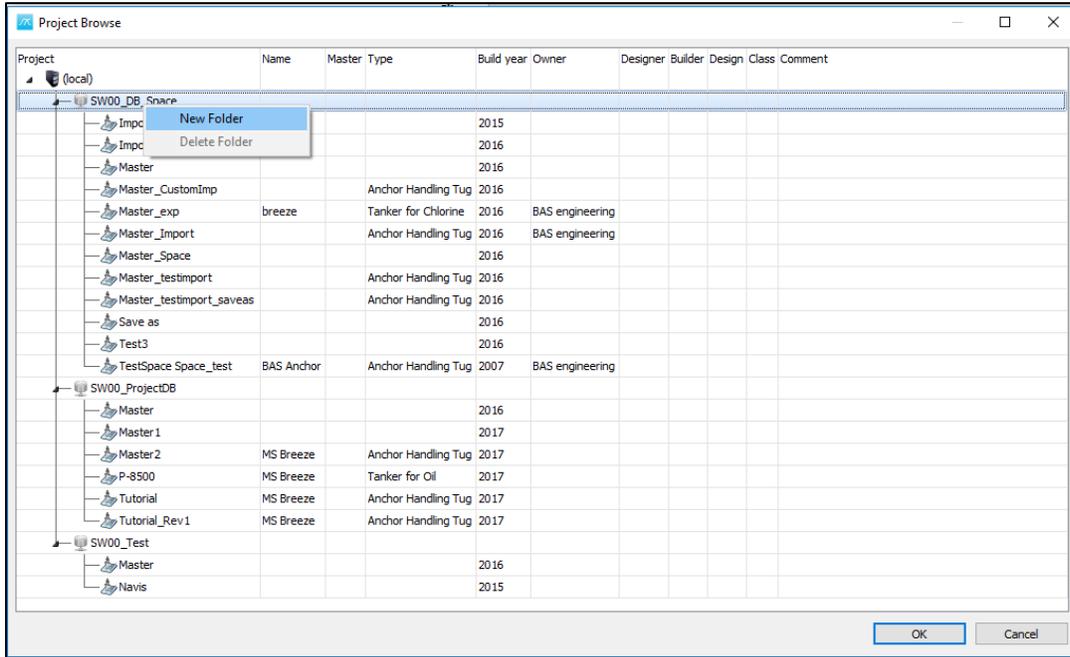
The list below here will get very long and tedious to select from. In this case you may organise your project in a hierarchy, by clicking the button to the right 

This opens up the Project Browse dialog:

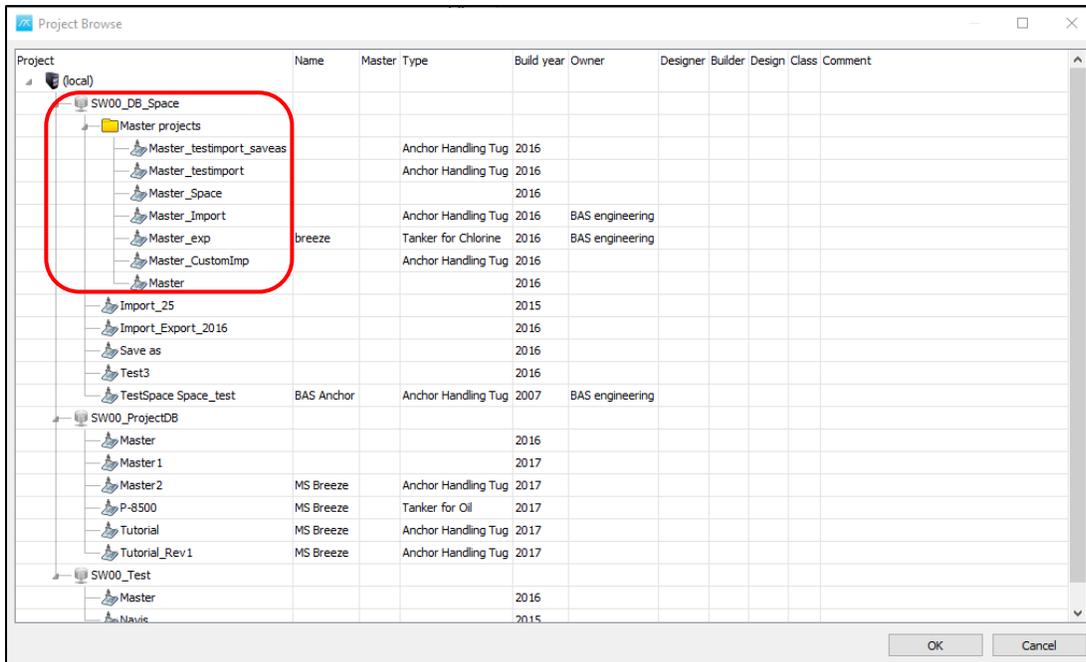


Here you can see again your project Databases and the projects id within each of your project databases.

This dialog allows you now to create some folders, by right click on SW00_DB_Space:

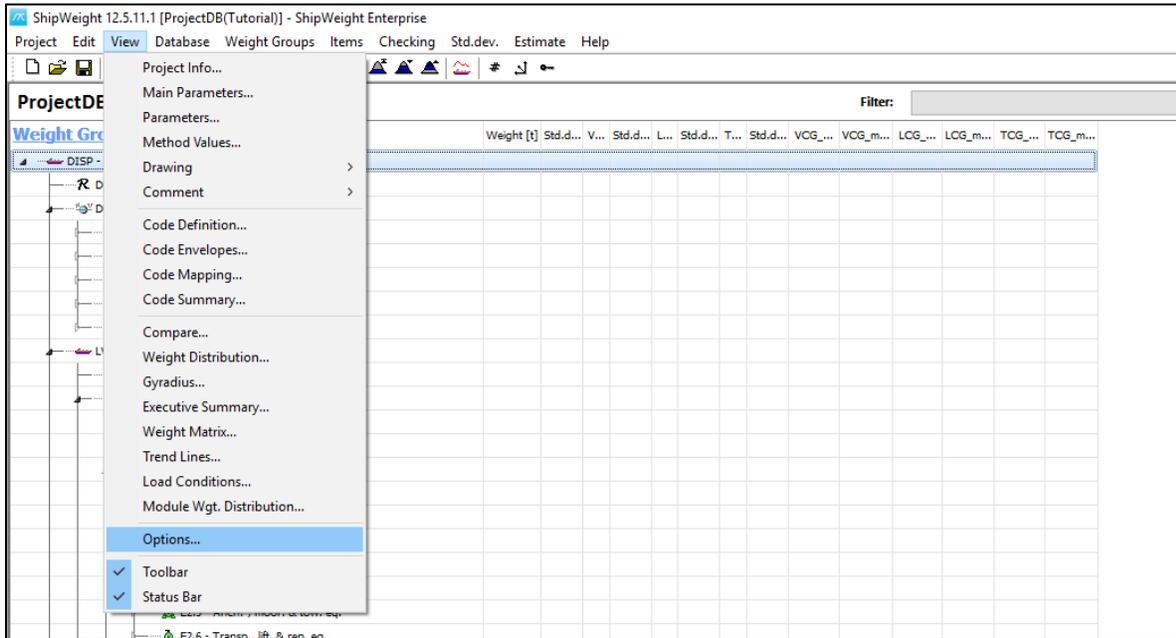


Let's create one folder, type in the name for the folder and then drag and drop your appropriate projects into the new folder to organize them better, as in the following example:

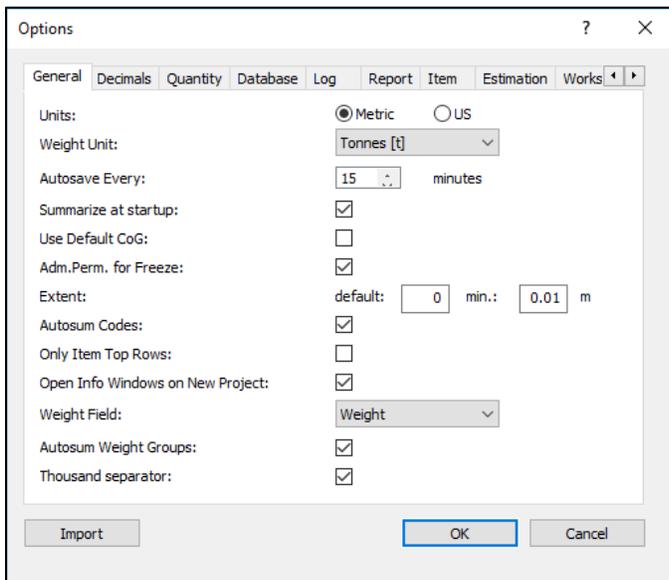


Another important part in the Project Administration is in the Options dialog. The Options dialog has important settings for each of the projects.

To open the Options dialog go into the View menu, and select Options...

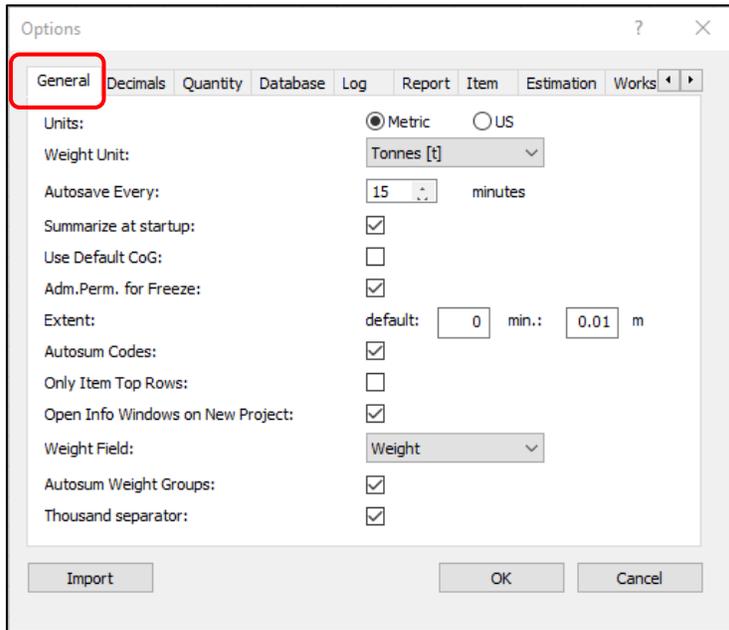


This will bring up a dialog that has many tabs, and in each tab you can set various options:

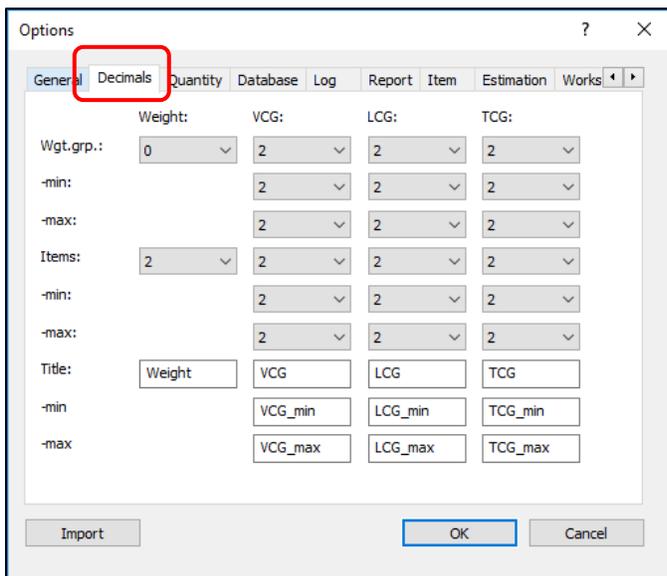


For example the first tab is **General**, where you can select:

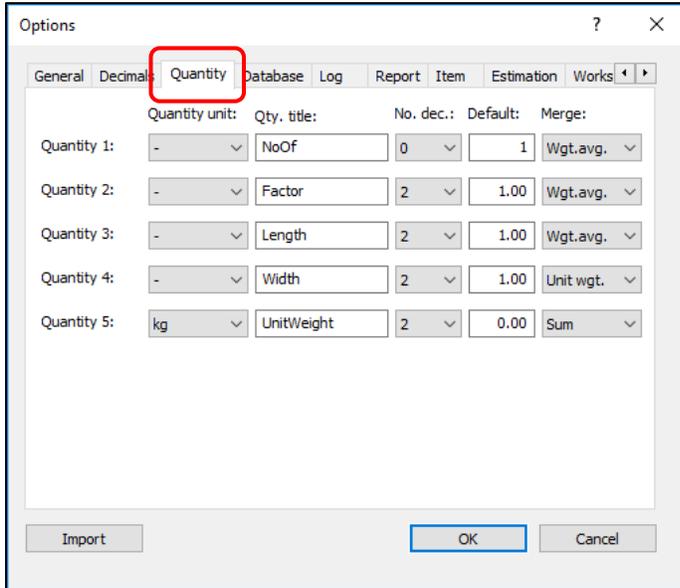
- the Units in Metric or US
- The Weight Unit
- Whether it should summarize at startup etc.



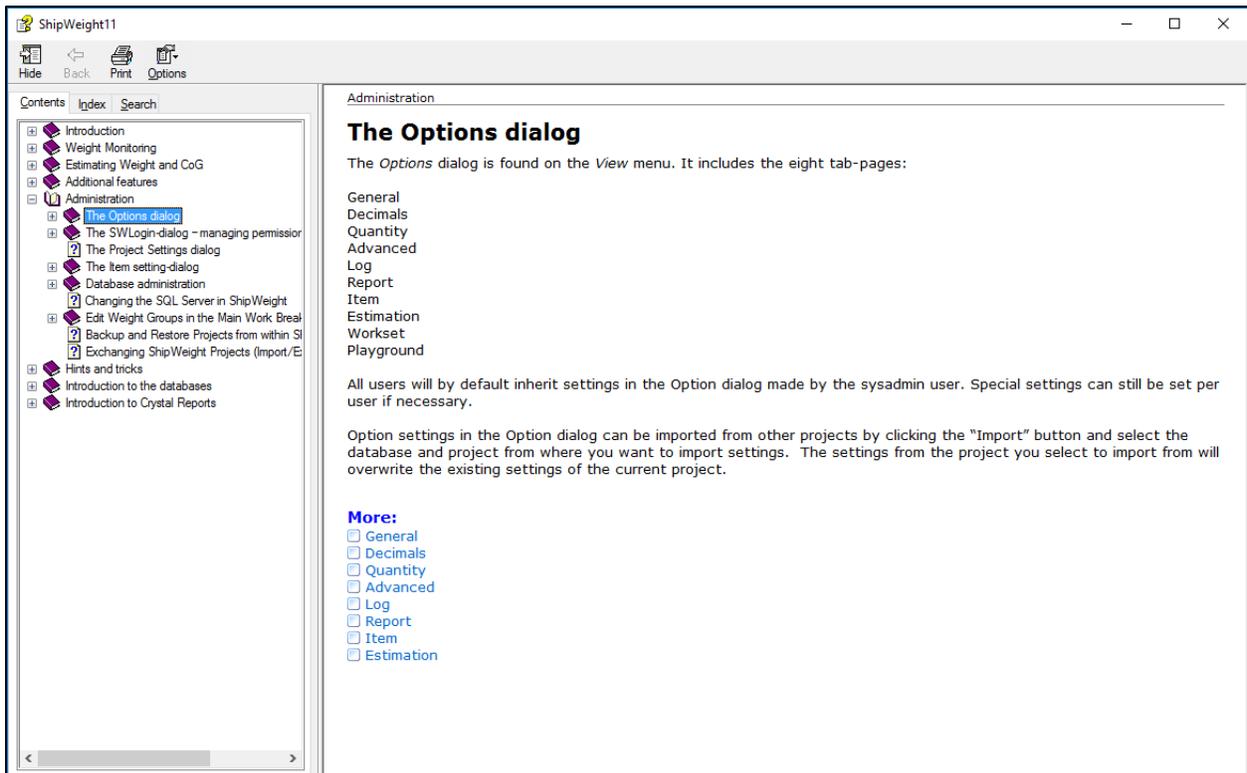
The next tab is the **Decimals** settings, for the weight groups in the main window and for the detailed items in the Item dialog:



Next you have names for **Quantity** and default settings for Quantities when a new row is added:

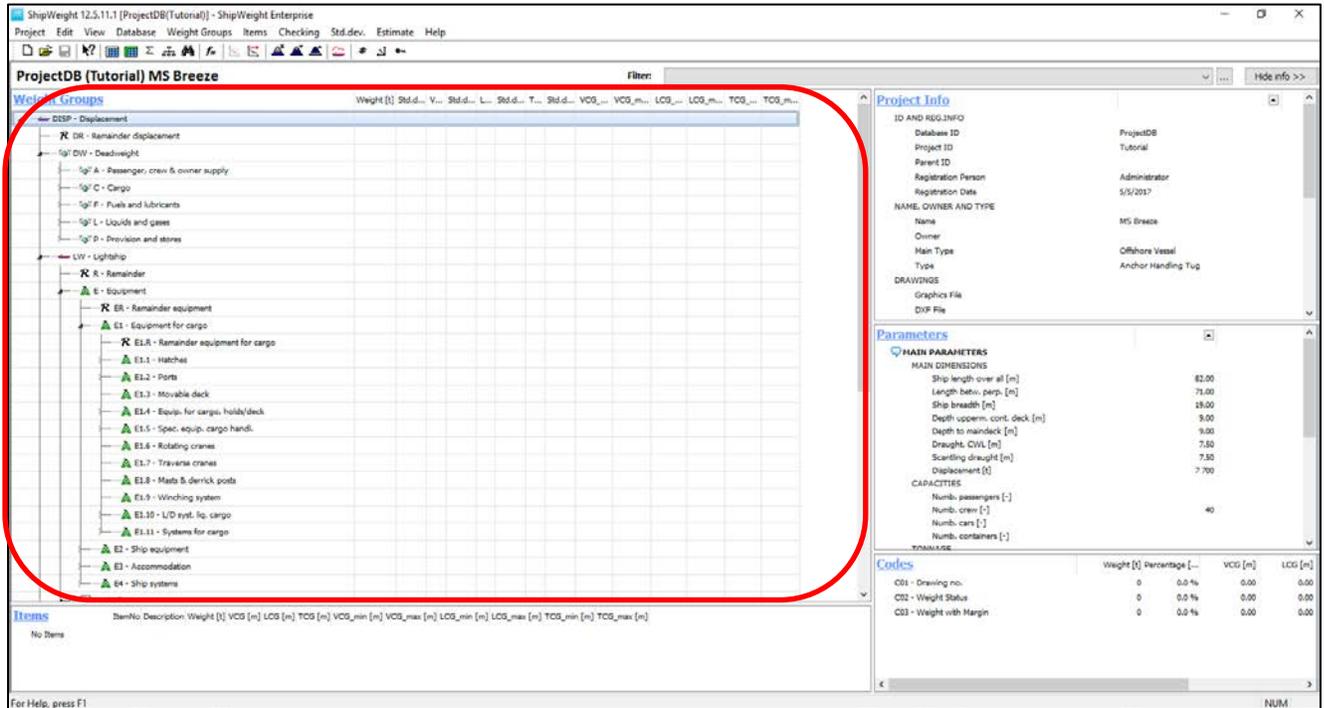


For more details about this settings hit the F1 key to bring up the context sensitive help, which will show you explanations for various tabs of the Options dialog:



Finally, in the Project Administration chapter, we will see how to navigate in the work breakdown structure.

The main area of the main window shows the work breakdown structure as a hierarchy and you can navigate in it just like you navigate in windows explorer, by exploding and colapsing nodes:

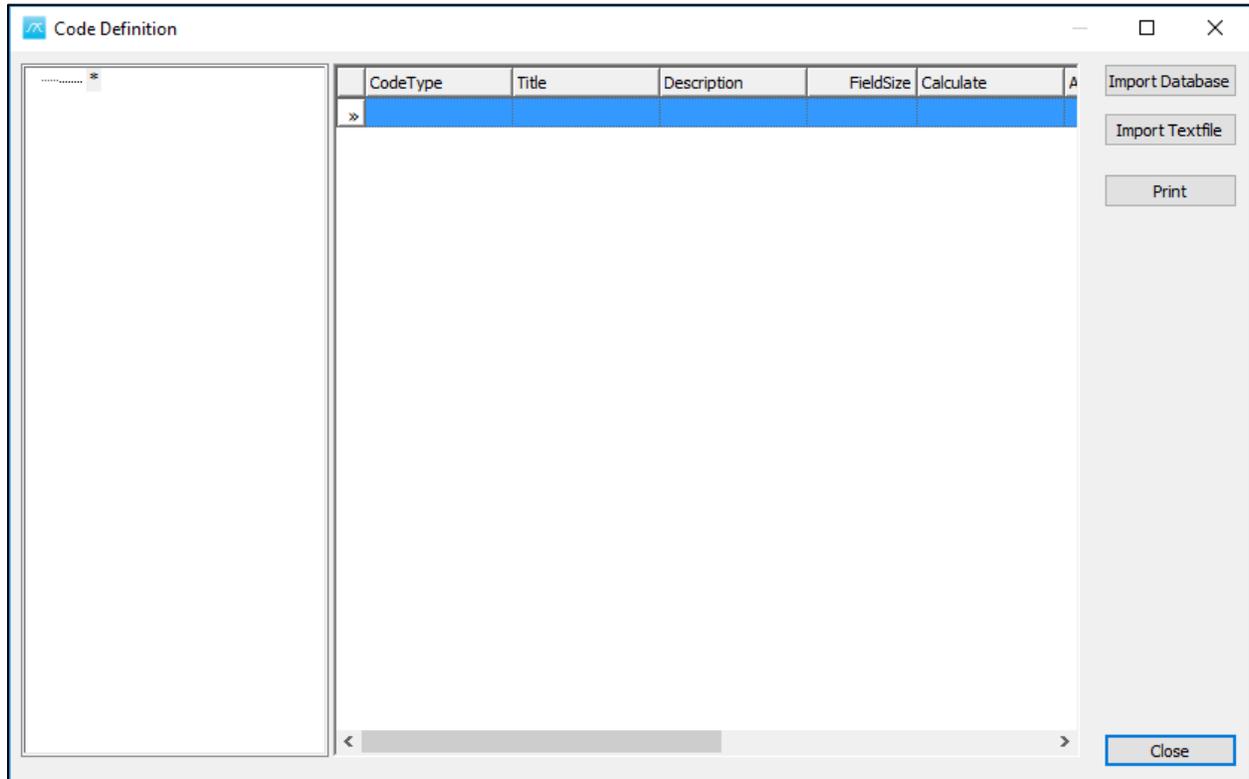


To the right of the main window, we have Project information, Parameters and Codes. These extra information can be hidden by using the [Hide info >>](#) button.

3. Getting data into ShipWeight

3.1 Code Definition Basic

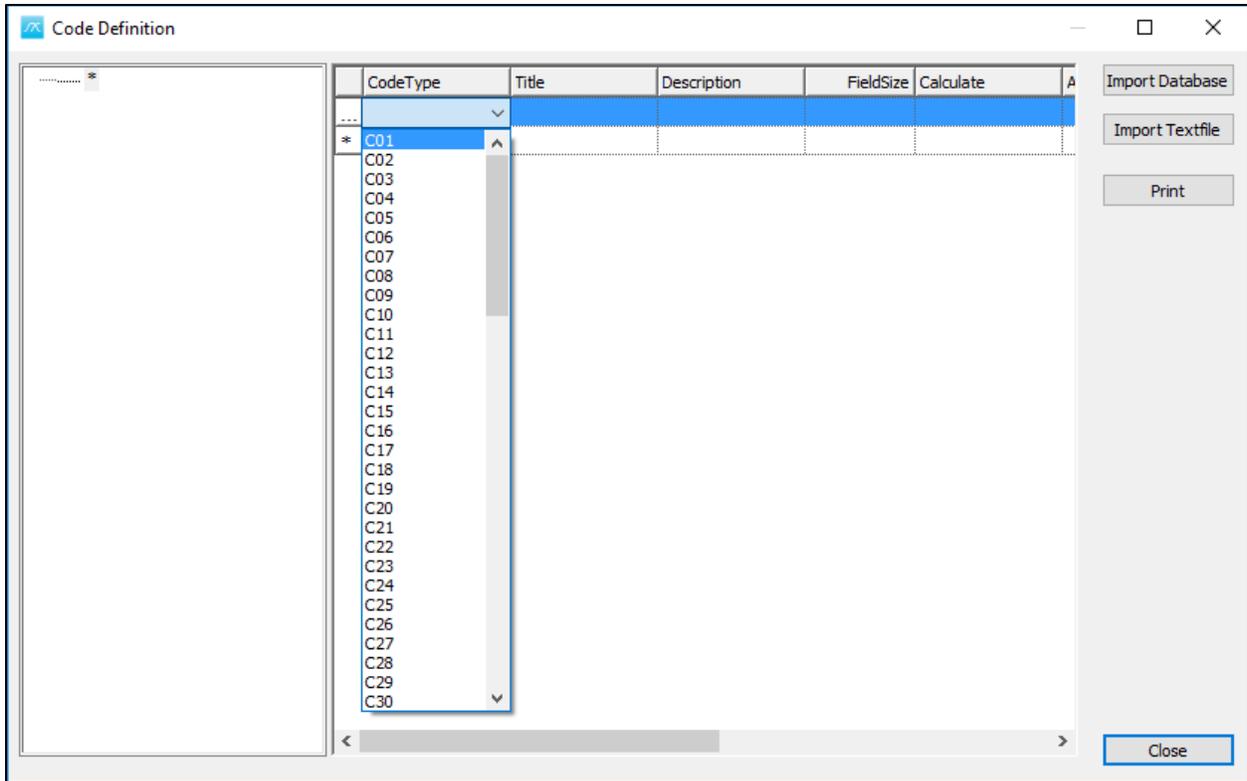
To open the Code Definition dialog, select **Code definition...** on the View menu of ShipWeight dialog.



The Code Definition dialog contains a tree-view on the left side, and a table on the right side. It allows the user to define his own fields in ShipWeight.

Define Drawing number code

To create a code, select the cell in the column “**CodeType**” of the table. The cell will become activated and editable. A new row automatically will be added, and the cell will turn into a combo box (editable dropdown list). Next, activate the dropdown of the combo box and select the ID of the custom code you want to make e.g. *C01*.



Next, fill in the following fields:

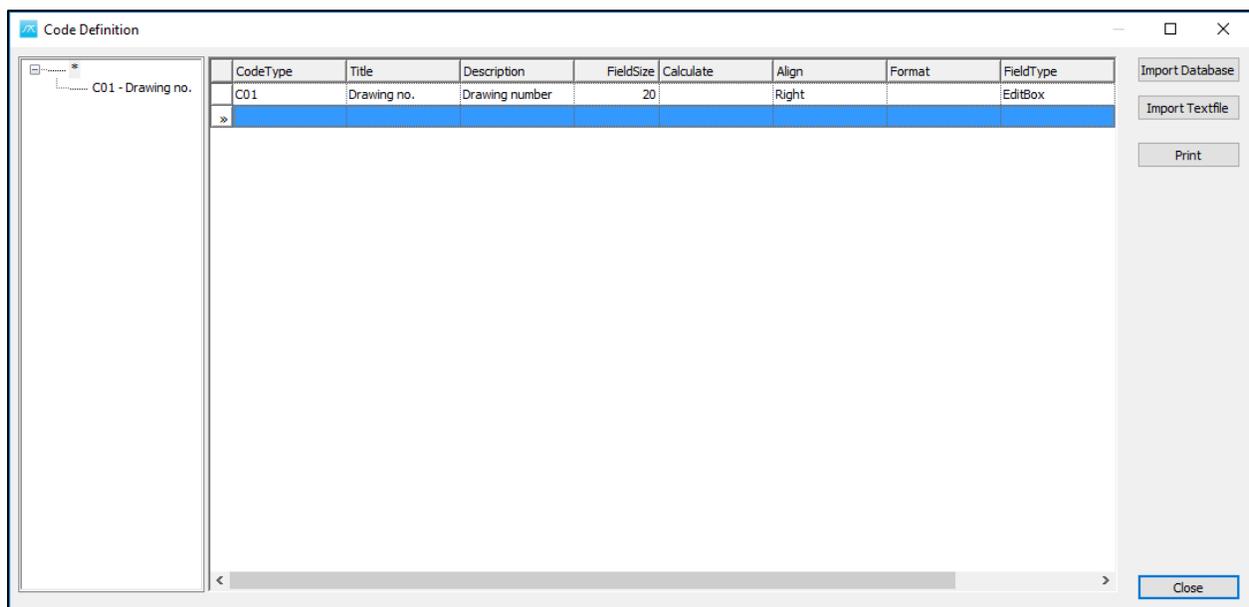
Field	Value	Description
Title	Drawing no.	<i>Title will show above field in Item dlg.</i>
Description	Drawing number	<i>Information only, no effect</i>
FieldSize	20	<i>Number of characters allowed in field</i>
Calculate	(leave empty)	<i>Formula for calculated codes (Leave empty)</i>
Align	Right	<i>Alignment of value in Item dlg.</i>
Format	(leave empty)	<i>Formatting of calculated fields (Leave empty)</i>
FieldType	EditBox	<i>Specify a standard editable field</i>

To finish off the registration of code **C01**, click with the mouse on the empty line in the table. You can make sure that the code has been registered by checking that it is added to the tree left of the grid. Click the minus/plus sign to (un)expand the tree.

The FieldType in this case is **EditBox**. This means that the custom code field will be an editable box where the user may type in freely.

The other Fieldtypes are:

- ListBox – the user must select value for the field from a dropdown list of predefined values
- ComboBox – the user may select value for the field from a dropdown list of predefined values or type in freely
- ReadOnly – the value cannot be changed by the user

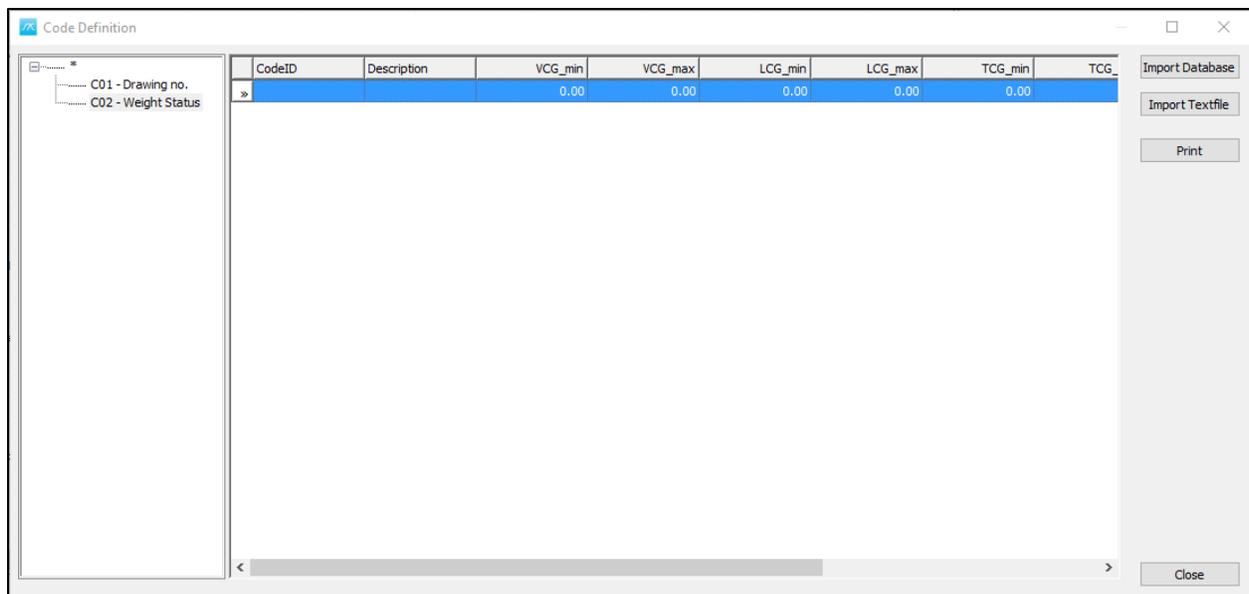


Define Weight status code

In the same way, add the code **C02** with the following values:

Field	Value
Title	Weight Status
Description	Weight Status Code
FieldSize	20
Calculate	(leave empty)
Align	Left
Format	(leave empty)
FieldType	ListBox

Next, we will add code values to the **Weight Status code**. In the tree-view, select code 'C02 – Weight Status'. An empty table for adding code values will appear on the right side of the tree-view.



Select the row of the table and fill in these values:

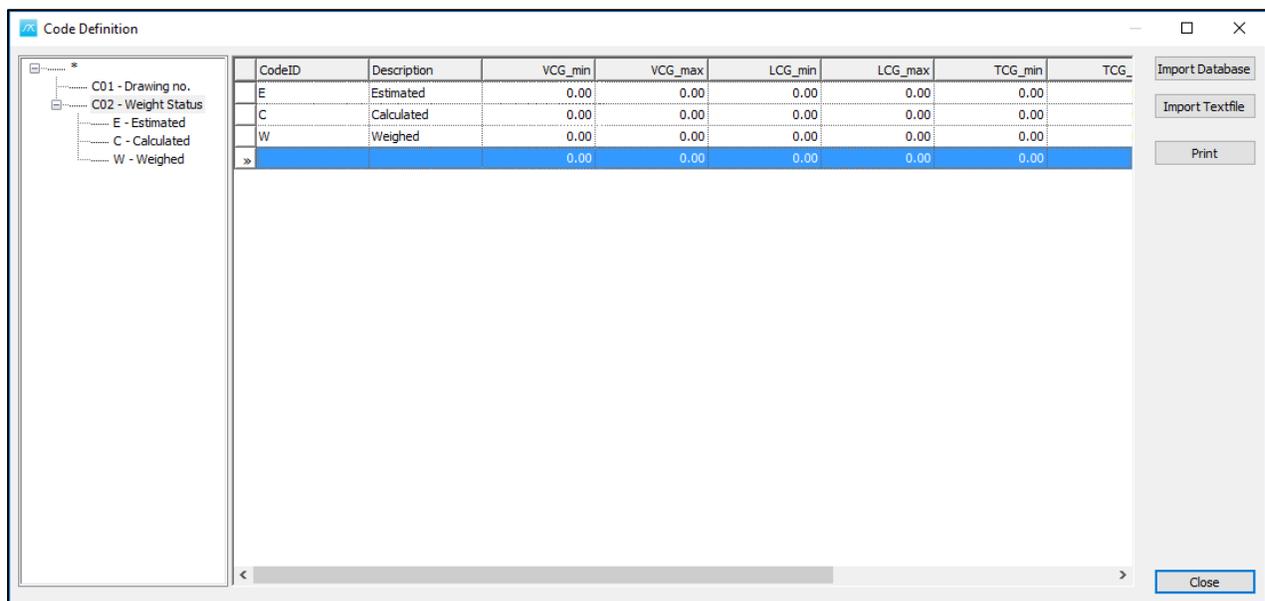
Field	Value
CodeID	E
Description	Estimated
Factor	1.1

Leave the rest of the fields empty, and click on the next row in the table. Enter two more code values:

Field	Value
CodeID	C
Description	Calculated
Factor	1.05

Field	Value
CodeID	W
Description	Weighed
Factor	1.02

Finish off registering the code value by clicking the last row in the table with the mouse.



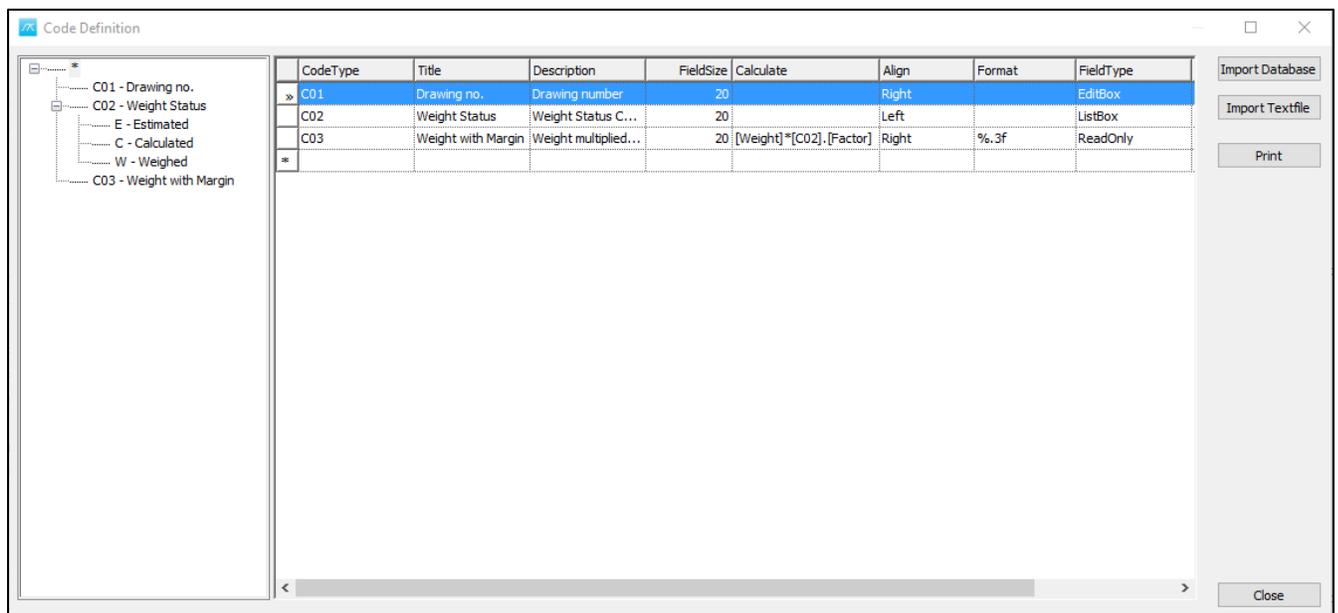
Define Weight with margin code

Next, click the topmost asterisk in the tree-view to display the Code Definition table.

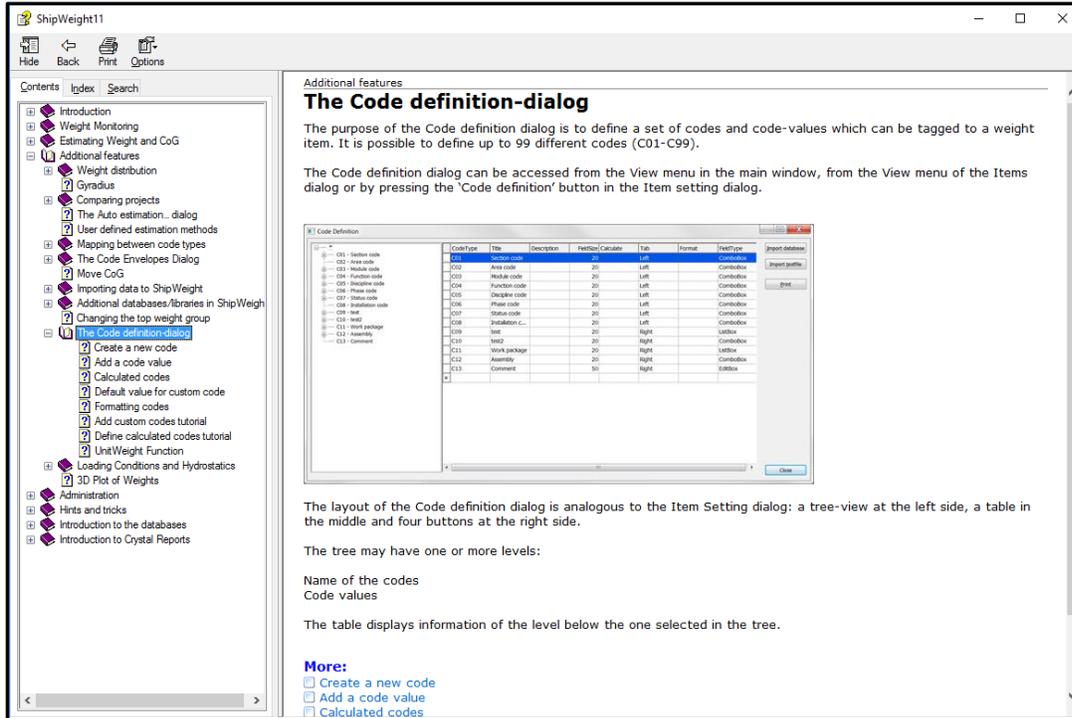
Add code **C03** with the following values:

Field	Value
CodeType	C03
Title	Weight with Margin
Description	Weight multiplied with margin based on Weight Status code
FieldSize	20
Calculate	[Weight]*[C02].[Factor]
Align	Right
Format	%.3f
FieldType	ReadOnly

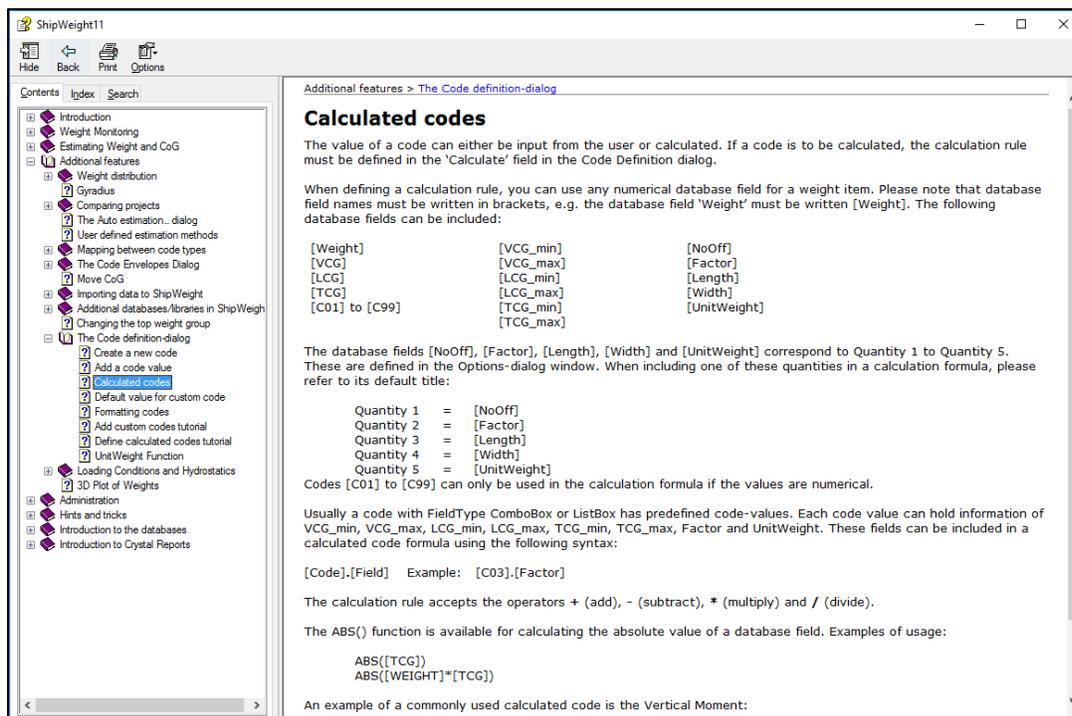
Click the empty row of the table to finish off the registration of **C03**.



Hit F1 button to bring up the Help file for Code definition dialog:



In the Help file, select the Calculated Codes to find all the options to use for the calculated fields and how to set the calculations:

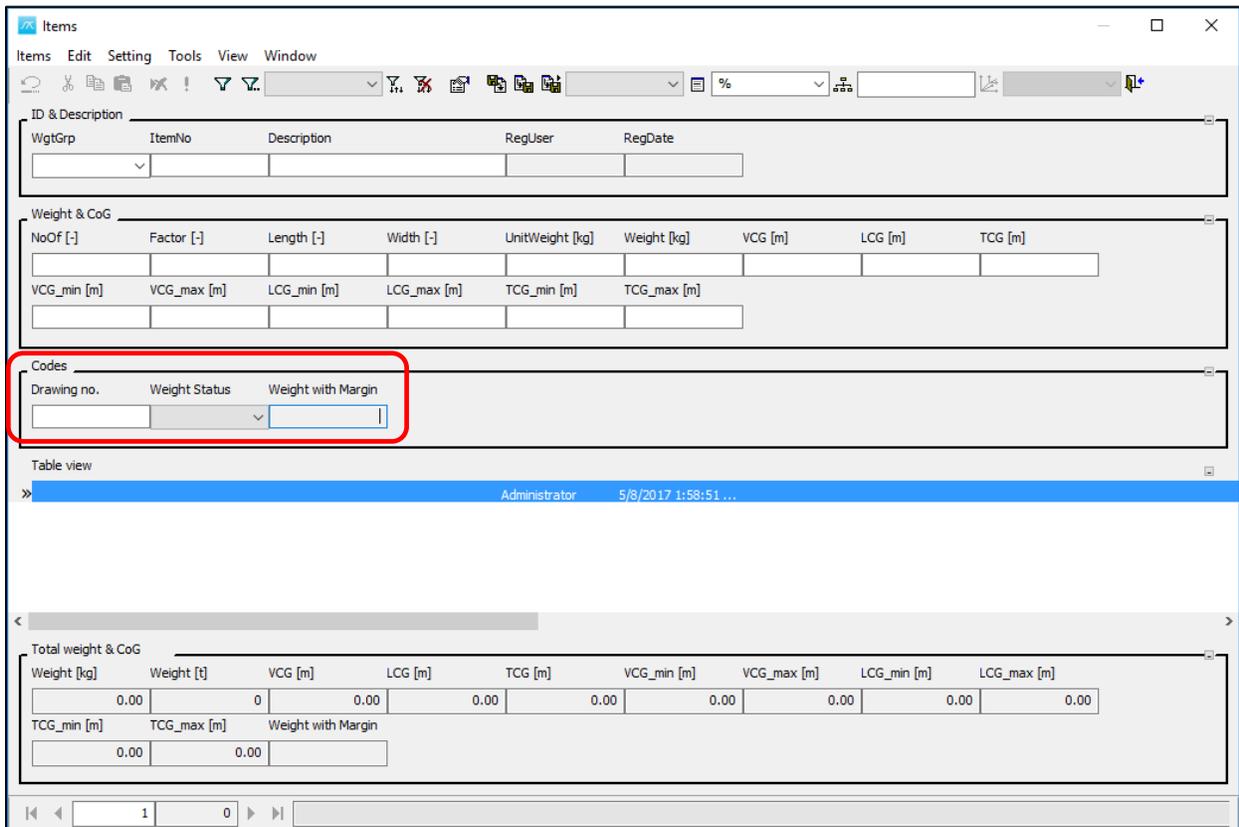


Finally, close the Code Definition dialog.

Now open the Items Dialog, in ShipWeight main window select Items and choose List Itels -> All...

Alternatively, press the 'Item level' button on the toolbar: 

The Items dialog now opens in default mode. In the Items view, it can be noticed all of the added codes:

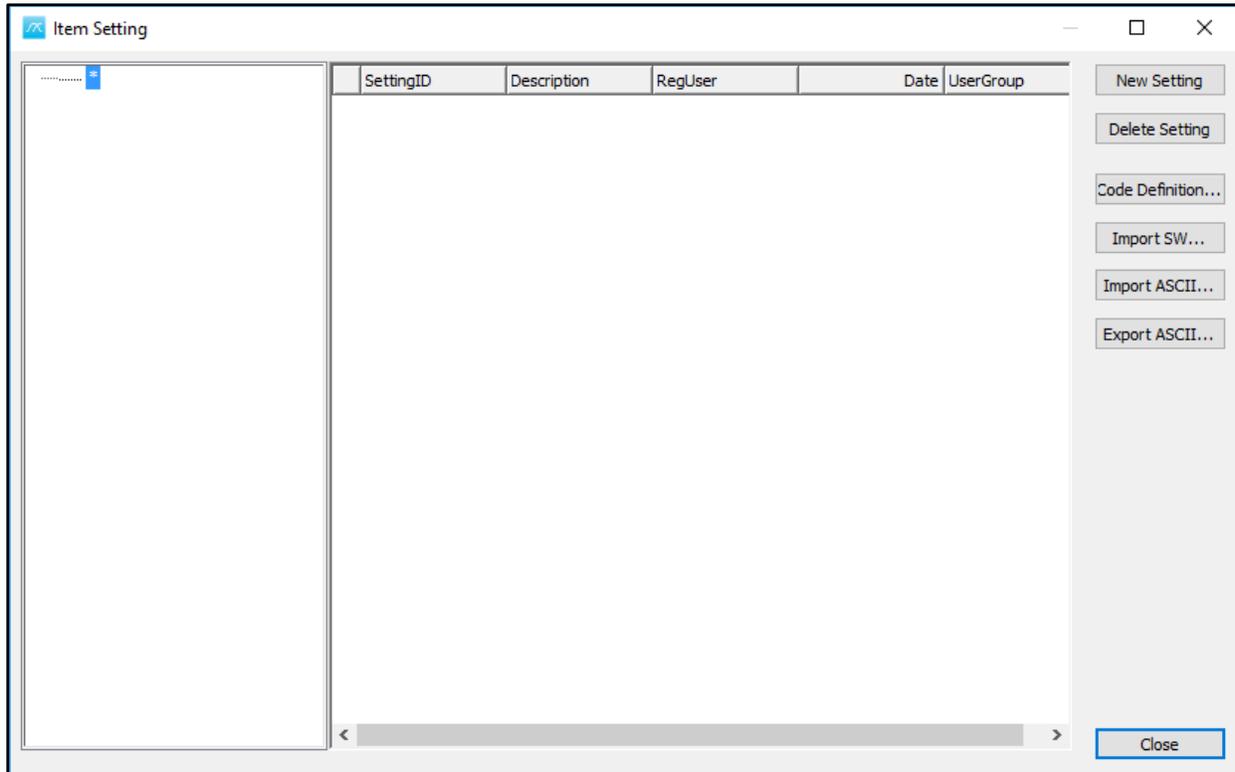


The Code Definition dialog can be reopened anytime from Items dialog, View menu -> Code Definition.

In the Item Settings dialog the user will have the possibility to take these codes and move them to different positions of the Items view, and learn how to generalize and customize this view.

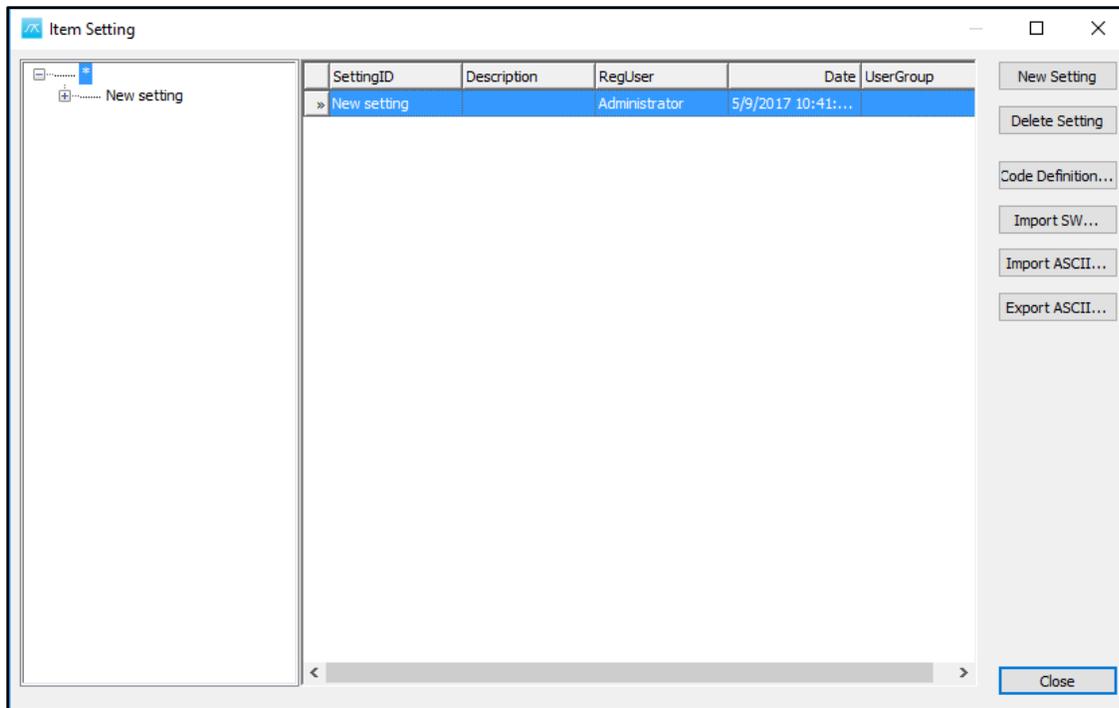
3.2 Item Setting dialog

Back in the Items dialog, select Item settings... in the Setting menu to display the Item setting dialog. Alternatively, press the Item setting... button on the toolbar. The Item setting dialog controls the layout of the Item dialog.

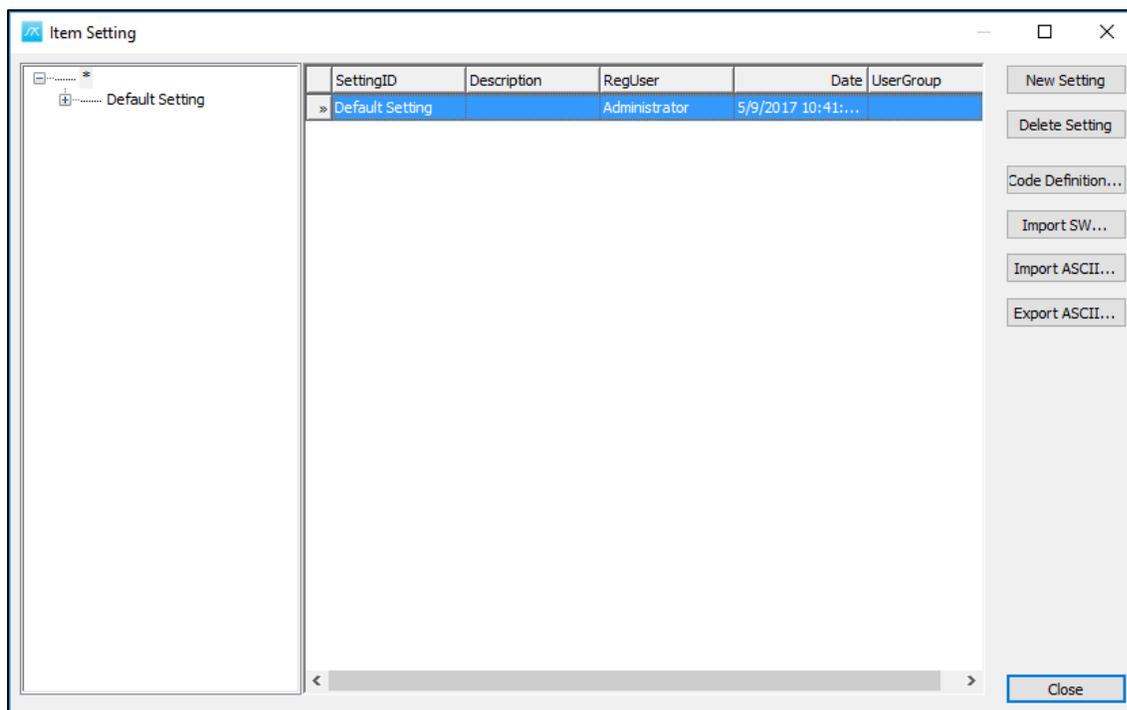


After the Item Setting dialog pops up, to start creating a new setting, press the **New Setting** button. This will generate the starting point for the new setting.

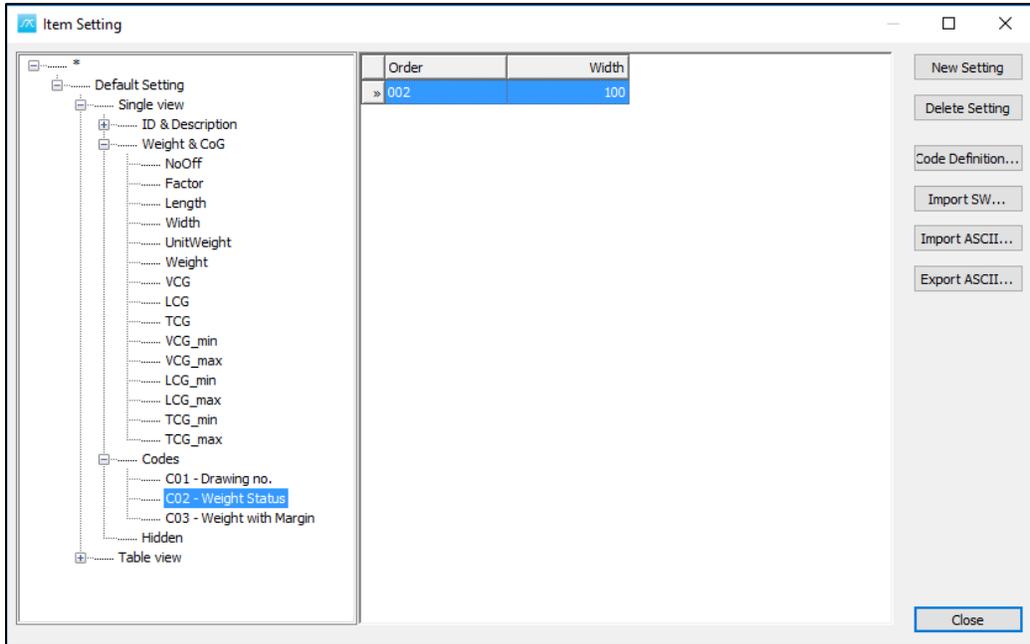
In the tree-view on the left side, click the plus sign next to the asterisk to expand the tree. A setting named '**New setting**' has been created. Your dialog should then look like this:



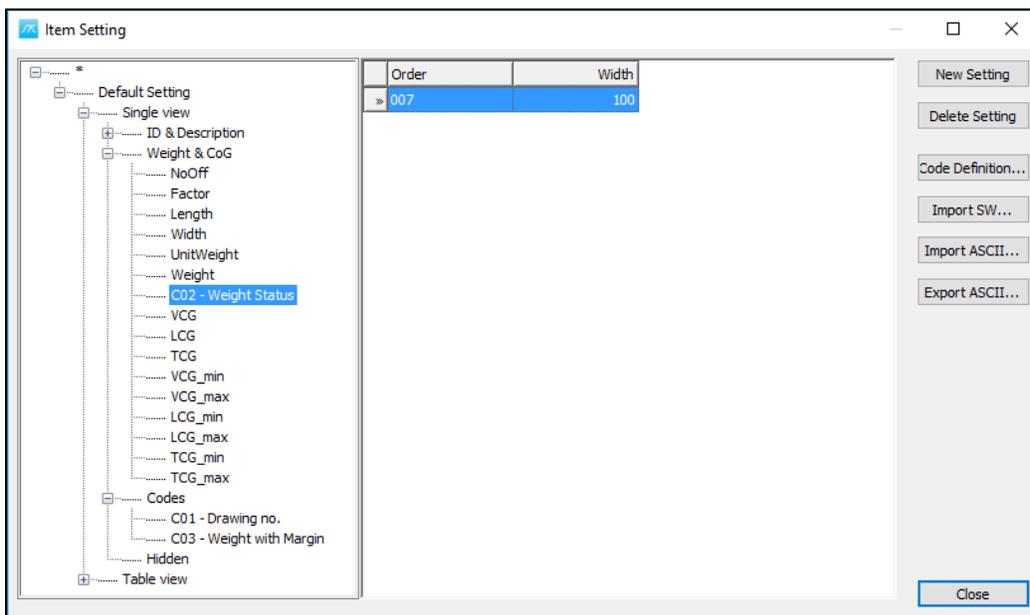
Make sure the topmost asterisk is selected in the tree. Click the 'New setting' cell in the SettingID column of the table. Change the Setting ID from 'New setting' to e.g. 'Default Setting':



Next, expand the tree further by clicking the plus sign in front of 'Default Setting', 'Single view', 'Weight & CoG' and 'Codes'. Select 'C02' in the 'Codes' branch of the tree:



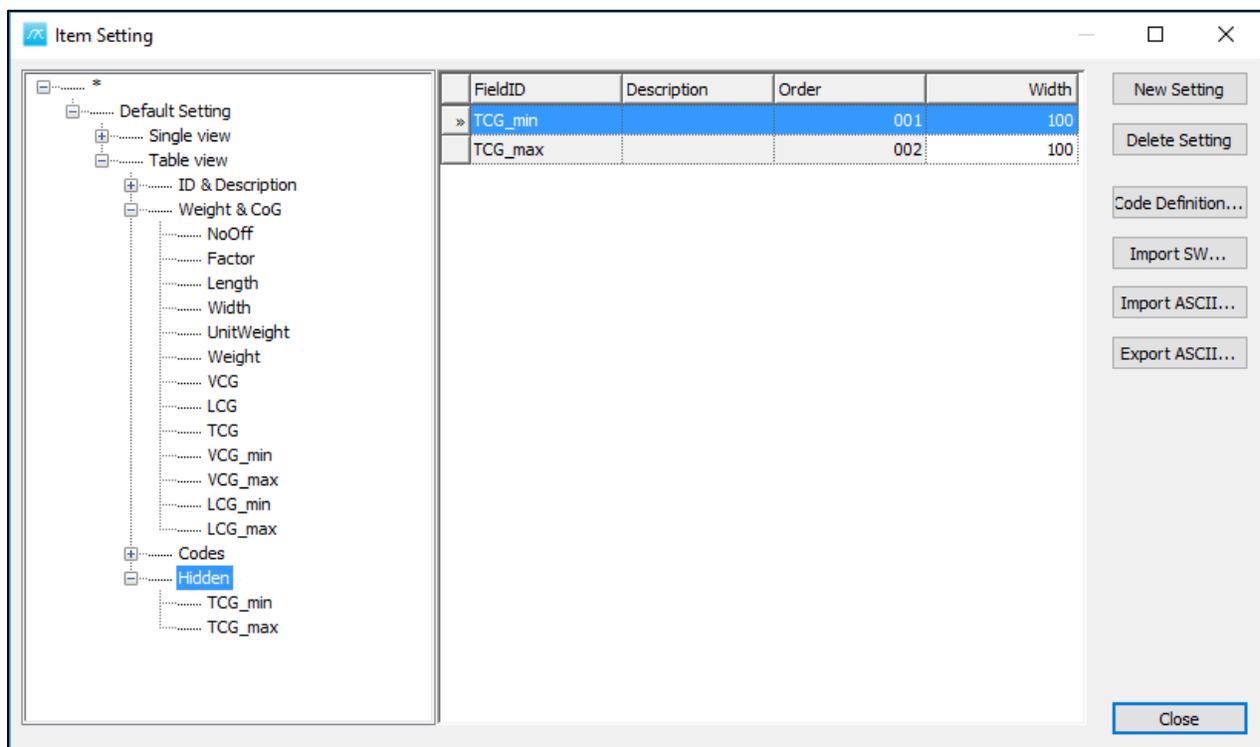
Using the mouse, drag 'C02' from the 'Codes' group and drop it on Weight in the 'Weight & CoG' group. C02 will now be placed directly after the Weight field in the Single Record area of the Item dialog:



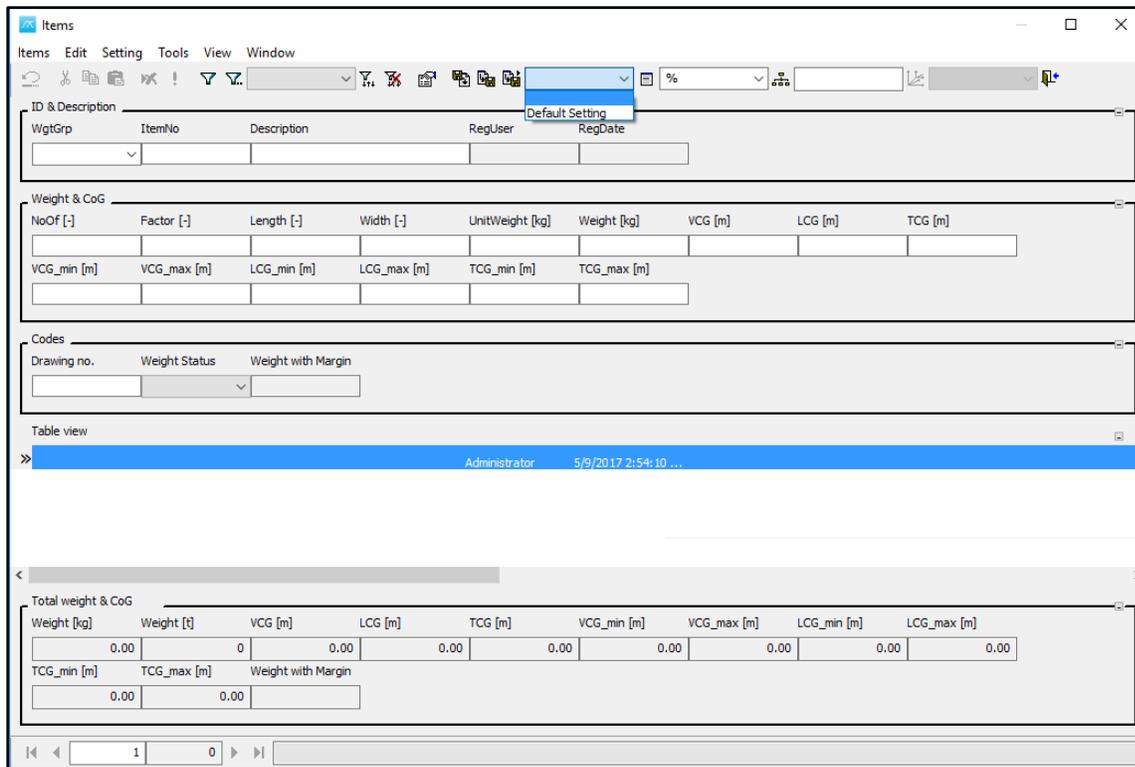
Now go to Table view.

Expand the 'Table View' branch by clicking the plus sign in front of it, and then the 'Weight & CoG' branch. Select 'TCG_min' with the mouse. Drag and drop it in the 'Hidden' group. Repeat this for TCG_max.

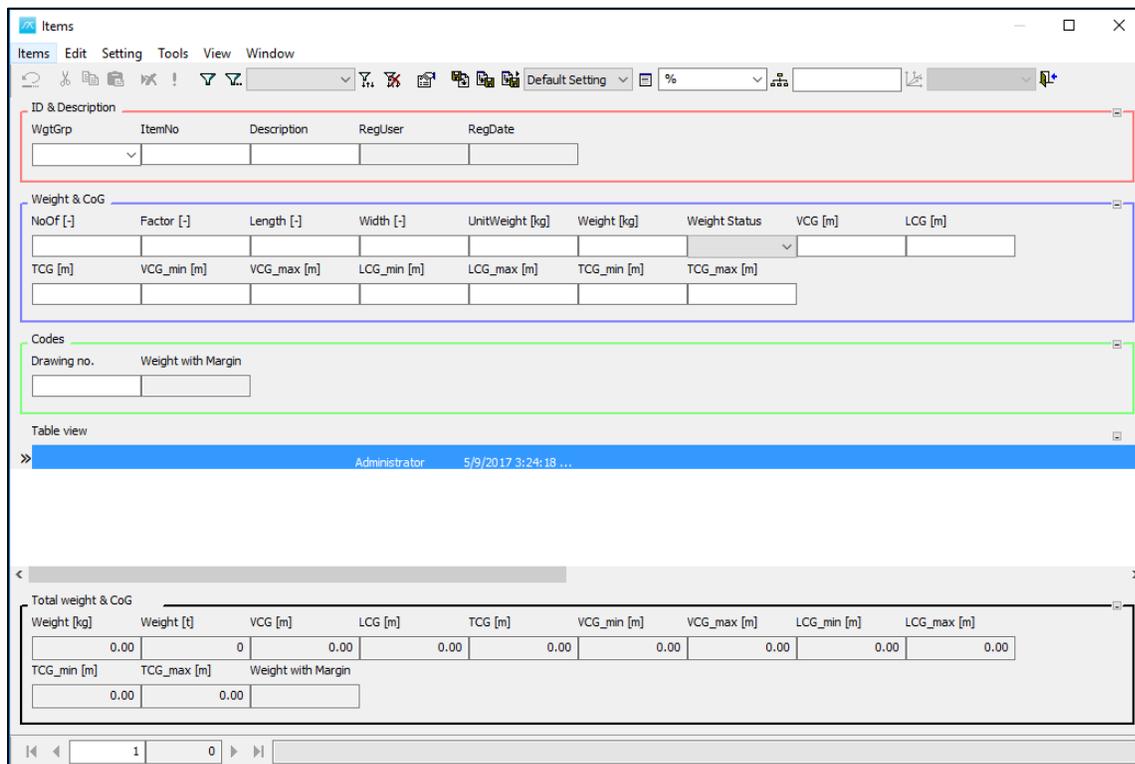
The TCG_min and TCG_max fields will now be hidden in the Table View area of the Item dialog.



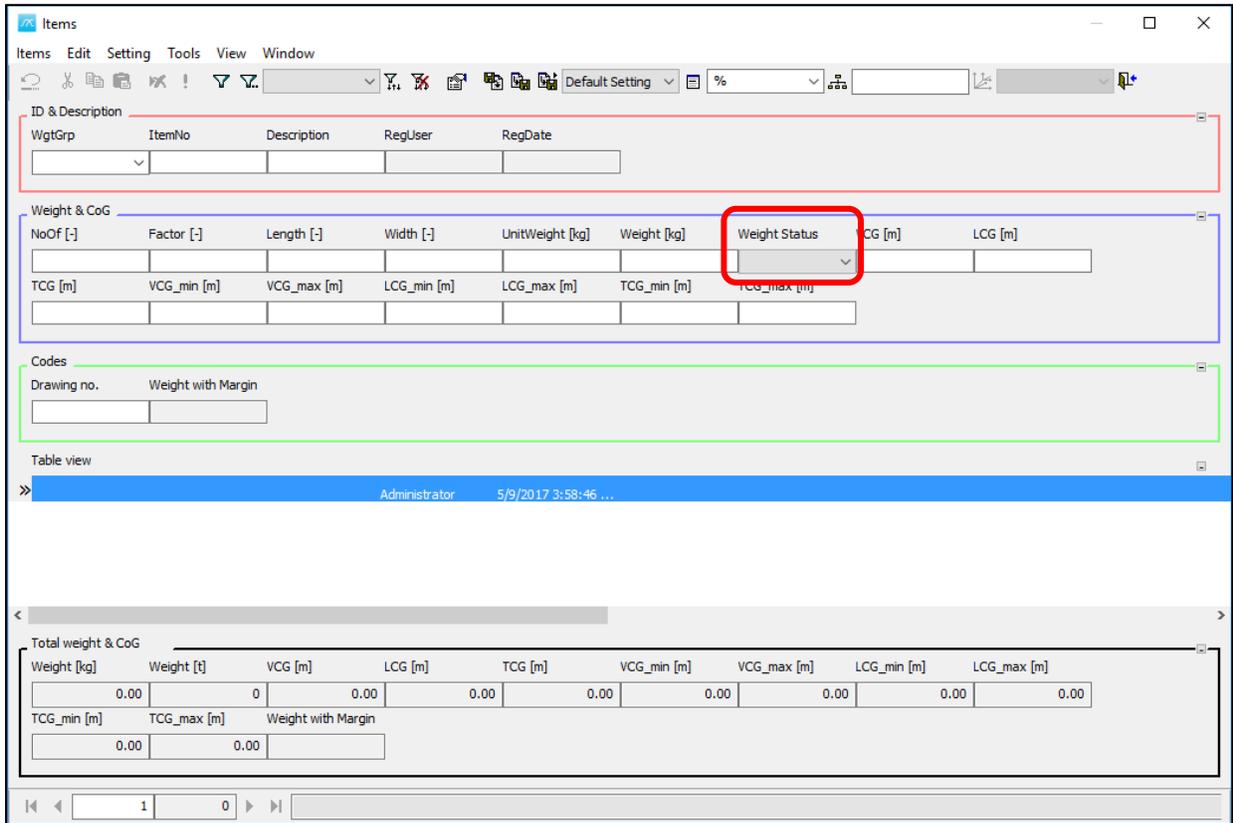
To activate the new setting 'Default Setting', close the Item Setting window, and then select 'Default Setting' from the 'Setting' dropdown list on the toolbar:



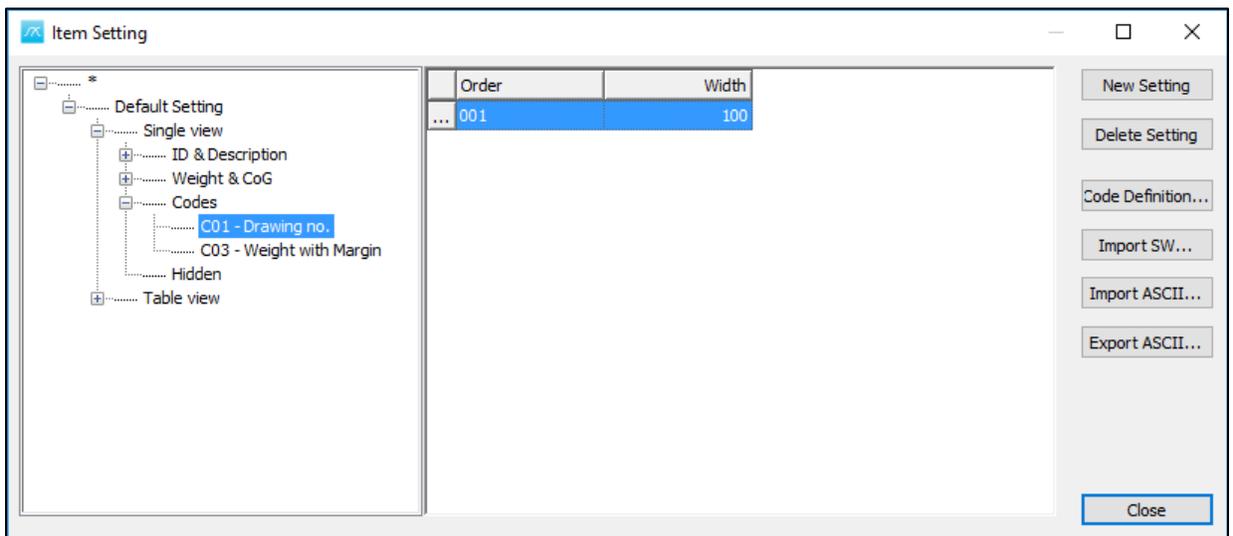
Now, the Item dialog should look like this:



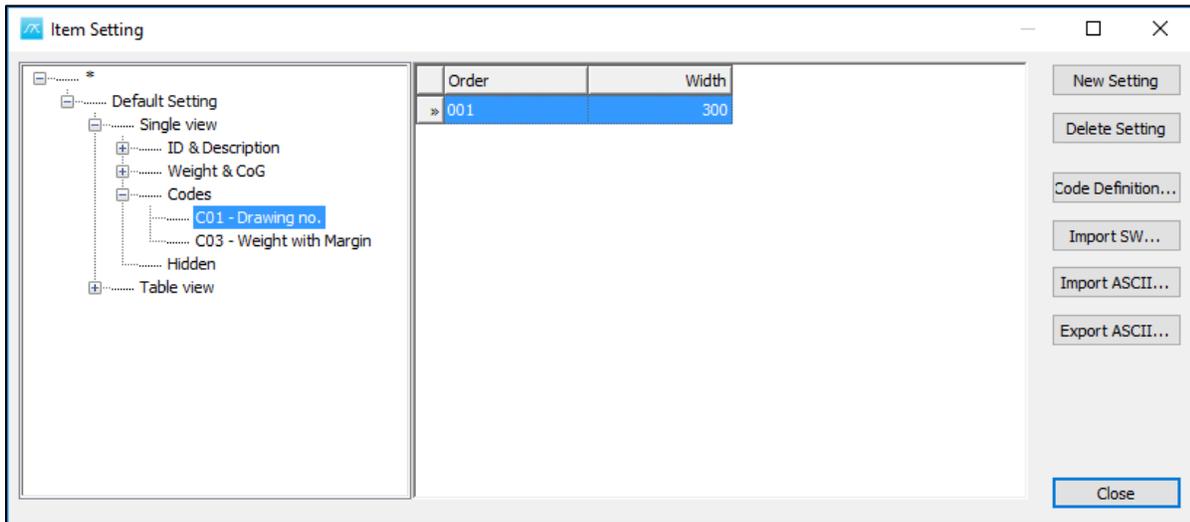
Based on the changes made in the Item Settings dialog, now it can be noticed that C02 code (Weight Status), is located in the Single View: Weight & CoG:



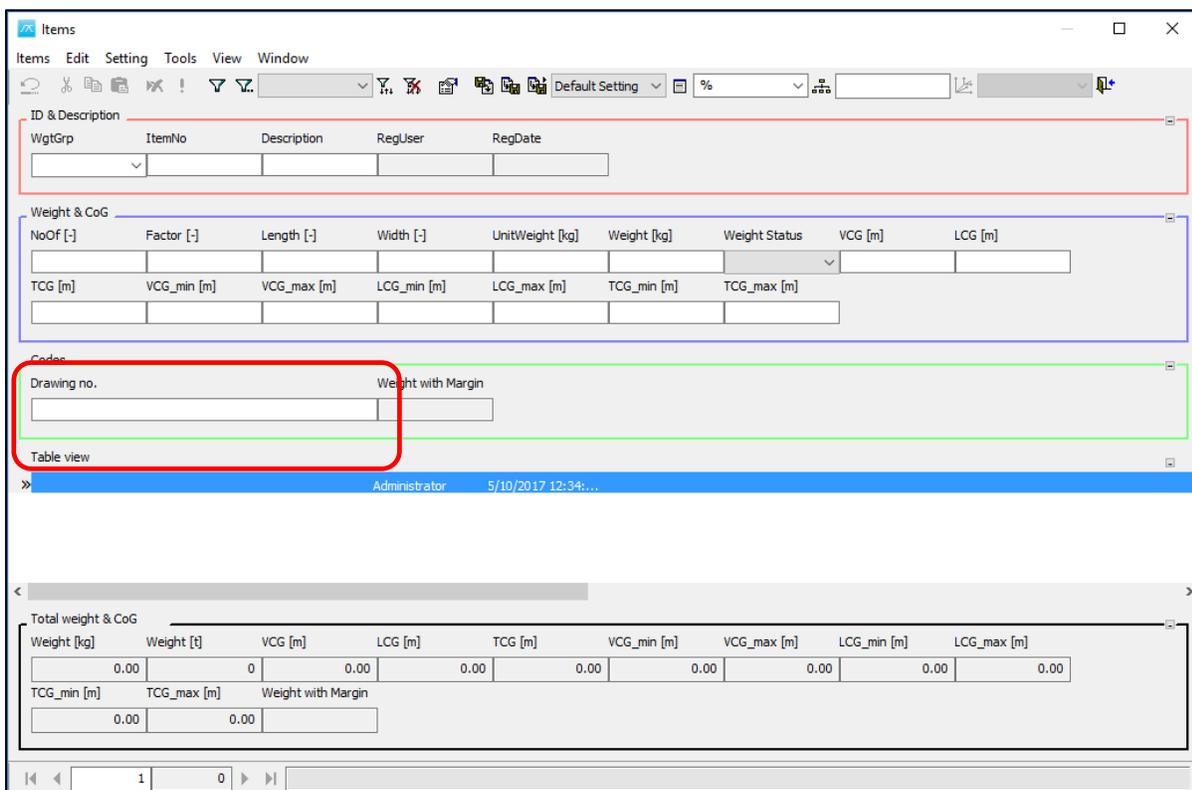
To change the width of items in the Single View, open the **Item Settings** dialog, go to **Single view**, then **Codes**, and click on **C01-Drawing no.**



Now change the standard C01 code Width from 100 to 300:



The result will be:

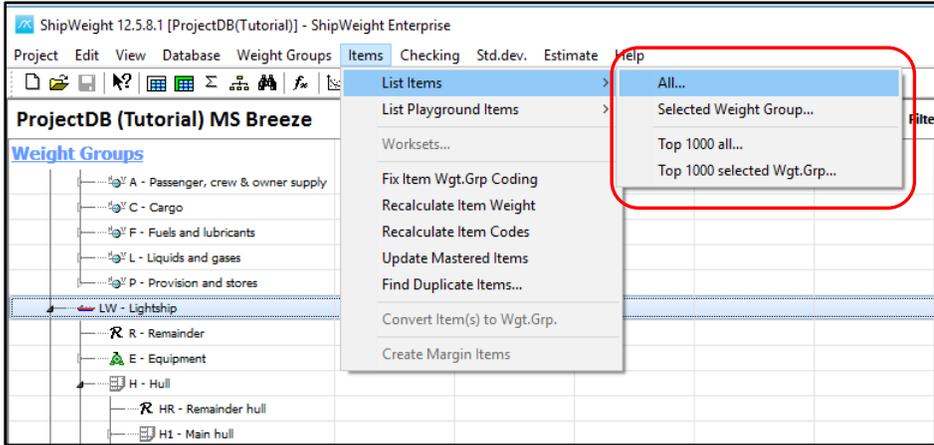


As long as the Item Setting 'Default Setting' is selected in the drop list, any changes that the user will do to the 'Item Setting' dialog will automatically be applied to the 'Items' dialog.

