

Creative Systems, Inc.
www.ghsport.com

GHS Crane Module Training Manual

GHS 起重机模块训练手册

中英文对照

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1.0 Working with Cranes in GHS 使用 GHS 起重机模块

When a load is suspended by a crane, the weight is considered as acting downward from a point on the crane that supports the cable. The BOOM command is available to simplify locating the coordinates of the boom end, allowing input of azimuth & elevation rather than L,T,V. By entering parameters based on the crane's geometry (boom length, topping angle, swing angle, etc.), GHS will determine the location of the support load in the model's coordinate system. This location is reported in the status weight output.

当起重机吊起重物时，钢丝绳所承受的力被看作重物作用在吊点向下的力。Boom 命令可以简化吊点位置，采用方位角以及仰角来代替 L,T,V(LCG,TCG,VCG)。通过输入起重机模型参数（臂长，仰角，方位角，等等），GHS 可以确定吊点在模型坐标系中的位置。重物以及吊点可以在重量状态报告中输出。

With macros and run files, the BOOM command can analyze multiple lifting scenarios. In addition, the BOOM command can also be used to account for the effects of counterweights, boom weight and other crane mounted weights.

使用宏命令和运行文件，Boom 命令可以分析各种各样的吊装方案。此外，Boom 命令还可以反应出配重块，吊臂以及其他起重机配件的重量重心。

Since cranes, geometrical and structural arrangements vary greatly, the use of the BOOM command can get complicated. The Crane Module is available to assist the user in setting up and analyzing complex and multiple cranes, this wizard can be found under the menu: Wizard > Conditions... > CRANE. Note: The Crane Module must be part of your GHS system to use this module. If desired you can add a shortcut key or macro to your GHS.LF load file. See the General Training Guide for additional details.

由于起重机，运行轨迹以及内部结构的复杂性，使得 Boom 命名在使用时显得非常麻烦。Crane Module 模块可以很好的帮助用户建立和分析复杂多变的起重机工况。这个模块向导可以在菜单：Wizard > Conditions... > CRANE 下找到。注：Crane Module 模块只有已安装到 GHS 系统中，这个模块才能使用。如果需要，您可以添加快捷键或者设置 GHS.LF 宏命令来运行文件。详情请参阅通用培训指南。

The CRANE wizard provides many advanced features to help analyze crane operations. It simplifies data entry for the BOOM command to calculate the effects of the crane load, boom, jib, counterweight, etc. Other loads, typically not considered by the Boom command, such as the weight of the rope and multiple blocks can be included. In addition, it provides the ability to set up a synchronized Condition Graphic view that will display the crane geometry respecting the current crane position.

Crane 模块提供了许多高级功能以帮助计算分析起重机的操作工况。简化了 Boom 命令用来计算吊物，吊臂，悬臂，配重块.....时输入的数据。包含了一些 Boom 命令下不太考虑的重量，例如索具和各式吊钩组重量。此外，还提供同步图像显示功能，显示当前状态下的起重工况。

To add to the functionality of Load Editor, hook load capacity tables can be defined. With these tables, the standard crane load displayed in Load Editor can include warnings if either the load or the list (sometimes called cross) angle are close to or exceed an allowable limit.

增加了装载编辑器，定义吊钩的起重量表。通过这些表，定义装载编辑器里面起重机许用起重量。当吊物重量或者横倾角接近或超过许用限度时，系统就会报警。

Options to select include:

可选项包括以下：

- **Predefined stability criteria**
预先定义稳性规范
- **Define lifting modes**
定义吊装模式
- **Set a stow mode which when in use, the boom weight is treated as a distributed weight**
在吊臂收起状态时，吊臂重量均布
- **Set options for a Crane Operator's Output Table (COOT)**
选择选项 “Crane Operator's Output Table” (起重机操作输出表) (COOT)

Define a lifting beam if present
定义吊梁（如果适用）

The weight effect of the lifting beam is automatically removed from its stowed location and added to the crane load when in use.

在使用吊梁时，吊梁上吊物的重量会自动的从它停留的位置移到吊点的位置。

As with most wizards, it is good practice to be in a working folder dedicated to the job at hand. The reason for this, is that files are created and saved by the wizard, some without warning. To return all the previous values, the wizard uses these files, again sometimes without warning if present in the working folder.. If you use a single folder for multiple crane analyses, previous data will be overwritten.

同大多数的向导模块一样，应将当前任务运行于一个独立的工作文件夹中。如此的原因是，在使用向导模块时，系统会自动生成并保存一些文件，且不会发出警告。当重新调用早前的数据时，如工作文件夹中存在这些文件，向导模块会自动调用它们，且也不发出警告。所以如果用一个文件夹来运行多个吊机向导模块，早前的数据就可能被互相替换掉。

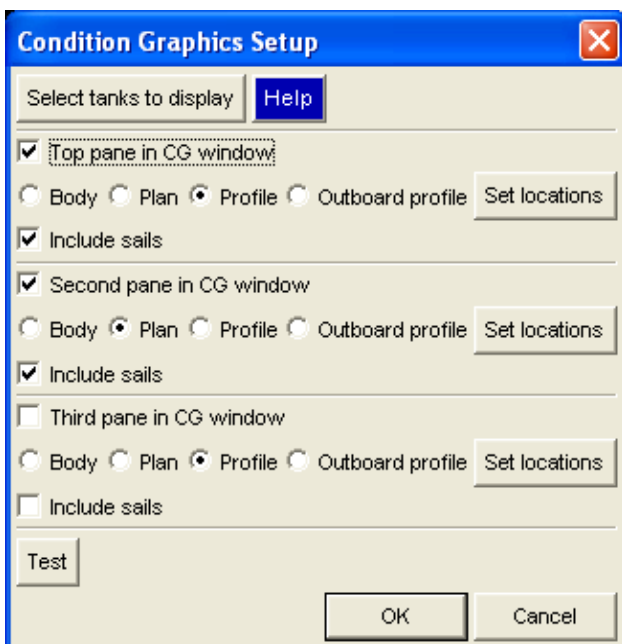
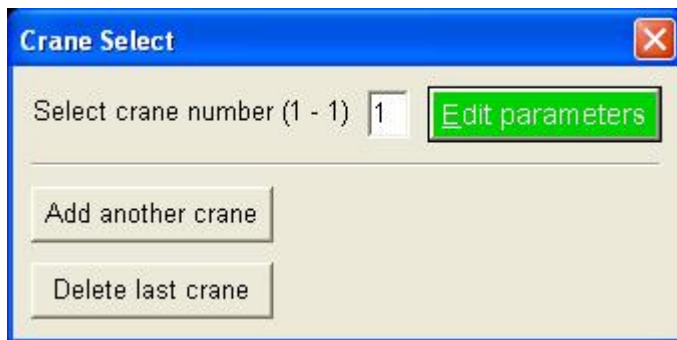
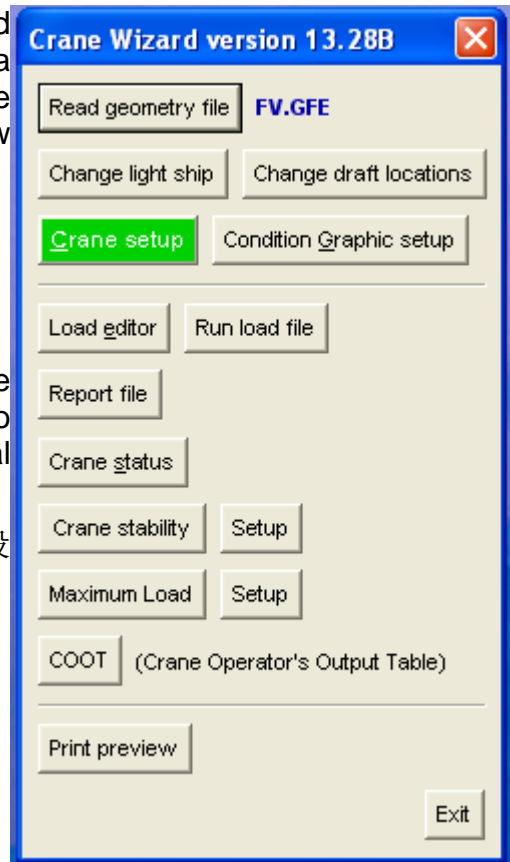
2.0 The Main Wizard Window 主向导窗口

