

命令模式

SEAKEEPING [/HULL:part[\component]] [/HEADING:h1,...,hn] [/SPEED:s1,...,sn]
 [/SAMPLES:n[,min,max]] [/CONFIDENCE:percentage[,hours]] [/PERIOD]
 [/CRTPT:num1,...,numn] [/BF:beamfactor] [/LF:lenfactor] [/NODAMP]
 [/SHW[:num1,...,numn]] [/MSI[:num1,...,numn]] [/TIME:hours]
 [/DATA[:[datadir\]datalist]] [/RESPONSE[:responselist]]
 [/[CASE]SUMMARY[:summarylist]] [/POLAR[:polarlist]] [/MIRror]
 [/SLAM[:location | FRA[,velocity]]] [/GUnit] [/RELATIVE]
 [/ROLLCOEF:d% | b1[,b2[,b3]]] [/BILGEKEEL:part[\component],...]
 [/ROLLTANK:part[\component],...] [/SPREAD[:angle[,div] | datafile]
 [/BOX] [/COUPLE[:l,t,v]] [/UNCOUPLE[:m,...]] [/SPECTRUM]
 [/EMG[:num1,...,numn]] [/NOPlot[:RAO]] [/BRIEF]

Invokes a linear, 6-degree-of-freedom, frequency-domain, boundary element strip theory method to compute vessel motions (requires the SK module). Output includes absolute and relative position/velocity/acceleration RAOs and phase angles, as well as response statistics and/or derived responses for the vessel Center of Gravity and any specified Critical Points.

调用线性、6 自由度、频域、边界元切片理论方法来计算船舶运动（需要 SK 模块）。输出包括绝对和相对位置/速度/加速度 RAO 和相位角，以及船舶重心和任何指定临界点的响应统计和/或派生响应。

SEAKEEPING DATA dataspec [/HYFO:forcingfile] [/dataparams]

Starts seakeeping in data mode, accepting input from the specified data file, respecting * wildcard to accommodate multiple cases. Data mode prevents numerical solving for the current condition, instead using external RAO data (unless the /HYFO parameter is present) to compute responses and statistics in the given seaway, allowing * for unknown data fields.

在数据模式下开始计算适航性，接受来自指定数据文件的输入，遵循 * 通配符以适应多种情况。数据模式阻止对当前条件进行数值求解，而是使用外部 RAO 数据（除非存在/HYFO 参数）来计算给定航道中的响应和统计信息，允许 * 表示未知数据字段。

SEAKEEPING LIMIT [(n)] limit [,mode, response] < | > minmax

Defines a dynamic limit to evaluate and plot during seakeeping analysis.

定义在适航性分析期间评估和绘制的动态极限。

SEAKEEPING LIMIT [(n)] COMBINE n1, ..., nn

Defines a combined limit for multiple dynamic limits.

定义多个动态限制的组合限制。

SEAKEEPING LIMIT [(n)] OFF

Deletes the nth limit, or all seakeeping limits if (n) is omitted.

删除第 n 个限制，如果省略 (n) 则删除所有适航限制。

SEAKEEPING LIMIT [(n)]

Displays one or all seakeeping limits to the screen.

在屏幕上显示一个或所有适航限制。

参数说明

/HULL: part[\compartment]

Specifies the hull component to be used in the seakeeping analysis. If only a part name is included, its first component is used. If omitted, the first HULL component or (if absent) the first displacer component is used.

指定要在适航性分析中使用的船体组件。如果仅包含部件名称，则使用其第一个组件。如果省略，则使用第一个 HULL 组件或（如果不存在）第一个提供浮力的组件。

/HEADING: h1, ..., hn

Specifies a list of wave headings (in degrees) with respect to the forward longitudinal ship axis; the default is 180 degrees for head seas. Note polar plots need at least 2 headings.

指定相对于前纵向船舶轴的波浪航向列表（以度为单位）；对于迎浪，默认值为 180 度。请注意，极坐标图至少需要 2 个迎浪角度。

/SPEED: s1, ..., sn

Specifies a list of forward ship speeds in knots; the default is zero for a stationary vessel.

指定以节为单位的前进船速列表；静止的默认值为零。

/SAMPLES: n[, min, max]

Specifies the number of wave component samples from a wave spectrum in the range 1 to 100; the default is 15. If frequency min and max are included, wave spectra are sampled over the specified frequency range using a constant bandwidth method; otherwise sampling uses a constant variance method, so more sampling will occur around the spectrum peak. This parameter is ignored if WAVE (SPECTRA) is undefined or specified a range of wave periods.

