

# FLOOD模块介绍

张新华

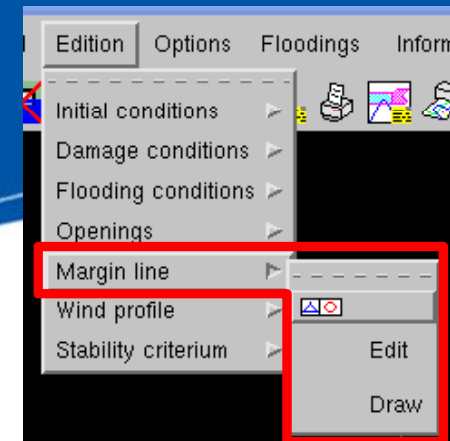


通力有限公司  
UNITED FORCE CORPORATION

# 实现的功能

- 确定性方法计算破舱稳性

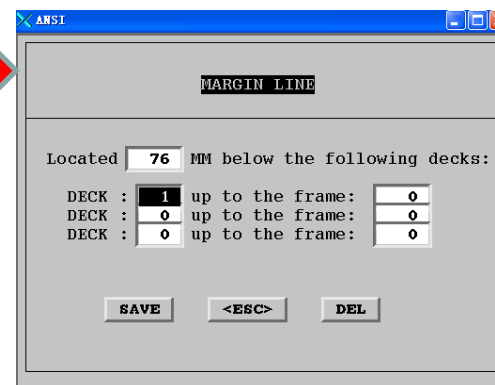
# 限界线



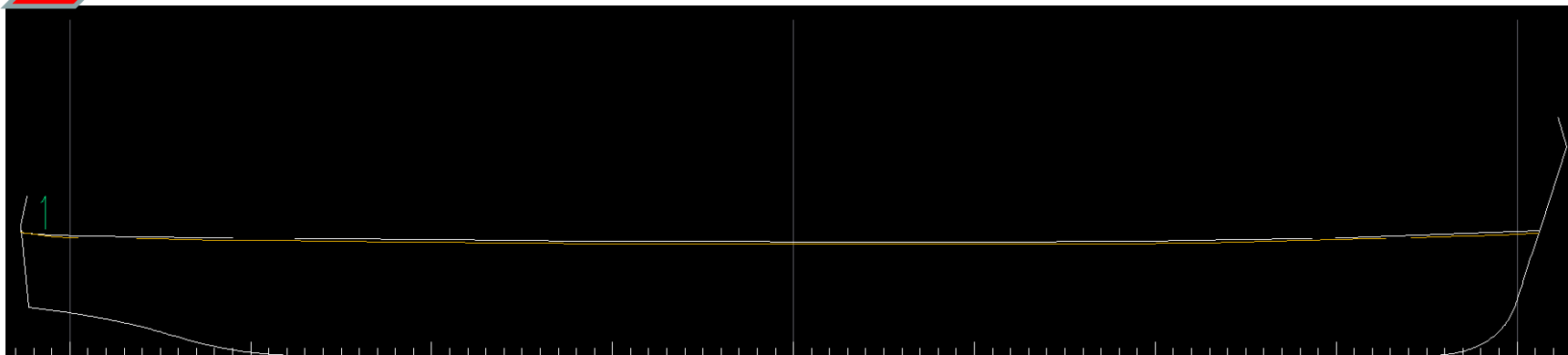
## ■ 限界线

- 1) 执行Edition->Margin line->Edit命令，定义干舷甲板和甲板下的76mm
- 2) 执行Edition->Margin line->Draw命令，在操作界面上显示限界线