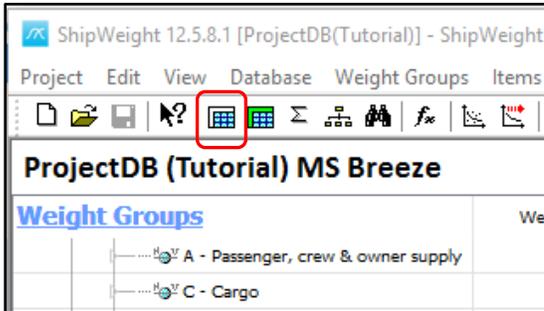
3.3 The Items dialog

There are three ways to open the item dialog:

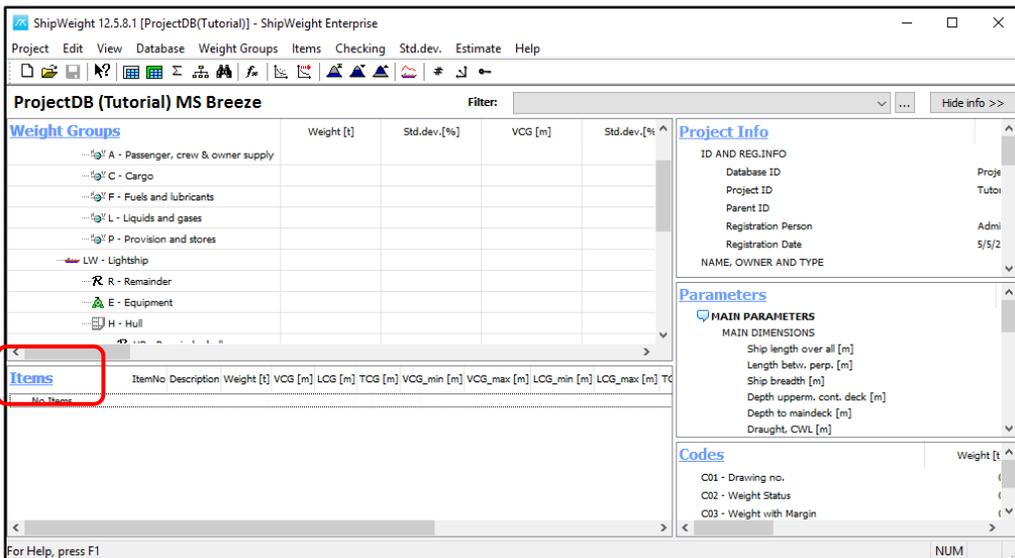
- Select Items and choose List Items -> All



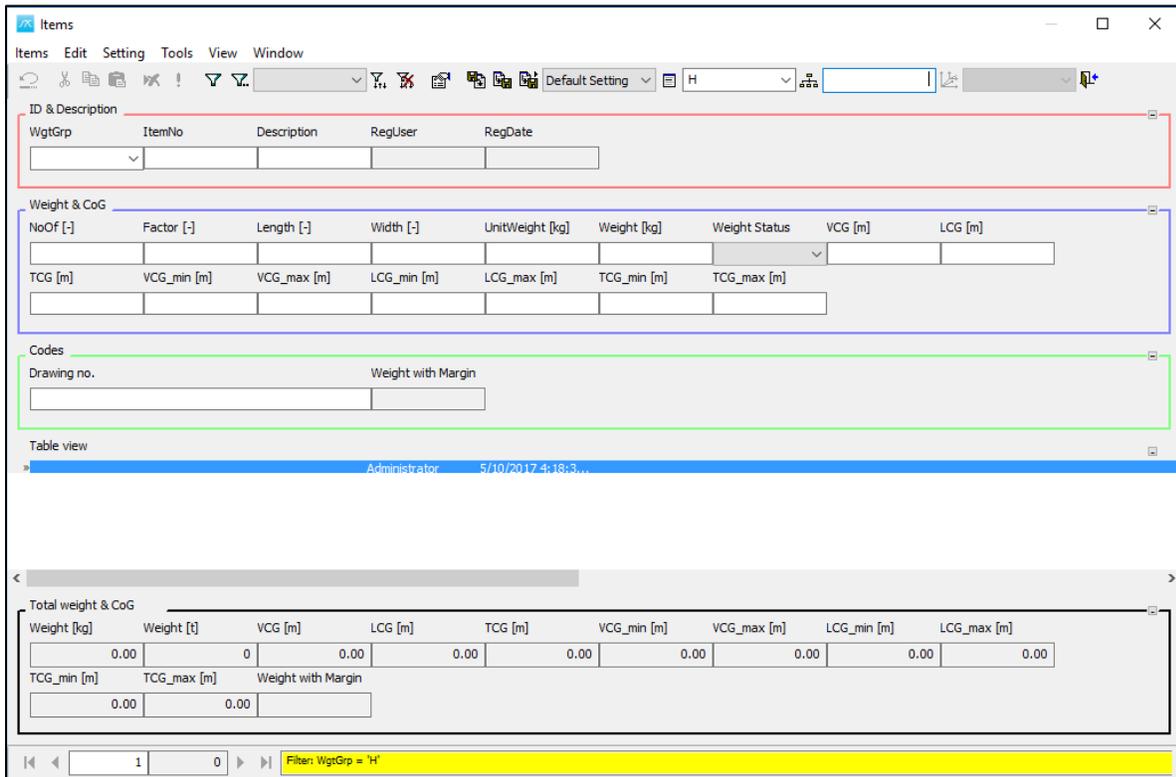
- Alternatively, press the 'Item level' button on the toolbar:



- Or select Items header on this preview window:

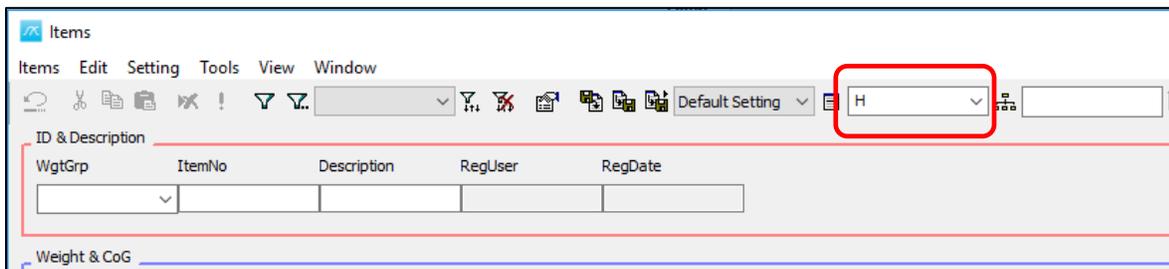


Choose one of the specified options to open the Items dialog:



It is very important to know the link between the selected weight group in the main window and the actual item dialog that pops up.

When the Items dialog was opened, the focus was on the SWBS group H – Hull, and this means that H is now opened in the item dialog. In the weight group filter we can see H:



To close the Items dialog press the Close dialog icon .

3.4 Entering data in Items dialog

Open the Items dialog for weight group H1.1 Aftbody.

In the ShipWeight main dialog window, navigate to weight group H1.1 Aftbody and open the Item dialog.

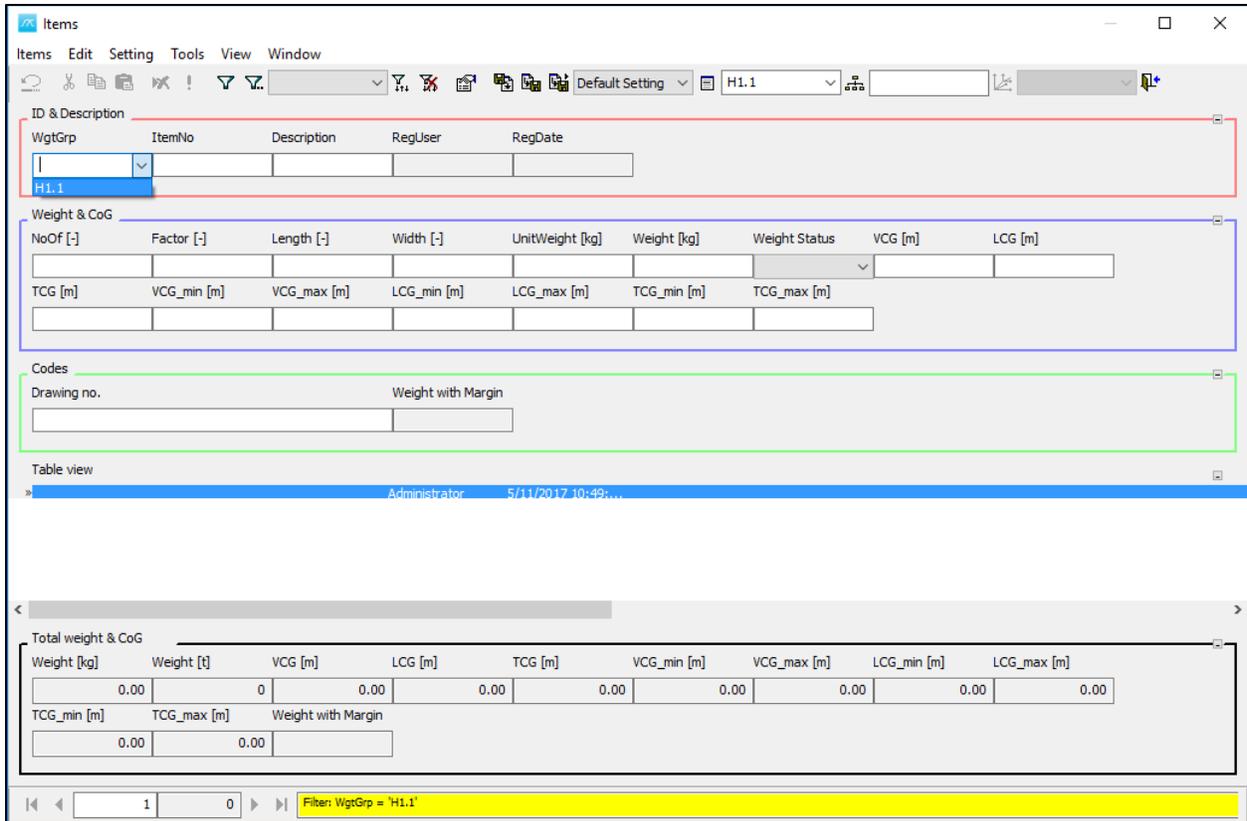
The screenshot shows the 'Items' dialog window with the following sections:

- ID & Description:** A table with columns: WgtGrp, ItemNo, Description, RegUser, RegDate.
- Weight & CoG:** A table with columns: NoOf [-], Factor [-], Length [-], Width [-], UnitWeight [kg], Weight [kg], Weight Status, VCG [m], LCG [m]. Below it are rows for TCG [m], VCG_min [m], VCG_max [m], LCG_min [m], LCG_max [m], TCG_min [m], and TCG_max [m].
- Codes:** Fields for Drawing no. and Weight with Margin.
- Table view:** A table with columns: Administrator, 5/11/2017 10:42:...
- Total weight & CoG:** A table with columns: Weight [kg], Weight [t], VCG [m], LCG [m], TCG [m], VCG_min [m], VCG_max [m], LCG_min [m], LCG_max [m]. Below it are rows for TCG_min [m], TCG_max [m], and Weight with Margin.

At the bottom, there is a filter bar: Filter: WgtGrp = 'H1.1'

Add weight item 'Section 1' using the 'Single Record' area

To register a new item weight using the Single Record area of the Item dialog, you must start by selecting Weight Group H1.1 from the WgtGrp dropdown list.



Jump to the ItemNo field by pressing the TAB button. Enter Item number 1. When pressing TAB once more, the item will be created. Continue filling in data for the weight item.

Data for **Section 1, H1.1 Aftbody**:

Field	Value
WgtGrp:	H1.1
ItemNo:	1
Description:	Section 1
NoOff:	1.000
Factor:	1.000
Length:	1.000
Width:	1.000
UnitWeight:	66000.00

Field	Value
Weight Status:	C
VCG:	4.300
LCG:	-1.250
TCG:	0.000
VCG_min:	1.500
VCG_max:	6.000
LCG_min:	-5.000
LCG_max:	2.500
TCG_min:	0 (hidden field)
TCG_max:	0 (hidden field)
Drawing no.	123-456

The screenshot shows the 'Items' software interface. The 'ID & Description' section is highlighted in red and contains the following data:

WgtGrp	ItemNo	Description	ReqUser	ReqDate
H1.1	1	Section 1	Administrator	5/11/2017 12:51:2

The 'Weight & CoG' section is highlighted in blue and contains the following data:

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	Weight Status	VCG [m]	LCG [m]
1	1.00	1.00	1.00	66000.00	66000.00	C	4.30	-1.25

The 'Codes' section is highlighted in green and contains the following data:

Drawing no.	Weight with Margin
123-456	69300.000

The 'Table view' section shows a table with the following columns: WgtGrp, ItemNo, Description, ReqUser, ReqDate, NoOf, Factor, Length, Width, and UnitWeight. The table contains one row of data:

WgtGrp	ItemNo	Description	ReqUser	ReqDate	NoOf	Factor	Length	Width	UnitWeight [kg]
H1.1	1	Section 1	Administrator	5/11/2017 12:51:...	1	1.00	1.00	1.00	66000.00

The 'Total weight & CoG' section is highlighted in black and contains the following data:

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]
66000.00	66	4.30	-1.25	0.00	1.50	6.00	-5.00	2.50

The 'Filter' section at the bottom shows 'Filter: WgtGrp = 'H1.1''.

To complete the registration of the weight item, press the right-arrow on the toolbar, or click the empty row in the table.

Add weight item 'Section 2' using the 'Table' area

Select the empty row in the table and double click the WgtGrp cell. WgtGrp will now be set to H1.1. Click the TAB-key to jump to the next column. Continue entering item data for 'Section 2'.

The screenshot displays the 'Items' application window. The 'ID & Description' section contains a table with the following data:

WgtGrp	ItemNo	Description	RegUser	RegDate
H1.1	2	Section 2	Administrator	5/11/2017 1:35:39

The 'Weight & CoG' section contains a table with the following data:

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	Weight Status	VCG [m]	LCG [m]
1	1.00	1.00	1.00	73000.00	73000.00	C	4.20	6.25

The 'Table view' section shows a list of items with the following data:

WgtGrp	ItemNo	Description	RegUser	RegDate	NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]
H1.1	1	Section 1	Administrator	5/11/2017 12:51:...	1	1.00	1.00	1.00	66000.00
H1.1	2	Section 2	Administrator	5/11/2017 1:35:3...	1	1.00	1.00	1.00	73000.00

The 'Total weight & CoG' section shows a summary table with the following data:

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]
139000.00	139	4.25	2.69	0.00	1.50	6.00	-5.00	10.00

Data for **Section 2, H1.1 Aftbody**:

Field	Value
-------	-------

WgtGrp:	H1.1
ItemNo:	2
Description:	Section 2
NoOff:	1
Factor:	1

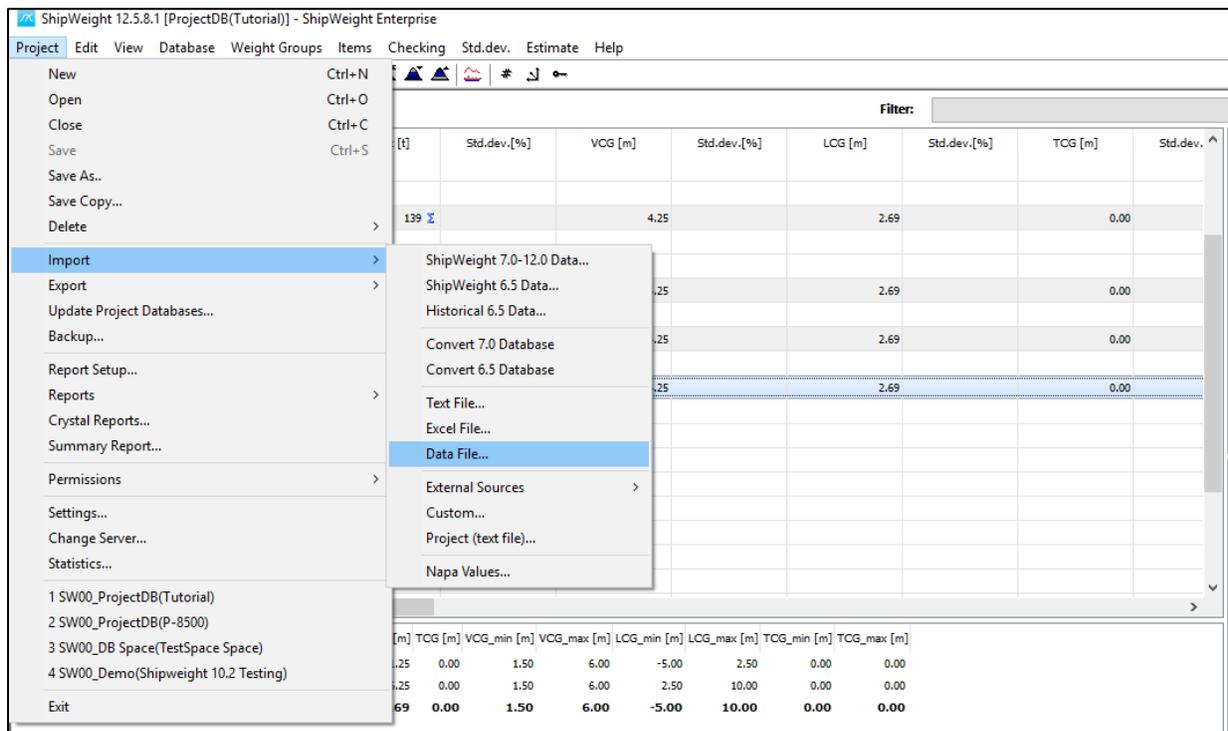
Length:	1
Width:	1
UnitWeight:	73000
VCG:	4.2
LCG:	6.25
TCG:	0.000
VCG_min:	1.5
VCG_max:	6.000
LCG_min:	2.500
LCG_max:	10
Drawing no.	123-654
Weight Status:	C

3.5 Import Data File

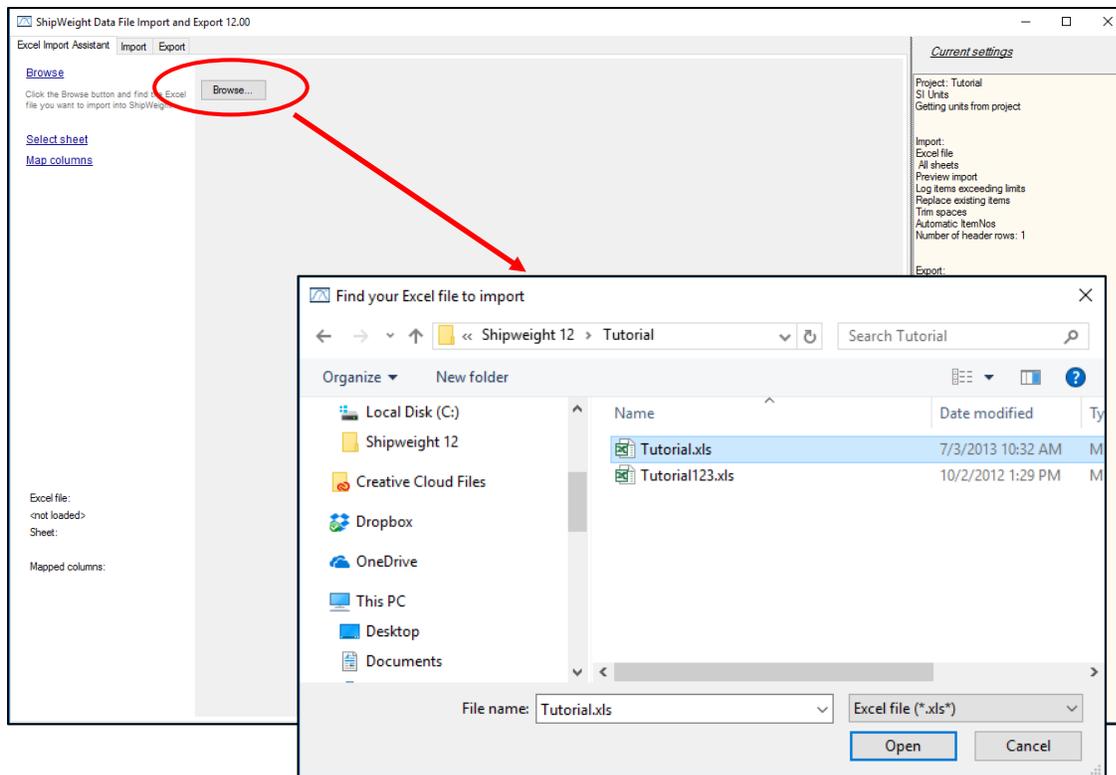
In this tutorial we will import weight data from an Excel workbook. This can be done using the ‘ShipWeight Data File Import (EasyImport)’-dialog.

To follow this tutorial, please open an appropriate project or create a new project. If you have just completed the previous chapters, you are set. Otherwise, please refer to chapter 1 for details on creating a new project.

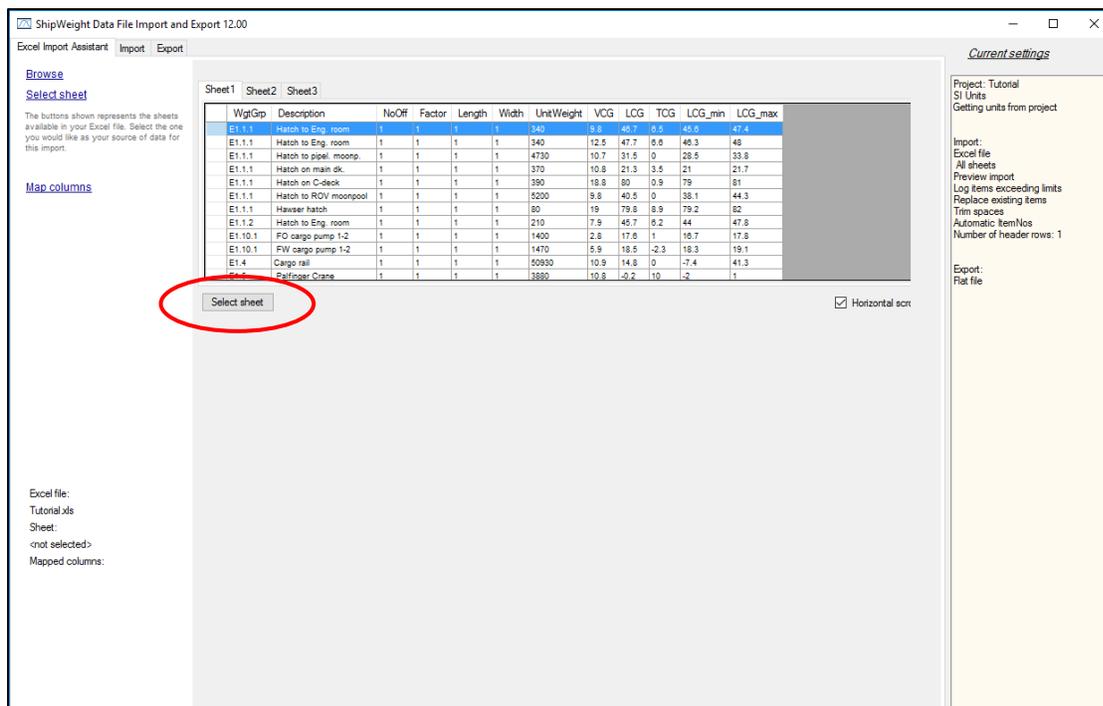
The Data File Import dialog (menu: Project -> Import -> Data file....) has an extra layer called EasyImport which is designed to provide a wizard-like user interface to guide the user through setting up and carry out the import step by step.



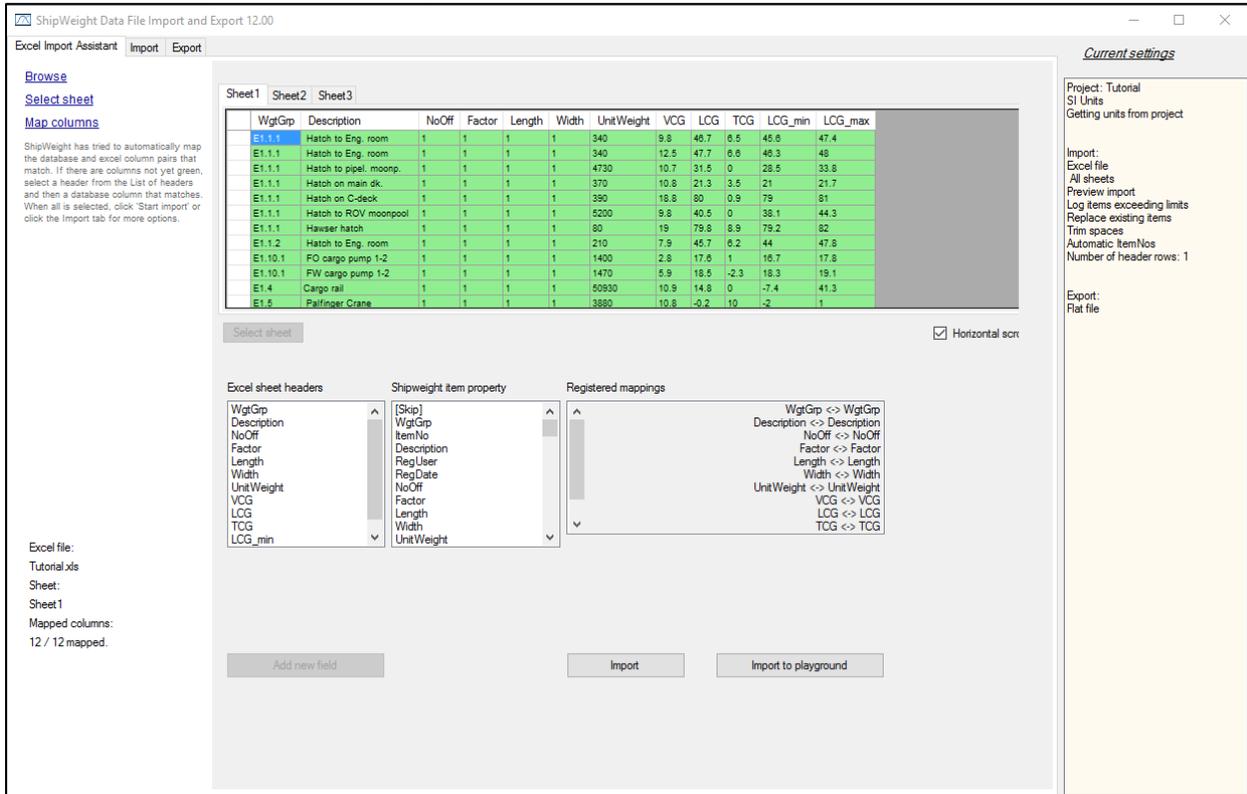
First we browse and select the spreadsheet file. On the ‘Assistant’ tab-sheet, we press the Browse button. Using the ‘Open dialog window, we locate the Excel file to import. Press the Open button to select the file “Tutorial.xls”.



The Data File Import Dialog supports the import of XLSX files in addition to XLS files. Once the Excel File has been selected, a preview of the sheet included in the file will be shown. Then, the next step is to select the sheet to import.



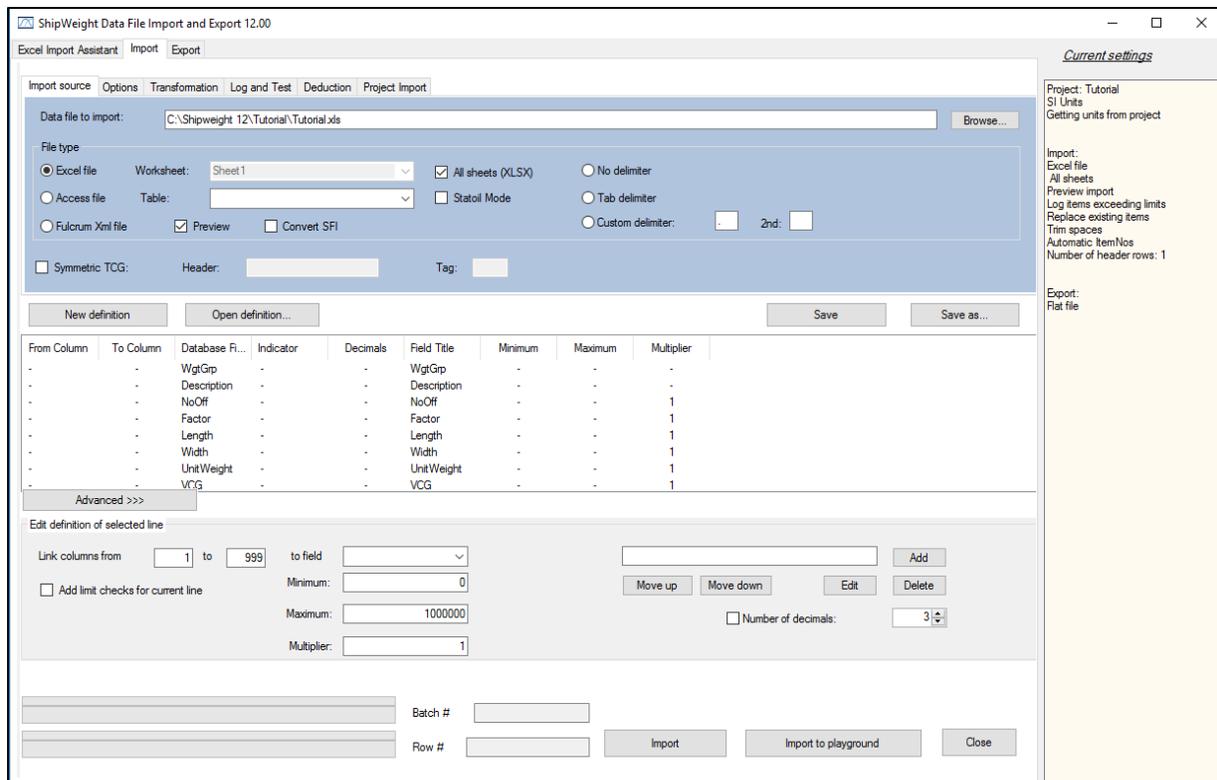
When the sheet is selected, the import dialog will try to guess the mapping between the columns in the spreadsheet and ShipWeight fields, based on the column headings in the spreadsheet.



Columns where mapping have been found automatically will get a green colour and the mapping will be shown in the list below. If this mapping is wrong, you can deselect the column either in the sheet preview or in this list of linked columns.

To manually add columns not automatically mapped, click on the column either in the preview sheet or in the column list and select the corresponding ShipWeight field from the ShipWeight list.

An import can be run directly from the 'Import' tabsheet (either to main database or to Playground area), or the mappings and settings can be transferred to the normal data file import for more advanced settings and checking.



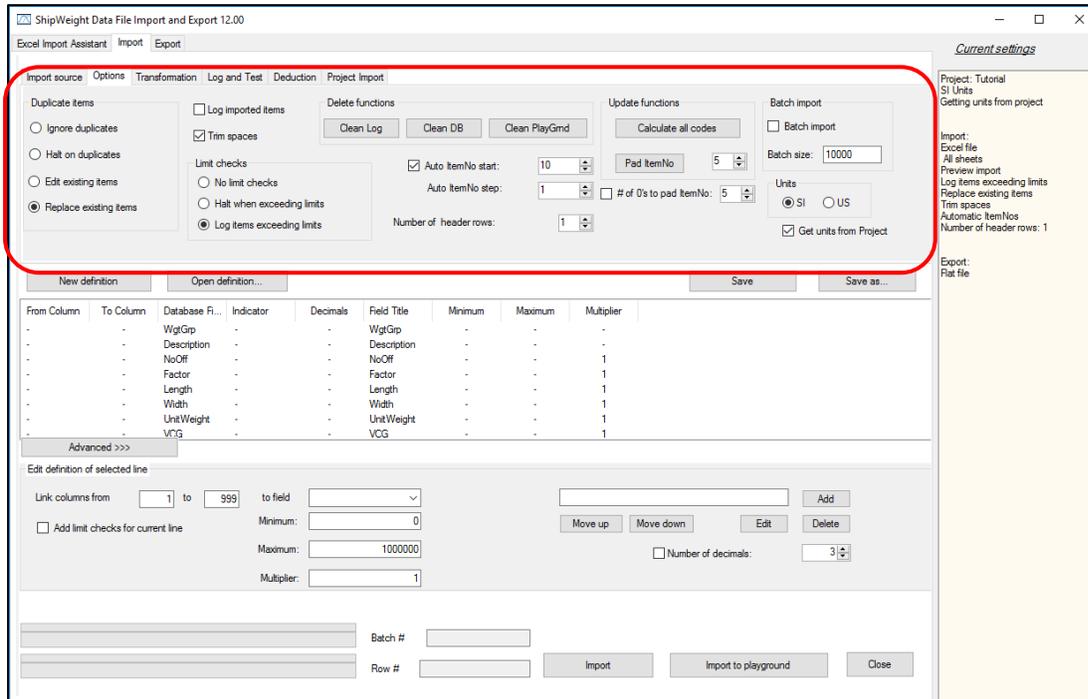
This import definition list may be saved (click “Save” button in the dialog) and restored by clicking from the “Open” button later.

Before we start importing data, we must set the import options. Click the ‘Options’ tab sheet. First we will keep the option ‘Auto ItemNo start’. The reason for this is that our spreadsheet doesn’t contain a column for item numbers.

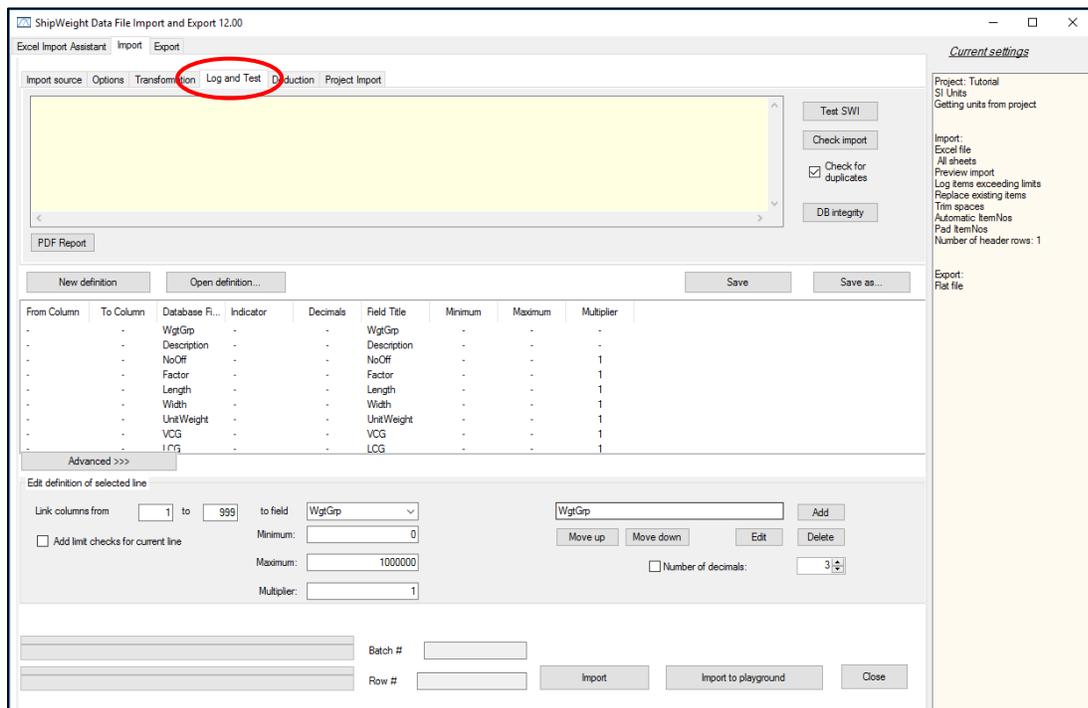
Please note that the import will fail if you try to import data with item numbers already in use in the database. If this is the case, please try to increase the number in the ‘Auto ItemNo start’ field.

The ‘Pad ItemNo’ button will change the format of the item number of existing items. First set the number of characters the item number should include. Pressing the “Pad ItemNo” button will add the digit 0 in front of the item number, so that the item number includes the proper number of characters. Please note that the option

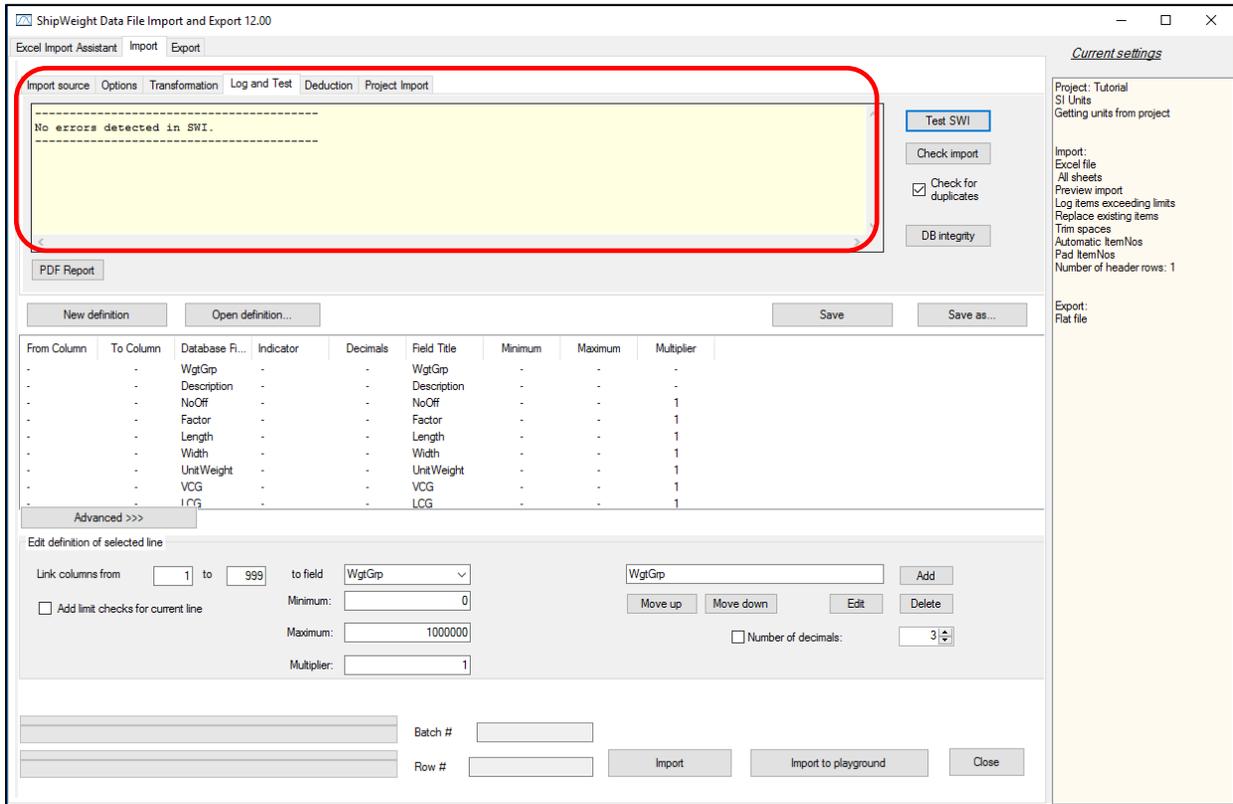
‘Number of header rows’ is disabled. The ‘ShipWeight Data File Import’ always assumes that the spreadsheet contains one header row.



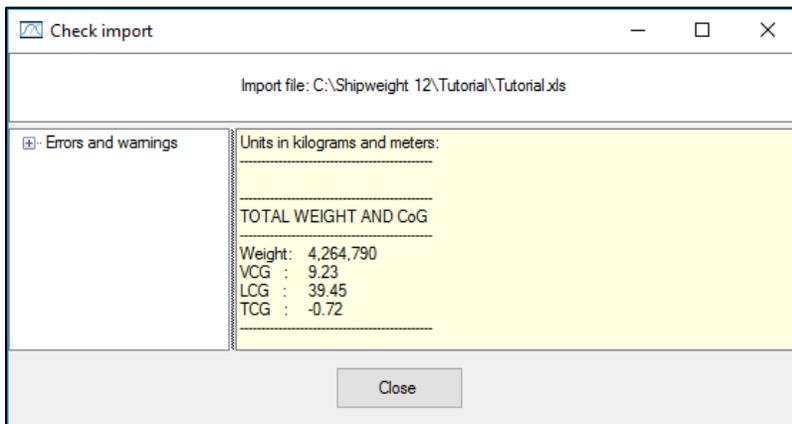
Now when the settings are ready we can choose either to Import or Test it. To test the import, first we go to the ‘Log and Test’ tab sheet:



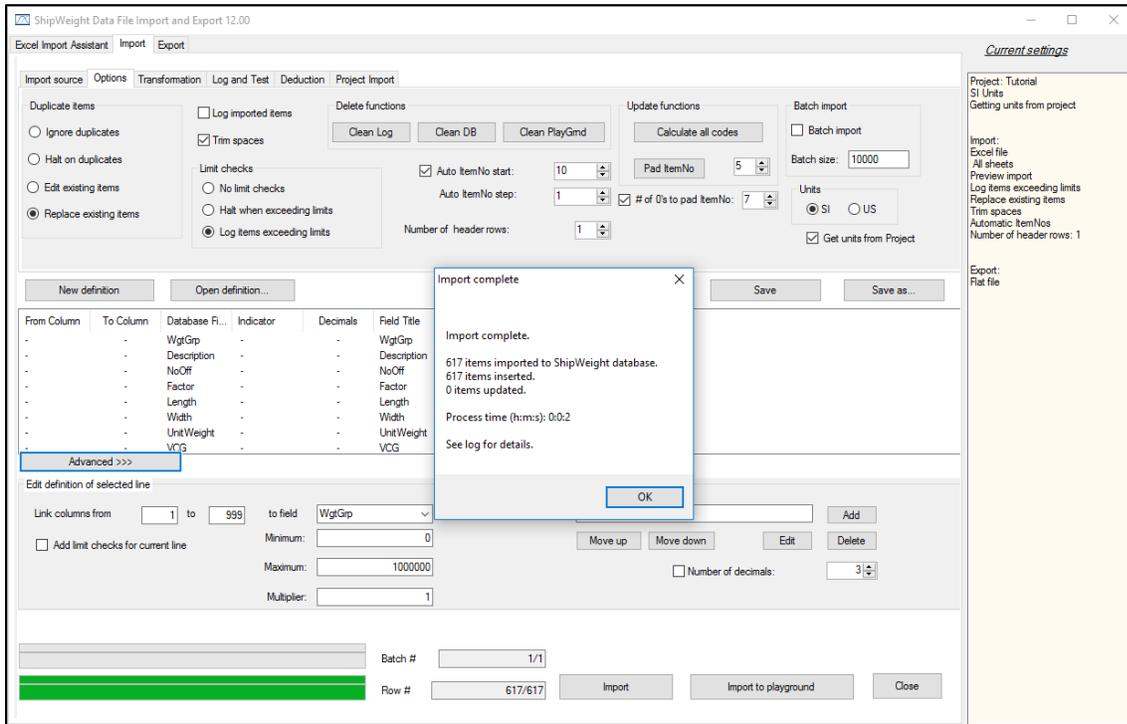
Select 'Test SWI' button to see if there are any errors detected in the import definition file. As we can see, right now there is no errors:



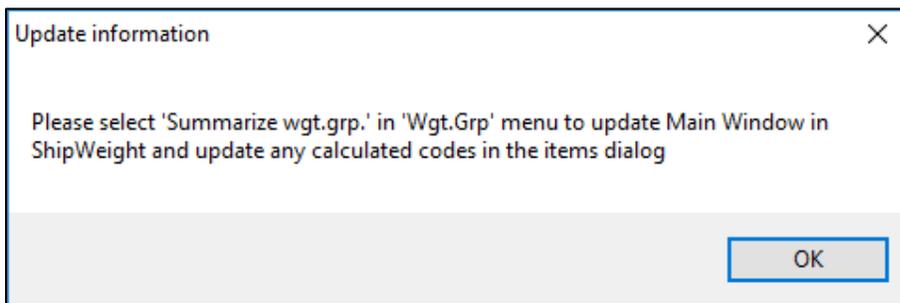
Then, we can also select the 'Check import' button, to perform the import without actually importing it. Now it runs through the import and it will show you a small report, that the import is completed:



Now we are ready to start importing data. Make sure that the spreadsheet you are going to import is not open in Excel.



In the Import complete dialog press **OK** button. Then press **Close** button in the Import dialog. The Update Information dialog will appear, asking you to ‘Summarize wgt.grp.’ in the ‘Wgt.Grp’ menu.



Click **OK**.

Now, in the main dialog window of ShipWeight, go to **Weight Groups** menu and select ‘Summarize Wgt.grp’:

ShipWeight 12.5.8.1 [ProjectDB(Tutorial)] - ShipWeight Enterprise

Project Edit View Database **Weight Groups** Items Checking Std.dev. Estimate Help

ProjectDB (Tutorial) M

Weight Groups

- E - Equipment
- H - Hull
 - HR - Remainc
 - H1 - Main hu
 - H1.R - I
 - H1.1 - A
 - H1.2 - E
 - H1.3 - C
 - H1.4 - F
 - H1.5 - U
 - H2 - Poop
 - H3 - Superstructure

Filter:

Std.dev.[%]	VCG [m]	Std.dev.[%]	LCG [m]
	4.25		2.69
	4.25		2.69
	4.25		2.69

Main ...

Search

Move CoG...

Comment...

Percentage Settings...

Absolute

Relative

Show Frames

Show Reference CoG

Frame Calculator...

Summarize Wgt.grp.

Convert to Item

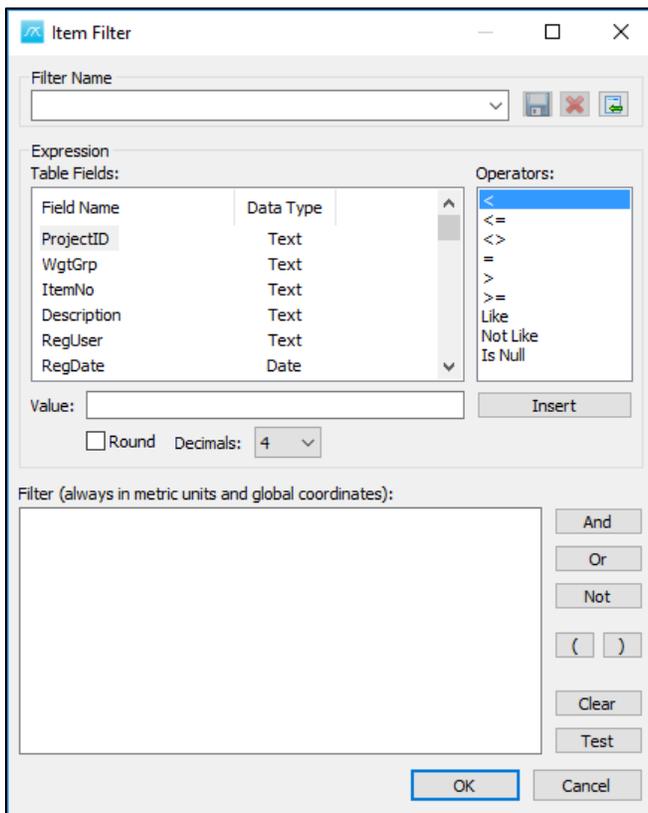
Convert All to Items

3.6 Sort, Filter, and MultiEdit

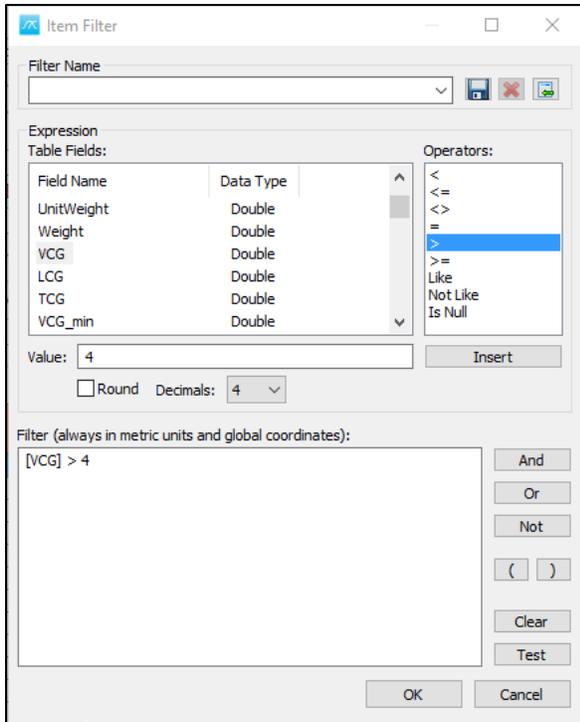
Create a filter to display weight items with VCG > 4 m.

In the tree-view on the main dialog, navigate to weight group E2.2 under LW – Lightship -> E – Equipment -> E2 – Ship equipment, and open the item dialog.

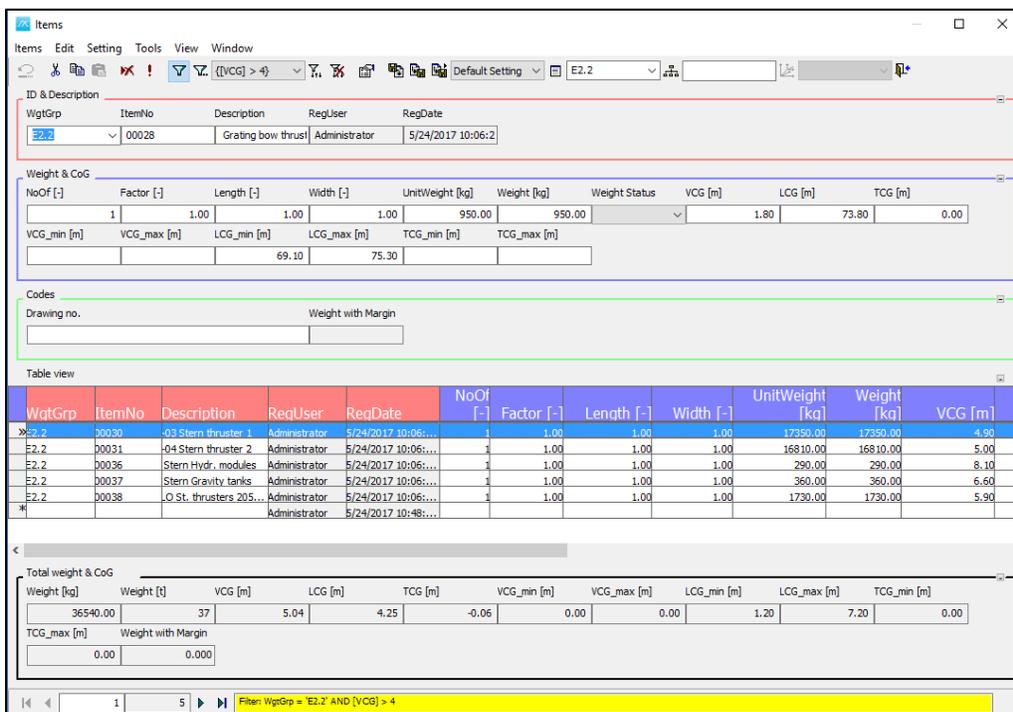
Press the ‘Apply filter’ button on the toolbar, or select Tools -> Filter -> Apply... on the Tools menu. The Item Filter dialog will pop up.



In the ‘Table Fields’ list, select VCG. Select the ‘>’ operator from the ‘Operators’ list. Set the ‘Value’ to 4, and press the Insert button.



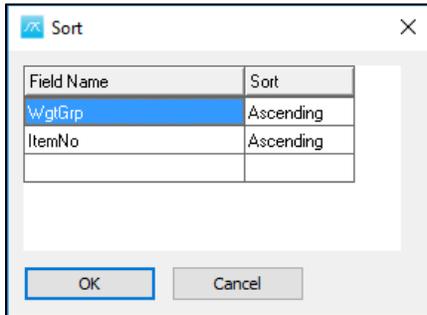
Press OK to apply the filter. Now, 5 items which have VCG's larger than 4.0 meters will be listed.



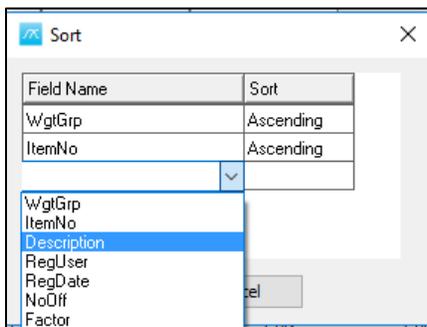
To remove the filter, select Tools -> Filter -> Clear, or press the 'Clear Filter' button.

Sort the weight items on Description and Weight

To open the Sort dialog, select Sort -> Apply... on the Tools menu, or press the 'Sort' button on the toolbar.



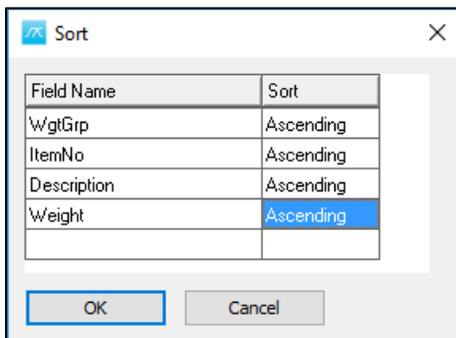
Click the 'Field Name' cell of the empty row. The cell will change to a combo box. Activate the dropdown list, and select Description.



Click the 'Sort' cell. By default, the value will be set to 'Ascending'.

On the next row, select Field Name: Weight.

Data Type: Ascending



Press the OK button to apply the Sort.

Items

Items Edit Setting Tools View Window

Default Setting E2.2

ID & Description

WgtGrp	ItemNo	Description	RegUser	RegDate
E2.2	00030	-03 Stern thruster	Administrator	5/24/2017 10:06:2

Weight & CoG

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	Weight Status	VCG [m]	LCG [m]	TCG [m]
1	1.00	1.00	1.00	17350.00	17350.00		4.90	2.80	0.00
VCG_min [m]		VCG_max [m]		LCG_min [m]		LCG_max [m]		TCG_min [m]	
		1.50		4.00					

Codes

Drawing no. Weight with Margin

Table view

WgtGrp	ItemNo	Description	RegUser	RegDate	NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	VCG [m]
E2.2	00028	Grating bow thruster	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	950.00	950.00	1.80
E2.2	00029	Grating stern thruster	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	1000.00	1000.00	1.50
E2.2	00030	-03 Stern thruster 1	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	17350.00	17350.00	4.90
E2.2	00031	-04 Stern thruster 2	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	16810.00	16810.00	5.00
E2.2	00032	Bow thr. 1 eks tunnel	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	14990.00	14990.00	2.80
E2.2	00033	Bow thr. 2 eks tunnel	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	14080.00	14080.00	2.80
E2.2	00034	/ros module	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	16150.00	16150.00	1.50

Total weight & CoG

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]
91980.00	92	3.34	43.15	0.19	0.00	0.00	1.20	75.30	0.00
TCG_max [m]		Weight with Margin							
0.00		0.000							

3 12 Filter: WgtGrp = 'E2.2'

4. Weight Monitoring and Reporting

4.1 Standard reports

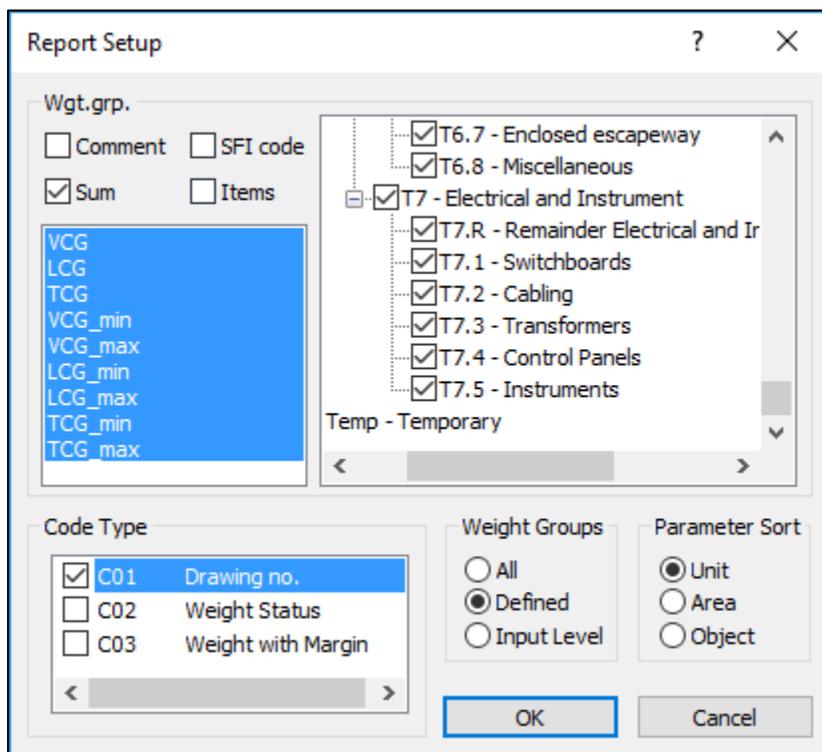
From the *Project* menu, select *Report setup*. Select:

Weight Groups *Defined*

Parameter sort *Unit*

Wgt.grp. *Sum*

Code type *C01 – Drawing no*



Click **OK** to close the dialog.

Select *Reports* and *4 Weight and CoG wgt.grp. summary* on the *Project* menu. The following dialog will open – just press **OK**

Report Filter [X]

Simple **Advanced**

Weight Group: [%] [v]

Item no.: [%]

Description: [%]

Code Type: [v]

Code: [%] [v]

Time: []

Setup... **OK** Cancel

The report will then be opened in the Print Preview dialog. In the Print Preview dialog, press the MS Word button to export the report. Close the Preview window.

Print Preview [X]

Print Setup MS Excel **MS Word** Ascii file |< < 1 > >| of 4 pages Close

Project: ProjectDB (Tutorial) MS Breeze  System owners have the right to modify the data without notice

Revision: 12:58:14, 26 May 2017

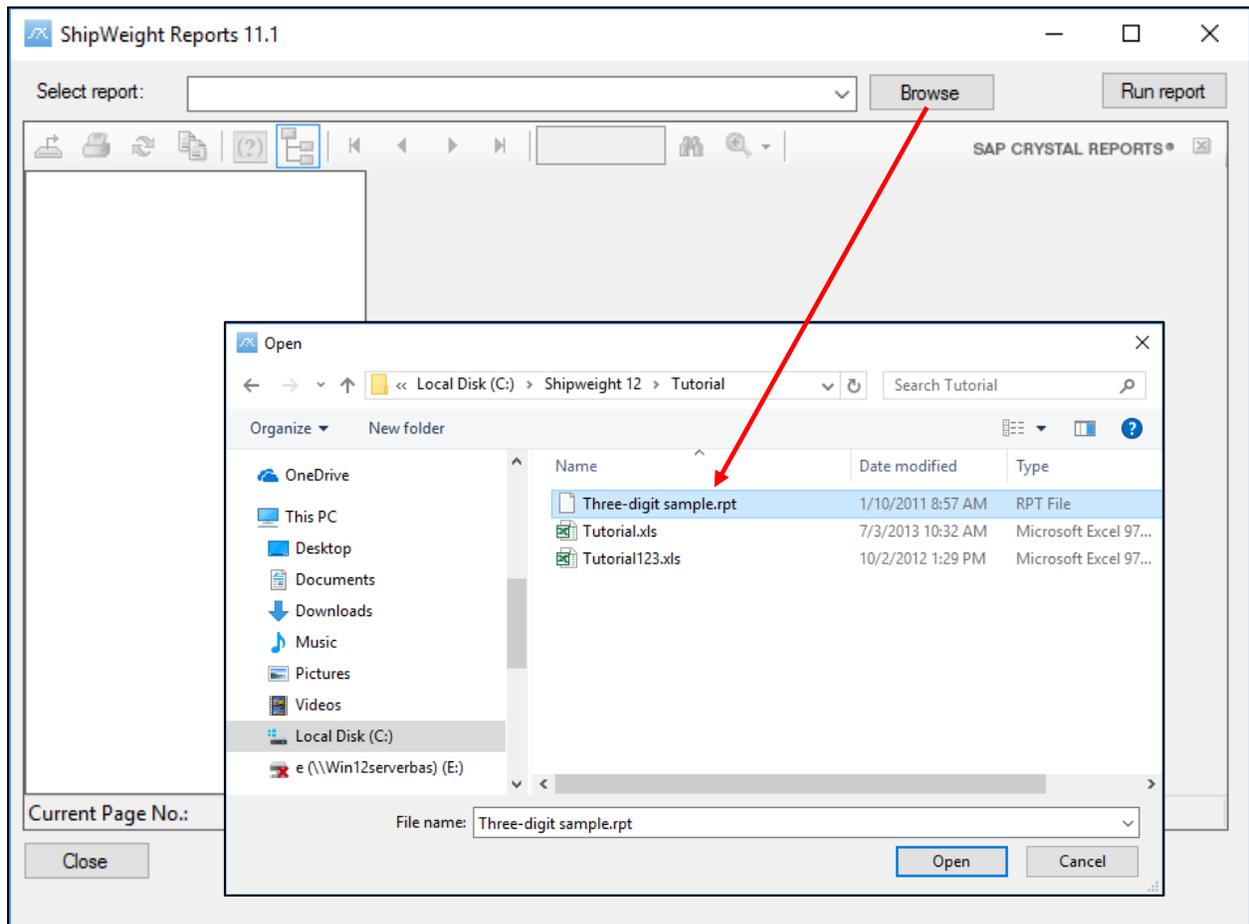
Report: WEIGHT & COG

Weight Group	Weight [t]	VCG [m]	LCG [m]	TCC [m]	VCG-min [m]	VCG-max [m]	LCG-min [m]	LCG-max [m]	TCC-min [m]	TCC-max [m]
U/I Lightship	4 285	9.33	39.45	-0.71	0.00	0.00	-9.40	90.60	0.00	0.00
DEP Displacement	4 285	9.33	39.45	-0.71	0.00	0.00	-9.40	90.60	0.00	0.00
E Equipment	1 054	11.66	45.24	0.26	0.00	0.00	-9.30	90.60	0.00	0.00
E Hull	2 896	9.04	37.06	-0.90	0.00	0.00	-9.40	89.20	0.00	0.00
E Machinery	225	5.07	40.75	-2.40	0.00	0.00	-14.40	83.60	0.00	0.00
U/I Lightship	4 285	9.33	39.45	-0.71	0.00	0.00	-9.40	90.60	0.00	0.00
E1 Equipment for cargo	66	12.46	33.24	0.46	0.00	0.00	-7.40	82.00	0.00	0.00
E2 DHP equipment	480	11.30	42.46	0.07	0.00	0.00	-9.30	90.60	0.00	0.00
E3 Accommodation	304	14.60	55.11	0.31	0.00	0.00	-9.90	80.30	0.00	0.00
E4 DHP systems	302	6.71	47.63	0.32	0.00	0.00	-5.50	87.10	0.00	0.00
E Equipment	1 054	11.66	45.24	0.26	0.00	0.00	-9.30	90.60	0.00	0.00
E1.1 Helms	12	10.61	36.22	0.70	0.00	0.00	21.00	82.00	0.00	0.00
E1.1.1 Deck for cargo, hold/clock	21	10.60	14.60	0.00	0.00	0.00	-7.40	41.30	0.00	0.00
E1.1.2 Deck above cargo hold	4	10.60	-0.30	10.00	0.00	0.00	-2.00	1.00	0.00	0.00
E1.1.3 Rotating crane	19	19.24	42.94	-0.33	0.00	0.00	41.00	44.50	0.00	0.00
E1.1.1.1 L/D winch for cargo	3	4.29	16.06	-0.69	0.00	0.00	16.70	19.10	0.00	0.00
E1 Equipment for cargo	66	12.46	33.24	0.46	0.00	0.00	-7.40	82.00	0.00	0.00
E1.1.1.1.1 Cargo hatch cov., weather d.	11	10.66	36.16	0.29	0.00	0.00	21.00	82.00	0.00	0.00
E1.1.1.1.2 Cargo hatch cov., truss d.	0	7.90	45.70	6.20	0.00	0.00	44.00	47.60	0.00	0.00
E1.1 Helms	12	10.61	36.22	0.70	0.00	0.00	21.00	82.00	0.00	0.00
E1.1.1.1.1 L/D pump	3	4.29	16.06	-0.69	0.00	0.00	16.70	19.10	0.00	0.00
E1.1.1.1.1.1 L/D winch for cargo	3	4.29	16.06	-0.69	0.00	0.00	16.70	19.10	0.00	0.00
E2.1 Winch, mach. & equip.	21	2.47	-0.26	-0.01	0.00	0.00	-5.20	-2.00	0.00	0.00
E2.2 Side thrusters	92	3.24	42.15	0.19	0.00	0.00	1.20	73.20	0.00	0.00
E2.3 Win., search. & serv. eq.	4	20.26	37.92	-0.00	0.00	0.00	-7.00	82.00	0.00	0.00
E2.5 Anch., moor. & tow. eq.	265	12.29	41.29	-0.07	0.00	0.00	-9.30	82.30	0.00	0.00
E2.6 Transp., lift. & hoist. eq.	6	10.70	63.25	4.26	0.00	0.00	42.20	66.90	0.00	0.00
E2.9 Deck equipment	40	26.20	76.21	0.00	0.00	0.00	87.00	90.60	0.00	0.00
E2 DHP equipment	480	11.30	42.46	0.07	0.00	0.00	-9.30	90.60	0.00	0.00
E2.1.1 Rudder, rudd. & bear.	24	2.00	-2.20	0.00	0.00	0.00	-4.90	-2.00	0.00	0.00
E2.1.2 Steering gear	7	6.25	-3.45	-0.03	0.00	0.00	-5.20	-2.60	0.00	0.00
E2.1 Winch, mach. & equip.	21	2.47	-0.26	-0.01	0.00	0.00	-5.20	-2.00	0.00	0.00
E2.1.1 Win. & search. equipment	4	20.26	37.92	-0.00	0.00	0.00	-7.00	82.00	0.00	0.00

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4.2 Crystal reports

Start ShipWeight Report by selecting *Crystal Reports...* on the *Project* menu of ShipWeight.

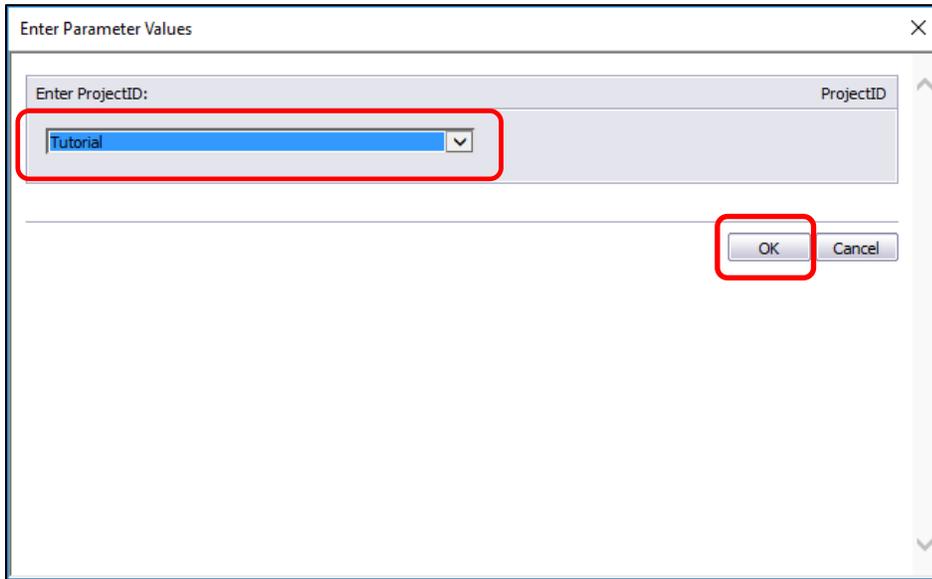


The first thing to do is to select the report you want to run. In this example we will use the report *Three-digit sample.rpt*. Locate the report file on your hard drive by pressing the *Browse* button to open the *Open* dialog window.

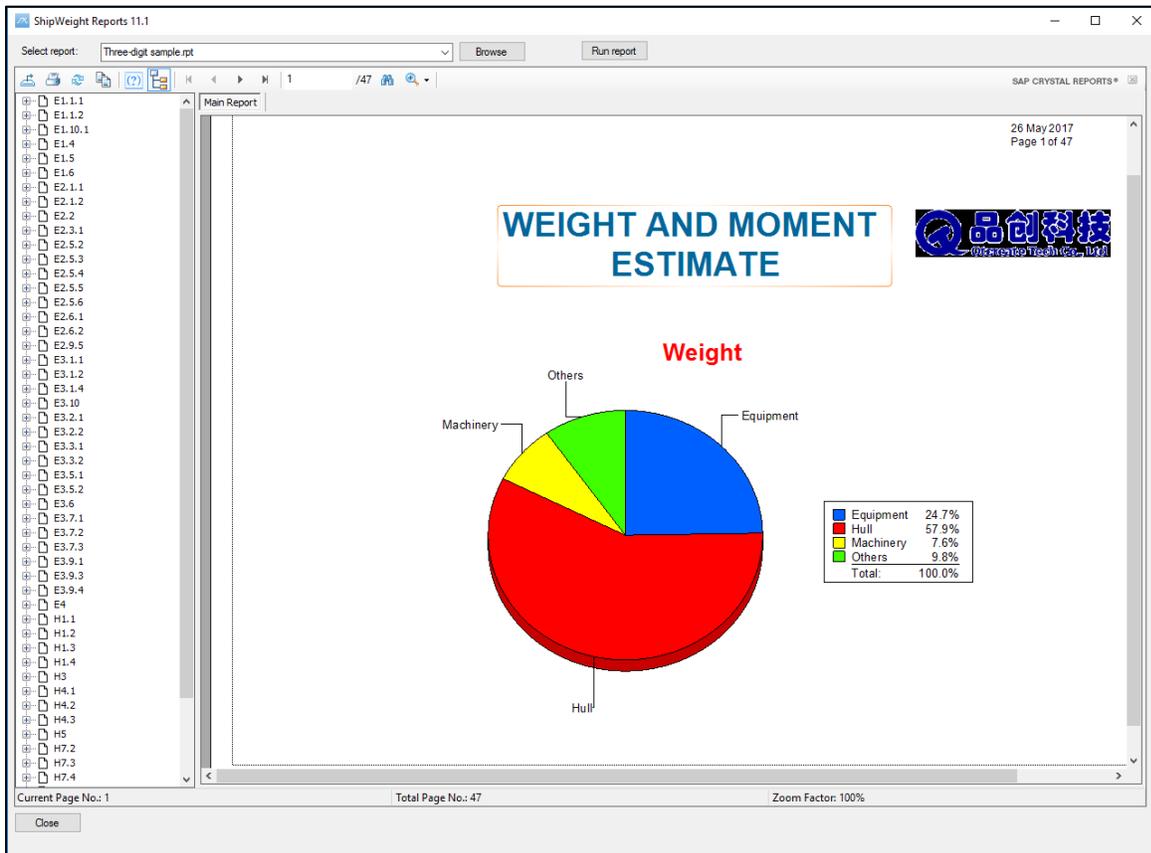
When you have located and selected the file *Three-digit sample.rpt*, press *open*. Now the file name will show in the *Select report* field.

Next, press the 'Run report' button.

In the “Enter project ID” dialog that now pops up, select “Tutorial” from the dropdown list and click “OK”.



The report should now be displayed after a few seconds.



Now, use the toolbar or the group tree to navigate through the report. Also try exporting the report to portable document format (PDF), Word or Excel.

5. Weight Estimation

5.1 Preparing an estimate

Starting a new project

Start a new project using the following Project info:

The 'Project Info' dialog box is shown with the following values:

- Database ID*: ProjectDB
- Project ID*: Est X-1000 (*Mandatory)
- Use Parents:
- Name: (empty)
- Owner: (empty)
- Main Type: Offshore Vessel
- Type: Supply Vessel Anchor Handling
- Registration Pers.: Administrator
- Registration Date: 6/2/2017
- Frame Spacing: 1#
- Coord.ref.point: VCG: 0, LCG: 0, TCG: 0
- Coord.ref.dir.: VCG: 1, LCG: 1, TCG: 1
- Units: Metric US

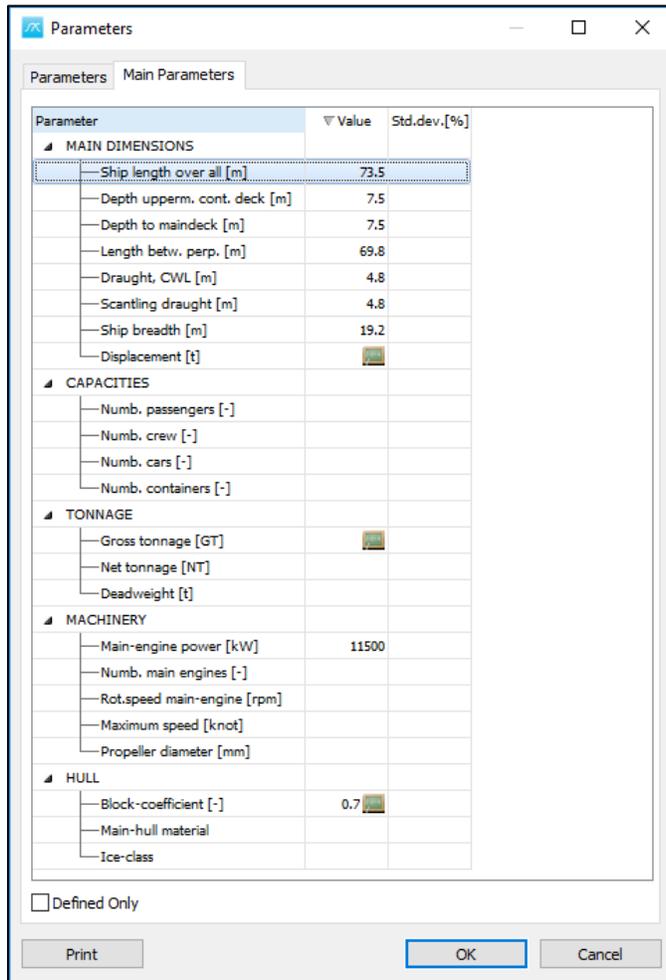
Press OK.

The 'Choose main weight group' dialog box shows a list with the following item:

- DISP Displacement

Press again OK.

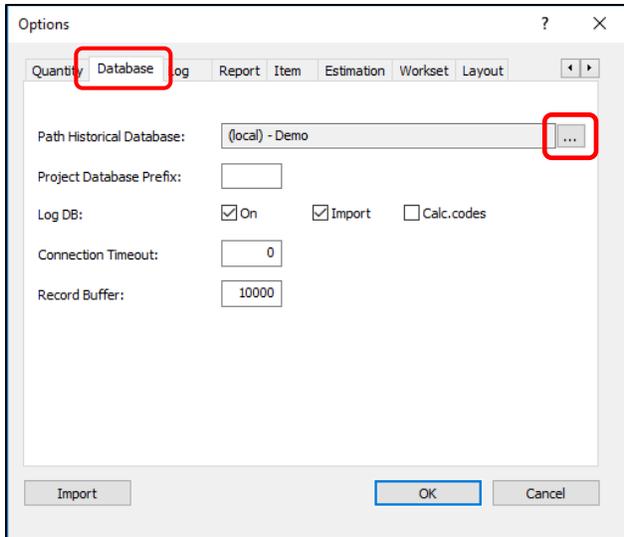
Fill in the following values for Parameters dialog:



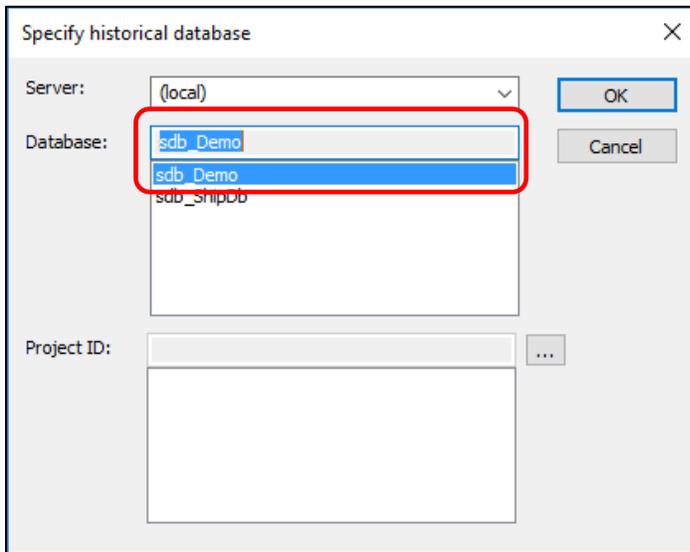
Select historical Demo database

To be able to follow the tutorial, the historical database must be switched to demo mode. To do this, follow these steps:

Select "Options..." from the "View" menu and select the "Database" tab. Next, select the browse button [...]



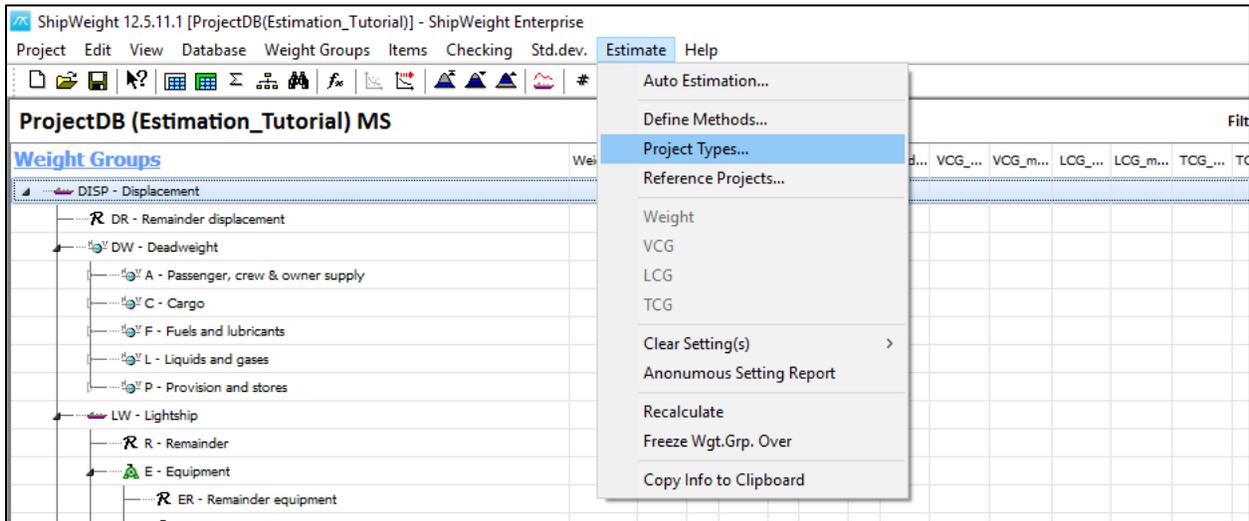
and select the historical database sdb_Demo:



Click OK to save and close the options dialog.

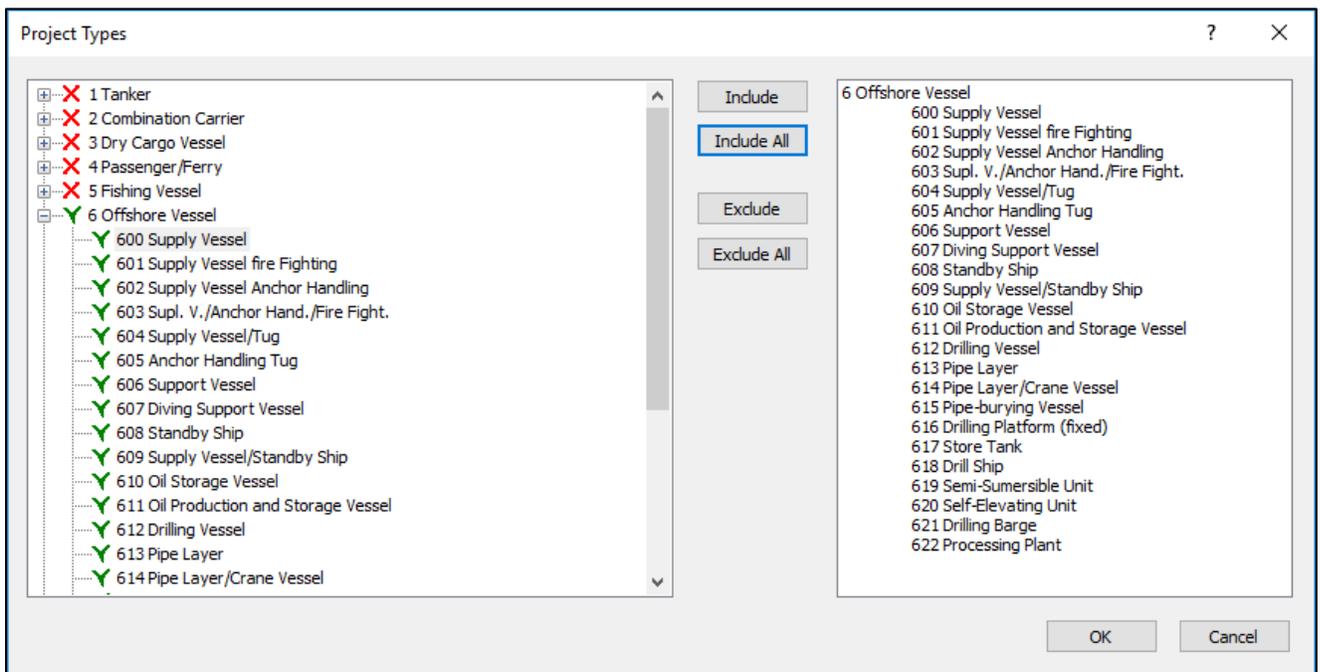
Ship types

Open the Ship types dialog by selecting *Project Types...* on the *Estimate* menu.



The *Project Types...* dialog opens.