指定波谱中波分量样本的数量，范围为 1 到 100；默认值为 15。如果包括最小频率和最大频率，则使用恒定带宽方法在指定频率范围内对波谱进行采样；否则，采样使用恒定方差方法，因此将在频谱峰值周围进行更多采样。如果未定义 WAVE (SPECTRA) 或指定了波周期范围，则忽略此参数。

/CONFIDENCE: percentage [,hours]

Allows computation of extreme response amplitudes in irregular waves by specifying a confidence percentage and optional time interval in hours (overriding any /TIME parameter). The extreme amplitudes are computed for all modes and added to the response statistics and any summary tables.

允许通过指定置信百分比和可选的时间间隔（以小时为单位）来计算不规则波中的极端响应幅度（覆盖任何/TIME 参数）。计算所有模式的极端幅度，并将其添加到响应统计量和任何汇总表中。

/PERIOD

Plots RAOs and phase angles over wave period instead of default frequency.

绘制波周期内的 RAO 和相位角，而不是默认频率。

/CRTPT: num1, ... , numn

Specifies a list of Critical Point numbers used for seakeeping (up to 25 points are supported).

指定用于适航的关键点数字列表（最多支持 25 个点）。

/BF: beamfactor

Specifies the "beam factor" used to develop the 2D panels; the default is $L_s/8$, where $L_s=bs$ if $bs<hs$, else $L_s=hs$, where bs is the section width and hs is the section height. The maximum panel length is then $bs/8$. The beam factor also implicitly sets the minimum panel length as half the maximum panel length (or $bs/16$ by default).

指定用于开发 2D 面板的“宽度系数”；默认值为 $L_s/8$ ，其中 $L_s=bs$ 如果为 $bs<hs$ ，否则 $L_s=hs$ ，其中 bs 是截面宽度， hs 是截面高度。最大面板长度为 $bs/8$ 。宽度系数还隐式将最小面板长度设置为最大面板长度的一半（或默认为 $bs/16$ ）。

/LF: lenfactor

Specifies the "length factor" used to refine the number and spacing of 2D sections; the default is 50.0, meaning the minimal longitudinal section spacing is 2% of the overall length.

指定用于优化 2D 截面的数量和间距的“长度因子”；默认值为 50.0，这意味着最小纵向截面间距为总长度的 2%。

/NODAMP

Omits non-wave-related hull roll damping terms, including hull eddy, hull friction, hull lift, and any /ROLLCOEF damping. Appendage effects are retained.

省略与波浪无关的船体侧倾阻尼术语，包括船体涡流、船体摩擦、船体升力和任何/ROLLCOEF 阻尼。保留附体效应。

/SHW [:num1, ... , numn]

Computes the probability and frequency of "shipping water" deck immersion events for the given list of Critical Point numbers (up to 25). If omitted, all seakeeping Critical Points are included. Probabilities are computed using the relative motions at each location, and freeboards are computed as the vertical heights of points above the waterplane. Frequency is computed over the /TIME interval.

计算给定临界点编号列表（最多 25）的“附连水”甲板浸水的概率和频率。如果省略，则包括所有适航临界点。概率是使用每个位置的相对运动计算的，干舷是计算为水平面上方点的垂直高度。频率是在 /TIME 间隔内计算的。

/MSI [:num1, ... , numn]

Computes the Motion Sickness Incidence (closely based on Bureau Veritas methods) for the given list of Critical Point numbers (up to 25). If omitted, all seakeeping Critical

Points are included. Exposure time defaults to 2 hours unless overridden by the /TIME parameter.

计算给定临界点数列表（最多 25 个）的晕船病发生率（紧密基于 BV 船级社的方法）。如果省略，则包括所有适航临界点。经历时间默认为 2 小时，除非被 /TIME 参数覆盖。

/TIME: hours

Defines the time interval in hours for computations like /CONF and /SHW; the default is 24.

定义 /CONF 和 /SHW 等计算的时间间隔（以小时为单位）；默认值为 24。

Datadir\

Subdirectory or absolute path for creation of data files; the default is the current directory.

用于创建数据文件的子目录或绝对路径；默认值为当前目录。

datalist

One or more of the following data types: FORCING, HYDROS, RESPONSE, STATS, TANKS, VARIANCE, WAVES.