1



2



# 入水点

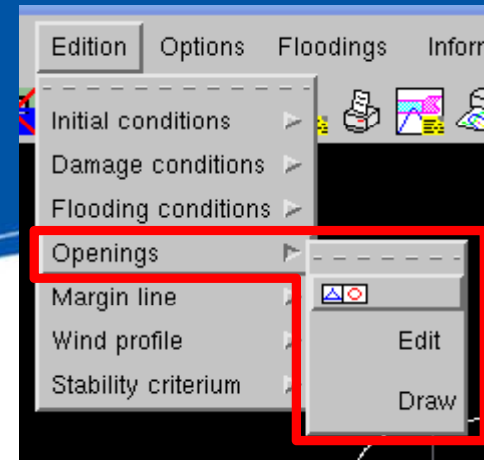
## ■ 入水点定义

执行Edition->Openings->Edit命令

- 定义入水点的名称和描述;
- 定义入水点的位置;
- 定义入水点相关联的舱室;
- 定义入水点的类型。

## ■ 在操作窗口中显示入水点的位置

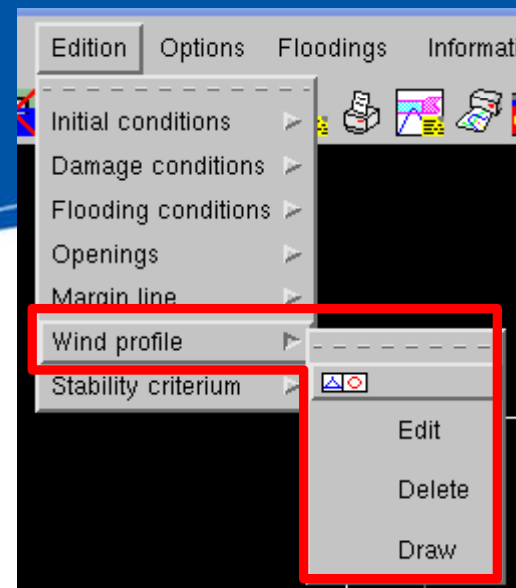
执行Edition-Openings->Draw命令

A screenshot of the 'Openings definition' dialog box. The dialog has a title bar with a question mark and a close button. It contains several sections: 'Openings' (a table with columns ID, Description, X (m), Y (m), Z (m), Type, DKOP, Spaces), 'Opening edition' (with fields for Identification and Description), 'Position' (with sub-sections for Coordinates and Z (height)), 'Symmetry' (with a dropdown for Symmetric to), 'Opening type' (with radio buttons for Reference point (REFE), Weathertight opening (DOWN), and Not weathertight opening (FLUS)), and 'Related spaces' (with a checkbox for F.W.). There are buttons for 'New', 'Edit', 'Delete', 'Add opening', 'Clear Fields', 'Cancel opening edition', 'OK', and 'Cancel'.

# 定义受风面积

## ■ 受风面积定义

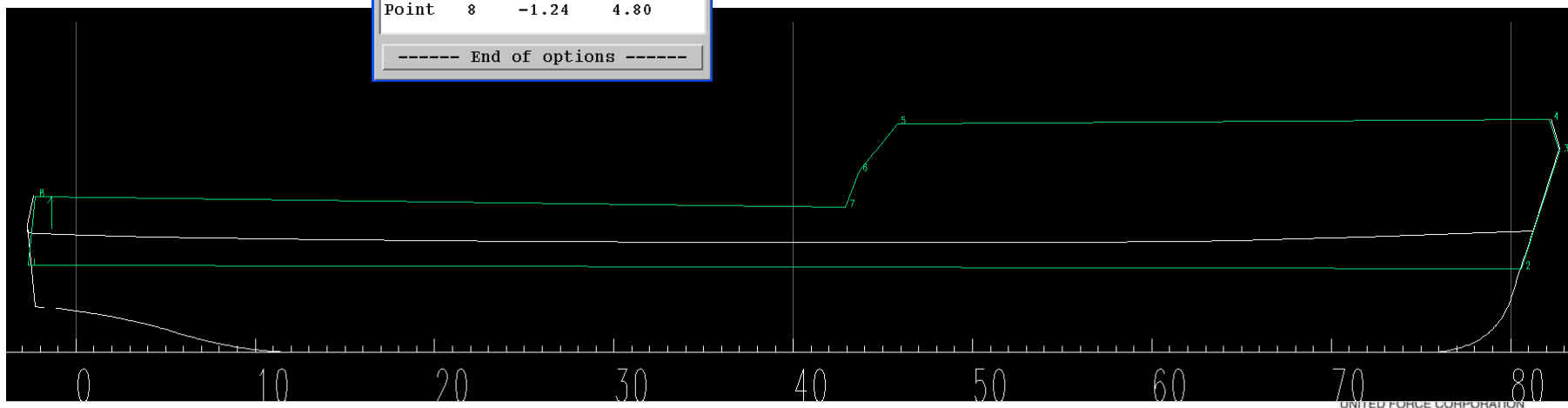
- 1) 执行Edition->Wind profile>Edit命令，通过输入点描绘受风面积
- 2) 执行Edition->Margin line->Draw命令，在操作界面上显示受风面积



1

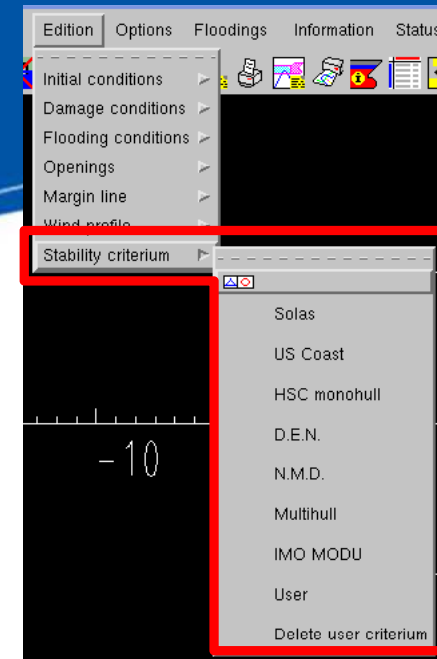
----- New point -----			
Point	1	-1.48	2.69
Point	2	44.35	2.61
Point	3	45.52	6.19
Point	4	45.20	7.18
Point	5	25.19	7.05
Point	6	24.01	5.58
Point	7	23.61	4.48
Point	8	-1.24	4.80
----- End of options -----			