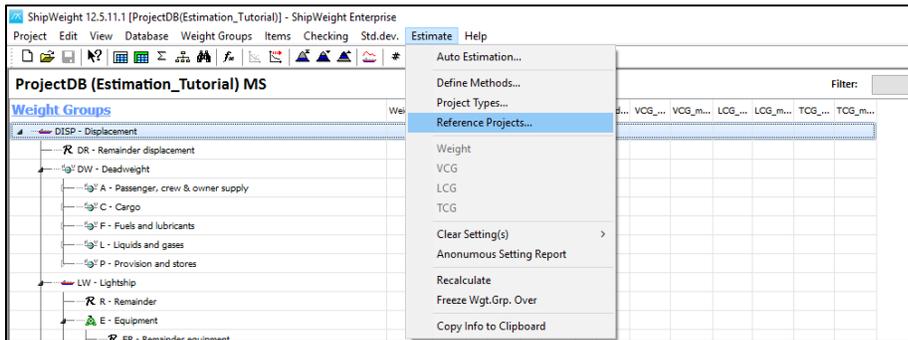
Expand the '6 Offshore Vessel' branch by clicking its + sign. Select e.g. '600 Supply Vessel' and click the 'Include all' button.



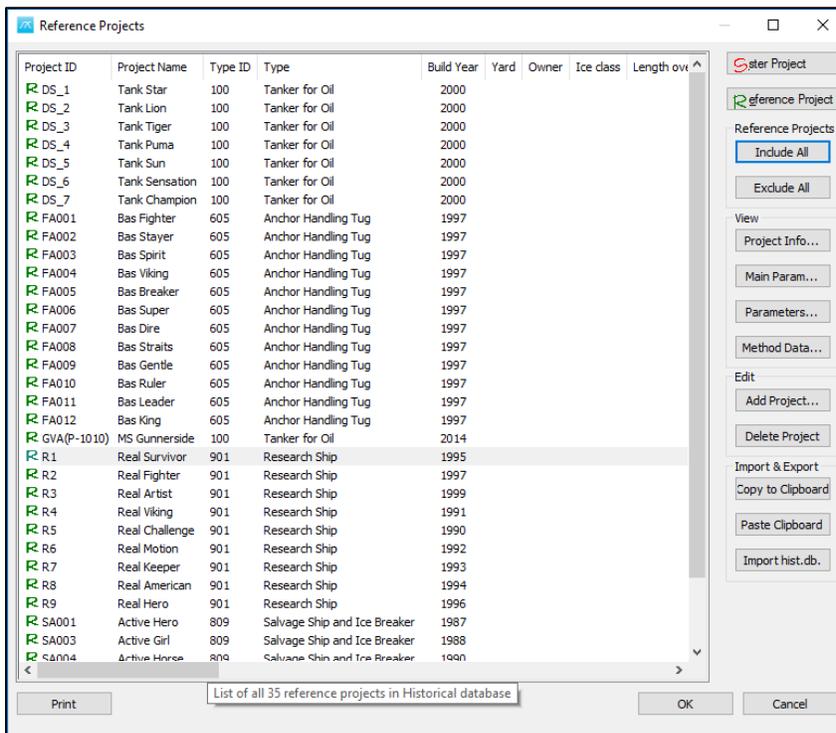
Now, historical data from ships of type 'Offshore vessel' will be included in the graph when estimating weight and centre of gravity. The vessels mentioned here might have been selected by default. Select **OK**.

Reference Ships

On the Estimate menu, select Reference Projects... to make sure that all projects are included as reference projects.



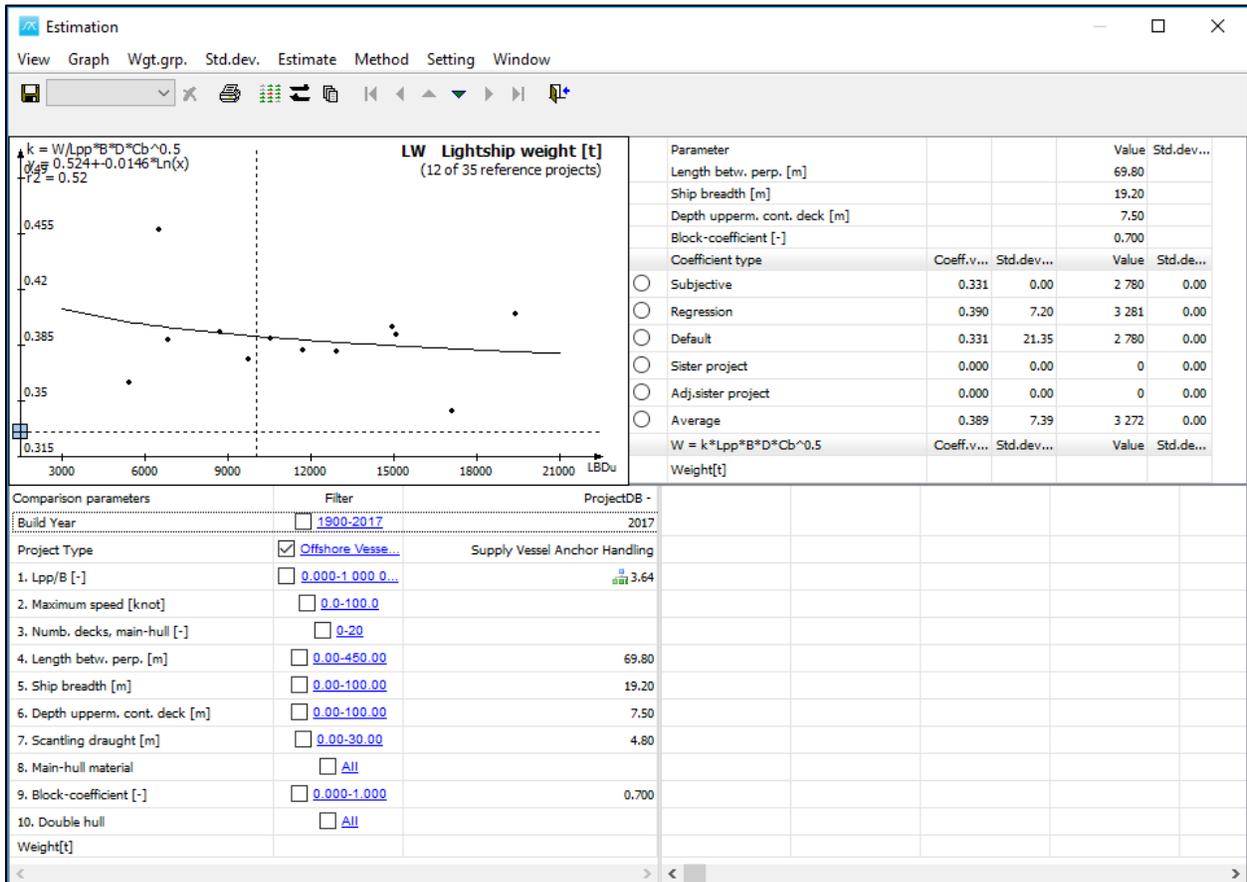
The vessels should have a green R to the left of the ship ID to be included. If there are no green Rs, click Include All button.



Click **OK**.

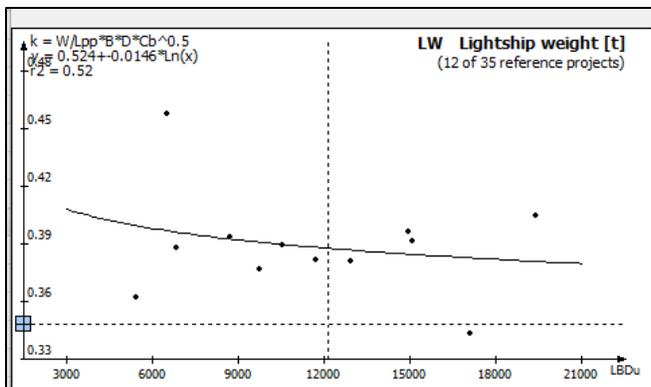
5.2 Estimating lightship weight

Navigate to the lightship weight group LW - Lightship in the main window. In the Estimate menu, select Weight or click the  Estimate weight button on the toolbar. The Estimation dialog appears.



This dialog has three main areas:

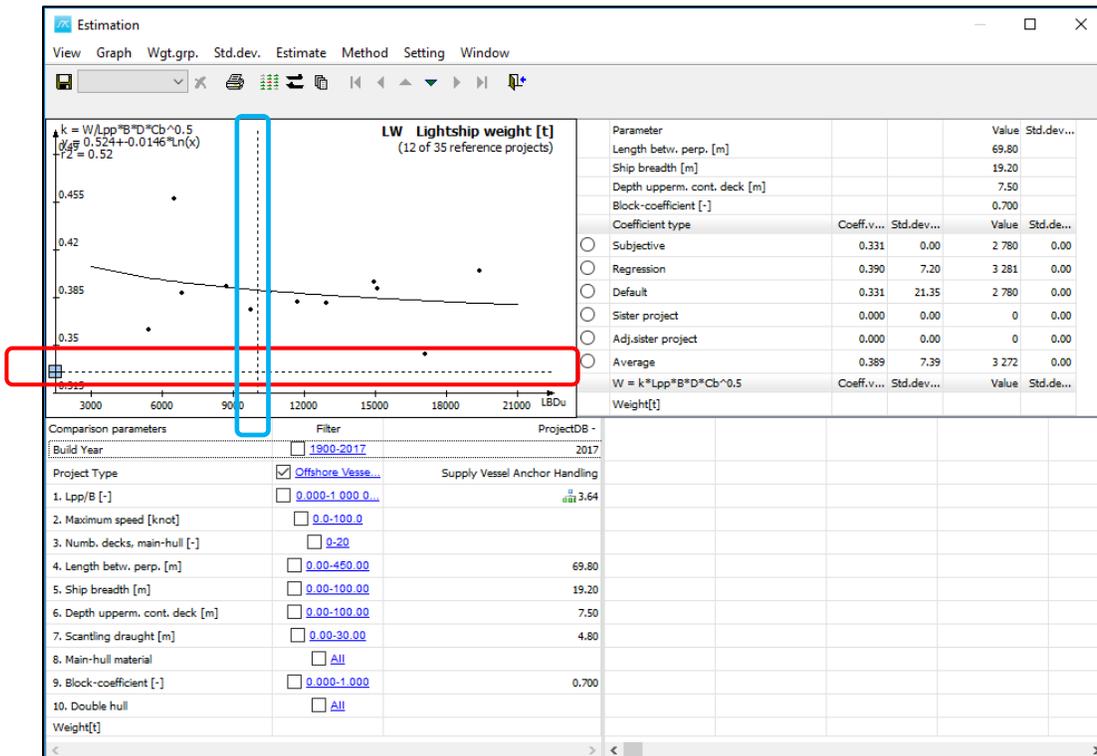
The **Graph** area itself which plots historical data. Each point represents a historical reference shi, and each point represents the relationship between the weight and parameters of the method.



In this case we are at the Lightship level, and the estimation formula can be seen in the **Parameter** area:

Parameter			Value	Std.dev...
Length betw. perp. [m]			69.80	
Ship breadth [m]			19.20	
Depth upperm. cont. deck [m]			7.50	
Block-coefficient [-]			0.700	
Coefficient type	Coeff.v...	Std.dev...	Value	Std.de...
<input type="radio"/> Subjective	0.331	0.00	2 780	0.00
<input type="radio"/> Regression	0.390	7.20	3 281	0.00
<input type="radio"/> Default	0.331	21.35	2 780	0.00
<input type="radio"/> Sister project	0.000	0.00	0	0.00
<input type="radio"/> Adj.sister project	0.000	0.00	0	0.00
<input type="radio"/> Average	0.389	7.39	3 272	0.00
$W = k * Lpp * B * D * Cb^{0.5}$	Coeff.v...	Std.dev...	Value	Std.de...
Weight[t]				

This method has been reversed plotting all historical coefficients, the coefficient value **k** on the Y axis and plot parameter **LBDu** on the X axis, indicating our plot value LBDu number or cubic number by the vertical line (circled in blue color) from the graph and our currently selected coefficient on the horizontal dotted line (circled in red color).



In the Reference Projects dialog we had 35 different vessels, and in the estimation dialog there are only 12 reference ships showing.

This brings us to the Comparison area with Filters, which can be seen below the Graph area:

Comparison parameters	Filter	ProjectDB -
Build Year	<input type="checkbox"/> 1900-2017	2017
Project Type	<input checked="" type="checkbox"/> Offshore Vesse...	Supply Vessel Anchor Handling
1. Lpp/B [-]	<input type="checkbox"/> 0.000-1 000 0...	3.64
2. Maximum speed [knot]	<input type="checkbox"/> 0.0-100.0	
3. Numb. decks, main-hull [-]	<input type="checkbox"/> 0-20	
4. Length betw. perp. [m]	<input type="checkbox"/> 0.00-450.00	69.80
5. Ship breadth [m]	<input type="checkbox"/> 0.00-100.00	19.20
6. Depth upperm. cont. deck [m]	<input type="checkbox"/> 0.00-100.00	7.50
7. Scantling draught [m]	<input type="checkbox"/> 0.00-30.00	4.80
8. Main-hull material	<input type="checkbox"/> All	
9. Block-coefficient [-]	<input type="checkbox"/> 0.000-1.000	0.700
10. Double hull	<input type="checkbox"/> All	
Weight[t]		

The **Comparison** area, contains the comparison parameters and filters that belongs to the Lightship weight.

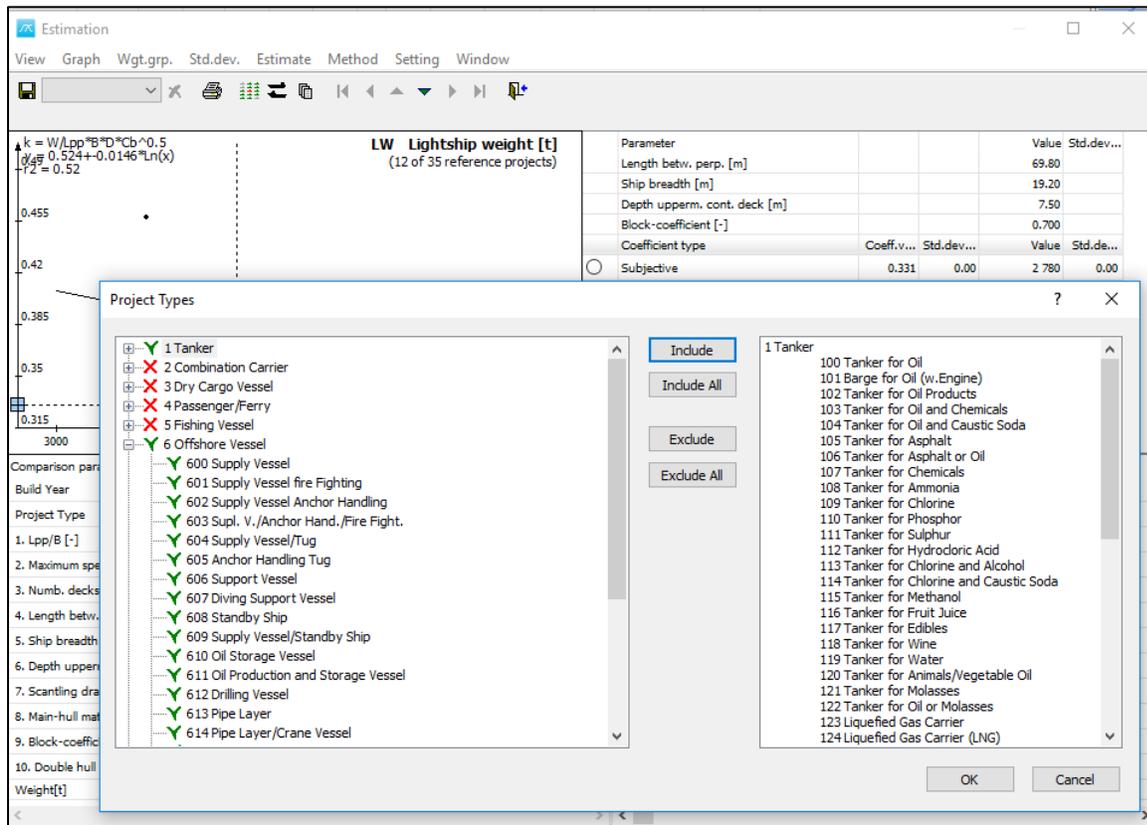
By default there is one **filter** that is automatically set, and that is the **Project Type** filter, as you can see that is enabled when the check box is checked:

Comparison parameters	Filter	ProjectDB -
Build Year	<input type="checkbox"/> 1900-2017	2017
Project Type	<input checked="" type="checkbox"/> Offshore Vesse...	Supply Vessel Anchor Handling
1. Lpp/B [-]	<input type="checkbox"/> 0.000-1 000 0...	3.64
2. Maximum speed [knot]	<input type="checkbox"/> 0.0-100.0	
3. Numb. decks, main-hull [-]	<input type="checkbox"/> 0-20	
4. Length betw. perp. [m]	<input type="checkbox"/> 0.00-450.00	69.80
5. Ship breadth [m]	<input type="checkbox"/> 0.00-100.00	19.20
6. Depth upperm. cont. deck [m]	<input type="checkbox"/> 0.00-100.00	7.50
7. Scantling draught [m]	<input type="checkbox"/> 0.00-30.00	4.80
8. Main-hull material	<input type="checkbox"/> All	
9. Block-coefficient [-]	<input type="checkbox"/> 0.000-1.000	0.700
10. Double hull	<input type="checkbox"/> All	
Weight[t]		

And this is why there are displayed only 12 ships in the Graph area.

By default, ShipWeight will always filter on the same main type as the vessel that is currently estimated. So now we are estimating an Offshore vessel and thus it shows all offshore vessels.

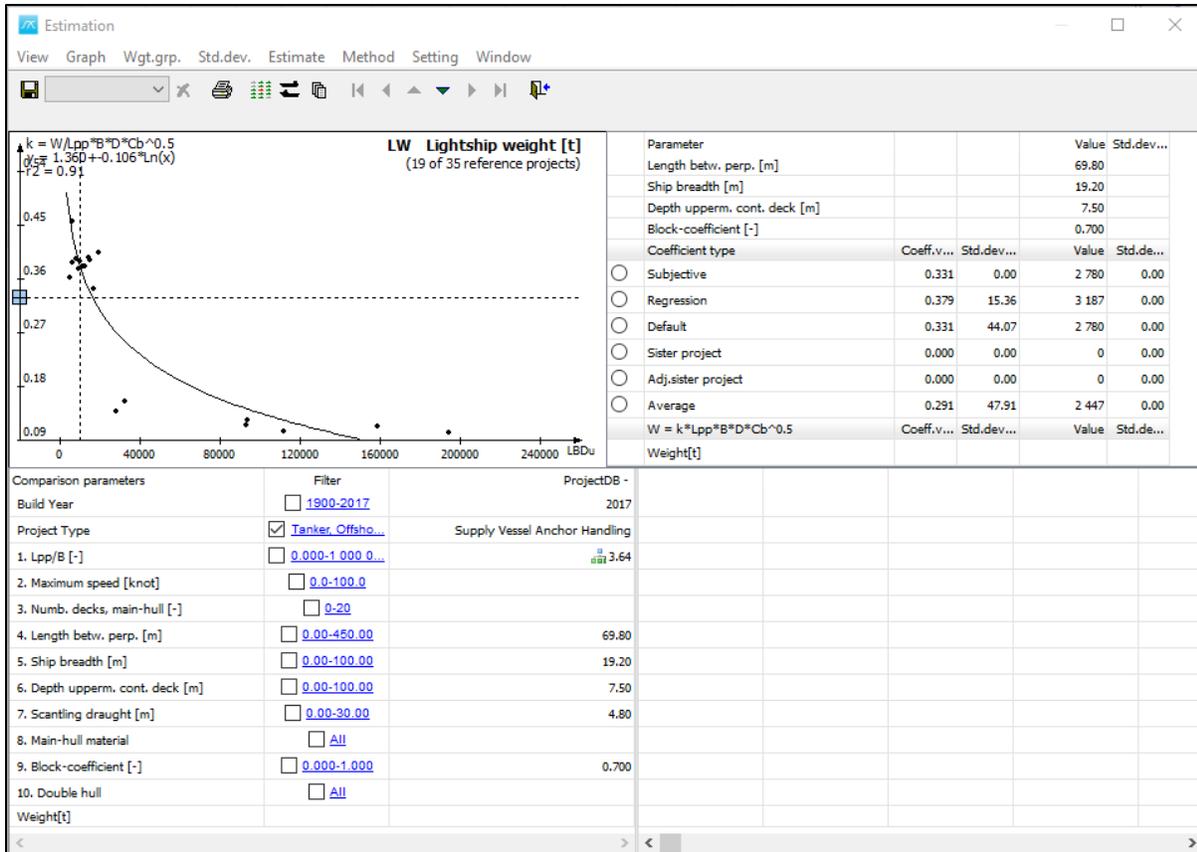
To change this, just click on the link of the filter parameter “[Offshore Vessel...](#)” and this brings up the Project Types dialog, and if we wanted to include the Tanker as well, just click on Tanker and then press **Include** button:



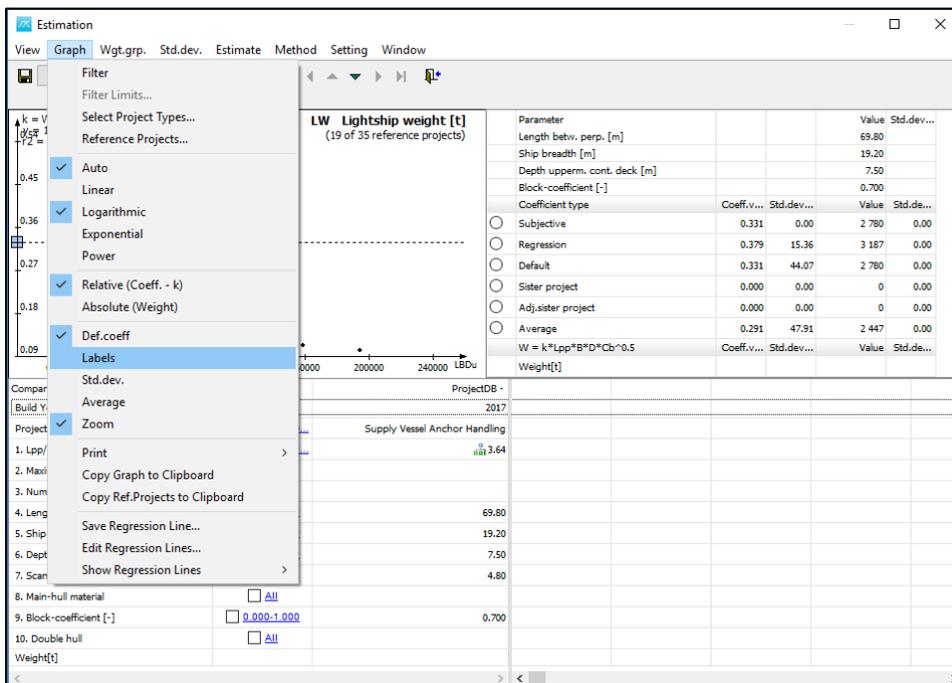
Then click **OK**.

Now in the Graph area, there are 19 reference ships, the tankers are down near the X axis and the offshores are up near the Y axis. We can clearly see that at this level it doesn't make much sense, to include both Offshore vessels and Tanker vessels in the same graph at this weight group.

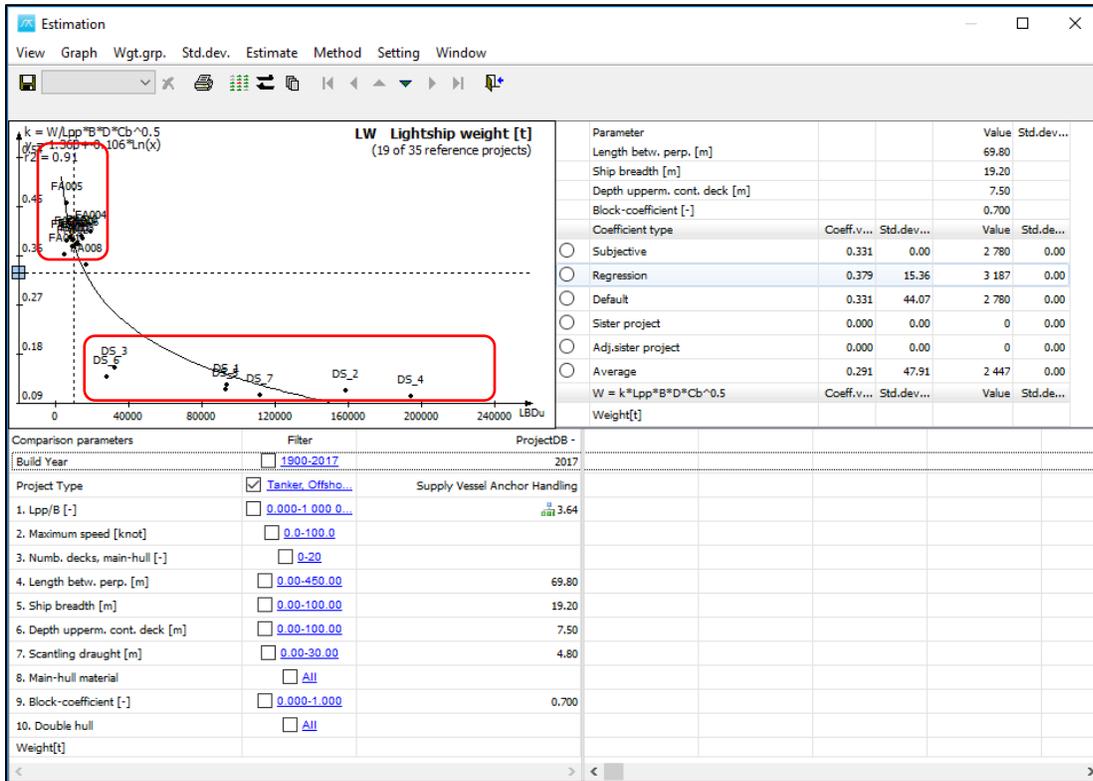
That being said it can make perfectly sense in other weight groups, further down in the hierarchy to mix different vessel types.



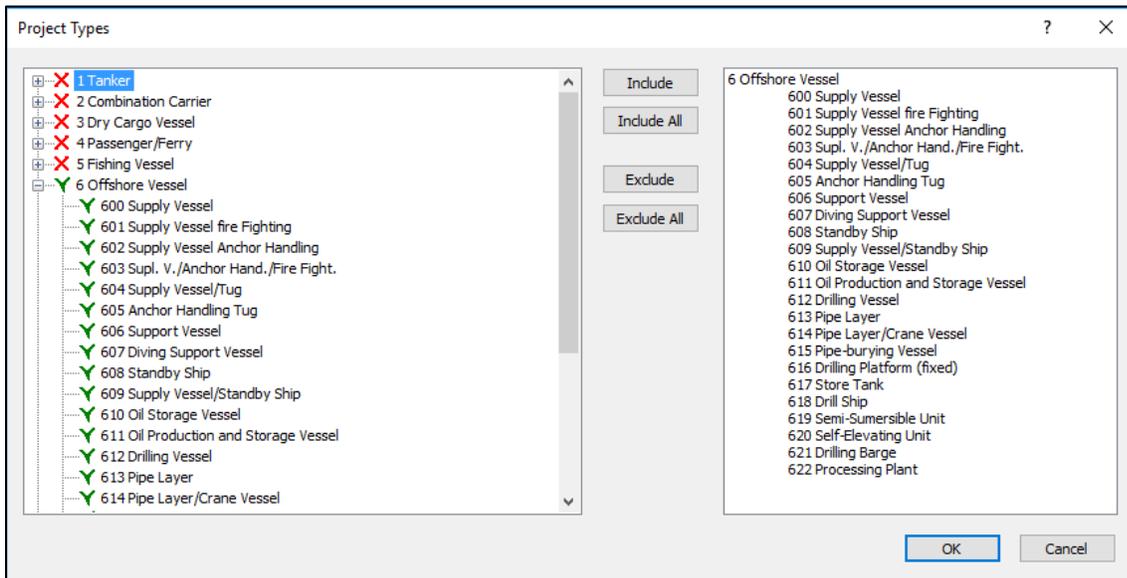
So, let's exclude our Tanker vessels again, and to know that these are the right Tankers, just go to **Graph** menu, and select **Labels**:



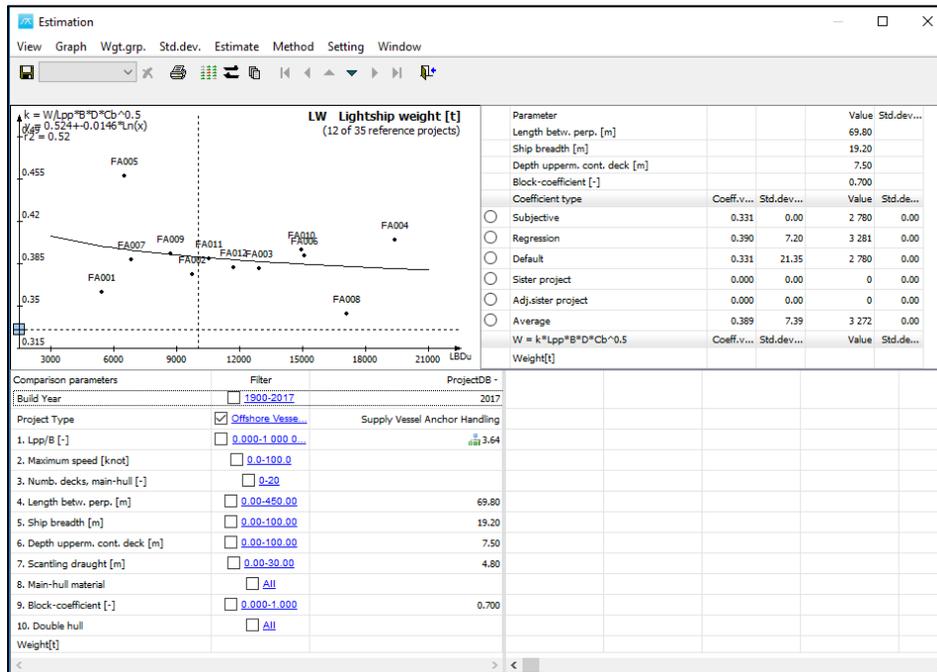
Now we can see the labels in the Graph area and know which the Tanker ships are and which are the Offshore vessels:



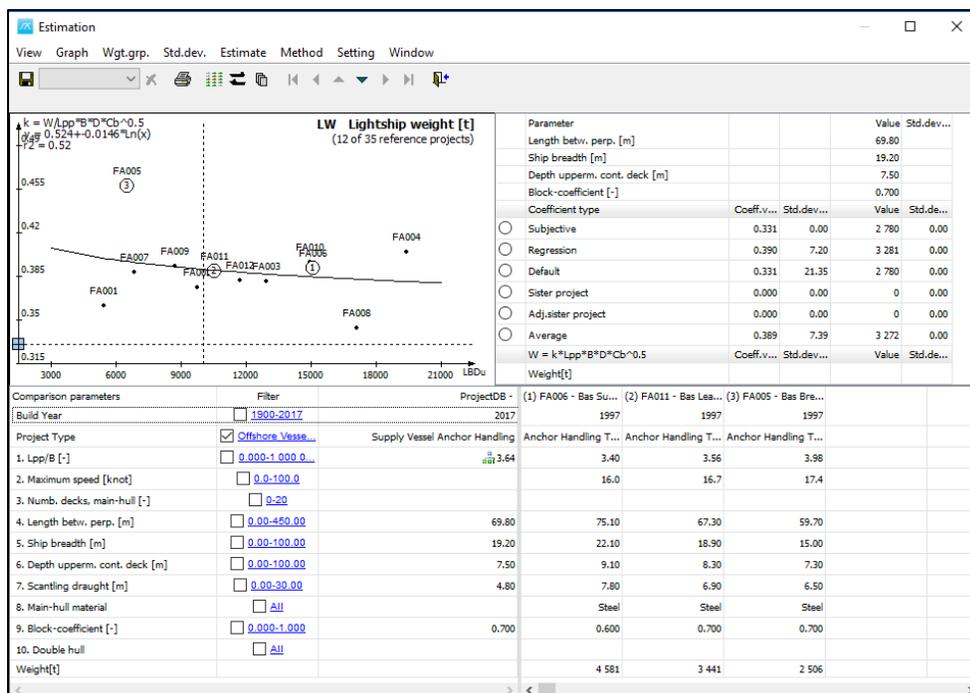
Let's go back to Project Types dialog and exclude again the Tanker vessels, by clicking on Tanker, then select **Exclude** button and press **OK**:



And now we are left only with the 12 offshore vessels:

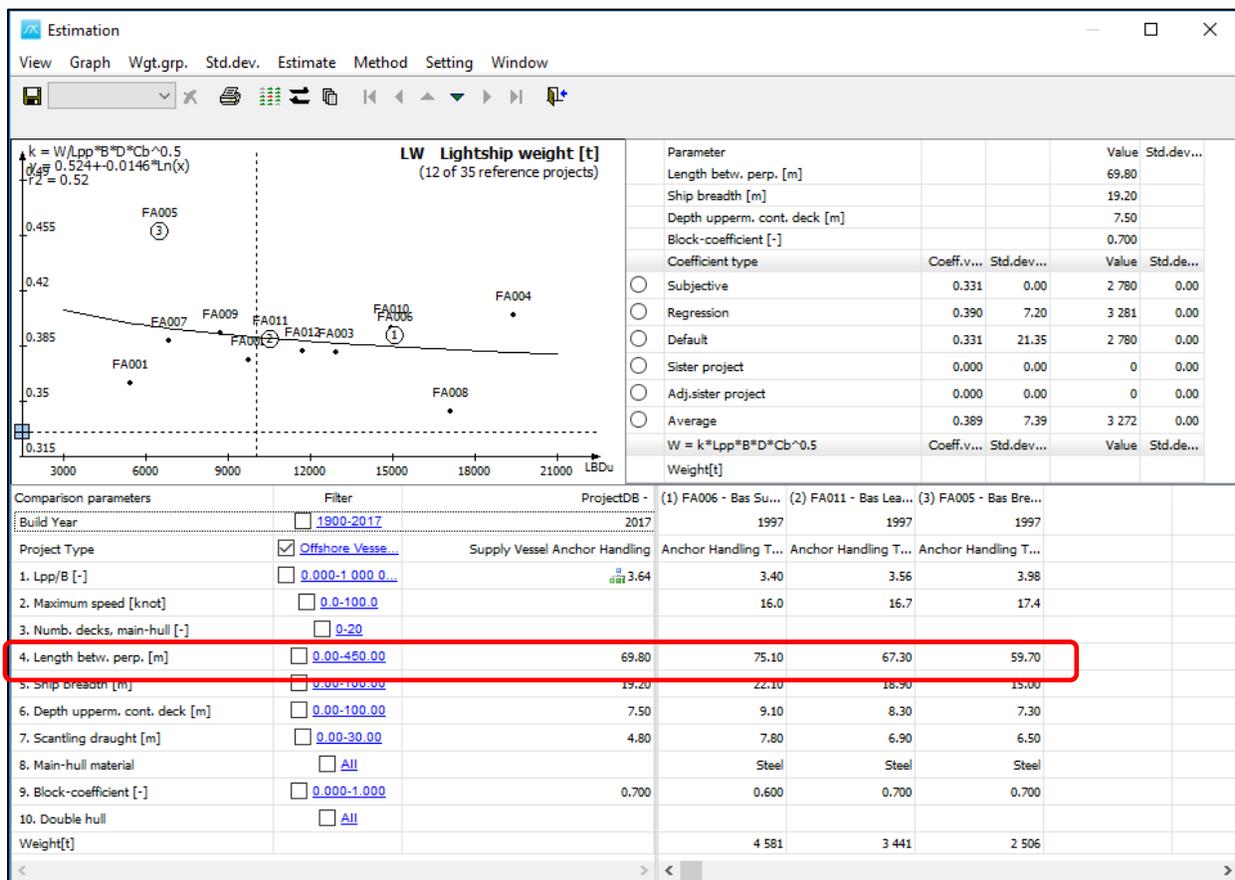


The next step would be to make sure that the 12 offshore vessels are relevant all of them for the estimation. The easiest way is to click on the points in the graph, let's say to check **FA006**, **FA011** and **FA005**.

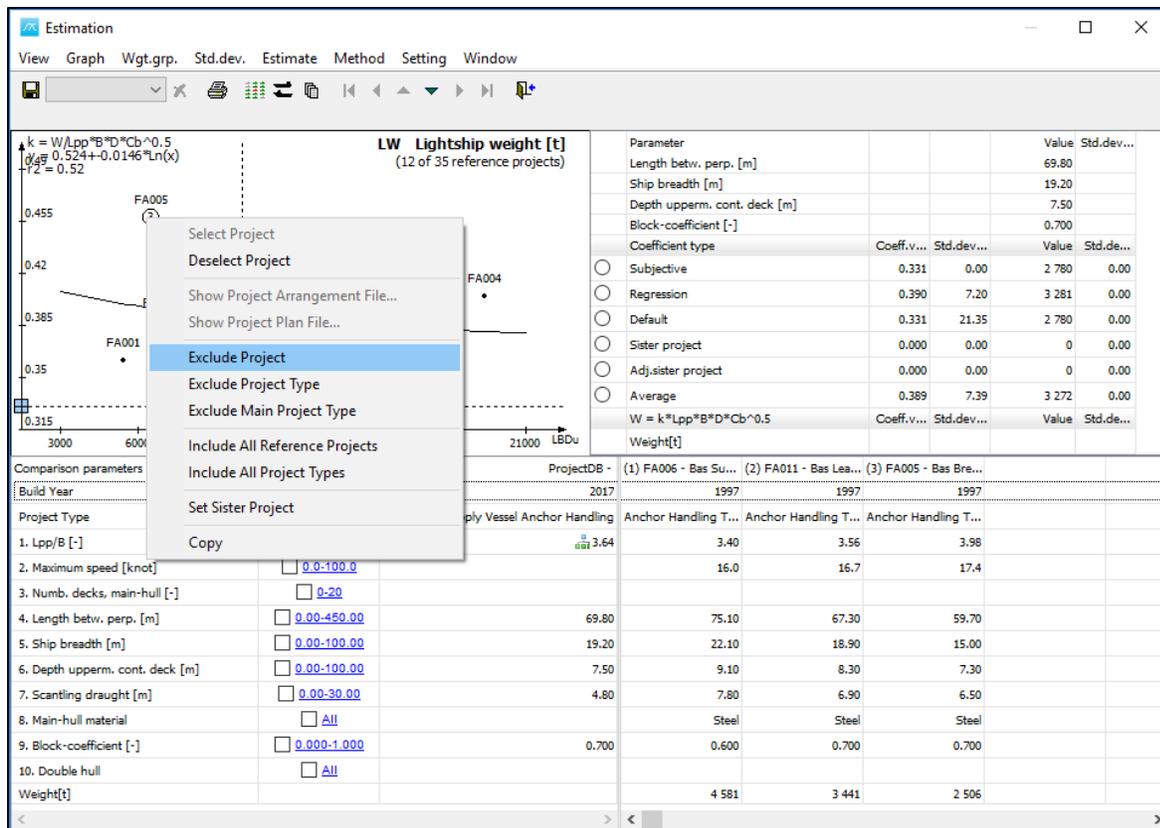


We can see they got circles and numbers, and we can find them in the lower right area of the Estimation window. The parameters values for the selected vessels are now visible and we can compare them with the parameters values of the vessel we are currently estimating.

Typically, we will look at points that are far from the trendline, such as vessel number (3) FA005, we can notice that the **Length betw. perp.** parameter for the vessel currently estimated is around 70 m, same with vessel number 1 and 2, but vessel number 3 is only 59.7 m. This may lead to conclude that this coefficient is a bit off the trendline, because it is very short vessel and maybe it is not good to include too short vessels.

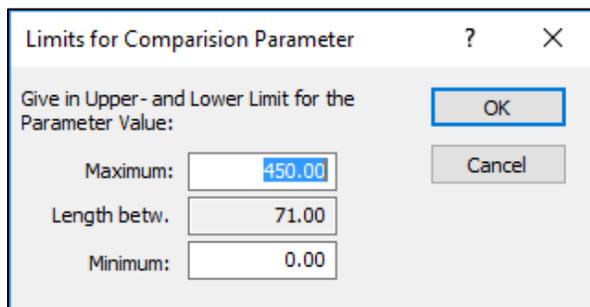


So, to exclude vessels that are not in the right range, the easy way is to right click on the point from the graph and just select **Exclude Project**:

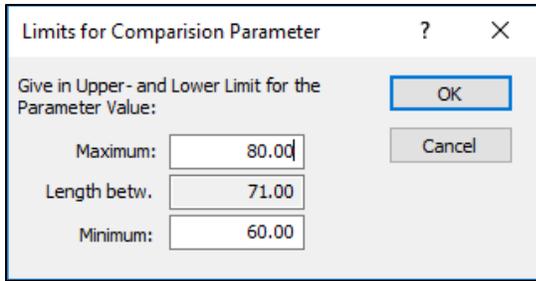


However, it is recommended not doing that, but rather use the Filters, because that seems to bring more logical approach how to exclude and include vessels.

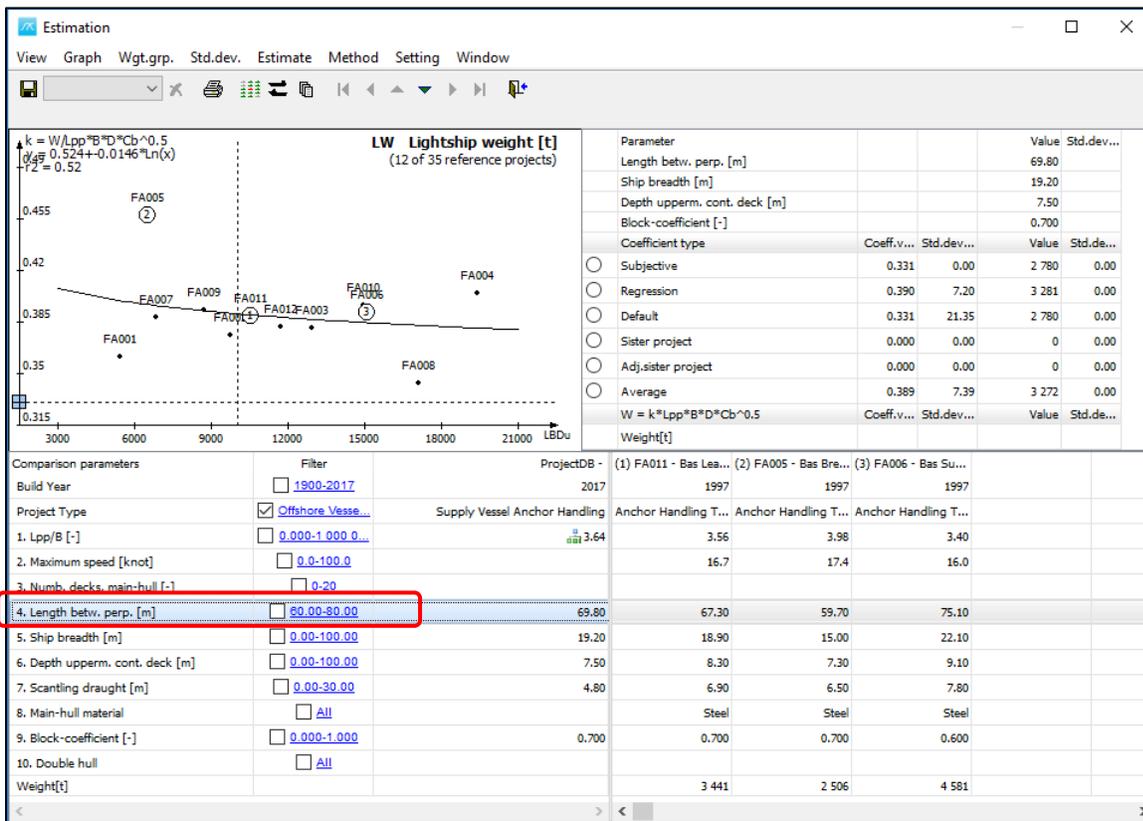
So, instead of doing that, just go down to Length betw. perp. and select the filter criteria "0.00-450.00", which will open the **Limits for Comparison Parameter** dialog:



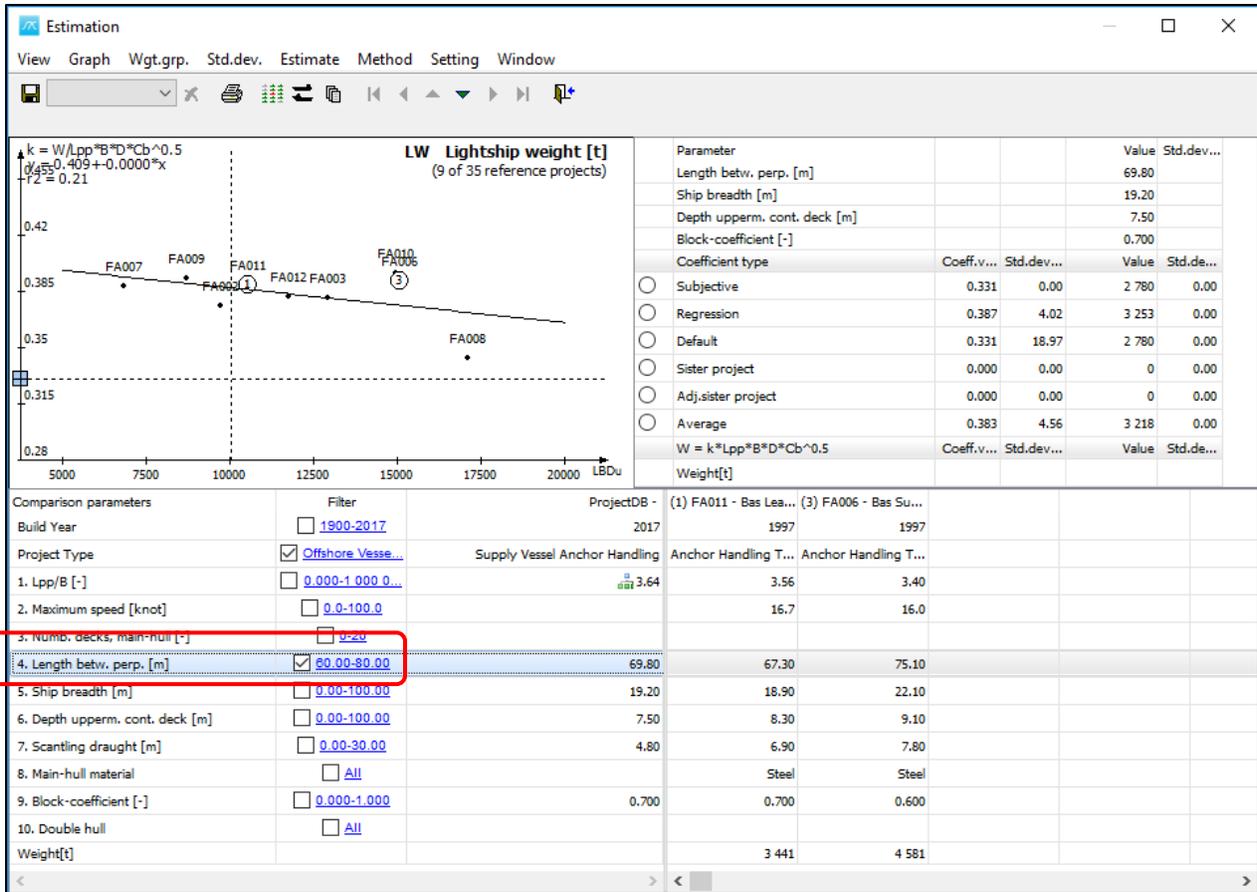
We can see the maximum is 450 meters and minimum 0 meters, so this needs to be changed to maximum 80 meters and minimum 60 meters.



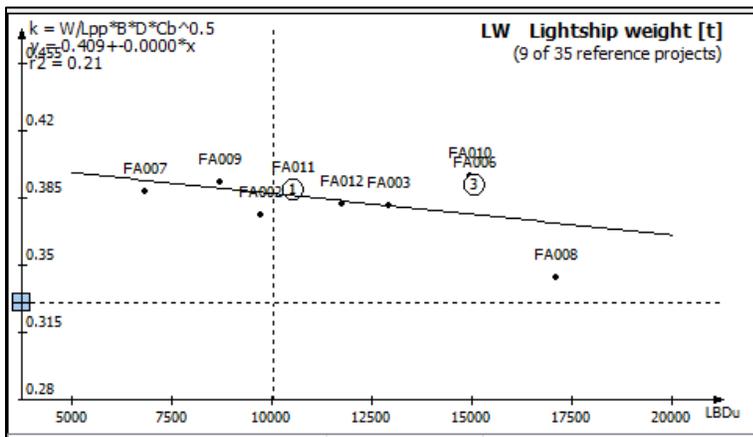
Click OK. Now, we can see the new range, **60.00-80.00**.



To activate this filter, check the checkbox from this filter. We have in the graph 12 reference ships, but after we activate the new filter range, we will have only 9 reference ships:



We can also see the trendline looks better fitted:



Another way of checking if you have done a good selection of the reference ships, is to notice the regression standard deviation **Std. dev...**, which was 7.2 with the 12 reference ships included, and now is **4.02** with 9 reference ships included.

Parameter			Value	Std.dev...
Length betw. perp. [m]			69.80	
Ship breadth [m]			19.20	
Depth upperm. cont. deck [m]			7.50	
Block-coefficient [-]			0.700	
Coefficient type	Coeff.v...	Std.dev...	Value	Std.de...
<input type="radio"/> Subjective	0.331	0.00	2 780	0.00
<input type="radio"/> Regression	0.387	4.02	3 253	0.00
<input type="radio"/> Default	0.331	18.97	2 780	0.00
<input type="radio"/> Sister project	0.000	0.00	0	0.00
<input type="radio"/> Adj.sister project	0.000	0.00	0	0.00
<input type="radio"/> Average	0.383	4.56	3 218	0.00
W = k*Lpp*B*D*Cb^0.5	Coeff.v...	Std.dev...	Value	Std.de...
Weight[t]				

Selecting the coefficient

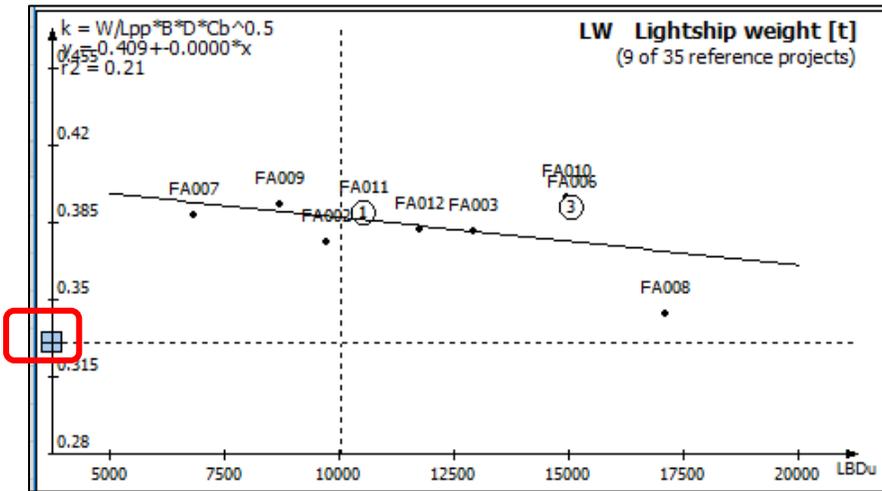
So, now we have a set of relevant ships, a trendline, a plot value and we should now select the coefficient from the graph.

To select the coefficient, it can be done subjectively:

- select **Subjective** from the Parameter area:

Parameter			Value	Std.dev...
Length betw. perp. [m]			69.80	
Ship breadth [m]			19.20	
Depth upperm. cont. deck [m]			7.50	
Block-coefficient [-]			0.700	
Coefficient type	Coeff.v...	Std.dev...	Value	Std.de...
<input checked="" type="radio"/> Subjective	0.331	0.00	2 780	0.00
<input type="radio"/> Regression	0.387	4.02	3 253	0.00
<input type="radio"/> Default	0.331	18.97	2 780	0.00
<input type="radio"/> Sister project	0.000	0.00	0	0.00
<input type="radio"/> Adj.sister project	0.000	0.00	0	0.00
<input type="radio"/> Average	0.383	4.56	3 218	0.00
W = k*Lpp*B*D*Cb^0.5	Coeff.v...	Std.dev...	Value	Std.de...
Weight[t]	0.331	0.00	2 780	

and grab the coefficient tear and move it up and down:



To put it wherever you want to select the Y value:

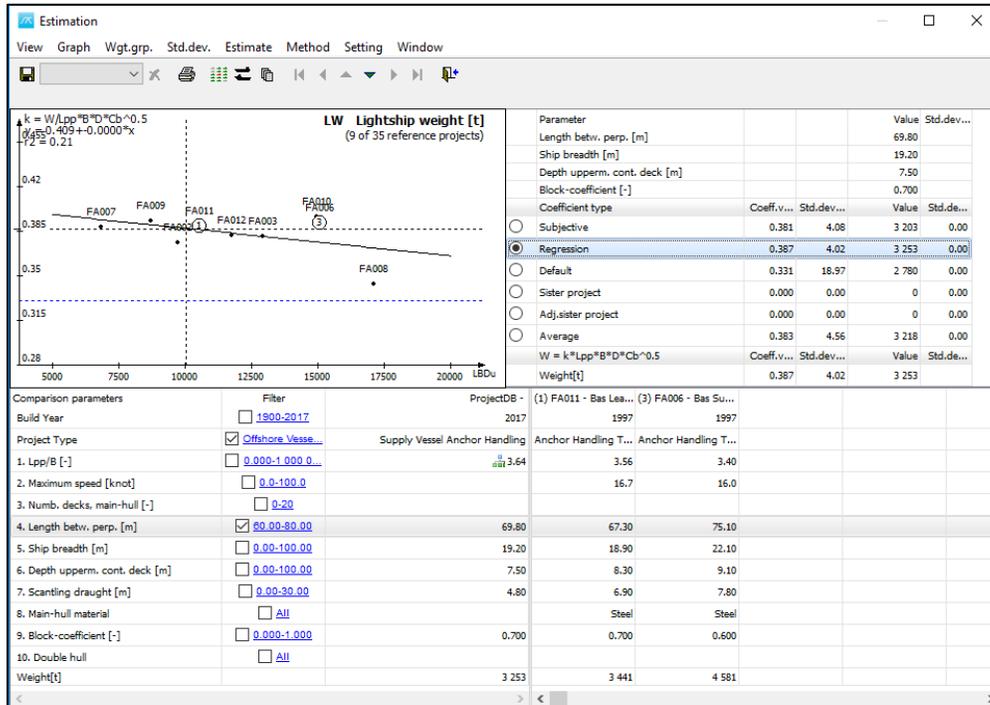
Estimation

View Graph Wgt.grp. Std.dev. Estimate Method Setting Window

Parameter	Value	Std.dev...
Length betw. perp. [m]	69.80	
Ship breadth [m]	19.20	
Depth upperm. cont. deck [m]	7.50	
Block-coefficient [-]	0.700	
Coefficient type		
Coeff.v...	Std.dev...	Value Std.de...
<input checked="" type="radio"/> Subjective	0.381 4.08	3 203 0.00
<input type="radio"/> Regression	0.387 4.02	3 253 0.00
<input type="radio"/> Default	0.331 18.97	2 780 0.00
<input type="radio"/> Sister project	0.000 0.00	0 0.00
<input type="radio"/> Adj.sister project	0.000 0.00	0 0.00
<input type="radio"/> Average	0.383 4.56	3 218 0.00
W = k*Lpp*B*D*Cb^0.5		
Coeff.v...	Std.dev...	Value Std.de...
<input checked="" type="radio"/> Weight[t]	0.331 0.00	2 780

Comparison parameters	Filter	ProjectDB	(1) FA011 - Bas Lea...	(3) FA006 - Bas Su...
Build Year	<input type="checkbox"/> 1900-2017	2017	1997	1997
Project Type	<input checked="" type="checkbox"/> Offshore Vesse...	Supply Vessel Anchor Handling	Anchor Handling T...	Anchor Handling T...
1. Lpp/B [-]	<input type="checkbox"/> 0.000-1.000 0...	3.64	3.56	3.40
2. Maximum speed [knot]	<input type="checkbox"/> 0.0-100.0		16.7	16.0
3. Numb. decks, main-hull [-]	<input type="checkbox"/> 0-20			
4. Length betw. perp. [m]	<input checked="" type="checkbox"/> 60.00-80.00	69.80	67.30	75.10
5. Ship breadth [m]	<input type="checkbox"/> 0.00-100.00	19.20	18.90	22.10
6. Depth upperm. cont. deck [m]	<input type="checkbox"/> 0.00-100.00	7.50	8.30	9.10
7. Scantling draught [m]	<input type="checkbox"/> 0.00-30.00	4.80	6.90	7.80
8. Main-hull material	<input type="checkbox"/> All		Steel	Steel
9. Block-coefficient [-]	<input type="checkbox"/> 0.000-1.000	0.700	0.700	0.600
10. Double hull	<input type="checkbox"/> All			
Weight[t]		2 780	3 441	4 581

- Or select **Regression** coefficient, which is the crossing of the trendline and the X line. The horizontal coefficient graph should then be moved until it intersects with the regression line and the vertical plot parameter line.



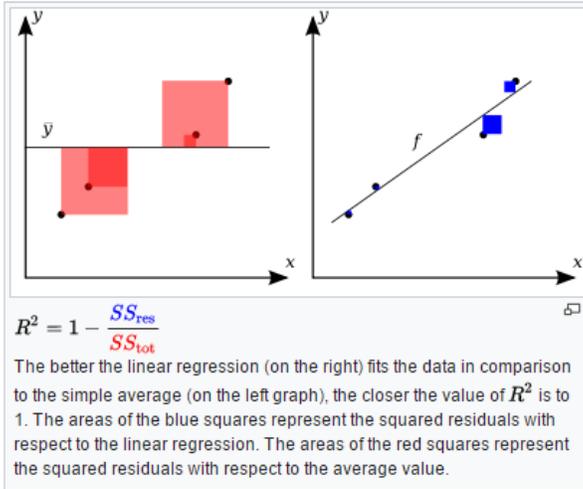
The r^2 value from the Graph area represents the coefficient of determination, and is a number that indicates the proportion of the variance in the dependent variable that is predictable from the independent variable (s).

There are several definitions of r^2 that are only sometimes equivalent. One class of such cases includes that of simple linear regression where r^2 is used instead of R^2 .

When an intercept is included, then r^2 is simply the square of the sample correlation coefficient (i.e., r) between the observed outcomes and the observed predictor values. If additional regressors are included, R^2 is the square of the coefficient of multiple correlation. In both such cases, the coefficient of determination ranges from 0 to 1. *See in our graph $r^2 = 0.21$.*

The most general definition of the coefficient of determination is:

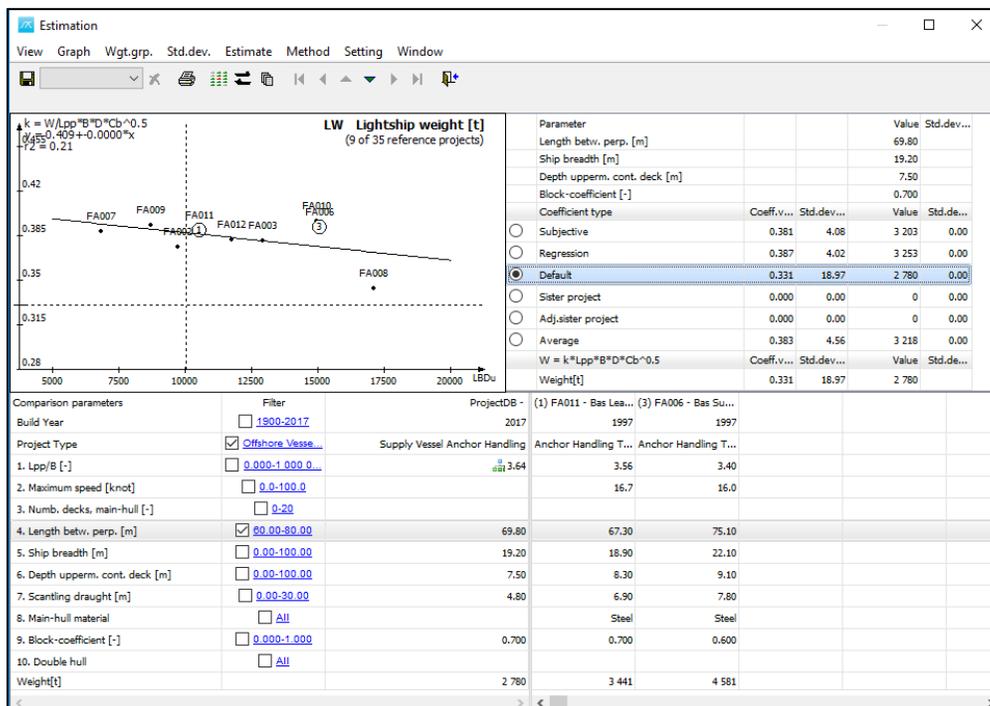
$$R^2 \equiv 1 - \frac{SS_{res}}{SS_{tot}}$$



More information about r^2 coefficient of determination can be found here:

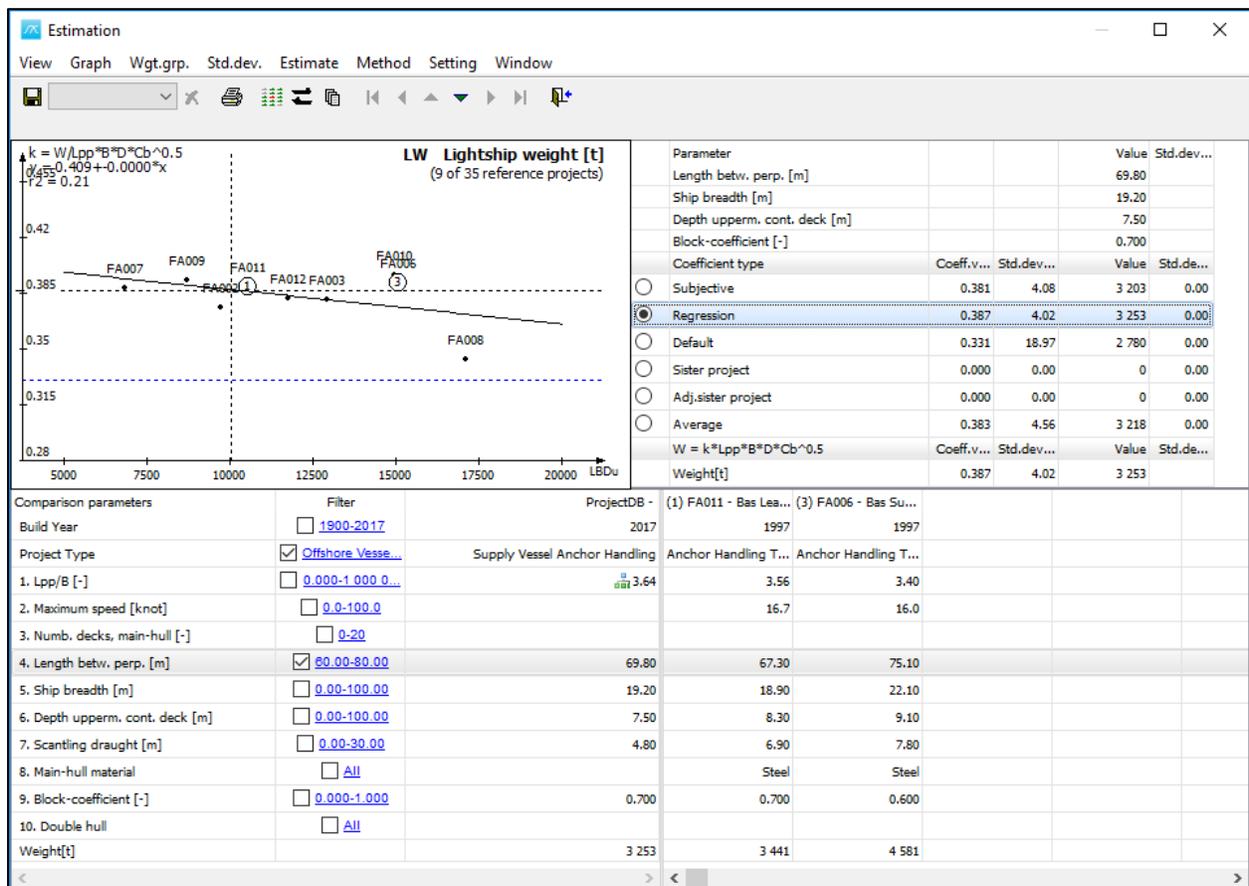
https://en.wikipedia.org/wiki/Coefficient_of_determination

- The **Default** coefficient is a static one, which can be saved.



- If you define a **Sister project** (ship), you can do a coefficient by scaling on one vessel.
- **Adj. sister ship** means moving the trendline through one of the sister ship, but still using the trendline to find the coefficient.
- **Factor** is the average coefficient.

In this case we have a clear trendline, so the right coefficient to be used is **Regression**. So, select this back:



And Save .

Move the Estimation dialog a little bit away, so that it can be seen in the ShipWeight main window the first estimation of the Lightship: 3998 tones, saved into the weight group hierarchy

ProjectDB (Est X-1000)

Weight Groups

Weight Group	Weight [t]
DISP - Displacement	3 253
DR - Remainder displacement	
DW - Deadweight	
A - Passenger, crew & owner supply	
C - Cargo	
F - Fuels and lubricants	
L - Liquids and gases	
Provision and stores	
LW - Lightship	3 253
Remainder	
E - Equipment	
H - Hull	
HR - Remainder hull	
H1 - Main hull	
H2 - Poop	
H3 - Superstructure	
H4 - Deckhouses	
H5 - Forecastle	
H6 - Keel	
H7 - Hull outfitting	
H8 - Material protection	
M - Machinery	
MR - Remainder machinery	
M1 - Machinery main-components	
M2 - Machinery system	
T - Topsides	
Temp - Temporary	

Estimation

View Graph Wgt.grp. Std.dev. Estimate Method Setting Window

LW - Weight

$k = W / (Lpp * B * D * Cb)^{0.5}$
 $k = 0.409 + 0.0000 * x$
 $r^2 = 0.21$

LW Lightship weight [t]
 (9 of 35 reference projects)

Parameter

- Length betw. perp. [m]
- Ship breadth [m]
- Depth upperm. cont. deck [m]
- Block-coefficient [-]
- Coefficient type
- Subjective
- Regression
- Default
- Sister project
- Adj.sister project
- Average
- $W = k * Lpp * B * D * Cb^{0.5}$
- Weight[t]

Comparison parameters

Parameter	Filter	ProjectDB -
Build Year	<input type="checkbox"/> 1900-2017	2017
Project Type	<input checked="" type="checkbox"/> Offshore Vesse...	Supply Vessel Anchor Handling
1. Rake of keel [-]	<input type="checkbox"/> 0.00-1.000 0...	
2. Froudes number [-]	<input type="checkbox"/> 0.000-1.000 0...	
3. LCG wheel house over shiplength [-]	<input type="checkbox"/> 0.000-1.000 0...	
4. Numb. decks, main-hull [-]	<input type="checkbox"/> 0-20	
5. Length betw. perp. [m]	<input type="checkbox"/> 0.00-450.00	69.80

Now move on, doing estimation for the **LCG** and **VCG**.

In the Estimation dialog, go to the **Estimate** menu, and switch from **Weight** to **LCG** first.

The calculation method now is the historical coefficient $k * \text{the } Lpp$:

Estimation

View Graph Wgt.grp. Std.dev. Estimate Method Setting Window

LW - Lightship LCG [m]

$k = LCG / Lpp$
 $k = 0.443 * e^{-0.0023x}$
 $r^2 = 0.73$

LW Lightship LCG [m]
 (12 of 28 reference projects)

Parameter

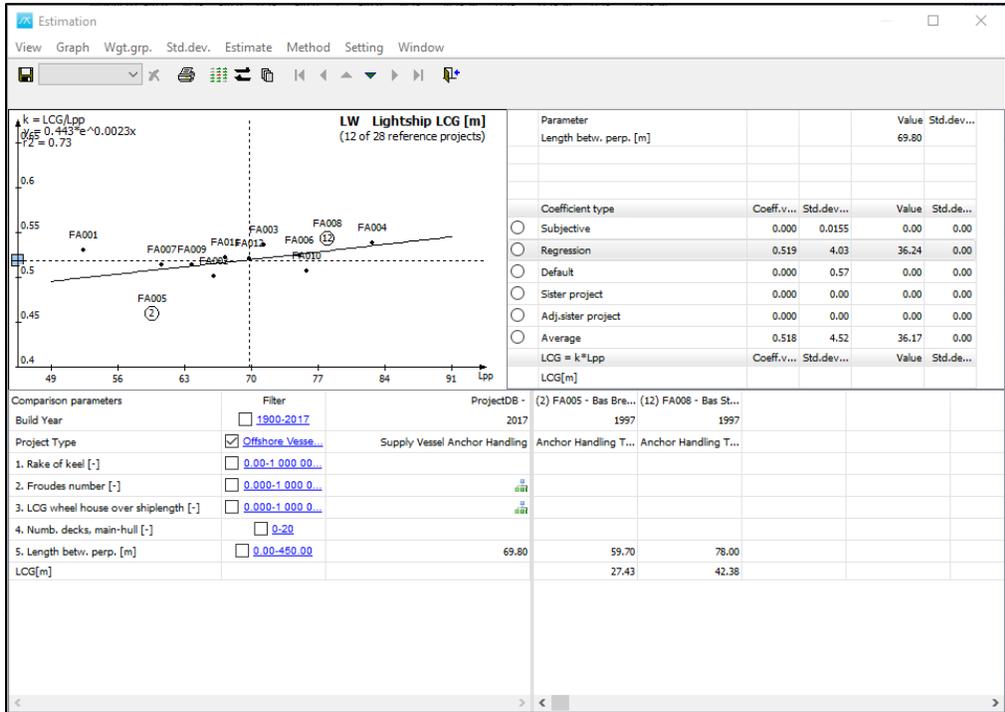
Parameter	Value	Std.dev...
Length betw. perp. [m]	69.80	
Coefficient type		
<input type="radio"/> Subjective	0.000	0.0155
<input checked="" type="radio"/> Regression	0.519	4.03
<input type="radio"/> Default	0.000	0.57
<input type="radio"/> Sister project	0.000	0.00
<input type="radio"/> Adj.sister project	0.000	0.00
<input type="radio"/> Average	0.518	4.52
LCG = k * Lpp		
LCG[m]		

Comparison parameters

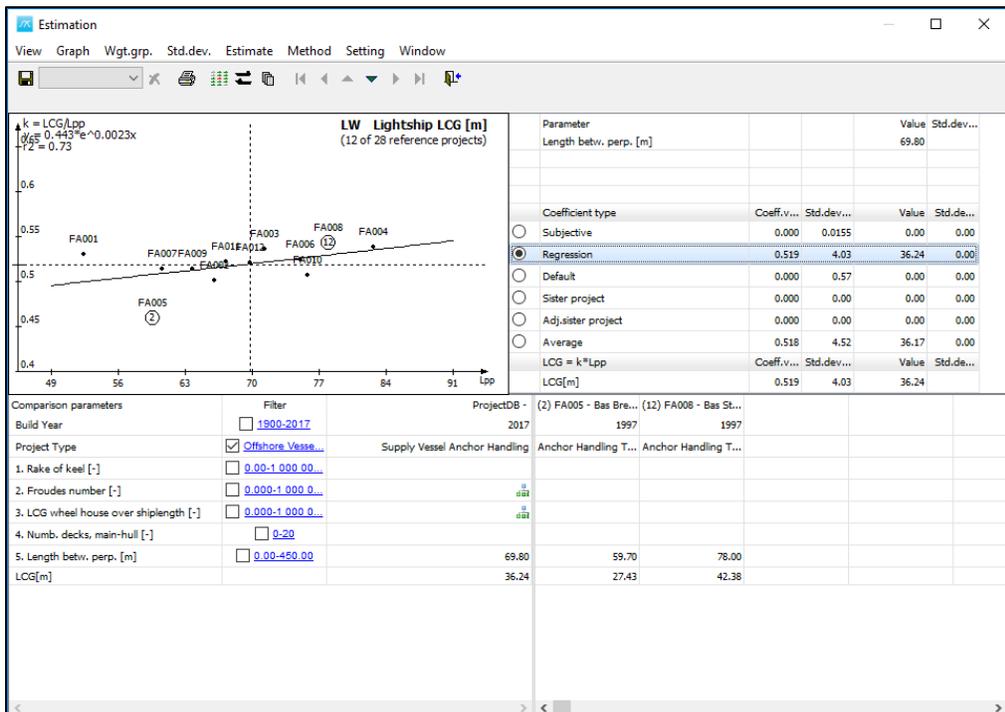
Parameter	Filter	ProjectDB -
Build Year	<input type="checkbox"/> 1900-2017	2017
Project Type	<input checked="" type="checkbox"/> Offshore Vesse...	Supply Vessel Anchor Handling
1. Rake of keel [-]	<input type="checkbox"/> 0.00-1.000 0...	
2. Froudes number [-]	<input type="checkbox"/> 0.000-1.000 0...	
3. LCG wheel house over shiplength [-]	<input type="checkbox"/> 0.000-1.000 0...	
4. Numb. decks, main-hull [-]	<input type="checkbox"/> 0-20	
5. Length betw. perp. [m]	<input type="checkbox"/> 0.00-450.00	69.80

In other words, we look at the historical relation between LCG and Lpp, again this relationships by the k factor plotted in the graph. We can go in and investigate:

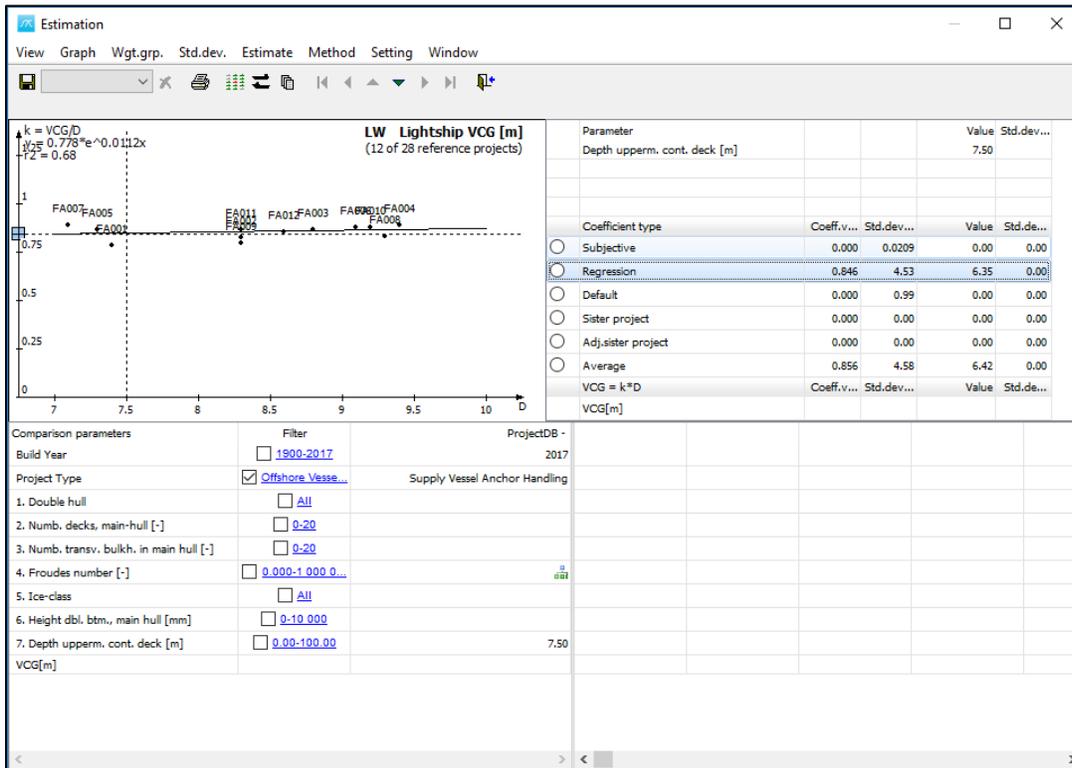
Click on **FA005** and **FA008**, making sure we have relevant vessels:



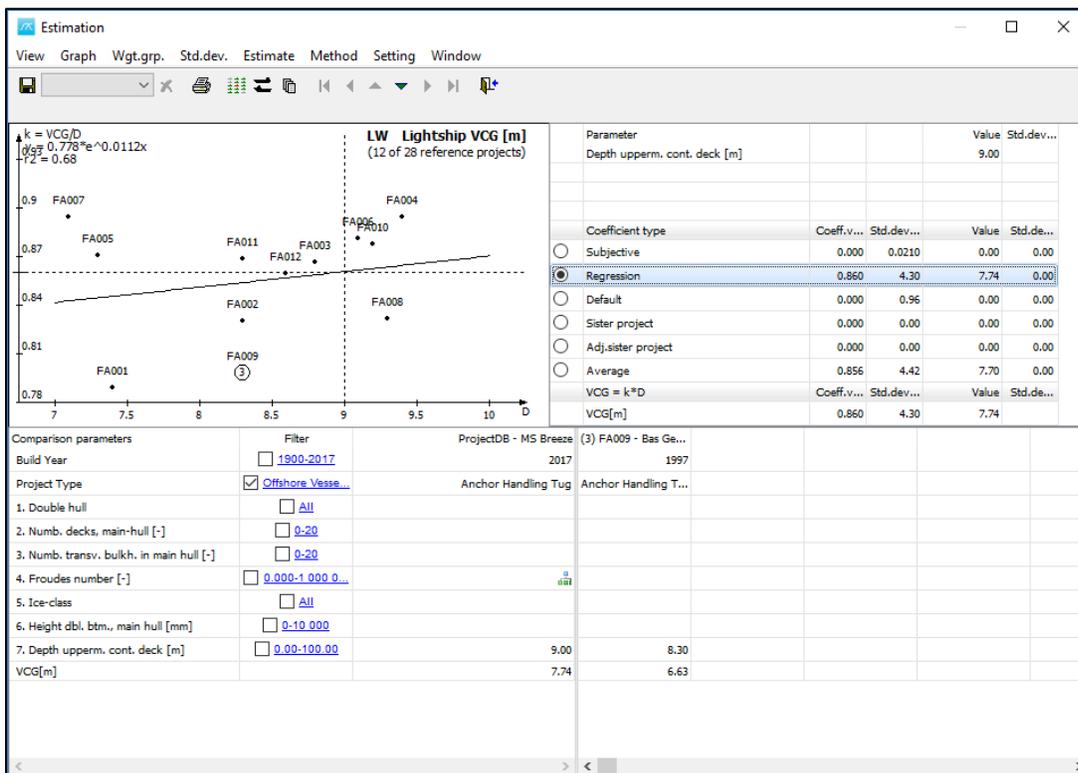
Select the **Regression** coefficient and **Save**:



Now, we can go and Estimate the VCG. Select from the Estimate menu, VCG:

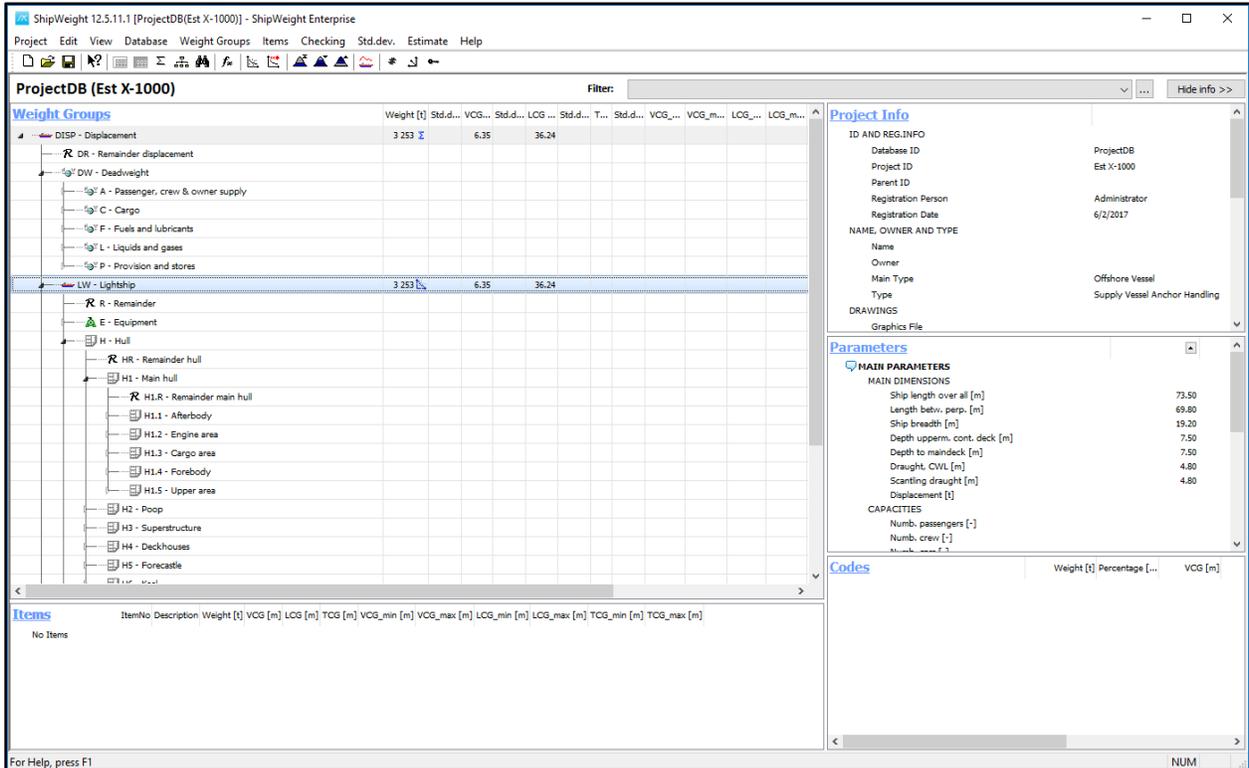


Select **Regression** coefficient from Parameter area and **FA009** from the graph:



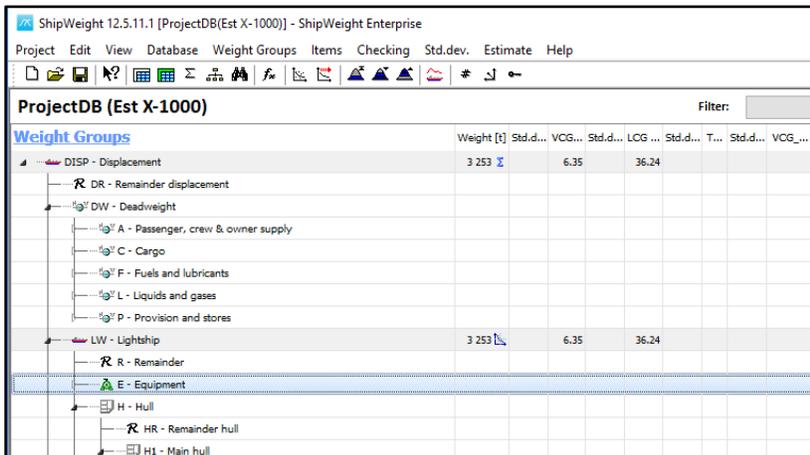
Save, and then close the Estimation dialog.