以下一种或多种数据类型：FORCING, HYDROS, RESPONSE, STATS, TANKS, VARIANCE, WAVES。

/DATA [[:datadir\]datalist]

Outputs the specified data files containing raw forcing, hydrodynamic, response, statistics, variance, and/or wave seakeeping data. If omitted, no data files are created; if just /DATA is present, all data files will be created. Data is output into any datadir to files named FORCING.DAT, HYDROS.DAT, RESPONSE.DAT, STATS.DAT, TANKS.DAT, VARIANCE.DAT, and WAVES.DAT prefixed by "SK[casenumber]-". Any existing data files with this prefix are automatically deleted from the directory before new files are created.

输出包含原始受力、流体动力学、响应、统计、方差和/或波浪适航数据的指定数据文件。如果省略，则不会创建任何数据文件；如果仅存在 /DATA，则将创建所有数据文件。数据被输出到名为 FORCING 的文件的任何数据目录中。FORCING.DAT, HYDROS.DAT, RESPONSE.DAT, STATS.DAT, TANKS.DAT, VARIANCE.DAT 和 WAVES.DAT 以“SK[案例编号]-”为前缀。在创建新文件之前，将自动从目录中删除具有此前缀的任何现有数据文件。

responselist

One or more of the following response types: POSITION, VELOCITY, ACCELERATION.

以下一种或多种响应类型：位置、速度、加速度。

/RESPONSE [[:responselist]

Limits report and data file output to only the specified responses. If omitted, all are included.

将报告和数据文件输出限制为仅指定的响应。如果省略，则包括所有内容。

summarylist

One or more of the following summary types: PERZUC, PERMAX, RMS, AVE, AVE10, SIG, MAX100, MAX1000, MAX10000, EXTR.

以下一种或多种摘要类型：PERZUC、PERMAX、RMS、AVE、AVE10、SIG、MAX100、MAX1000、MAX10000、EXTR。

/[CASE]SUMMARY [:summarylist]

Concludes the report with the specified response summary tables. If no subparameters are present, RMS values will be displayed for spectra wave types, or absolute response amplitudes otherwise. If multiple cases are present (i.e. multiple headings or speeds) the concluding summary table will display the maximum response values over all cases along with their case numbers. If /CASESUM is used, a case-specific summary table will also be included at the end of each case. The EXTR subparameter requires the use of the /CONF parameter.

使用指定的响应摘要表结束报告。如果不存在子参数，将显示频谱波类型的 RMS 值，否则将显示绝对响应幅度。如果存在多个案例（即多个标题或速度），结论摘要表将显示所有工况的最大响应值及其工况编号。如果使用/CASESUM，则每个工况的末尾还将包含特定于工况的摘要表。EXTR 子参数需要使用/CONF 参数。

polarlist

One or more of the following polar types: VAR, PERZUC, PERMAX, RMS, AVE, AVE10, SIG, MAX100, MAX1000, MAX10000, EXTR, SHWP, SHWN, MSI, SLAMP, SLAMN, EMGP, EMGN.

以下一种或多种极性类型：VAR、PERZUC、PERMAX、RMS、AVE、AVE10、SIG、MAX100、MAX1000、MAX10000、EXTR、SHWP、SHWN、MSI、SLAMP、SLAMN、EMGP、EMGN。

/POLAR [:polarlist]

Includes a concluding polar plot for the specified response identifiers. If none are given, RMS values will be displayed for spectra wave types, or absolute response amplitudes otherwise.

包括指定响应标识符的结论极坐标图。如果未给出，则将显示频谱波类型的 RMS 值，否则将显示绝对响应幅度。

/MIRROR

Mirrors polar data across the 0 to 180 degree longitudinal axis.

在 0 到 180 度纵轴上镜像极坐标数据。

/SLAM [:location | FRA [,velocity]]

Computes the slamming probability, frequency, and pressure at a single longitudinal location or at all frame locations if FRA is specified; the default is the forward perpendicular, which is required. The threshold velocity (in ft/sec or m/sec depending on units) may be specified; if omitted, it is computed according to the local geometry. Significant pressure (i.e. the average of the highest tertile of expected pressures) will be returned for all locations, excluding those within 0.01*LOA of the vessel ends. Slamming pressure is computed using a non-dimensional form coefficient k_1 computed for each slamming section using either the basic, Chuang "Wedge", or Ochi 3-Parameter

method, as automatically selected based on the geometry and marked on the Slamming table using ^ for Chuang, + for Ochi, and no mark for basic.