2

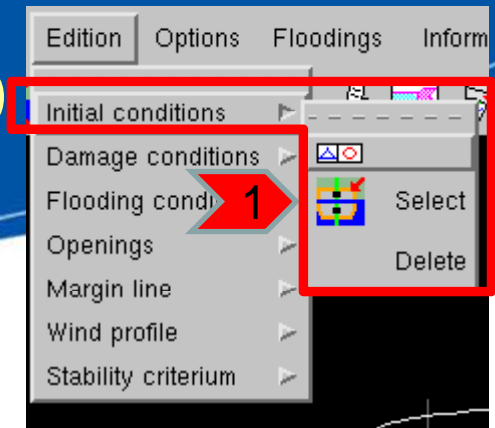


# 定义规范

- 定义必要的规范值
- 定义用户自定义的规范

A screenshot of a dialog box titled 'ANSI'. The main text is 'SOLAS-90 Stability criterion for passenger ships'. Below this, there are two rows of input fields. The first row has 'Number of passengers : 0' and 'Lever arm: 0.00 m.'. The second row has 'Boats & people weighth : 0.00' and 'Lever arm: 0.00 m.'. Below these is a button labeled 'More than one compartment floode'. At the bottom, there are two buttons: 'SAVE' and '<ESC>'. The dialog box has a blue title bar and standard Windows window controls.

# 破舱稳性计算 (1)



## 步骤:

1) 执行Edition->Initial conditions命令, 定义初始装载情况

1.1) 点击Initial condition identification按钮, 选择新的初始装载情况

1.2) 选择定义的方式

➤ LOAD COND.: 选择在LOAD模块的载况状态

➤ DRAFT+KG: 吃水+重心高度

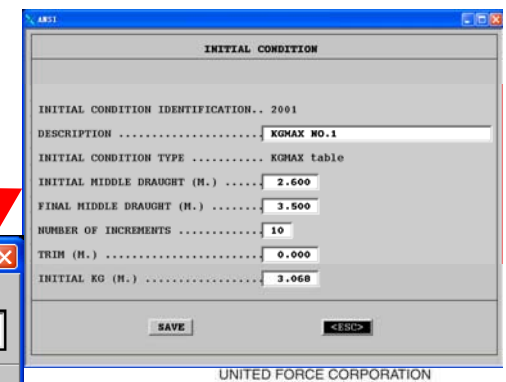
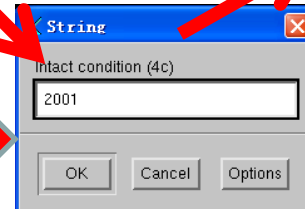
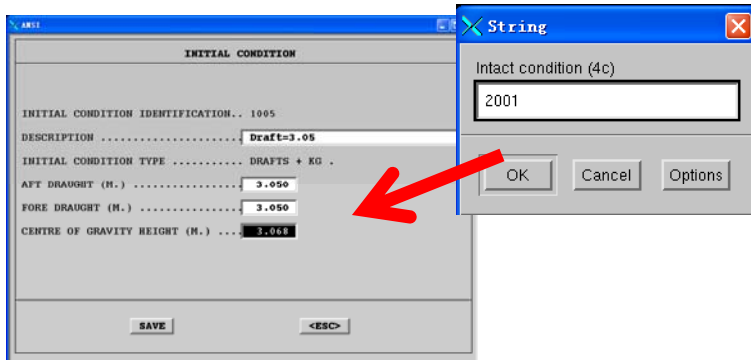
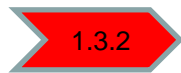
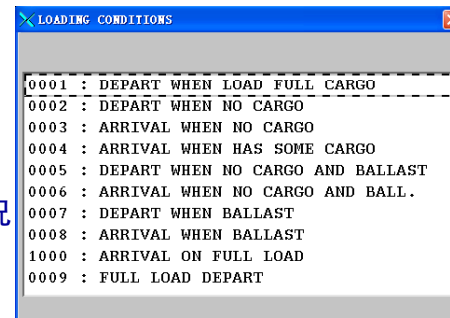
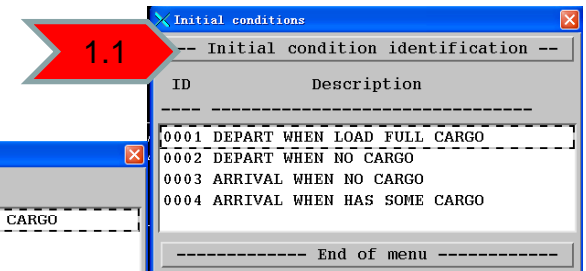
➤ KGMAX table: 不同吃水

