命令模式

FSMmt [(tanklist)] = f1 [,f2 [@ b2] [,f3 [@ b3]]] [/UNCONDitional] [/BOTHsides]

Assigns to one or more tanks a method of deriving free surface moments.

设定求解一个或多个舱室自由液面矩的方法。

FSMmt [(tanklist)]

Displays (on the screen only) the current free surface moments of the given tanks.

屏幕显示当前工况下给定舱室的自由液面矩。

参数说明

tanklist

The names of one or more tanks or groups which are to have their free surface moments changed or displayed. Tank names in the tanklist may end in an asterisk to represent all tanks whose names have the same beginning. If this parameter is omitted, the current tank selection is assumed (see the TANKS command for establishing a current tank selection).

所要改变或显示自由液面矩的一个或多个舱室。舱室名称可以用*结尾,表示选中所有以相同名称开头的舱室。如果省略此参数，默认选择当前激活舱室。（参看命令 TANKS 如何选择当前舱室）。

f1

The main function which defines the formal free surface setting for the selected tanks.

主参数，用于定义舱室形式的自由液面矩。

f1, f2 [@ b2]

With just two functions, the alternate function f2 is applied at the boundary b2 and to the smaller load range. However if b2=0.5, then f2 applies at load fractions >= to 0.5. If not specified, b2 defaults to 0.95.

两个参数，用于定义不同装载范围的舱室形式的自由液面矩。其中参数 f2 适用于装载小于 b2 的范围，但当 b2=0.5 时，f2 适用于装载大于等于 0.5 的范围。如果不指定，b2 默认为 0.95。

f1, f2 [@ b2], f3 [@ b3]

Three functions that define the formal free surface over different load ranges. The main function f1 is applied for loads between the boundary values b2 and b3. Alternate functions f2 and f3 are applied when the load is <= to the lower boundary and >= to the higher boundary. If not specified, boundaries default to 0.95 (but b2 and b3 must differ).

三个参数，用于定义不同装载范围的舱室形式的自由液面矩。主参数 f1 适用于装载范围在 b2 和 b3 之间。f2 适用于装载小于等于 b2 的范围，f3 适用于装载大于等于 b3 的范围。如果不指定，装载范围默认为 0.95（b2 和 b3 必须不同）。

/UNCONDITIONAL

Makes constant free surface moments persist even when the tank is empty or full. If not present, the FSM value is zero when the tank is empty or full. Applies universally, even if f2 and f3 are specified.

设置自由液面矩为固定值，即使舱室是空的或满的也同样适用。如果不加此参数，舱室满时或空时，自由液面矩为 0。普遍适用，即使指定了 f2 和 f3。

/BOTHSIDES

Causes the calculation for PRESENT and [V]MAX functions to be done at both the current and opposite-side heel angles, with the greater value assigned to the function. Note [V]MAX sets the load having maximum FSM at the current heel angle, even if a load having higher FSM was found on the opposite side.

在计算时，当前浮态和对称的反向横倾角都要考虑，以求取两者的最大值。注意 [V]MAX 设置在当前横倾角处具有最大 FSM，即使在反方向横倾时发现具有较高 FSM 也是如此。

Operation

操作

The FSMMT command assigns up to three functions to the named tank(s) that determine how free surface moments are to be derived in subsequent calculations.

命令 FSMMT 中附加的三个参数决定下面的计算中如何求得自由液面矩。

Six forms are available for functions f1, f2, and f3 (which can be shortened to a single letter):

参数 f1, f2, 和 f3 有 6 种形式（可以简写为单个字母）。

1) TRUE means that true free surface moments are to be used, which is the "default" assignment prior to any FSMMT command. A true free surface moment is calculated whenever required by the formula: FSM = I * P * D, where I is the tank waterplane moment of inertia, P is the tank permeability, and D is the density of the tank contents.

1） TRUE 表示实际的自由液面矩，是 FSMMT 命令默认设置。实际的自由液面力矩由下列公式 FSM = I * P * D 计算，I 表示液面的惯性矩，P 表示舱室渗透率，D 表示舱容物质密度。

2) FREE is like TRUE, except it uses the waterplane inertia taken about the ship's centerline, as if the tank were freely connected to its mirror image on the opposite side of the vessel. This allows interconnected port and starboard tanks to be modeled separately so their loads can be set differently (as if due to some pressurization).

2） 参数 FREE 作用同参数 TRUE 相似，不同在参数 FREE 考虑基于船中对称的惯性矩，类似舱室可以与以船中镜像的另一舷的舱室自由连通。它用于左右舷相连通的舱室建立独立的模型，使之可以分别装载（比如因压力不同）。

3) PRESENT means that the particular free surface moment present at the time of the FSMMT command is assigned to the tank as a constant value.