计算单个纵向位置或所有肋位位置（如果指定了 FRA）的撞击概率、频率和压力:默认值为前向垂直，这是必需的。可以指定阈值速度（以英尺/秒或米/秒为单位，具体取决于单位）；如果省略，则根据局部几何进行计算。所有位置将返回显着压力(即预期压力的最高三分位数的平均值)，不包括船舶末端 0.01*LOA 以内的那些。砰击压力是使用非尺寸形式系数 k1 计算的，该系数使用 Basic 、Chuang “Wedge” 或 Ochi 3 参数方法计算每个猛击截面，根据几何形状自动选择并在猛击表上使用 ^ 表示庄，+ 表示 Ochi，基本没有标记。

/GUNIT

Allows accelerations to be returned in "g" gravitational units instead of current length units.

允许加速度以“g”重力单位而不是当前长度单位返回。

/RELATIVE

Specifies that vertical motions should be computed for the vessel CG and any critical points relative to the wave elevation at the point of interest, adding a section to report and data files.

指定应计算船舶 CG 和相对于感兴趣点处波高程的任何临界点的垂直运动，并向报告和数据文件添加一个部分。

/ROLLCOEF: d%| b1 [,b2 [,b3]]

Specifies additional roll damping as a critical damping ratio (when % is included), or first-, second-, and/or third-order nonlinear roll damping coefficients as derived from model testing. Specified damping will override any non-wave hull numerical roll damping. Any appendage damping is retained. The coefficients b1, b2, and b3 are dimensional and must be given using current weight units (WU) and length units (LU) with b1 in WU-LU²/s, b2 in WU-LU², and b3 in WU-LU²-s.

将附加侧倾阻尼指定为临界阻尼比（如果包括%时），或从模型测试得出的一阶、二阶和/或三阶非线性侧倾阻尼系数。指定的阻尼将覆盖任何非波船体数值侧倾阻尼。保留任何附件阻尼。系数 b1、b2 和 b3 是维度，必须使用当前重量单位（WU）和长度单位（LU）给出，其中 b1 在 WU-LU²/s 中，b2 在 WU-LU² 中，b3 在 WU-LU²-s 中。

/BILGEKEEL: part[\component],...

Specifies a list of one or more bilge keel appendages to be included in the seakeeping formulation. Bilge keels must be modeled and included in the geometry file as components separate from the main hull component (so not joined to the hull). A component name may end in an asterisk to include all components whose names have the same beginning; if the component name is omitted, the first component of the part is used for the appendage. Symmetric appendages should be modeled as a port and starboard pair (not a single centerline component), which can still be referenced using a single common name ending in *.

指定要包括在适航中的一个或多个舱底龙骨附属物的列表。舱底龙骨必须建模并作为独立于主船体构件的组件包含在几何文件中（因此不连接到船体）。组件名称可以以星号结尾，以包含名称具有相同开头的所有组件；如果省略元件名称，则零件的第一个元件将用于附属物。对称附属物

应建模为左舷和右舷对（而不是单个中心线组件），仍然可以使用以 * 结尾的单个公用名来引用。

`/ROLLTANK: part[\component],...`

Specifies a list of one or more passive U-style roll tanks. Tanks must have a single component if none is specified. The effect of roll tanks at their current load will be included in the vessel roll, sway, and yaw response. A Tank Dynamics table will be included in the report output.

指定一个或多个被动 U 型减摇舱室的列表。如果未指定任何组件，则舱室必须具有单个组件。减摇舱室在其当前负载下的影响将包含在舱室横摇、摇摆和偏航响应中。舱室动力学表将包含在报告输出中。

`/SPREAD [:angle [,div] | datafile]`

Specifies a short-crested seaway by applying a COS2 spreading function about the dominant wave heading defined by `/HEADING`. Optional angle specifies the spread half-angle (\pm about the dominant heading) of the seaway in degrees; the default is 90 degrees, corresponding to a standard COS2 spread. Optional div specifies the number of divisions to be used when computing the spread (i.e. the number of subheadings within the total spread angle) and must be an odd integer; the default is 9 (for one subheading every 22.5 degrees of the default spread). Optional datafile allows for a user-defined spreading function; following a header line and unit line ("F" or "M") comes the data lines, each containing a single comma-separated subheading and spreading fraction pair. Wave ranges may only have a single wave period.

