

# Users



MANAGING RISK



# Dynamic Positioning System

- Power System

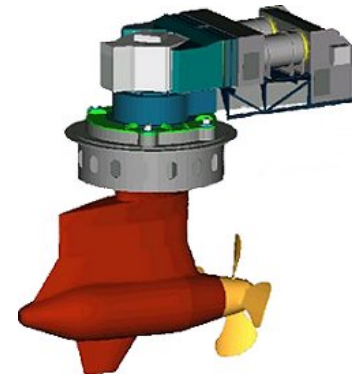
All components and systems necessary to supply the DP-system with power.

- Thruster System

All components and systems necessary to supply the DP-system with thrust force and direction.

- DP-Control System

All control systems and components, hardware and software necessary to dynamically position the vessel.

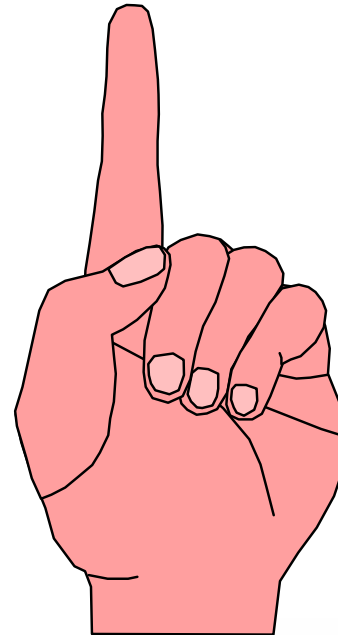


MANAGING RISK



# Important Concepts

- Class Notations
- Single Failure
- Redundancy
- Separation
- Selectivity
- Independence
- Consequence Analysis
- FMEA
- ERN



# Class notations

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- ~~DYNPOS T: (Old notation. 1 vessel in class: “Lady Cyntia”).~~
  - ~~Semiautomatic (joystick with auto heading)~~
  - ~~Without any redundancy~~
  - ~~Manual levers~~
- ~~DYNPOS AUTS:~~
  - ~~Without any redundancy~~
  - ~~Manual levers~~
- DYNPOS AUT:
  - Independent joystick backup with auto heading
  - Positioning reference system back-up
  - UPS power supply
  - Manual levers



# Class Notations cont.

- ~~DYNPOS AUTR:~~

- ~~– Redundancy in technical design~~
- ~~– Independent joystick backup with auto heading~~
- ~~– UPS power supply~~
- ~~– Manual levers~~

- ~~DYNPOS AUTRO:~~

- ~~– Redundancy and separation in technical design~~
- ~~– Independent joystick backup with auto heading~~
- ~~– Backup DP-control system, in a separate compartment~~
- ~~– UPS power supply~~
- ~~– Manual levers~~



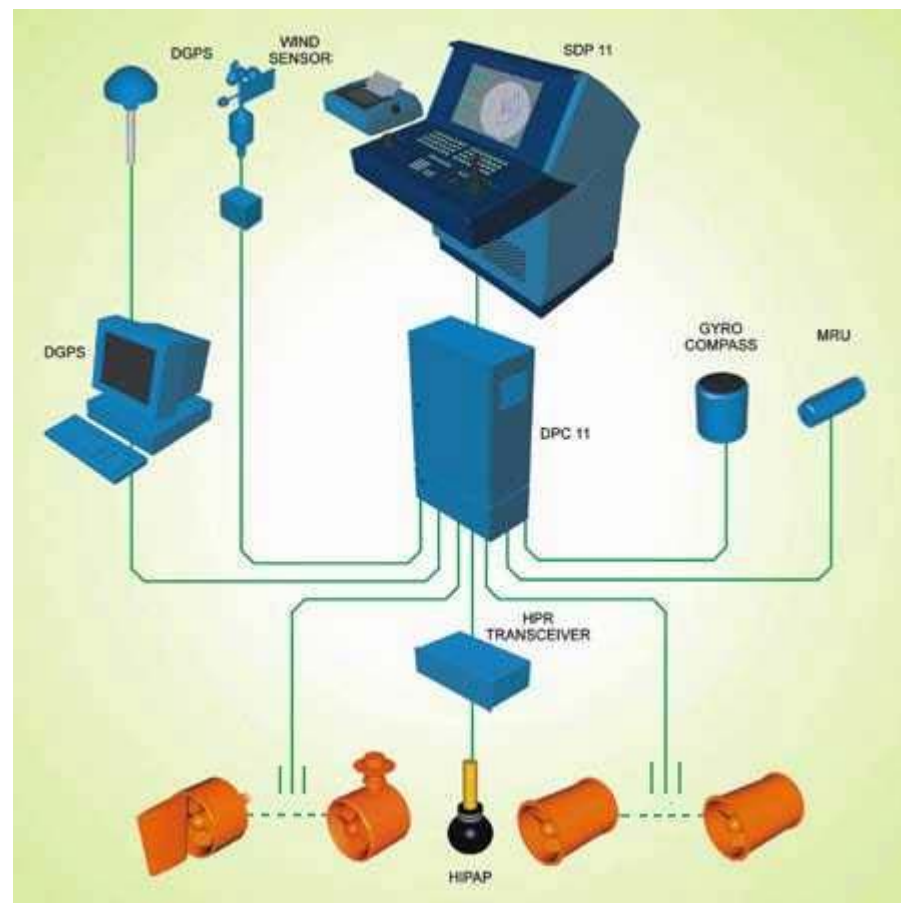
# Class Notation DYNPOS AUT

## Equipment:

- 1 computer system
- 2 position reference system
- 1 wind sensor
- 1 MRU/VRS
- 1 Gyro compass
- 1 printer