1.3) 定义详细的载况信息

1.3.1) 当在1.2中点击LOAD COND时选择在LOAD模块的载况

1.3.2) 定义初始状态的名字, 点击OK后填写必要的信息

1.3.3) 定义初始状态的名字, 点击OK后填写必要的信息



# 破舱稳性计算 (2)

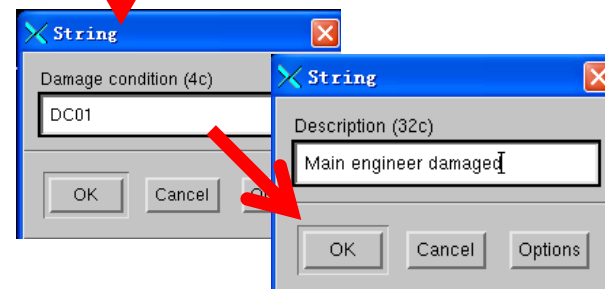
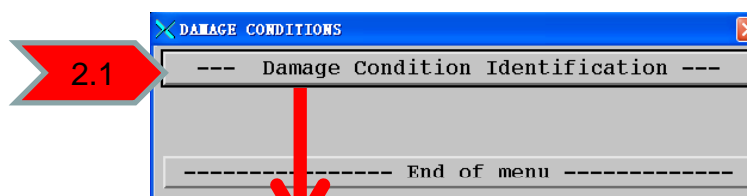
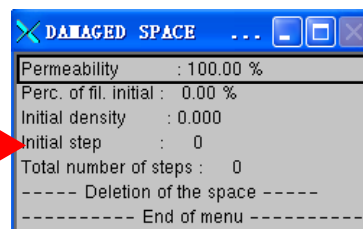
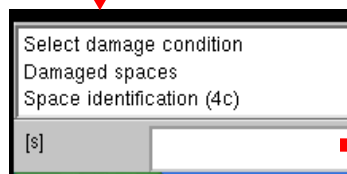
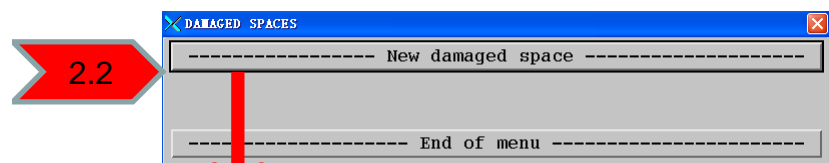
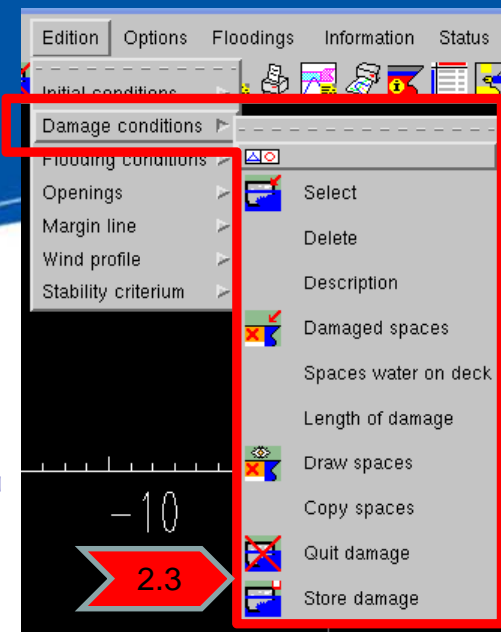
## 步骤 (续):

### 2) 定义破损部位数据

2.1) 执行Edition->Damage condition->Select命令: 定义破损部位数据和名字和描述

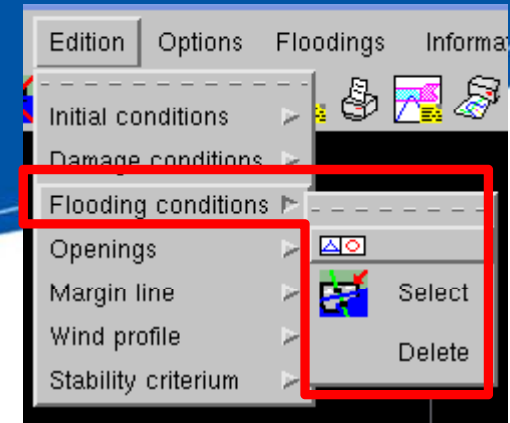
2.2) 执行Edition->Damage condition->Damage spaces命令: 选择破损的舱室, 在操作界面上单击滚轴弹出可选窗口。可以使用区域选择, 在操作界面上框选一个范围, 系统会自动计算包含在这个框选范围内的舱室, 然后再进行确切的舱室选择。

2.3) 执行Edition->Damage condition->Quit damage / Store damage命令, 保存或退出





# 破舱稳性计算 (3)



## 步骤 (续) :

3) 选择破舱稳性计算的组合状态

3.1) 执行Edition->Flooding conditions->Select命令，点击New flooding condition identification按钮