Opening up the wizard without a geometry file loaded will prompt the user for a geometry file and then a lightship weight. If a geometry file is loaded when the wizard is run, this step is skipped. The main window looks like this.

打开向导模块，没有载入模型时，会提示用户载入模型和空船重量。如果模型已被载入，那么在启动向导模块时，则跳过此步骤。主界面如图所示。

The current geometry file is displayed in blue at the top and two buttons, directly below, are available to change the lightship data or set the longitudinal locations of the forward and aft draft marks.

当前的模型在顶部显示蓝色，下方的两个按钮，可设置更改空船重量和船首尾吃水标记。



The Condition Graphic setup button allows the user to choose the order of appearance of Plan, Profile or Body views within the synchronized CG window that is displayed during the Load Editor session. Select the check-box beside the pane and the desired display, with or without sails, although including sails in the profile and plan views is preferable.

Condition Graphic setup (图形显示设置) 可允许用户选择显示俯视，侧视或者横剖面图形，图形在 CG 窗口下，根据装载编辑器的调整，实时同步显示。选择各窗口下所需显示视角，选择是否带有上层建筑。推荐在侧视和俯视视角下显示上层建筑。

We will now temporarily leave the main window to setup one crane.

现在，我们暂时离开主窗口来设置起重机。

3.0 Crane Setup 起重机设置

To proceed with setup, select the Crane setup button, a new dialog will open displaying the number of cranes, an edit parameters button and buttons to add or to delete a crane. If a second crane is to be added to a geometry that already includes a crane, click the Add another crane button. When more than one crane exists, the number of cranes will be displayed on the top line. To edit the parameters for a particular crane, enter the crane number in the field and click the Edit parameters button. This will produce the main data entry dialog shown on the next page.

继续设置，选择“Crane setup”（起重机设置）按钮，出现新对话框，显示起重机数量，参数编辑按钮，增加或删除按钮。模型中已有一台起重机，如果想增加一台，点击“Add another crane”（增加另外一台起重机）按钮。当有一台或多台起重机存在时，起重机的数量编号显示在顶部。输入起重机编号，点击“Edit parameters”（参数编辑）按钮，编辑起重机参数。主数据输入对话框在下一个页面显示。

4.0 Crane Parameters Dialog 起重机参数对话框

The first button on this page allows the user to select or change the type of crane being created. Crane options available are conventional, conventional with tie-back and knuckle-boom. While this document will describe setup for a conventional crane most fields in this dialog are type independent, though ones that are not will be described with tool-tips.

此页面上的第一个按钮，用户可以选择或更改所创建的起重机类型。起重机类型选项：常规型，常规带有固系型，折臂型。本文档将讲解如何设置常规型起重机，在起重机参数对话框中，大多数设置的类型是互相独立。且一些设置并不提供提示信息。

Other than changing the units, the top row of buttons contains a button to view a graphic of all parameters to be entered in the present dialog and another to write a text file, which serves to back-up the values entered in the crane data dialog. Remember to always click **Write This Form** after entering crane parameters to prevent any data being unnecessarily lost.

除了单位转换，顶部还有“view parameter definitions”（参数图解）按钮和编写文本格式的运行文件。文件备份了起重机界面已输入参数。注意经常点击“Write This Form”（编写）按钮，保存参数数据，避免意外丢失。

Longitudinal location of base center and Transverse location of base center specifies the location of the vertical axis of rotation in the model coordinate system. Main pin offset from base center is the horizontal distance from the center of the pin to the center of rotation. Pin height ABL is the vertical distance from the main pin's center to the model's baseline.

纵向基准中心和横向基准中心定义在模型坐标系垂向旋转坐标轴上。主销偏离基准中心

点距离指销子到旋转中心的水平距离。销子距基线高度指销子中心到基线的垂向距离。

The Effective half base length at beam lift is the length of the longitudinal support of the crane's foundation. The Track radius is the radius of the slew or ring support. These are used when longitudinal strength is to be evaluated. The weight of the crane and hook load are applied over a length that depends on the azimuth angle. When the azimuth angle is zero, the track radius is used, when the azimuth is 90, the half base length at it's beam lift is Typically the track radius is the larger value.

在吊梁有效半基线长指作用在起重机基座上的纵向长度。轨道半径指旋转半径或者环形支架的半径。这些长度值被应用在计算评估总纵强度上。根据方位角，起重机重量和吊钩吊物重量分布在一定的长度上。当方位角为 0 度时，轨道半径起作用；当方位角是 90 度时，吊梁半基线长具有代表性，而轨道半径是很大的值。

Next, Select from the pull down menu whether the supported weight is to be a linear distribution along the crane track, distributed uniformly with equal and opposite point weights at the longitudinal ends of the crane track or a pedestal type with shear located at crane pedestal center.

接下来，从下拉菜单中选择作用的重量分布方式：沿起重机轨道分布；均匀分布+重量反作用在纵向轨道末端点；作用力作用在起重机基座中心。

Boom length to main sheave or jib and Main jib length are as stated. The Jib angle is the angle between the jib axis from main sheave to jib sheave and the boom reference line. A line between the hinge pin and the main sheave. Positive 90° is a jib axis perpendicular to the boom reference line downward. An angle of 0° is a straight extension of the main boom.

确定吊臂到主滑轮或悬臂长度，主悬臂长度。悬臂角度指悬臂轴方向和沿吊臂直线方向之间的角度，悬臂轴指主滑轮到悬臂滑轮之间的轴，吊臂直线指铰链销到主滑轮之间的直线。正 90 度指悬臂轴垂直吊臂直线向下。0 度指沿着吊臂方向直线延伸。

Boom CG: pin to CG distance, Boom weight, Approx. rope CG below boom CG, Rope weight and Offset angle of boom CG from the reference line will account for these measurable loads in stability and longitudinal strength calculations. If negligible, they should be set to zero.