## In addition (not shown):

- 1 Joystick with automatic heading
- Manual levers
- 1 UPS



# Documentation ( I )

- Description and particulars of the vessel
- ERN calculations
- DP system Instrumentation and automation, including computer based control and monitoring, see Pt.6 Ch.7 Sec.1 Table D1 and Pt.4 Ch.9 Sec.1
  - Functional description
  - System block diagram (T)
  - User interface description
  - Power supply arrangement (T)
  - Arrangement and layout (T)
  - Cable routing layout drawing (T) ( AUTRO only)
  - Data sheets with environmental specifications
  - Documentation related to software
  - Failure mode and effect analysis or redundancy test procedure (T) ( AUTR/AUTRO only )
  - Test program for application software at manufacturer (T)
  - Test program for quay and sea trial (T)
  - Operational manual

T = required also for type approved systems

Usually delivered by the DP control system manufacturer



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# Documentation ( II )

- Thruster documentation
  - According to main class and Pt.6 Ch.7 Sec.4.
  - Additional calculations and procedures on request (Usually not requested.)
- Electric power system documentation
  - According to main class
  - Electric load calculation during DP operation
  - For AUTRO notation, cable routing layout drawing and fire and flooding separation arrangement
- FMEA (AUTR and AUTRO)
  - Ship systems
  - DP control system
  - PMS system

# Documentation ( III )

- DP control centre arrangement: The drawing must at least indicate arrangement of:
  - DP control system operator stations
  - Independent joystick system control station(s)
  - Position reference systems HMIs
  - Manual thruster control system
  - Placing of mode change system (DP/Joystick/Manual)
  - Placing of emergency stops for thrusters under DP control

- Mode change systems (DP / Joystick / Manual)
- Emergency stop systems (As required for DP class. See rules Sec.4)
- Independent joystick system (As for DP control system: Usually delivered by the joystick system manufacturer.)
- Program(s) for tests and trials (Usually delivered by the control system manufacturer(s).)

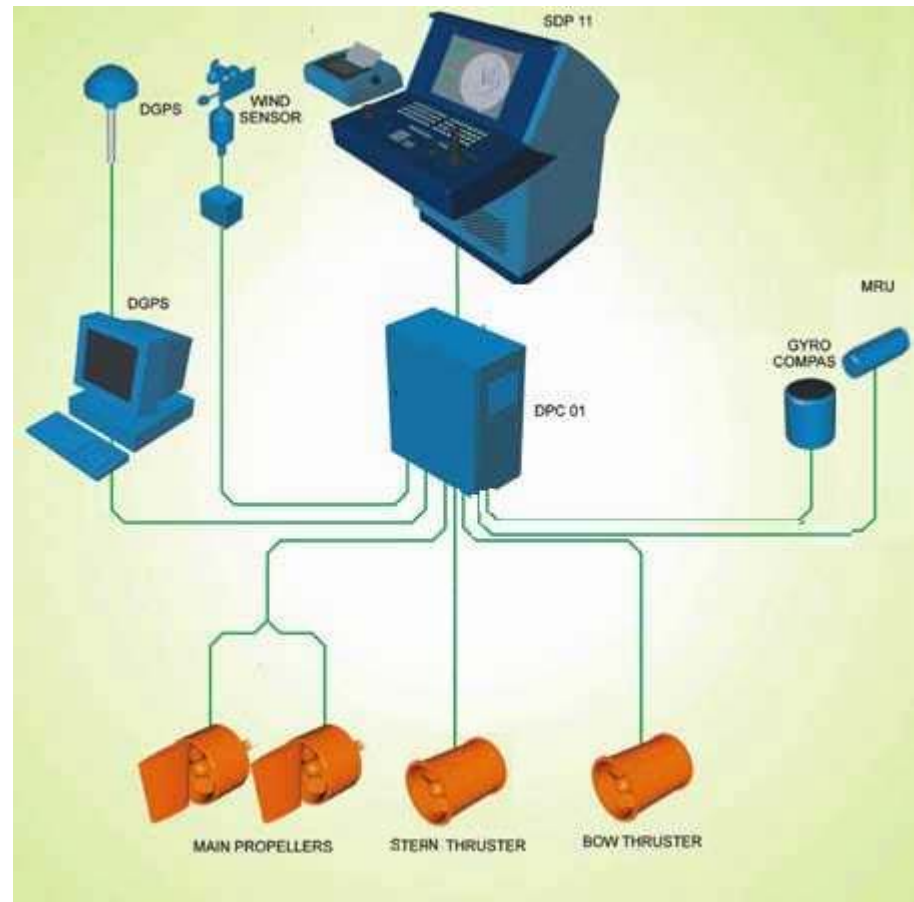
# Class Notation DYNPOS AUTS

## Equipment:

- 1 computer system
- 1 position reference system
- 1 wind sensor
- 1 MRU/VRS
- 1 gyro compass
- 1 printer

## In addition (not shown):

- Manual levers



# Class Notation DYNPOSS AUTR

## Equipment:

- 2 computer system
- 3 position reference system
- 2 wind sensor
- 2 MRU/VRS
- 3 gyro compass
- 1 printer

## In addition (not shown):

- 1 Joystick with automatic heading
- Manual levers
- 2 UPS`s



# Class Notation DYNPOS AUTRO

## Equipment:

- 2 + 1 computer system
- 2 + 1 position reference system
- 1 + 1 wind sensor
- 2 + 1 MRU/VRS
- 2 + 1 gyro compass
- 1 printer

## In addition (not shown):

- 1 Joystick with automatic heading
- Manual levers
- 3 UPS`s
- Separation is NOT shown for all equipment