The first estimation of Weight and Center of Gravity can be seen in ShipWeight main window:



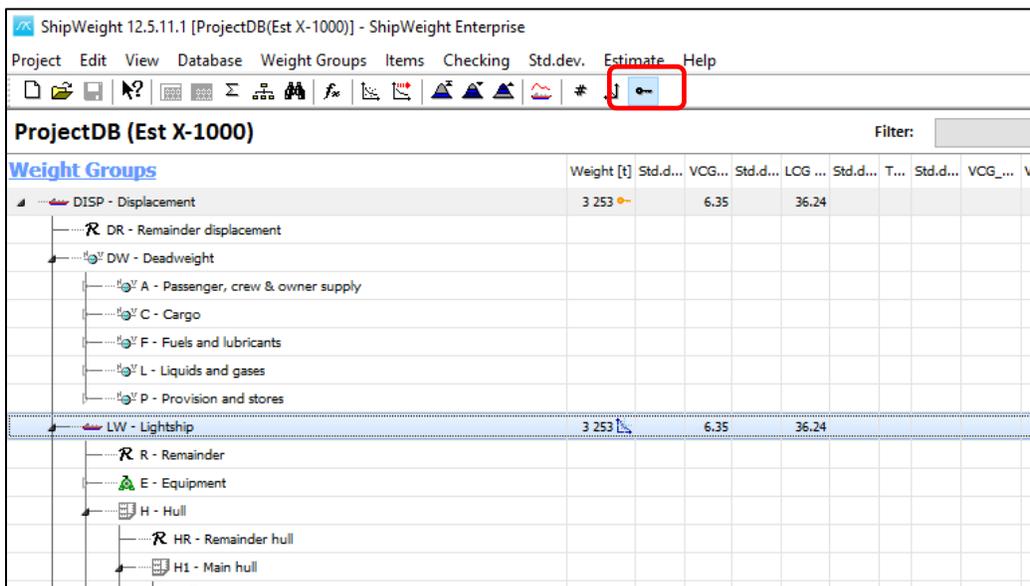
Oviously, we want to do more detailed estimation, so we now want to go down to **Equipment, Hull and Machinery** groups.

Select Equipment and now we should estimate this group:



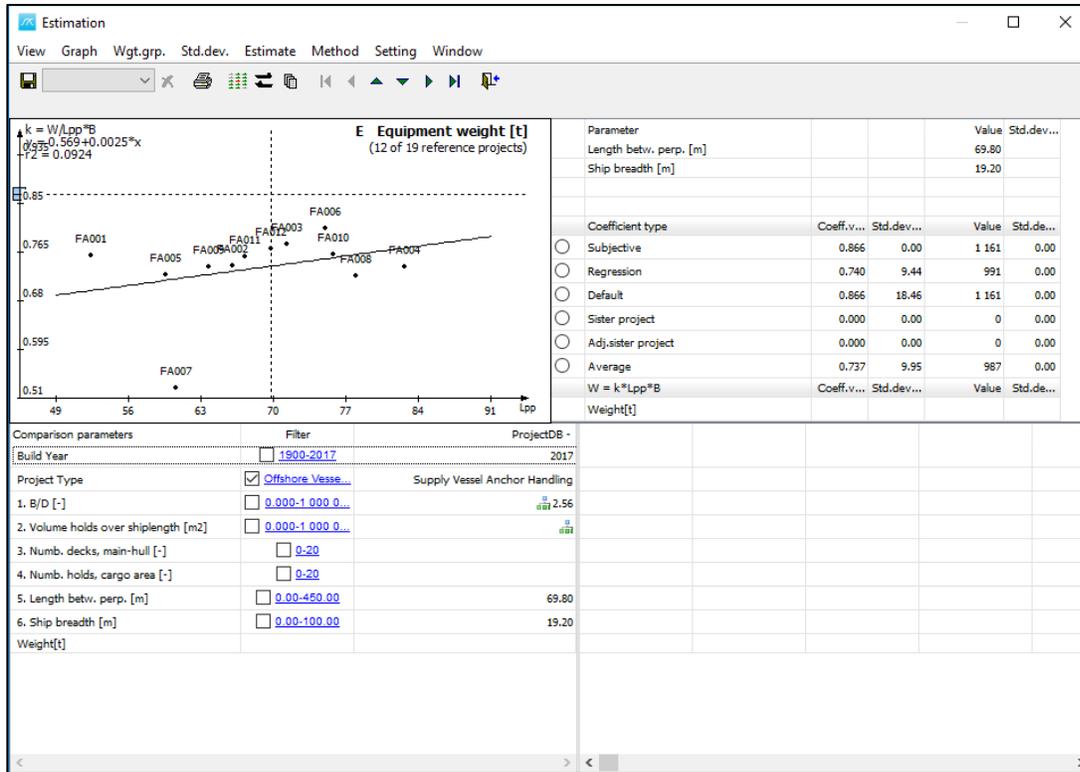
Since, ShipWeight is by default doing a calculation that goes bottom-up, we should take some care, because if we now estimate de Equipment weight group, it's going to start summarize the Equipment, Hull and Machinery, and remove the initial Lightship estimation, and give the sum of whatever has estimated down here.

To prevent this, go to the toolbar and click on the button with the key, which locks the parent group:

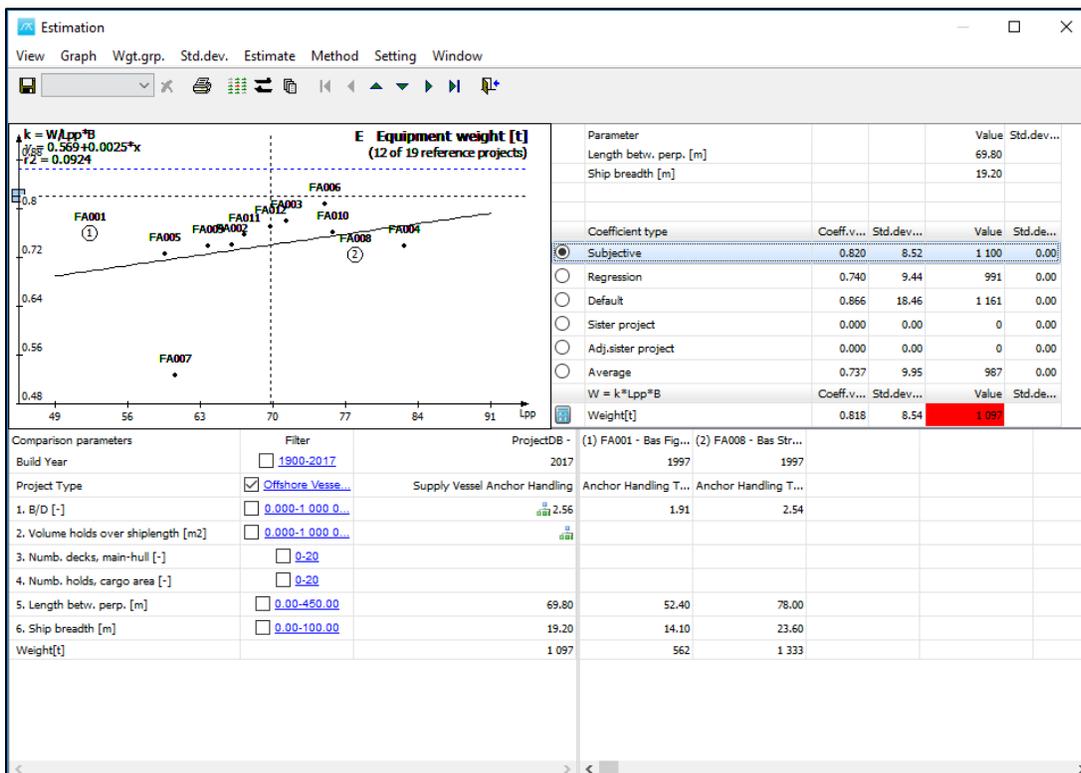


Now the values from the Lightship will not be lost, but the deviation between the summary of the subgroup and the parent group will be automatically kept in the **Remainder**.

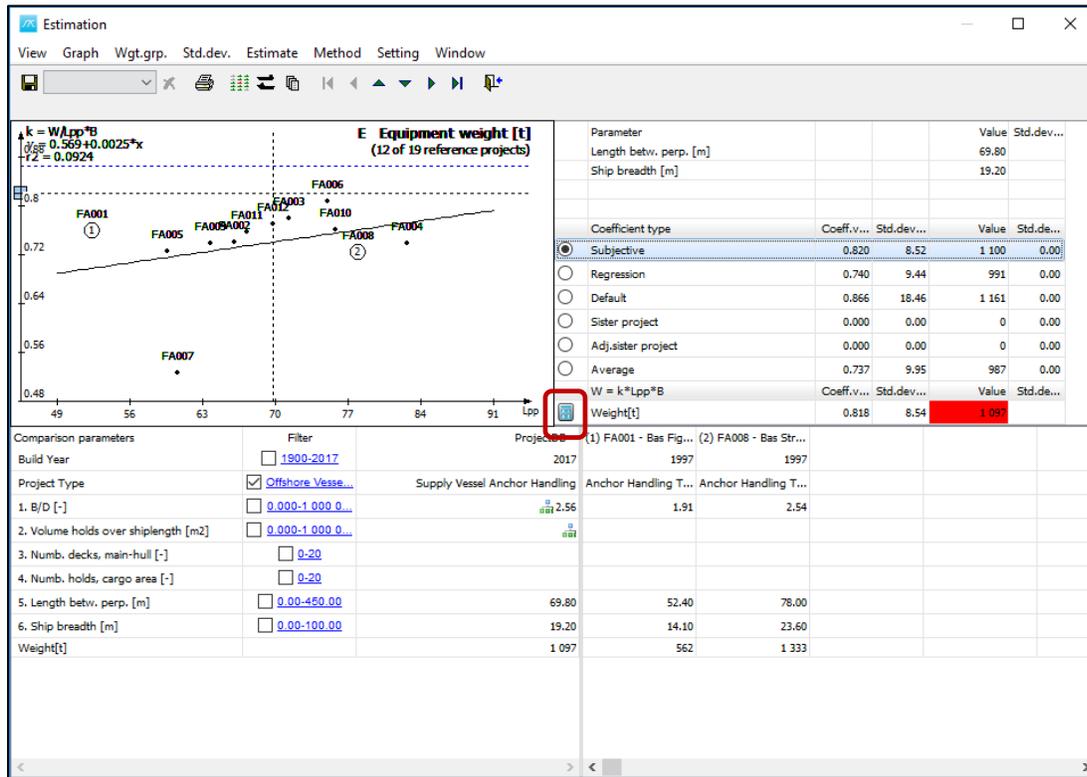
So selecting **Equipment** group, and open up the Parametric Estimation dialog, which will give now the window with the Estimation of Equipment weight group:



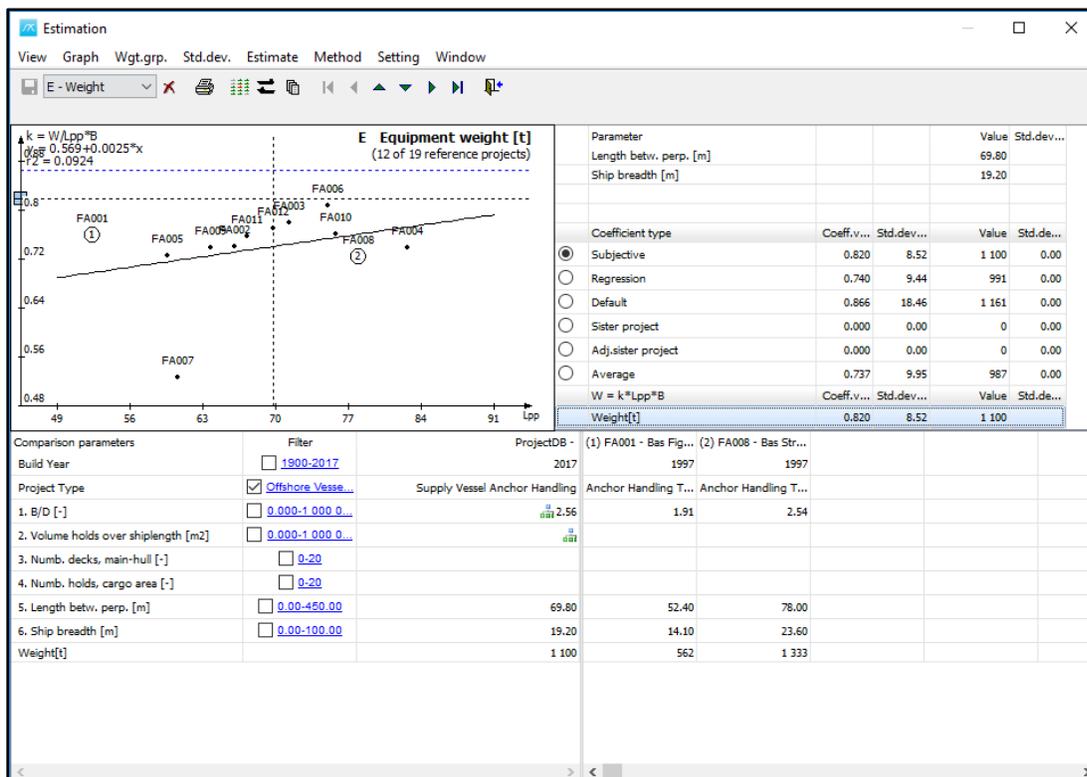
Again, we need to investigate, pick projects in the graph, **FA001**, **FA008**, and do the filtering. Check the **Subjective** coefficient:



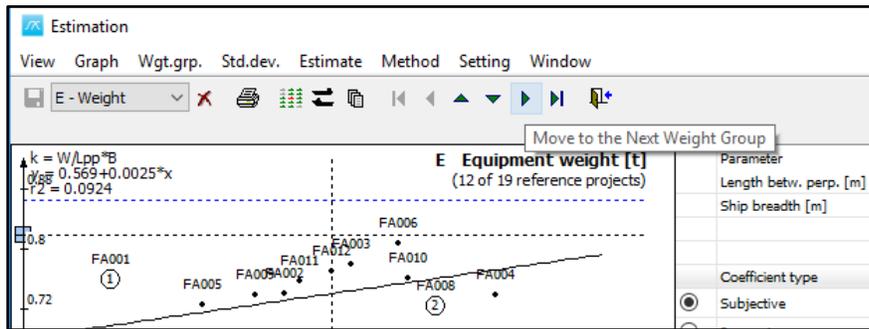
And estimate the Weight by pressing the calculator button:



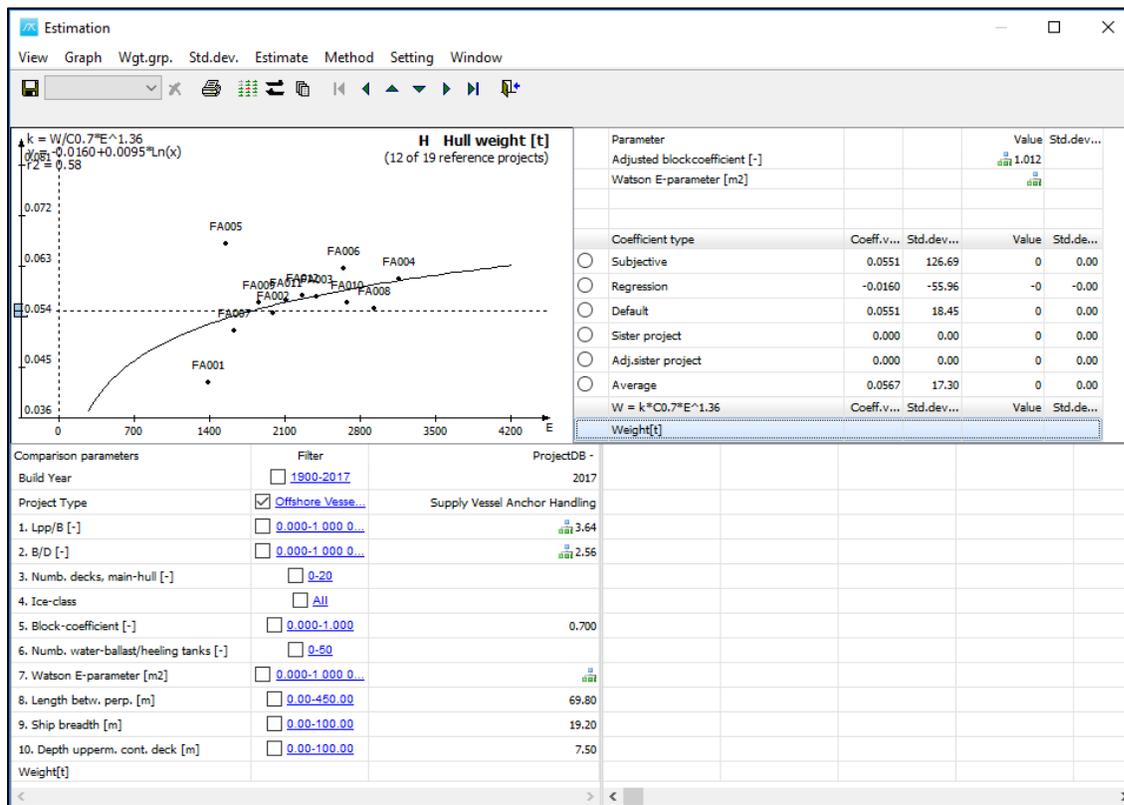
Then save:



And now we can use the arrow button to go to the Next Weight Group, from **Equipment to Hull**:



The Hull weight default method it is a little bit complex:



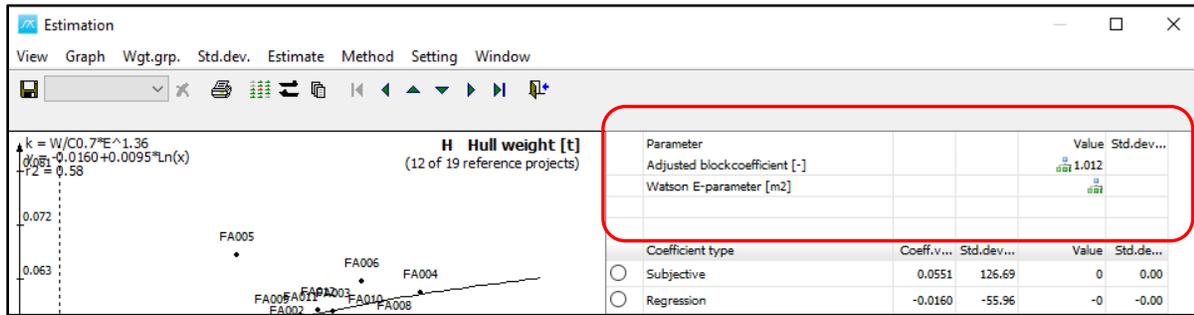
It is the weight $W = k * C07 * E^{1.36}$

k: is the coefficient

C07: is the adjusted block coefficient

E: is the Watson E-parameter

The parameters for the current vessel are displayed on the Parameter area:



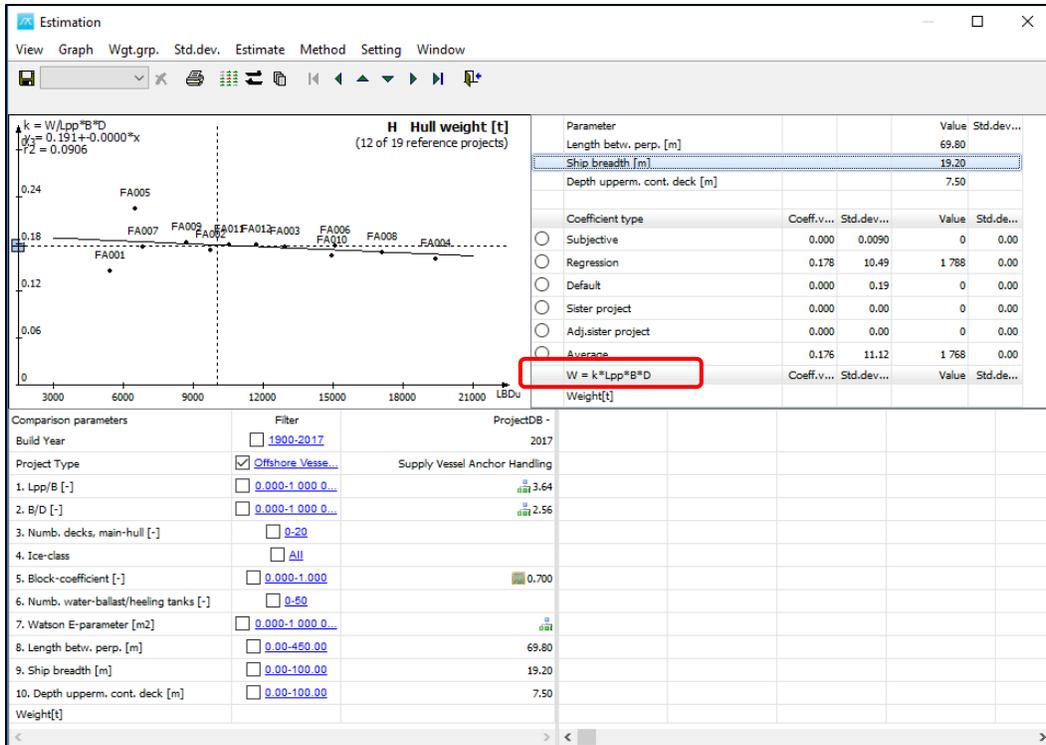
To enter the Watson E-Parameter, click on the  icon. The Composite Parameter dialog will open:

In the last row, we can see the entire formula for the Watson E-Parameter.

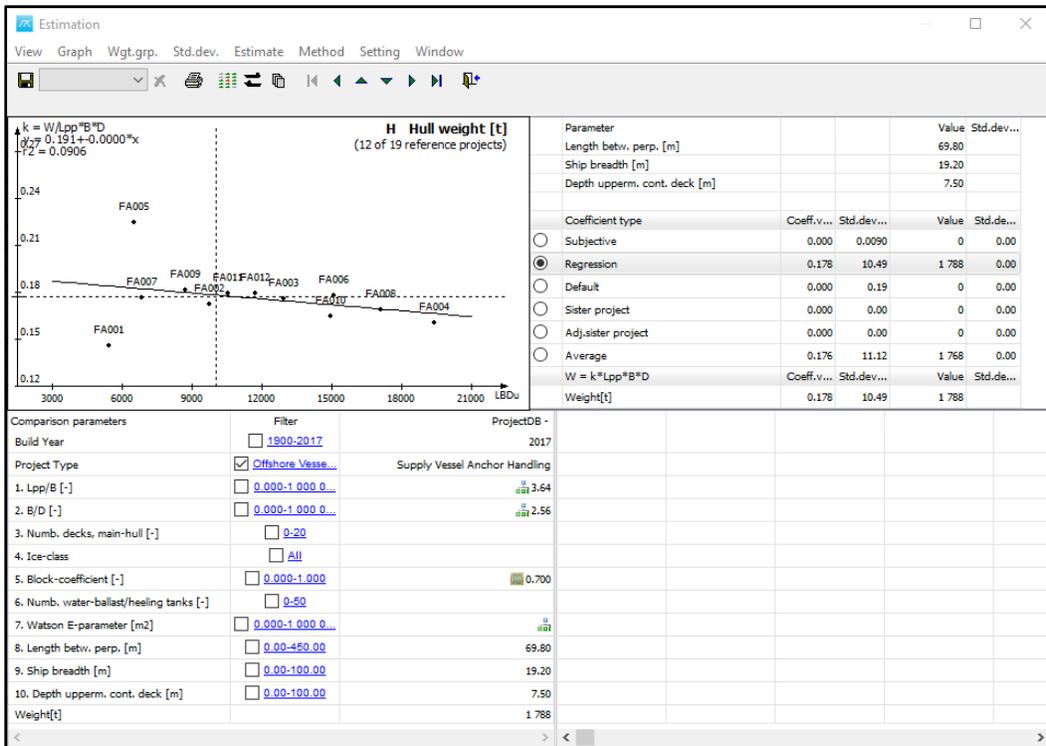
We can see as well, the rest of the parameters that are lacking to be able to calculate the Watson E-Parameter, to get the X value for the graph and do an estimation.

Because it is too early in the project to know the values of these parameters, we need to change to a different method, so just **Close** the Composite Parameter dialog.

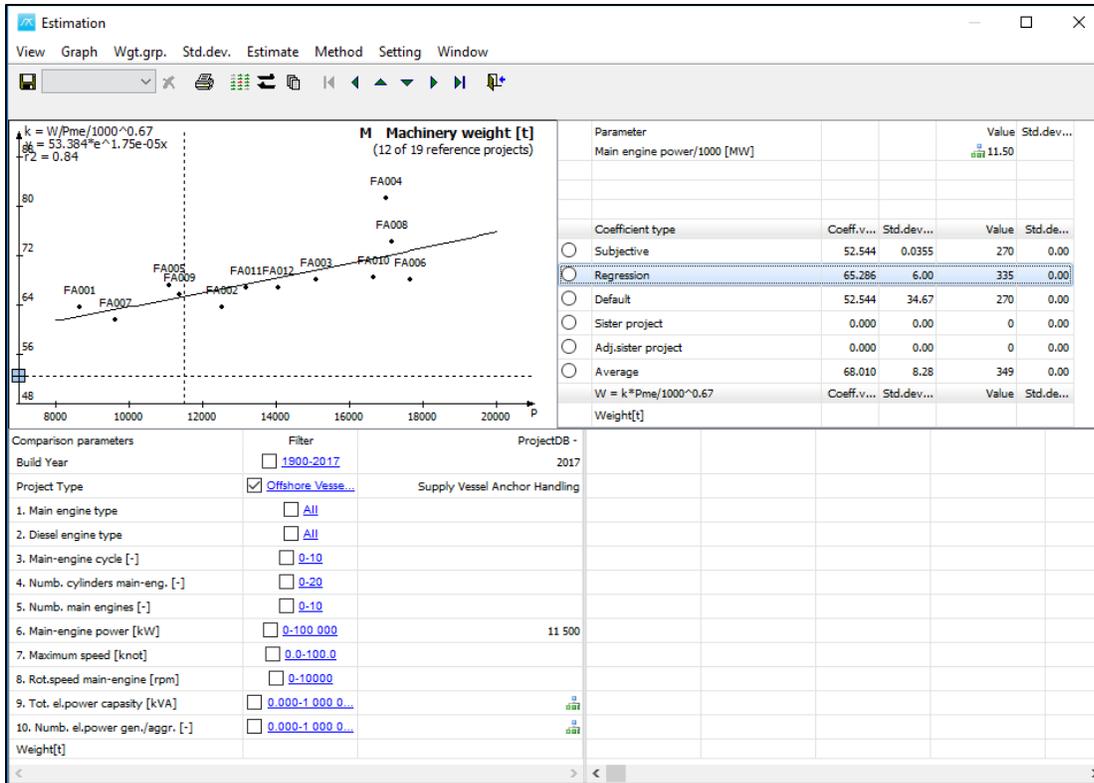
Go to the **Method** menu, select **Main Parameter** option. Now we can see there is a simpler parameter estimation formula:



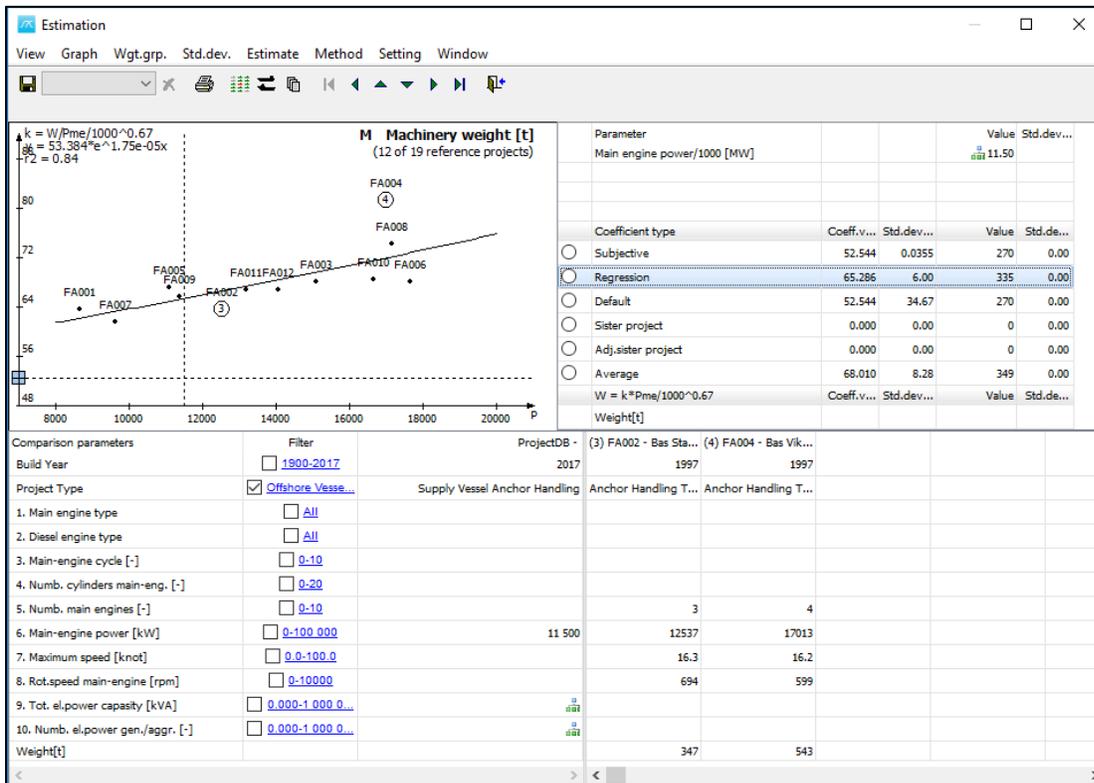
Select **Regression** coefficient and **Save**:



Next, click the arrow to move to **Machinery** weight:

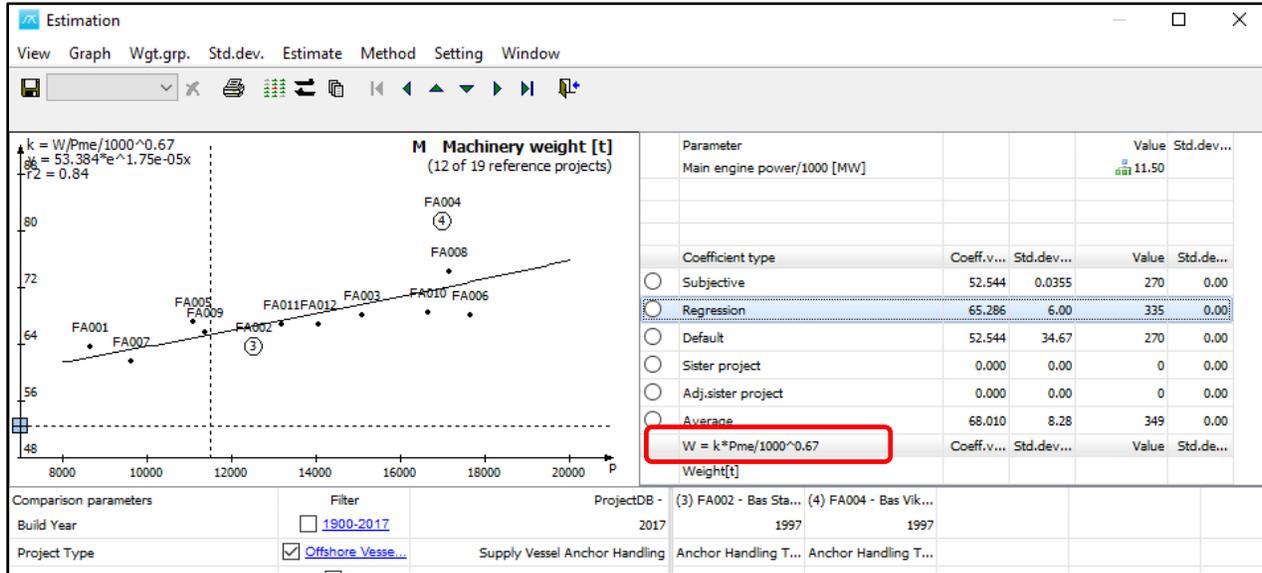


For the Machinery weight, select **FA002**, **FA004** reference ships:



We can see the FA004 project has very heavy machinery 17013 kW, maybe this should be filtered out.

For the Machinery weight group, the weight formula is:



And the comparison parameters have changed. They are attached to the weight group and the method.

Now, let's do a filter of the main-engine power. Click the link for main-engine power, and the Limits for Comparison Parameter dialog will open:

The screenshot shows the 'Limits for Comparison Parameter' dialog box. It has a title bar with a question mark and a close button. The main text says 'Give in Upper- and Lower Limit for the Parameter Value:'. There are three input fields: 'Maximum:' with the value '100 000', 'Main-engine' with the value '11 500', and 'Minimum:' with the value '0'. There are 'OK' and 'Cancel' buttons.

And change Maximum from 100 000 to 15 000, and Minimum from 0 to 8000:

Limits for Comparison Parameter ? X

Give in Upper- and Lower Limit for the Parameter Value:

Maximum:

Main-engine:

Minimum:

OK

Cancel

Click OK and activate this filter by checking the box to the left of 8000-15000:

Estimation

View Graph Wgt.grp. Std.dev. Estimate Method Setting Window

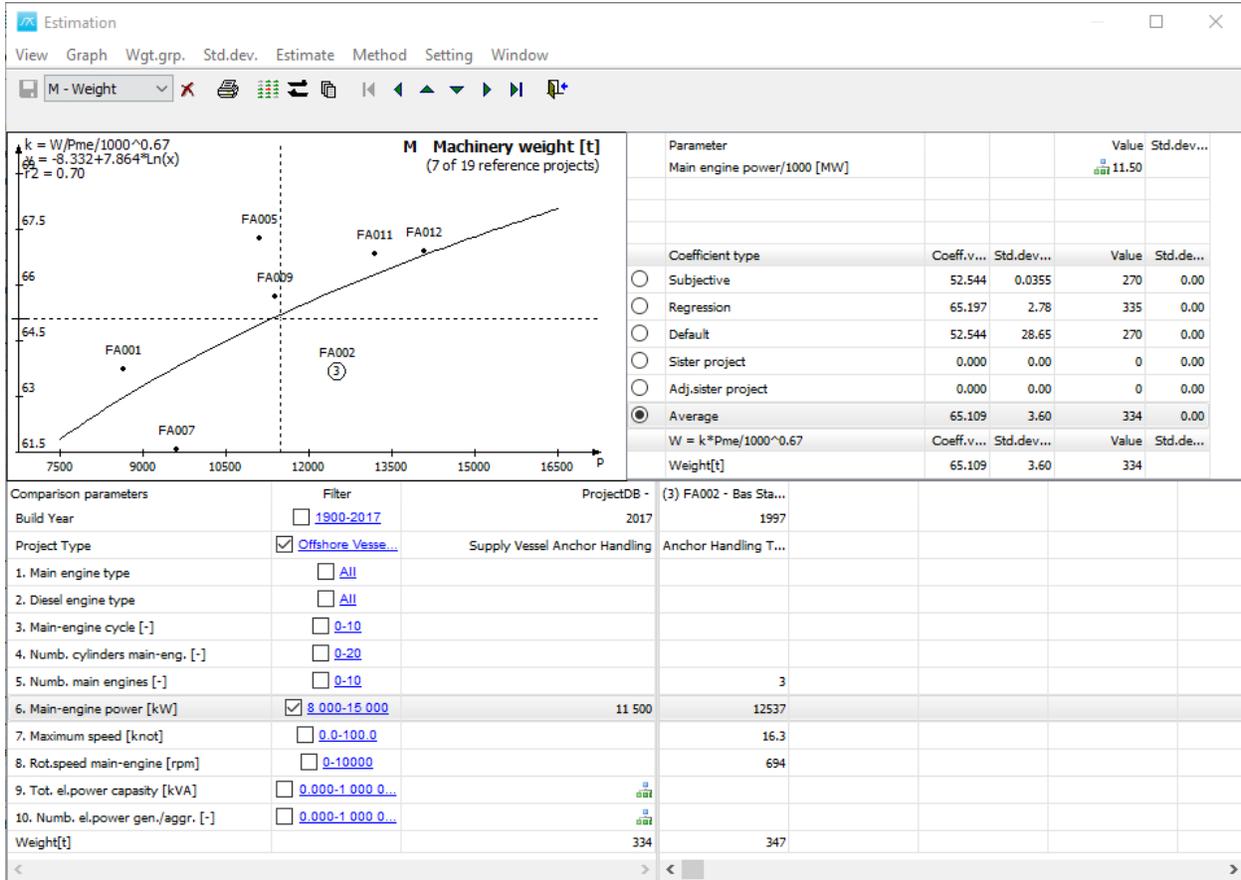
Parameter	Value	Std.dev...
Main engine power/1000 [MW]	11.50	

Coefficient type	Coeff.v...	Std.dev...	Value	Std.de...
<input type="radio"/> Subjective	52.544	0.0355	270	0.00
<input type="radio"/> Regression	65.197	2.78	335	0.00
<input type="radio"/> Default	52.544	28.65	270	0.00
<input type="radio"/> Sister project	0.000	0.00	0	0.00
<input type="radio"/> Adj.sister project	0.000	0.00	0	0.00
<input type="radio"/> Average	65.109	3.60	334	0.00

W = k*Pme/1000^0.67	Coeff.v...	Std.dev...	Value	Std.de...
Weight[t]				

Comparison parameters	Filter	ProjectDB -
Build Year	<input type="checkbox"/> 1900-2017	2017
Project Type	<input checked="" type="checkbox"/> Offshore Vesse...	Supply Vessel Anchor Handling
1. Main engine type	<input type="checkbox"/> All	
2. Diesel engine type	<input type="checkbox"/> All	
3. Main-engine cycle [-]	<input type="checkbox"/> 0-10	
4. Numb. cylinders main-eng. [-]	<input type="checkbox"/> 0-20	
5. Numb. main engines [-]	<input type="checkbox"/> 0-10	3
6. Main-engine power [kW]	<input checked="" type="checkbox"/> 8 000-15 000	11 500
7. Maximum speed [knot]	<input type="checkbox"/> 0.0-100.0	16.3
8. Rot.speed main-engine [rpm]	<input type="checkbox"/> 0-10000	694
9. Tot. el.power capacity [kVA]	<input type="checkbox"/> 0.000-1 000 0...	
10. Numb. el.power gen./aggr. [-]	<input type="checkbox"/> 0.000-1 000 0...	
Weight[t]		347

We are now left with 7 reference ships. In this case, maybe the trendline is not so clear. So, it is better to select the **Average** coefficient and then **Save**:



Close the Estimation dialog. In ShipWeight main window, now are visible the results from the parametric estimation for Equipment, Hull, Machinery.

Weight Groups	Weight [t]	Std.d...	VCG...	Std.d...	LCG [m]	Std.d...	T...	Std.d...	VCG...	VCG_m...	LCG...	LCG_m...
DISP - Displacement	3 253		6.35		36.24							
DR - Remainder displacement												
DW - Deadweight												
A - Passenger, crew & owner supply												
C - Cargo												
F - Fuels and lubricants												
L - Liquids and gases												
P - Provision and stores												
LW - Lightship	3 253		6.35		36.24							
R - Remainder	31		669.52		3 823.63							
E - Equipment	1 100		0.00		0.00							
H - Hull	1 788		0.00		0.00							
M - Machinery	334		0.00		0.00							
MR - Remainder machinery												
M1 - Machinery main-components												
M2 - Machinery system												

The sum of Equipment, Hull and Machinery is 31 tones less than the initial estimation of the Lightship.

If we think the Equipment, Hull and Machinery estimation is more accurate than the Lightship estimation, we can just remove the Remainder and use the sum of these weight groups.

Instead, we can just go and unlock the Lightship, and delete the Remainder group, and now we have the sum of the subgroups:

ProjectDB (Est X-1000)		Weight [t]	Std.d...	VCG...	Std.d...	LCG [m]	Std.d...	T...	Std.d...	VCG...	VCG_m...	LCG...	LCG_m...	T
DISP - Displacement		3 222		0.00		0.00								
DR - Remainder displacement														
DW - Deadweight														
A - Passenger, crew & owner supply														
C - Cargo														
F - Fuels and lubricants														
L - Liquids and gases														
P - Provision and stores														
LW - Lightship		3 222		0.00		0.00								
R - Remainder														
E - Equipment		1 100		0.00		0.00								
H - Hull		1 788		0.00		0.00								
M - Machinery		334		0.00		0.00								
MR - Remainder machinery														
M1 - Machinery main-components														
M2 - Machinery system														

The next step will be to continue, to go into the subgroups of Hull, Equipment and Machinery and then start estimating all under:

ShipWeight 12.5.11.1 [ProjectDB(Est X-1000)] - ShipWeight Enterprise

Project Edit View Database Weight Groups Items Checking Std.dev. Estimate Help

ProjectDB (Est X-1000) Filter:

Weight Groups

	Weight [t]	Std.d...	VCG...	Std.d...	LCG [m]	Std.d...	T...	Std.d...	VCG...	VCG_m...	LCG...	LCG_m...
L - Liquids and gases												
P - Provision and stores												
LW - Lightship	3 222				0.00							
R - Remainder												
E - Equipment	1 100				0.00							
ER - Remainder equipment												
E1 - Equipment for cargo												
E2 - Ship equipment												
E3 - Accommodation												
E4 - Ship systems												
H - Hull	1 788				0.00							
HR - Remainder hull												
H1 - Main hull												
H2 - Poop												
H3 - Superstructure												
H4 - Deckhouses												
H5 - Forecastle												
H6 - Keel												
H7 - Hull outfitting												
H8 - Material protection												
M - Machinery	334				0.00							
MR - Remainder machinery												
M1 - Machinery main-components												
M2 - Machinery system												

Or we can lock the parent groups again, to keep the parent groups unchanged.

Finally, at some point you may want to list Items in detail in the subgroup. In that case, just select the weight group:

ShipWeight 12.5.11.1 [ProjectDB(Est X-1000)] - ShipWeight Enterprise

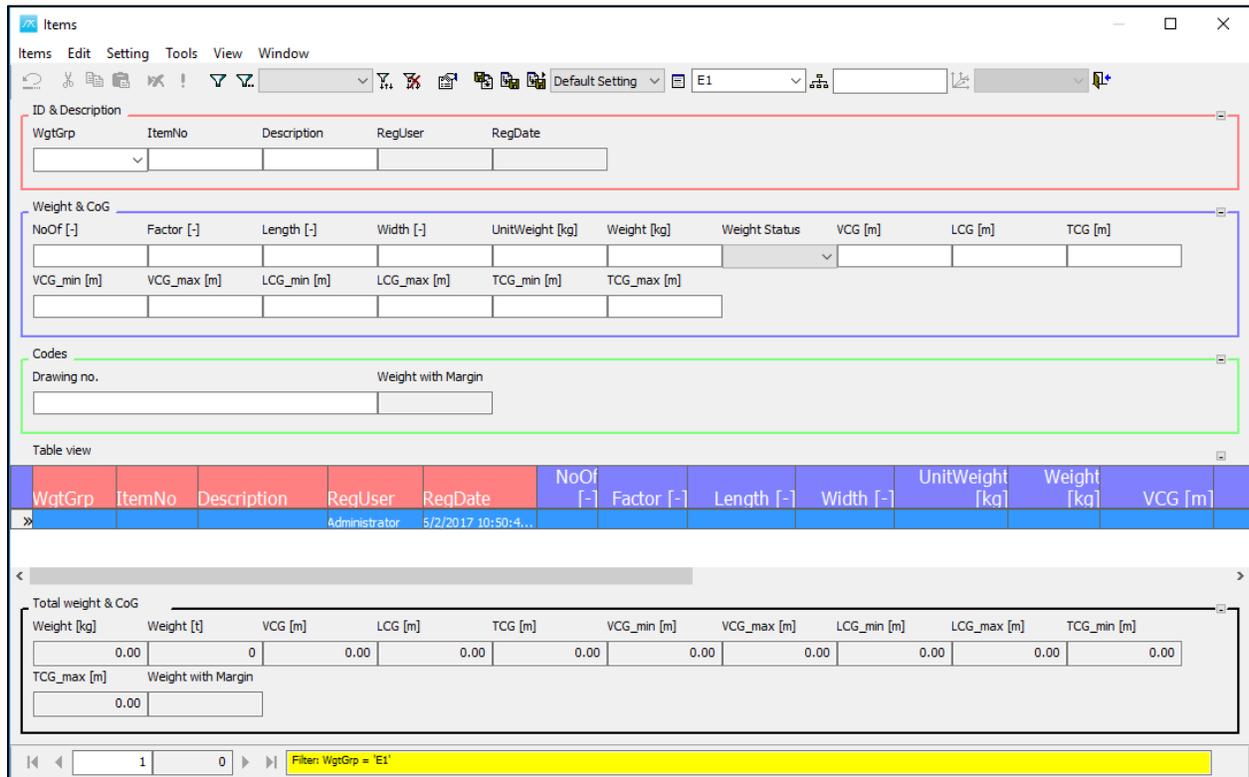
Project Edit View Database Weight Groups Items Checking Std.dev. Estimate Help

ProjectDB (Est X-1000) Filter:

Weight Groups

	Weight [t]	Std.d...	VCG...	Std.d...	LCG [m]	Std.d...	T...	Std.d...	VCG...	VCG_m...	LCG...	LCG_m...
L - Liquids and gases												
P - Provision and stores												
LW - Lightship	3 222				0.00							
R - Remainder												
E - Equipment	1 100				0.00							
ER - Remainder equipment												
E1 - Equipment for cargo												
E2 - Ship equipment												
E3 - Accommodation												
E4 - Ship systems												
H - Hull	1 788				0.00							
M - Machinery	334				0.00							
T - Topside												
Temp - Temporary												

And open the Items dialog and read the items from that weight group:

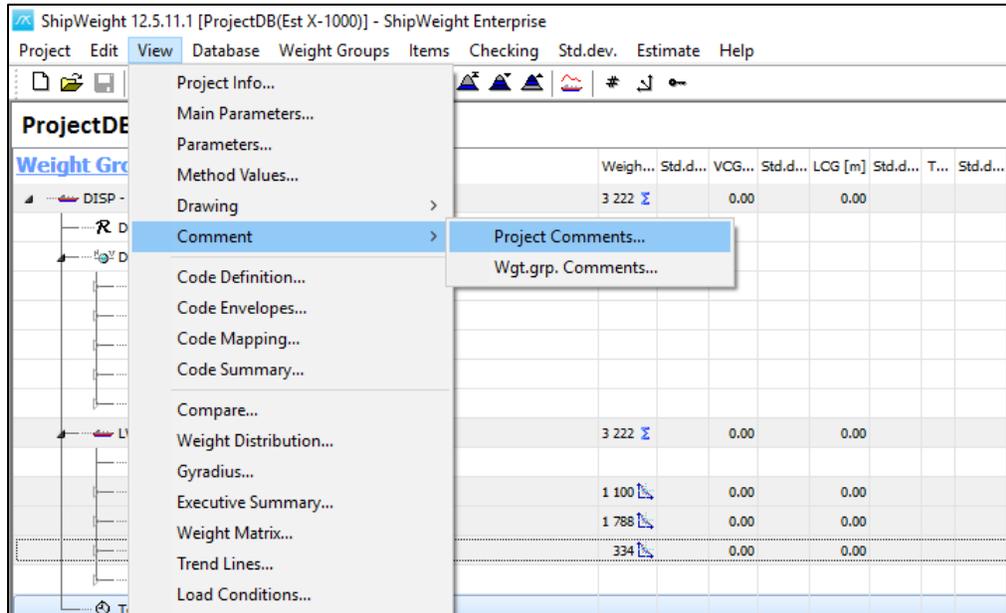


So, it is not a problem to combine line items and parametric estimation. And typically, as the project mature you may eventually exchange all parametric groups with line items and also check the deviation between the parametric subgroup to see when the list of items is more mature.

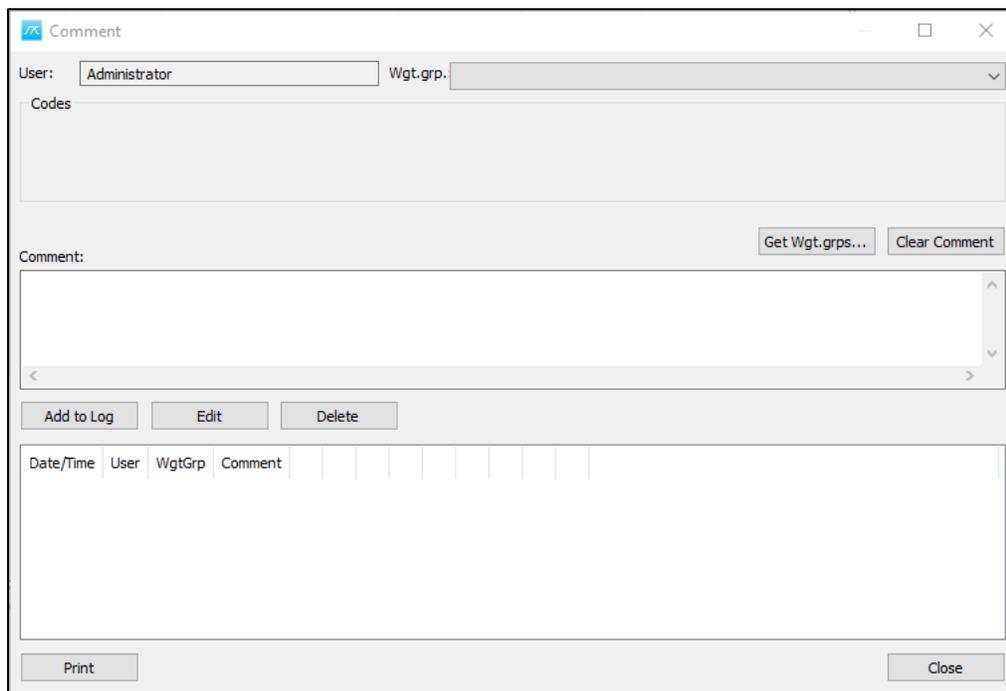
5.3 Log result

You can log your work using the Project Comments dialog.

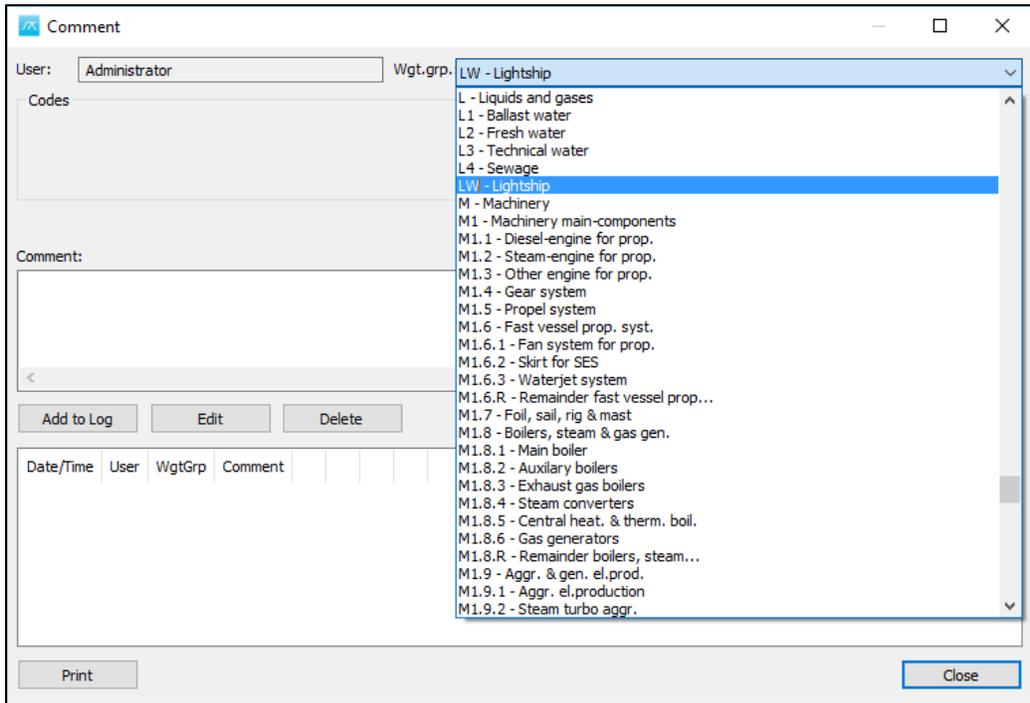
In the main window, select **View -> Comment -> Project Comments...**



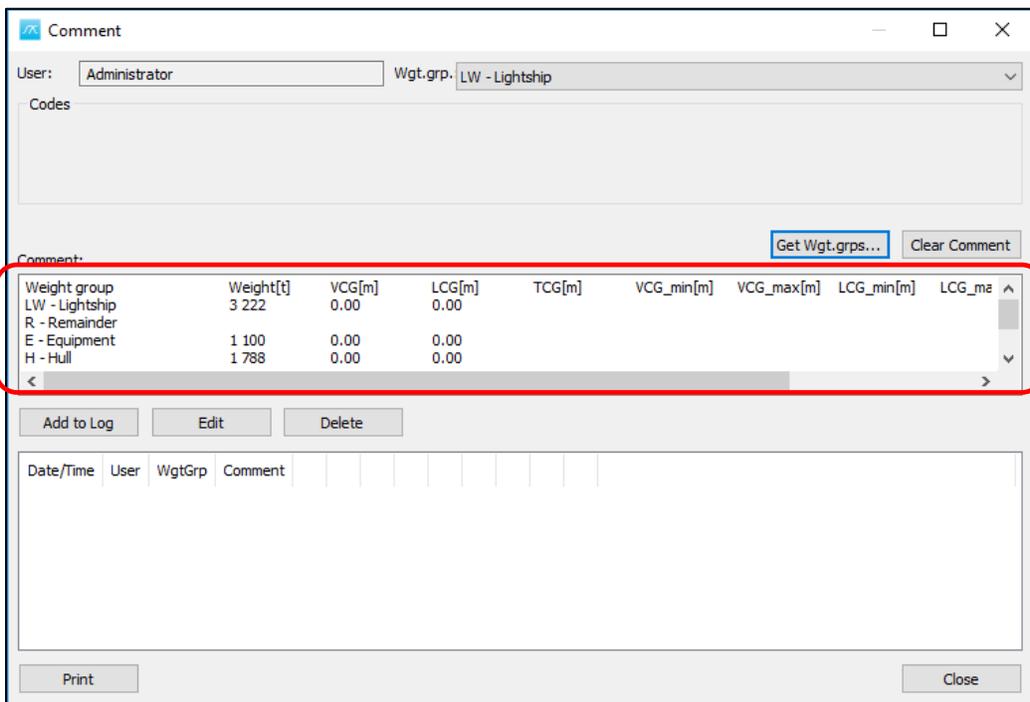
The **Comment** dialog will open:



In the *Wgt.grp* field select from the listbox LW – Lightship:



Then click the **Get Wgt.grps...** button and the LW information will be displayed in the Comment area:



And then click the **Add to log** button to store the initial result:

The screenshot shows a 'Comment' dialog box with the following elements:

- User:** Administrator
- Wgt.grp.:** LW - Lightship
- Codes:** (Empty text area)
- Comment:** (Empty text area)
- Buttons:** Get Wgt.grps..., Clear Comment
- Table:**

Weight group	Weight[t]	VCG[m]	LCG[m]	TCG[m]	VCG_min[m]	VCG_max[m]	LCG_min[m]	LCG_max[m]	TCG_min[m]	TCG_max[m]
LW - Lightship	3 222	0.00	0.00							
R - Remainder										
E - Equipment	1 100	0.00	0.00							
H - Hull	1 788	0.00	0.00							

Buttons: Add to Log (highlighted), Edit, Delete

Log Table:

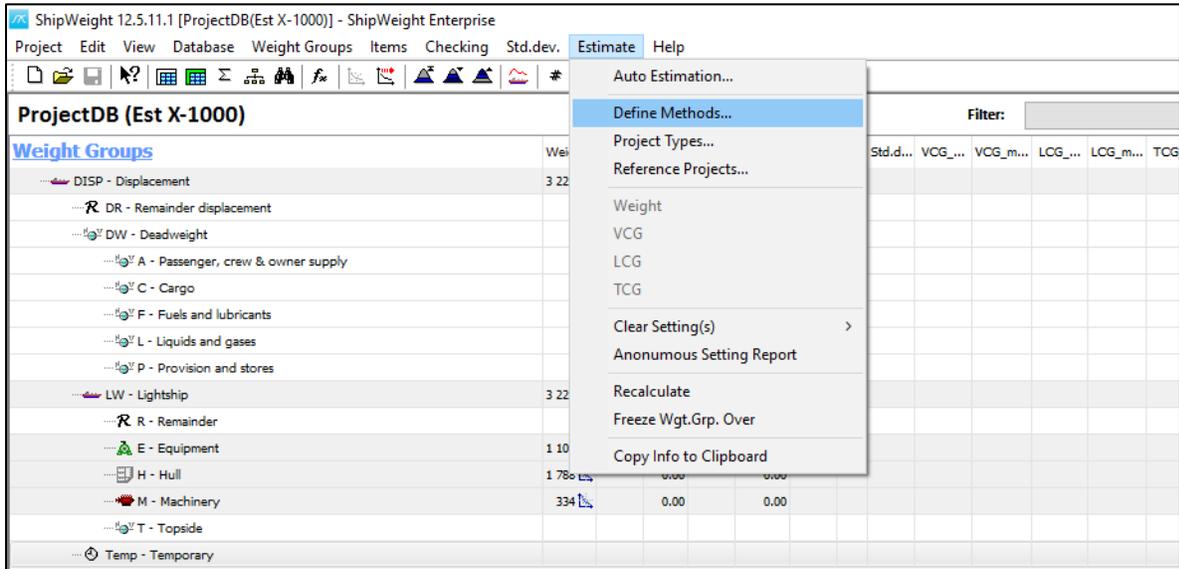
Date/Time	User	WgtGrp	Comment
2017.06.07 10:19:51	Administrator	LW	Weight groupWeight[t]VCG[m]LCG[m]TCG[m]VCG_min[m]VCG_max[m]LCG_min[m]LCG_max[m]TCG_min[m]TCG_max[m]

Buttons: Print, Close

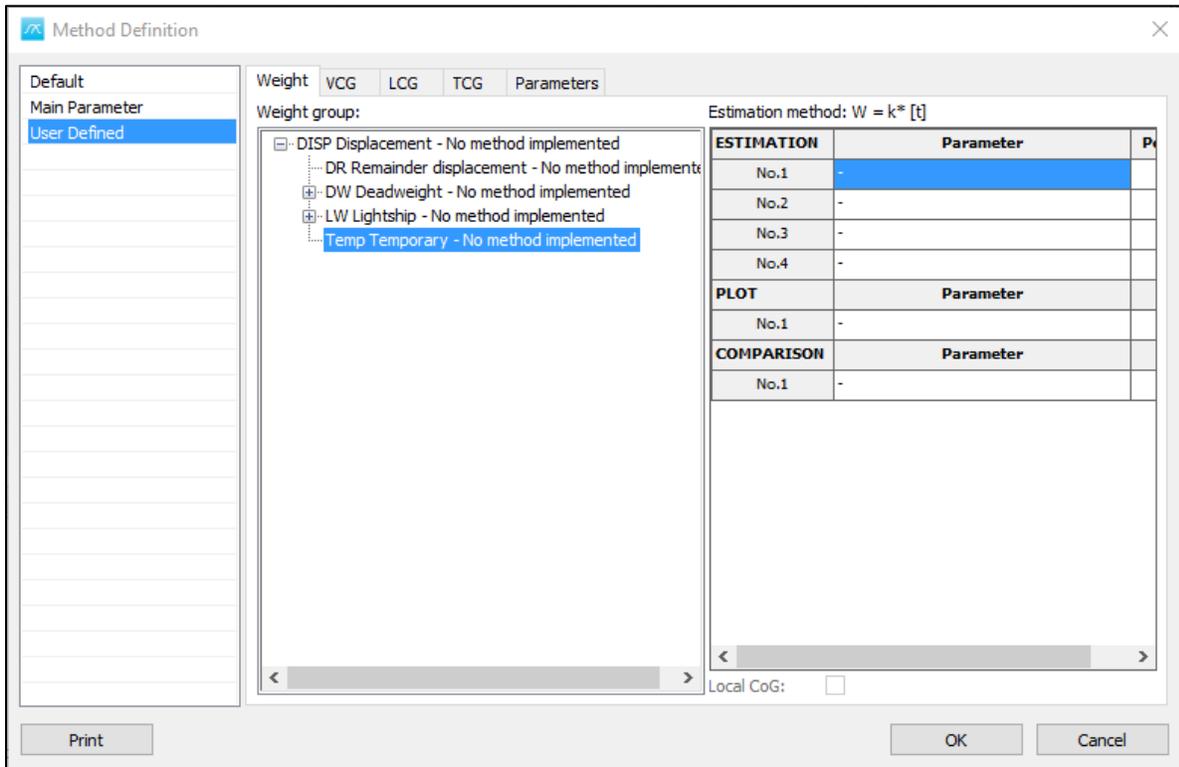
Click the Close button to get back to the main window.

5.4 User defined estimation methods

On the menu **Estimate**, click **Define Methods...**



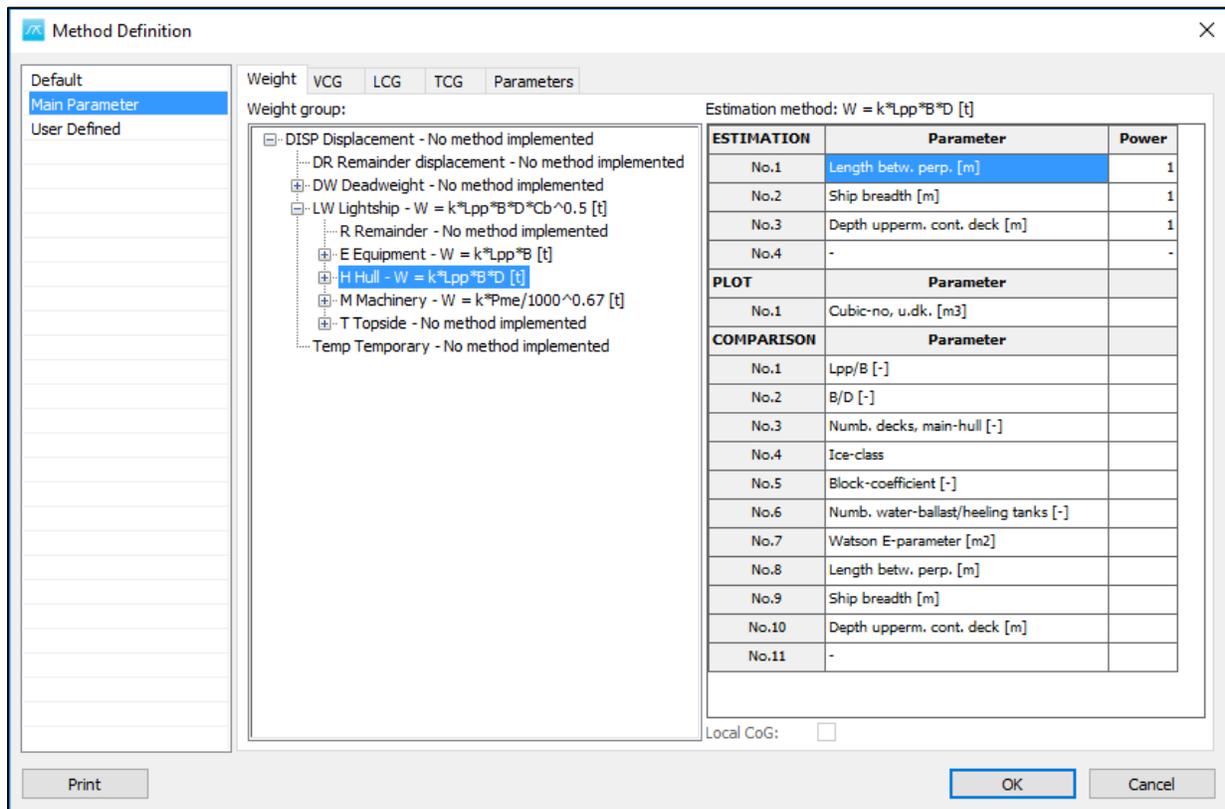
The Method Definition dialog window will show up:



The area to the left contains the Default parameters. Select **Main Parameter** as Default.

The area in the middle contains the work breakdown structure. In this area, use the mouse to select the weight group **Hull**.

The method for this weight group will be shown in the area to the right.



You want the method for Hull to be $W=k*L_{pp}*B*D$ and plot the coefficient against ship length. Select the estimation parameters and click once more, to reveal a combo box. Select – on top of the list to clear the parameter.

Select the plot parameter and delete it. Leave the comparison parameters as they are. Under ESTIMATION, select a "length parameter" (e.g. Length betw. perp) in the combo box for No.1. Add breadth and depth parameters in same way (e.g. Ship breadth and Depth upperm. cont. deck). Set the Power parameters to be 1, 1 and 1.

Under PLOT, select the "length parameter" again in the right area and click ADD button. Now you are done, select the OK button.

To be able to use your own method do the following: Enter the main estimation dialog window in the weight group H Hull. From the menu Method select User defined. Now your own method will be applied when estimating.

6. Basic Additional Features

6.1 Weight distribution curve

For this we will use the Tutorial project from 1-4 chapter.

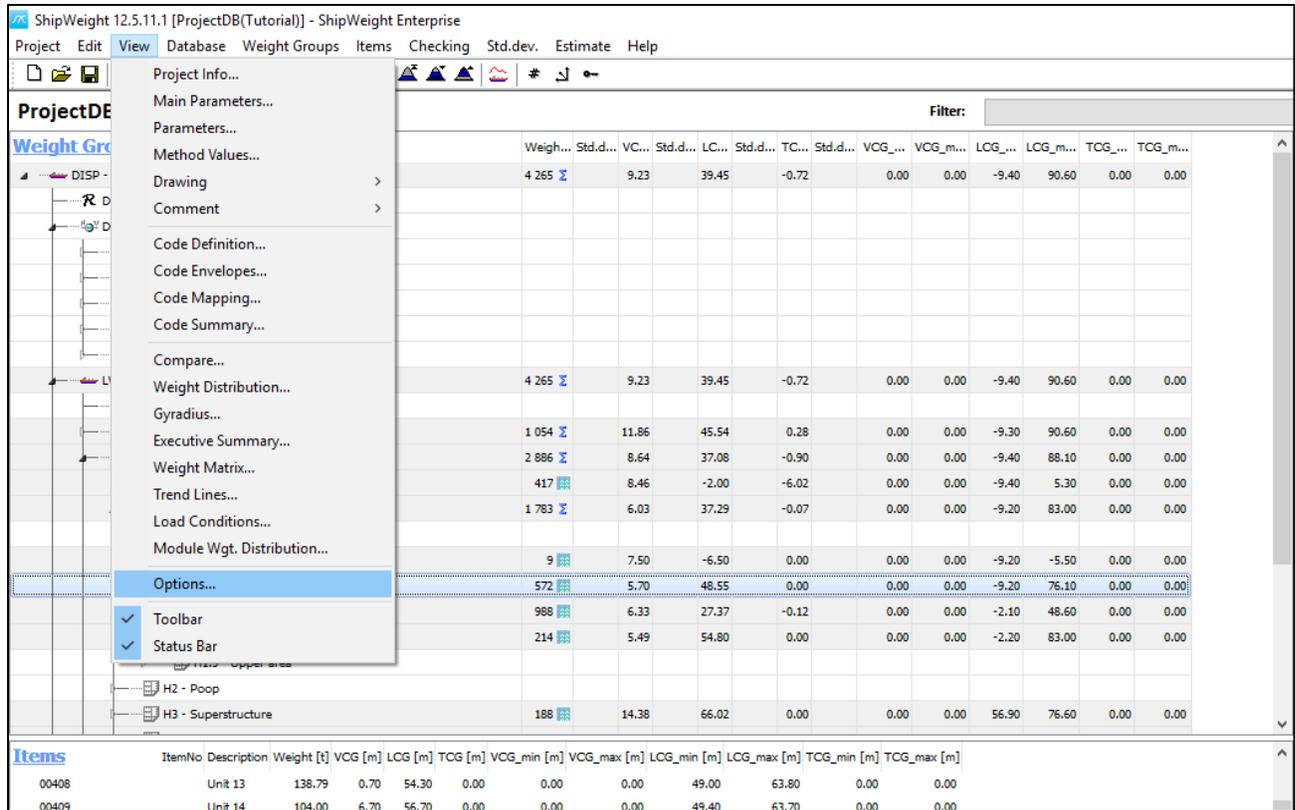
To get a good distribution curve it is a big advantage if you have the starting point and ending point of your weight items. Basically you should have the LCG, and the LCG_min, LCG_max values for each item to get a good weight distribution curve.

The screenshot shows the 'Items' software interface. The main window displays a table of items with various parameters. The 'Table view' section is highlighted, showing a list of items with columns for WgtGrp, ItemNo, Description, ReqUser, ReqDate, NoOf, Factor, Length, Width, UnitWeight, Weight, VCG, LCG, TCG, VCG_min, VCG_max, LCG_min, and LCG_max. The LCG, LCG_min, and LCG_max columns are highlighted with red boxes. Below the table, there is a 'Total weight & CoG' section with a summary table.

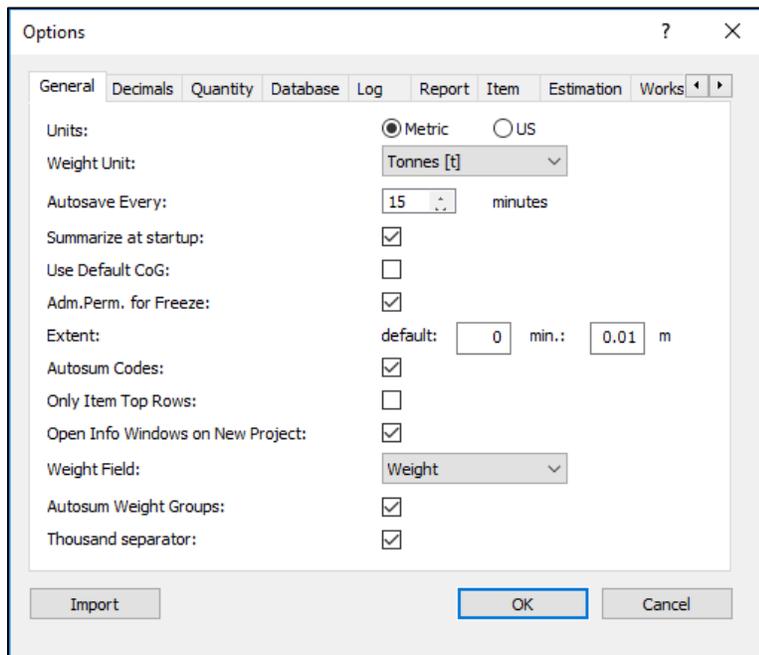
WgtGrp	ItemNo	Description	ReqUser	ReqDate	NoOf	Factor	Length	Width	UnitWeight	Weight	VCG	LCG	TCG	VCG_min	VCG_max	LCG_min	LCG_max
H1.2	00403	Unit 01	Administrator	5/24/2017 10:06:2	1	1.00	1.00	1.00	18000.00	18000.00	7.70	-4.70	0.00			-9.20	-0.70
H1.2	00405	Unit 03	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	80000.00	80000.00	8.80	3.80	0.00			-0.70	8.30
H1.2	00408	Unit 13	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	138790.00	138790.00	0.70	54.30	0.00			49.00	63.80
H1.2	00409	Unit 14	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	104000.00	104000.00	6.70	56.70	0.00			49.40	63.70
H1.2	00410	Unit 15	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	131220.00	131220.00	9.00	57.10	0.00			49.10	63.50
H1.2	00411	Unit 16	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	61210.00	61210.00	2.00	66.10	0.00			63.80	74.80
H1.2	00412	Unit 17	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	38480.00	38480.00	8.30	66.60	0.00			62.80	76.10

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]	Weight with Margin
571700.00	572	5.70	48.55	0.00	0.00	0.00	-9.20	76.10	0.00	0.00	0.000

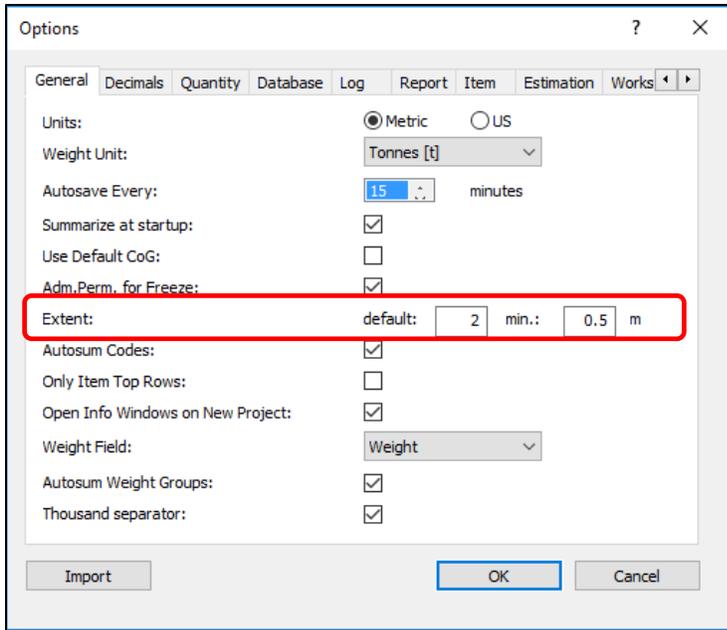
However if there are some items who do not have extensions, default extensions can be set to be used for those. To do this go to View menu and select Options:



The Options dialog will pop up:

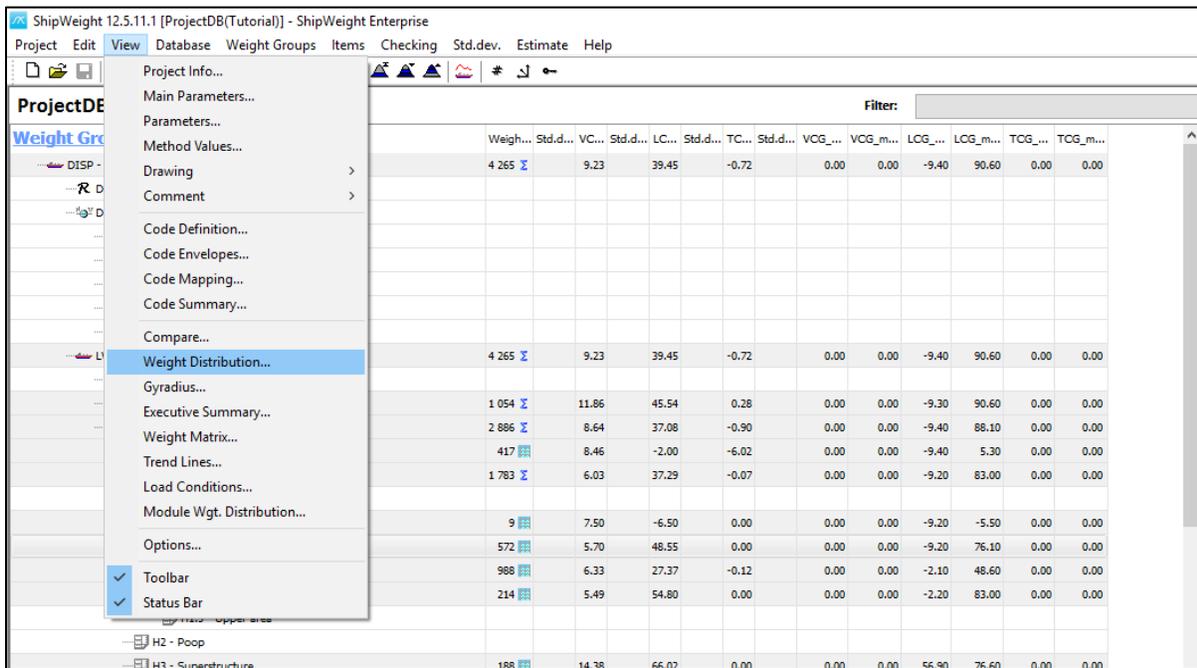


Change the default Extent from 0 to 2 and min. from 0.01 to 0.5 meters:



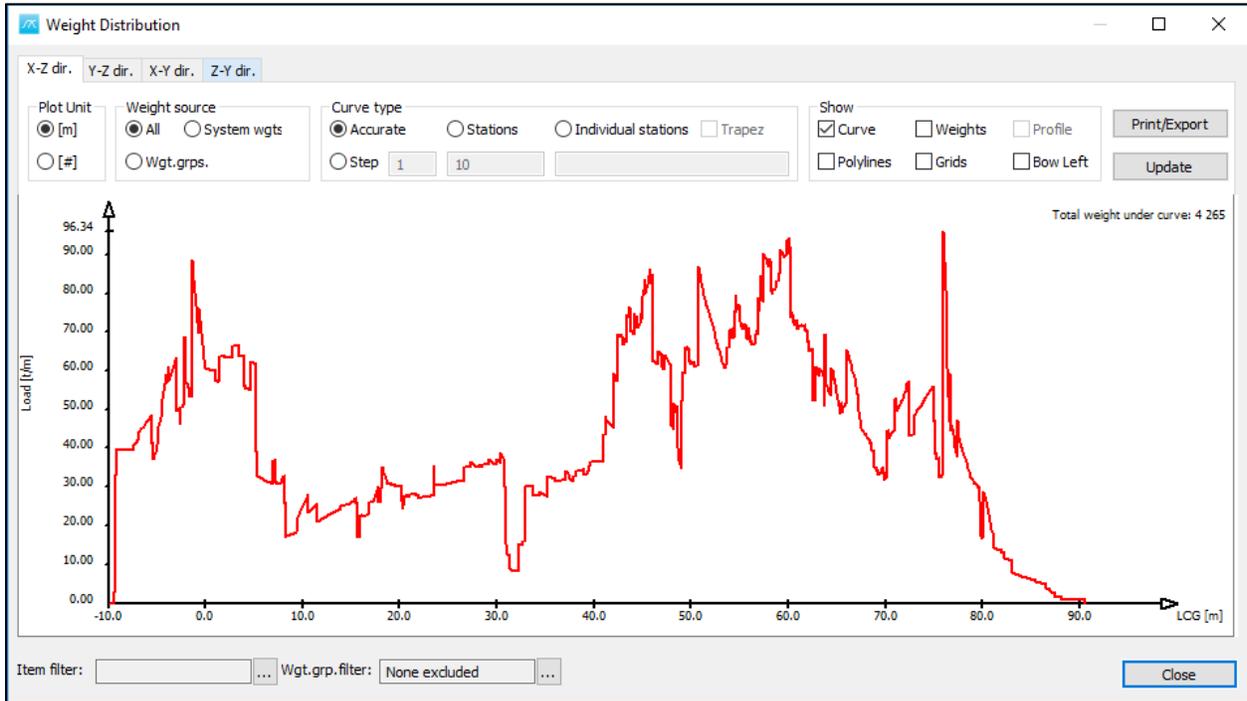
And then click OK.

Now, to open the weight distribution window go to View menu, and select Weight Distribution...:

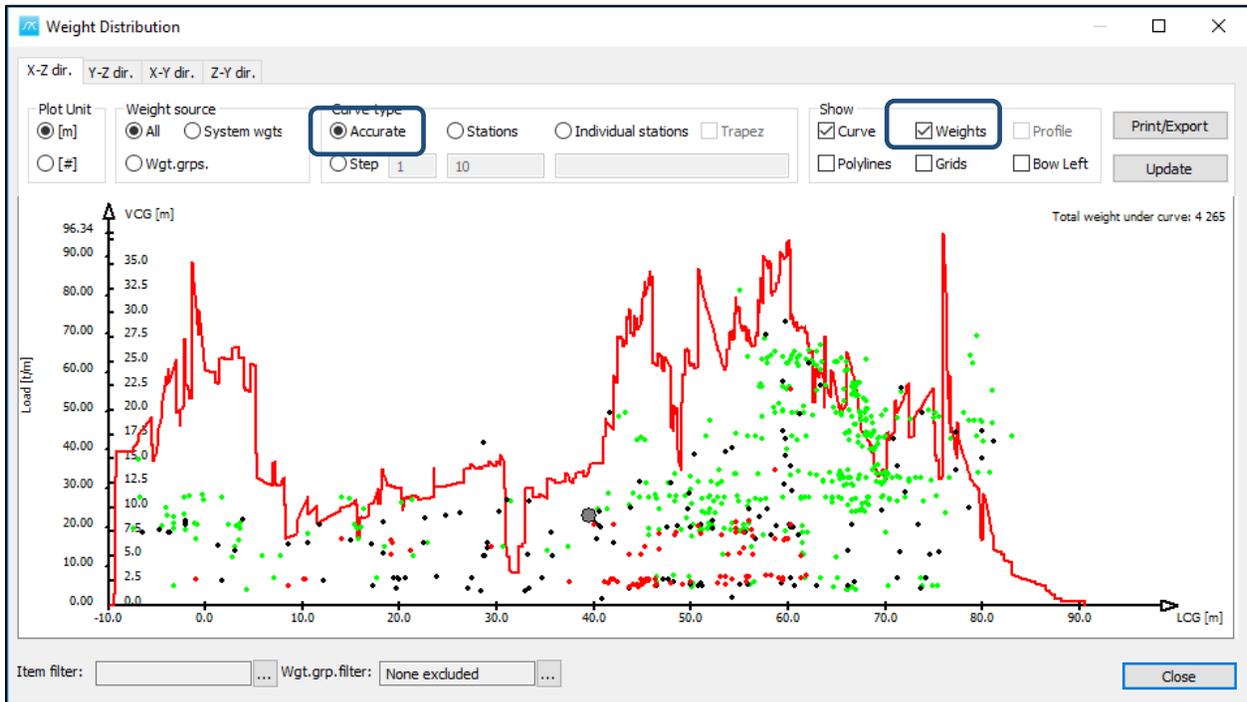


Or the shortcut from the toolbar .