吊臂重心：销子到重心距离，吊臂重量，钢丝绳索具重心在吊臂重心下方大致位置，钢丝绳索具重量和吊臂重心与参考直线之间的夹角。运用这些设置的重量及重心计算算稳定性和总纵强度。如果忽略不计，则重量及重心设置成 0。

The Main block weight is the weight of the block used in the capacity tables. The **Other main blocks** button provides for two additional blocks denoted as the Light lifting block weight and the Heavy lifting block weight. These values are used to adjust the capacity tables when the operator specifies one of them to be in use.

主吊钩重量指在起重量表里面用到的吊钩组重量。“**Other main blocks**”（其他吊钩）按钮提供了另两种吊重方式：轻型吊钩组和重型吊钩组。在使用中，操作者可以定义其中一个起重量表，这些吊钩组重量根据不同的起重量表相应改变。

Main hook minimum distance below sheave is used for determining the placement of the center of gravity of the hook load.

吊物吊点的重心由主吊钩在滑轮下的最小距离决定。

Main hook capacity is the value if only a single capacity is to be used. Enter a negative number if a capacity table is available. The **Main hook tables, Auxiliary and Whip** button starts a series of dialog boxes to enter table values. Creating a capacity table is discussed below.

主钩起重量值指只使用单一的起重值。输入一个负值，起重量表将起作用。“Main hook tables, Auxiliary and Whip”（主钩，副钩以及小钩起重表）这些按钮通过一系列对话框来输入起重表的值。以下详述建立起重表。

The screenshot shows a software dialog box with the following elements:

- Main hook capacity (neg to use tables):** 22.00
- Main hook tables:** Main hook tables, Auxiliary, Whip, Other
- Capacity derating subtracted:** 13.00
- derating factor:** 0.8000
- Capacity percentage yellow band start:** 50.00
- Red band start:** 52.50
- Minimum boom elevation angle:** 30.0
- Initial elevation angle:** 45.0
- Initial azimuth angle:** 0.0
- Buttons:** Counterweight, Upperworks, Define Lift Modes, Stow mode, COOT, Lifting Beam
- Labels:** Label describing zero deg azimuth: Over Stern (e.g. "Over stern"); Label describing 180 deg azimuth: Over CL (e.g. "Over ship CL")
- Make crane graphic:** Crane Graphic (highlighted in green)
- Test** (green button) and **Done** (yellow button)

Capacity derating subtraction reduces lift capacities by the same amount regardless of the magnitude. The derating factor reduces the lift capacities by a fraction of the magnitude. Capacity percentage yellow band start and Red band start sets the threshold, as a percentage of the capacity, when the load set in Load Editor is displayed in either yellow or red respectively.

“Capacity derating subtraction（降低额定起重量）”强制减小额定起重量。“derating factor（降低额定因数）按小数比值减低额定值。按百分比设置起重量黄色警报和红色警报临界点。当达到临界点时，装载编辑器里面显示黄色或者红色警报。

Minimum boom elevation angle sets a lower limit on the elevation angle to prevent the user from selecting an angle where the crane can not be operated. Initial elevation angle and Initial azimuth angle set the angles use each time the Load Editor is started.

设置吊臂最小仰角限制，防止用户选择起重机使用限制角度。初始仰角和初始方位角设置，设置每次启用装载编辑器时吊臂初始角度。

The **Counterweight** and **Upperworks** buttons produce input boxes to enter the weight, height of CG above the model baseline and distance of the CG from the crane axis. The latter distance is entered as a positive number if the CG is located on the opposite side of the crane axis as the hinge pin.

“Counterweight（配重块）” 和 “Upperworks（起重机上部模块）” 按钮，提供输入框来输入重量，距基线的重心高度，距起重机旋转轴的距离。如果这两个重心位于起重机旋转轴与铰链销的相反方向，那么这个值是正值。

User defined labels can be set for the swing angles of 0° and 180°. These labels are displayed in the Crane Operator's output table above their respective azimuth angles.

用户可以命名旋转角 0 度和 180 度，在起重机操作输出表里，新名称可以显示在各自方位角上方。

5.0 Crane Drawing Wizard 起重机绘制向导

The **Crane Graphic** button opens a dialog box that is used to create surface parts representing the crane. The surface models are saved to new geometry files which are opened in the Load Editor / Condition Graphics window. The surface model of the crane will be updated realtime to represent the current azimuth and elevation angles.

“Crane Graphic”（起重机图像）按钮打开一个对话框，用来创建起重机外表面图像。新模型文件保存起重机图像，能在装载编辑器/图像窗口中显示。外表面模型能根据当前的方位角和仰角实时更新。

If the geometry file being used for this analysis contains well defined crane parts, these part names can be entered in the “Use existing part name” dialogs, to better represent the crane surface geometry. For this introduction to crane geometry, we will use the wizard to create the various crane parts and will explain the values to enter in each input field.

如果用于此分析的模型文件里面包含完整定义的起重机部件，那么可以在“Use existing part name”（使用现有的部件名）对话框里输入这些部件名，这样可以更好的显示起重机的外表面模型。在起重机模型介绍中，我们可以用向导模块建立各种各样的起重机，并且完整解释在输入文件中的参数。

It is important to remember that some of the values to be entered here are independent of the previously defined crane parameters and others are based on those parameters. For all of the parts, a choice of nine colors is available. Gray, blue, green, cyan, red, magenta, brown, white and yellow.

重要的是要记住，在这里输入的有些值，与先前在起重机参数和其他以参数为基准的值无关。所有部件可以有九种颜色可供选择。灰色，蓝色，绿色，青色，红色，洋红色，棕色，白色和黄色。

Boom: Uses the following values (previously input) to define the base end: Main pin offset and Pin height ABL relative to the Longitudinal and Transverse location.

吊臂 用以下值（之前输入的）来定义基准点末端：相对于纵向和横向位置的主销偏离距离和销子距基线高度。

Boom length to sheave and Initial elevation angle determines the length of the boom and the direction of the boom's longitudinal axis from this end. If the elevation angle is 45°, the sections created will be perpendicular to the baseplane. The boom created is tapered from the hinge pin to tip consisting of rectangular sections. See crane graphic on next page where jib and boom are in red.

吊臂到滑轮长度和初始仰角决定了吊臂长度和吊臂纵向轴的末端。如果仰角是 45 度，产生的截面垂直于基准面。建立的吊臂从铰链销斜向到末端组成了一个矩形截面。请参阅下页起重机图，其中悬臂和吊臂为红色。

Jib: From the location of the sheave determined by the boom, the jib part is constructed based on the Main jib length and Jib angle. See crane graphic

on next page where jib and boom are in red.