通过对 `/HEADING` 定义的向角应用 COS2 扩散函数来指定短波航道。可选角度指定航道的展开半角（ \pm 围绕主航向），以度为单位；默认值为 90 度，对应于标准 COS2 跨页。可选的 div 指定计算扩散时要使用的分割数（即总扩散角内的副标题数），并且必须是奇数；默认值为 9（对于默认跨页的每 22.5 度一个小标题）。可选的数据文件允许用户定义的扩展功能；在标题行和单位行（“F”或“M”）之后是数据行，每个数据行都包含一个逗号分隔的子标题和扩展分数对。波浪范围可能只有一个波浪周期。

`/BOX`

Computes surge wave forcing, added mass, and damping using a longitudinal section cut integrated transversely, allowing for accurate surge response when analyzing box-shaped geometry. This parameter should not be used when significant transverse geometric variation is present and may not be used with heel angles greater than 3 degrees.

使用横向集成的纵向截面切片计算浪涌波强迫、附加质量和阻尼，从而在分析箱形几何形状时实现准确的浪涌响应。当存在明显的横向几何变化时，不应使用此参数，并且不得在鞋跟角度大于 3 度的情况下使用此参数。

`/COUPLE [:l,t,v]`

Fully couples all modes in the equation of motion, including all 36 hydrodynamic coefficients and generalized mass and stiffness matrices. Optional l,t,v specifies the center of motion; the default origin is at LCF and TCF on the waterplane. If omitted, the default partially-coupled method couples the vertical modes (1,3,5) and horizontal modes (2,4,6) separately, with the origin at the CG.

完全耦合运动方程中的所有模态，包括所有 36 个流体动力学系数以及广义质量和刚度矩阵。可选 l, t, v 指定运动中心;默认原点位于水上平面上的 LCF 和 TCF。如果省略，默认的部分耦合方法将垂直模式（1, 3, 5）和水平模式（2, 4, 6）分别耦合，原点位于 CG 处。

/UNCOUPLE [:m,...]

Uncouples the specified modes (or all modes if none given) in the equation of motion and derived responses, where mode 1=surge, 2=sway, 3=heave, 4=roll, 5=pitch, and 6=yaw. Appendage coupling terms are always retained.

解耦运动和派生响应方程中的指定模式（如果未给出所有模式），其中模式 1=浪涌，2 =摇摆，3 =升沉，4 =滚动，5 =俯仰，6 =偏航。始终保留附件耦合术语。

/SPECTRUM

Adds a scaled wave spectrum curve to each RAO plot.

将缩放的波谱曲线添加到每个 RAO 图。

/EMG [:num1, ..., numn]

Computes the probability and frequency of point emergence events for a given list of Critical Point numbers (up to 25). If omitted, all seakeeping critical points are included. Probabilities are computed using the relative vertical motion at each location, and point depth is computed as the vertical height below the waterplane. Frequency is computed over the /TIME interval.

计算给定临界点编号列表（最多 25）的点出现事件的概率和频率。如果省略，则包括所有适航临界点。使用每个位置的相对垂直运动计算概率，并将点深度计算为水平面下方的垂直高度。频率是在/TIME 间隔内计算的。

/NOPLOT [:RAO]

Omits specified plots from the report. If no subparameters are given, all plots are omitted.

从报告中省略指定的图解。如果未给出子参数，则省略所有图。

/BRIEF

Greatly reduces report length by including a single table containing the wave environment and vessel RAOs at the CG for all 6 DOF (respecting /REL and /SPREAD). The wave spectrum plot is omitted and all RAO plots are retained but may be reduced using /NOPLOT or /RESP.

通过包含所有 6 自由度（相应的/REL 和/SPREAD）的 CG 处的波浪环境和船舶 RAO 的单个表格，大大减少了报告长度。省略波谱图，保留所 RAO 图，但可以使用/NOPLOT 或/RESP 进行缩减。

dataspec

Data file specification, respecting * wildcard to accommodate multiple case numbers.

数据文件规范，遵循 * 通配符以适应多个案例编号。

/HYFO: forcingfile

Uses hydrodynamic (instead of RAO) and specified forcing data; when in this mode, numerical solving for hydrodynamic forces is prevented, but the equation of motion is still solved.

使用流体动力学（而不是 RAO）和指定的强制数据；在这种模式下，可以防止流体动力的数值求解，但仍能求解运动方程。

/dataparams

One or more of the following slash parameters: /SAMPLE, /CONFIDENCE, /PERIOD, /CRTPT, /SHW, /MSI, /TIME, /DATA, /RESPONSE, /NOPLOT, /[CASE]SUM, /POLAR, /MIRROR, /GUNIT, /RELATIVE, /BILGEKEEL.

