Requirements and Class Notation

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Requirements by

- Client/Oil Company
- Flag State / Coastal State
- Vessel Owner
- Class

- Abstract of The Rules

- Class Notations
- Class 1 systems
- Class 2 systems
- Class 3 systems
- Integrated Automation System (IAS)

IMO - DP Classifications

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Description	IMO	Corresponding Class Notations		
	DP Class	ABS	LRS	DnV
Manual position control and automatic heading control under specified maximum environmental conditions	-	DPS- 0	DP (CM)	DNV-T
Automatic and manual position and heading control under specified maximum environmental conditions.	Class 1	DPS-1	DP (AM)	DNV-AUT DNV-AUTS
Automatic and manual position and heading control under specified maximum environmental conditions, during and following any single fault excluding loss of a compartment. (Two independent computer systems)	Class 2	DPS-2	DP (AA)	DNV-AUTR
Automatic and manual position and heading control under specified maximum environmental conditions, during and following any single fault excluding loss of a compartment due to fire or flood. (At least two independent computer systems with a separate back-up system separated by A60 class divisions)	Class 3	DPS-3	DP (AAA)	DNV-AUTRO

IMO Guidelines

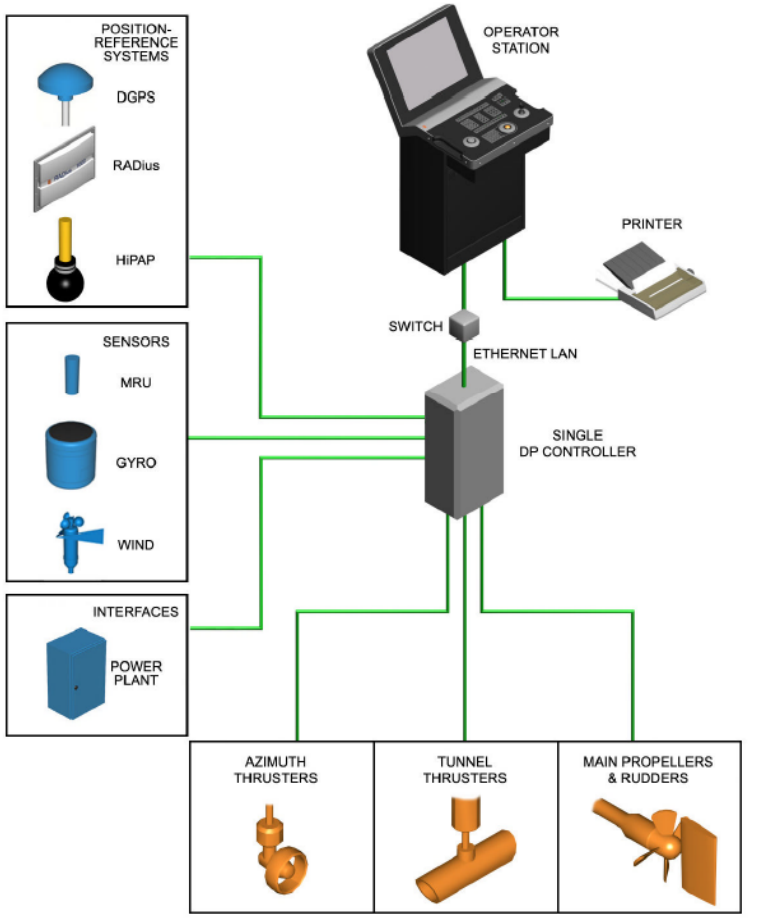
- Owner and Operator shall determine which Equipment Class should be applied for a specific operation by performing a risk analysis to document all aspects of the operation
- Risk analysis taking into account:
  - Technical evaluation of vessel and DP control system.
  - Evaluation of planned operation, highlighting critical phases
  - Emergency procedures
  - Relevant experience of vessel and crew
- The risk analysis document shall show that the selected vessel will provide the reliability and performance that the planned operation will require in view of risk level

IMO

Circ 645
Guidelines for Vessels with
Dynamic Positioning Systems

IMO Class 1

- DP Control System
- Independent Joystick System
- Position Reference Systems 1 (2)
- Sensors
  - Gyro 2
  - MRU 1
  - Wind 1