Then the Weight Distribution is opened for the vessel:

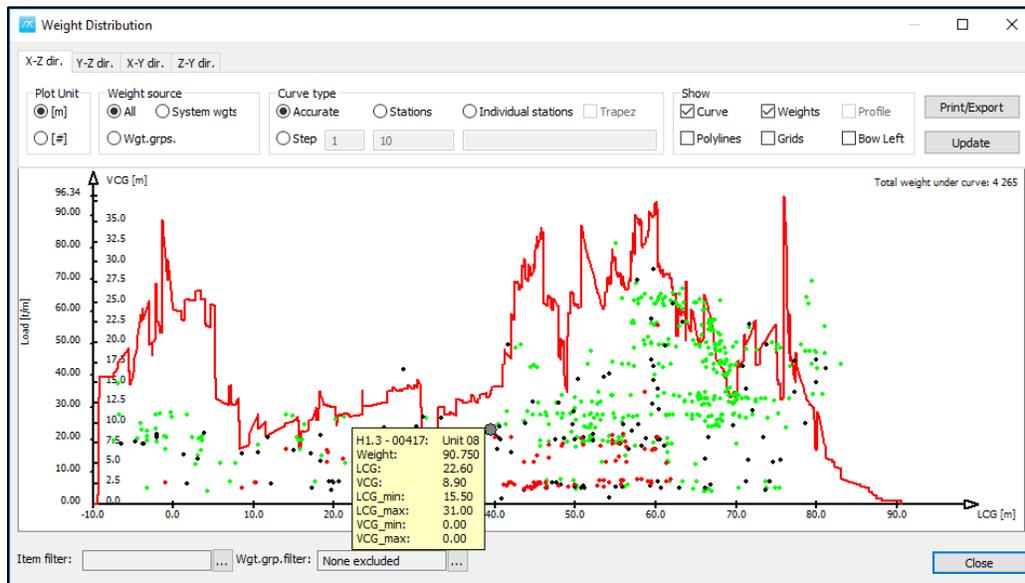


By default we are looking at **Accurate** weight distribution curve type, and to see the data behind the curve you can enable the plotting of the **Weights** option:

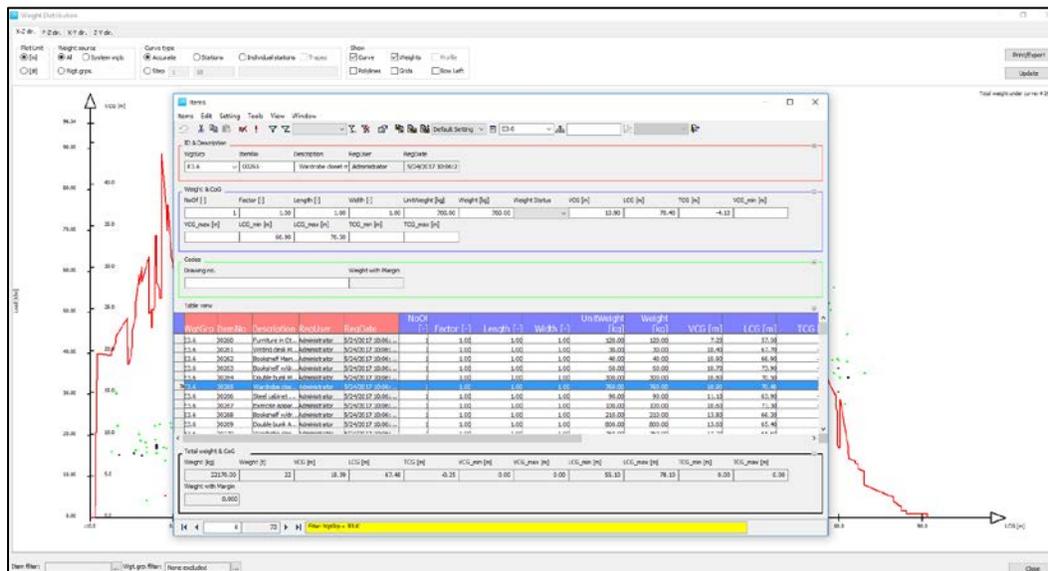


The center of gravity location for each weight in the database is plotted. The black dots represent the steel weights, the green dots for equipment weights, and the red dots for machinery weights.

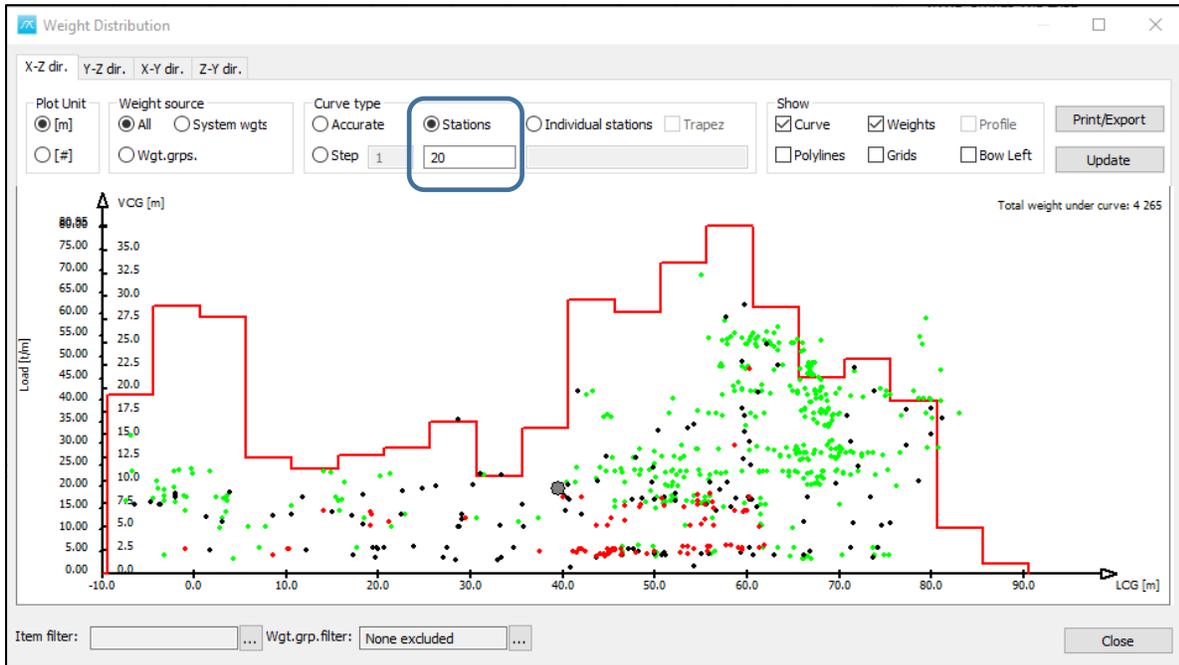
To check the weight data for any dot, click and hold on the specific dot:



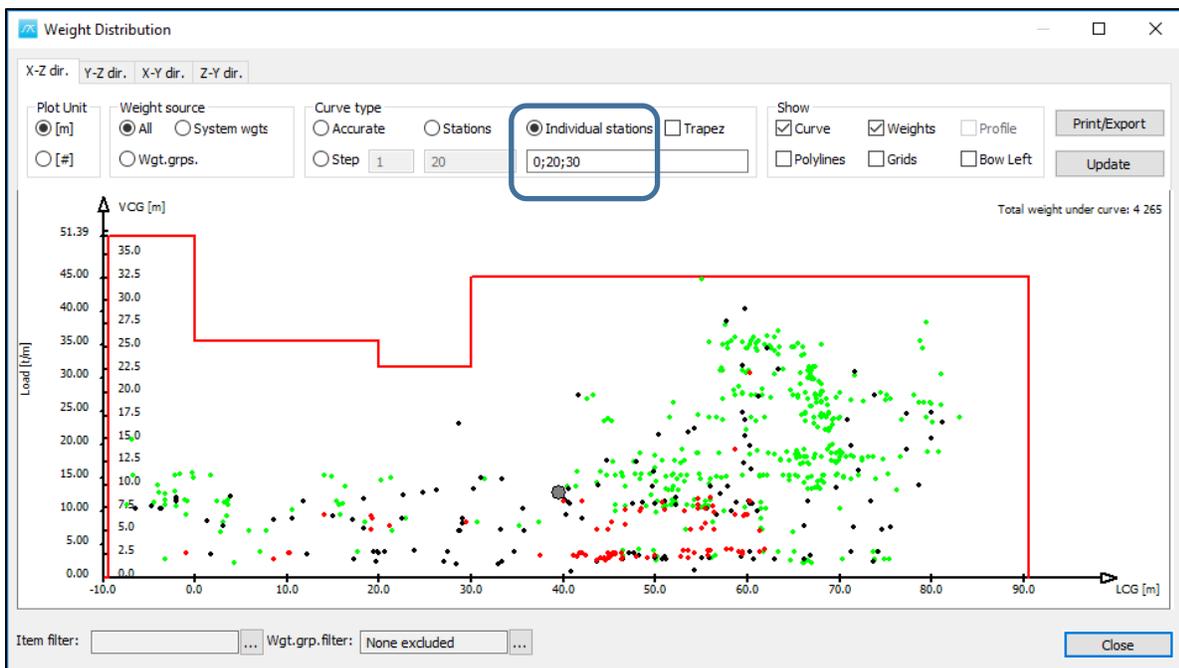
In this way you can check suspicious looking items. If you find some items which are not correct, the double click on the point and it will bring up the Items dialog, and finds that item for you and allows you to change that item:



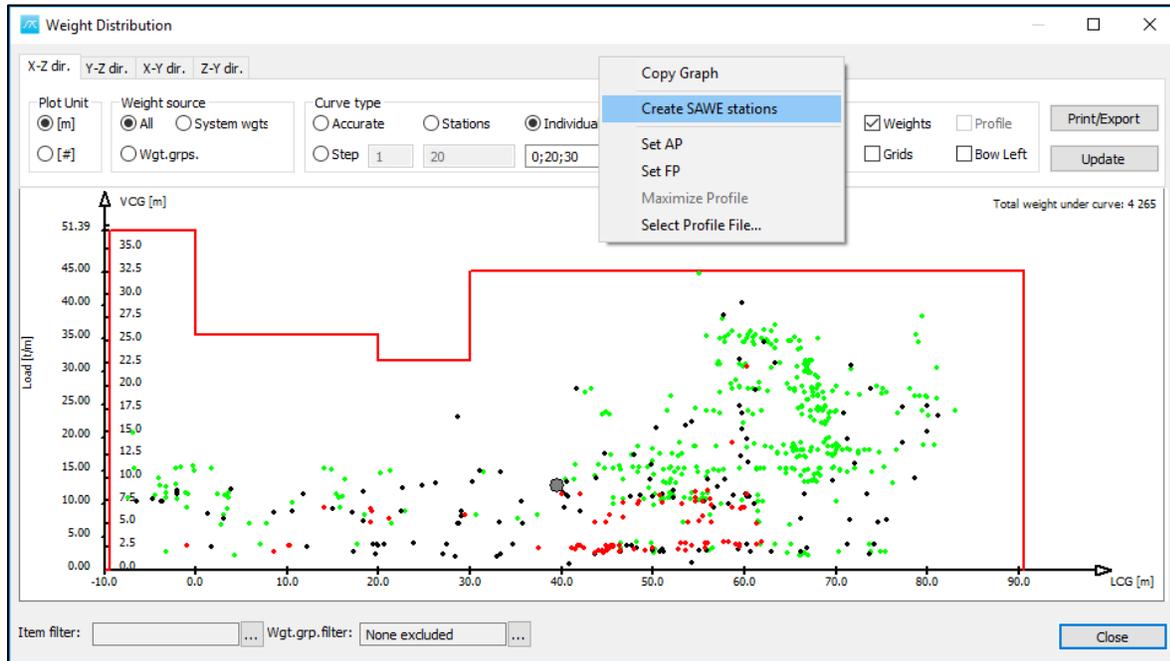
Now in addition to get this accurate curve, you can also select **Stations** curve type and type in **20** stations curve:



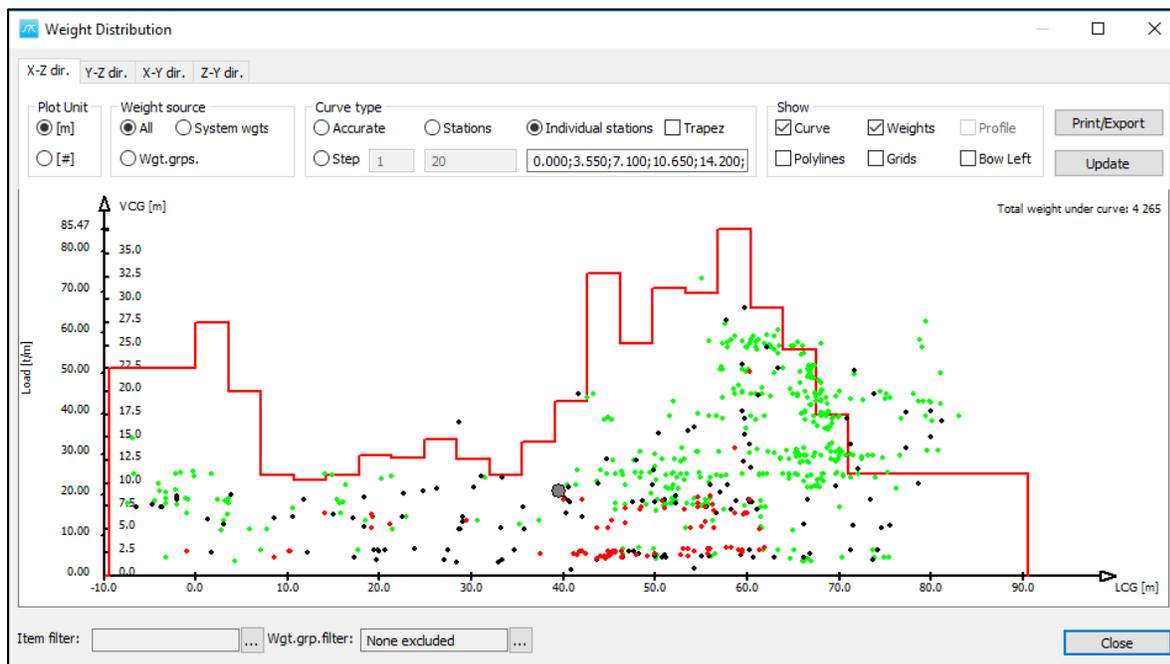
You can also do **Individual stations** curve type, and by typing the numbers and points **0;20;30** where you want to see the various stations:



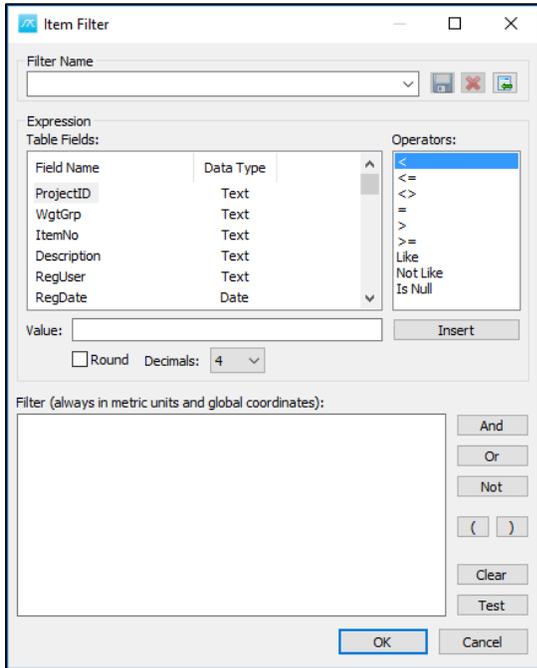
You can also right click and select **Create SAWE stations**:



Which will by default give 20 stations between AP and FP and then 1 station in front of FP and 1 station behind the AP:

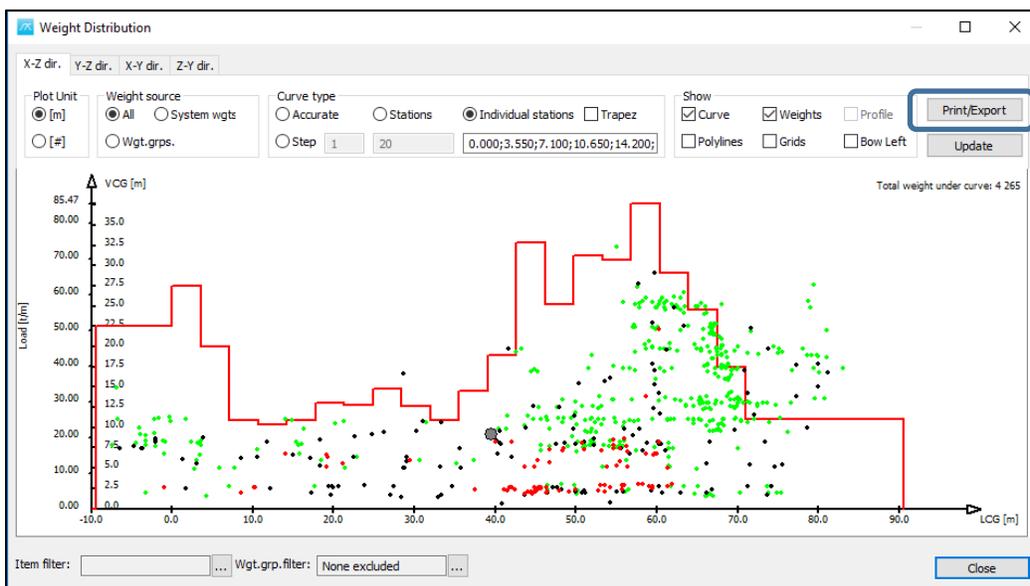


In addition, there is also the Item Filter, can be opened from the Item filter  browse button in the lower left corner of the Weight distribution window:

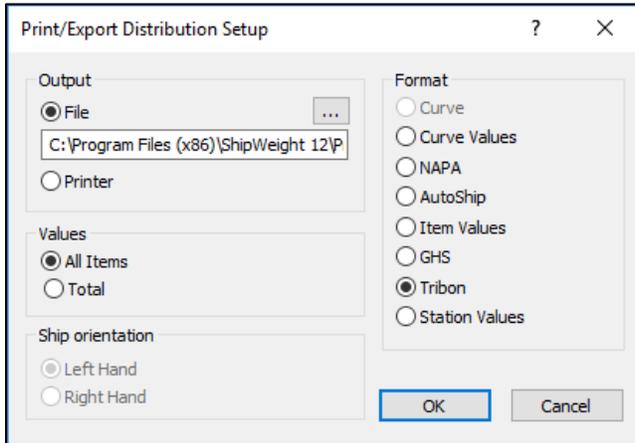


And you can set any filter you want, WgtGrp, ItemNo, Description, etc.

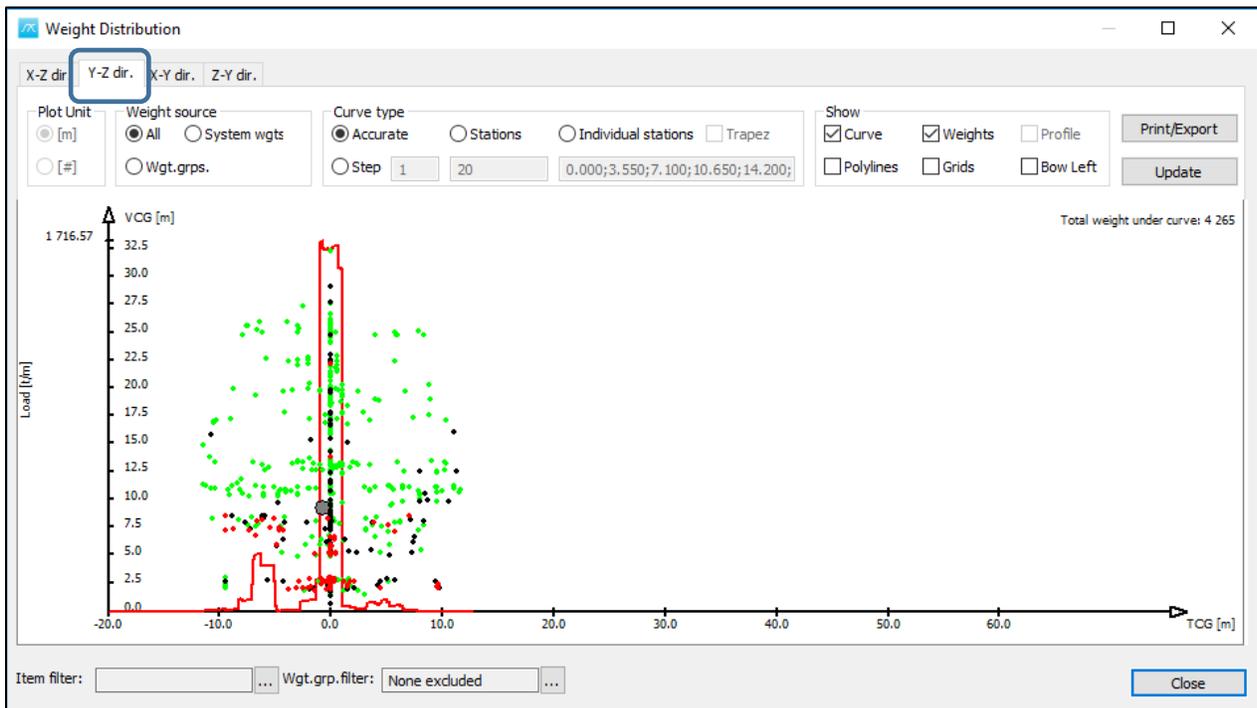
If everything looks ok with the curve, you can go and export the weight distribution curve by using the Print/Export button:



The Print/Export Distribution Setup dialog pops up and you can select the desired Format to get formats that are suitable for import to this stability software for doing longitudinal strength calculations:

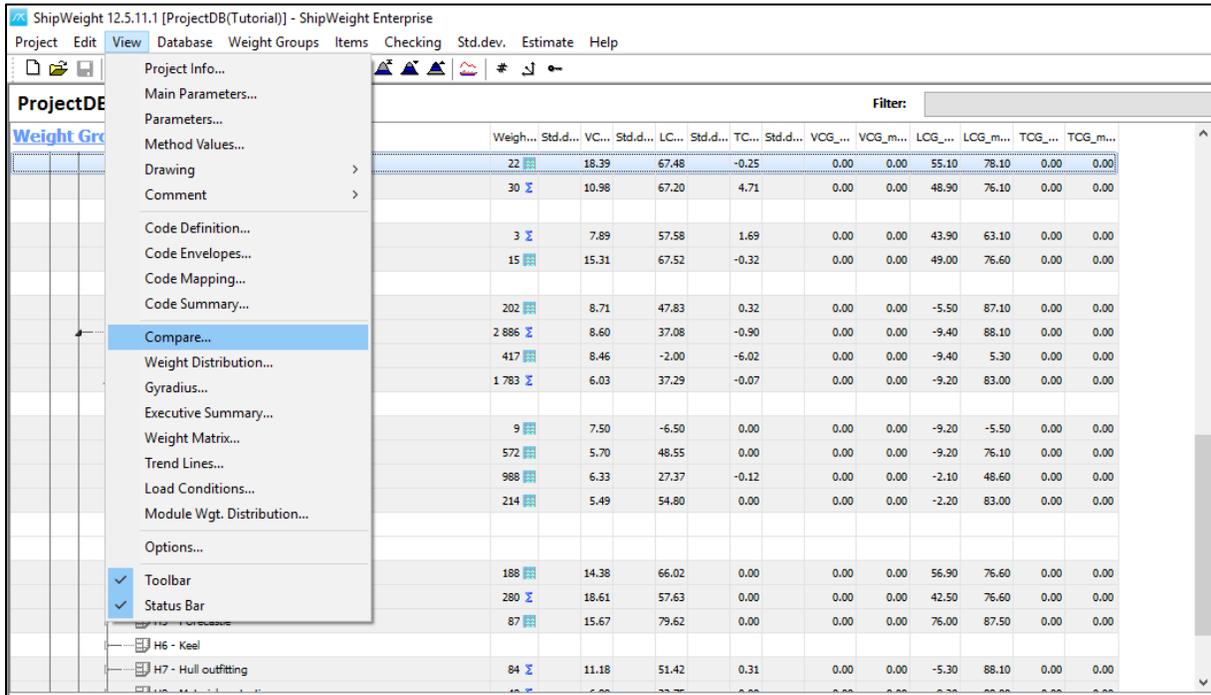


Finally, the user should know that not only the longitudinal extent (**X-Z dir.**), but also other directions to look at the curve are available. For example in the Y-Z direction, go to the tab sheet **Y-Z dir.**, and it will show the distribution curve over the beam of the vessel:

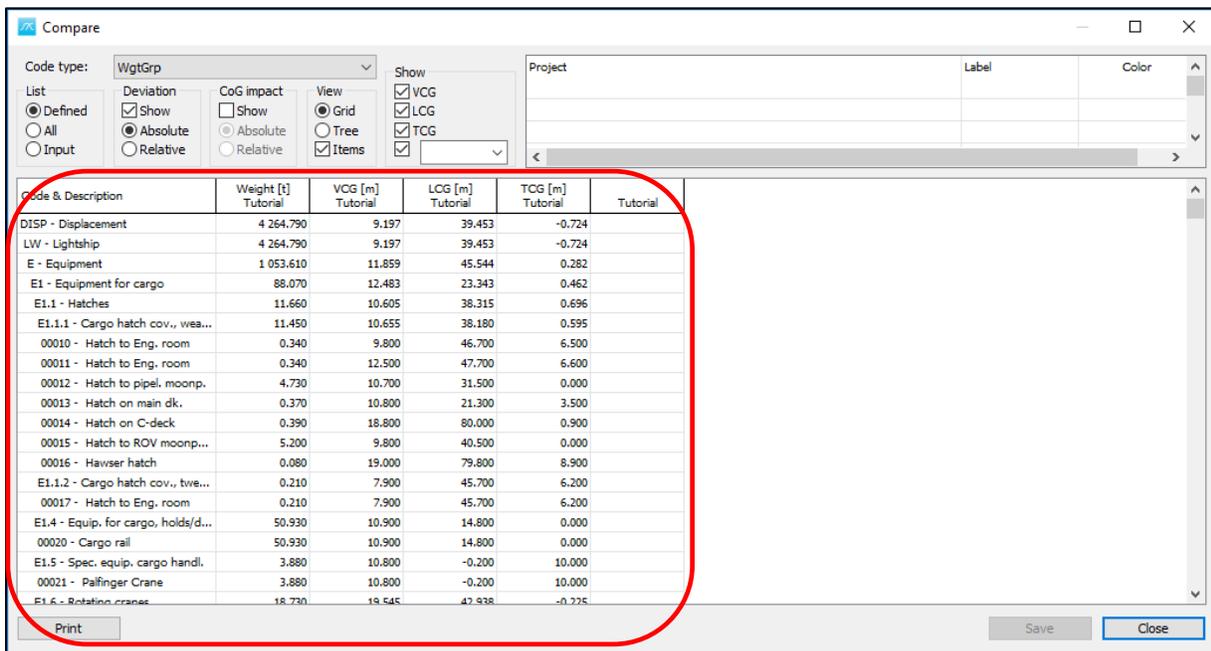


6.2 Compare dialog

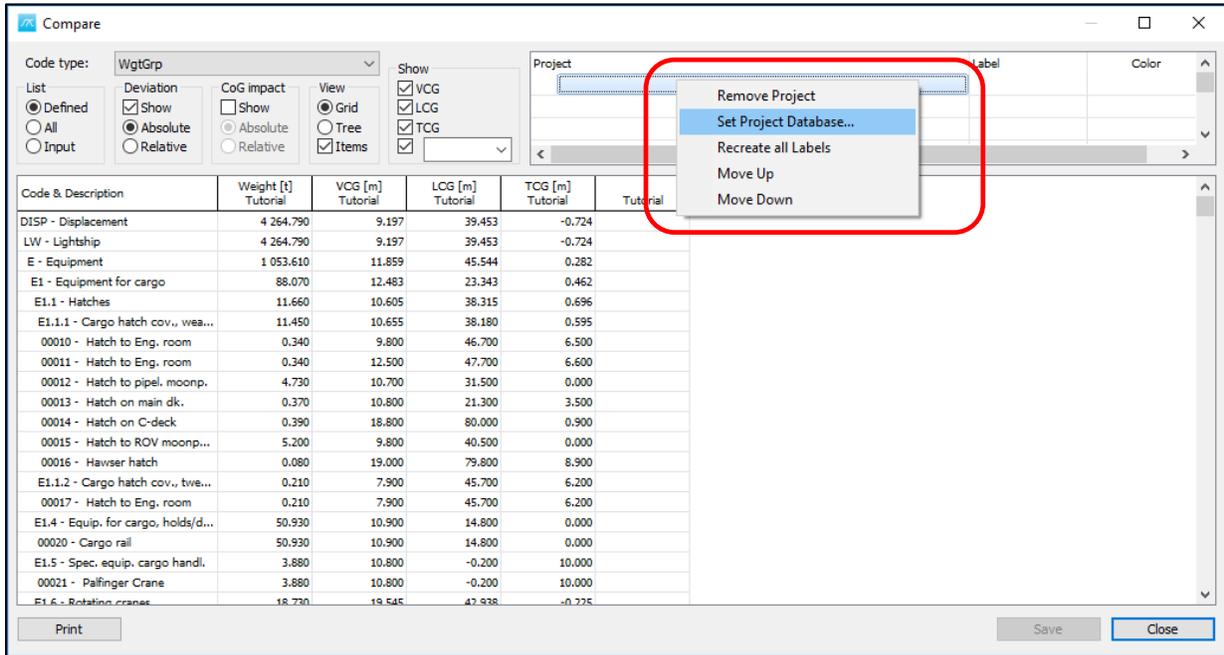
The Compare dialog allows the user to compare his current project with any other project in ShipWeight. To open the Compare window go to View menu, and select Compare...



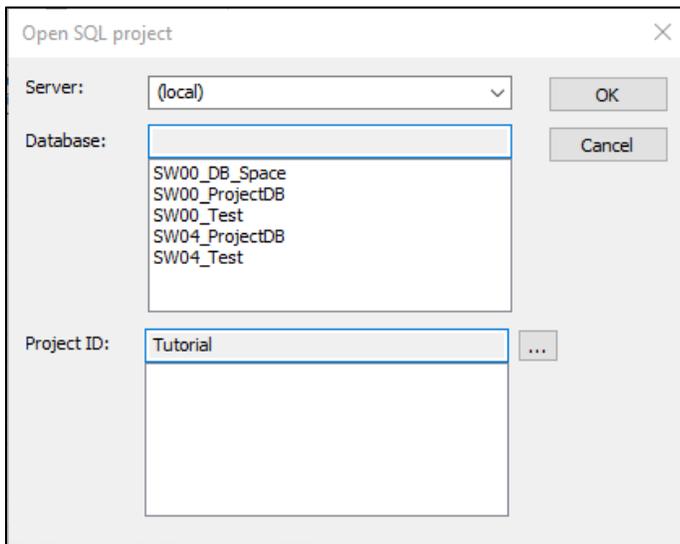
This will bring up the Compare dialog with the additional features:



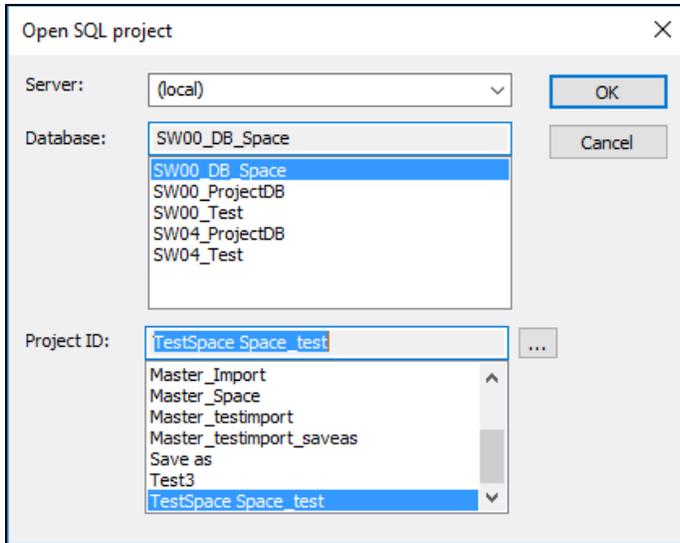
Now we can see the values for our project as Displacement, Lightship and so forth. To add a project, right click in the Project area and select **Set Project Database...**:



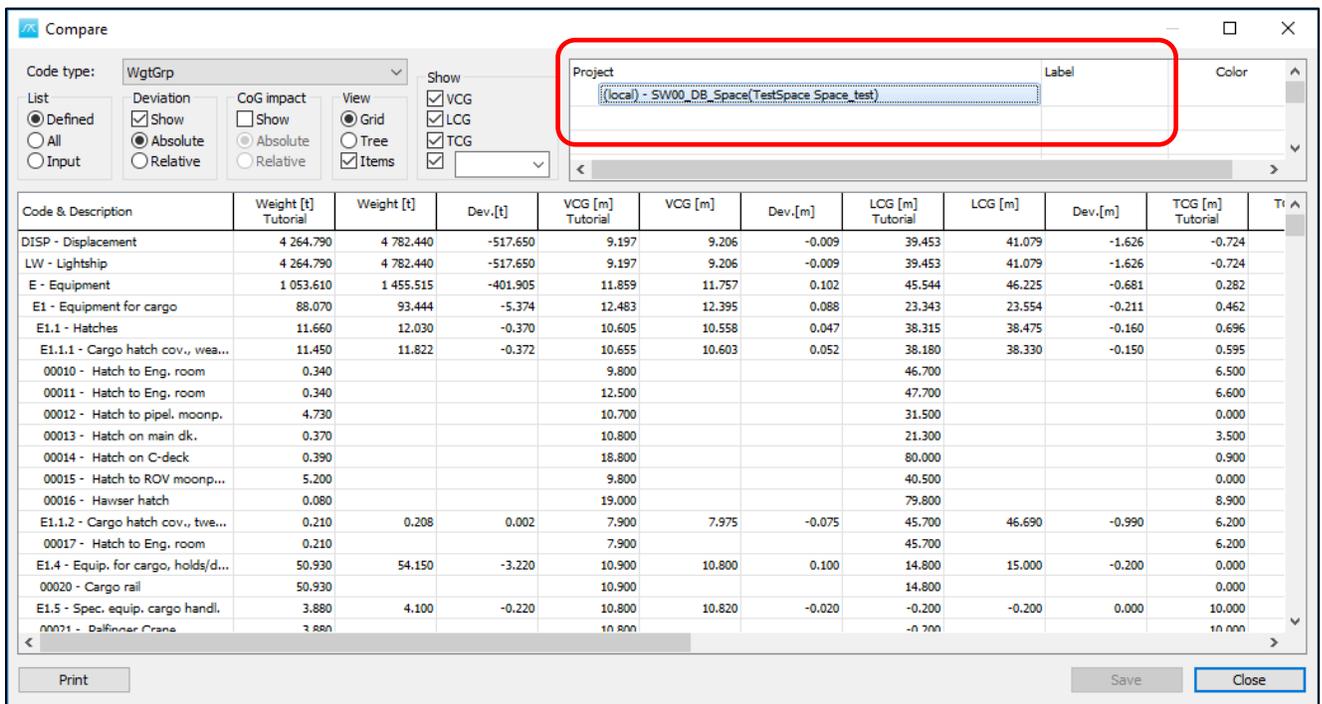
The Open SQL project dialog will appear:



Now select SW00_DB_Space database, and for example TestSpace Space_test Project ID:



Then we get the new project added in the Project list:



We can also give a Label, for example Estimate:



Now we can see the values for the current project compared to the values from the selected project, and the deviation as well:

Code & Description	Weight [t] Tutorial	Weight [t]	Dev.[t]	VCG [m] Tutorial	VCG [m]	Dev.[m]	LCG [m] Tutorial	LCG [m]	Dev.[m]	TCG [m] Tutorial
DISP - Displacement	4 264.790	4 782.440	-517.650	9.197	9.206	-0.009	39.453	41.079	-1.626	-0.724
LW - Lightship	4 264.790	4 782.440	-517.650	9.197	9.206	-0.009	39.453	41.079	-1.626	-0.724
E - Equipment	1 053.610	1 455.515	-401.905	11.859	11.757	0.102	45.544	46.225	-0.681	0.282
E1 - Equipment for cargo	88.070	93.444	-5.374	12.483	12.395	0.088	23.343	23.554	-0.211	0.462
E1.1 - Hatches	11.660	12.030	-0.370	10.605	10.558	0.047	38.315	38.475	-0.160	0.696
E1.1.1 - Cargo hatch cov., wea...	11.450	11.822	-0.372	10.655	10.603	0.052	38.180	38.330	-0.150	0.595
00010 - Hatch to Eng. room	0.340			9.800			46.700			6.500
00011 - Hatch to Eng. room	0.340			12.500			47.700			6.600
00012 - Hatch to pipel. moonp.	4.730			10.700			31.500			0.000
00013 - Hatch on main dk.	0.370			10.800			21.300			3.500
00014 - Hatch on C-deck	0.390			18.800			80.000			0.900
00015 - Hatch to ROV moonp...	5.200			9.800			40.500			0.000
00016 - Hawser hatch	0.080			19.000			79.800			8.900
E1.1.2 - Cargo hatch cov., twe...	0.210	0.208	0.002	7.900	7.975	-0.075	45.700	46.690	-0.990	6.200
00017 - Hatch to Eng. room	0.210			7.900			45.700			6.200
E1.4 - Equip. for cargo, holds/d...	50.930	54.150	-3.220	10.900	10.800	0.100	14.800	15.000	-0.200	0.000
00020 - Cargo rail	50.930			10.900			14.800			0.000
E1.5 - Spec. equip. cargo handl.	3.880	4.100	-0.220	10.800	10.820	-0.020	-0.200	-0.200	0.000	10.000
00021 - Dalfinner Crans	3.880			10.800			-0.200			10.000

Now we are looking for the Absolute deviation. But we can also look at the Relative Deviation:

Compare

Code type: WgtGrip

List: Defined All Input

Deviation: Show Absolute Relative

CoG impact: Show Absolute Relative

View: Grid Tree Items

Show: VCG LCG TCG

Project: (local) - SW00_DB_Space(TestSpace Space_test) Label: Estimate Color: [dropdown]

Code & Description	Weight [t] Tutorial	Weight [t] Estimate	Dev.[%]	VCG [m] Tutorial	VCG [m] Estimate	Dev.[%]	LCG [m] Tutorial	LCG [m] Estimate	Dev.[%]	TCG [m] Tutorial
DISP - Displacement	4 264.790	4 782.440	-10.824	9.197	9.206	-0.093	39.453	41.079	-3.959	-0.724
LW - Lightship	4 264.790	4 782.440	-10.824	9.197	9.206	-0.093	39.453	41.079	-3.959	-0.724
E - Equipment	1 053.610	1 455.515	-27.613	11.859	11.757	0.865	45.544	46.225	-1.474	0.282
E1 - Equipment for cargo	88.070	93.444	-5.751	12.483	12.395	0.709	23.343	23.554	-0.896	0.462
E1.1 - Hatches	11.660	12.030	-3.076	10.605	10.558	0.450	38.315	38.475	-0.415	0.696
E1.1.1 - Cargo hatch cov., wea...	11.450	11.822	-3.147	10.655	10.603	0.491	38.180	38.330	-0.392	0.595
00010 - Hatch to Eng. room	0.340			9.800			46.700			6.500
00011 - Hatch to Eng. room	0.340			12.500			47.700			6.600
00012 - Hatch to pipel. moonp.	4.730			10.700			31.500			0.000
00013 - Hatch on main dk.	0.370			10.800			21.300			3.500
00014 - Hatch on C-deck	0.390			18.800			80.000			0.900
00015 - Hatch to ROV moonp...	5.200			9.800			40.500			0.000
00016 - Hawser hatch	0.080			19.000			79.800			8.900
E1.1.2 - Cargo hatch cov., twe...	0.210	0.208	0.962	7.900	7.975	-0.940	45.700	46.690	-2.120	6.200
00017 - Hatch to Eng. room	0.210			7.900			45.700			6.200
E1.4 - Equip. for cargo, holds/d...	50.930	54.150	-5.946	10.900	10.800	0.926	14.800	15.000	-1.333	0.000
00020 - Cargo rail	50.930			10.900			14.800			0.000
E1.5 - Spec. equip. cargo handl.	3.880	4.100	-5.366	10.800	10.820	-0.185	-0.200	-0.200	-0.000	10.000
00021 - Dalfinner Crans	3.880			10.800			-0.200			10.000

Print Save Close

And the View can be Grid or Tree view:

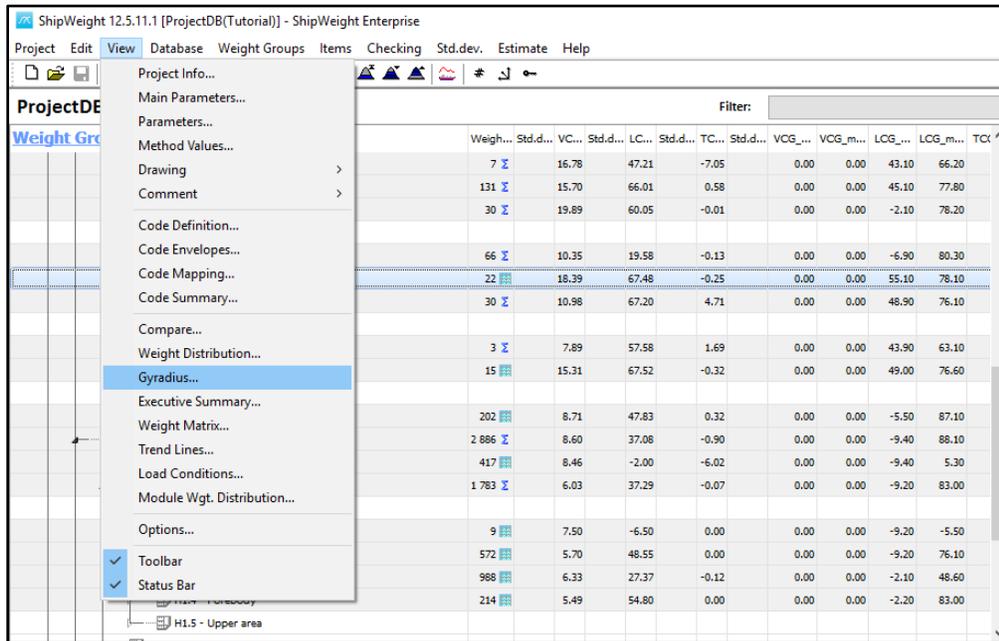
The 'Compare' dialog box is shown with the 'View' dropdown menu open. The 'Items' option is selected. The table below displays comparison data for various ship components.

Code & Description	Weight [t] Tutorial	Weight [t] Estimate	Dev. [%]	VCG [m] Tutorial	VCG [m] Estimate	Dev. [%]	LCG [m] Tutorial	LCG [m] Estimate	Dev. [%]
DISP - Displacement	4 264.790	4 782.440	-10.824	9.197	9.206	-0.093	39.453	41.079	
LW - Lightship	4 264.790	4 782.440	-10.824	9.197	9.206	-0.093	39.453	41.079	
E - Equipment	1 053.610	1 455.515	-27.613	11.859	11.757	0.865	45.544	46.225	
E1 - Equipment for cargo	88.070	93.444	-5.751	12.483	12.395	0.709	23.343	23.554	
E1.1 - Hatches	11.660	12.030	-3.076	10.605	10.558	0.450	38.315	38.475	
E1.1.1 - Cargo hatch cov., weather d.	11.450	11.822	-3.147	10.655	10.603	0.491	38.180	38.330	
00010 - Hatch to Eng. room	0.340			9.800			46.700		
00011 - Hatch to Eng. room	0.340			12.500			47.700		
00012 - Hatch to pipel. moonp.	4.730			10.700			31.500		
00013 - Hatch on main dk.	0.370			10.800			21.300		
00014 - Hatch on C-deck	0.390			18.800			80.000		
00015 - Hatch to ROV moonpool	5.200			9.800			40.500		
00016 - Hawser hatch	0.080			19.000			79.800		
E1.1.2 - Cargo hatch cov., tween d.	0.210	0.208	0.962	7.900	7.975	-0.940	45.700	46.690	
00017 - Hatch to Eng. room	0.210			7.900			45.700		
E1.4 - Equip. for cargo, holds/deck	50.930	54.150	-5.946	10.900	10.800	0.926	14.800	15.000	
00020 - Cargo rail	50.930			10.900			14.800		

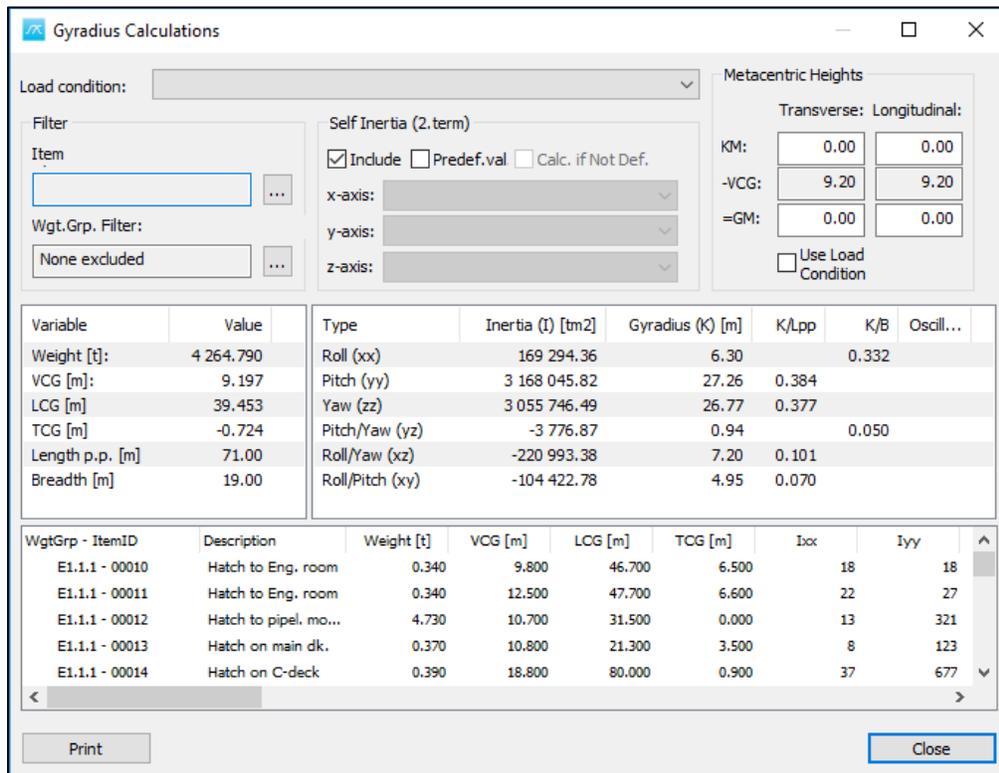
We are comparing now only with one project, but more projects can be added anytime into this dialog for comparison.

6.3 Gyradius Calculations dialog

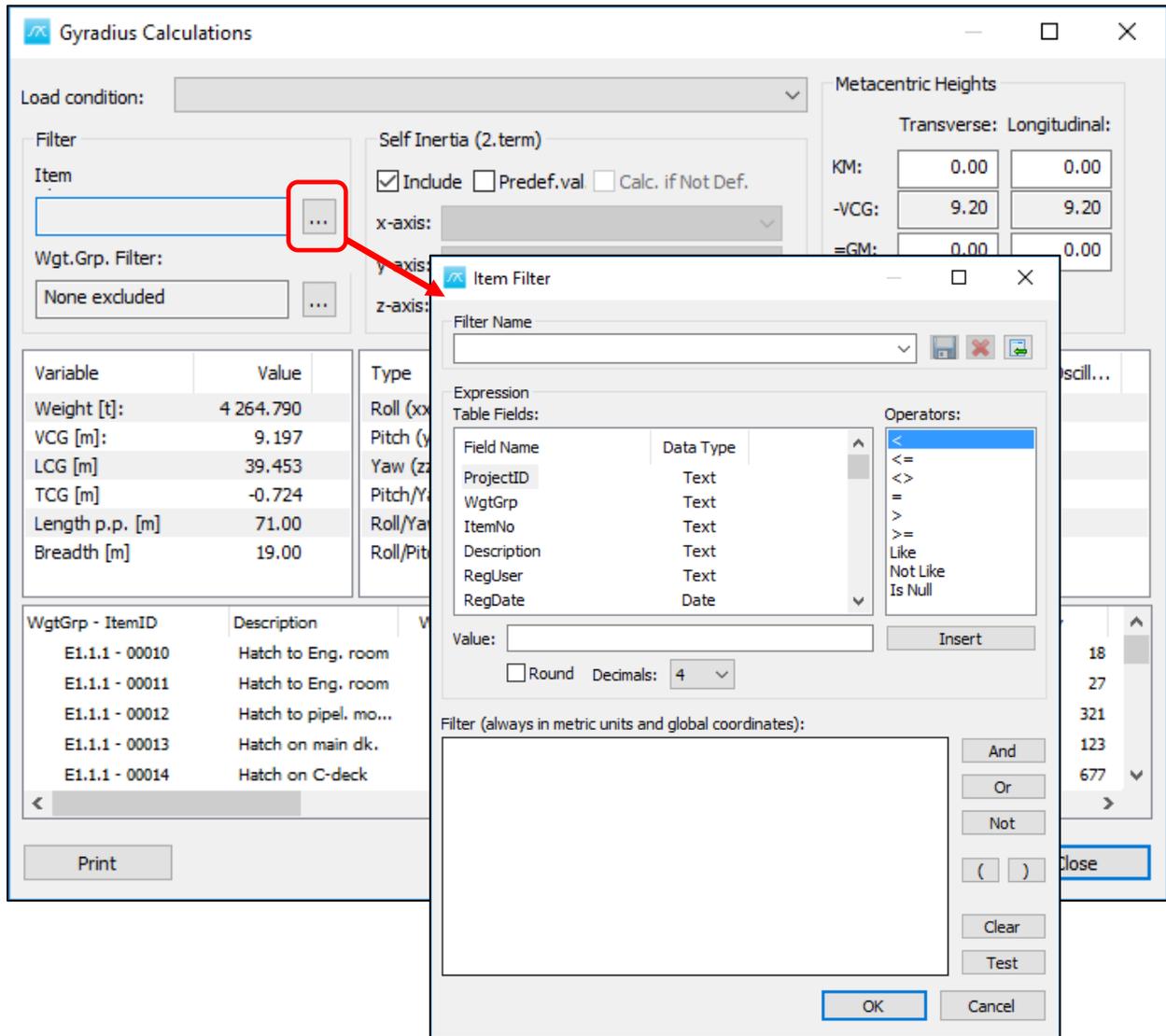
It can be opened from the **View** menu, and then select **Gyradius...**



This brings up calculation for gyradius and moment of inertia for the vessel:



Here we can apply Item filters:



Now it is calculating Moment of Inertia and Gyradius values for Roll, Pitch, Yaw, and also for the product of inertia Pitch/Yaw, Roll/Yaw, Roll/Pitch:

Variable	Value	Type	Inertia (I) [tm ²]	Gyradius (K) [m]	K/Lpp	K/B	Oscill...
Weight [t]:	4 264.790	Roll (xx)	169 294.36	6.30		0.332	
VCG [m]:	9.197	Pitch (yy)	3 168 045.82	27.26	0.384		
LCG [m]:	39.453	Yaw (zz)	3 055 746.49	26.77	0.377		
TCG [m]:	-0.724	Pitch/Yaw (yz)	-3 776.87	0.94		0.050	
Length p.p. [m]:	71.00	Roll/Yaw (xz)	-220 993.38	7.20	0.101		
Breadth [m]:	19.00	Roll/Pitch (xy)	-104 422.78	4.95	0.070		

Here you can find details for each individual item:

Variable	Value	Type	Inertia (I) [tm ²]	Gyradius (K) [m]	K/Lpp	K/B	Oscill...
Weight [t]:	4 264.790	Roll (xx)	169 294.36	6.30		0.332	
VCG [m]:	9.197	Pitch (yy)	3 168 045.82	27.26	0.384		
LCG [m]:	39.453	Yaw (zz)	3 055 746.49	26.77	0.377		
TCG [m]:	-0.724	Pitch/Yaw (yz)	-3 776.87	0.94		0.050	
Length p.p. [m]:	71.00	Roll/Yaw (xz)	-220 993.38	7.20	0.101		
Breadth [m]:	19.00	Roll/Pitch (xy)	-104 422.78	4.95	0.070		

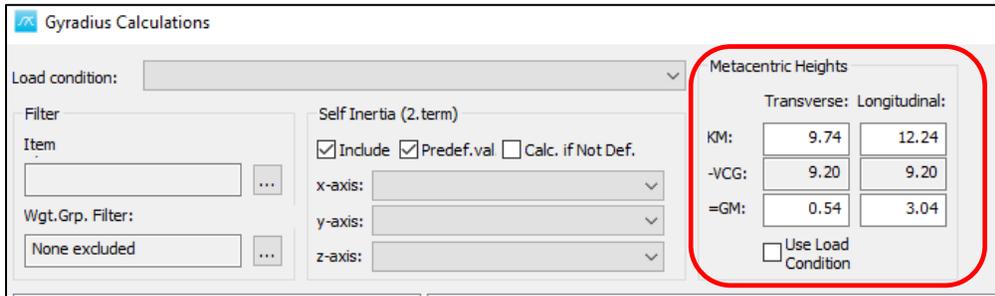
WgtGrp - ItemID	Description	Weight [t]	VCG [m]	LCG [m]	TCG [m]	Ixx	Iyy	Izz	Iyz	Ixz	Ixy
E1.1.1 - 00010	Hatch to Eng. room	0.340	9.800	46.700	6.500	18	18	36	1	1	18
E1.1.1 - 00011	Hatch to Eng. room	0.340	12.500	47.700	6.600	22	27	41	8	9	21
E1.1.1 - 00012	Hatch to pipel. mo...	4.730	10.700	31.500	0.000	13	321	313	5	-57	-27
E1.1.1 - 00013	Hatch on main dk.	0.370	10.800	21.300	3.500	8	123	129	3	-11	-28
E1.1.1 - 00014	Hatch on C-deck	0.390	18.800	80.000	0.900	37	677	642	6	152	26
E1.1.1 - 00015	Hatch to ROV moo...	5.200	9.800	40.500	0.000	5	24	25	2	3	4
E1.1.1 - 00016	Hawser hatch	0.080	19.000	79.800	8.900	15	138	138	8	32	31
E1.1.2 - 00017	Hatch to Eng. room	0.210	7.900	45.700	6.200	10	9	19	-2	-2	9
E1.4 - 00020	Cargo rail	50.930	10.900	14.800	0.000	174	41 168	41 047	63	-2 139	-909

The way ShipWeight is calculating:

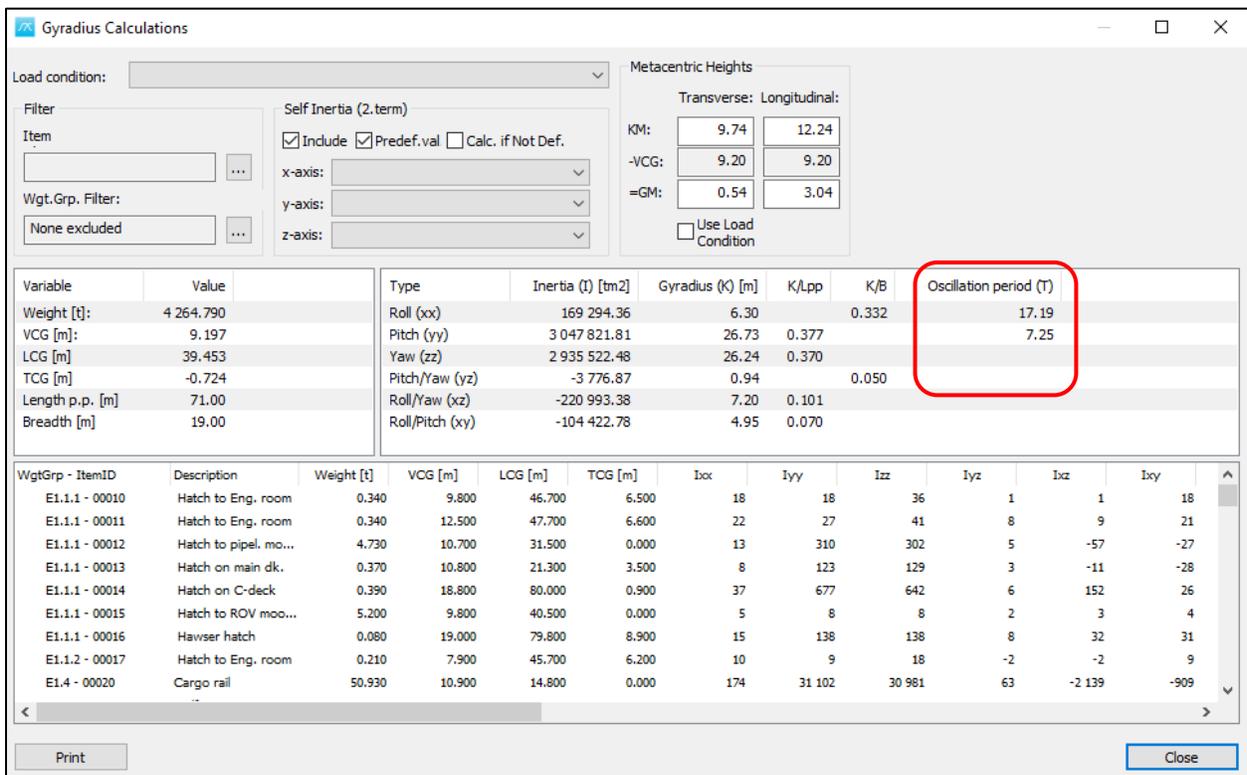
The Moment of Inertia by taking the Transverse inertia using the Steiner's theorem or parallel axis theory and that it's done for all items. If there is an item that has extents in all three directions then the item will be approximated to a box and also calculate the local inertia for that particular item.

It is also possible to point to custom codes which can have exact values for the moment of inertia stored in the custom codes if you can get such values from the CAD software.

Finally, if the GM values for transverse and longitudinal are known from the stability software. So let's type in some values:

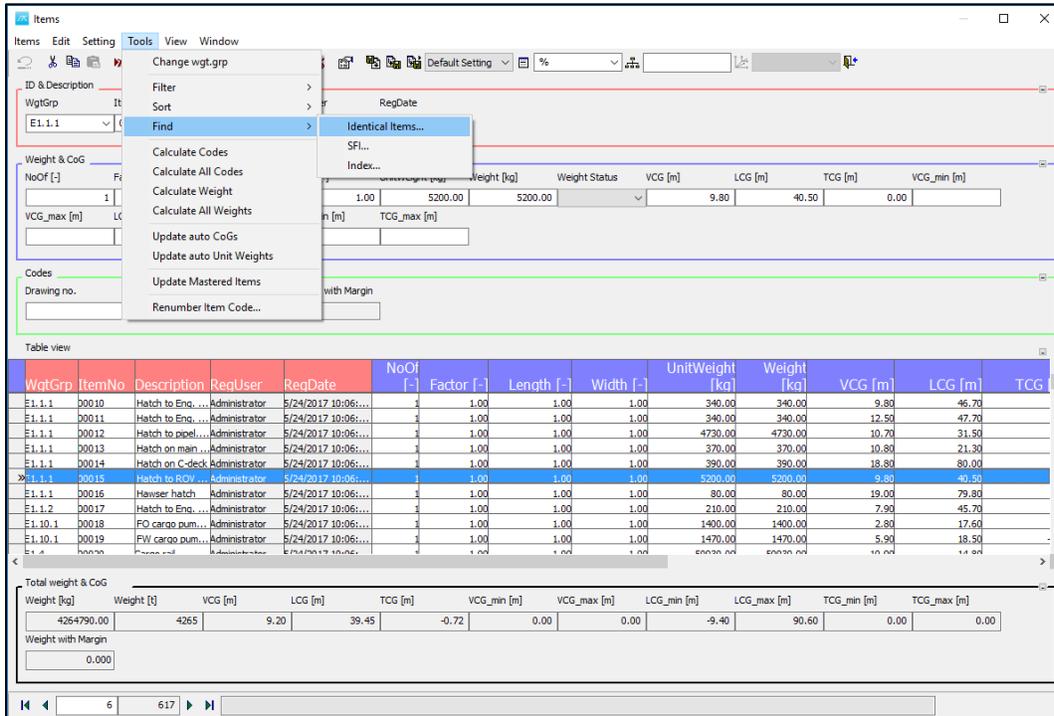


Also based on this we can calculate the Oscilation period (T):

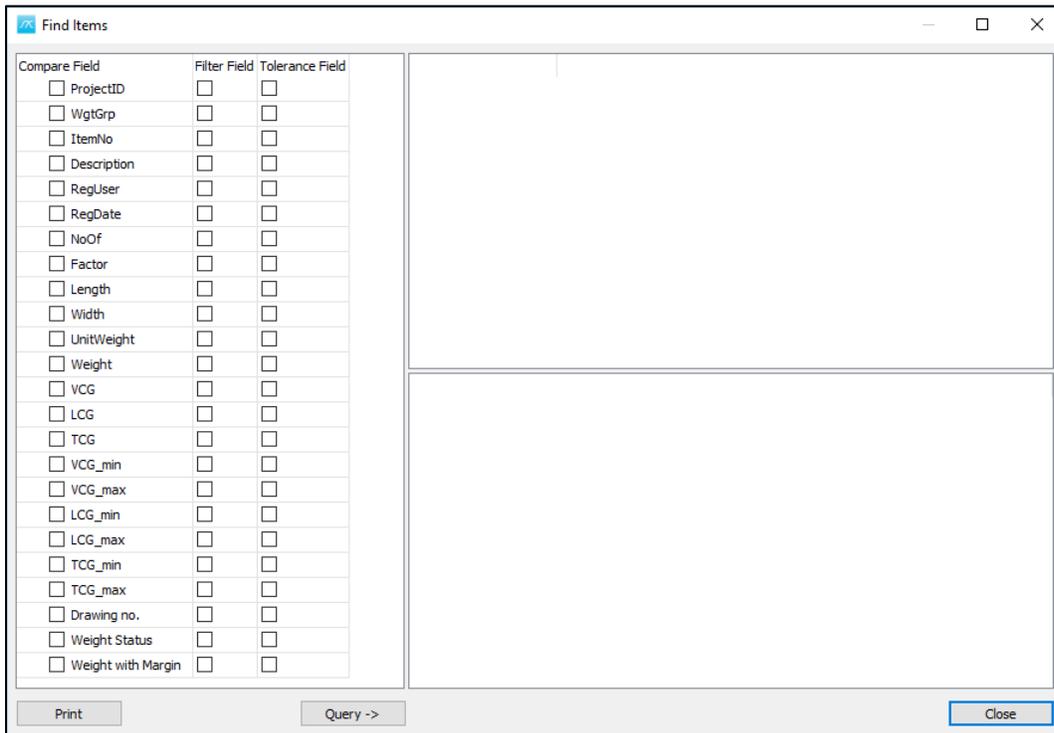


6.4 Find identical items...

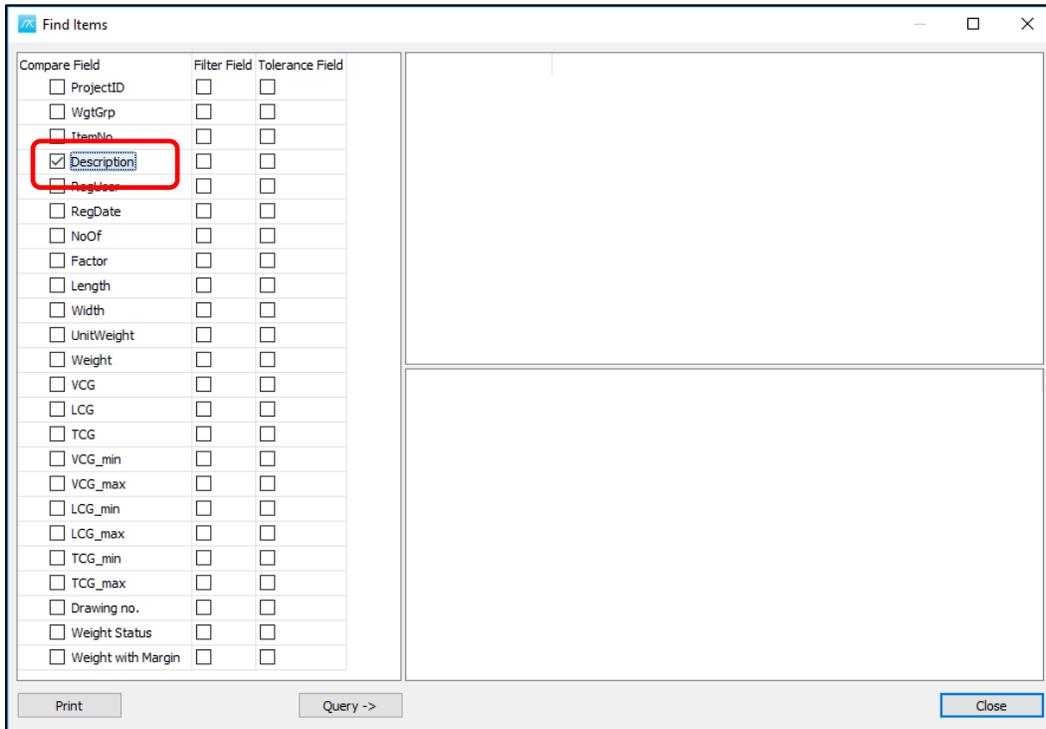
Open the **Items** dialog. Go to **Tools** menu, select **Find** and then **Identical Items...**



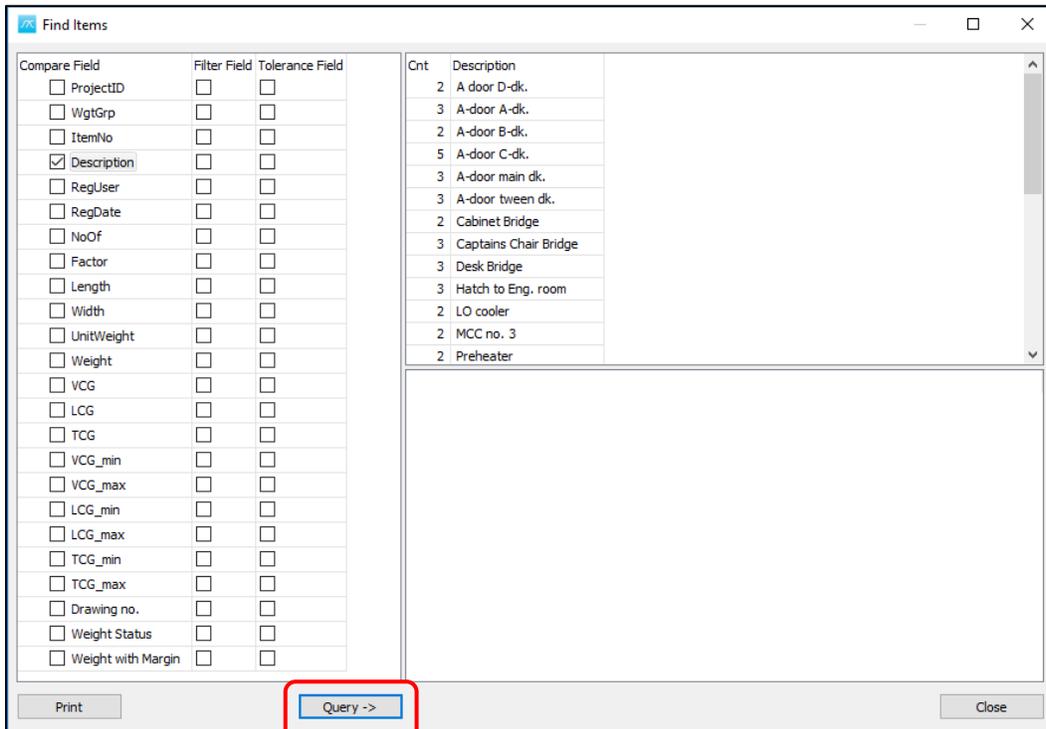
This brings up the Find Items dialog:



We can find here identical items based on the way we define them. So, for example let's say we want to check items with the same Description. Then click on Description in the Compare Field area:

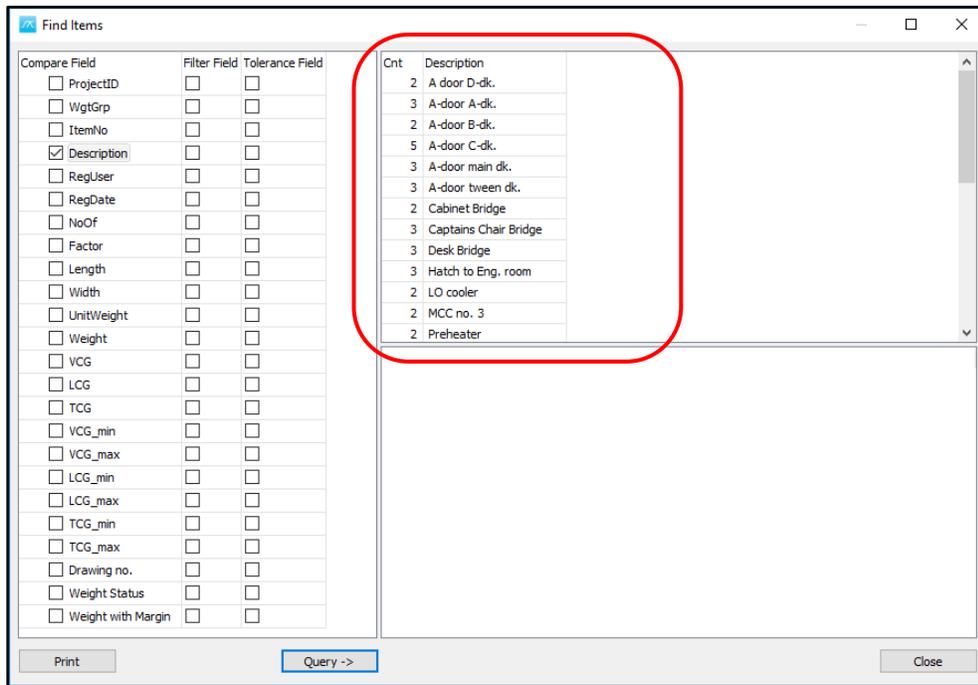


And push the Query -> button:



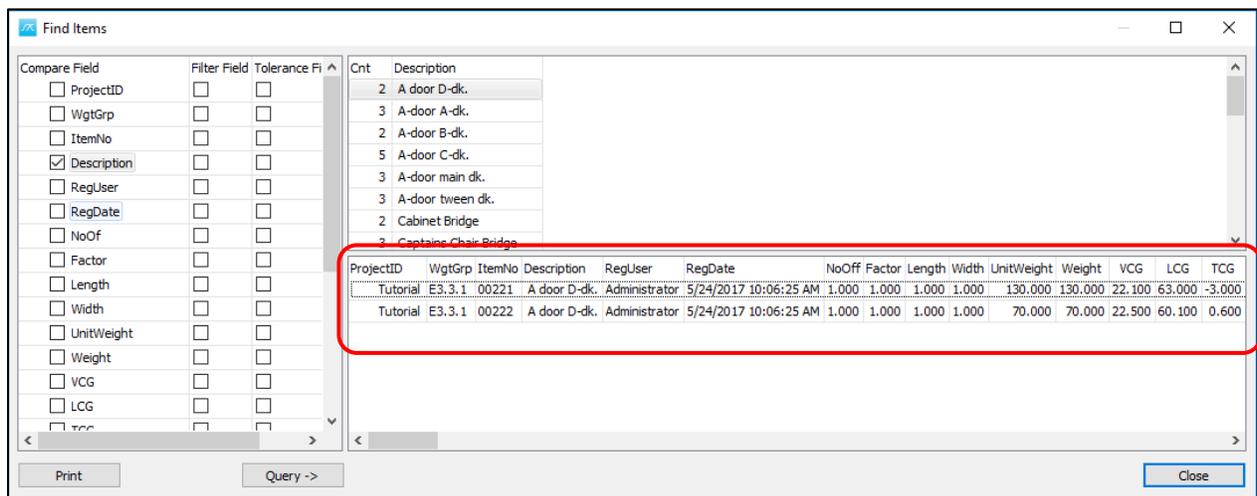
Then in the upper right dialog information is provided:

- The first column is the Count, the findings
- And the second column is the Description

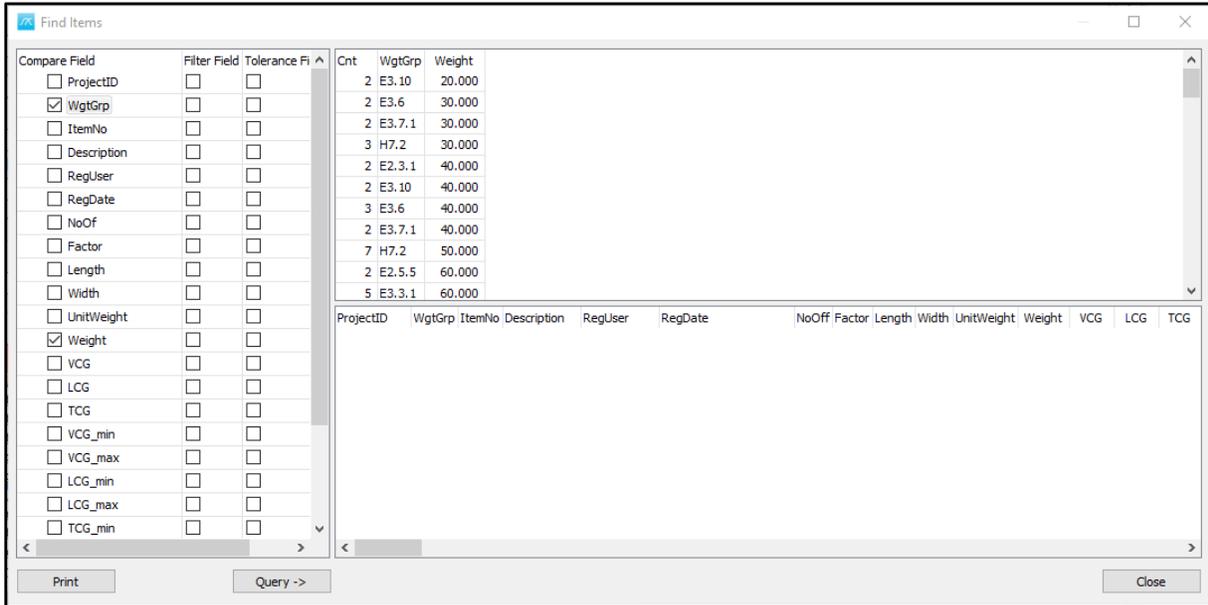


In other words, it finds two places where it says “D door D-dk.” description, and three places where it says “A door D-dk.” Description, and so forth.

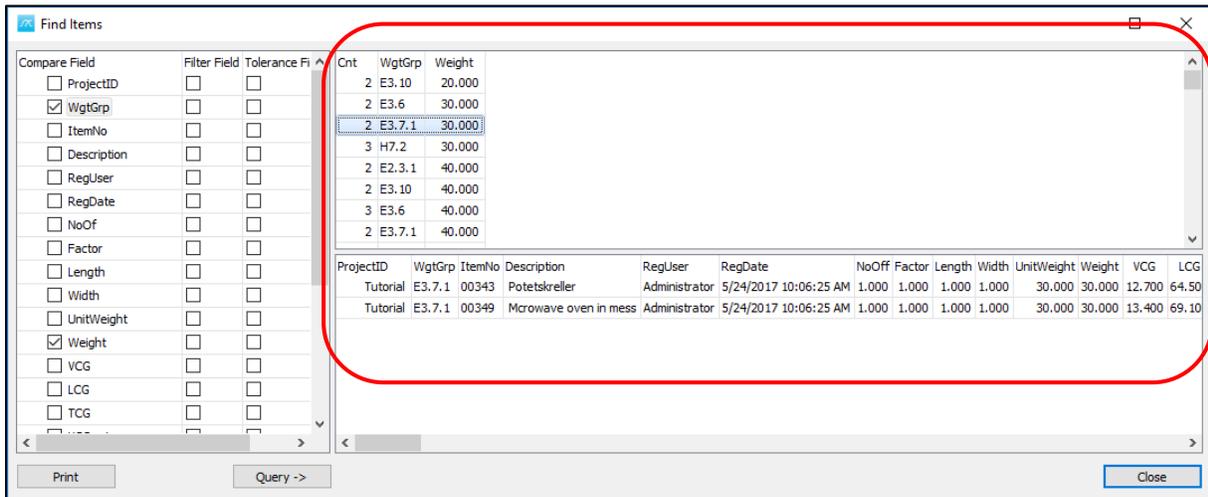
To have a look at this, click on the first row 2 A door D-dk. and down in the lower right corner it will show all the detailed information about the items that’s been described as “A door D-dk.”



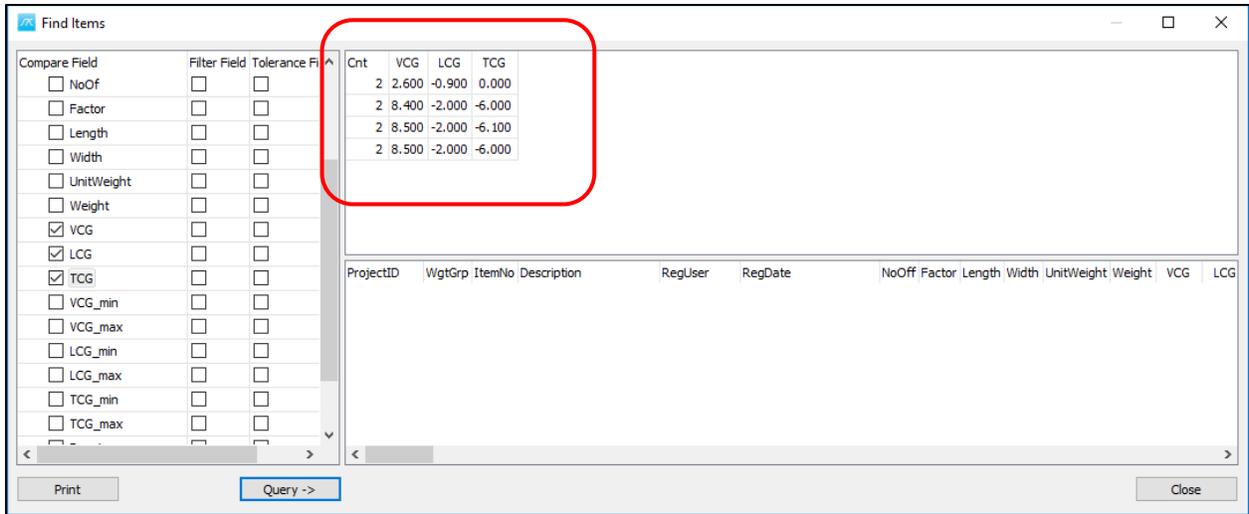
To check items with the same Weight in the same Weight Group, check the boxes from **Weight** and **WgtGrp** from Compare Field area, and then press **Query** button:



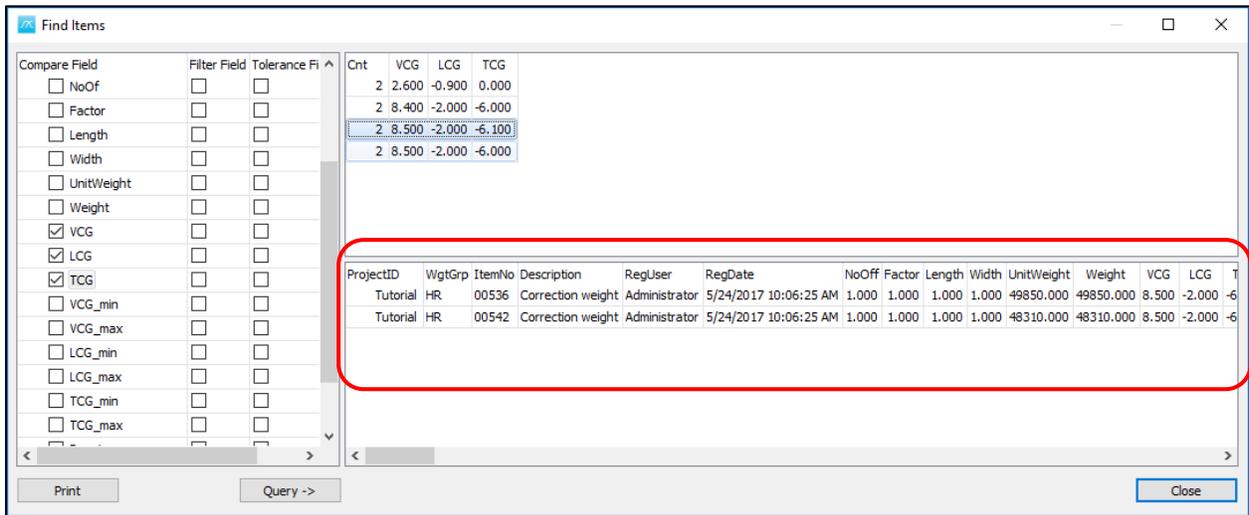
The result will be displayed in the upper right corner. So, for example in weight group E3.7.1 there are two instances where the items have the same weight “30”:



If we click on VCG, LCG and TCG and then press Query button, it will give items in the database that have the exact center of gravity location:



So there are two items located at VCG 8.5, LCG -2, and TCG 6.1. So click on this line and it will bring up those two items:



7. Setting up the Playground Area

Step1: Create (or select existing) code definition to be used for grouping items in worksets!