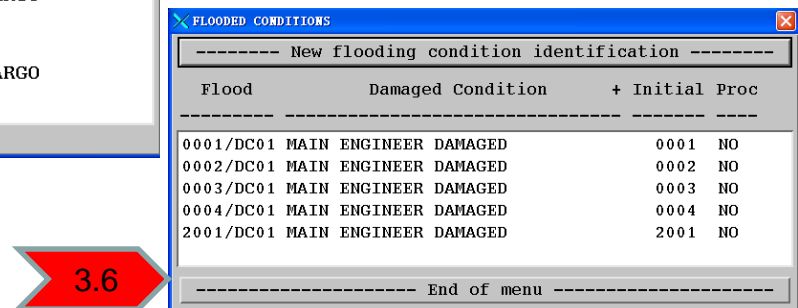
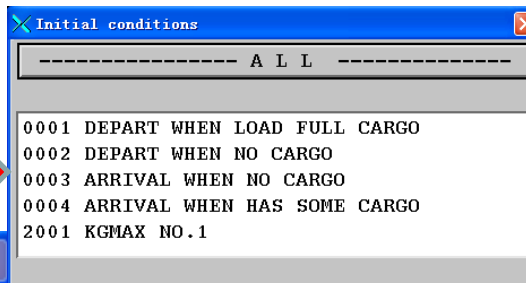
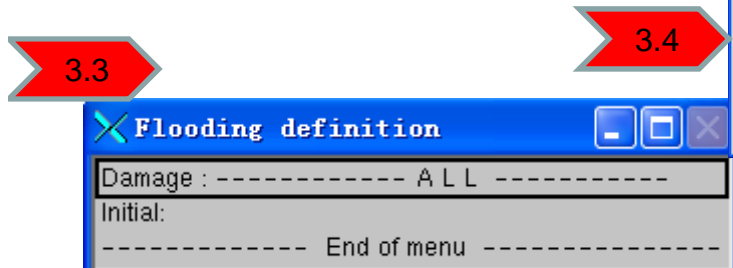
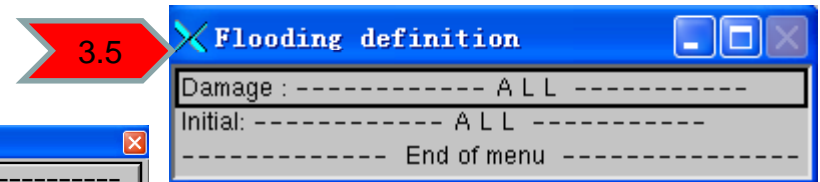
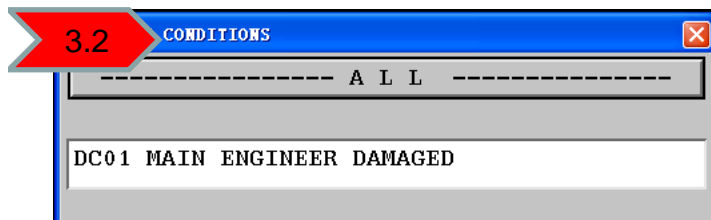
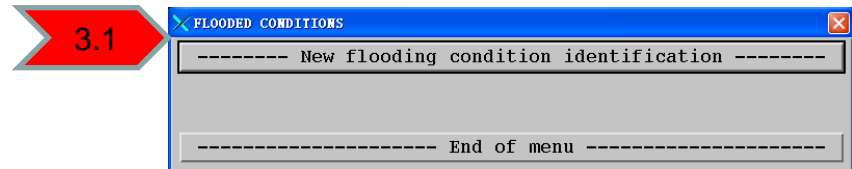
3.2) 选择已有的破损的状态，或者选择ALL

3.3) 点击Initial选项

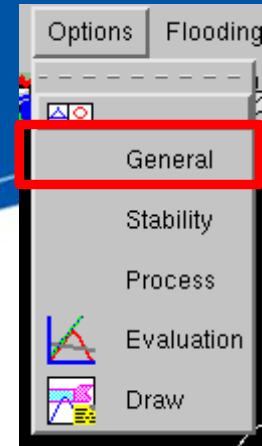
3.4) 选择已有的初始的状态，或者选择ALL

3.5) 点击End of menu按钮

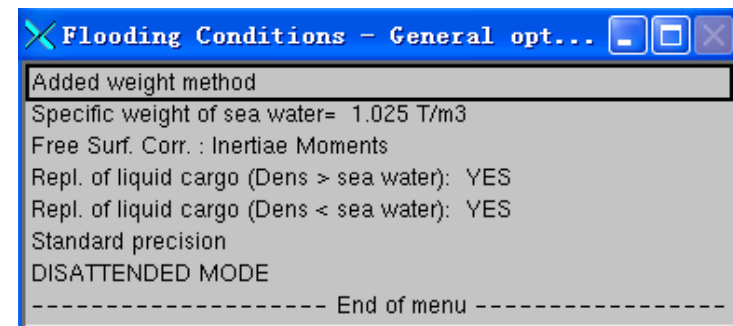
3.6) 显示已经选择的破舱稳性计算的组合状态，点击End of menu按钮结束



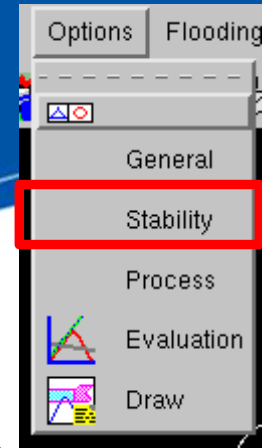
# 破舱稳性计算（4）



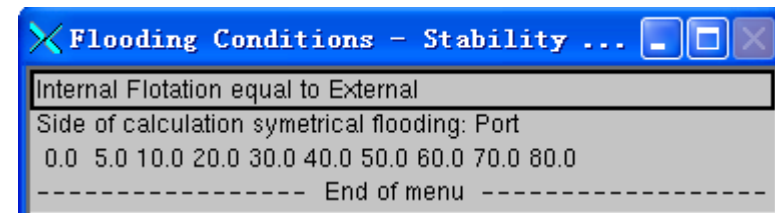
- 初始的基本数据定义：执行Options->General命令
- Added weight method或Lost buoyancy method: 增加重量法或损失浮力法
- Specific weight of sea water: 海水密度
- Free Surf. Corr.: 自由液面的修正
- Repl. Of liquid cargo (Dens>Sea water): 当舱室的液体密度大于海水密度时，破舱时海水是否取代舱室的液体
- Repl. Of liquid cargo (Dens<Sea water): 当舱室的液体密度小于海水密度时，破舱时海水是否取代舱室的液体
- Standard precision或Low precision : 精度的差别，选择低精度时时间将减少，但计算值的准确度会非常接近标准的精度值
- ATTENDED MODE或DISATTENDED MODE: 是否干预计算过程，如果选择DISATTENDED MODE模式，一旦运行破舱稳性计算，用户将不能停止计算