DP Class 1 - Examples

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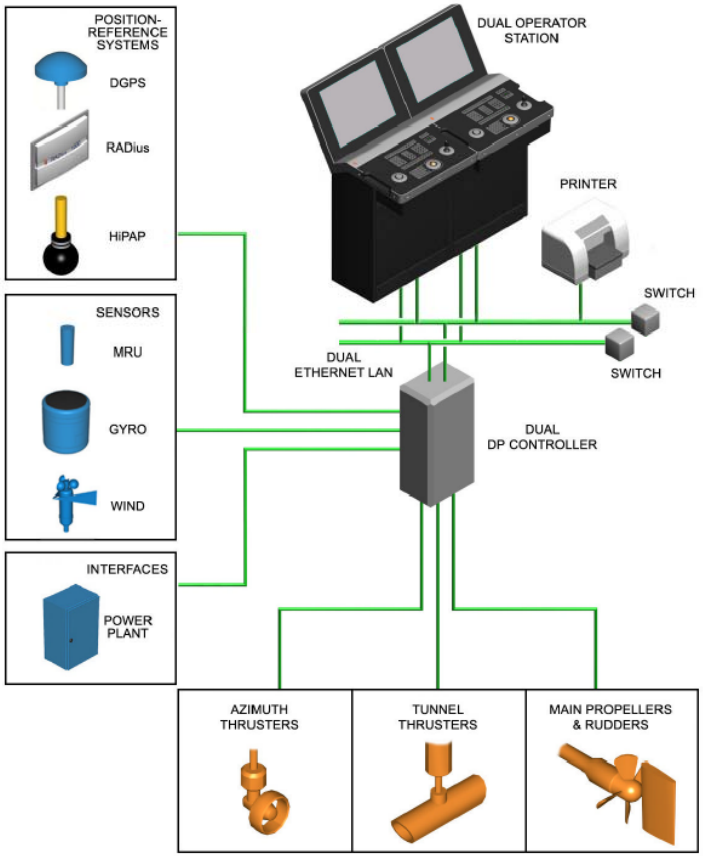
IMO Class 2

- DP control system
  - Computer Redundancy
  - Failure Detection
  - Fault Isolation
  - Dual Network
- Independent Joystick System
- Position Reference Systems 3
- Sensors
  - Gyro 3
  - MRU 2 / 3
  - Wind 2



IMO Class 2 (Triple Redundancy)

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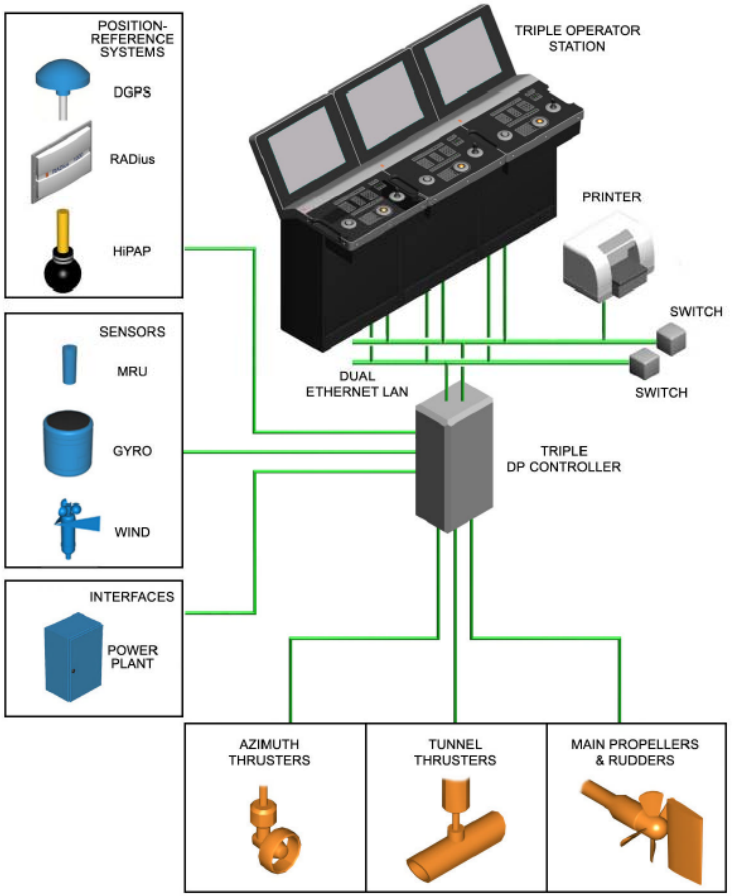
- DP Control System
  - Three Computers w/Majority Voting
  - Self Adjusting
  - Failure Detection
  - Failure Isolation
  - According to Class 2 after single failure
  - Dual Network
- Independent Joystick System
- Position Reference Systems 3
- Sensors
  - Gyro 3
  - MRU 3
  - Wind 2