悬臂 悬臂位置源自滑轮位置，滑轮位置取决于吊臂，悬臂部件由主悬臂和悬臂角度构成。请参阅下页起重机图，其中悬臂和吊臂为红色

Crane Fdn: The foundation height value entered is added to the Effective base height above BL.

起重机基座 输入的基座高度是指距基线的有效高度。

Crane Hse: The House length and width is centered over the longitudinal and transverse base center. The base of the house is located at the top of the foundation. A simple derrick is constructed on top of the house, shown in cyan in the graphic below.



Crane graphic

起重机室 起重机室的旋转中心在基准点纵向和横线中心。起重机室的底部位于基座的顶部。起重机室上方有简单的支架，在下面的图形中显示青色。

Top wires: Creates small parts connecting the sheave location to the point specified as the pin location. The pin height above base is the height above the top of the foundation/bottom of the house. Colored in green in the above graphical image.

上部钢丝绳 创建了连接滑轮位置到销子点的位置的小部件。销子基准面高度指距基座顶部/起重机室底部高度。在上图中显示的绿色。

Falls: Creates a part that always extends vertically downward from the sheave. The fall is colored green and hanging below the jib in the graphic above.

起重机绳 创建沿着滑轮垂直向下的部件。在上图中，起重机绳显示绿色并悬在悬臂下方。

Clicking the **Prepare specified geometry** button will create a run file, CRD_MAKE.RF, and automatically execute it to create a geometry file with any of the following extensions GFC, .GFD,.GFE and GFX. The geometry extensions are created in successive order as needed by the wizard to prevent overwriting crane models. If multiple cranes are included in the geometry it's important to remember which crane extension, eg. GFC, GFD etc., was last created, and should be used as a base to add the new surface models to, thereby preventing any unnecessary loss of geometry

点击 “**Prepare specified geometry**” （准备定义模型）按钮会创建运行文件

CRD_MAKE.RF, 自动运行这个文件，创建带有后缀名 “GFC, .GFD,.GFE 和 GFX 的模型文件。模型根据向导模块的需要创建一系列的后缀名，防止原起重机模型被覆盖。当模型文件里面有多个起重机时，重要的是要记住哪个模型后缀名 “GFC, GFD” 是最后被创建的，或者用哪个基本模型来建立新模型，因此这种做法可以预防意外丢失模型文件。

The crane parts made by the wizard in this way will be updated in the Condition Graphics display in Load Editor whenever the elevation or azimuth angle is changed.

无论仰角或方位角如何改变，在向导模块里面做出来的起重机部件都会更新到装载编辑器里的图像显示。

Crane Drawing Wizard

Crane 1 geometric parameters - Standard boom General orientation: Aft Fwd ?

Boom Color: red

Use existing part Boom part name: cr_boom

Make new part

Jib Color: red

Use existing part Jib part name:

Make new part

Crane Foundation

Make one Foundation height: 0.000

Crane house Color: cyan

Use existing part Part name:

Make new part House length: 8.000 House width: 7.000 House height: 7.000

Top wires Color: green

Wire set 1:

Use existing part Part name:

Make new part

Pin offset from base CL: -3.250 Pin height above base: 16.650

Wire set 2:

Use existing part Part name:

Make new part

Pin offset from base CL: 0.000 Pin height above base: 0.000

Falls Color: blue

MAIN sheave:

Use existing part Part name:

Make new vertical rope line Rope line length: 1.000

AUX sheave:

Use existing part Part name:

Make new vertical rope line Rope line length: 0.000

WHIP sheave:

Use existing part Part name:

Make new vertical rope line Rope line length: 0.000

OTHER sheave:

Use existing part Part name:

Make new vertical rope line Rope line length: 0.000

Enter the values shown in the template on the next page.

输入下一页模板数据。

6.0 Testing the Geometry Model 测试几何模型

Click OK to return to the main crane data entry window. Click the green Test button which will open a GHS window with a condition graphic image, a test dialog and a list of the crane parts created. From the Crane Test dialog, various hook loads and azimuth or elevation angles can be tested by making modifications and clicking the Update button. Click View in LE to open the LE window for testing.

点击确定返回起重机数据进入主界面。点击绿色的“Test”（测试）按钮，打开带有图像显示的 GHS 窗口，创建测试对话框和起重机部件目录。在测试对话框里，通过修改和点击更新各式吊钩吊重，仰角，方位角，来进行测试。点击“View in LE”（装载编辑器界面），打开装载编辑器进行测试。

When the wizard generated parts are not suitable for the actual crane, the user can create sail parts that represent the actual structure. For realism, the parts should be modeled in 3 dimensions rather than flat panels as is often used for wind area calculations. After clicking the View in LE button, Click Exit in the Load Editor window to return to the Crane Test dialog and OK to return to the Crane input dialog.

当向导模块生成的部件不符合实际的起重机时，使用者可以按照实际结构创建上层建筑部件。为了真实，应建立三维模型而不是平面模型，平面模型常常被在受风面积计算中。点击“View in LE”（装载编辑器界面），点击退出装载编辑器窗口，返回起重机测试对话框，点击确定返回起重机输入对话框。

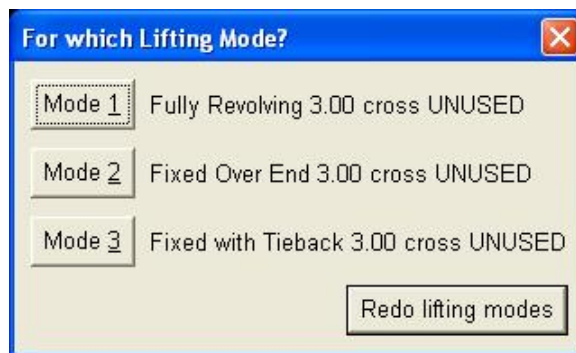
The screenshot shows the 'Crane Test' dialog box with the following data:

Field	Value
Lift number	1
Base location - Long	21.000a
Base location - Trans	0.000
Azimuth	0.0
Elevation angle	0.0
Hook	MAIN
Jib angle	90.0
Radius	27.50
Hook load	0.00

7.0 Setting Lifting Modes 设置起吊装模式

Click the **Main Hook Loads** button to input hook load capacities. The next dialog you will be presented with seeks information on lifting modes. One or more lifting modes can be defined, specifying fixed or rotational azimuth, list and trim maximums and whether a tieback is available. A lifting capacity table can then be applied to each specific mode.

点击“Main Hook Loads”（主钩吊重）按钮，载入吊钩起重量。下一个对话框显示寻找吊装模式。可以定义一个或多个吊装模式，设置方位锁定或自由旋转，最大横倾纵倾，是否使用系固设施。可以在各自吊装模式里设置相应的起重表。



Clicking the **Redo lifting modes** button presents you with a lifting modes definition dialog. options to create a capacity table for each mode.

点击“Redo lifting modes”（重置吊装模式）按钮，显示吊装模式定义对话框，给各自模式选择起重表。

The table can include capacities for up to 6 different modes of operation. If only one lifting mode is applicable for your crane then setting a mode title of Limit is sufficient.