以下一个或多个斜杠参数：/SAMPLE, /CONFIDENCE, /PERIOD, /CRTPT, /SHW, /MSI, /TIME, /DATA, /RESPONSE, /NOPLOT, /[CASE]SUM, /POLAR, /MIRROR, /GUNIT, /RELATIVE, /BILGEKEEL。

(n)

Limit identification number; $1 \leq n \leq 10$. If omitted, the first available unassigned limit number is used when defining a limit, otherwise all limits are deleted or displayed.

限制识别号； $1 \leq n \leq 10$ 。如果省略，则在定义限制时使用第一个可用的未分配限制编号，否则将删除或显示所有限制。

limit

Any one of limit types: VAR, PERZUC, PERMAX, RMS, AVE, AVE10, SIG, MAX100, MAX1000, MAX10000, EXTR, SHWP, SHWN, MSI, SLAMP, SLAMN, EMGP, EMGN.

以下任意一种限制类型：VAR、PERZUC、PERMAX、RMS、AVE、AVE10、SIG、MAX100、MAX1000、MAX10000、EXTR、SHWP、SHWN、MSI、SLAMP、SLAMN、EMGP、EMGN。

mode

Any one of the modes: SURGE, SWAY, HEAVE, RELHEAVE, ROLL, PITCH, YAW. No mode is required for the derived limit types SHWP, SHWN, MSI, SLAMP, SLAMN, EMGP, and EMGN.

任何一种模式：浪涌、摇摆、升沉、重振、滚动、俯仰、偏航。派生的极限类型 SHWP、SHWN、MSI、SLAMP、SLAMN、EMGP 和 EMGN 不需要模式。

response

Any one of the following response types: POSITION, VELOCITY, ACCELERATION. No response type is required for derived limit types SHWP, SHWN, MSI, SLAMP, SLAMN, EMGP, and EMGN.

以下任一响应类型：位置、速度、加速度。派生的极限类型 SHWP、SHWN、MSI、SLAMP、SLAMN、EMGP 和 EMGN 不需要响应类型。

minmax

The minimum or maximum limit value, depending on whether ">" or "<" comparison is specified. Units depend on any response type; accelerations allow "g" unit suffix; percentages may be entered as decimal fractions (i.e. 0.10 for 10%) or suffixed by the % character.

最小或最大限制值，具体取决于是否指定了“>”或“<”比较。单位取决于任何响应类型；加速度允许“g”单位后缀；百分比可以输入为小数（即 0.10 表示 10%）或以%字符为后缀。

Operation

操作

SEAKEEPING requires that a loading condition, wave environment (via WAVE), critical points (if desired), and any SEA LIMITs be defined prior to issuing the command. SEAKEEPING performs all computations using the current geometry file, so quality geometry is essential. Other factors affecting seakeeping include WATER spgr and viscosity.

SEAKEEPING 要求在发出命令之前定义装载工况、波浪环境（通过 WAVE）、临界点（如果需要）和任何 SEA 限制。SEAKEEPING 使用当前几何文件执行所有计算，因此高质量的几何图形至关重要。影响适航性的其他因素包括 WATER spgr 和粘度。

Loading conditions may be specified using WEIGHT and/or ADD commands; tank weights may be included by loading the desired tanks and these loads will be included in the loading condition passed to SEAKEEPING. When establishing a loading condition, it is very important to consider the inertial properties of weight items by specifying individual or composite gyradii. For example, when setting lightship WEIGHT, include the /GYRADIUS parameter to specify gyradii about each axis (see the WEIGHT command for more details). A /GYRADIUS parameter is likewise available for the ADD command. Note that products of inertia may also be specified if needed. The gyradii for distributed weights and loaded tanks are computed automatically.

装载条件可以使用 WEIGHT 和/或 ADD 命令指定；可以通过装载所需的舱室来包括舱室重量，这些装载将包含在传递给 SEAKEEPING 的装载条件中。在建立载荷工况时，通过指定单个或复合回转半径来考虑重量项目的惯性特性非常重要。例如，在设置空船重量时，请包括/GYRADIUS 参数以指定每个轴的 gyradii（有关详细信息，请参阅 WEIGHT 命令）。/GYRADIUS 参数同样可用于 ADD 命令。请注意，如果需要，也可以指定惯性乘积。自动计算分布重量和装载舱室的回转半径。

It is advisable to include STATUS INERTIA and/or STATUS PRODUCT in your seakeeping analysis run file to provide a convenient reference of the total inertia condition. Note that displayed gyradii and mass moments of inertia are about the center-of-gravity axes parallel to the geometry coordinate system. If needed, the inertia tensor will be transformed for use in the seakeeping calculations.