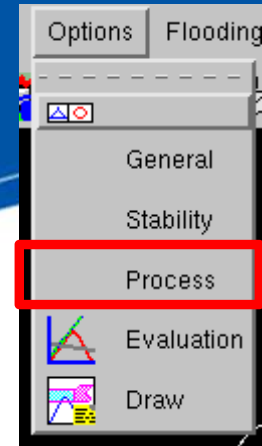
# 破舱稳性计算 (5)



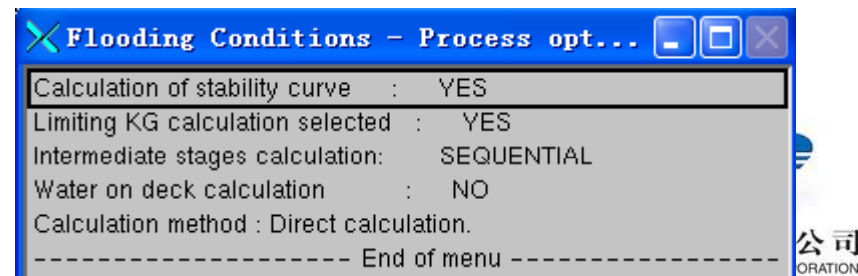
- 稳性的基本定义：执行Options->Stability命令
- Internal Flotation equal to External或Water in Damage Compartments is Constant:
  - a) Internal Flotation equal to External: 在计算时，破损的舱的液面高度始终与船外保持一致；
  - b) Water in Damage Compartments is Constant: 在计算时，破损的舱进水一直达到内外平衡后将不再进水
- Side of calculation symmetrical flooding: Port或Default或Starboard: 横摇计算的方向
- 0, 5.0, 10.0, 20.0, 30.0, 40.0, 50.0, 60.0, 70.0, 80.0: 定义横稳性计算的横摇角度



# 破舱稳性计算（6）



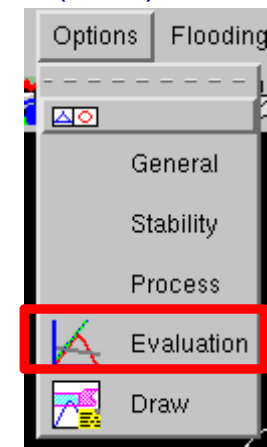
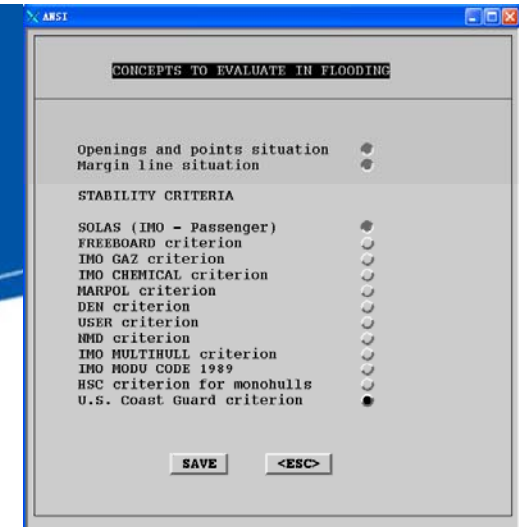
- 运算选项的基本定义：执行Options->Process命令
- Calculation of stability curve: YES: 是否计算稳性曲线
- Limiting KG calculation selected: 是否需要计算KG/GM
- Intermediate stages calculation: SEQUENTIAL或LINEAL或NO, 破损稳性计算的步骤方法
- Water on deck calculation:
  - a) NO: 不需要计算此项
  - b) FIXED HEIGHT: 根据IMO Circ. 1891, April 29, 1996
  - c) FIXED VOLUME: 根据MSC65, April 1995
- Calculation method:
  - a) Direct calculation
  - b) Interpolation



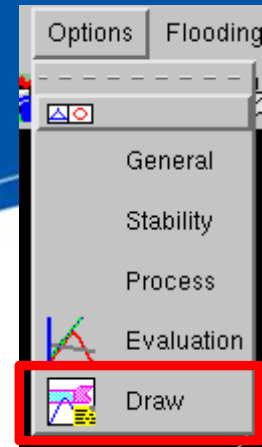
# 破舱稳性计算 (7)