起重表里包含的起重量可以给定多达 6 个不同的吊装操作模式。如果起重机只有一个吊装模式，那么设置一个吊装模式限定就足够了。

The first comment warns that once the lifting modes are defined in this step, additional modes cannot be added. The 3 default modes, fully revolving, fixed over end and fixed with tieback, may cover all modes of lifting for some vessels. A crane with multiple tieback locations, tieback lengths or variable impact levels (Azimuth angles) will require additional modes. The independent variable in the capacity table can be selected as the elevation (topping) angle, the crane radius or the boom radius. After setting the values or accepting the defaults and clicking OK, the following appears.

首先要提醒的是，一旦在这一步定义了起重机的吊装模式，其他模式就不能被添加了。三种默认的模式，全回转，定点起吊，定点起吊带有系固设施，对有些船来说，可以覆盖全部的吊装模式。有多个系固位置，长度，可变作用面（方位角）的起重机需要使用额外的模式。起重量表里面的变量可以选择仰角（顶部），回转半径或吊臂半径。在完成设置值或默认模式，点击确认，显示以下内容。

Define lifting modes

----> After the lifting modes are here defined, the descriptions can be changed, but no additional modes can be added.
 ----> A separate lift mode is required for each unique set of azimuth/list/trim and also for multiple impact levels etc.
 ----> If there is only one lift mode in use, the title can be Limit.
 ----> All hooks share the same lift modes, but each hook can assign its own impact levels etc.

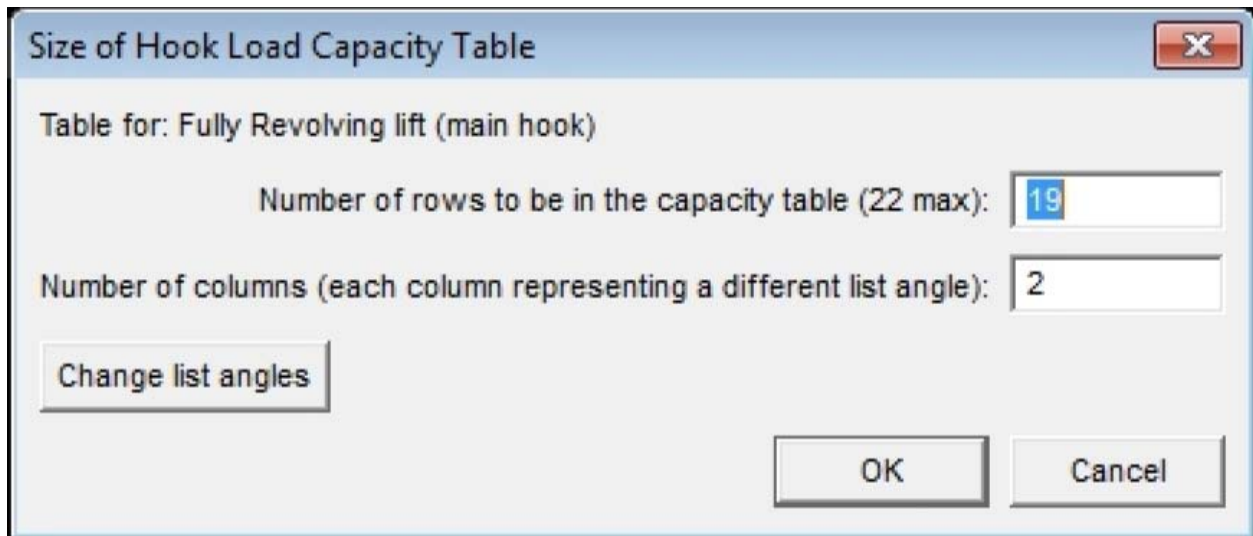
----> The "Fixed Azimuth" field should be blank in revolving modes.
 ----> The List Angle is also called the Cross Angle.

		Fixed Azimuth	Tieback	Maximum List	Warning List	Maximum Trim	Warning Trim	Fixed Radius
Mode 1:	Fully Revolving		No	3.00	2.65	2.00	1.65	
Mode 2:	Fixed Over End	0	No	3.00	2.65	2.00	1.65	
Mode 3:	Fixed with Tieback	0	Yes	3.00	2.65	2.00	1.65	12
Mode 4:			No	3.00	2.65	2.00	1.65	
Mode 5:			No	3.00	2.65	2.00	1.65	
Mode 6:			No	3.00	2.65	2.00	1.65	

Specify independent variable:

- Elevation Angle
- Crane radius
- Boom radius

8.0 Hook Capacity Table 吊钩能力表



Size of Hook Load Capacity Table

Table for: Fully Revolving lift (main hook)

Number of rows to be in the capacity table (22 max): 19

Number of columns (each column representing a different list angle): 2

Change list angles

OK Cancel

The table can contain up to 22 rows according to the independent variable selected previously. For elevation angles from 0° to 90°, 19 rows would be required. The number of columns is dependent on the number of list (cross) angles for which a capacity limit is to be specified.

根据先前选择的自变量，该表内容可以容纳多达 22 行。仰角从 0 度到 90 度，需要 19 行。列数的数量根据不同横倾角下的起重量来确定。

Next the capacity data is entered.

接下来输入起重量数据。

Fully Revolving Capacity (main hook)

Mode parameters

Fully Revolving 2 deg cross

No tieback Impact level, etc.:

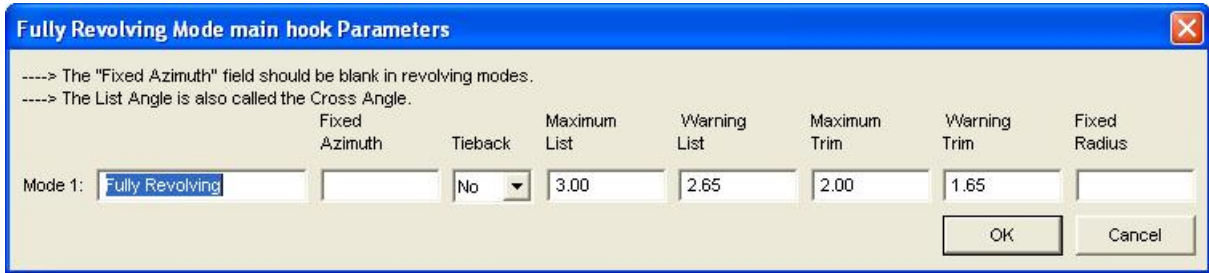
Note: The radius must decrease as you go down the table.

Capacity units:

Crane radius	Capacity@ list=0.00	list=1.00	list=2.00
100	157.3	157.3	157
95	175.1	175.1	166.1
90	194.2	194.2	176.2
85	215.3	215.3	187.4
80	238.9	238.9	200.1
75	265.9	265.9	214.4
70	297.3	297.3	230.8
65	334.6	330.3	249.7
60	379.8	358.9	271.8
55	436	392.6	297.9
50	506	433.1	300
45	585.5	434	302
40	589.5	435	304
38	591.3	436	305
36	593	436.5	306
34	594.8	437	307.1
24	594.8	437	307

The **Mode parameters** button returns you to an abbreviated version of the mode definition dialog. Impact level, etc. provides a field to enter a string description that pertains to this capacity table. After completing this step for all defined modes, the data is saved in the file CRANE1W.DAT.