建议在适航性分析运行文件中包括状态惯性和/或状态产品，以提供总惯性条件的便捷参考。请注意，显示的回转半径和质量惯性矩与平行于几何坐标系的重心轴有关。如果需要，惯性张量将被转换以用于适航性计算。

SEAKEEPING models all tanks as frozen in their equilibrium condition. This means that SEAKEEPING will accommodate true CG shifts if allowed, but formal free-surface corrections will be omitted. SEAKEEPING does not include dynamic sloshing effects.

SEAKEEPING 将所有舱室建模为处于平衡状态的冻结状态。这意味着如果允许，SEAKEEPING 将适应真正的 CG 位移，但正式的自由表面修正将被省略。适航不包括动态晃动效果。

A wave environment is specified using the WAVE command, which offers three methods for wave input: a single sinusoidal wave, a range of waves at constant amplitude, or a wave energy spectrum. If an energy spectrum is used, SEAKEEPING will sample the spectrum using one of two sampling methods. SEAKEEPING will not resample wave spectra when specified via a data file. See the /SAMPLE parameter and WAVE command for details.

使用 WAVE 命令指定波浪环境，该命令提供三种波形输入方法：单个正弦波、恒定振幅的一系列波或波能谱。如果使用波能谱，SEAKEEPING 将使用两种采样方法之一对波谱进行采样。当通过数据文件指定时，SEAKEEPING 不会对波谱进行重新采样。有关详细信息，请参阅/SAMPLE 参数和 WAVE 命令。

If motion results are desired at points other than the vessel Center of Gravity, their locations must first be defined as Critical Points using the CRTPT command so they can be listed in the SEAKEEPING /CRT parameter (irrespective of flooding status).

如果需要在船舶重心以外的点获得运动结果，则必须首先使用 CRTPT 命令将其位置定义为临界点，以便它们可以列在 SEAKEEPING /CRT 参数中（无论浸水状态如何）。

Seakeeping can be rerun based on saved /DATA files instead of numerical solving using the SEAKEEPING DATA command accompanied by selected reporting parameters.

可以基于保存的/DATA 文件重新运行 Seakeeping，而不是使用 SEAKEEPING DATA 命令和选定的报告参数进行数值求解。

If dynamic limits are required, each limit should be specified using SEA LIMIT commands prior to calling SEAKEEPING, which will automatically evaluate all current SEA LIMITS.

如果需要动态限制，则应在调用 SEAKEEPING 之前使用 SEA LIMIT 命令指定每个限制，这将自动评估所有当前的 SEA 限制。

Display Output

输出显示

SEAKEEPING begins by displaying a summary section to the screen and writing to any open report file. The summary section includes general input parameters, such as the method type, meshing parameters, coupling parameters, and a table of all seakeeping part\component names and types.

SEAKEEPING 首先在屏幕上显示摘要部分并写入任何打开的报告文件。摘要部分包括常规输入参数，例如方法类型、网格划分参数、耦合参数以及所有适航零件\组件名称和类型的表格。

Second, a Critical Points table summarizes all seakeeping Critical Points including the Center of Gravity. The table includes the number, description, and position of points in the geometry coordinate system.

其次，临界点表总结了所有适航临界点，包括重心。该表包括几何坐标系中点的数量、描述和位置。

Third, the report is organized into Cases, where each case explores a unique heading, speed, wave combination. Cases comprise separate subsections within the report. In each case, a Wave Components table lists the wave type, spectra type, sampling method, number of wave components, component variance or bandwidth, and the numerically derived total variance and significant wave height. As the motions problem is solved for each wave component, its period, frequency, waterline-to-wavelength ratio, encounter frequency, spectral ordinant, and component wave amplitude are displayed, and a wave spectrum plot is included in the report (if a spectrum is used).

第三，报告被组织成工况，每个工况都探讨了独特的航向、速度、波浪组合。工况包括报告中的单独小节。在每种情况下，波分量表都列出了波浪类型、频谱类型、采样方法、波分量数、分量方差或带宽，以及数值派生的总方差和有效波高。求解每个波分量的运动问题时，将显示其周期、频率、水线与波长比、遭遇频率、光谱阶数和分量波幅度，并在报告中包括波谱图（如果使用波谱）。

Within each case, the position, velocity, and acceleration RAO and phase angles for all modes (Surge, Sway, Heave, Relative (if specified), Roll, Pitch, and Yaw) are included for the Center of Gravity and each Critical Point. If using a wave spectrum, response statistics tables follow the RAO tables. By default, RAO and phase angle plots are then included in the report. Any optional derived responses, such as slamming or MSI, are displayed in individual tables, and if specified, a case summary table is included at the end of each case.