## ■ 选择规范：执行Options->Evaluation命令

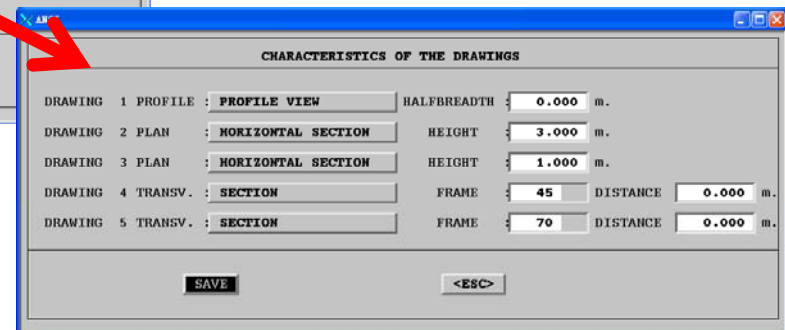
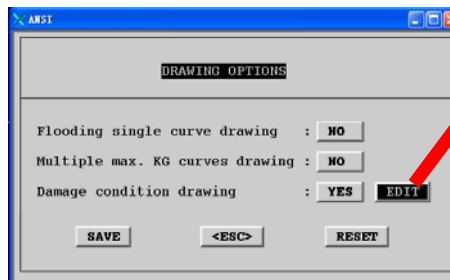
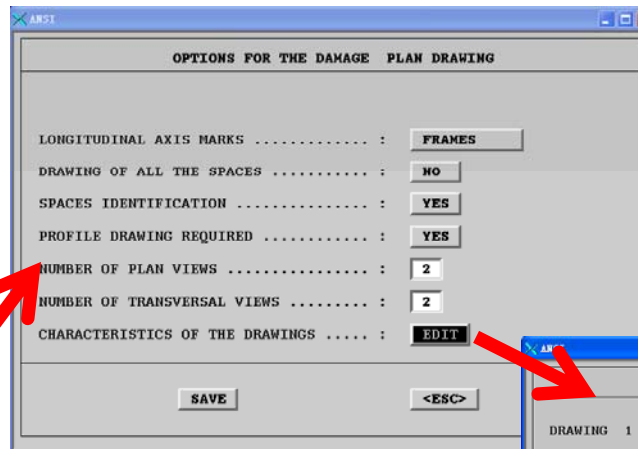
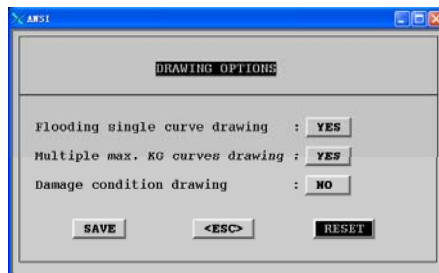
- Evaluation of downflooding points, openings and reference points.
- Evaluation of the distance between the margin line and the equilibrium flotation.
- Checking of one or some of the following criteria:
  - a) SOLAS - 90. Stability criterion for passenger ships.
  - b) Load lines convention criterion - 1966 (FREEBOARD)
  - c) IMO stability criterion for gas carriers.
  - d) IMO stability criterion for chemicals carriers.
  - e) Stability criterion according with MARPOL rules.
  - f) Stability criterion for Mobil Offshore units. Department of Energy of the United Kingdom (DEN)
  - g) User stability criterion.
  - h) Stability criterion for Mobil Offshore units. Norwegian Maritime Directorate.
  - i) IMO MULTIHULL criterion
  - j) IMO MODU CODE 1989 criterion.
  - k) HSC Criteria for multihull craft. (IMO)
  - l) U.S. Coast Guard criterion



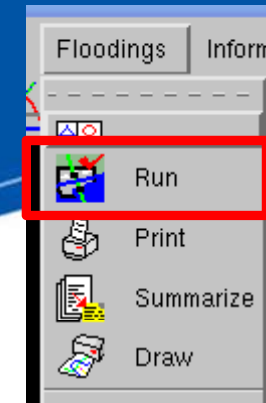
# 破舱稳性计算 (8)



- 出图纸的选项：执行Options->Draw命令
- Flooding single curve drawing: 是否产生破舱稳性图纸
- Multiple max. KG curves drawing: 是否产生最大KG曲线图纸
- Damage condition drawing: 是否产生破舱位置图



# 破舱稳性计算（9）



- 运算破舱稳性计算：执行Flooding->Run命令
- All the flooding conditions: 选择所有的破舱稳性计算的组合状态
- All with the same initial condition: 选择所有包含某种初始装载状态的破舱稳性计算的组合状态
- All with the same damage condition: 选择所有包含某种破舱数据的破舱稳性计算的组合状态
- Delete selection: 取消选择
- End of selection: 结束选择并进行计算

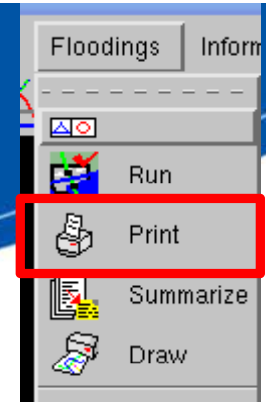
备注：在Proc下面有Yes或No选项， Yes表示已经计算的， No表示没有计算或计算未成功的