To set up a successful playground area first we have to select a custom code that will work as our work packages or that will group the items that we need to check in and out of the playground area.

Go to the **View** menu and select **Code Definition...**

The screenshot shows the ShipWeight Enterprise interface. The 'View' menu is open, and 'Code Definition...' is highlighted. The main window displays a table of items with columns for Weight, VCG, LCG, and TCG. The right sidebar shows Project Info and Parameters.

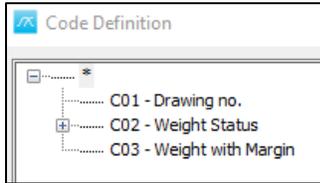
ItemNo	Description	Weight [t]	VCG [m]	LCG [m]	TCG [m]
4 265		9.20	39.45	-0.72	
1 054		11.86	45.54	0.28	
88		12.48	23.34	0.46	
460		11.30	42.46	0.07	
31		3.47	-3.26	-0.01	
92		3.34	43.15	0.19	
4		30.26	57.93	-0.00	
285		12.39	41.29	-0.07	
8		10.70	63.55	4.36	
40		26.35	79.21	0.00	
304		14.60	55.12	0.52	

The Code Definition window will open:

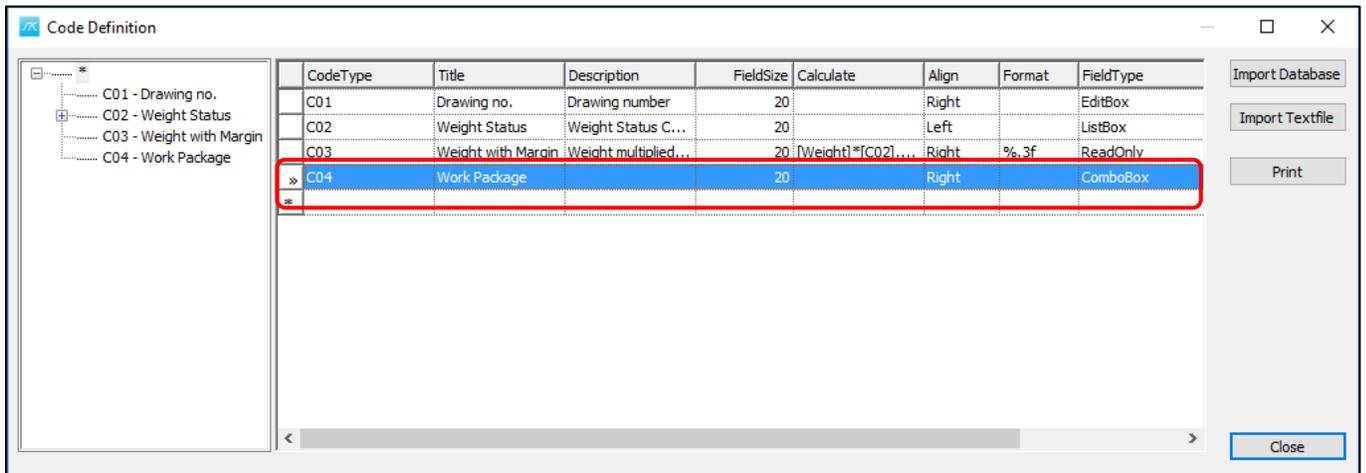
The screenshot shows the Code Definition window. The table contains the following data:

CodeType	Title	Description	FieldSize	Calculate	Align	Format	FieldType
C01	Drawing no.	Drawing number	20		Right		EditBox
C02	Weight Status	Weight Status C...	20		Left		ListBox
C03	Weight with Margin	Weight multiplied...	20	[Weight]*[C02]...	Right	%.3f	ReadOnly

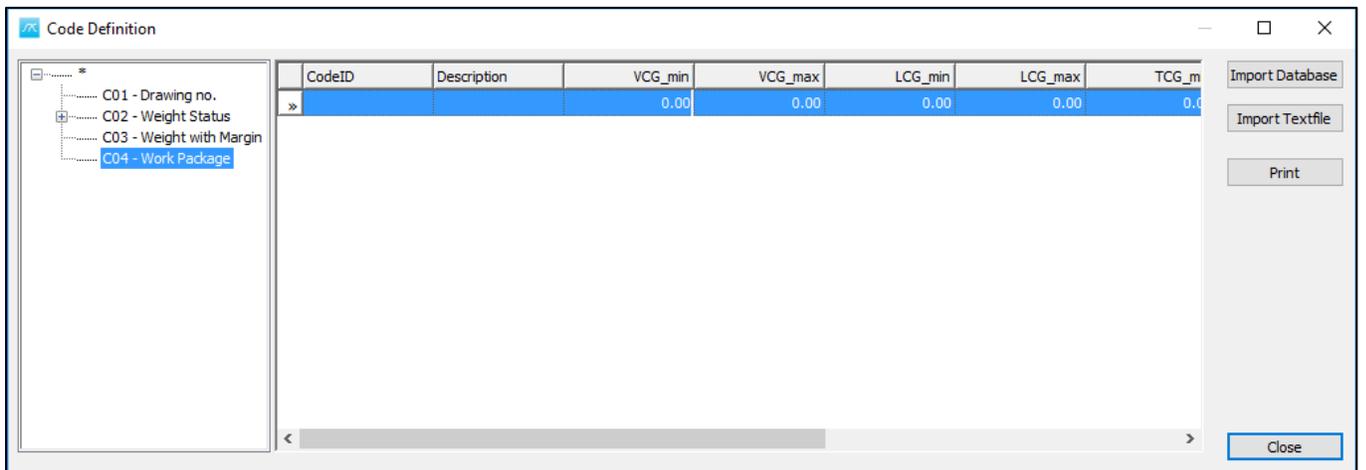
Within the code definition dialog we could have selected any of the existing codes to be used as our playground area codes:



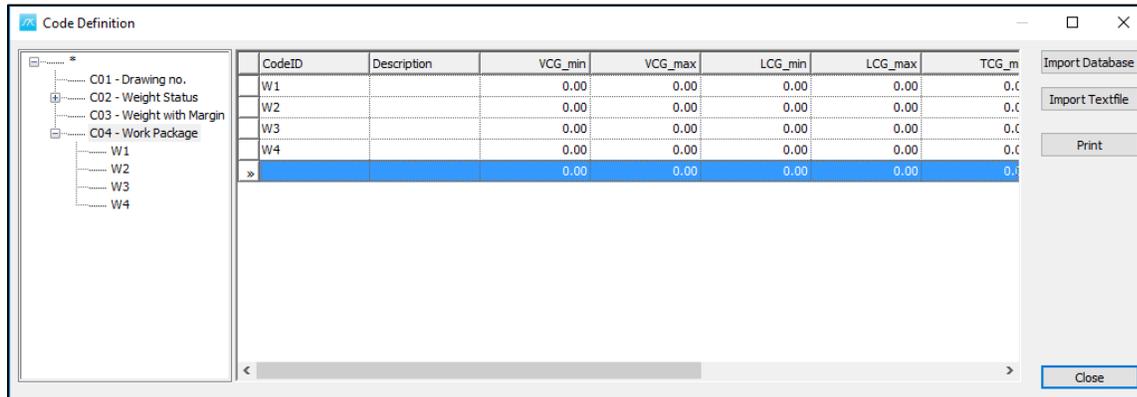
or we can define our own code, specific playground area code:



Now we need to add few subcodes for the work package so that we can use to group items to check them in and out of the playground area. Select the new code C04 – Work Package:



And add the following subcodes:



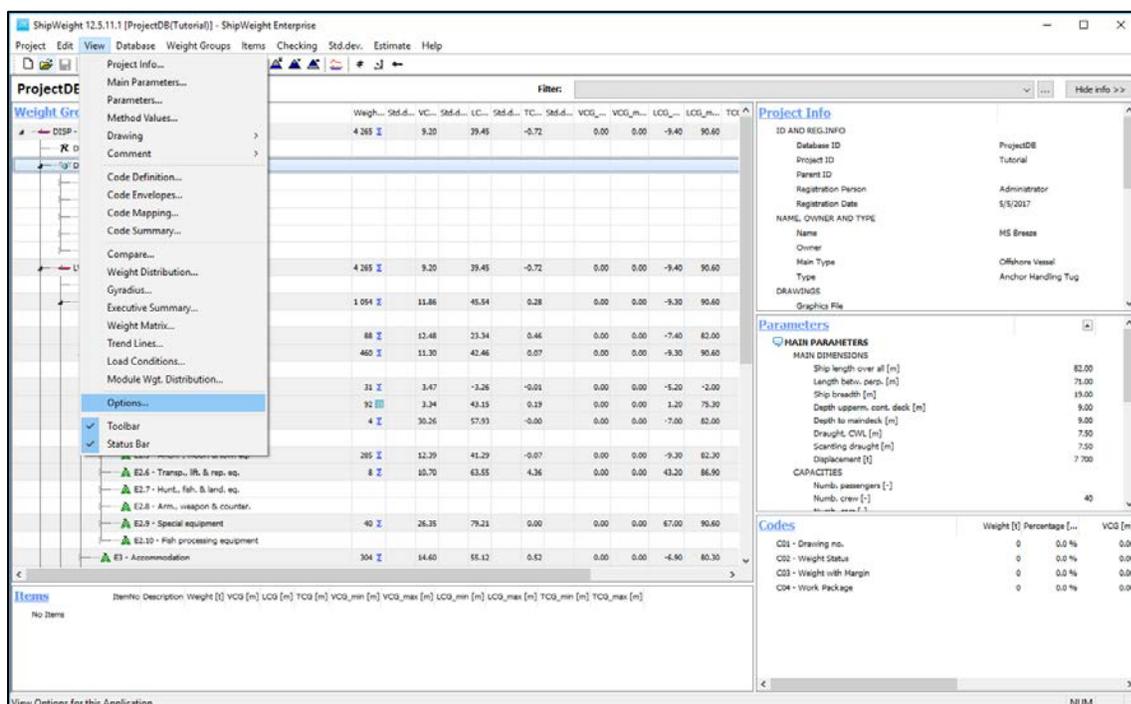
So, basically we have the code to groups the items that need to be checked in and out of the playground area.

In principle, any code may work as a workset code (drawing number, CAD package, department number, etc...)

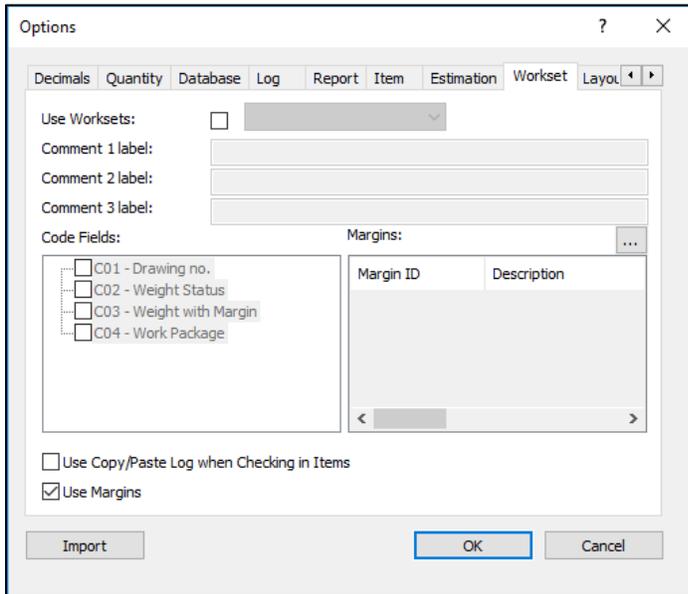
Now Close the Code Definition dialog.

Step 2: Enable the “Playground” in the Option dialog

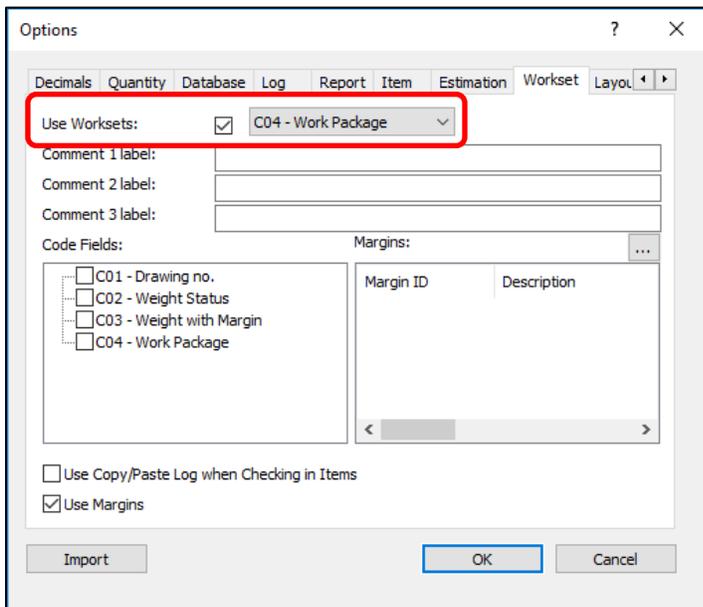
Go to the **View** menu and select **Options...**



The Options dialog will pop up:



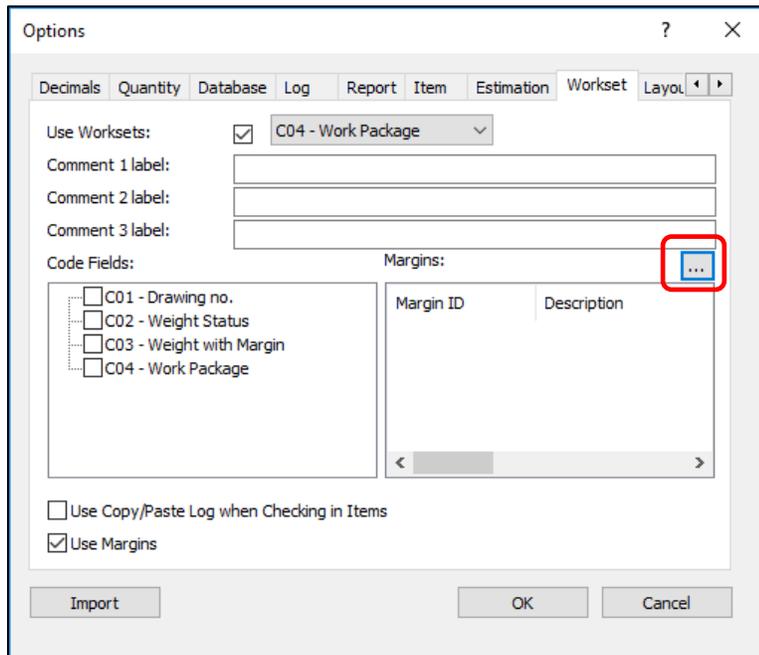
Now, enable the workset, by checking the **Use Worksets** box, and select C04 – Work Package code:



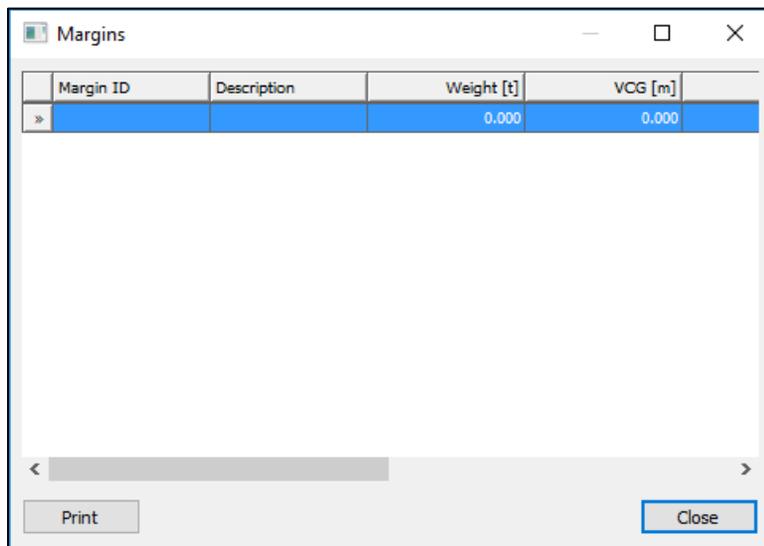
Below there are some Comment Labels which can be freely edited.

Step 3: Define margins!

Finally, in the Options dialog are the margins, in the lower right corner. These margins can be set and defined in the Margins dialog. To open the Margins dialog, press the browse button:



The margins dialog pops up:



Define the following margins:

Margin ID	Description	Weight [t]	VCG [m]
Builder Margin		1000.000	0.000
Design Margin		50.000	0.000
GFM		0.000	0.000
Future		1.000	0.000
Change Orders		0.000	0.000
»		0.000	0.000

Click Close.

So, now we have defined the Workset to start working with the Playground:

Options

Decimals Quantity Database Log Report Item Estimation Workset Layout

Use Worksets: C04 - Work Package

Comment 1 label:

Comment 2 label:

Comment 3 label:

Code Fields: C01 - Drawing no.
 C02 - Weight Status
 C03 - Weight with Margin
 C04 - Work Package

Margins:

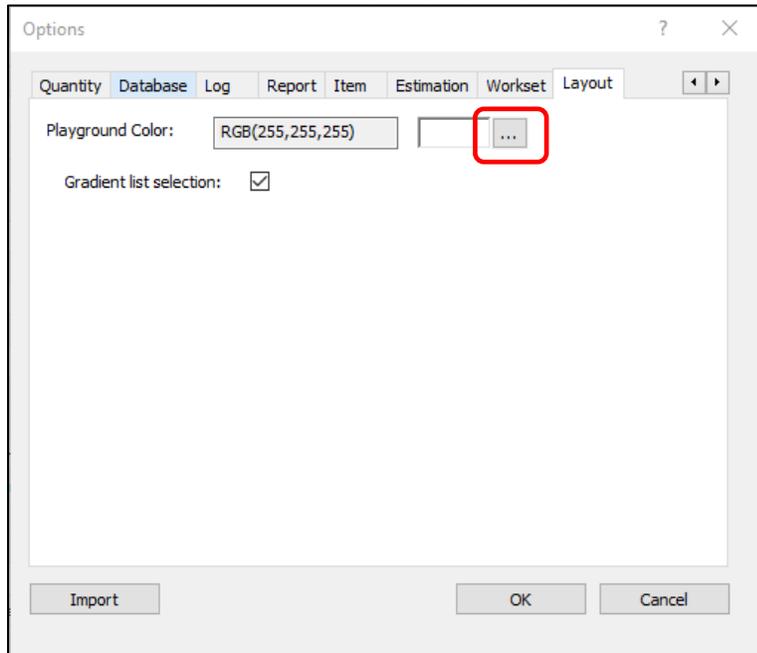
Margin ID	Description
Builder Margin	
Change Orders	
Design Margin	
Future	
GFM	

Use Copy/Paste Log when Checking in Items
 Use Margins

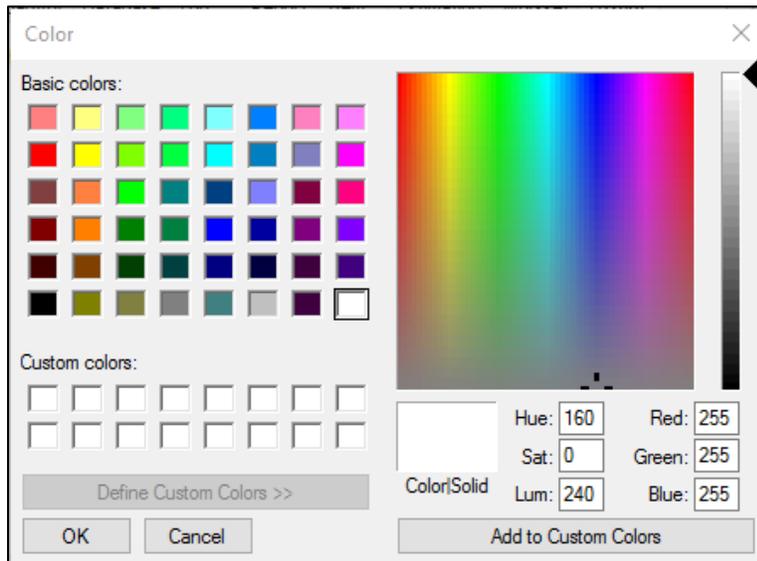
Import OK Cancel

Step 4: Choose a background color for the Playground item dialog!

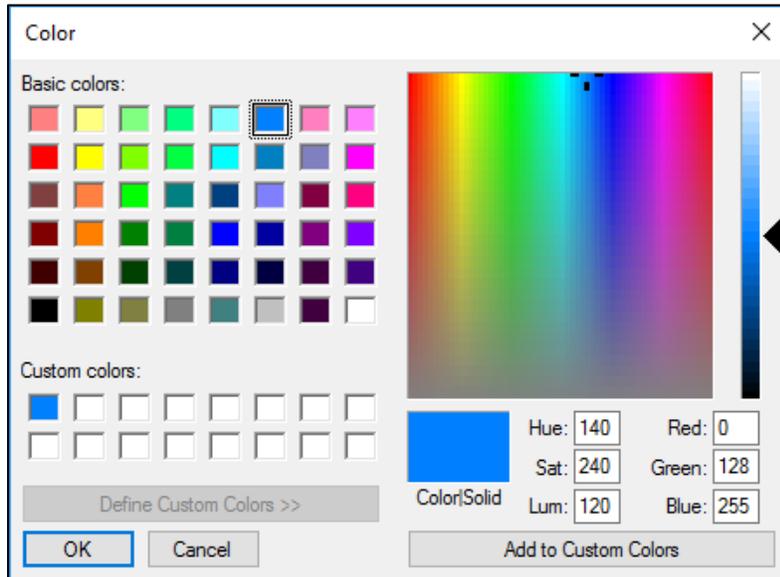
The last thing is to select the Playground Color. To do this, from the Options dialog, go to Layout tab and click the Browse button:



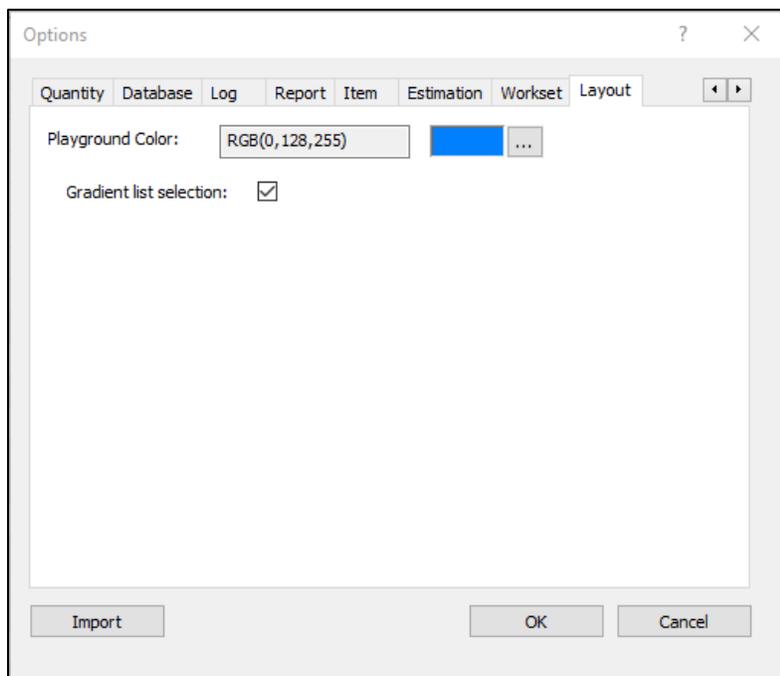
The Color dialog will appear:



Choose the background color:



Press **Add to Custom Colors** and click **OK**.



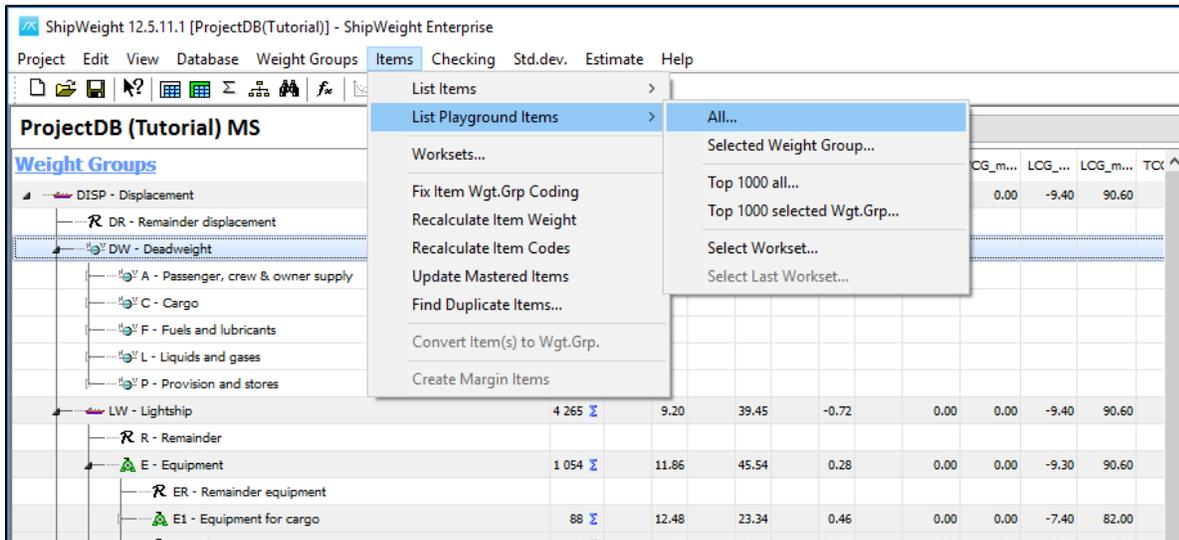
This was done to distinguish the difference between the live database and the playground area database.

Click OK to close the Options dialog.

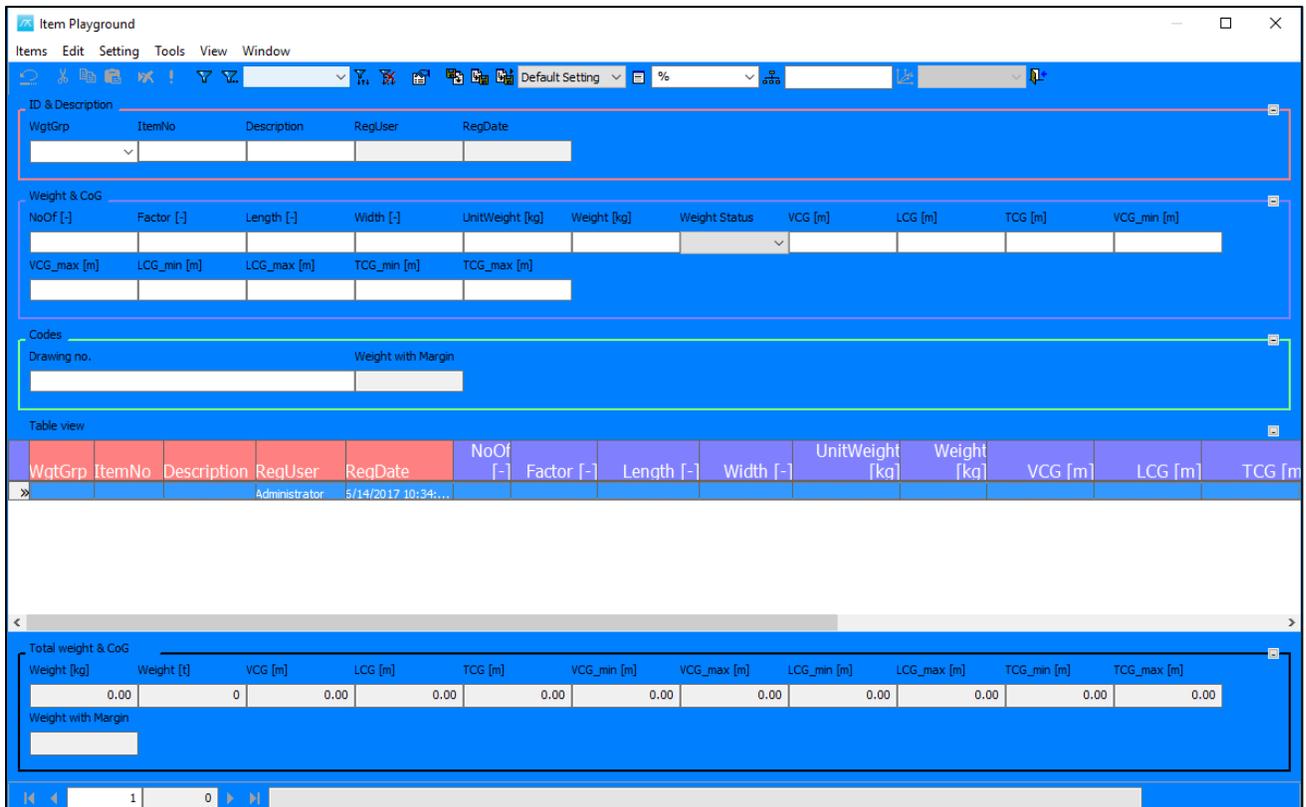
8. Using the Playground Area

Now open the Item Playground dialog.

From ShipWeight main menu -> Items -> List Playground Items -> All...



The Item Playground dialog opens:

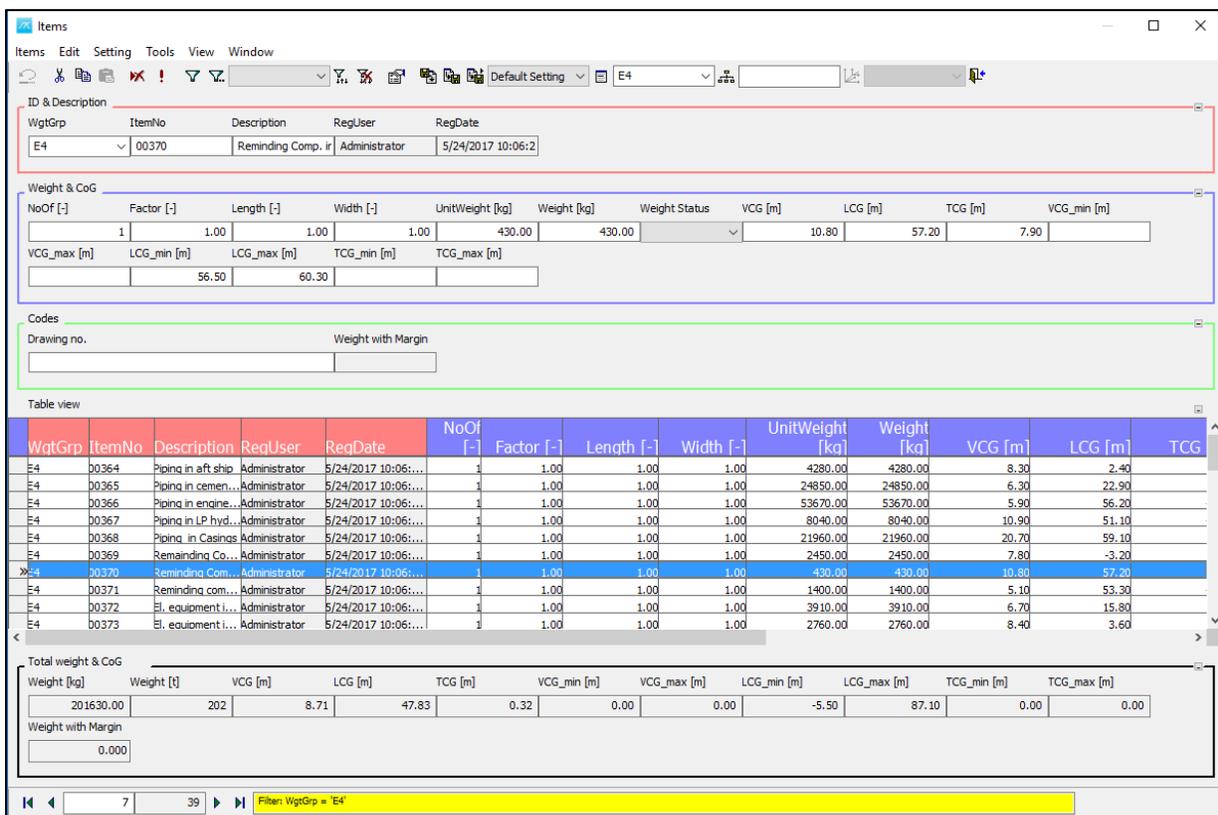


The playground dialog got the blue background, so we clearly can see this is working in the playground and not in the live database (the Items dialog).

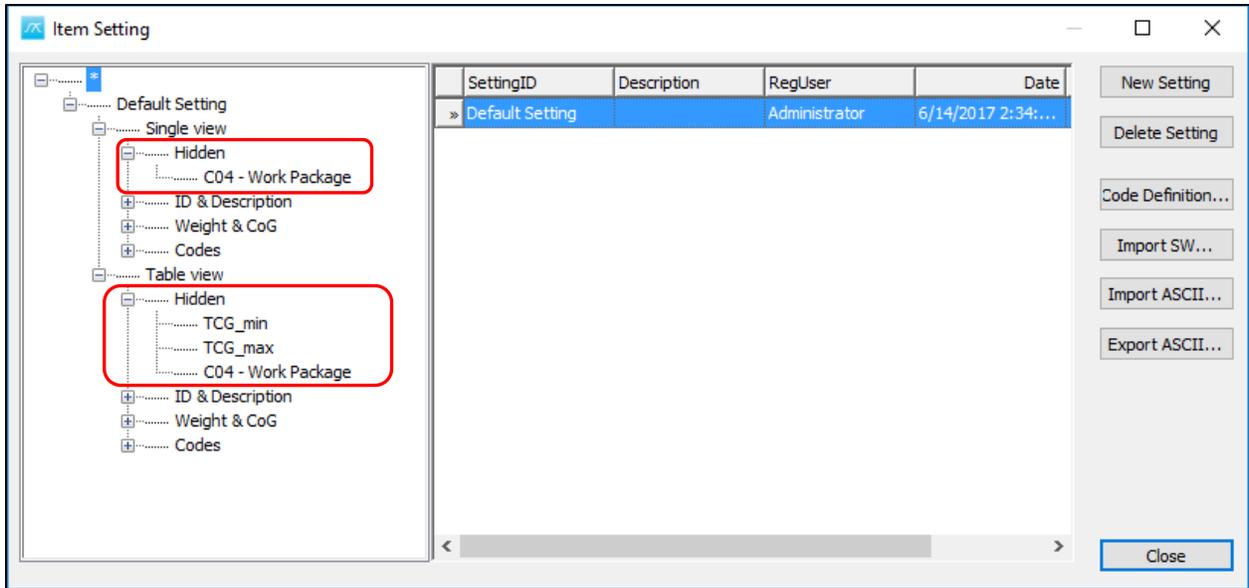
So, currently there are no items in the playground dialog. Now we have to check some items into the playground. Close the Playground dialog for now.

Step 1: Assign items to a workset and check out the workset

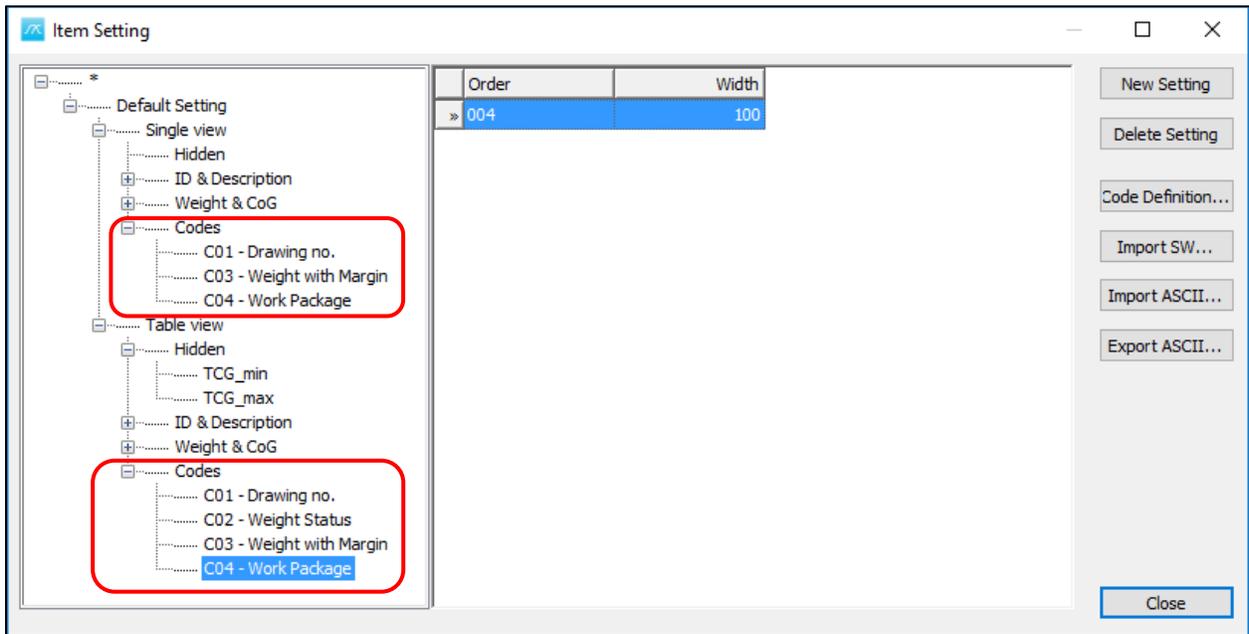
To do this we need to select items in the live database, mark them with the work package and check them out. So, open up the live database:



The Work Package column should already be visible in the Table view area. If it is not visible, then it means it is hidden and needs to be moved from Hidden to Codes in the Item Settings dialog. So, open the Items Settings dialog from Setting menu -> Item Settings... and expand the single and table view Hidden folders:



Because C04 – Work Package is hidden, we need to drag and move it to Codes folder:



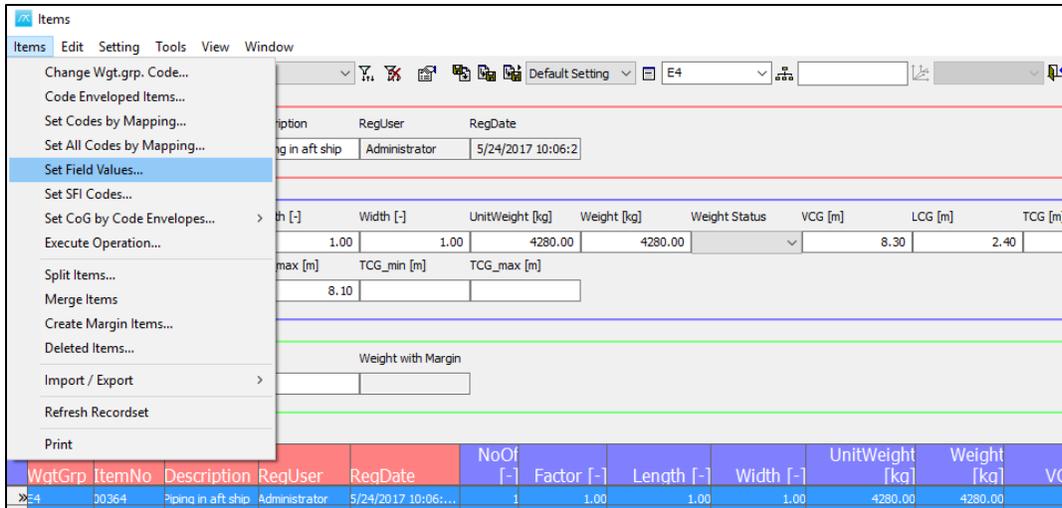
Now press Close. You will notice that the Work Package column has been added in the Table View:

The screenshot shows the 'Items' application window. The 'ID & Description' section displays: WgtGrp: E4, ItemNo: 00364, Description: Piping in aft ship, RegUser: Administrator, RegDate: 6/15/2017 10:52:4. The 'Weight & CoG' section shows: NoOf: 1, Factor: 1.00, Length: 1.00, Width: 1.00, UnitWeight: 4280.00, Weight: 4280.00, Weight Status: (dropdown), VCG: 8.30, LCG: 2.40, TCG: 0.20. The 'Codes' section has: Drawing no. (empty), Weight with Margin (empty), Work Package (dropdown). The 'Table view' section contains a table with columns: UnitWeight [kg], Weight [kg], VCG [m], LCG [m], TCG [m], VCG_min [m], VCG_max [m], LCG_min [m], LCG_max [m], Drawing no., Weight Status, Weight with Margin, Work Package. The table lists several items with their respective values. The 'Total weight & CoG' section shows: Weight [kg]: 201630.00, Weight [t]: 202, VCG [m]: 8.71, LCG [m]: 47.83, TCG [m]: 0.32, VCG_min [m]: 0.00, VCG_max [m]: 0.00, LCG_min [m]: -5.50, LCG_max [m]: 87.10, TCG_min [m]: 0.00, TCG_max [m]: 0.00. The status bar at the bottom shows 'Filter: WgtGrp = 'E4''.

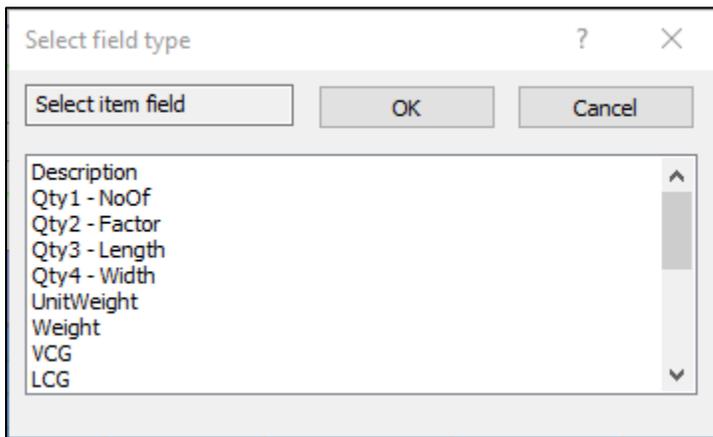
Select all of the items in group E4 using Ctrl A

The screenshot shows the 'Items' application window with the 'Table view' section selected. The 'ID & Description' section displays: WgtGrp: E4, ItemNo: 00364, Description: Piping in aft ship, RegUser: Administrator, RegDate: 5/24/2017 10:06:2. The 'Weight & CoG' section shows: NoOf: 1, Factor: 1.00, Length: 1.00, Width: 1.00, UnitWeight: 4280.00, Weight: 4280.00, Weight Status: (dropdown), VCG: 8.30, LCG: 2.40, TCG: 0.20. The 'Codes' section has: Drawing no. (empty), Weight with Margin (empty). The 'Table view' section contains a table with columns: WgtGrp, ItemNo, Description, RegUser, RegDate, NoOf, Factor, Length, Width, UnitWeight, Weight, VCG, LCG, TCG. The table lists multiple items, all of which are highlighted in blue, indicating they are selected. The 'Total weight & CoG' section shows: Weight [kg]: 201630.00, Weight [t]: 202, VCG [m]: 8.71, LCG [m]: 47.83, TCG [m]: 0.32, VCG_min [m]: 0.00, VCG_max [m]: 0.00, LCG_min [m]: -5.50, LCG_max [m]: 87.10, TCG_min [m]: 0.00, TCG_max [m]: 0.00. The status bar at the bottom shows 'Filter: WgtGrp = 'E4''.

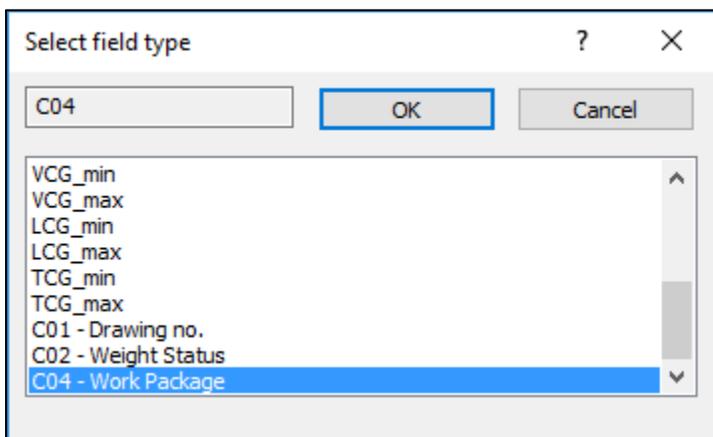
and go to **Items** menu and select **Set Field Values...**



The Select field type dialog will open:

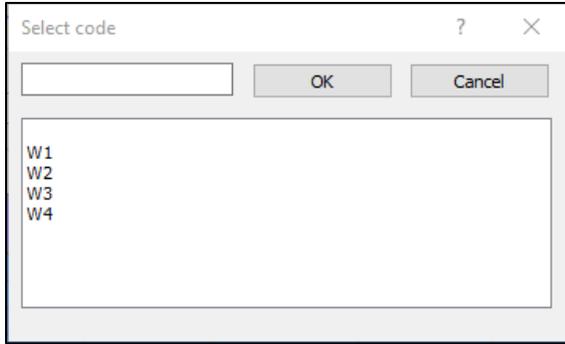


Select **C04 – Work Package**:

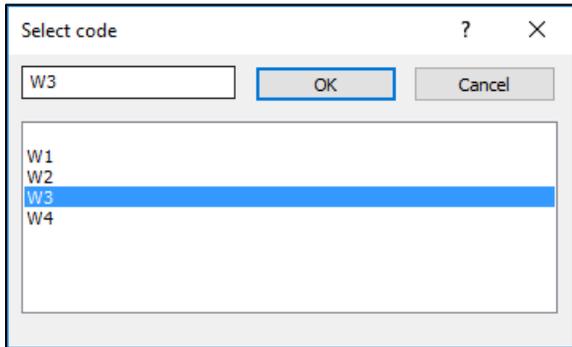


And then press **OK**.

The Select code dialog will appear:



Assign all of this to **W3** code to group the items:



And press **OK**.

Now, if we scroll to the right, we can see the work package, we have W3 for all items from E4 group, and they are still in the live database:

The screenshot shows the 'Items' application window with the following data:

ID & Description	WgtGrp	ItemNo	Description	RegUser	RegDate
E4	00402	Fire gen. serv. pu	Administrator	6/15/2017 12:32:4	

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	Weight Status	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]
1	1.00	1.00	1.00	1.00	970.00	970.00	5.30	61.50	-4.40	
VCG_max [m]		LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]					
		60.50	62.60							

Codes	Drawing no.	Weight with Margin	Work Package
			W3

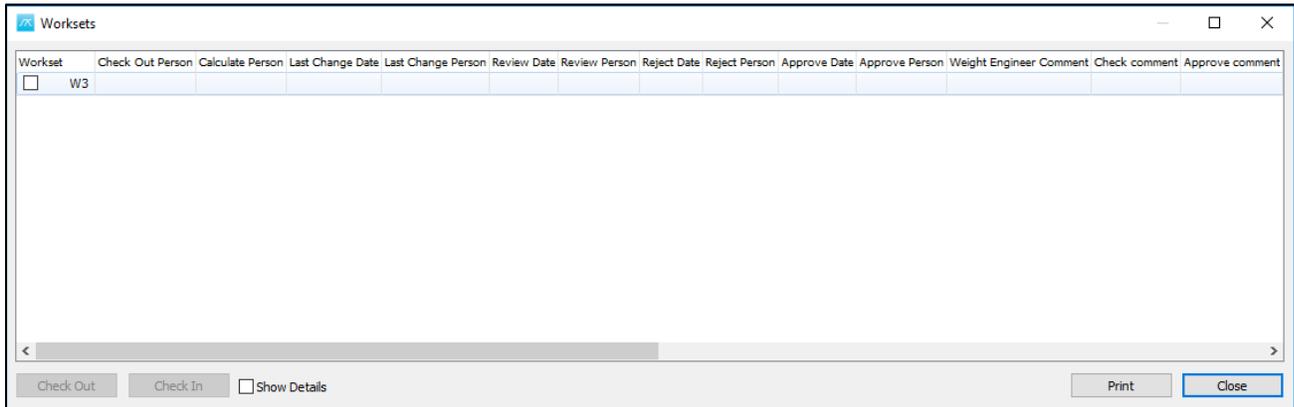
UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]	Drawing no.	Status	Weight with Margin	Work Package
580.00	580.00	2.90	49.80	0.40			48.90	50.40						W3
20.00	20.00	1.80	50.10	1.20			49.80	51.20						W3
240.00	240.00	2.90	46.50	1.60			45.80	46.90						W3
40.00	40.00	2.30	46.40	1.80			45.60	46.70						W3
460.00	460.00	5.20	61.60	4.40			61.10	63.00						W3
970.00	970.00	5.30	61.50	-4.40			60.50	62.60						W3

Total weight & CoG	Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]
	201630.00	202	8.71	47.83	0.32	0.00	0.00	-5.50	87.10	0.00	0.00

To get these items into the playground area, we need to check them out.

Go to Items menu and select Worksets...

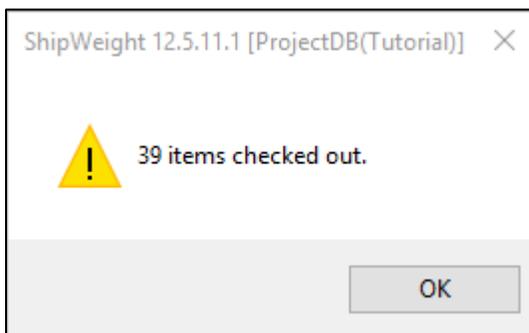
The Worksets dialog opens:



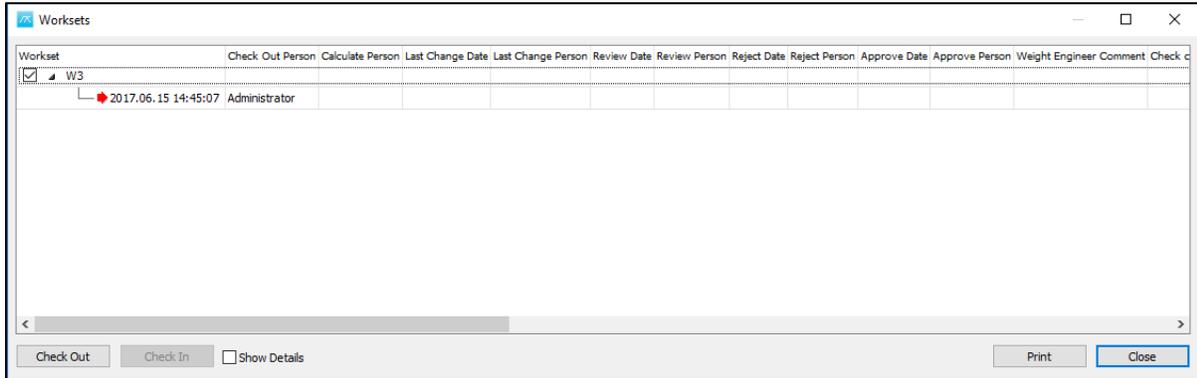
Now to check out the items market with W3, in the Worksets dialog select **W3** and press the **Check Out** button:



The following message will be displayed:

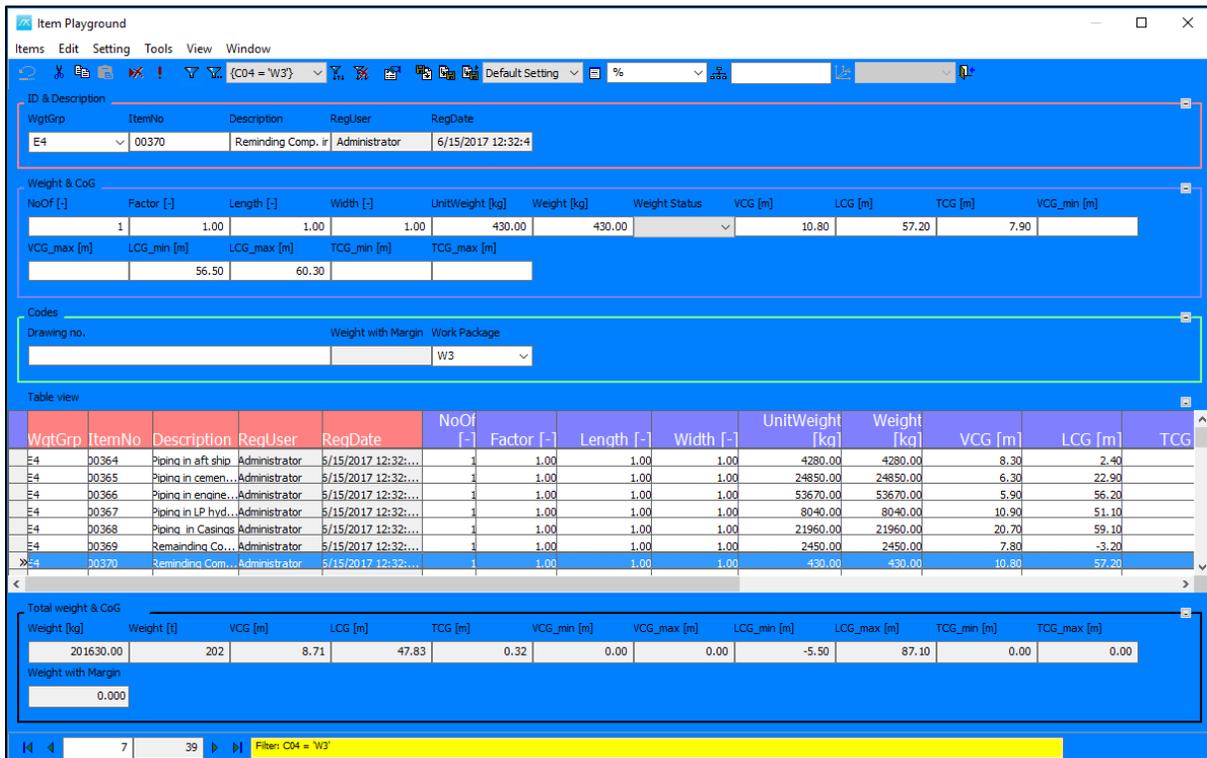


Click OK. Now we can see we have a new line with a red arrow which indicates that items with W3 have been checked out:



Close the Worksets dialog.

These items are still existing in the live database (Items dialog), but also a copy of them have been moved into the Playground area.



Step 2: Make your changes to the weights in the playground area!

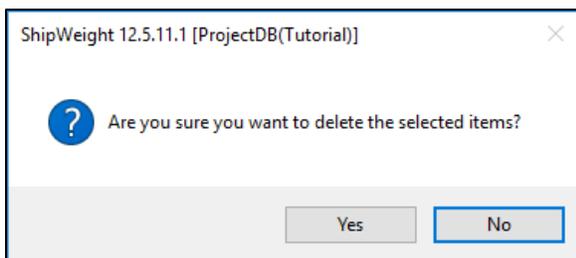
For example delete one item, by using right click and Delete option:

The screenshot shows the 'Item Playground' application window. A context menu is open over a table, with the 'Delete Item(s)' option selected. The table displays various items with their properties. Below the table, there is a 'Total weight & CoG' section with a summary table.

Date	NoOf	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]
2017 12:32:...	1	1.00	1.00	1.00	4280.00	4280.00	8.30	2.40	
5/15/2017 12:32:...	1	1.00	1.00	1.00	24850.00	24850.00	6.30	22.90	
5/15/2017 12:32:...	1	1.00	1.00	1.00	53670.00	53670.00	5.90	56.20	
5/15/2017 12:32:...	1	1.00	1.00	1.00	8040.00	8040.00	10.90	51.10	
5/15/2017 12:32:...	1	1.00	1.00	1.00	21960.00	21960.00	20.70	59.10	
5/15/2017 12:32:...	1	1.00	1.00	1.00	2450.00	2450.00	7.80	-3.20	
5/15/2017 12:32:...	1	1.00	1.00	1.00	430.00	430.00	10.80	57.20	

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]
201630.00	202	8.71	47.83	0.32	0.00	0.00	-5.50	87.10	0.00	0.00

You will be asked the following:



And click **Yes**.

You can also change the UnitWeight for one item, for example:

Item Playground

Items Edit Setting Tools View Window

{C04 = 'W3'}

Default Setting %

ID & Description

WgtGrp	ItemNo	Description	ReqUser	ReqDate
E4	00370	Reminding Comp. ir	Administrator	6/15/2017 12:32:4

Weight & CoG

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	Weight Status	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]
1	1.00	1.00	1.00	430.00	430.00		10.80	57.20	7.90	
VCG_max [m]		LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]					
		56.50	60.30							

Codes

Drawing no. Weight with Margin Work Package

W3

Table view

WgtGrp	ItemNo	Description	ReqUser	ReqDate	NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG
E4	00364	Piping in aft ship	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	4280.00	4280.00	8.30	2.40	
E4	00366	Piping in engine...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	53670.00	53670.00	5.90	56.20	
E4	00367	Piping in LP hyd...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	8040.00	8040.00	10.90	51.10	
E4	00368	Piping in Casings	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	21960.00	21960.00	20.70	59.10	
E4	00369	Remainding Co...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	2450.00	2450.00	7.80	-3.20	
E4	00370	Reminding Com...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	430.00	430.00	10.80	57.20	
E4	00371	Reminding com...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	1400.00	1400.00	5.10	53.30	

Total weight & CoG

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]
176780.00		177	9.05	51.34	0.19	0.00	0.00	-5.50	87.10	0.00
Weight with Margin		0.000								

6 38 Filter: C04 = 'W3'

For item no 00370 instead of 430 for UnitWeight, type for example 1000:

Item Playground

Items Edit Setting Tools View Window

{C04 = 'W3'}

Default Setting %

ID & Description

WgtGrp	ItemNo	Description	ReqUser	ReqDate
E4	00370	Reminding Comp. ir	Administrator	6/15/2017 12:32:4

Weight & CoG

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	Weight Status	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]
1	1.00	1.00	1.00	1000	1000		10.80	57.20	7.90	
VCG_max [m]		LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]					
		56.50	60.30							

Codes

Drawing no. Weight with Margin Work Package

0.000 W3

Table view

WgtGrp	ItemNo	Description	ReqUser	ReqDate	NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG
E4	00364	Piping in aft ship	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	4280.00	4280.00	8.30	2.40	
E4	00366	Piping in engine...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	53670.00	53670.00	5.90	56.20	
E4	00367	Piping in LP hyd...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	8040.00	8040.00	10.90	51.10	
E4	00368	Piping in Casings	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	21960.00	21960.00	20.70	59.10	
E4	00369	Remainding Co...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	2450.00	2450.00	7.80	-3.20	
E4	00370	Reminding Com...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	1000.00	1000.00	10.80	57.20	
E4	00371	Reminding com...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	1400.00	1400.00	5.10	53.30	

Total weight & CoG

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]
176780.00		177	9.05	51.34	0.19	0.00	0.00	-5.50	87.10	0.00
Weight with Margin		0.000								

6 38 Filter: C04 = 'W3'

Or add a new item:

The screenshot shows the 'Item Playground' application window. The 'Table view' section contains a table with the following data:

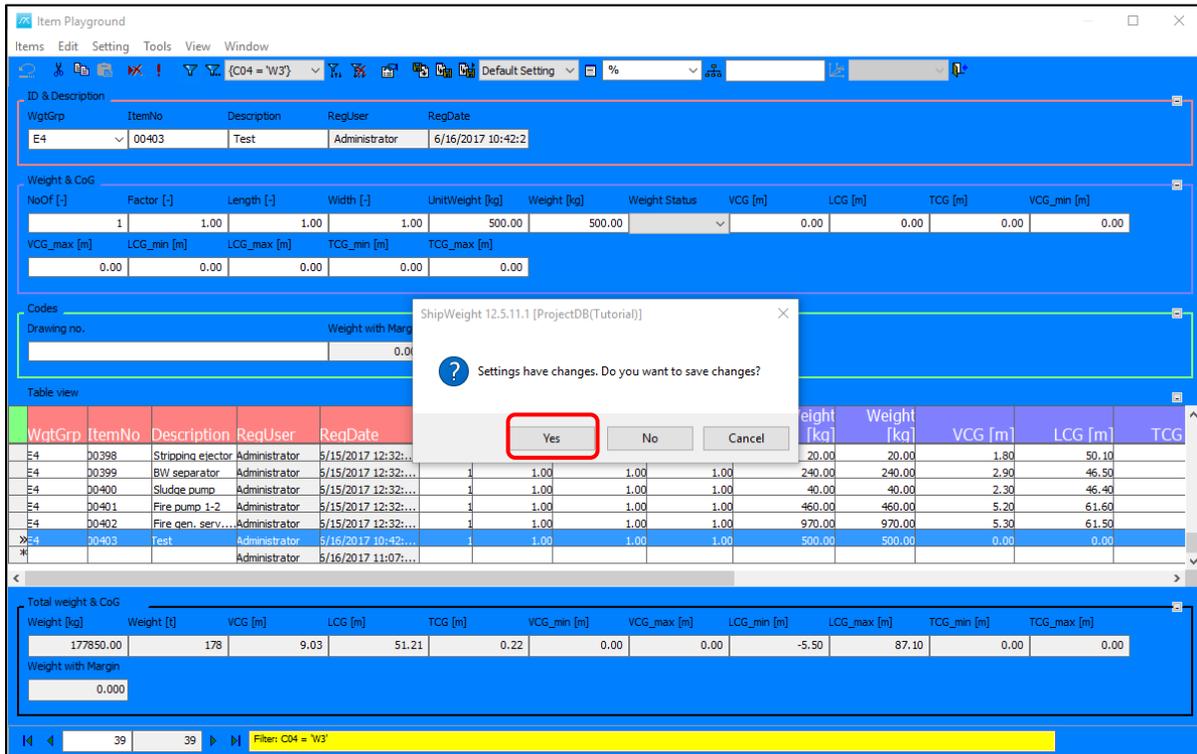
WgtGrp	ItemNo	Description	ReqUser	ReqDate	NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]
E4	00397	Blow pump 1-2	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	580.00	580.00	2.90	49.80	
E4	00398	Stripping elector	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	20.00	20.00	1.80	50.10	
E4	00399	BW separator	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	240.00	240.00	2.90	46.50	
E4	00400	Sludge pump	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	40.00	40.00	2.30	46.40	
E4	00401	Fire pumo 1-2	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	460.00	460.00	5.20	61.60	
E4	00402	Fire gen. serv...	Administrator	5/15/2017 12:32:...	1	1.00	1.00	1.00	970.00	970.00	5.30	61.50	
E4	00403	Test	Administrator	5/16/2017 10:42:...	1	1.00	1.00	1.00	500.00	500.00	0.00	0.00	

After we added the new item, we also need to assign it to the work package. So go the **Test** item line, to **Work Package** column and select from the list **W3**:

The screenshot shows the 'Item Playground' application window. The 'Table view' section contains a table with the following data:

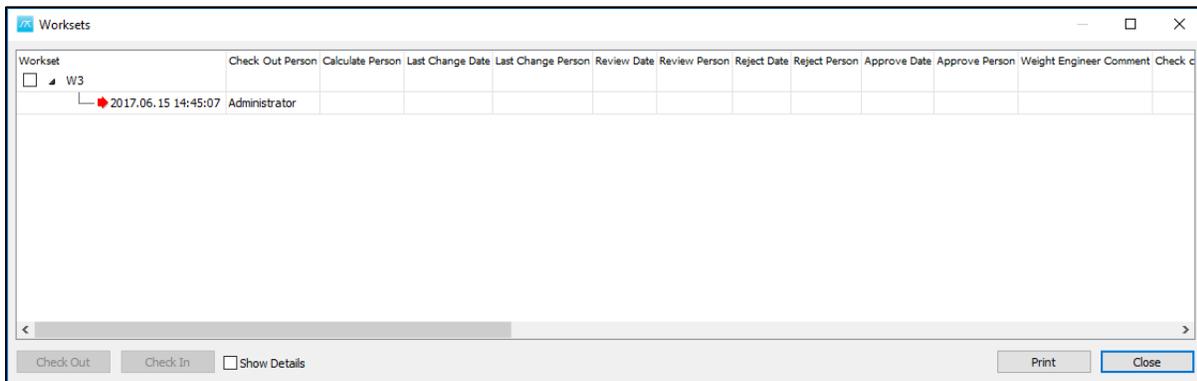
UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	Drawing no.	Status	Weight with Margin	Work Package
580.00	580.00	2.90	49.80	0.40			48.90	50.40				W3
20.00	20.00	1.80	50.10	1.20			49.80	51.20				W3
240.00	240.00	2.90	46.50	1.60			45.80	46.90				W3
40.00	40.00	2.30	46.40	1.80			45.60	46.70				W3
460.00	460.00	5.20	61.60	4.40			61.10	63.00				W3
970.00	970.00	5.30	61.50	-4.40			60.50	62.60				W3
500.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	W3

Close the Item Playground dialog and save.

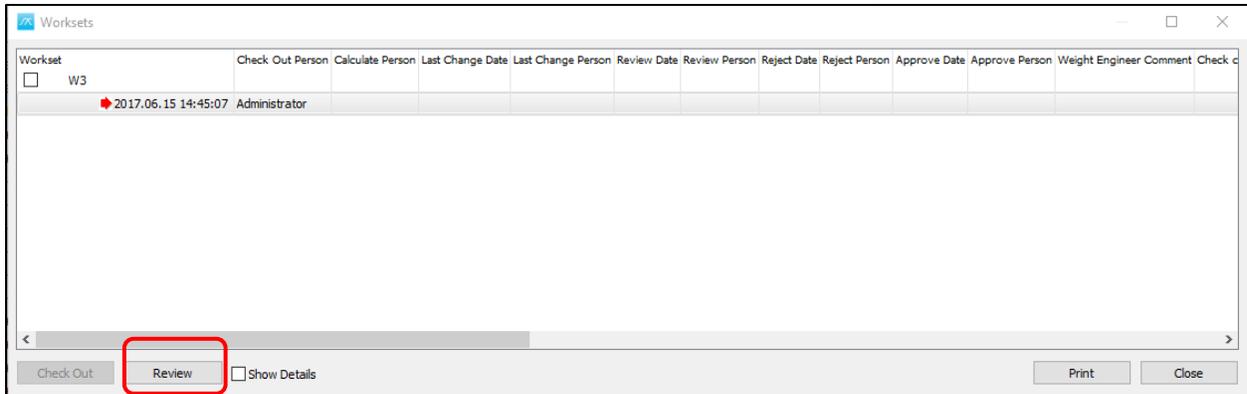


Step 3: Validate the change in the net change dialog!

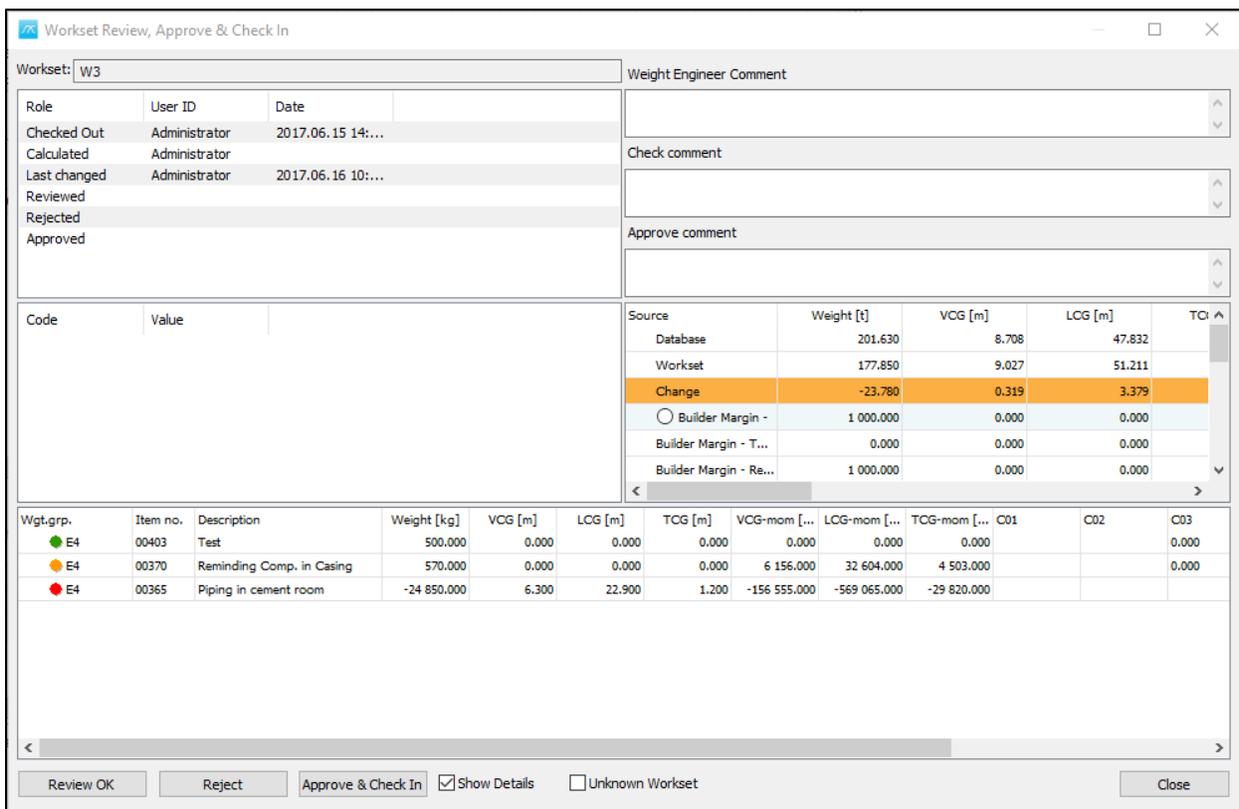
Now we can go and check in the net changes. Go to Items menu, then Worksets...



Click on the red arrow, which represents the items that we checked out and click the **Review** button.



Once **Review** button has been clicked, the **Workset Review, Approve & Check In** dialog will appear:



In this dialog we can see the net changes that have been done to the workset.

In the upper level, it can be noticed the User ID detail, who checked the workset out, and the date, also who is the last person that changed it.

Also, the net overall changes can be seen here:

Workset Review, Approve & Check In

Workset: W3

Weight Engineer Comment

Role	User ID	Date
Checked Out	Administrator	2017.06.15 14:...
Calculated	Administrator	
Last changed	Administrator	2017.06.16 10:...
Reviewed		
Rejected		
Approved		

Check comment

Approve comment

Source	Weight [t]	VCG [m]	LCG [m]	TCI
Database	201.630	8.708	47.832	
Workset	177.850	9.027	51.211	
Change	-23.780	0.319	3.379	
Builder Margin -	1 000.000	0.000	0.000	
Builder Margin - T...	0.000	0.000	0.000	
Builder Margin - Re...	1 000.000	0.000	0.000	

Wgt.grp.	Item no.	Description	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG-mom [...]	LCG-mom [...]	TCG-mom [...]	C01	C02	C03
E4	00403	Test	500.000	0.000	0.000	0.000	0.000	0.000	0.000			0.000
E4	00370	Reminding Comp. in Casing	570.000	0.000	0.000	0.000	6 156.000	32 604.000	4 503.000			0.000
E4	00365	Piping in cement room	-24 850.000	6.300	22.900	1.200	-156 555.000	-569 065.000	-29 820.000			

Review OK Reject Approve & Check In Show Details Unknown Workset Close

Also the detail changes, under the overall changes:

Wgt.grp.	Item no.	Description	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG-mom [...]	LCG-mom [...]	TCG-mom [...]	C01	C02	C03
E4	00403	Test	500.000	0.000	0.000	0.000	0.000	0.000	0.000			0.000
E4	00370	Reminding Comp. in Casing	570.000	0.000	0.000	0.000	6 156.000	32 604.000	4 503.000			0.000
E4	00365	Piping in cement room	-24 850.000	6.300	22.900	1.200	-156 555.000	-569 065.000	-29 820.000			

From the detail changes, we can see a new item (Test) has been added. The green circle means it is a new item.

Orange circle indicates that the item had some changes to it.

The red circle means that the item has been removed.

Finally, the net change of all these items is shown here, in the orange line:

Source	Weight [t]	VCG [m]	LCG [m]	TCI
Database	201.630	8.708	47.832	
Workset	177.850	9.027	51.211	
Change	-23.780	0.319	3.379	
Builder Margin -	1 000.000	0.000	0.000	
Builder Margin - T...	0.000	0.000	0.000	
Builder Margin - Re...	1 000.000	0.000	0.000	

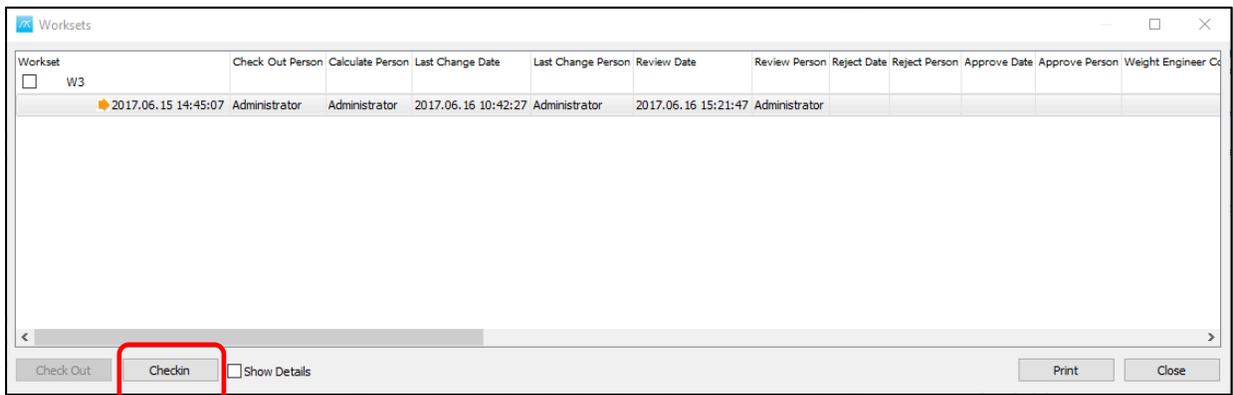
Step 4: Review, Accept (or Reject) change!

Now to approve this click **Review OK**.

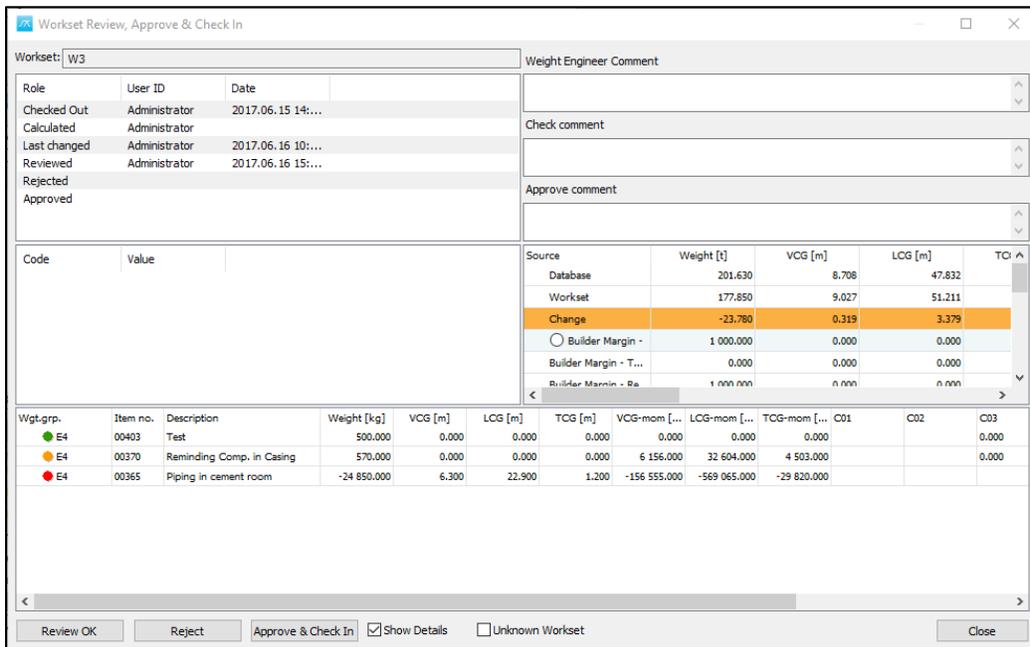
If the results are not satisfactory click **Reject**.

If we click **Review OK**, and close the dialog, we will see the arrow changed from red to orange, meaning that this has now been reviewed ok, but it has not yet been checked in.

So, no changes has currently been done to the live database. To make the changes effective to the live database, select the orange arrow and click **Checkin** button:



And the **Workset Review, Approve & Check In** dialog will open:



Final step: Approve and check in workset!

Give an approved comment:

Workset: W3

Weight Engineer Comment

Role | User ID | Date

Checked Out | Administrator | 2017.06.15 14:...

Calculated | Administrator

Last changed | Administrator | 2017.06.16 10:...

Reviewed | Administrator | 2017.06.16 15:...

Rejected

Approved

Check comment

Approve comment

Changes approved

Source	Weight [t]	VCG [m]	LCG [m]	TCG [m]
Database	201.630	8.708	47.832	
Workset	177.850	9.027	51.211	
Change	-23.780	0.319	3.379	
Builder Margin -	1 000.000	0.000	0.000	
Builder Margin - T...	0.000	0.000	0.000	
Builder Margin - Ba...	1 000.000	0.000	0.000	

Wgt.grp.	Item no.	Description	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG-mom [...]	LCG-mom [...]	TCG-mom [...]	C01	C02	C03
E4	00403	Test	500.000	0.000	0.000	0.000	0.000	0.000	0.000			0.000
E4	00370	Reminding Comp. in Casing	570.000	0.000	0.000	0.000	6 156.000	32 604.000	4 503.000			0.000
E4	00365	Piping in cement room	-24 850.000	6.300	22.900	1.200	-156 555.000	-569 065.000	-29 820.000			

Review OK | Reject | **Approve & Check In** | Show Details | Unknown Workset | Close

Net change must be assigned to a margin:

Workset: W3

Weight Engineer Comment

Role | User ID | Date

Checked Out | Administrator | 2017.06.15 14:...

Calculated | Administrator

Last changed | Administrator | 2017.06.16 10:...

Reviewed | Administrator | 2017.06.16 15:...

Rejected

Approved

Check comment

Approve comment

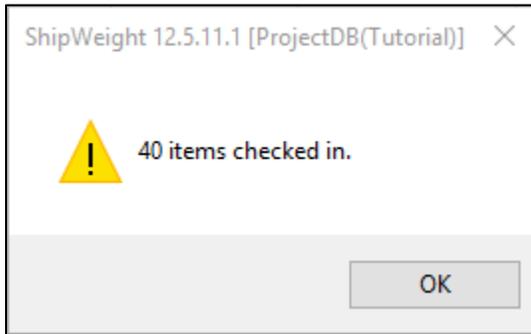
Changes approved

Source	Weight [t]	VCG [m]	LCG [m]	TCG [m]
Future - Total cha...	0.000	0.000	0.000	
Future - Remaining	0.000	0.000	0.000	
GFM -	0.000	0.000	0.000	
GFM - Total change	-23.780	-0.846	-3.016	
GFM - Remaining	23.780	0.846	3.016	

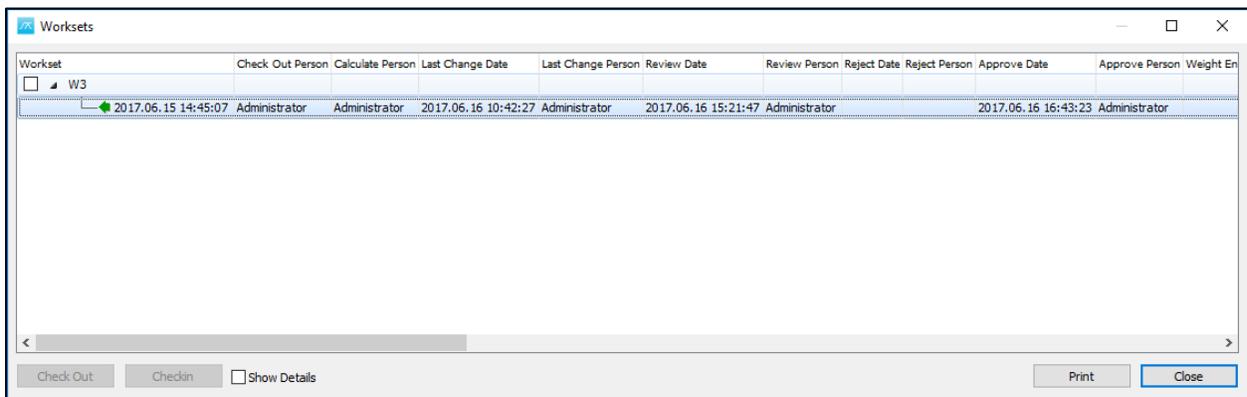
Wgt.grp.	Item no.	Description	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG-mom [...]	LCG-mom [...]	TCG-mom [...]	C01	C02	C03
E4	00403	Test	500.000	0.000	0.000	0.000	0.000	0.000	0.000			0.000
E4	00370	Reminding Comp. in Casing	570.000	0.000	0.000	0.000	6 156.000	32 604.000	4 503.000			0.000
E4	00365	Piping in cement room	-24 850.000	6.300	22.900	1.200	-156 555.000	-569 065.000	-29 820.000			

Review OK | Reject | **Approve & Check In** | Show Details | Unknown Workset | Close

Then select **Approve & Check In** button. 40 items checked in:



And the orange arrow become green:



Now close the workset dialog. Then open the Playground area. It is empty, the items have been checked in.