“**Mode parameters**”（模式参数）按钮，返回到简化版的模式定义对话框。作用面等提供了一行描述关于起重表的区域。完成所有定义吊装模式之后，这些数据保存在文件 CRANE1W.DAT 里面



After completion of data entry in the main hook capacity table and clicking **OK**, the user is then presented with a Converted Table dialog, listing capacities in specified units at various elevation angles. Note - The program's internal version of the tables is organized by elevation angle, not radius (this is what you see in the converted table when you exit the table setup dialog box). When checking the reported capacity in the COOT or Crane Status you need to match the effective elevation, not effective radius, to the elevation in the capacity table. The reason for this is that the effective radius takes into account the height of the crane above the water -- how far it's leaning out due to the crane's trim.

PLEASE CHECK CAREFULLY!		
Capacity in LONG TONS		
Elevation	List	columns
10.00	17.86	13.39
15.00	17.86	13.39
20.00	16.07	12.95
25.00	16.07	12.95
30.00	15.18	12.50
35.00	15.18	12.50
40.00	14.29	8.93
45.00	13.39	8.93
50.00	13.39	8.04
55.00	12.50	8.04
60.00	12.50	8.04
65.00	12.50	8.04
70.00	12.50	6.25
75.00	11.61	6.25
80.00	11.61	6.25
85.00	10.71	4.46
90.00	8.93	4.46
90.00	8.93	4.46
90.00	8.93	4.46

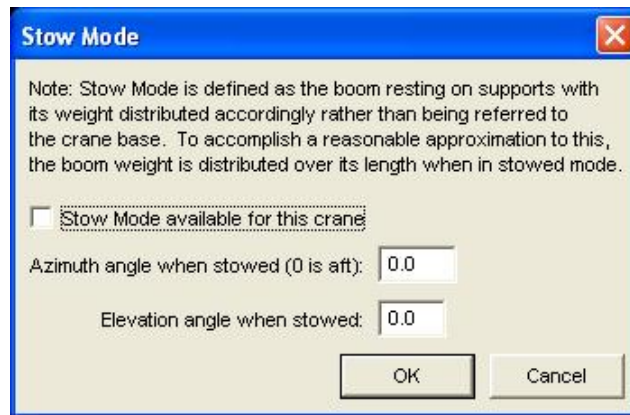
完成主钩起重表输入数据之后，点击确定，用户面前显示出转化表对话框，列出不同仰角下的定义起重重量。注：该程序内部版本中起重表由仰角构成，而不是半径（这就是当退出起重表设置对话框时在转化表里看到的）。当在 **COOT**(起重机操作输出表)或 **Crane Status**（起重机状态栏）点击输出起重重量报告时，需要使用有效仰角，不是有效半径，与起重表里的有效仰角相应。这样做的原因是，从有效半径是考虑的是起重机距离水面的高度-由于起重机的倾斜而探出的距离。

Press **OK** to exit back to the Crane Setup parameters dialog.

按确认键退出回到起重机参数设置对话框。

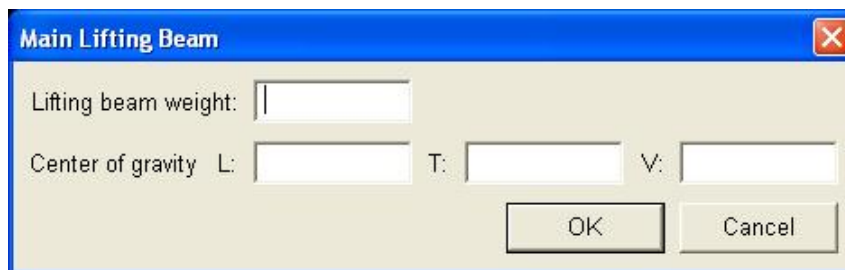
The **Stow Mode** button allows the user to select the position, azimuth and elevation, where the boom is considered stowed. When stowed, the crane is modeled as a distributed weight aboard the vessel.

“**Stow Mode**”（收起模式）按钮，允许用户设置收起吊臂时吊臂位置，方位角，仰角。当吊臂收起时，起重机重量被设计成均匀分布在船上。



If applicable, select **Lifting Beam** to input weight and L, T, V offsets of the main lifting beam.

如果适用，选择“Lifting Beam”（吊梁），输入其重量，和主吊梁的偏移距离 L,T,V。



For Conventional crane with Tieback the following additional fields will be filled in on the Crane parameters dialog:

常规带有系固设施型起重机，需填写以下起重机参数项：

Longitudinal Tieback lug location

纵向系固拉力点

Tieback lug height above baseline (ABL)

系固拉力点距基线高度

Tieback point on crane - height above baseline (ABL)

起重机系固点-距基线高度

Azimuth angle where tieback is possible

可发生的方位角

Select from the drop-down box how you would like the Crane Wizard to handle the tieback: Disregard tieback point on crane, User inputs tension, or Fixed tension.

从下拉菜单中选择起重机向导模块如何操作固系：忽略起重机系固点，用户输入的拉力，或固定拉力。

9.0 Crane Analysis 起重机分析

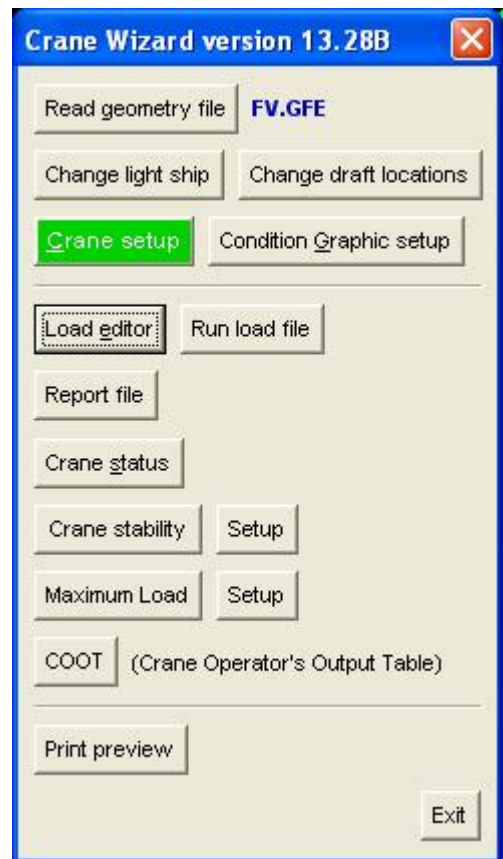
Once a crane has been modeled, analysis can be performed using the buttons below the horizontal line on the initial Crane Wizard window. There are two options provided for setting up an initial loading condition:

- 1) Run load file button
- 1) Run load file (运行装载文件) 按钮
- 2) The Load Editor button
- 2) Load Editor (装载编辑器) 按钮

A Load file should ONLY contain commands directly related to loading, such as ADD and Load. No crane load commands or other GHS commands should be included in this file.