DP Class 2 operations - Examples

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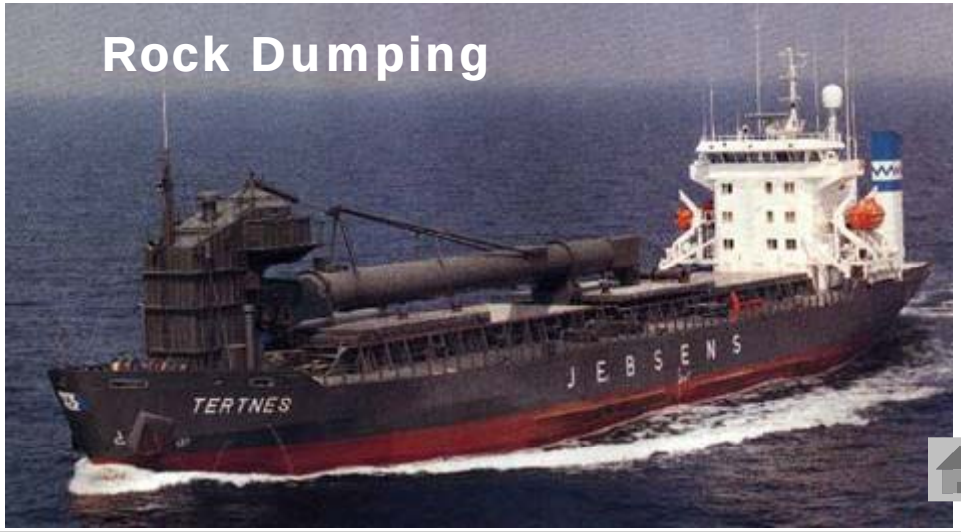

K-Pos DP2 + K-Pos DP1
K-Pos DP3 + K-Pos DP1 - IMO Class 3

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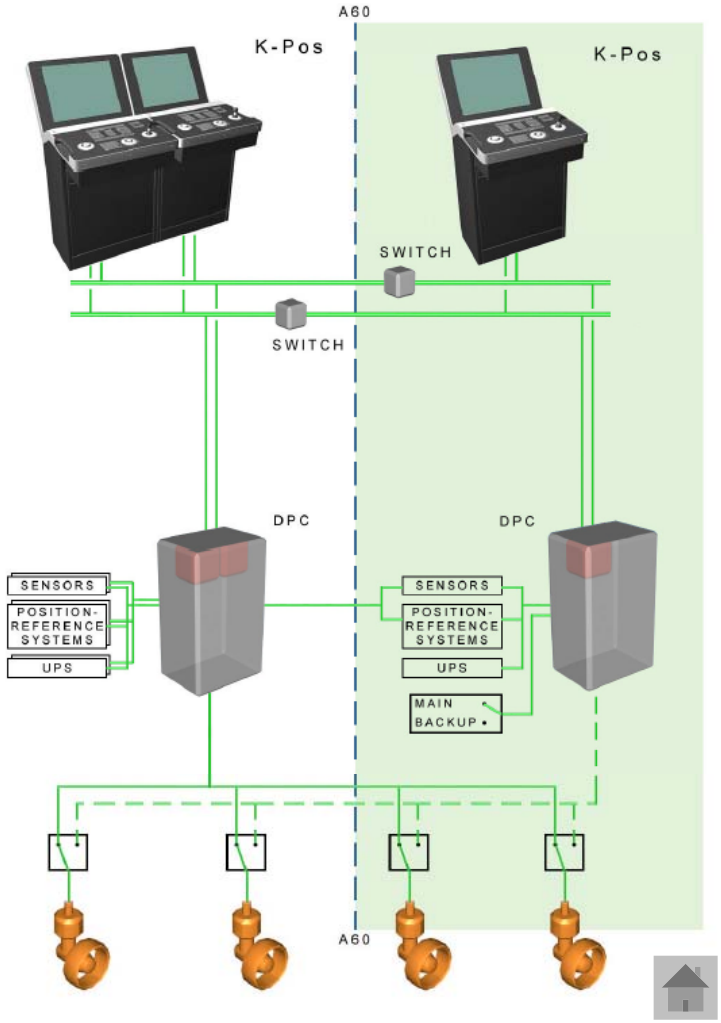
- Main DP control system
- Backup DP control system
- Independent Joystick System
- Position Reference Systems 3 / 1
- Sensors
  - Gyro 2 + 1
  - MRU 2 + 1
  - Wind 2 + 1



