

命令模式

SOLve [DRAFT | DEPTH] [TRIM] [HEEL] [WEIGHT] [LCG] [TCG] [VCG] [MAXVcg[:"item"]] [/GM: method] [/RAMACRO[:name]] [/GMRA]] [MAXWeight[:"item"]] [/GMRA]] [/NOMMT] [/FIRSTMAX] [/FIXDIR] [/FSM | TRUEFSM | EXTRAFSM [:UPright]] [/INIT] [/TOL:tolerance]

Solves for the variable(s) indicated by the given parameters, optionally taking into account a Free Surface Moment. With no parameters: solves for depth, trim and heel simultaneously.

求解由指定参数标示的变量，还可同时考虑自由液面矩。如果没有参数：则同时求解吃水、纵倾和横倾。

参数说明

DRAFT or DEPTH

Finds the depth at which displacement equals total weight.

求出排水量和总重平衡时的吃水。(译者注：实际是原点到水线面的垂直距离)值。

TRIM

Finds the trim at which trimming moment equals trim righting moment. Also maintains weight equilibrium by adjusting depth.

求出纵倾力矩等于纵向回复力矩的倾斜值。同时通过调整吃水保持重量平衡。

HEEL

Finds the heel at which heeling moment equals heel righting moment. Also maintains weight equilibrium by adjusting depth.

求出横倾力矩等于横向回复力矩的倾斜值。同时通过调整吃水保持重量平衡。

WEIGHT

Finds the Light Ship weight at which displacement equals total weight.

求出空船重量，使得排水量等于总重。

LCG

Finds the Light Ship LCG at which the trim righting moment is zero. Requires weight equilibrium.

求出空船纵向重心，使得纵向回复力矩为0。要求重量平衡。

TCG

Finds the Light Ship TCG at which the heel righting moment is zero. Requires weight equilibrium.

求出空船横向重心，使得横向回复力矩为0。要求重量平衡。

VCG

Finds the Light Ship VCG at which the heel righting moment is zero. Requires weight equilibrium.

求出空船垂向重心，使得横向回复力矩为0。要求重量平衡。

MAXVCG [:"item"] [/GM:method] [/RAMACRO [:name]]

Finds the maximum VCG of the named item (or the Light Ship if none) under the current transverse stability criterion (see the LIMIT command). If /GM is present, the given GM calculation method is used (see the RA command). If /RAMACRO is present, the named macro ("RAMACRO" by default) is responsible for defining the output real variable RAH_RA to equal the effective heel righting arm in current length units based on the current heel. Not available in BHS.

求出指定项目（默认为空船）在当前横向稳性衡准（详见 LIMIT 命令）要求下的最大 VCG（译者注：极限重心高）。如果出现 /GM，则使用 GM 计算方法（详见 RA 命令）。如果出现 /RAMACRO，则用指定宏（默认为“RAMACRO”）定义实变量 RAH_RA 的输出，使之等于当前横倾在当前长度单位下的有效横向回复力臂。不适用于 BHS。

MAXWEIGHT [:"item"]

Finds the maximum weight of the named item or PULL force (or the Light Ship if none) under the current transverse stability criterion (see the LIMIT command). Not available in BHS.

求出指定项目或拉力（默认为空船）在当前横向稳性衡准（详见 LIMIT 命令）要求下的最大重量。不适用于 BHS。

/GMRA

Causes GM to be calculated from righting arms rather than from the waterplane (see the RA command for more information; applies to MAXVCG and MAXWEIGHT).

使得 GM 从回复力臂进行计算，而不是从水线面（详见 RA 命令；适用于 MAXVCG 和 MAXWEIGHT 命令）

/NOMMT

Causes heel/trim solving to ignore any external heeling or trimming moments.

使得在求解横倾/纵倾时，忽略所有外部横倾或纵倾力矩。

/FIRSTMAX

Makes MAX in the LIMIT command refer to the angle at the first-encountered maximum RA.

使得 LIMIT 命令中 MAX 值等于第一次出现最大回复力臂时的角度值。

/FIXDIR

Keeps the heel direction from changing when solving for maximum VCG or maximum weight. The direction of heel goes according to the ANGLES list.

当求解最大 VCG 或重量时，保持现有横倾方向。横倾方向遵循角度列表。

/FSM | TRUEFSM | EXTRAFSM [:UPRIGHT]

Temporarily increases the VCG by applying the specified Free Surface Moment (only applicable when HEEL, TRIM, MAXVCG, or EXTRAFSM are being found). See the RA command where these parameters perform a similar function. If not initially in equilibrium or the UPRIGHT subparameter is present, the VCG is temporarily increased according to the free surface moments existing at zero heel and trim (with the tanks

effectively frozen) for the duration of the SOLVE operation, in accordance with traditional methods of applying FSM; otherwise the CG is temporarily elevated perpendicular to the existing equilibrium waterplane. The UPRIGHT subparameter also communicates to any subsequent RA /FSM command that the FSM is to be applied from an upright waterplane (see the RA command section "Applying Free Surface Moment").