装载文件里面只能含有直接关系到装载的命令，如 ADD(增加命令)和 Load (装载命令)。禁止在文件中出现起重机装载命令或其他 GHS 命令。

To enter loads manually, click the Load Editor button. A Load Editor window will open with a synchronized Condition Graphics session displaying the vessel with any cranes that have been configured. Full analysis for any intact or damaged



Tank Description	Status	Contents	Load Cu.Ft	Load%	Sounding
FOREPEAK BALLAST	Alt-3	SALT WATER	630.8	100.0	
FUEL DAY TANK	Alt-4	FUEL OIL	132.4	98.0	
FUEL DAY TANK	Alt-5	FUEL OIL	132.4	98.0	
LUBE OIL	Alt-6	LUBE OIL	141.7	98.0	
HYDRAULIC OIL	Alt-7	HYDR OIL	141.7	98.0	
ENGINE RM DBL BOTTOM	Alt-8	FUEL OIL	0.0	0.0	
ENGINE RM DBL BOTTOM	Alt-8	FUEL OIL	0.0	0.0	
POTABLE WATER TANK	Alt-9	FRESH WATER	133.9	98.0	
POTABLE WATER TANK	Alt-9	FRESH WATER	133.9	98.0	
WING TANK #1	WT1.S	FUEL OIL	0.0	0.0	
WING TANK #1	WT1.P	FUEL OIL	0.0	0.0	
WING TANK #2	WT2.S	FUEL OIL	0.0	0.0	
WING TANK #2	WT2.P	FUEL OIL	519.7	100.0	
WING TANK #3	WT3.S	FUEL OIL	0.0	0.0	
WING TANK #3	WT3.P	FUEL OIL	0.0	0.0	
DOUBLE BOTTOM #1	DB1.S	FUEL OIL	0.0	0.0	
DOUBLE BOTTOM #1	DB1.P	FUEL OIL	0.0	0.0	
DOUBLE BOTTOM #2	DB2.S	FUEL OIL	0.0	0.0	
DOUBLE BOTTOM #2	DB2.P	FUEL OIL	242.8	100.0	

Load percentage (right-click field to select) Total SALT WATER: 630.8 Cu.Ft FEET

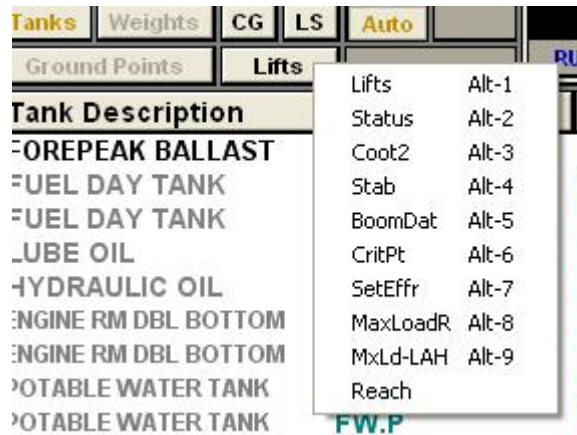
loading condition can be performed from this window. See LEWOP in the GHS Help menu for detailed operator instructions for the Load Editor interface. Tank loads can be

input from the tank loading screen and any added weight items can be included by clicking the Weights button. The CG button is useful if you mistakenly close the Condition Graphics window. If your GHS configuration includes Longitudinal Strength the LS button will be included for strength analysis.

进入手动装载，点击“**Load Editor**”（装载编辑器）按钮。打开装载编辑器窗口和配置起重机的同步图像显示器。由此窗口全面分析完整稳性和破舱稳性工况。在 GHS 帮助文件中见“LEWOP”，有装载编辑器界面的详细操作指南。在舱室装载界面装载舱室，点击“**Weight**”（重量）按钮增加重量条目。当由于误操作而关闭图像显示窗口时，“**CG**”（图形显示）按钮将起作用。如果你的 GHS 系统配置了总纵强度，可计入“**LS**”（总纵强度）按钮，用于总纵强度分析。

There is a Macro button, initially displaying the text label, LIFTS, corresponding to the Lifts macro. By right-clicking this button a lift of additional macros is displayed, these include:

有一个宏命令按钮，初始字体显示“Lifts”（起重机），相当于起重机宏命令。右击这个按钮，显示额外的起重机宏命令，它们包括：



Lifts – Solves for equilibrium in current lift condition.

Lifts（起重机） - 在当前吊装工况下求解平衡

Status – Status report to screen of tank loads and weight items, including crane.

Status（状态）- 在界面输出舱室装载和重量条目报告，其中包括起重机。

Coot2 – Full report of capacity of current load at azimuth angles 0-355.

Coot2（起重机报告输出表） -方位角从 0 度到 355 度，全面报告当前起重量

Stab - User defined stability checking macro. If the user has stability checking requirements not included in the crane stability setup section, these may be defined as macro U_STAB, contained in a separate run file and read into GHS prior to commencing the Crane wizard.

Stab (稳性)- 用户定义稳性校核命令。如果用户要求的稳性横准不在起重机稳性原有选项里，那么这些稳性横准被定义在 **U_STAB** 宏命令中，这个宏命令含在一个单独的运行文件中且在启用 **Crane wizard**（起重机向导模块）之前载入。

BoomDat – Provides details of boom, eg. Length, elevate

on angle, azimuth and provides user setting for main boom to jib angle.

BoomDat（吊臂数据）-提供详细的吊臂数据，例如长度，仰角，方位角，还提供用户设置从吊臂到悬臂的角度。

CritPt - Displays all critical points in effect

CritPt（进水点）- 显示所有实际进水点

SetEfr – Prompts user to set the effective radius and azimuth of the crane.

SetEfr（设置有效值）-提示用户设置起重机有效半径和方位角

MaxLoadR – Sets the maximum load at user specified effective radius and azimuth.

MaxLoadR（最大吊重）-在用户指定的有效半径和方位角设置最大吊重。

Mxld-lah – An alternative method with trace file to screen for calculating maxload.

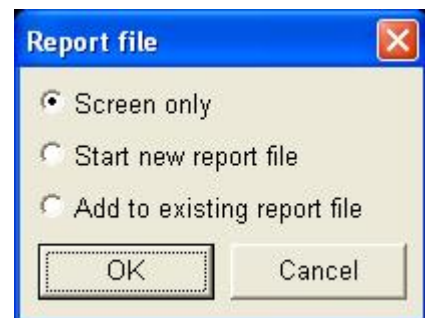
Mxld-lah（最大吊重）- 另外一种找出最大吊重的方法。

Reach - Displays a plan image of the vessel with a circle representing the current crane boom pick radius and boom.

Reach（达到）- 显示用圆圈表示当前起重机吊臂选取半径和吊臂的俯视图。

Click the Exit button to return to the main Crane wizard window, saving the current load condition. Please note that clicking “X”, instead of Exit, will simply exit the current GHS session without saving changes made during the session.