DP Class 3 operations - Examples

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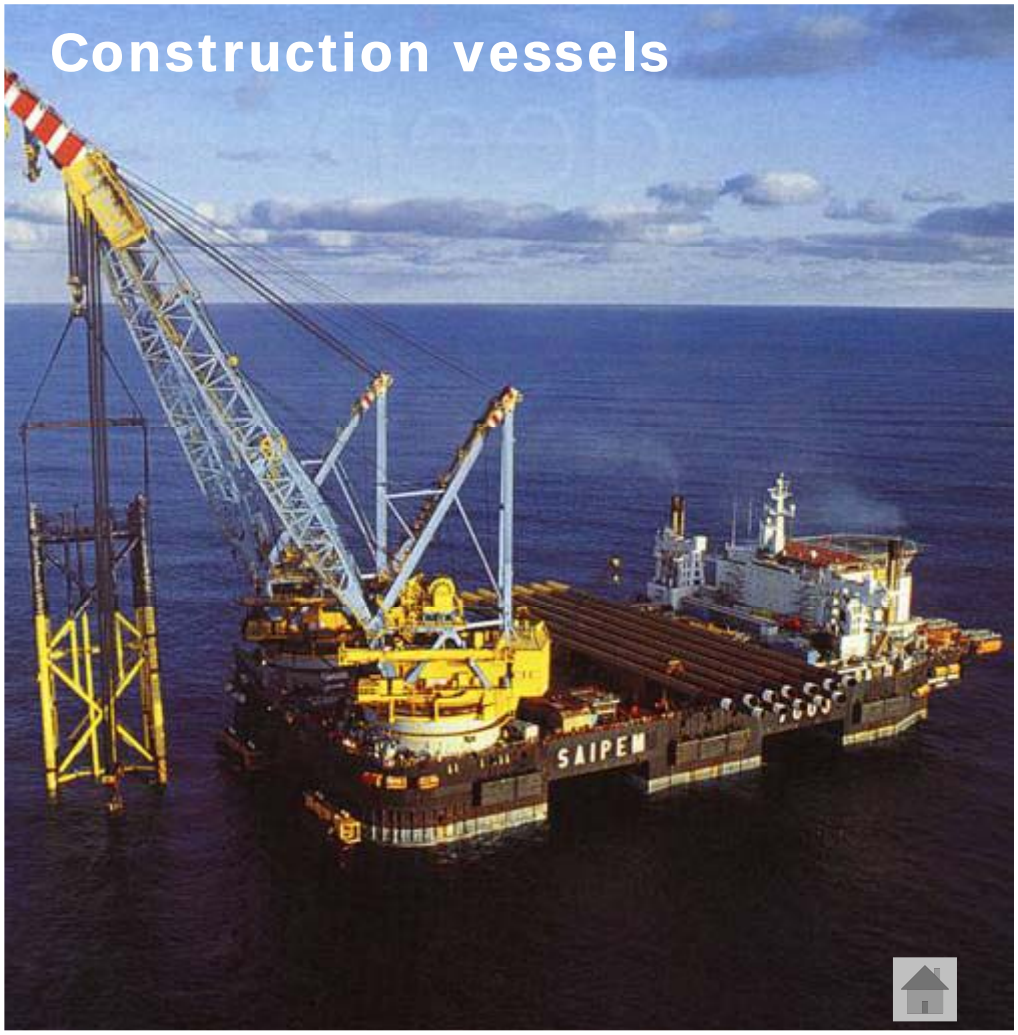

Integrated Automation System (IAS)

- Seamless integration with other Kongsberg systems:
  - K-Chief Vessel Automation
  - K-Thrust Thruster Control
- Advantages of IAS
  - Common technology
  - Common operator interface
  - Common tools and methods
  - Common mode control and mode supervision
  - Performance optimization
  - Reduced cable and cable installation cost
  - Reduced service and spare parts cost
  - Reduced need for training