通过增加额定自由液面矩的方法（仅当横倾、纵倾、最大 VCG 或 EXTRAFSM 确定时适用）暂时增加 VCG。这些参数用法类似，详见 RA 命令。如果初始状态不平衡或 UPRIGHT 子参数出现，那么根据求解时，正浮状态下现有自由液面矩（有效冻结舱室），导致 VCG 暂时增加，这和传统增加自由液面矩的方法一致；否则，重心相对于现有平衡水线面垂直增加。UPRIGHT 子参数也可和任何 RA/FSM 命令进行通讯，其中自由液面矩的增加来自正浮水线面（详见 RA 命令中“施加自由液面矩”）

/INIT

Initializes heel and trim to zero along with any history-dependent program data prior to solving, in order to ensure repeatability of results regardless of history.

在求解之前，初始化横倾和纵倾为 0，也初始化所有历史系统数据，从而保证结果重复性不受历史数据影响。

/TOL: tolerance

Supplies a tolerance to be used when solving for maximum VCG or maximum weight. The units of tolerance are length (for VCG) or weight. This feature should be used with caution, for it may reduce the accuracy of the results.

当求解最大 VCG 或重量时，提供一个可用公差。公差单位为长度或重量单位。该参数慎用，因为其可能会降低结果的准确性。

Operation

操作

One or more of the variables may be named in any order. The SOLVE command causes the value of each variable to be found in turn while holding all of the others constant. It will not, however, solve for depth/draft, trim or heel if they have been declared fixed via the FIX command.

单个或多个变量可按任何次序进行命名。SOLVE 命令使得每个变量值依次定义，同时保持其他变量不变。然而，如果吃水、横倾或纵倾通过 FIX 命令定义了，那么 SOLVE 命令不会对这些变量进行求解。

One of the Free Surface Moment parameters may be included if heel or maximum VCG or maximum weight is being found. If /FSM or /TRUEFSM is specified, tank loads are not allowed to shift and the C.G. is temporarily raised while the solution is being found.

如果定义了横倾、最大 VCG 或最大重量，则可包含其中一个自由液面矩参数。如果定义了 /FSM 或 /TRUEFSM，则不允许改变舱室装载，并且求解时会临时增加重心高度。

If no attributes are named, depth, heel and trim are solved simultaneously (unless one of them is Fixed). One of /FSM, /TRUEFSM and /EXTRAFSM may be included.

如果未命名任何属性，则同时求解吃水、横倾和纵倾（除非某个参数被指定了）。可包含/FSM, /TRUEFSM 或 /EXTRAFSM 其中之一。

Solving for weight and C.G. respects trimming/heeling moments in effect from the TMMT or HMMT commands. The changes are made to the Light Ship without affecting any tanks or added weights (unless there are no tanks or added weights in the model, in which case the total weight is adjusted).

关于纵倾/横倾力矩求解重量和重心，实际上是通过 TMMT 和 HMMT 命令。在不改变任何舱室和固有重量的情况下，改变空船重量（除非模型中没有任何舱室或固有重量，这种情况下，则调整总重）。

The MAXWEIGHT and MAXVCG modes require that a stability criterion be defined.

MAXWEIGHT 和 MAXVCG 要求设定一个稳性衡准。

The process used here is essentially the same as that employed by the MAXVCG command. Depth, trim and heel are also changed so that the vessel is left in equilibrium, taking into account any FSM parameter and the new VCG or weight value.

这里使用的方法本质上和 MAXVCG 命令相同。吃水、纵倾和横倾变化，并且在考虑自由液面矩参数和新 VCG 或重量值的情况下，保持船舶平衡。

The following dependencies should be considered:

以下条款需周知：

- 1) Solving for trim or heel requires equilibrium in weight vs. buoyancy; hence the depth will automatically be adjusted as well (so if depth is fixed, trim and heel are also fixed).
- 1) 求解纵倾或横倾，要求重力和浮力平衡；因此吃水会被自动调整（如果吃水给定，则纵倾和横倾也为固定）
- 2) Solving for heel generally will upset trim equilibrium and vice versa (unless both heel and trim are solved for simultaneously using the no-parameter form of the command).
- 2) 求解横倾时，通常会影响到纵倾平衡，反之亦然（除非使用命令的无参数形式同时求解横倾和纵倾）
- 3) If added weight and/or tank parts are present, solving for weight or C.G. changes only the Light Ship weight and center.
- 3) 如果给定舱室状态和固定装载，求解只会改变空船的重量重心。
- 4) Solving for LCG brings the trim righting arm to zero, but may change heel righting arm; solving for TCG or VCG zeroes the heel righting arm while upsetting trim righting arm.

4) 求解 LCG 使得纵向回复力臂为 0, 但同时可能改变横向回复力臂; 求解 TCG 或 VCG 时, 使横向回复力臂为 0, 但同时影响纵向回复力臂。

Output

输出

None.

无

Examples

样例

Solving for depth, trim and heel:

求解吃水、纵倾和横倾:

SOLVE

Same, but using the formal FSM:

同上, 但使用自由液面矩形式:

SOLVE /FSM

Solving for weight and LCG (Light Ship):

求解重量和 LCG (空船)

VCG = 15

SOLVE WEIGHT, LCG

Solving for weight, LCG and TCG (2 iterations):

求解重量、LCG 和 TCG (重复 2 次)

VCG = 15

HEEL = 5

TRIM = 1.5/

DRAFT = 10 @ 72f, 12 @ 83a

SOLVE WEIGHT, LCG, TCG, LCG, TCG

Solving for the maximum VCG:

求解最大 VCG:

SOLVE MAXVCG

Solving for the maximum weight of a crane load:

求解吊车载荷的最大重量:

SOLVE MAXWEIGHT: "CRANE LOAD"