点击退出按钮返回起重机主向导模块窗口，保存当前工况。请注意,点击“X”,代替退出，简单的退出当前 GHS 会话，不会保存会话过程中所做的更改。



The following button selections are all found on the main Crane Wizard window.

下面是起重机向导模块主窗口上发现的所有按钮选择。

Prior to beginning further analysis, the user should decide whether to open a report file, append to an existing report or simply send output data to the screen. To open a report simply click the Report file button and select Start new report file. A subtitle can be provided at this stage or cancel to proceed. Set the report file name, page size, style and if necessary enter title page information. Click Open to open the report and return back to the main wizard window.

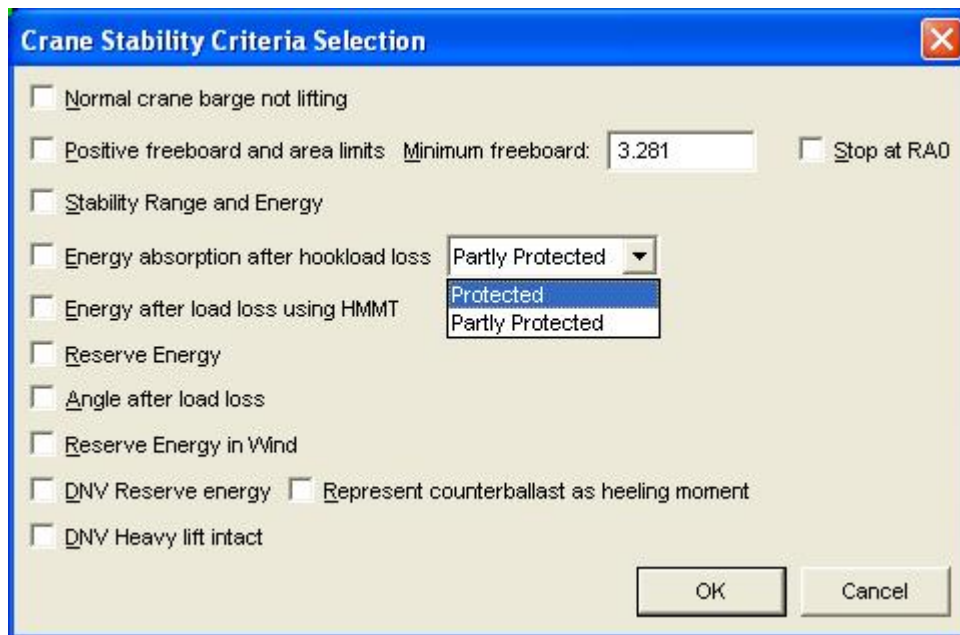
在开始进一步的分析之前，用户应决定是否打开报告文件，附加到现有的报告或简单地发送数据输出到屏幕上。打开一个报表只需点击报告文件按钮，选择开始新的报告文件。这时提供一个副标题或取消继续进行。设置报告的文件名，页面大小，样式，是否需要输入书名页的信息。点击打开以打开报告，并返回到主向导窗口。

For a complete weight, load and crane status of the current condition select the Crane Status button, then select one of the options presented to either send output to the screen, start a new report or append to an existing report file.

选择“Crane Status”（起重机状态）按钮，显示当前工况全面的重量，装载以及起重机状态。然后选择其中一项并发送到界面，开始一个新报告或者附加到现有的报告文件。

Before selecting the **Crane Stability** button, one must setup the applicable stability criteria. Select the **Setup** button to open the Stability Criteria Selection dialog and check the boxes next to all necessary criteria. Placing your mouse directly over each checkbox will display a tool-tip of the actual GHS limit commands activated by its selection.

选择“Crane Stability”（起重机稳性）按钮之前，必须设置适用的稳性横准。选择“Setup”按钮，打开稳性横准选择对话框，并检查旁边的所有必要的横准。将的鼠标直接悬停在每个复选框会显示提示栏，提示其选择可激活的 GHS 稳性横准命令。



Click **OK** after selecting the appropriate Criteria, then select the **Crane Stability** button to produce a righting arm curve including analysis of the previously selected stability criteria. Output will be sent to the chosen output device.

选择适用的横准后，点击确认，然后选择“Crane Stability”（起重机稳性）按钮，显示复原力臂曲线包括计算分析先前选定的稳性横准。输出信息将被发送到所选择的输出区域。

The next available button is **Maximum Load** and before the max load calculations can be performed one must select **SETUP**. Clicking Setup opens a dialog requesting the effective crane radius, azimuth angle, whether the specified angle is a single angle or an increment, a checkbox to allow excess angles at zero load or to use an experimental maxload algorithm. Finally, if a report file is to be written with maximum load data, that filename needs to be specified.

下一个可用的按钮是“Maximum Load”（最大吊重）和在执行最大吊重计算之前，必须选择“SETUP”（设置）。单击设置打开一个对话框，要求输入有效起重机半径，方位角，指定的角是单独角度还是角增量，选择框选择是否允许在零吊重时超过许用角度，

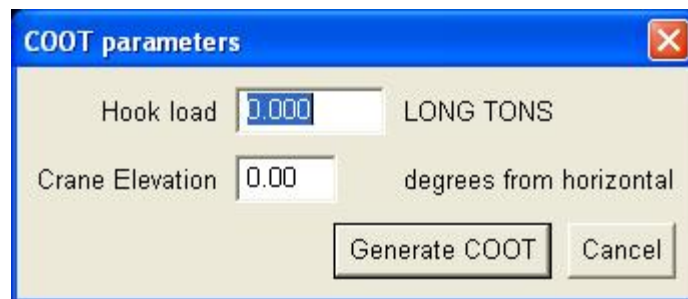
或使用吊重实验值。最后，如果报告文件用最大吊重数据编写，则定义该文件名。

Clicking **OK** returns to the main Crane wizard window where the **Maximum Load** button can now be selected. Maximum load output, directed to file or screen, consists of a condition and crane status report at the given azimuth angle or angles.

点击确认返回起重机主窗口，此时“Maximum Load”（最大吊重）按钮可选择。输出最大吊重到指定文件或者界面，输出包括装载工况和方位角或其他角度下起重机状态报告。

Selecting the **COOT** button, (Crane Operators Output Table), opens a dialog where hook load and crane elevation can be input, finally, selecting the Generate COOT button.

选择“COOT”（起重机操作输出表）按钮，打开一个对话框，输入吊钩吊物和起重机仰角，最后，选择“Generate COOT”（生成报告）。



The COOT, generates a detailed report, to report file or screen, of the effective elevation, effective radius, boom radius, net capacity, crane and vessel trim and list and lift height at azimuth angles 0 to 355 degrees.

该 COOT（起重机操作输出表），在报告文件或屏幕生成一份详细的报告，包括有效仰角，有效半径，有效吊臂半径，净起重量，起重机和船的横倾纵倾，方位角从 0 度到 355 度的吊重高度。