在每种情况下，重心和每个临界点都包括所有模式（浪涌、摇摆、升沉、相对（如果指定）、横滚、俯仰和偏航）的位置、速度和加速度 RAO 以及相位角。如果使用波谱，则响应统计表遵循 RAO 表。默认情况下，RAO 和相位角图将包含在报告中。任何可选的派生响应（如猛击或 MSI）都显示在单独的表中，如果指定，则在每个案例的末尾包含一个案例摘要表。

Fourth, after all cases are reported, any optional polar plots, limit plots, or overall summary tables will be included at the end of the report.

第四，报告所有病例后，报告末尾将包括任何可选的极坐标图、极限图或总体汇总表。

Note that if a single wave or wave range was specified for the analysis, response statistics are not included in the report and any data files. Response statistics are also omitted if less than three wave samples are used. Plots are omitted if less than two wave components are used or if the /NOPLOT parameter is used.

请注意，如果为分析指定了单个波浪或波浪范围，则响应统计数据不包括在报告 and 任何数据文件中。如果使用的波样本少于三个，则也会省略响应统计量。如果使用的波分量少于两个或使用 /NOPLOT 参数，则省略图解。

Examples

样例

Computing center-of-gravity absolute HULL motions at zero speed in head seas:

计算迎浪零速下的重心绝对 HULL 运动:

SEA

Computing CG and a range of Critical Point absolute motions for HULL\BOAT.C at 8.0 knots with a wave heading of 135 degrees:

计算 CG 和一系列船体\船的临界点绝对运动。在 8.0 节时，波向为 135 度:

SEA /HULL: HULL\BOAT.C /HEAD: 135 /SPEED: 8.0 /CRT: 1,2,...,9

Computing CG absolute and relative HULL motions at zero speed for wave headings between 0 and 180 degrees every 15 degrees using 30 constant-variance wave samples and polar plotting the RMS response amplitudes and Zero-Up-Crossing periods (assumes a spectra type has been defined):

使用 30 个恒定方差波样本计算每 15 度 0 到 180 度之间的波向的零速 CG 绝对和相对船体运动，并极坐标绘制 RMS 响应幅度和零向上交叉周期（假设已定义光谱类型）:

SEA /HEAD: 0,15,...,180 /REL /SAMP: 30 /POLAR:RMS,PERZUC

Setting dynamic RMS heave acceleration and roll position amplitude limits and creating a composite limit statement by combining two limits:

设置动态 RMS 升沉加速和滚动位置幅度限制，并通过组合两个限制来创建复合极限语句:

SEA LIMIT (1) RMS HEAVE A < 0.6 ` In current units

SEA LIMIT (2) RMS ROLL P < 10 ` In degrees

SEA LIMIT (3) COMBINE 1, 2 ` Combined limit

Computing the worst case absolute maximum response in 1000 samples via summary tables over a range of speeds and headings using 50 wave samples over a sampling range of 0.1 to 1.5 rad/s (assumes a spectra type has been defined):

在 0.1 至 1.5 rad/s 的采样范围内，使用 50 个波样本，通过汇总表计算 1000 个样本在一系列速度和航向上的最坏情况绝对最大响应（假设已定义光谱类型）:

SEA /HEAD:0,30,...,360 /SPEED:0,4,...,16 /SAMP:50,0.1,1.5 /CASESUM:MAX1000

Including all components starting with HULL\BK as bilge keel appendages and computing MSI at all Critical Points:

包括以 HULL\BK 开头的所有组件作为船底龙骨附件，并在所有关键点计算 MSI:

SEA /HEAD: 90 /SPEED: 18 /BILGEKEEL:HULL\BK* /MSI /CRT:2,5,13

Writing RAO, hydrodynamic, and forcing data to comma-separated text files:

写入 RAO、流体动力学和强制数据到逗号分隔的文本文件:

SEA /DATA:RE,HY,FO

Computing responses at additional Critical Points using prior saved RAO data:

使用先前保存的 RAO 数据计算其他关键点的响应:

SEA DATA SK-RESPONSE.DAT /CRT:1,2

Computing motions using saved hydrodynamic and forcing to write new RAO data:

使用保存的流体动力学计算运动并强制写入新的 RAO 数据:

SEA DATA SK-HYDROS.DAT /HYFO:SK-FORCING.DAT /DATA:RE