And the live database has been updated with the changes done in the playground area.

9. Use of Phase codes

Doing weight tracking for series production of vehicles with configuration changes raises some challenges.

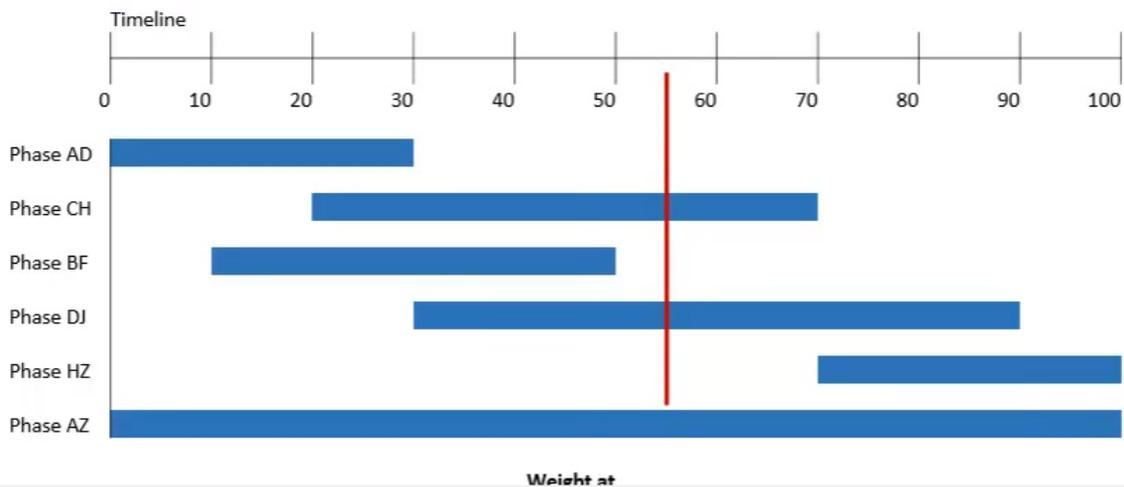
Phase coding means looking at the series production as a timeline, where:

- The timeline is starting with vessel 1 and ending at vessel n.
- The user defines the necessary phases, ranging from any start and endpoint on the timeline
- Weight items are tagged to a phase, meaning that they are to be included for vehicles in this phase
- The total weight of an individual vehicle is the sum of all items tagged to the phases that the time of the vehicle corresponds to

Phase Codes

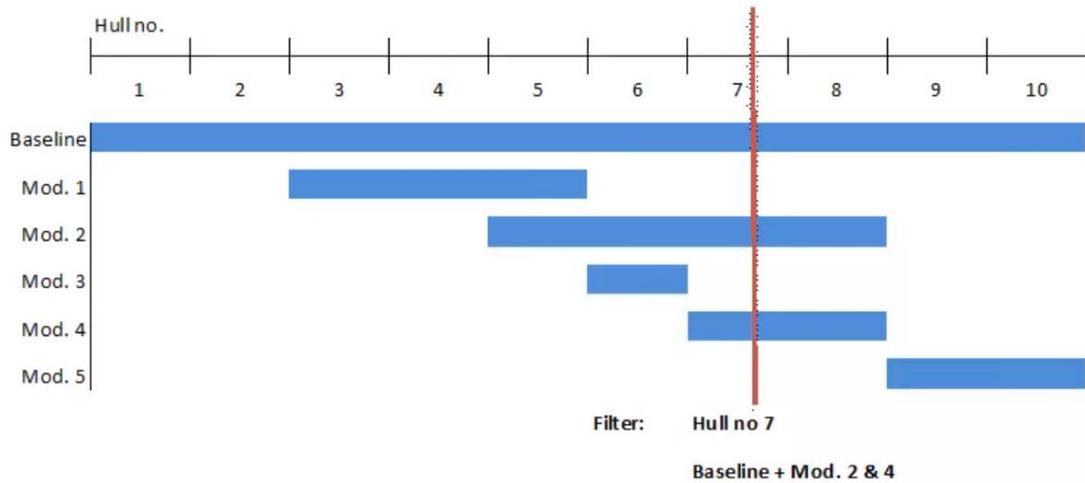
- Allowing to set "Time In" and "Time Out"
 - Defining the "time" an item is to be included
- To be used when "Flags" are not sufficient
- To be combined with Global Filter

Code	Time In	Time Out
Phase AD	0	30
Phase CH	20	70
Phase BF	10	50
Phase DJ	30	90
Phase HZ	70	100
Phase AZ	0	100



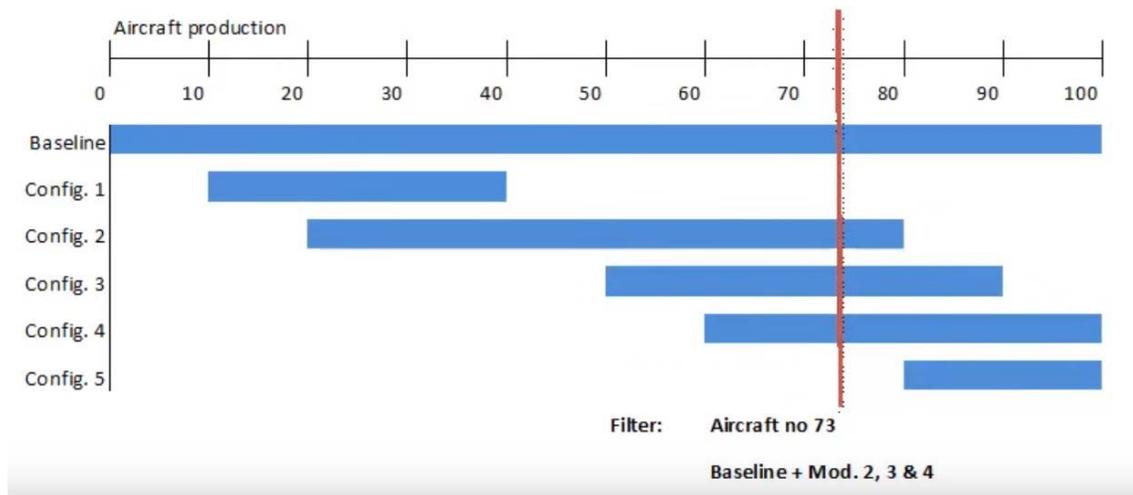
Examples:

- **Vessels:** series of 10 monohull with modifications

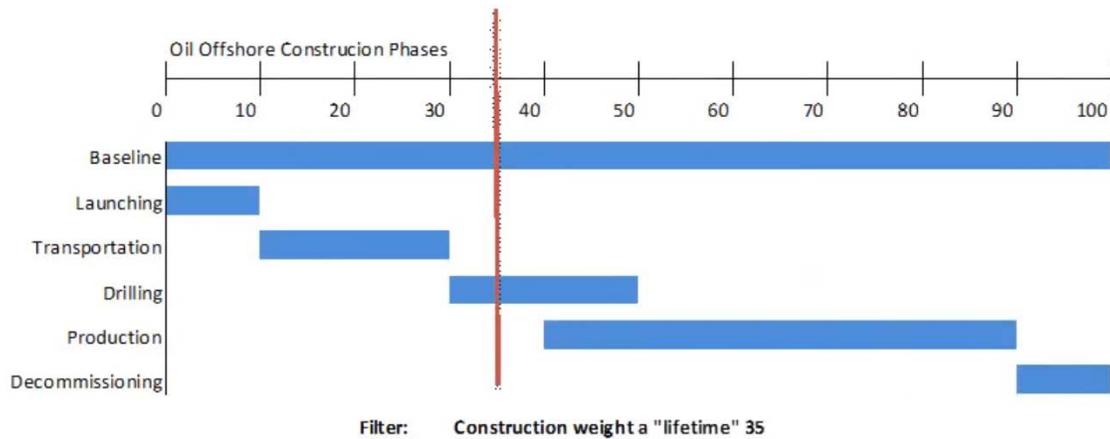


- **Aircrafts:** aircraft series production

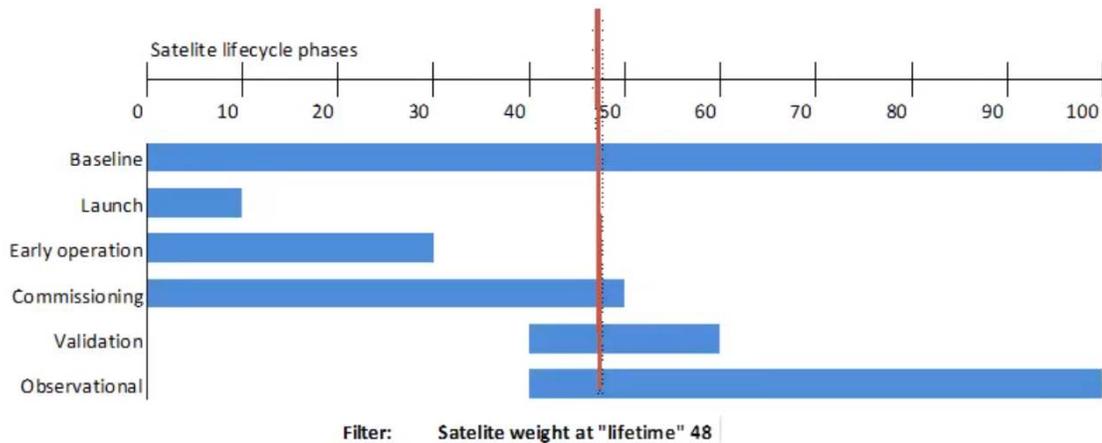
Various configurations during production:



- **Offshore construction:** lifecycle phases of an offshore construction

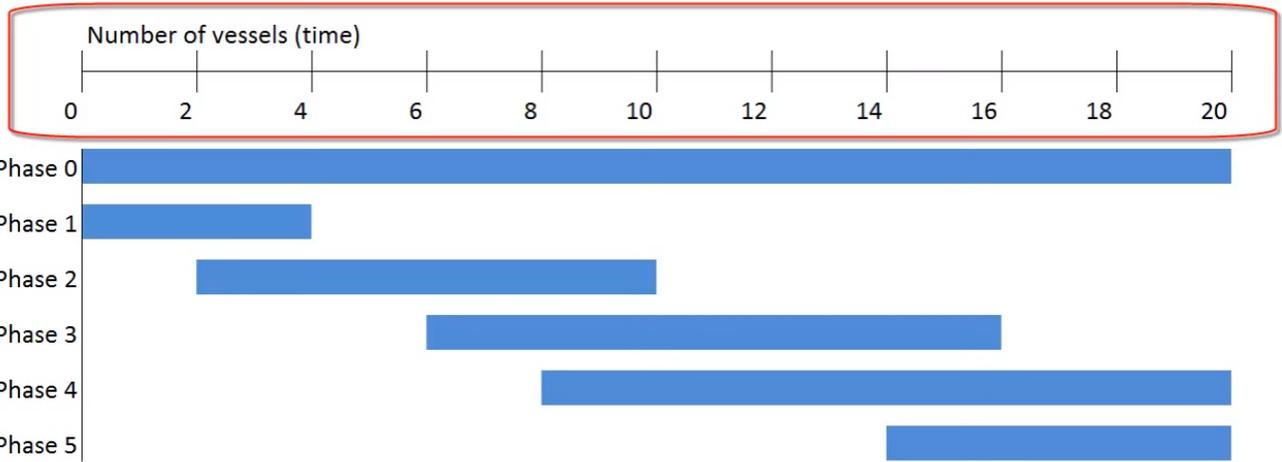


- **Satellite:** satellite phases

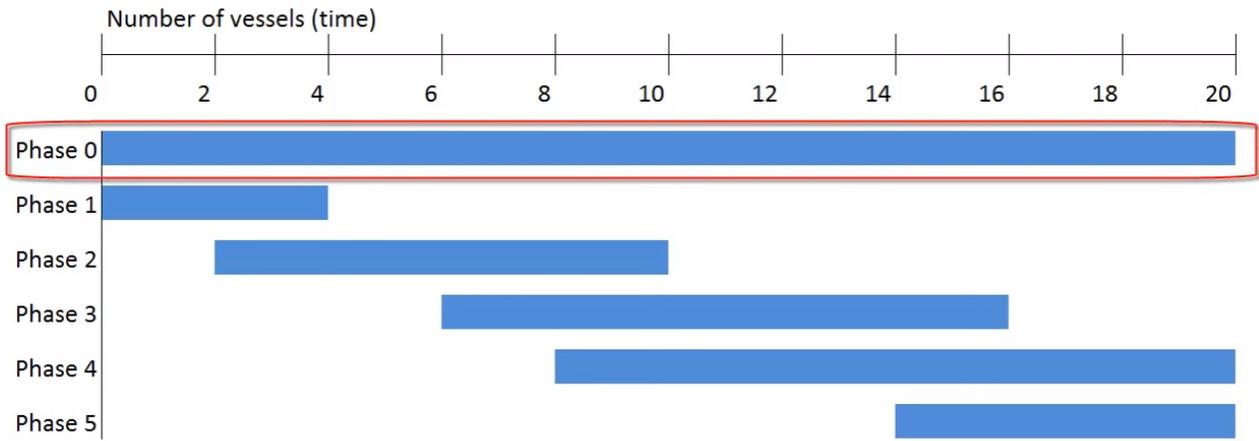


We consider the building of 20 vessels of the same class. Now this 20 vessels will not be completely identical, so we can not have them in only one project, but we can define phases containing the differences and use the phase codes to handle all 20 vessels still in one project.

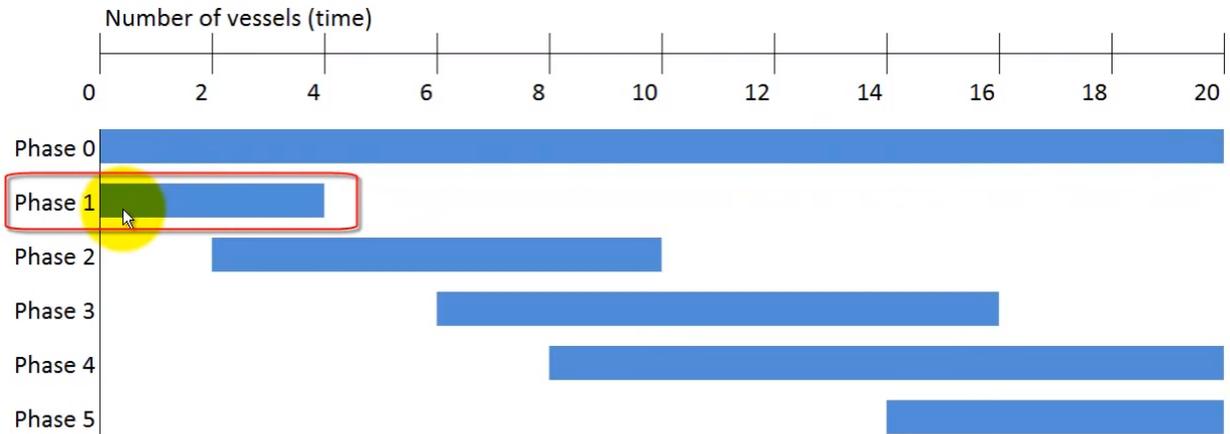
So, we imagine we have a timeline, representing the number of vessels, going from 0 to 20:



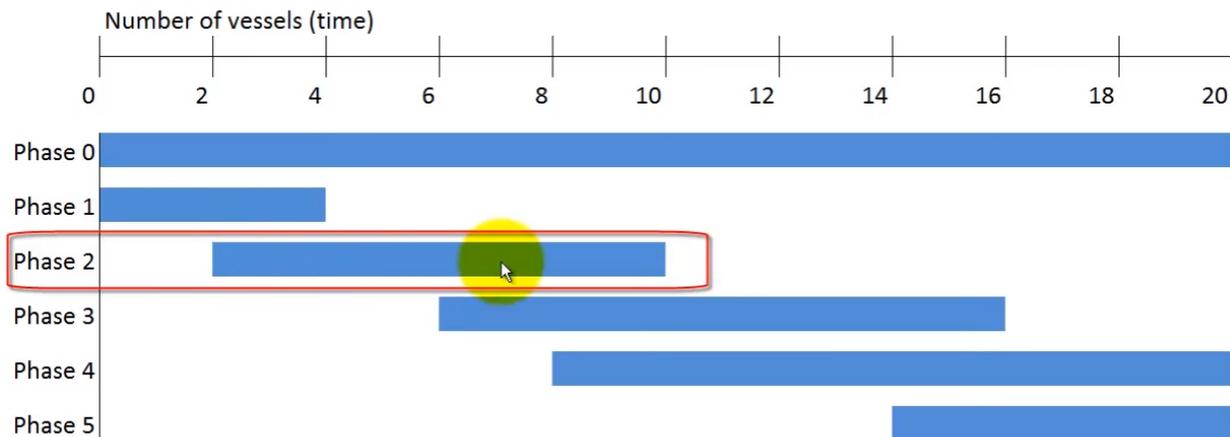
Then we can imagine we have an initial phase (Phase 0), which defines all weight items that will belong to all 20 vessels. So Phase 0 will stretch from 0 to 20:



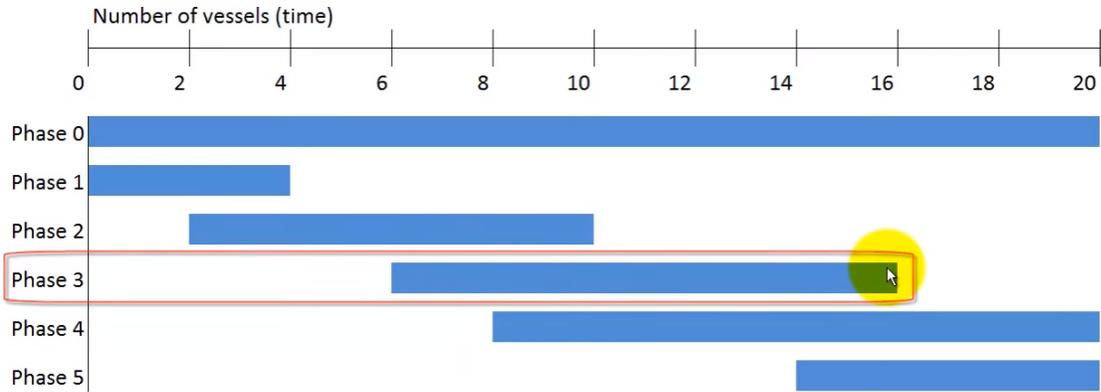
And then if there are modifications, or some special equipment that is valid for example only for the first vessels, then we define a new phase (Phase 1) for these vessels only:



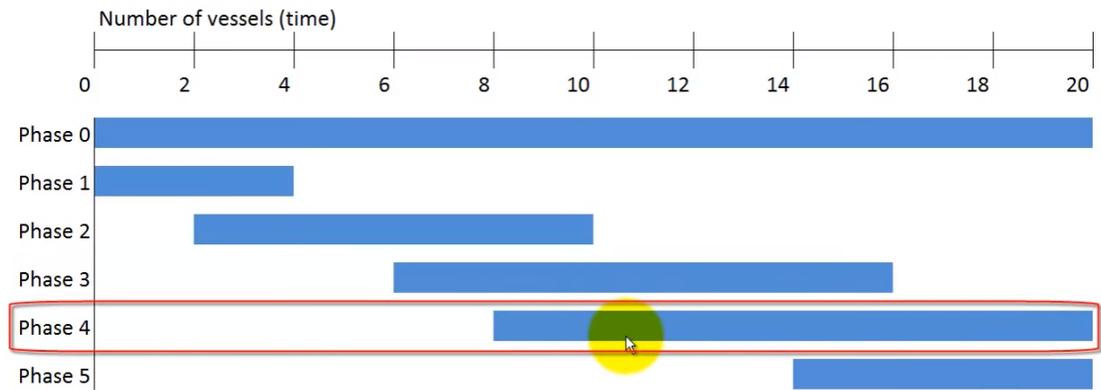
Another modification or change in design may happen at any time, so in this example we also have a Phase 2, going from vessel 2 to 10:



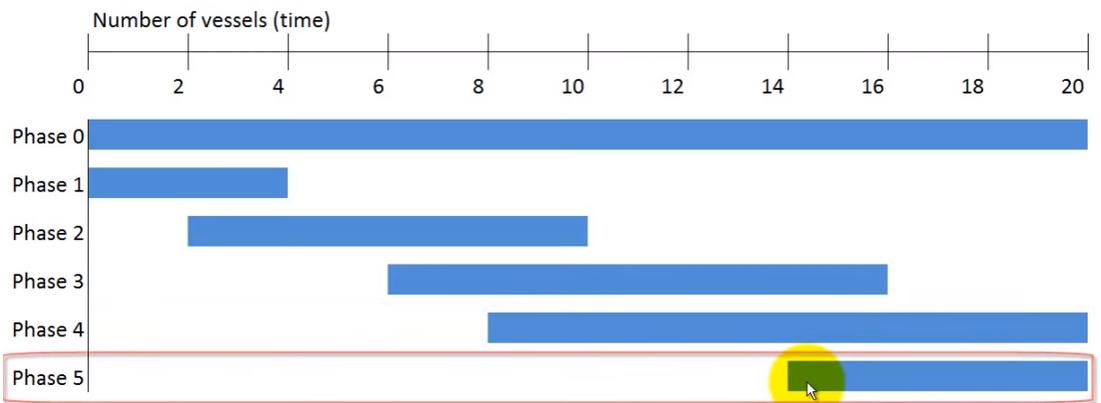
And another phase which indicates a modification or change, from vessel 6 to 16 (Phase 3):



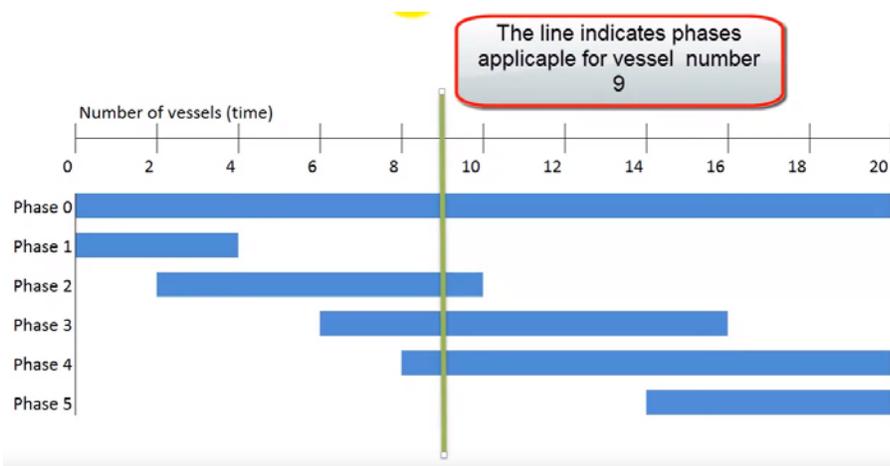
Phase 4 going from 4 to 20:



And finally, the last phase (Phase 5) goes from 14 to 20:

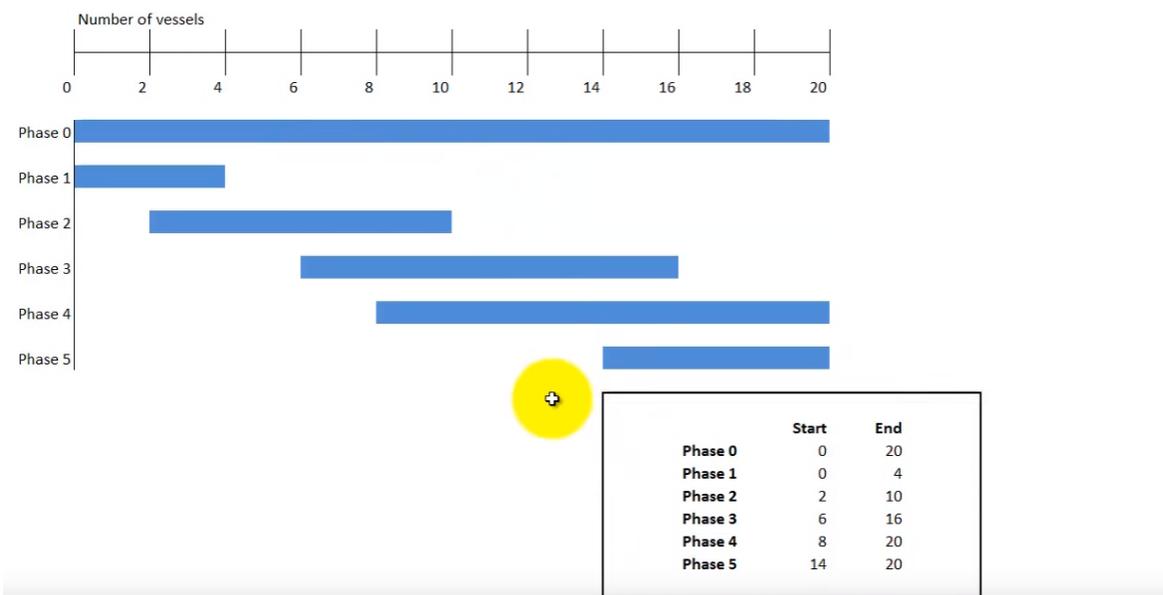


We combine all of this weight items in one project, and tag items to the phases and then if we need to know the weight of for example vessel number 9, we slice through the database at vessel number 9:

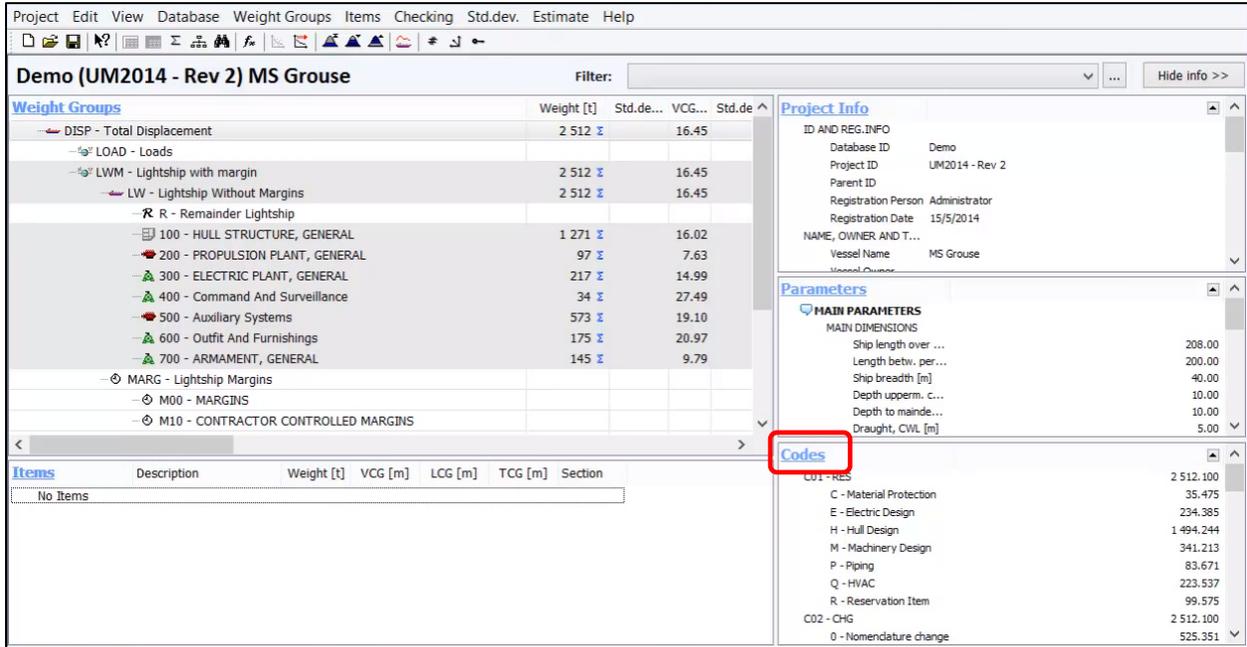


And only add up the items that are tagged to phases or modifications that are valid for that vessel or that time. In this case we can see that slicing through phases at vessel number 9, indicates that we need to include items tagged with Phase 0, Phase 2, Phase 3, 4 and leave out Phase 1 and 5 for this vessel.

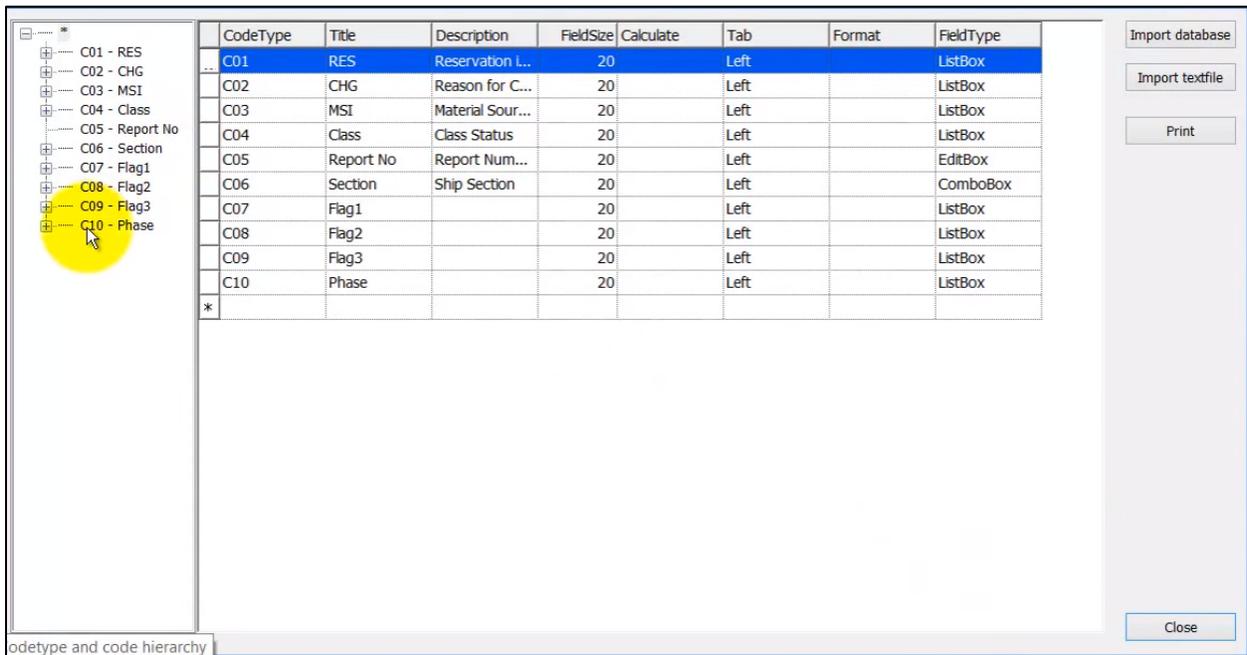
Another way of representing this graph is to not use the bar, but just show the numbers for **Start** and **End** point.



Now, let's define these phases in ShipWeight. To implement or to use this functionality, first we need to define these codes. Open the code definition:



The Code Definition dialog will open:



And we notice we already have defined a phase code C10 - Phase:

The screenshot shows a software interface with a code hierarchy tree on the left and a table of code types on the right. The tree includes entries from C01 - RES to C10 - Phase. The table has columns: CodeType, Title, Description, FieldSize, Calculate, Tab, Format, and FieldType. The row for C10 - Phase is circled in red.

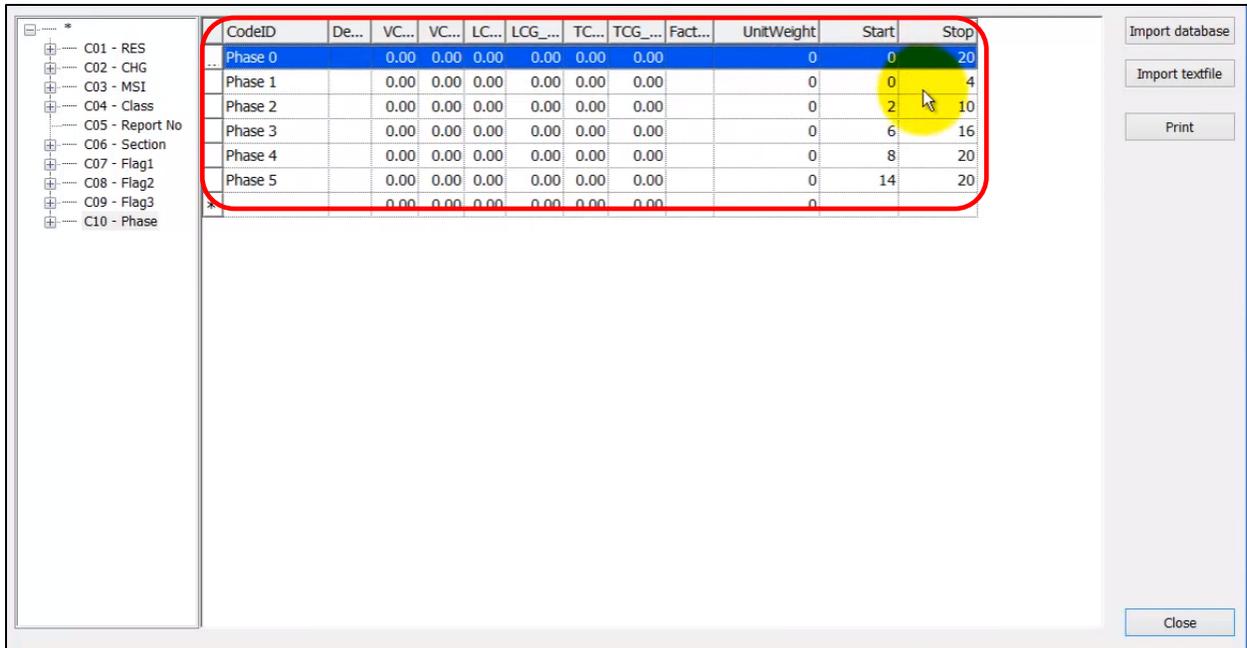
CodeType	Title	Description	FieldSize	Calculate	Tab	Format	FieldType
C01	RES	Reservation L...	20		Left		ListBox
C02	CHG	Reason for C...	20		Left		ListBox
C03	MSI	Material Sour...	20		Left		ListBox
C04	Class	Class Status	20		Left		ListBox
C05	Report No	Report Num...	20		Left		EditBox
C06	Section	Ship Section	20		Left		ComboBox
C07	Flag1		20		Left		ListBox
C08	Flag2		20		Left		ListBox
C09	Flag3		20		Left		ListBox
C10	Phase		20		Left		ListBox

And defined the phase ids as well:

The screenshot shows a software interface with a code hierarchy tree on the left and a table of phase IDs on the right. The tree includes entries from C01 - RES to C10 - Phase. The table has columns: CodeID, Description, VCG_min, VCG_max, LCG_min, LCG_max, TCG_min, and TCG_max. The row for Phase 0 is highlighted in blue.

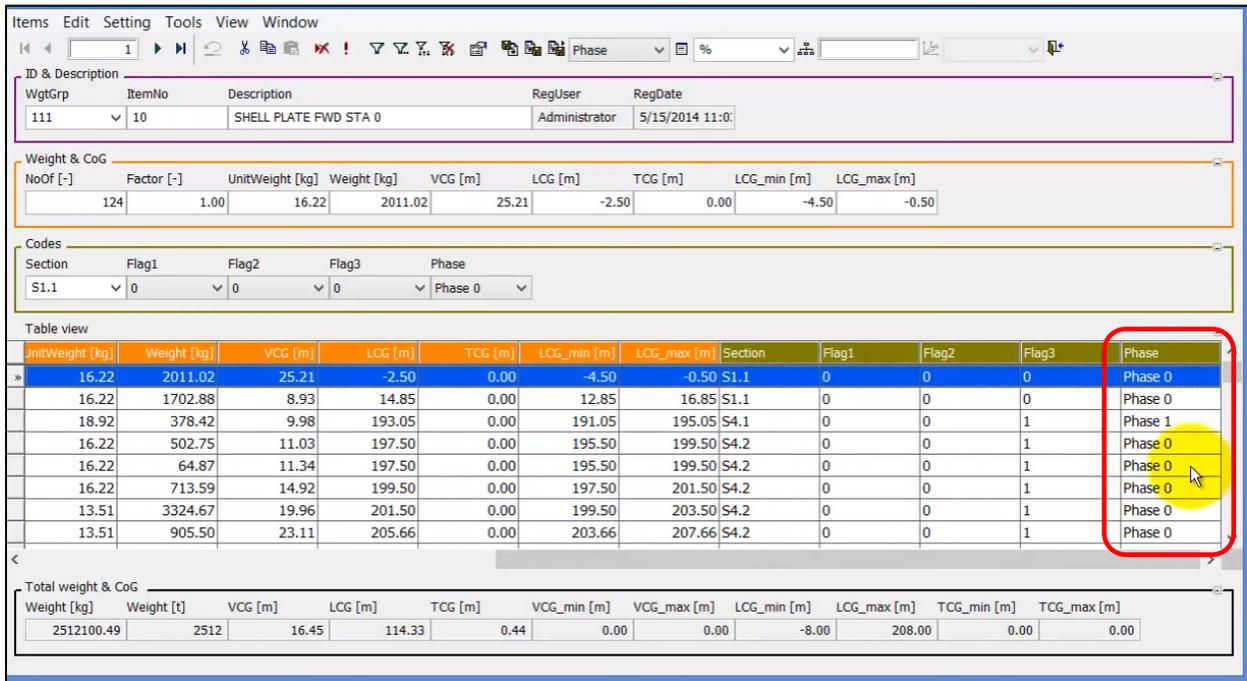
CodeID	Description	VCG_min	VCG_max	LCG_min	LCG_max	TCG_min	TCG_max
Phase 0		0.00	0.00	0.00	0.00	0.00	0.00
Phase 1	Code description	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2		0.00	0.00	0.00	0.00	0.00	0.00
Phase 3		0.00	0.00	0.00	0.00	0.00	0.00
Phase 4		0.00	0.00	0.00	0.00	0.00	0.00
Phase 5		0.00	0.00	0.00	0.00	0.00	0.00
*		0.00	0.00	0.00	0.00	0.00	0.00

So far this is just like any normal custom code. But the special thing is that at the end of this table where we can define the codes we added two columns **Start** and **Stop** (which are the same values as in the previous example):



Now Close the Code Definition dialog.

In the Items dialog, items will be tagged to the phase code in a normal way:



You can anytime set a different phase for any item:

Items Edit Setting Tools View Window

Phase %

ID & Description

WgtGrp	ItemNo	Description	RegUser	RegDate
111	1020	TRANSOM	Administrator	5/15/2014 11:00

Weight & CoG

NoOf [-]	Factor [-]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	LCG_min [m]	LCG_max [m]
4	1.00	16.22	64.87	11.34	197.50	0.00	195.50	199.50

Codes

Section	Flag1	Flag2	Flag3	Phase
S4.2	0	0	1	Phase 0

Table view

UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	LCG_min [m]	LCG_max [m]	Section	Flag1	Flag2	Flag3	Phase
16.22	2011.02	25.21	-2.50	0.00	-4.50	-0.50	S1.1	0	0	0	Phase 0
16.22	1702.88	8.93	14.85	0.00	12.85	16.85	S1.1	0	0	0	Phase 0
18.92	378.42	9.98	193.05	0.00	191.05	195.05	S4.1	0	0	1	Phase 1
16.22	502.75	11.03	197.50	0.00	195.50	199.50	S4.2	0	0	1	Phase 0
16.22	64.87	11.34	197.50	0.00	195.50	199.50	S4.2	0	0	1	Phase 0
16.22	713.59	14.92	199.50	0.00	197.50	201.50	S4.2	0	0	1	Phase 0
13.51	3324.67	19.96	201.50	0.00	199.50	203.50	S4.2	0	0	1	Phase 0
13.51	905.50	23.11	205.66	0.00	203.66	207.66	S4.2	0	0	1	Phase 0

Total weight & CoG

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]
2512100.49	2512	16.45	114.33	0.44	0.00	0.00	-8.00	208.00	0.00	0.00

Now we have to do the “slicing”, meaning we have to filter out only the items relevant for the vessel we want to know the weight and CG of...

Because right now the total displacement shows 2512 tonnes, will be the summary of all items, meaning the summary of all phases, which is not any particular vessel:

Project Edit View Database Weight Groups Items Checking Std.dev. Estimate Help

Demo (UM2014 - Rev 2) MS Grouse

Filter: Hide info >>

Weight Groups

Weight Groups	Weight [t]	Std.de...	VCG...	Std.de
DISP - Total Displacement	2 512		16.45	
LOAD - Loads				
LWM - Lightship with margin	2 512		16.45	
LW - Lightship Without Margins	2 512		16.45	
R - Remainder Lightship				
100 - HULL STRUCTURE, GENERAL	1 271		16.02	
200 - PROPULSION PLANT, GENERAL	97		7.63	
300 - ELECTRIC PLANT, GENERAL	217		14.99	
400 - Command And Surveillance	34		27.49	
500 - Auxiliary Systems	573		19.10	
600 - Outfit And Furnishings	175		20.97	
700 - ARMAMENT, GENERAL	145		9.79	
MARG - Lightship Margins				
M00 - MARGINS				
M10 - CONTRACTOR CONTROLLED MARGINS				

Project Info

ID AND REG.INFO

Database ID Demo
Project ID UM2014 - Rev 2
Parent ID
Registration Person Administrator
Registration Date 15/5/2014
NAME, OWNER AND T...
Vessel Name MS Grouse
Vessel Owner

Parameters

MAIN PARAMETERS

MAIN DIMENSIONS

Ship length over ...	208.00
Length betw. per...	200.00
Ship breadth [m]	40.00
Depth upperm. c...	10.00
Depth to mainde...	10.00
Draught, CWL [m]	5.00

Codes

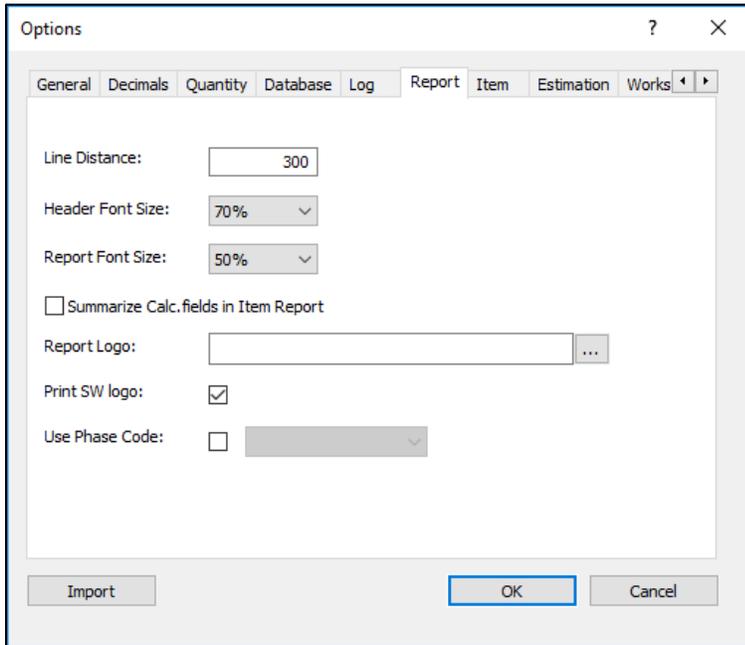
C01 - RES	2 512.100
C - Material Protection	35.475
E - Electric Design	234.385
H - Hull Design	1 494.244
M - Machinery Design	341.213
P - Piping	83.671
Q - HVAC	223.537
R - Reservation Item	99.575
C02 - CHG	2 512.100

Items

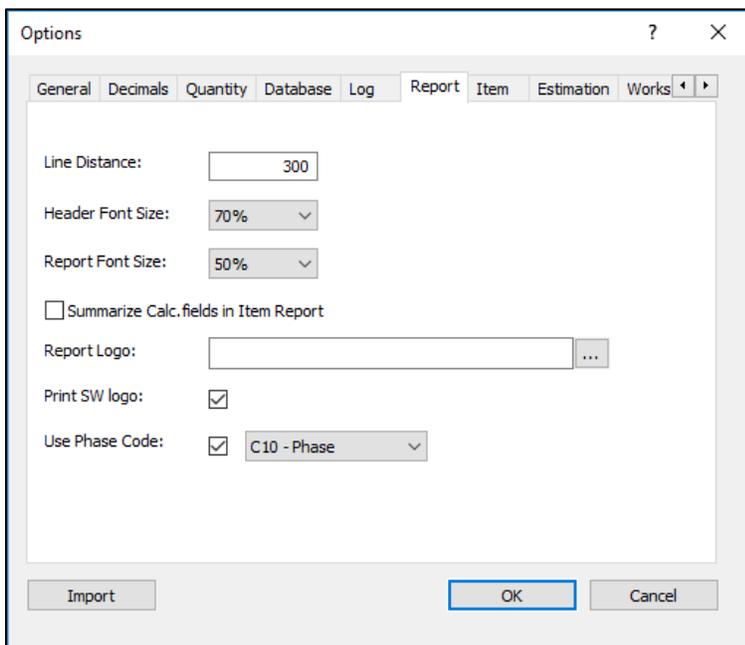
Description	Weight [t]	VCG [m]	LCG [m]	TCG [m]	Section
No Items					

So, to get the weight and center of gravity for a particular vessel, we need to apply a global filter for this one vessel.

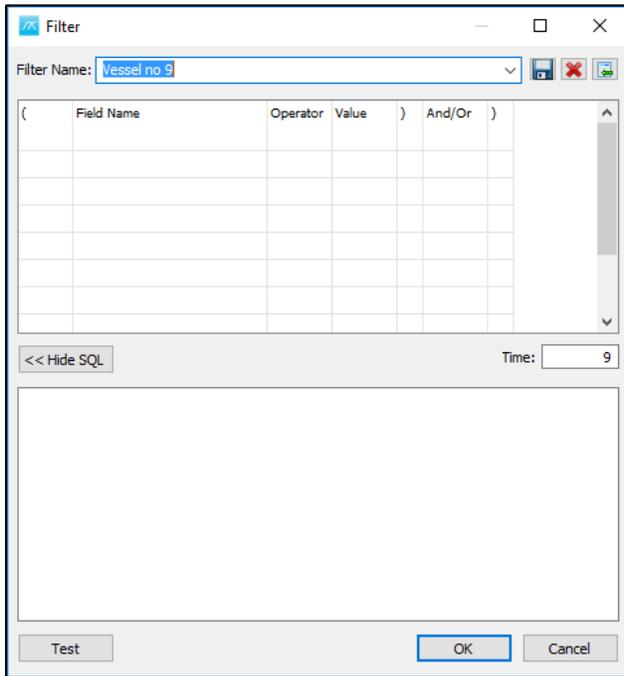
To be able to do that there is one thing we need to do first, to set in the options dialog (View -> Options), and go to the Report tab:



You will see that last option **Use Phase Code**. Check the box and select from the list C10 – Phase:

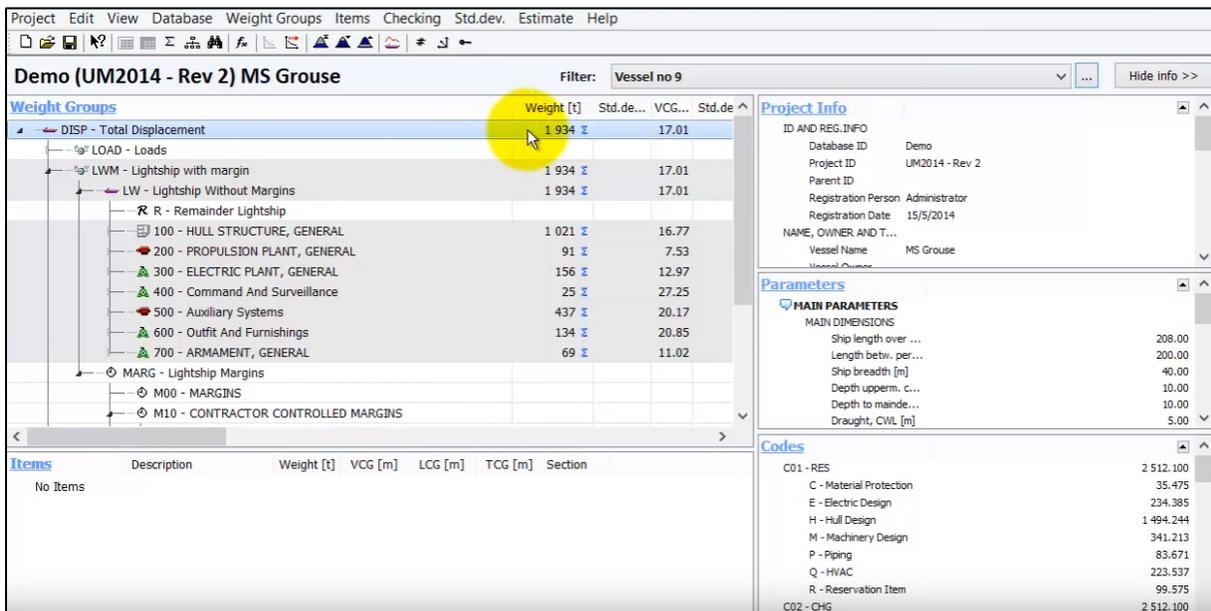


And in the global filter dialog, we can see we are able to define any type of filter.
Give a **Time**, then a **Filter Name**, and then press the Save button:

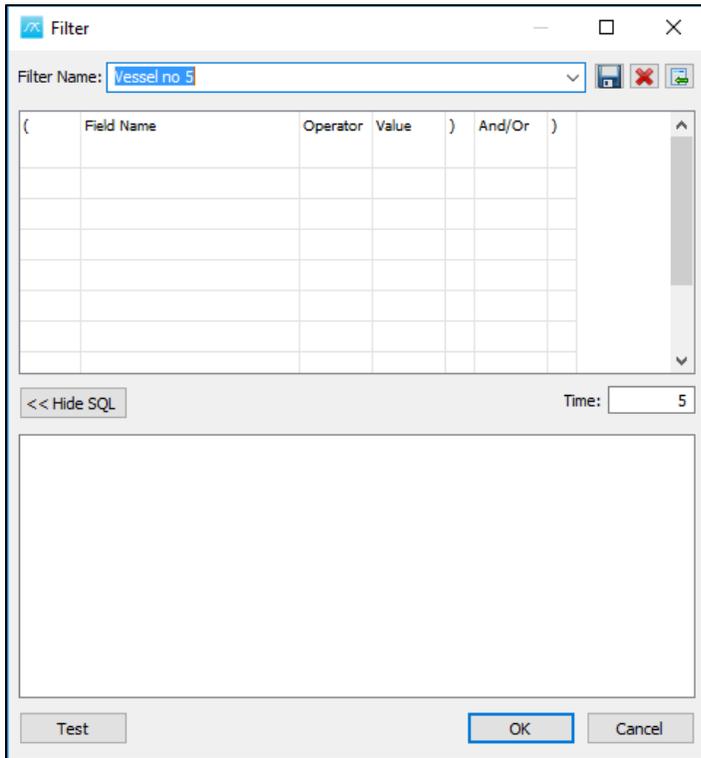


Then click OK.

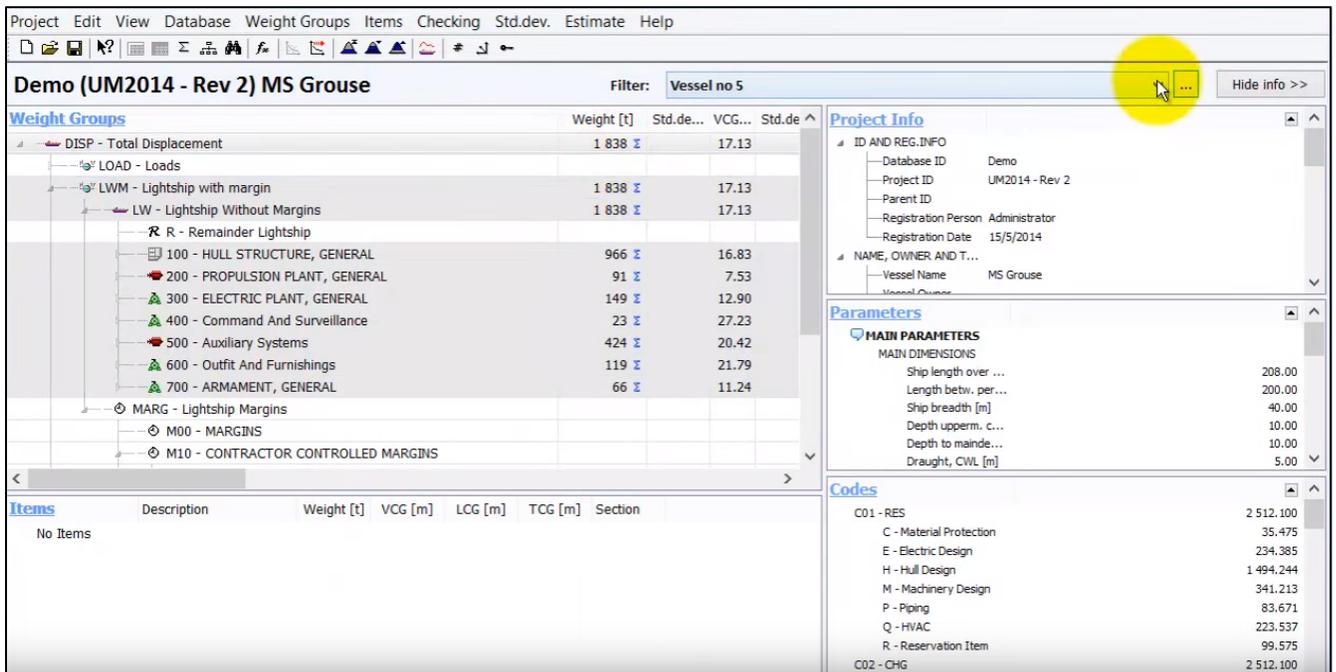
The filter will be activated and we will see that now in the main window the weight will be reduced from 2510 to 1934 tones. And this is the weight for vessel number 9.



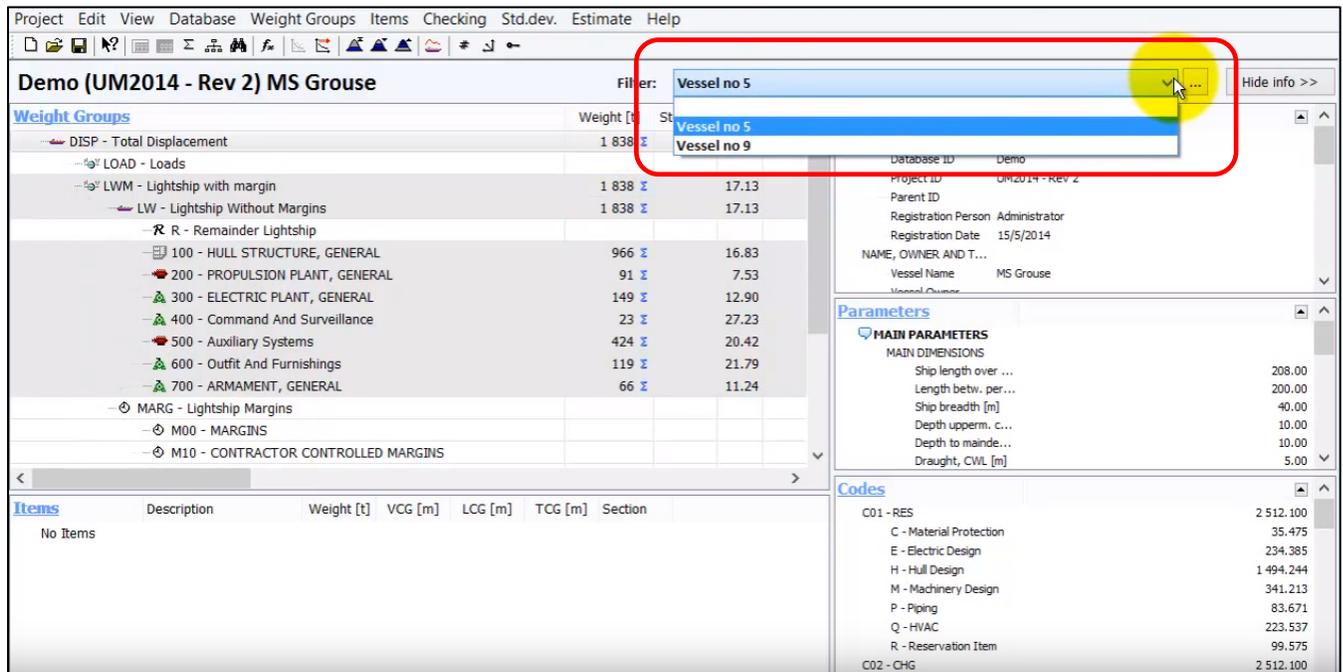
To change the vessel numer, press again on browse button and change the Time and Filter name:



Save and press OK. And now the weight and CG have changed based on vessel no. 5:



Now we have two existing filters:



And we can change anytime between vessel no.5 and no.9.

When we enable filters, is not only the CG from the main window that changes, but now everything in ShipWeight changes according to this filter. So, if we go to the Items dialog we will see items belonging only to vessel no. 5 if the filter is Vessel no 5.

Advantages of the Phase Code Approach:

- Items are only needed once (one row) in the database regardless of how many vehicles are in the production line
- It is easy to deploy weight items to a range of vehicles, and to change the extent of the range
- You can easily find the weight of an individual vehicle by slicing through the phases at the time of the vehicle
- Same approach can be used for multiple phases of a single vehicle throughout its life-cycle

10. QA Methods

10.1 Find Duplicates/Identical Items

Open up the items dialog to see all items:

The screenshot shows the 'Items' dialog box with the following data in the table view:

WgtGrp	ItemNo	Description	RegUser	RegDate	NoOf	Factor	Length	Width	UnitWeight	Weight	VCG	LCG	TCG
E1.1.1	00010	Hatch to Eng. ...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	340.00	340.00	9.80	46.70	6.50
E1.1.1	00011	Hatch to Eng. ...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	340.00	340.00	12.50	47.70	
E1.1.1	00012	Hatch to pipel...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	4730.00	4730.00	10.70	31.50	
E1.1.1	00013	Hatch on main ...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	370.00	370.00	10.80	21.30	
E1.1.1	00014	Hatch on C-deck	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	390.00	390.00	18.80	80.00	
E1.1.1	00015	Hatch to ROV ...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	5200.00	5200.00	9.80	40.50	
E1.1.1	00016	Hawser hatch	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	80.00	80.00	19.00	79.80	

On the Tools menu choose Find -> Identical Items...

The screenshot shows the 'Items' dialog box with the 'Tools' menu open. The 'Find' option is selected, and its sub-menu is visible, showing 'Identical Items...' as the first option. The table view below the menu shows the first two rows of the items list:

WgtGrp	ItemNo	Description	RegUser	RegDate	NoOf	Factor	Length	Width	UnitWeight	Weight	VCG	LCG	TCG
E1.1.1	00010	Hatch to Eng. ...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	340.00	340.00	9.80	46.70	6.50
E1.1.1	00011	Hatch to Eng. ...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	340.00	340.00	12.50	47.70	

This will bring up Find Items dialog to help you find identical items:



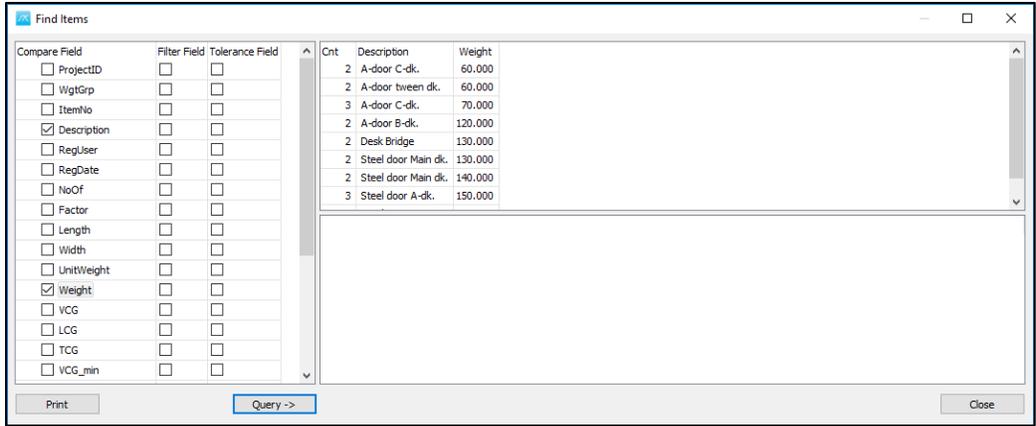
The combination of weight group and item number has to be unique in ShipWeight, so you are not allowed to enter any items with the same combination of weight group and item number. So, that is the first way to prevent duplicate items going into the database.

There can be errors that make duplicate items going into different items number and different weight groups, so you can use this tool to detect those.

Firstly, the user checks the boxes next to the Compare Field. For example if we want to find any items in the database that share same Description and Weight:



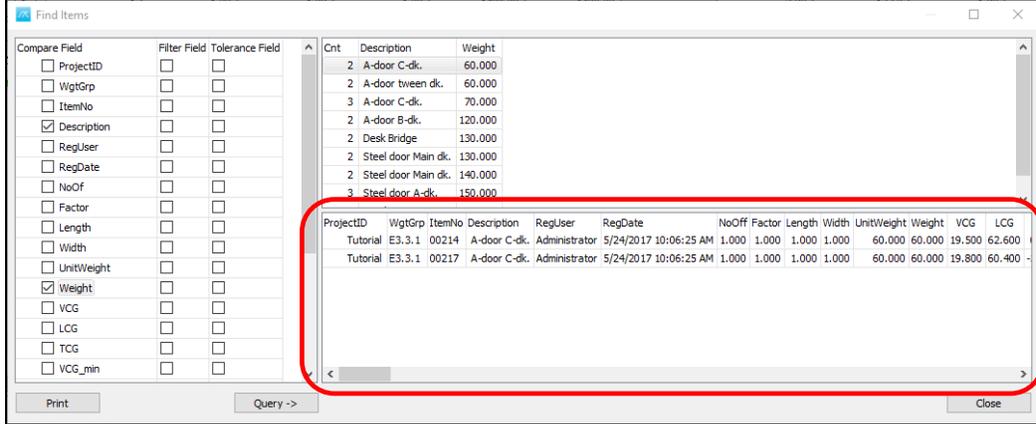
Then click the Query button, the dialog is going to search through the database:



On the right side we can see several instances with items that share the same Description and Weight:

Cnt	Description	Weight
2	A-door C-dk.	60.000
2	A-door tween dk.	60.000
3	A-door C-dk.	70.000
2	A-door B-dk.	120.000
2	Desk Bridge	130.000
2	Steel door Main dk.	130.000
2	Steel door Main dk.	140.000
3	Steel door A-dk.	150.000

And if we click on the first one, then we get the details under:



The detail shows that weight group E3.3.1 contains two items (00214 and 00217) with the same Description and Weight.

10.2 Checking for Extreme Values

Another typical mistake is entering in wrong CG or Weight, by for example putting in mm instead of meters, or somehow else getting some extreme value.

The easiest way to check is by going into the Items dialog, make sure you are listing all items:

The screenshot shows the 'Items' dialog box with the 'Table view' tab selected. The table contains the following data:

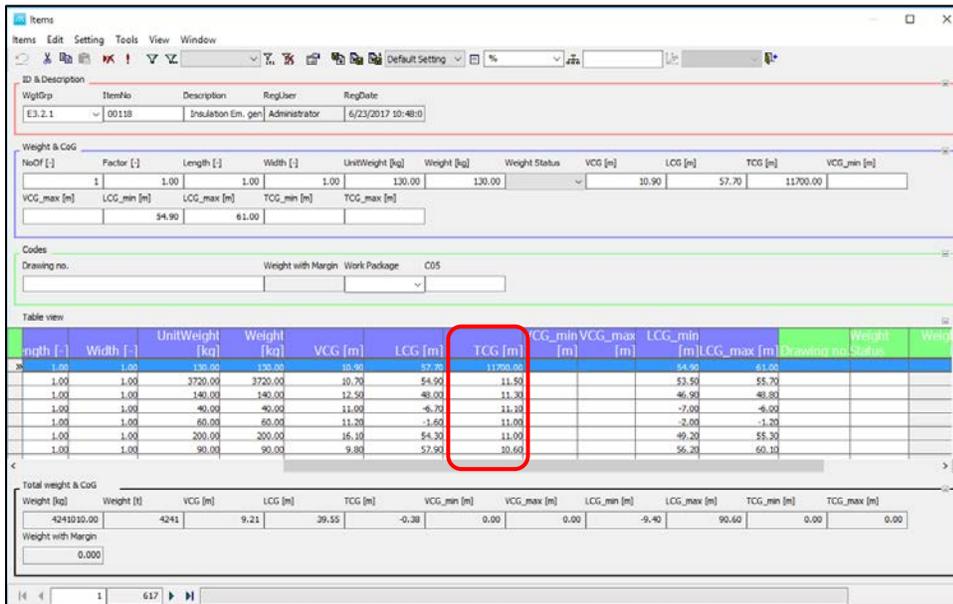
WgtGrp	ItemNo	Description	ReqUser	ReqDate	NoOf	Factor	Length [m]	Width [m]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]
E1.1.1	20010	Hatch to Eng...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	340.00	340.00	9.80	12.50	46.70	42.70
E1.1.1	20011	Hatch to Eng...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	240.00	240.00	12.50	10.20	31.50	21.30
E1.1.1	20012	Hatch to pod...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	4730.00	4730.00	10.20	18.80	80.00	40.50
E1.1.1	20013	Hatch on man...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	370.00	370.00	10.80	19.00	79.00	19.00
E1.1.1	20014	Hatch on C-deck	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	380.00	380.00	18.80	9.80	40.50	40.50
E1.1.1	20015	Hatch to 502...	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	5200.00	5200.00	9.80	9.80	79.00	79.00
E1.1.1	20016	Heavier hatch	Administrator	5/24/2017 10:06:...	1	1.00	1.00	1.00	80.00	80.00	19.00	19.00	19.00	19.00

Then go to the Table View, and click on the headers to sort. For example, go to TCG column and click once on the header. It's going to start with the lowest TCG value -11.4:

The screenshot shows the 'Items' dialog box with the 'Table view' tab selected. The table is sorted by TCG [m]. The 'TCG [m]' column header is highlighted with a red box. The table contains the following data:

Length [m]	Width [m]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	Drawing no.	Status
1.00	1.00	43.00	43.00	14.90	11.40	-11.40	-11.40	-11.40	40.10	42.70		
1.00	1.00	130.00	130.00	11.40	11.30	-11.30	-11.30	-11.30	44.40	48.80		
1.00	1.00	60.00	60.00	11.30	11.30	-11.20	-11.20	-11.20	49.70	53.20		
1.00	1.00	7130.00	7130.00	11.30	11.00	-10.80	-10.80	-10.80	53.00	55.00		
1.00	1.00	150.00	150.00	11.00	11.00	-10.80	-10.80	-10.80	55.00	55.00		
1.00	1.00	50.00	50.00	11.00	11.00	-10.80	-10.80	-10.80	55.00	55.00		
1.00	1.00	170.00	170.00	15.80	15.80	-10.80	-10.80	-10.80	55.00	55.00		

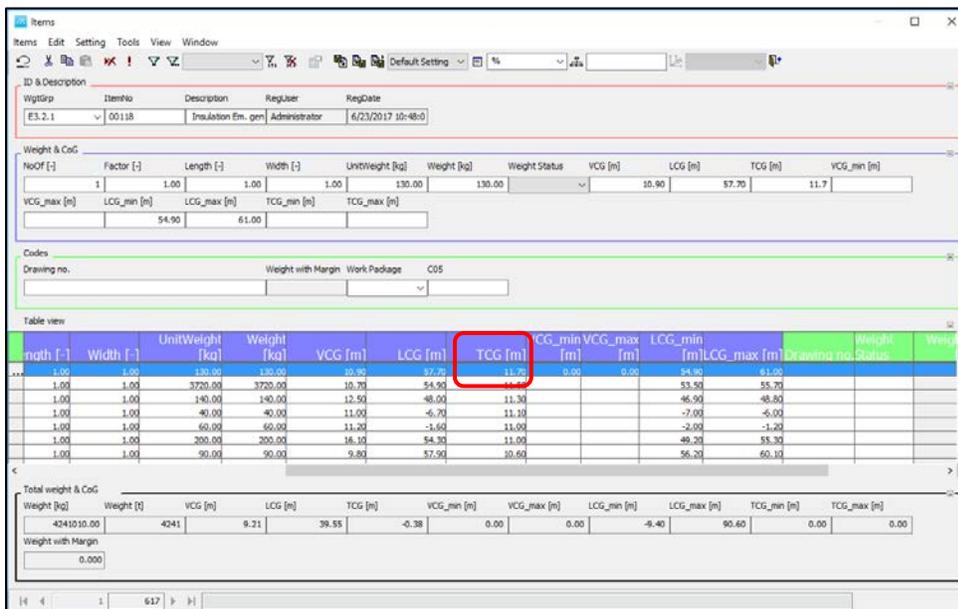
If we click again, the largest value will be the first one displayed:



So, here is a typical mistake, when someone entered millimeters instead of meters.

So it is very easy to find the extreme values, by clicking on the header.

Now we can just go and correct the value, by putting the decimal:



And we can also do the same procedure to check the LCG and VCG.

We can notice the VCG value is also not introduced correct, and we will show you another way to find the extreme values.

Items

Items Edit Setting Tools View Window

ID & Description

WgtGrp	ItemNo	Description	RegUser	RegDate
E2.3.1	00040	Radar and signal n	Administrator	6/23/2017 1:47:15

Weight & CoG

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	Weight Status	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]
1	1.00	1.00	1.00	1.00	3140.00		320.30	55.10	0.00	
VCG_max [m]		LCG_min [m]		LCG_max [m]		TCG_min [m]		TCG_max [m]		
		54.60		57.90						

Codes

Drawing no.	Weight with Margin	Work Package	C05

Table view

Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	Drawing no.	Status	Weight
1.00	1.00	3140.00	3140.00	320.30	55.10	0.00			54.60	57.90			
1.00	1.00	1070.00	1070.00	29.20	59.70	0.00			53.80	66.80			
1.00	1.00	9840.00	9840.00	27.80	57.70	0.00			53.60	60.10			
1.00	1.00	21420.00	21420.00	27.60	79.40	0.00			67.00	90.60			
1.00	1.00	290.00	290.00	27.40	57.60	-2.50			57.20	59.00			
1.00	1.00	1320.00	1320.00	26.70	63.40	0.00			54.90	70.30			
1.00	1.00	2680.00	2680.00	26.20	62.10	0.00			54.60	70.70			

Total weight & CoG

Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]
42410.00	4241	9.43	39.55	-0.73	0.00	0.00	-9.40	90.60	0.00	0.00
Weight with Margin		0.000								

1 617

Another way to discover errors is to compare on the weight group level.

Close the items dialog.

10.3 Compare Function

Go to View menu and select Compare...

The screenshot shows the ShipWeight Enterprise interface. The 'View' menu is open, and 'Compare...' is highlighted. The main window displays a table with columns: Weigh..., Std.d..., VC..., Std.d..., LC..., Std.d..., TC..., VCG..., VCG_m..., LCG..., LCG_m..., TCG... The table lists various weight groups and their corresponding values. The 'Compare' dialog is open, showing options for comparison type (WgtGrp), deviation (Absolute, Relative), CoG impact (Absolute, Relative), and view options (Grid, Tree, Items). The dialog also includes a table for codes and their weights.

Code & Description	Weight [t]	VCG [m]	LCG [m]	TCG [m]
DISP - Displacement	4 241.010	9.426	39.548	-0.734
LW - Lightship	4 241.010	9.426	39.548	-0.734
E - Equipment	1 029.830	12.865	46.074	0.264
E1 - Equipment for cargo	88.070	12.483	23.343	0.462
E1.1 - Hatches	11.660	10.605	38.315	0.696
E1.1.1 - Cargo hatch cov., wea...	11.450	10.655	38.180	0.595
E1.1.2 - Cargo hatch cov., twe...	0.210	7.900	45.700	6.200
E1.4 - Equip. for cargo, holds/d...	50.930	10.900	14.800	0.000
E1.5 - Spec. equip. cargo handl.	3.880	10.800	-0.200	10.000
E1.6 - Rotating cranes	18.730	19.545	42.938	-0.225
E1.10 - L/D syst. liq. cargo	2.870	4.388	18.061	-0.690
E1.10.1 - L/D pumps	2.870	4.388	18.061	-0.690
E2 - Ship equipment	459.740	13.272	42.458	0.074
E2.1 - Manoev. mach. & -equip.	31.230	3.470	-3.257	-0.005
E2.1.1 - Rudder, -stocks & -bear.	24.000	2.000	-3.200	0.000
E2.1.2 - Steering gear	7.230	8.351	-3.448	-0.023
E2.2 - Side thrusters	91.980	3.344	43.150	0.186
E2.3 - Nav., search. & comm. eq.	3.830	266.370	57.933	-0.003
E2.3.1 - Nav. & search. equipm...	3.830	266.370	57.933	-0.003
E2.5 - Anch. - moor. & tow. eq.	284.650	12.381	41.788	-0.066

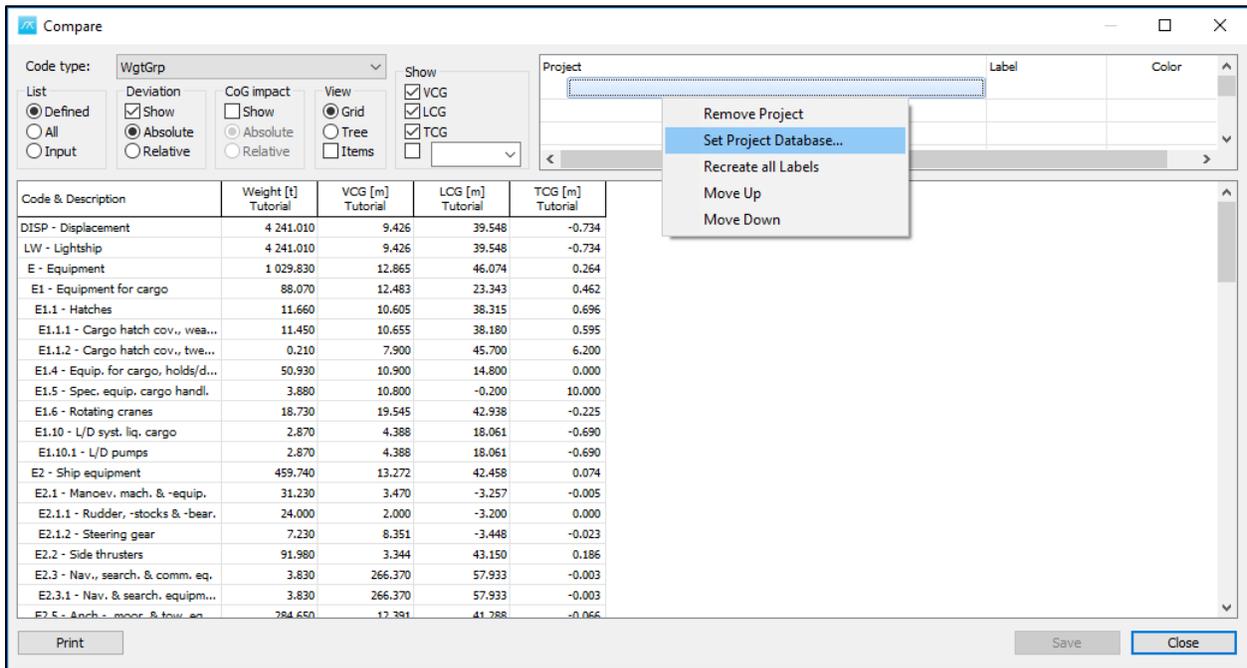
This brings up the Compare dialog:

The 'Compare' dialog box is shown, allowing users to configure comparison settings. It includes options for 'Code type' (WgtGrp), 'List' (Defined, All, Input), 'Deviation' (Show, Absolute, Relative), 'CoG impact' (Show, Absolute, Relative), and 'View' (Grid, Tree, Items). The dialog also features a table for codes and their weights.

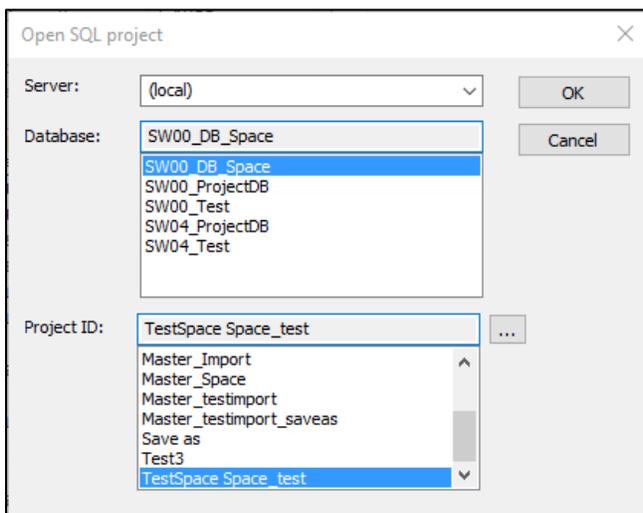
Code & Description	Weight [t]	VCG [m]	LCG [m]	TCG [m]
DISP - Displacement	4 241.010	9.426	39.548	-0.734
LW - Lightship	4 241.010	9.426	39.548	-0.734
E - Equipment	1 029.830	12.865	46.074	0.264
E1 - Equipment for cargo	88.070	12.483	23.343	0.462
E1.1 - Hatches	11.660	10.605	38.315	0.696
E1.1.1 - Cargo hatch cov., wea...	11.450	10.655	38.180	0.595
E1.1.2 - Cargo hatch cov., twe...	0.210	7.900	45.700	6.200
E1.4 - Equip. for cargo, holds/d...	50.930	10.900	14.800	0.000
E1.5 - Spec. equip. cargo handl.	3.880	10.800	-0.200	10.000
E1.6 - Rotating cranes	18.730	19.545	42.938	-0.225
E1.10 - L/D syst. liq. cargo	2.870	4.388	18.061	-0.690
E1.10.1 - L/D pumps	2.870	4.388	18.061	-0.690
E2 - Ship equipment	459.740	13.272	42.458	0.074
E2.1 - Manoev. mach. & -equip.	31.230	3.470	-3.257	-0.005
E2.1.1 - Rudder, -stocks & -bear.	24.000	2.000	-3.200	0.000
E2.1.2 - Steering gear	7.230	8.351	-3.448	-0.023
E2.2 - Side thrusters	91.980	3.344	43.150	0.186
E2.3 - Nav., search. & comm. eq.	3.830	266.370	57.933	-0.003
E2.3.1 - Nav. & search. equipm...	3.830	266.370	57.933	-0.003
E2.5 - Anch. - moor. & tow. eq.	284.650	12.381	41.788	-0.066

Which will show the Weight, VCG, LCG and TCG. It is sorted by hierarchy, and you can add previous revisions or previous projects in the upper right area, and compare values on the weight group level.

To add more projects, right click in the Project area and select **Set Project Database...**



The Open SQL project dialog will open. For example, SW00_DB_Space database and TestSpace Space_test project ID:



Then click OK.

Now it will show the values for the weights and center of gravity for the current project compared with the weights and center of gravity values for the selected project:

The screenshot shows the 'Compare' window with the following settings: Code type: WgtGrp, List: Defined, Deviation: Show, CoG impact: Show, View: Grid, Show: VCG, LCG, TCG. The table below is sorted by 'Absolute' deviation.