Flood	Damaged Condition	+ Initial	Proc
0001/DC01	MAIN ENGINEER DAMAGED	000	YES
0002/DC01	MAIN ENGINEER DAMAGED	000	YES
0003/DC01	MAIN ENGINEER DAMAGED	000	NO
0004/DC01	MAIN ENGINEER DAMAGED	000	NO
2001/DC01	MAIN ENGINEER DAMAGED	200	YES

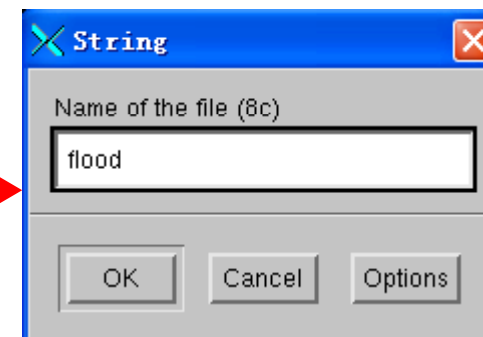
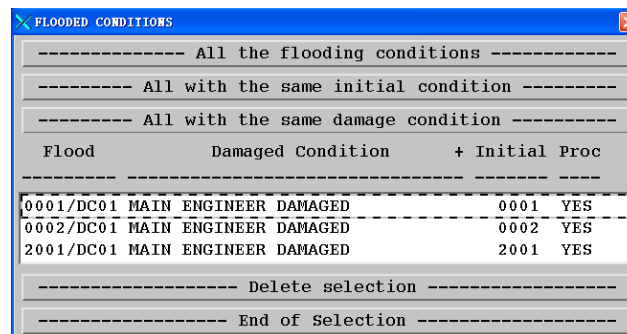
Below the table, there are two buttons: 'Delete selection' and 'End of Selection'.



# 破舱稳性计算（10）

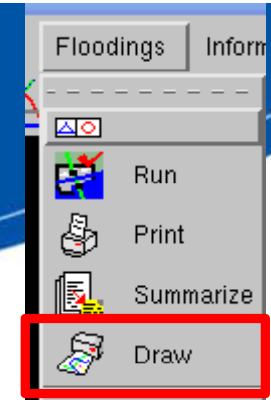


- 产生报告：执行Flooding->Print命令，显示所有已经计算完成的破损组合状态
- All the flooding conditions: 选择所有的破舱稳性计算的组合状态
- All with the same initial condition: 选择所有包含某种初始装载状态的破舱稳性计算的组合状态
- All with the same damage condition: 选择所有包含某种破舱数据的破舱稳性计算的组合状态
- Delete selection: 取消选择
- End of selection: 结束选择并进行计算

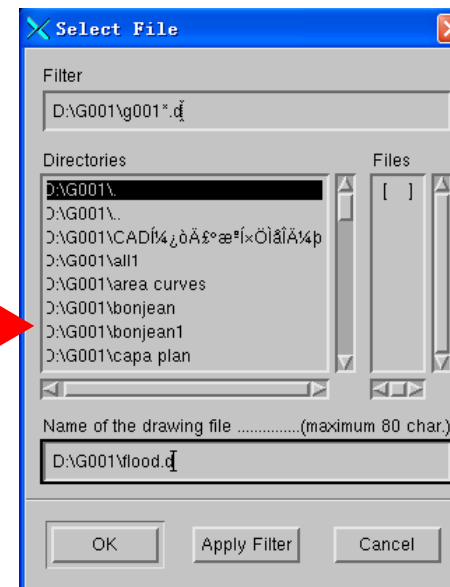
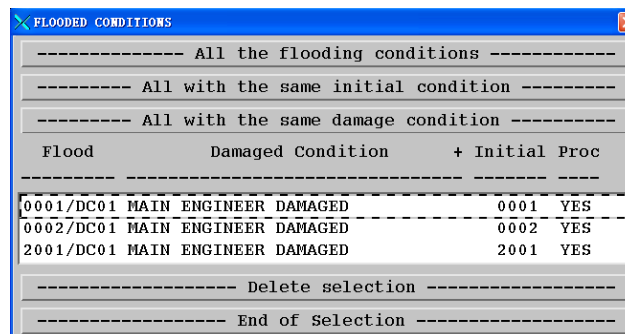




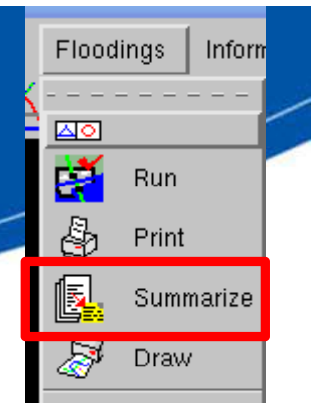
# 破舱稳性计算 (11)



- 产生图纸：执行Flooding->Draw命令，显示所有已经计算完成的破损组合状态
- All the flooding conditions: 选择所有的破舱稳性计算的组合状态
- All with the same initial condition: 选择所有包含某种初始装载状态的破舱稳性计算的组合状态
- All with the same damage condition: 选择所有包含某种破舱数据的破舱稳性计算的组合状态
- Delete selection: 取消选择
- End of selection: 结束选择并进行计算



# 报告摘要



- 1) Limiting kg's/gm's summary:
- 2) Water on deck summary:
- 3) Equilibrium and stability summary