3） 参数 PRESENT 表示将当前自由液面矩作为固定值赋予舱室。

4) MAX [:KEEP] first finds the maximum free surface moment (of all loads at the present heel and trim), then assigns it to the tank as a constant value. The tank's present load is changed to the maximum FSM load unless the KEEP subparameter is

present. This form cannot be used for alternate functions unless the main function is also MAX.

4） 参数 MAX 首先基于当前浮态计算所有装载工况，找到自由液面力矩最大的工况，根据此工况装载舱室，然后把最大的自由液面力矩作为固定值赋予舱室。除非存在 KEEP 子参数，否则舱室的当前 FSM 将更改为最大 FSM 值。这种形式不能用作第二种参数，除非主参数也是 MAX。

5) VMAX is like MAX, except that the level in the tank is set such that the sum of free surface moment and vertical moment of volume is at its maximum. Heel and trim angles must have been set to zero.

5） 参数 VMAX 作用同参数 MAX 相似，不同在于参数 VMAX 设定的舱室装载液位使其自由液面矩和容积垂向力矩之和为最大值。横倾角和纵倾角必须设置为 0。

6) A numerical value which becomes the constant free surface moment value. (If f1 is a constant, the FSMMT command cannot be abbreviated to avoid confusion with FSMFLOOR.)

6） 设定某数值作为自由液面力矩的固定值。（如果 f1 是固定值，命令 FSMMT 不能被简写以避免与命令 FSMFLOOR 相混淆。）

In forms other than TRUE and FREE, the free surface moment value is constant except that it normally becomes zero when a tank is completely empty or full. However if the /UNCONDITIONAL parameter is present, the FSM value remains constant even at empty and full loads.

除了 TRUE 和 FREE 的形式外，自由液面矩是固定值，但是当舱室装载为满载或空舱时自由液面矩为 0。当然如果出现参数/UNCONDITIONAL，在舱室装载为满载或空舱时，自由液面矩仍保持不变。

Because the function assigned for deriving free surface moments does not always yield the true free surface moment, the value given by the function is called a "formal" FSM value.

因为按照设定的方法求得的自由液面矩并不总是和实际的力矩相符，所以按照设定的方法求得的自由液面矩被称为“形式”力矩。

In the case of flooded and frozen tank types, the FSM value is regarded as zero, even if a constant value has been assigned.

在舱室进水或冻结的情况下，自由液面矩被认为是 0，即使已经指定了固定值。

The STATUS /FSM command shows the FSM values yielded by the assigned functions in the condition at the time the STATUS command is given, and it marks with an asterisk those which depart from true free surface moment values.

命令 STATUS /FSM 会根据当前设置，显示自由液面矩。形式力矩和实际力矩不符的舱室会用星号*加以标注。

Display Output

输出显示

Display mode occurs when FSMMT is issued without a parameter or with only a tank list, in which case the value currently assigned to each tank is displayed on the screen. If the value is a constant it is followed by the word "FIXED", and "UNCOND" if it does not become zero when empty and full.

当运行命令FSMMT不附加任何参数或值附加舱室名称时，会屏幕显示所选舱室的自由液面矩值。当自由液面矩值为固定值时，则会显示文字"FIXED"。且当装载为空或者为满舱时，则会显示文字"UNCOND"。

Nondisplay Output:

非显示输出

none.

无

Examples

样例

Specifying true free surface moments for all tanks:

设定舱室自由液面矩为实际自由液面矩：

FSMMT (*) = TRUE

Maximizing the sum of free surface moment and vertical moment of volume for cargo tanks:

设置货舱自由液面矩和容积垂向矩之和为最大值：

HEEL = 0 | TRIM = 0

FSMMT (CARGO*) VMAX

Assigning free surface moments to all tanks beginning with "FO" – maximum below 95% load and equal to the 95%-load FSM at 95% and above (except zero when empty and full) - all derived at zero trim and 5 degrees heel:

在纵倾为 0 度，横倾 5 度的浮态下，设置名字以"FO"开头的所有舱室，在装载 0.95 下的自由液面力矩最大值：

TRIM = 0

HEEL = 5

TANK FO*

LOAD = 0.95

FSMMT = MAX, PRESENT

Assigning a two function formal free surface moment where the FSM is set to the largest value at any tank load for loads greater than 5% but less than 1, or to constant 0.65 for loads greater than 0 but less than or equal to 5%:

在舱室装载大于 5%小于 1 时，设置自由液面矩为最大值，在舱室装载大于 0 小于 5%时，设定自由液面矩为 0.65：

FSMMT = MAX, 0.65 @ 0.05

Assigning a three function formal free surface moment where the FSM is set to the maximum for loads greater than 2% but less than 98%, or to zero for loads closer to empty or full:

当装载大于 2%小于 98%时，设置自由液面矩为最大值；在装载接近满载或空舱时，设定自由液面矩为 0：

FSMMT = MAX, 0 @ 0.02, 0 @ 0.98

Displaying all present free surface moments on the screen:

屏幕显示当前所有自由液面矩：

FSM