Code & Description	Weight [t] Tutorial	Weight [t]	Dev.[t]	VCG [m] Tutorial	VCG [m]	Dev.[m]	LCG [m] Tutorial	LCG [m]	Dev.[m]	TCG [m] Tutorial	TCG [m]	Dev.[m]
DISP - Displacement	4 241.010	4 782.440	-541.430	9.426	9.206	0.220	39.548	41.079	-1.531	-0.734	-0.159	-0.575
LW - Lightship	4 241.010	4 782.440	-541.430	9.426	9.206	0.220	39.548	41.079	-1.531	-0.734	-0.159	-0.575
E - Equipment	1 029.830	1 455.515	-425.685	12.865	11.757	1.108	46.074	46.225	-0.151	0.264	-0.059	0.323
E1 - Equipment for cargo	88.070	93.444	-5.374	12.483	12.395	0.088	23.343	23.554	-0.211	0.462	0.542	-0.080
E1.1 - Hatches	11.660	12.030	-0.370	10.605	10.558	0.047	38.315	38.475	-0.160	0.696	0.700	-0.004
E1.1.1 - Cargo hatch cov., wea...	11.450	11.822	-0.372	10.655	10.603	0.052	38.180	38.330	-0.150	0.595	0.602	-0.007
E1.1.2 - Cargo hatch cov., twe...	0.210	0.208	0.002	7.900	7.975	-0.075	45.700	46.690	-0.990	6.200	6.270	-0.070
E1.4 - Equip. for cargo holds/d...	50.930	54.150	-3.220	10.900	10.800	0.100	14.800	15.000	-0.200	0.000	0.000	0.000
E1.5 - Spec. equip. cargo handl.	3.880	4.100	-0.220	10.800	10.820	-0.020	-0.200	-0.200	0.000	10.000	10.000	0.000
E1.6 - Rotating cranes	18.730	19.900	-1.170	19.545	19.500	0.045	42.938	43.600	-0.662	-0.225	0.166	-0.391
E1.10 - L/D syst. liq. cargo	2.870	3.264	-0.394	4.388	4.293	0.095	18.061	18.093	-0.032	-0.690	-0.632	-0.058
E1.10.1 - L/D pumps	2.870	3.264	-0.394	4.388	4.293	0.095	18.061	18.093	-0.032	-0.690	-0.632	-0.058
E2 - Ship equipment	459.740	617.080	-157.340	13.272	11.352	1.920	42.458	44.892	-2.434	0.074	-0.451	0.525
E2.1 - Maneuv. mach. & -equip.	31.230	34.000	-2.770	3.470	2.000	1.470	-3.257	-3.200	-0.057	-0.005	0.000	-0.005
E2.1.1 - Rudder, -stocks & -bear.	24.000	34.000	-10.000	2.000	2.000	0.000	-3.200	-3.200	0.000	0.000	0.000	0.000
E2.1.2 - Steering gear	7.230	7.230	0.000	8.351	8.351	0.000	-3.448	-3.448	0.000	-0.023	-0.023	0.000
E2.2 - Side thrusters	91.980	98.320	-6.340	3.344	3.334	0.010	43.150	44.065	-0.915	0.186	0.188	-0.002
E2.3 - Nav., search. & comm. eq.	3.830	4.123	-0.293	266.370	30.003	236.367	57.933	58.832	-0.899	-0.003	0.024	-0.027
E2.3.1 - Nav. & search. equipm...	3.830	4.123	-0.293	266.370	30.003	236.367	57.933	58.832	-0.899	-0.003	0.024	-0.027
E2.5 - Anchr., moor. & tow. eq.	284.650	626.114	-341.464	12.391	11.934	0.457	41.288	44.800	-3.512	-0.066	-0.680	0.614
E2.5.2 - Comb. windl./moor. wi...	13.600	14.530	-0.930	18.887	18.898	-0.011	78.746	78.561	0.185	0.068	0.067	0.001
E2.5.3 - Warping/mooring win...	22.660	23.650	-0.990	11.789	11.892	-0.103	35.299	34.465	0.834	-1.083	-1.079	-0.004

By default is sorted by Absolute deviation, and obviously if you list all the hierarchy, then the aggregated weight groups to top weight groups will come up on the top of the column.

To avoid this, go to List and select Input:

The screenshot shows the 'Compare' window with the following settings: Code type: WgtGrp, List: Input, Deviation: Show, CoG impact: Show, View: Grid, Show: VCG, LCG, TCG. The table below is sorted by 'Input' deviation.

Code & Description	Weight [t] Tutorial	Weight [t]	Dev.[t]	VCG [m] Tutorial	VCG [m]	Dev.[m]	LCG [m] Tutorial	LCG [m]	Dev.[m]	TCG [m] Tutorial	TCG [m]	Dev.[m]
E1.1.1 - Cargo hatch cov., wea...	11.450	11.822	-0.372	10.655	10.603	0.052	38.180	38.330	-0.150	0.595	0.602	-0.007
E1.1.2 - Cargo hatch cov., twe...	0.210	0.208	0.002	7.900	7.975	-0.075	45.700	46.690	-0.990	6.200	6.270	-0.070
E1.4 - Equip. for cargo holds/d...	50.930	54.150	-3.220	10.900	10.800	0.100	14.800	15.000	-0.200	0.000	0.000	0.000
E1.5 - Spec. equip. cargo handl.	3.880	4.100	-0.220	10.800	10.820	-0.020	-0.200	-0.200	0.000	10.000	10.000	0.000
E1.6 - Rotating cranes	18.730	19.900	-1.170	19.545	19.500	0.045	42.938	43.600	-0.662	-0.225	0.166	-0.391
E1.10.1 - L/D pumps	2.870	3.264	-0.394	4.388	4.293	0.095	18.061	18.093	-0.032	-0.690	-0.632	-0.058
E2.1.1 - Rudder, -stocks & -bear.	24.000	34.000	-10.000	2.000	2.000	0.000	-3.200	-3.200	0.000	0.000	0.000	0.000
E2.1.2 - Steering gear	7.230	7.230	0.000	8.351	8.351	0.000	-3.448	-3.448	0.000	-0.023	-0.023	0.000
E2.2 - Side thrusters	91.980	98.320	-6.340	3.344	3.334	0.010	43.150	44.065	-0.915	0.186	0.188	-0.002
E2.3.1 - Nav. & search. equipm...	3.830	4.123	-0.293	266.370	30.003	236.367	57.933	58.832	-0.899	-0.003	0.024	-0.027
E2.5.2 - Comb. windl./moor. wi...	13.600	14.530	-0.930	18.887	18.898	-0.011	78.746	78.561	0.185	0.068	0.067	0.001
E2.5.3 - Warping/mooring win...	22.660	23.650	-0.990	11.789	11.892	-0.103	35.299	34.465	0.834	-1.083	-1.079	-0.004
E2.5.4 - Mooring equipment	32.520	75.795	-43.275	10.500	9.956	0.544	77.379	77.879	-0.500	0.000	0.000	0.000
E2.5.5 - Towing equipment	215.820	512.084	-296.264	12.333	12.032	0.301	34.116	39.422	-5.306	0.025	-0.782	0.807
E2.5.6 - Common hydr. oil syst...	0.050	0.055	-0.005	2.200	2.245	-0.045	50.200	50.027	0.173	-9.500	-9.585	0.085
E2.6.1 - Workshop/store outfit	4.750	5.273	-0.523	12.748	12.844	-0.096	70.732	70.852	-0.120	3.039	3.058	-0.019
E2.6.2 - Clean. eq. & garb. chu...	3.430	3.750	-0.320	7.864	7.823	0.041	53.607	53.435	0.172	6.180	6.084	0.096
E2.9.5 - Aircraft, helicopters	39.870	45.500	-5.630	26.351	26.082	0.269	79.215	78.900	0.315	0.000	0.000	0.000
E3.1.1 - Lifeboats	4.660	5.225	-0.565	16.809	16.849	-0.040	44.917	45.121	-0.204	-9.792	-9.789	-0.003
E3.1.2 - Liferafts	1.750	2.000	-0.250	17.300	17.500	-0.200	51.600	52.000	-0.400	0.000	0.000	0.000
E3.1.4 - Med., first aid & denteq	0.170	0.185	-0.015	10.700	10.856	-0.156	65.041	64.723	0.318	-4.529	-4.459	-0.070
E3.2.1 - Insulation & panels	74.550	79.607	-5.057	18.017	18.011	0.006	65.076	65.315	-0.239	-0.184	-0.173	-0.011

We can also sort by Relative deviation, to show which group has the largest relative deviation.

All the information can be copied with **Copy Table** option and paste it to excel:

The screenshot shows the 'Compare' application window. The main area displays a table with columns for 'Code & Description', 'Weight [t] Tutorial', 'Weight [t]', 'Dev.[t]', 'VCG [m] Tutorial', 'VCG [m]', 'Dev.[m]', 'LCG [m] Tutorial', 'LCG [m]', 'Dev.[m]', 'TCG [m] Tutorial', 'TCG [m]', and 'Dev.[m]'. A context menu is open over the table, listing options: Refresh, Show Items, Hide Items, Copy Table (highlighted), Import Weight, Import Weight & CoG, Colorize Deviation, and Sort Hierarchical. The 'Print' button is visible at the bottom left, and 'Save' and 'Close' buttons are at the bottom right.

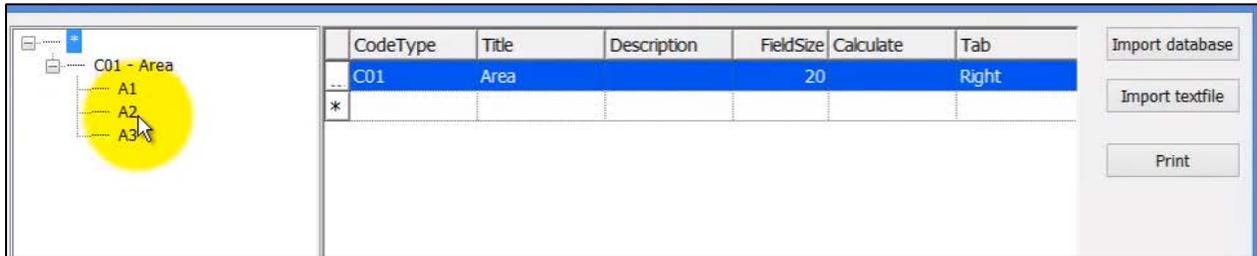
We can also print the table to make the report, by using the Print option.

You can shift from the Grid View to the Tree view, which will show you the weight groups in a hierarchy tree.

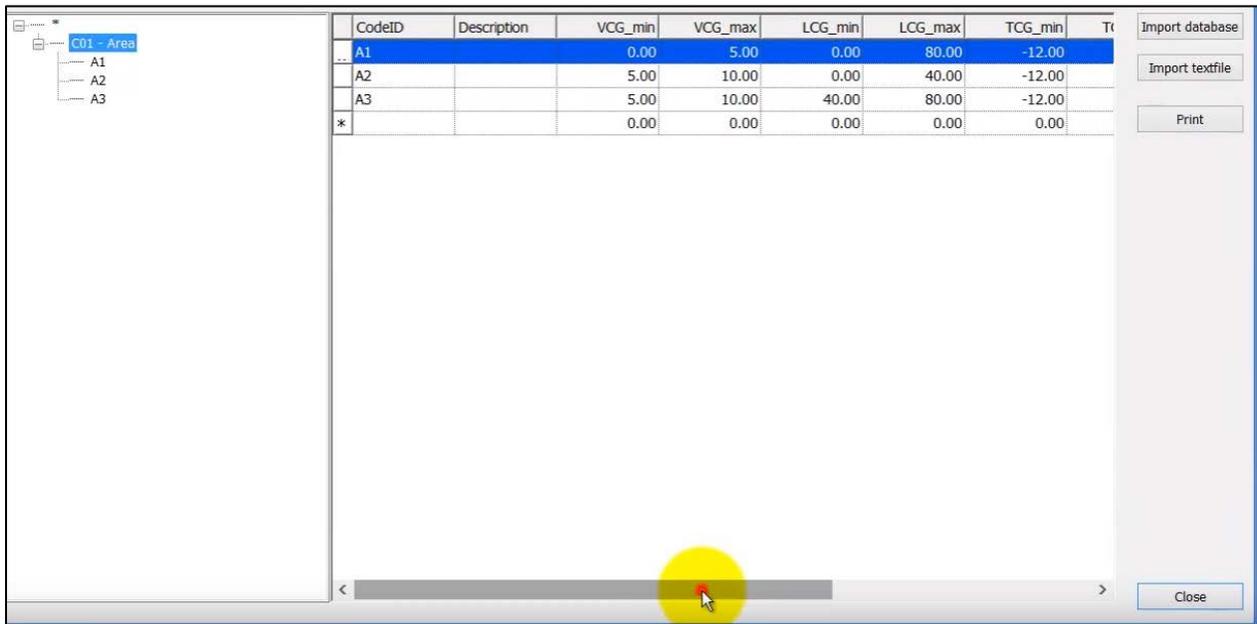
The screenshot shows the 'Compare' application window with the 'Tree' view selected in the 'View' section. The table content is the same as in the previous screenshot, but the 'Copy Table' option is no longer visible in the context menu. The 'Print' button is at the bottom left, and 'Save' and 'Close' buttons are at the bottom right.

10.4 Code Envelope Check

If you have defined a custom code, for example for area:



And this custom code C05 has sub areas A1, A2 and A3 (these areas have been given box limits):



Press Close.

Now in the items dialog, Items have been tagged to various areas:

The screenshot shows a software interface with a menu bar (Items, Edit, Setting, Tools, View, Window) and a toolbar. The main window displays data for an item with ID 'E1.1.1' and description 'Hatch to Eng. room'. Below this, there are sections for 'Weight & Cog' and 'Codes'. The 'Table view' section contains a table with columns for various weight and volume metrics. A red box highlights the 'Area' column in this table.

ID & Description	WgtGrp	ItemNo	Description	RegUser	RegDate
E1.1.1	00010	Hatch to Eng. room	Administrator	10/9/2015 10:1	

NoOf [-]	Factor [-]	Length [-]	Width [-]	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	
1.000	1.000	1.000	1.000	340.000	340.000	10.300	46.700	6.500	0.000	0.000	
LCG_min [m]				LCG_max [m]				TCG_max [m]			
45.600				47.400				0.000			

Table view	UnitWeight [kg]	Weight [kg]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]	Area
b	14140.000	14140.000	2.600	-0.900	0.000	0.000	0.000	-1.400	1.000	0.000		A1
b	2820.000	2820.000	2.600	10.100	0.000	0.000	0.000	9.300	10.500	0.000		A2
b	8500.000	8500.000	5.200	19.100	0.000	0.000	0.000	18.000	20.200	0.000		A2
b	36700.000	36700.000	5.600	21.100	0.000	0.000	0.000	-0.200	46.100	0.000		A1
b	4260.000	4260.000	2.600	10.300	0.000	0.000	0.000	-0.200	20.500	0.000		A3
b	2310.000	2310.000	7.400	54.700	-8.700	0.000	0.000	54.500	56.100	0.000		

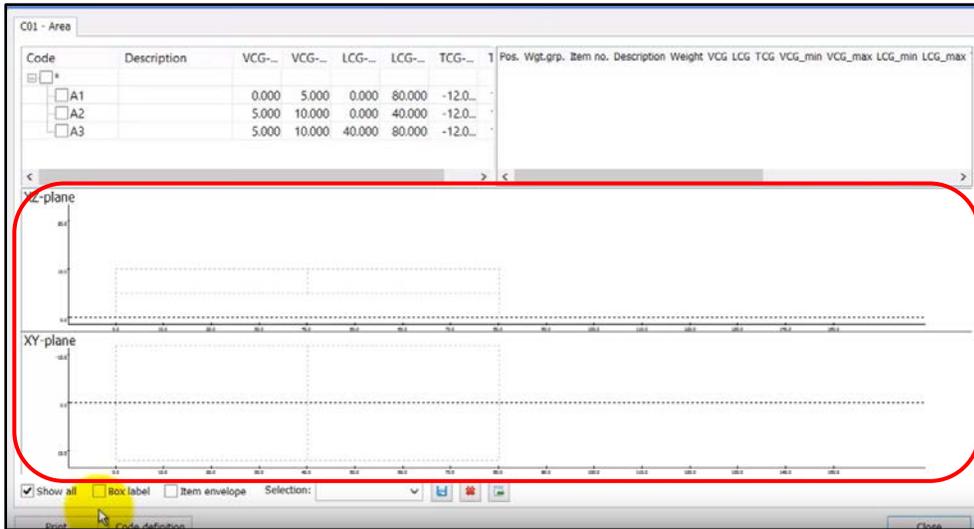
Total weight & Cog	Weight [kg]	Weight [t]	VCG [m]	LCG [m]	TCG [m]	VCG_min [m]	VCG_max [m]	LCG_min [m]	LCG_max [m]	TCG_min [m]	TCG_max [m]
	4070170.000	4070	9.40	39.02	-0.77	0.00	0.00	-9.40	90.60	0.00	0.00

And we can check the correctness of these by going to menu View and Code Envelopes. This brings up the Code envelopes dialog:

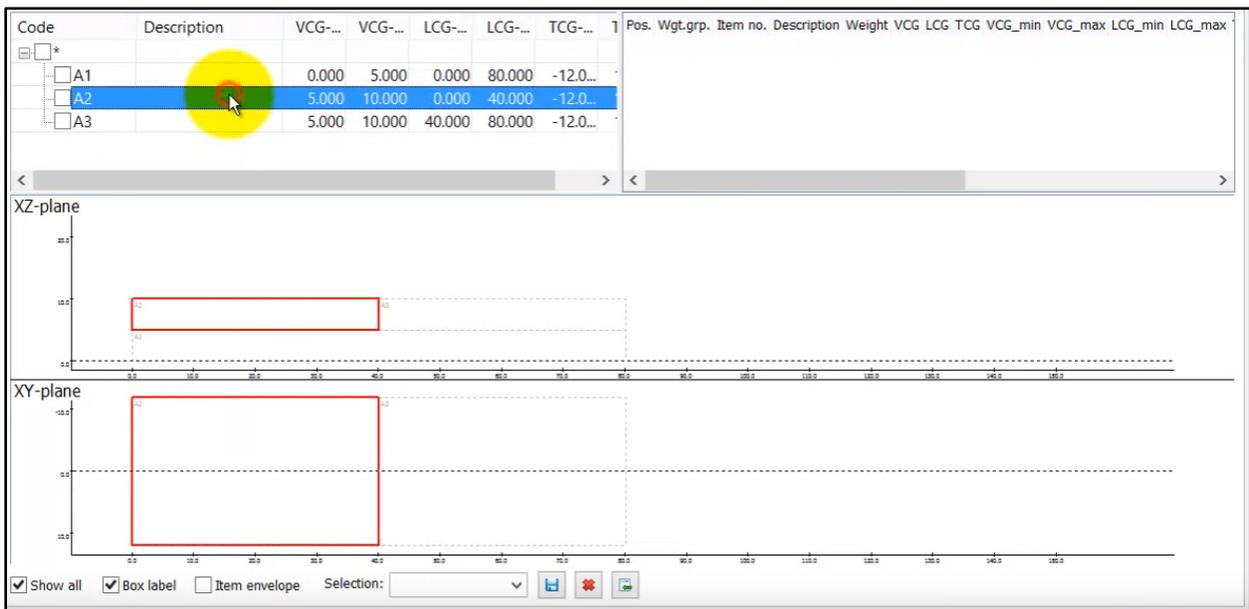
The screenshot shows the 'Code envelopes dialog' for 'C01 - Area'. It features a table with columns for Code, Description, VCG, LCG, and TCG. Below the table are two empty coordinate planes labeled 'XZ-plane' and 'XY-plane'. At the bottom, there are checkboxes for 'Show all', 'Box label', and 'Item envelope', along with a 'Selection:' dropdown and several icons.

Code	Description	VCG...	LCG...	TCG...
<input type="checkbox"/> A1		0.000	5.000	0.000
<input type="checkbox"/> A2		5.000	10.000	0.000
<input type="checkbox"/> A3		5.000	10.000	40.000

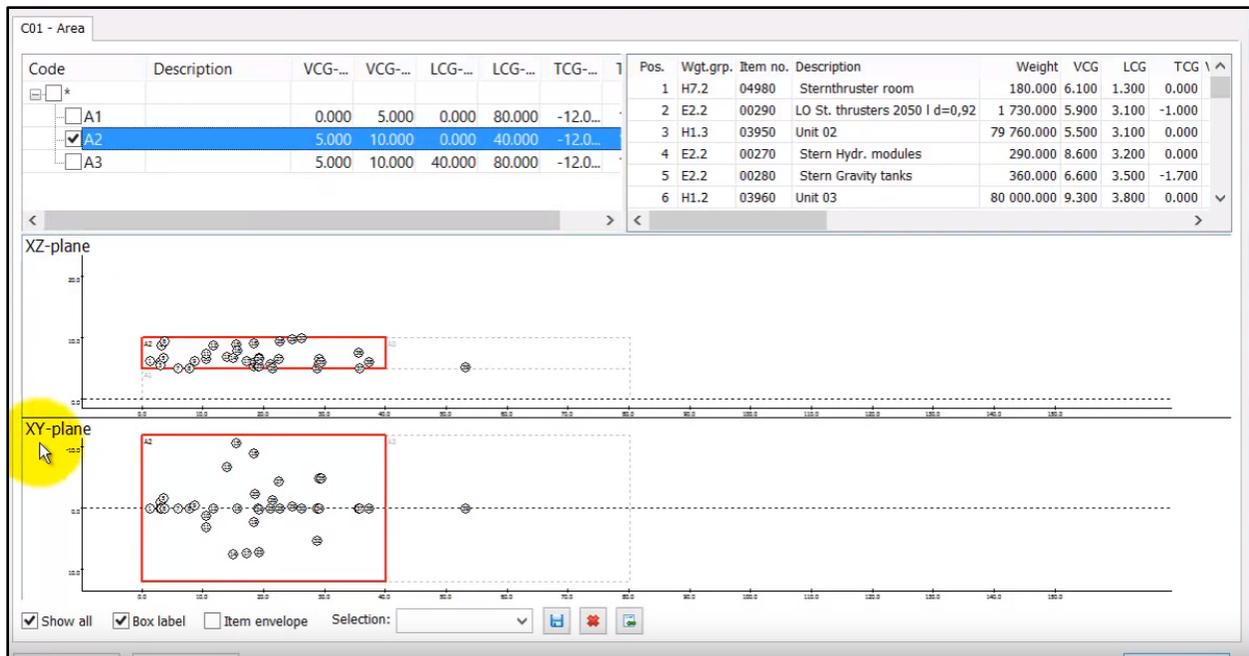
This will show the custom code. If we select **Show all** option, the boundaries of the boxes will be displayed.



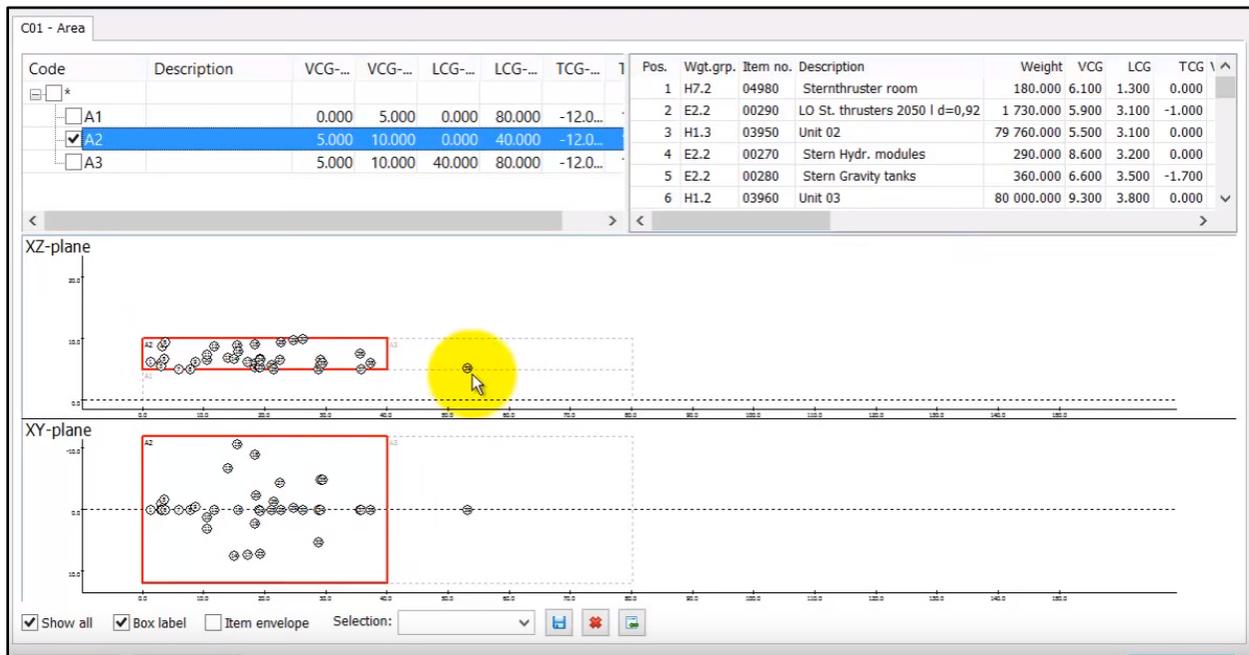
Now check the Box label option and by clicking in A1, A2 or A3 row, various boxes will be highlighted:



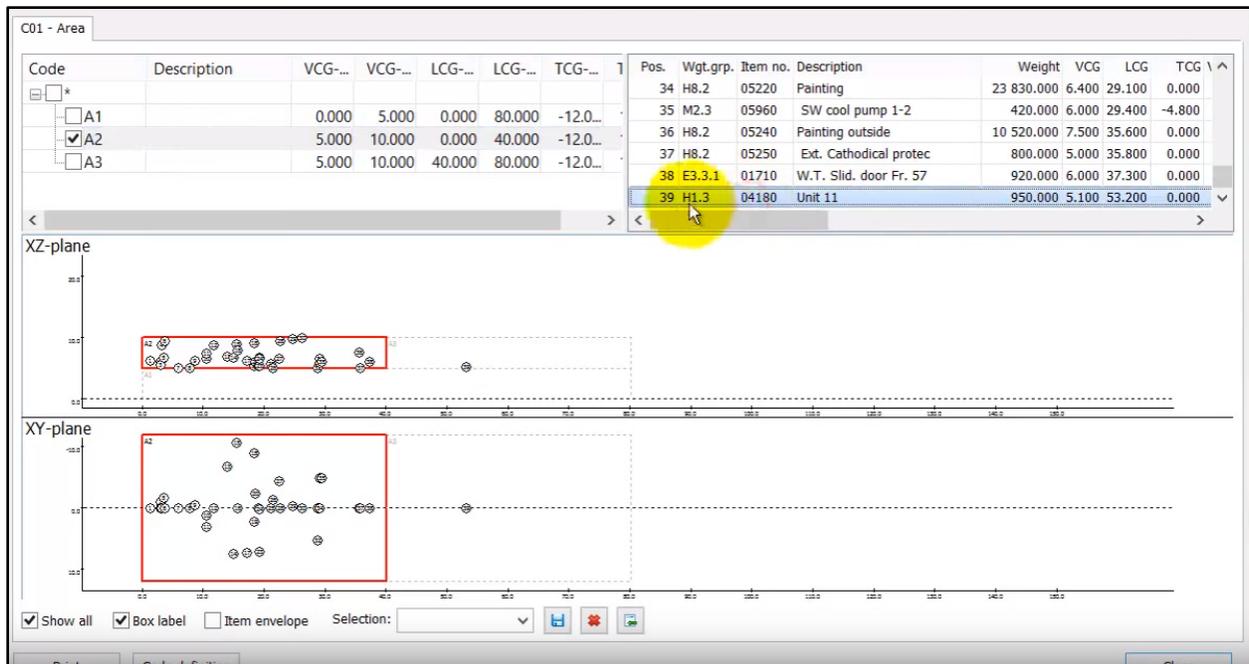
If we highlight A2 and also check the box in front of A2, all items tagged to A2 will be printed in the XZ-plane and XY-plane:



We see if all of the items are inside the box. We see one item outside the box:



The item number is 39, so we can scroll down to Pos. 39 and find item 39:

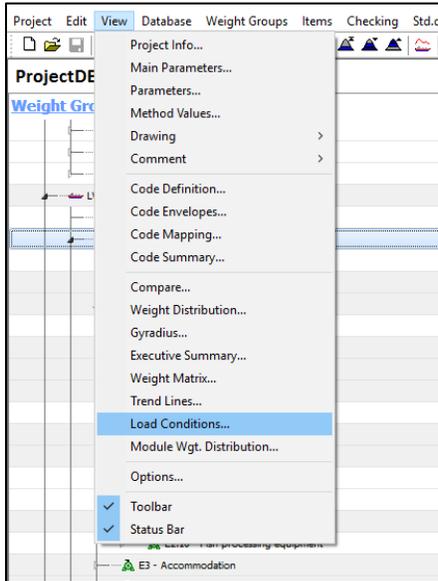


And obviously this is an error, so either item 39 has wrong CoG value or it has been tagged to the wrong area code.

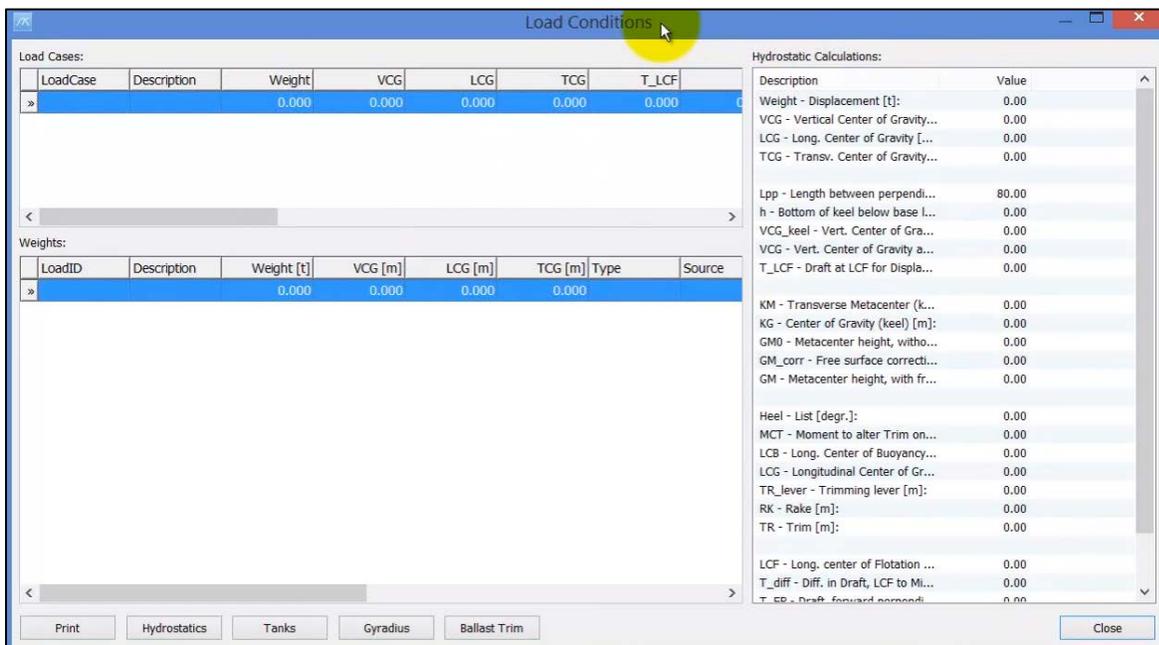
You can also print out the report for this using Print command.

11. Loading Conditions and Hydrostatics

To start the Loading conditions window, go to View menu and select Load Conditions...

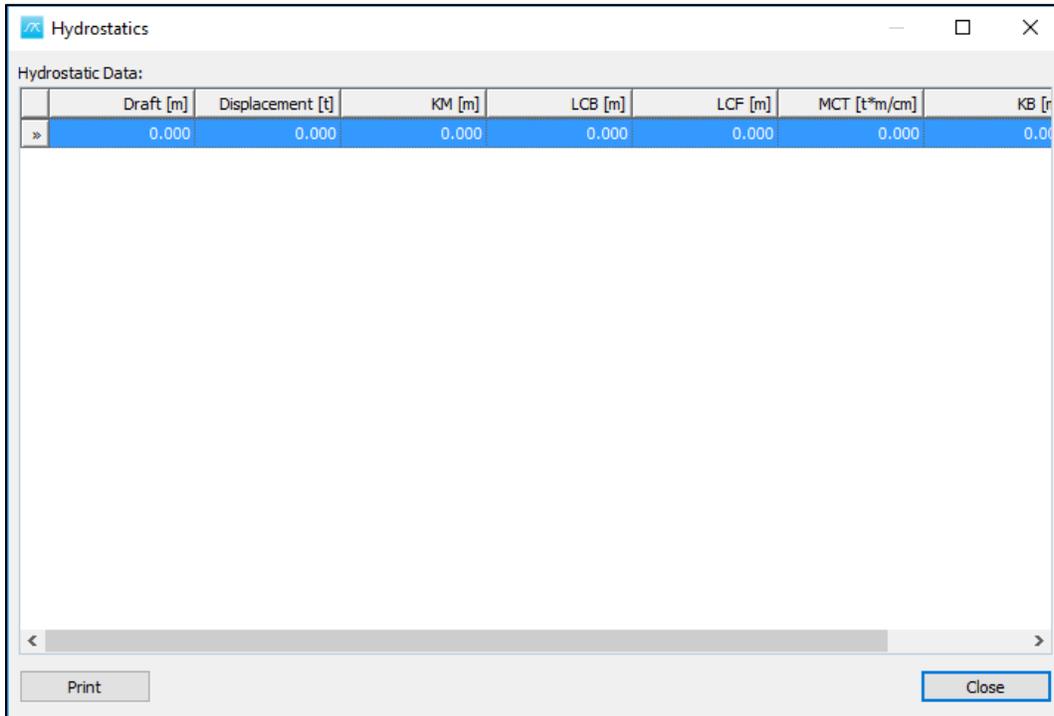


The Load Conditions dialog will appear:

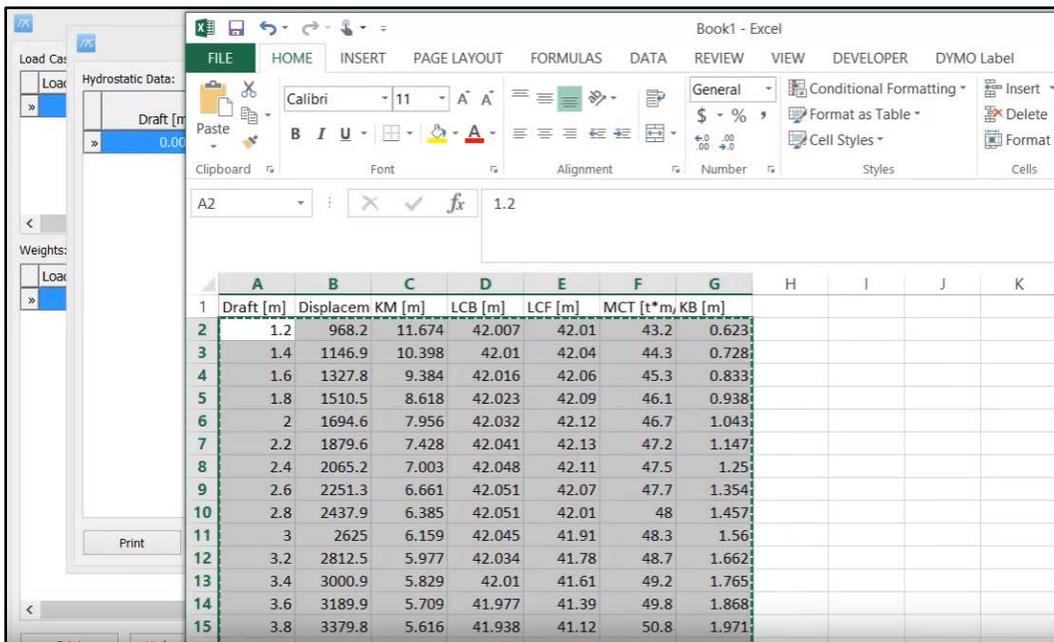


The first thing to do here, is to get Hydrostatics into ShipWeight:

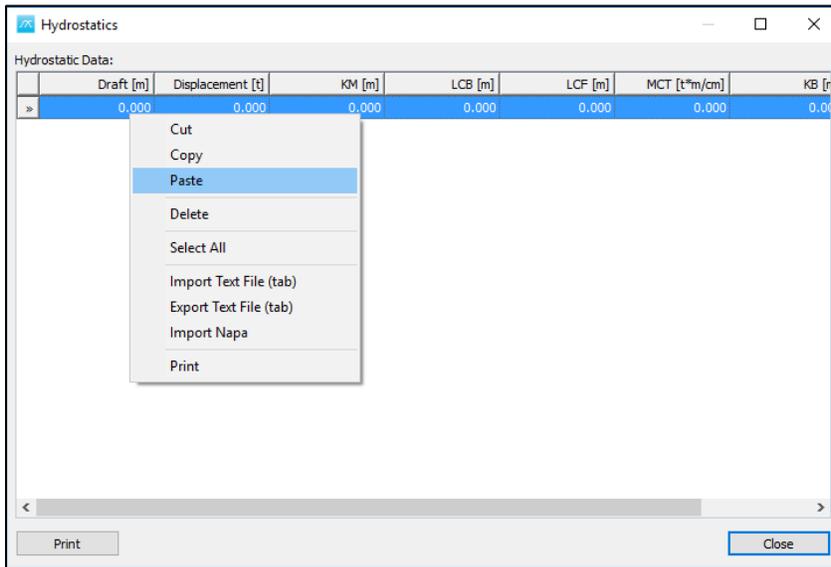
To get the hydrostatics table into ShipWeight, press the Hydrostatics button and this brings up the Hydrostatics dialog:



We can input all the needed values or Copy them from Excel (taken from the stability software):

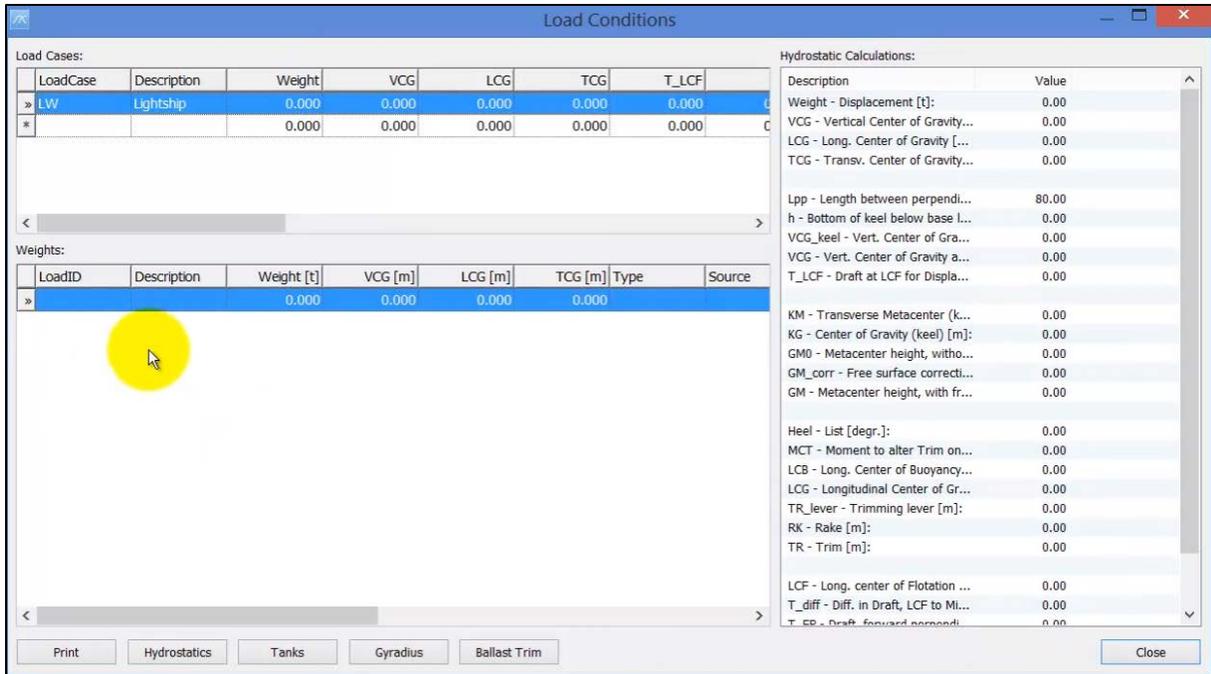


And then Paste them in the Hydrostatics dialog:

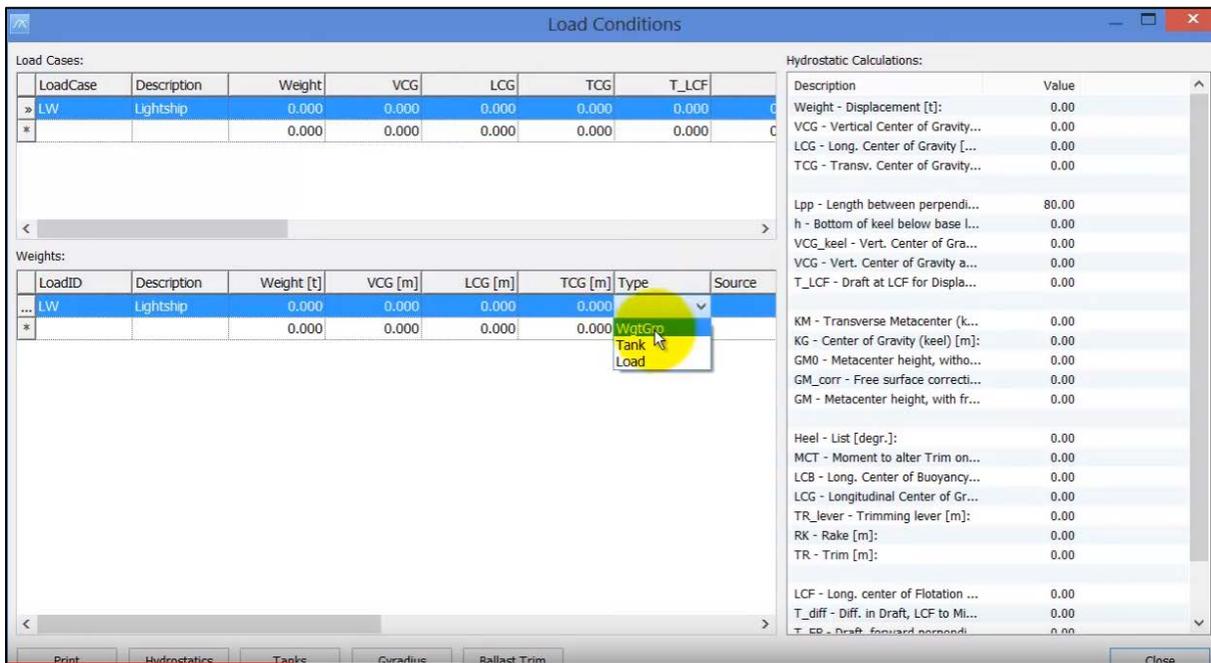


And press Close.

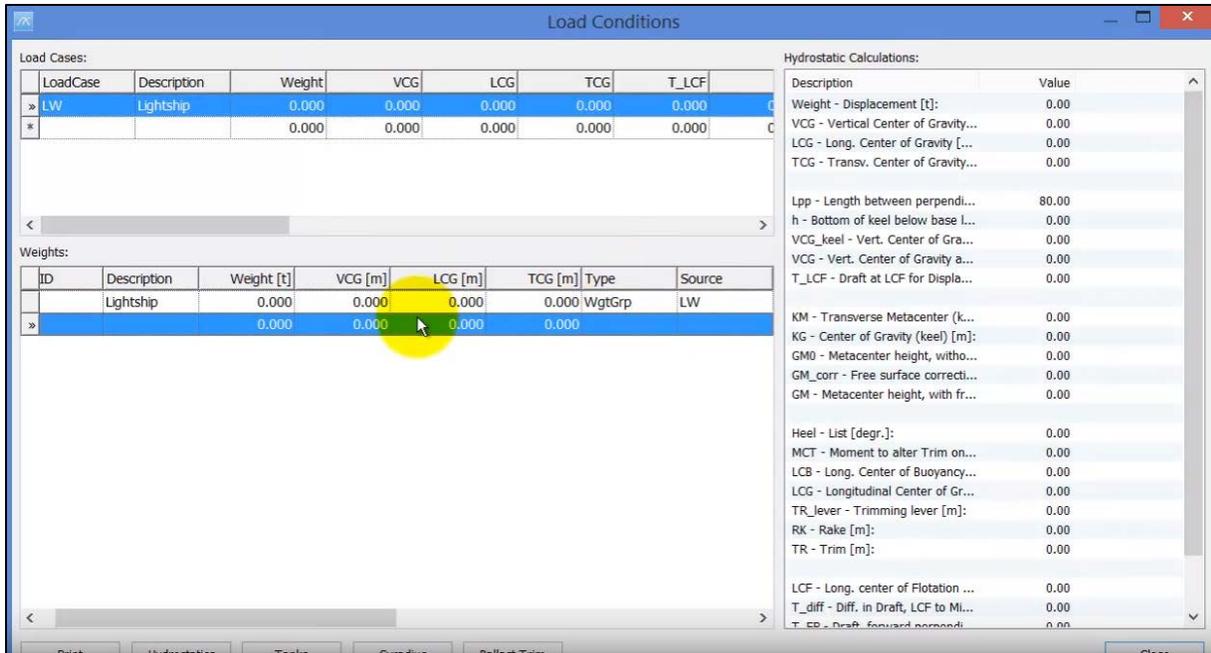
Now we can start to create the loading conditions. The Loading Conditions are created in the Load Cases area, where each row will define one loading case. Let's start by creating the Lightship condition. Type LW for LoadCase, then Lightship for Description. As always in ShipWeight when you create a new row, go to the row below to make sure this data has been properly registered in the database, then go back to the first row:



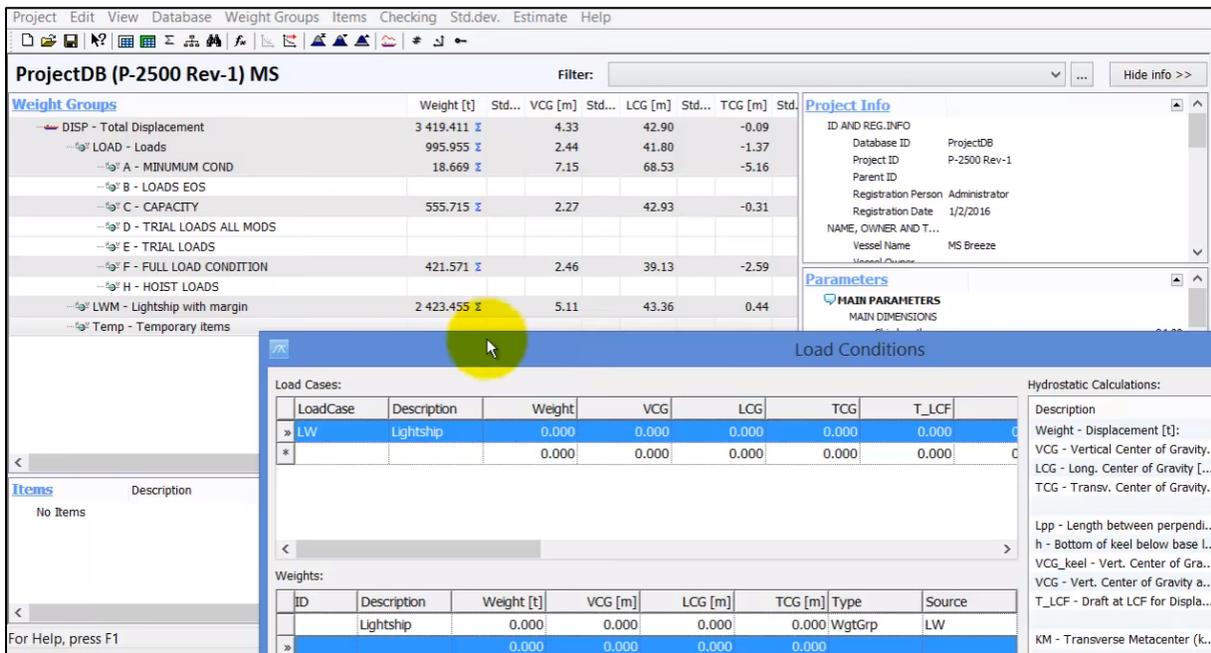
The definition of the lightship condition is done in the Weights area, and since is the lightship only, is just one weight to be defined:



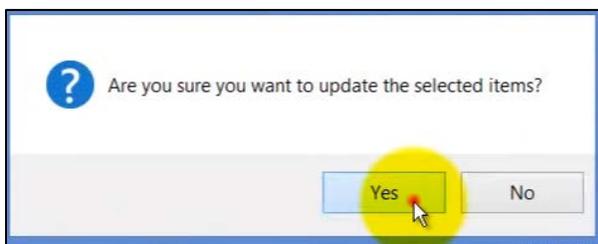
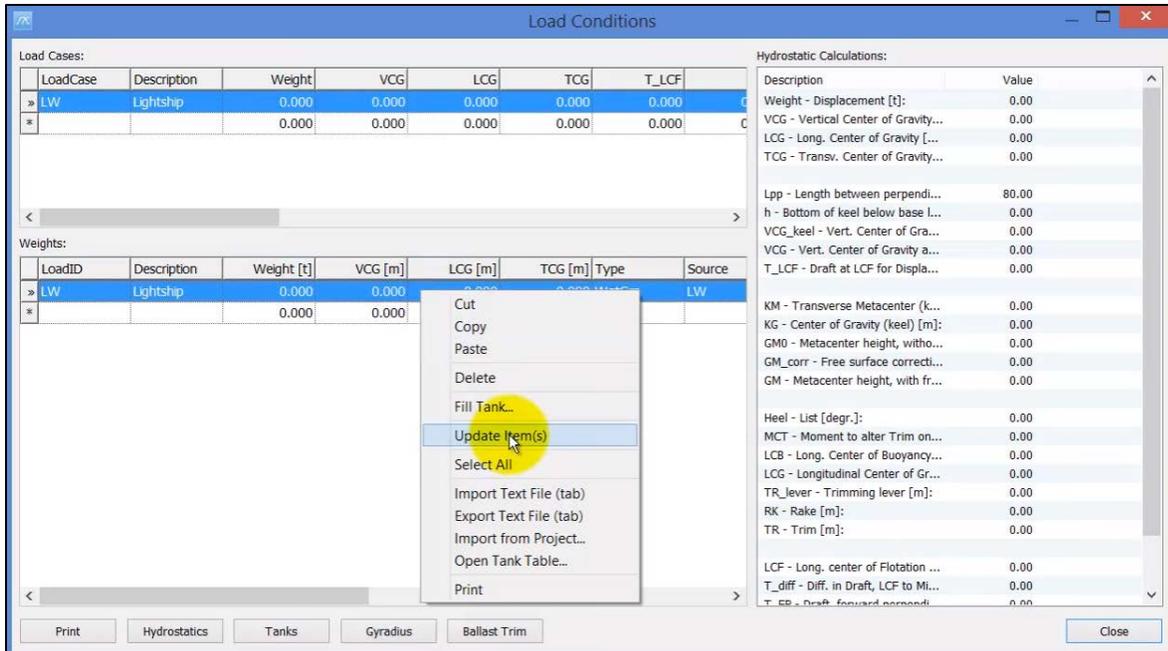
And select LW for Source column:



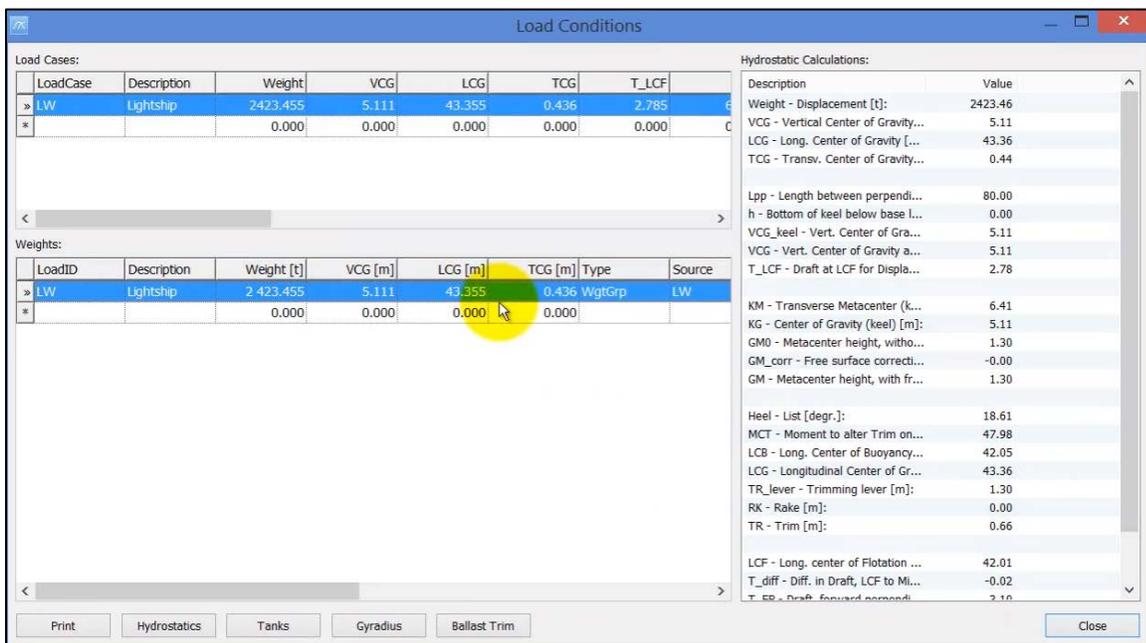
So, we are referring to the weight group Lightship in ShipWeight main window:



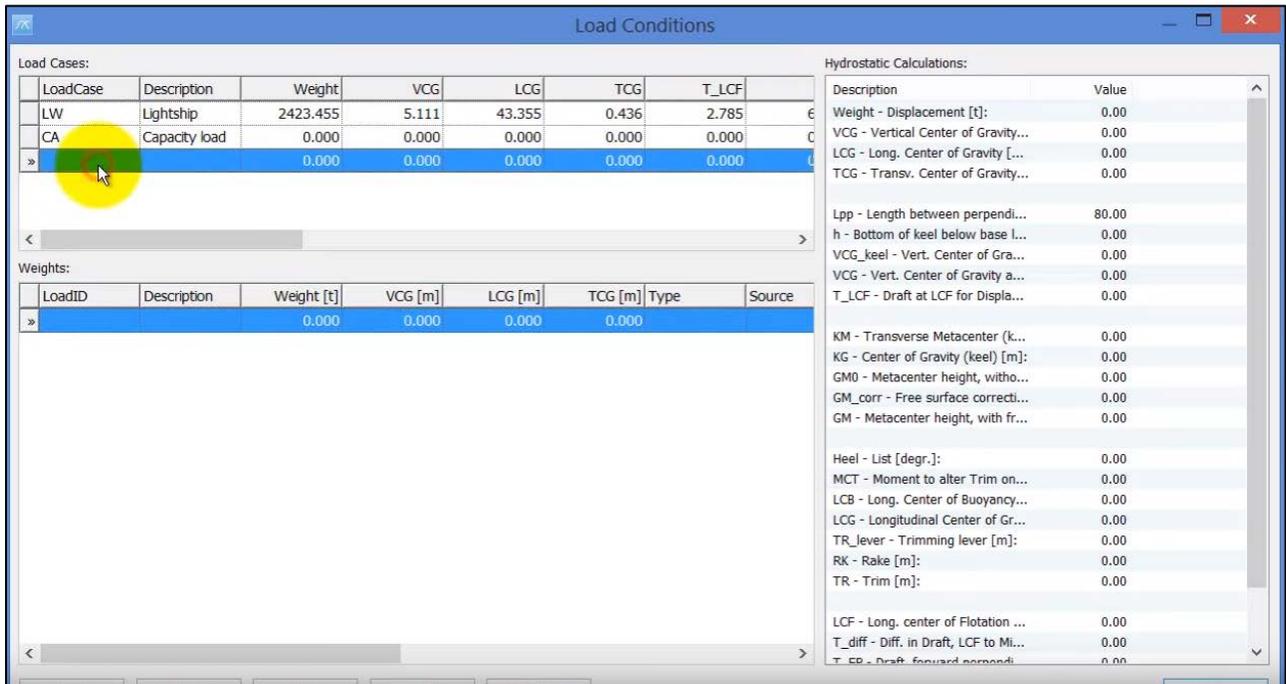
Then right click and select **Update Item(s)** option:



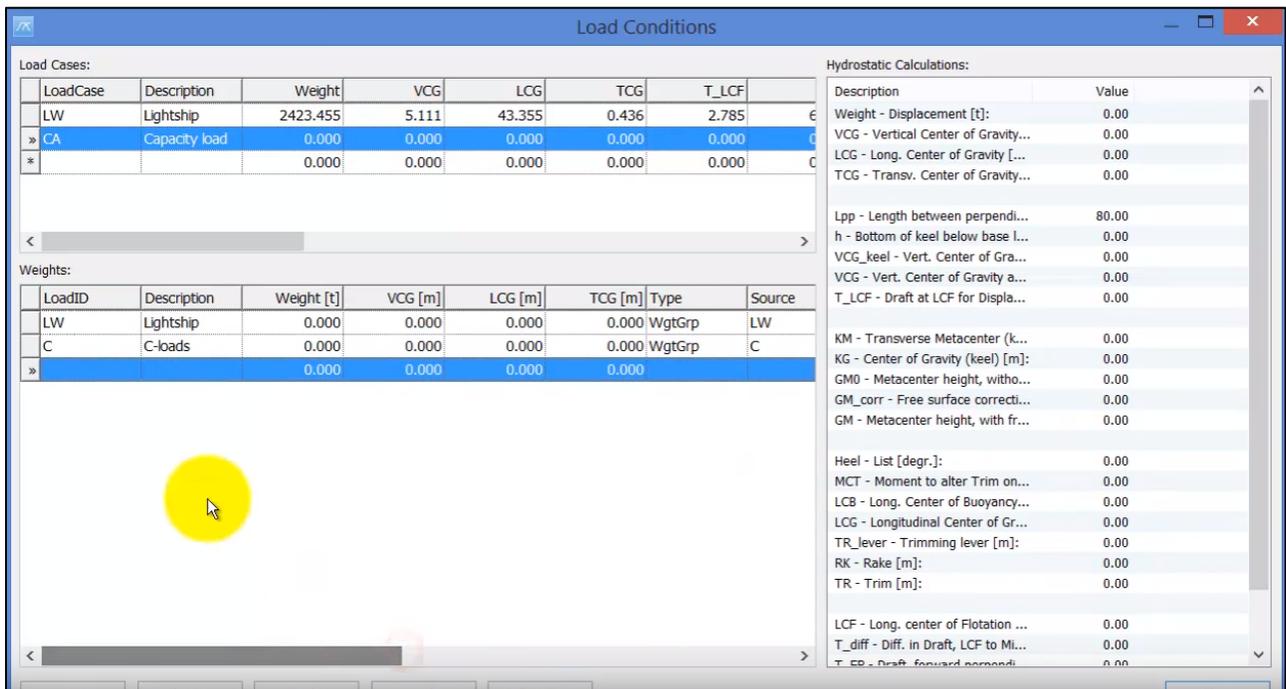
And now it brings in the numbers of the weight and cg of the lightship, and also calculates the values for the Hydrostatics on the right side of the dialog:



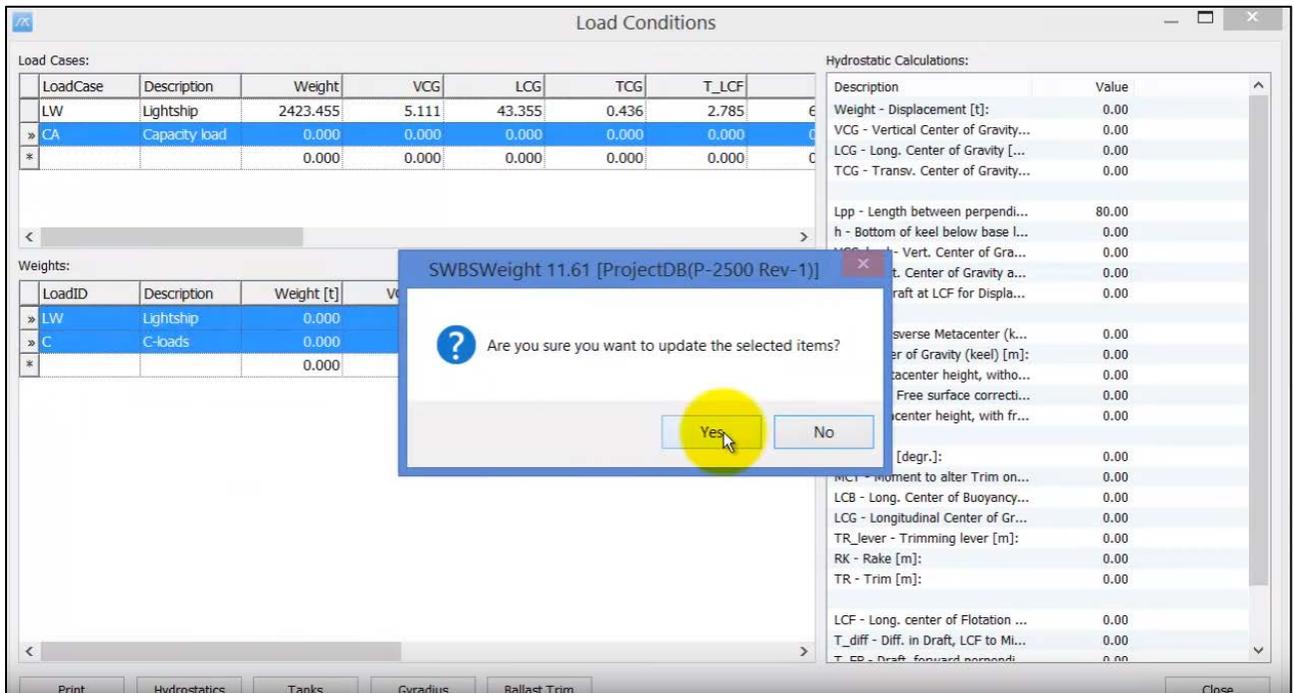
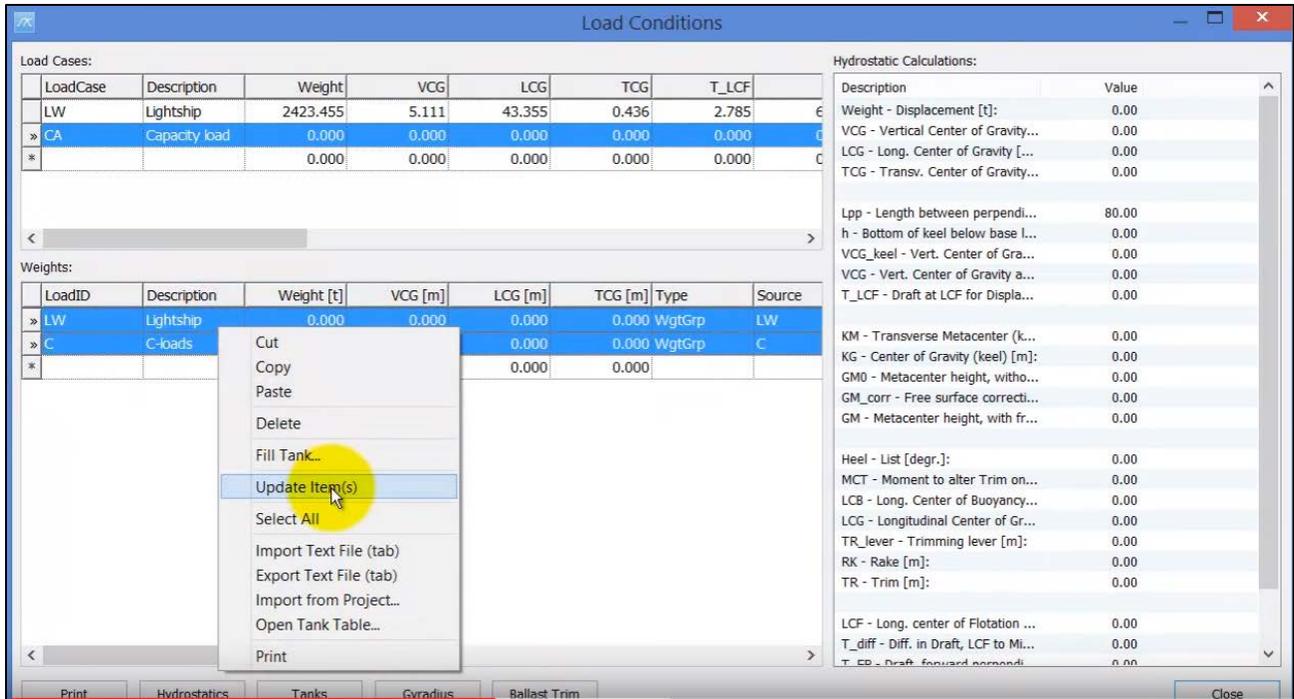
Let's create a new loading condition, which now can be the capacity load:



And the Lightship and C-loads weights:



Again, select both lines from Weights area, right click and Update Item(s):



This brings in the numbers of the weight and cg of the lightship, and also calculates the values for the Hydrostatics on the right side of the dialog:

Load Conditions

LoadCase	Description	Weight	VCG	LCG	TCG	T_LCF
LW	Lightship	2423.455	5.111	43.355	0.436	2.785
CA	Capacity load	2979.171	4.580	43.276	0.296	3.377
*		0.000	0.000	0.000	0.000	0.000

LoadID	Description	Weight [t]	VCG [m]	LCG [m]	TCG [m]	Type	Source
C	C-loads	555.715	2.266	42.933	-0.315	WgtGrp	C
LW	Lightship	2423.455	5.111	43.355	0.436	WgtGrp	LW
*		0.000	0.000	0.000	0.000		

Description	Value
Weight - Displacement [t]:	2979.17
VCG - Vertical Center of Gravity...	4.58
LCG - Long. Center of Gravity [...]	43.28
TCG - Transv. Center of Gravity...	0.30
Lpp - Length between perpendi...	80.00
h - Bottom of keel below base l...	0.00
VCG_keel - Vert. Center of Gra...	4.58
VCG - Vert. Center of Gravity a...	4.58
T_LCF - Draft at LCF for Displa...	3.38
KM - Transverse Metacenter (k...	5.85
KG - Center of Gravity (keel) [m]:	4.58
GM0 - Metacenter height, witho...	1.27
GM_corr - Free surface correcti...	-0.00
GM - Metacenter height, with fr...	1.27
Heel - List [degr.]:	13.17
MCT - Moment to alter Trim on...	49.14
LCB - Long. Center of Buoyancy...	42.01
LCG - Longitudinal Center of Gr...	43.28
TR_lever - Trimming lever [m]:	1.26
RK - Rake [m]:	0.00
TR - Trim [m]:	0.77
LCF - Long. center of Flotation ...	41.63
T_diff - Diff. in Draft, LCF to Mi...	-0.02
T_FR - Draft forward perpendi...	2.74

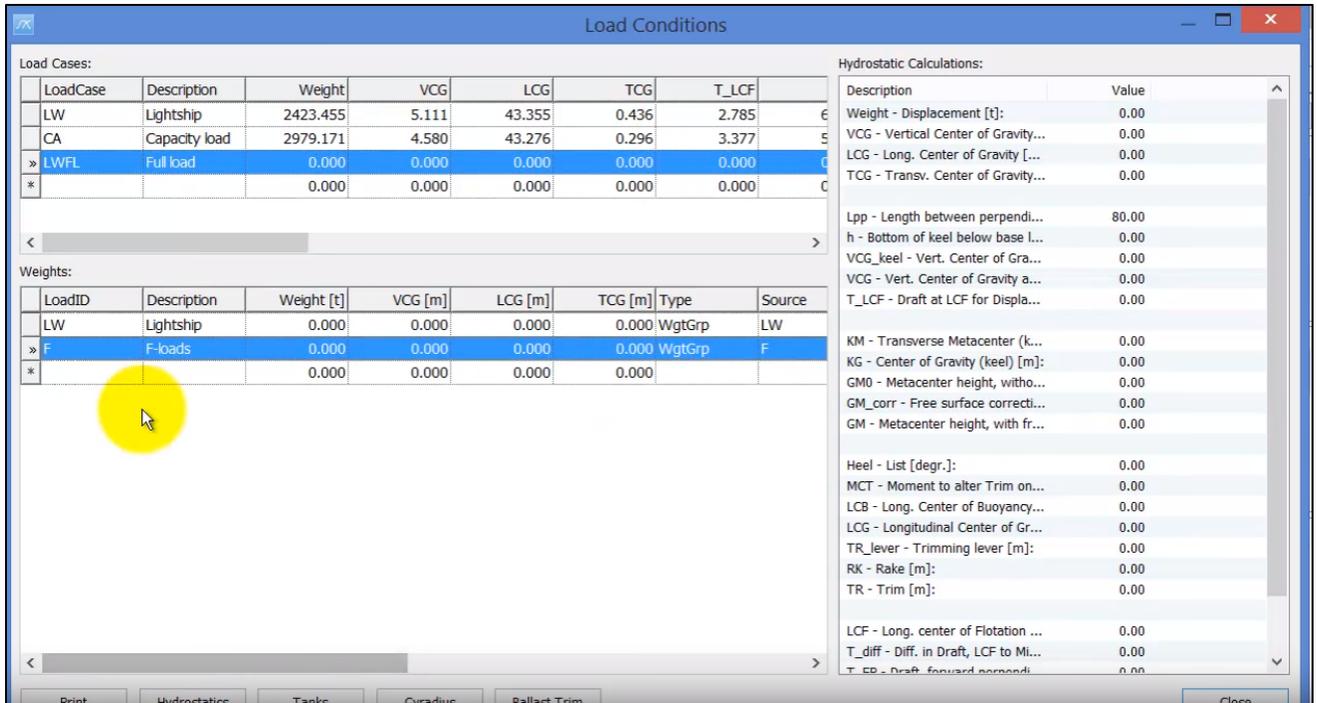
Let's create a third loading condition, a full load condition LWFL:

Load Conditions

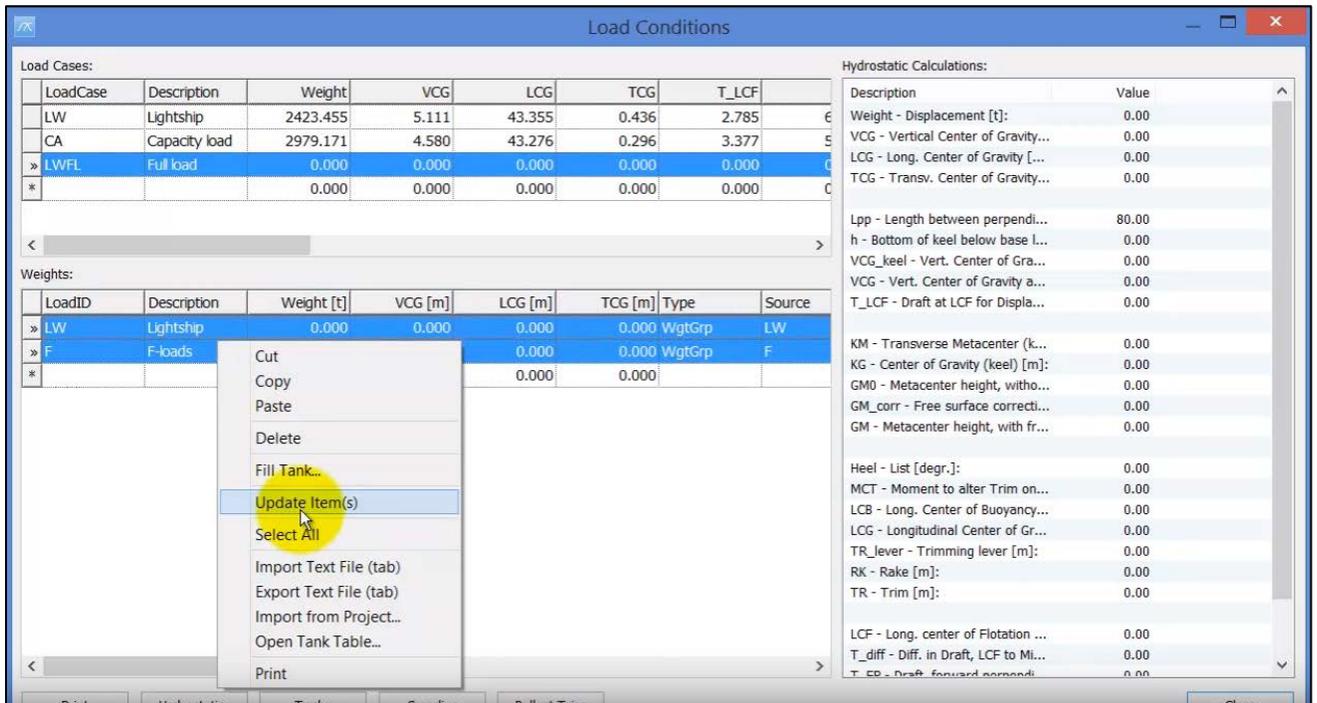
LoadCase	Description	Weight	VCG	LCG	TCG	T_LCF
LW	Lightship	2423.455	5.111	43.355	0.436	2.785
CA	Capacity load	2979.171	4.580	43.276	0.296	3.377
LWFL	Full load	0.000	0.000	0.000	0.000	0.000
*		0.000	0.000	0.000	0.000	0.000

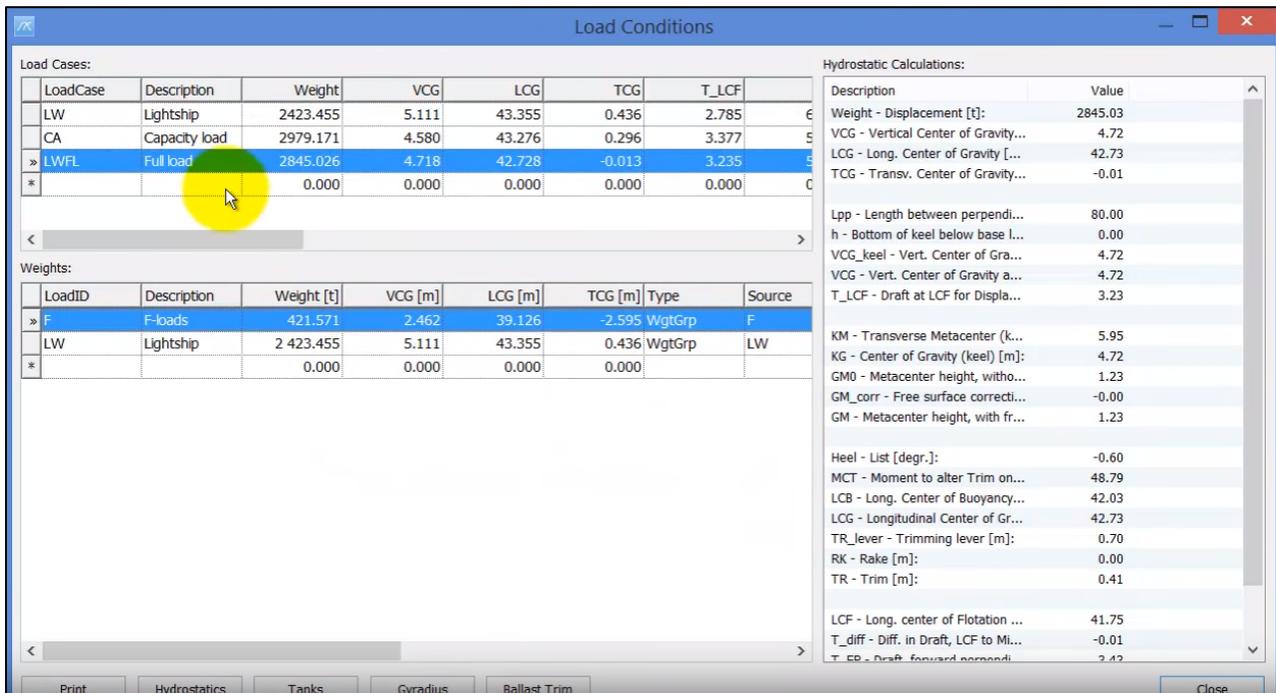
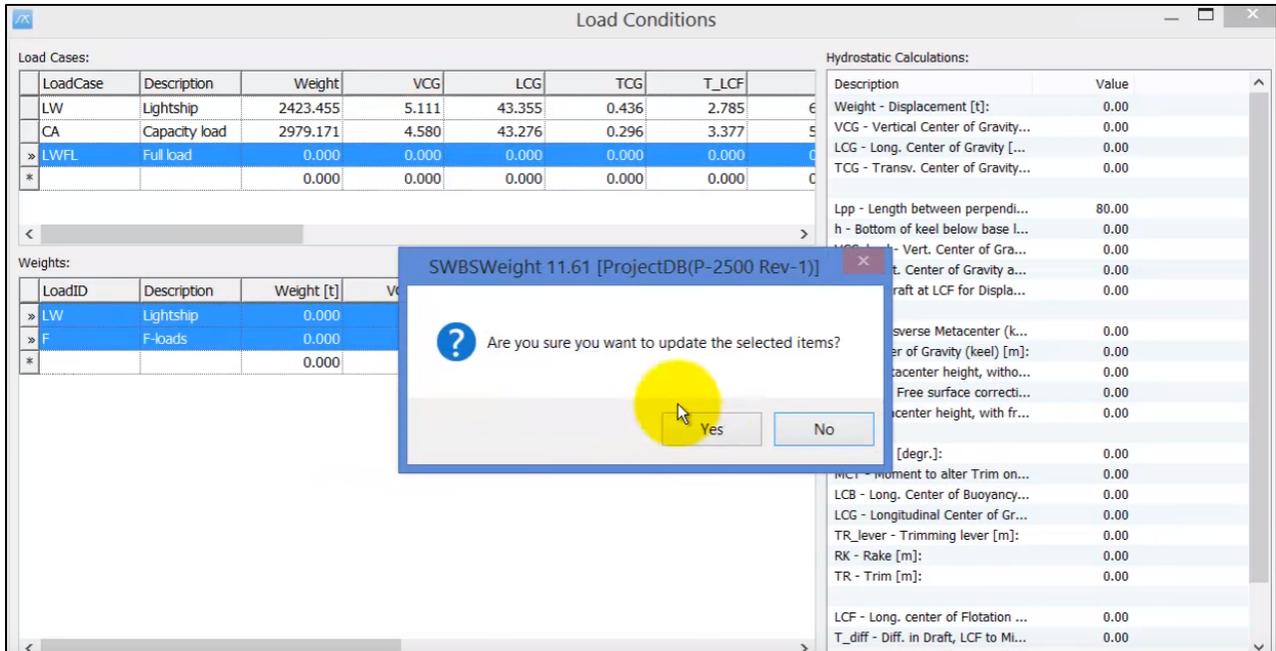
LoadID	Description	Weight [t]	VCG [m]	LCG [m]	TCG [m]	Type	Source
*		0.000	0.000	0.000	0.000		

Description	Value
Weight - Displacement [t]:	0.00
VCG - Vertical Center of Gravity...	0.00
LCG - Long. Center of Gravity [...]	0.00
TCG - Transv. Center of Gravity...	0.00
Lpp - Length between perpendi...	80.00
h - Bottom of keel below base l...	0.00
VCG_keel - Vert. Center of Gra...	0.00
VCG - Vert. Center of Gravity a...	0.00
T_LCF - Draft at LCF for Displa...	0.00
KM - Transverse Metacenter (k...	0.00
KG - Center of Gravity (keel) [m]:	0.00
GM0 - Metacenter height, witho...	0.00
GM_corr - Free surface correcti...	0.00
GM - Metacenter height, with fr...	0.00
Heel - List [degr.]:	0.00
MCT - Moment to alter Trim on...	0.00
LCB - Long. Center of Buoyancy...	0.00
LCG - Longitudinal Center of Gr...	0.00
TR_lever - Trimming lever [m]:	0.00
RK - Rake [m]:	0.00
TR - Trim [m]:	0.00
LCF - Long. center of Flotation ...	0.00
T_diff - Diff. in Draft, LCF to Mi...	0.00
T_FR - Draft forward perpendi...	0.00



The links that we create to ShipWeight, they are not live, so we need to select these items and right click and Update Item(s) manually every time:

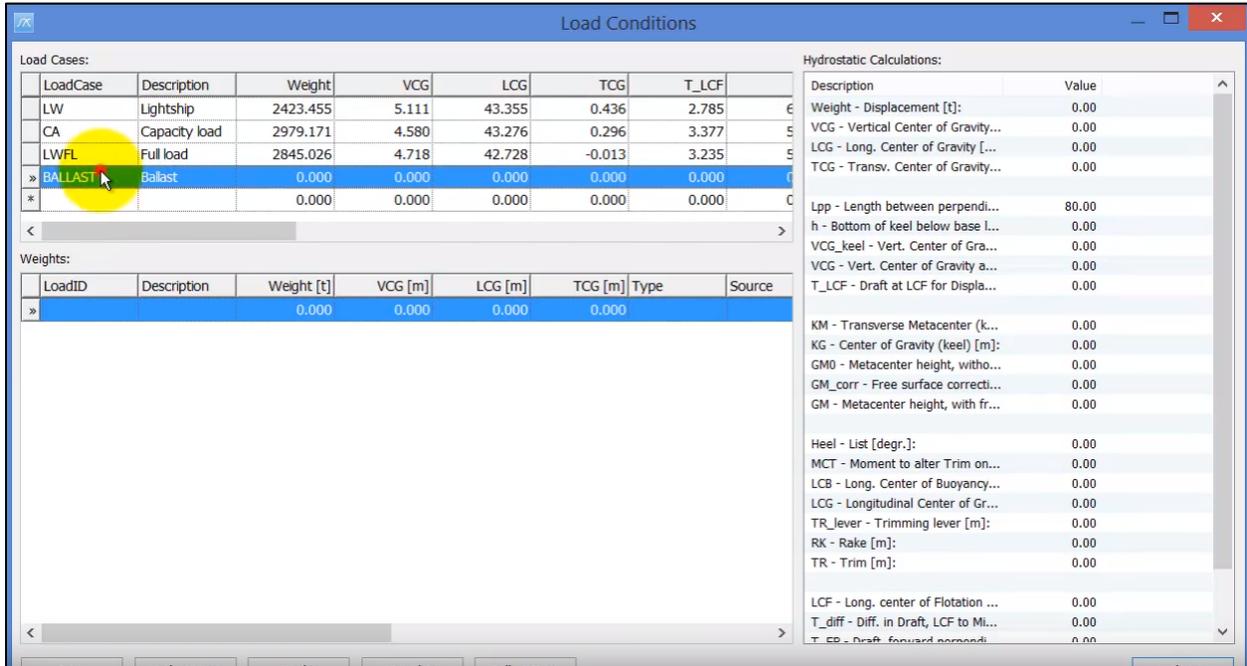




Now we have created 3 loading cases, and have the hydrostatics values calculated for all 3 of them. All of the loading cases have one line each, but of course more weights can be added for each loading condition.

Another way to create loading conditions is just referring to weight groups in the main hierarchy.

So let's define BALLAST condition:



We will not refer to any weight groups, we will only define the lightship weight in ShipWeight:

