



TRAINING

Advanced Training For DP Operators

Is it time? What Should it look like? How could it be used?

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[Return to Session Directory](#)



“Advanced Training For DP Operators”

Is it time? What should it look like? How could it be used?

Douglas C. Olson

WARNING !



This Presentation :

Does NOT Contain any Mathematical Formulae

Does NOT Contain any Technical Drawings

Does NOT Contain any Charts or Graphs



Is it time ?

What should it look like ?

How could it be used ?



Terms Used To Describe The Capability Of A DP Operator



☐ Qualified:

To make fit for occupation, meeting requirements, legally capable.

☐ Competent:

Well qualified, capable, sufficient, adequate, legally qualified, authorized, or fit.

☐ Experienced:

Having had much experience, as in a particular occupation or activity, having learned from experience, made wise, competent etc. by experience.



Present Training Program Effect on Qualification & Competence



- ❑ Formal shore based training conducted near beginning of training program.
- ❑ No formal testing requirement upon completion of Induction or Simulator courses.
- ❑ Training Centers have essentially same curriculum – emphasis on any one portion may vary dramatically.
- ❑ Some Centers may provide very little information regarding power generation, power problems, or safe power plant operation.
- ❑ Large number of DPO trainees today may have very little sea time or vessel operations experience.



Inadequate On Board Training

- ❑ DPO Trainee may be third member of watch team with Certified DPO and Senior DPO.
- ❑ DPO Trainee may be second member of watch team with Certified DPO.
- ❑ DPO Trainee may be second member of watch team with other Trainee.
- ❑ Little consistency on how and what training is conducted – emphasis mostly on control functions.
- ❑ Few Trainees attending DP Simulator Course have seen or reviewed FMEA or Capability Plots.
- ❑ Absence of DP operational procedures & policy on a company wide scale – confusion resulting from differing degrees of policy & safety between DP vessels in a particular fleet.



DP Work Experience



- ❑ A 12 hour DP watch may consist of 3 hours DP operating time and 9 hours in transit.
- ❑ A 12 hour DP watch consisting of 6 hours monitoring displays and trends with little or no maneuvering, or interaction with DP system.
- ❑ DP operator spending 6 to 12 hours per watch monitoring, maneuvering, and interacting with DP system.
- ❑ DP operator transfers to vessel engaged in different type of DP operation – higher level of risk to operational safety without sufficient familiarization time or additional training.



Changes in DP System Equipment and Functions



- ❑ New system control modes – enhanced control functions.
- ❑ Changes in system hardware & software.
- ❑ Different thruster configurations & modes.
- ❑ Diesel electric propulsion vs. engine driven thruster propulsion.



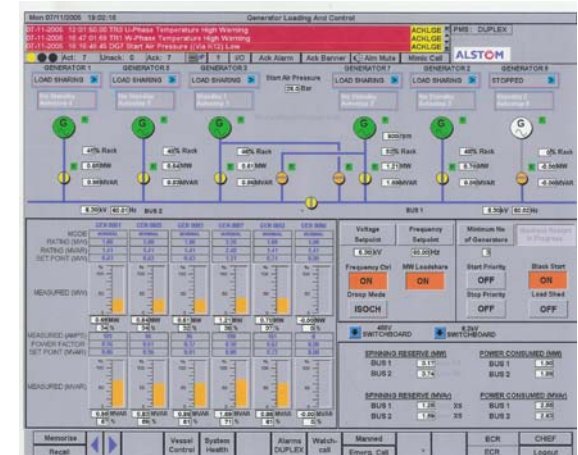
What should it look like ?



Course Subject Matter Outline

DAY ONE

- DP Operational Situations Written Exercise
- Power Management System
- Power System Faults, Failures, & Safe Operation
- AC Drives and Thrusters
- DP Incidents Review (IMCA) - loss of position cases

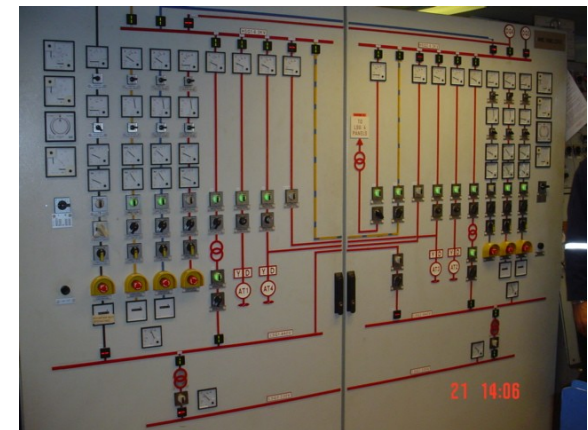


Course Subject Matter Outline



DAY TWO

- DP Operational Situations Written Exercise
- Position Measurement System Processing
- DP System Control Loops & Control Functions
- DP Operations
- DP System Familiarization
- Conduct of Simulator Exercises



Dynamic Positioning Operational Situations Exercise (DPOS - 3)

Date & Time:

2 July 2007, 1200 local

Operation Type & Location:

Accommodation Vessel
Gulf of Mexico

Vessel Type, length, beam & DP Class:

Semi-Submersible (class 2)
LOA: 75 m. Beam: 55m.

Vessel Heading (true):

180 deg

Water Depth:

72 m.

Mean Draft:

15.2 m.

Control Mode:

DP Mode
(auto heading & position)

COR Location:

Gangway Pedestal

Wind Speed & Dir:

170 deg. 15 kts

Computed Sea Force:

320 deg. Relative, 7.8 T

Thrusters Available & Type

T-1 (AZ,CP) T-2 (AZ,CP)
T-3 (AZ,CP) T-4 (AZ,CP)

Thrusters Selected & (Mode):

T-1, T-2, T-3, T-4 (Free Mode)

Generators Available & (KW) rating:

G-1, G-5, G-3 (1880 KW each) Bus 1
G-6, G-2, G-7 (1880 KW each) Bus 2

Generators On Line & Bus Tie CB Position:

G-1, G-5 (bus 1)
G-6, G-2 (bus 2)
Bus Tie CB CLOSED

Control Gain Settings:

Surge (F/A) 50% (medium)
Sway (P/S) 50% (medium)
Yaw 50% (medium)

Sensors:

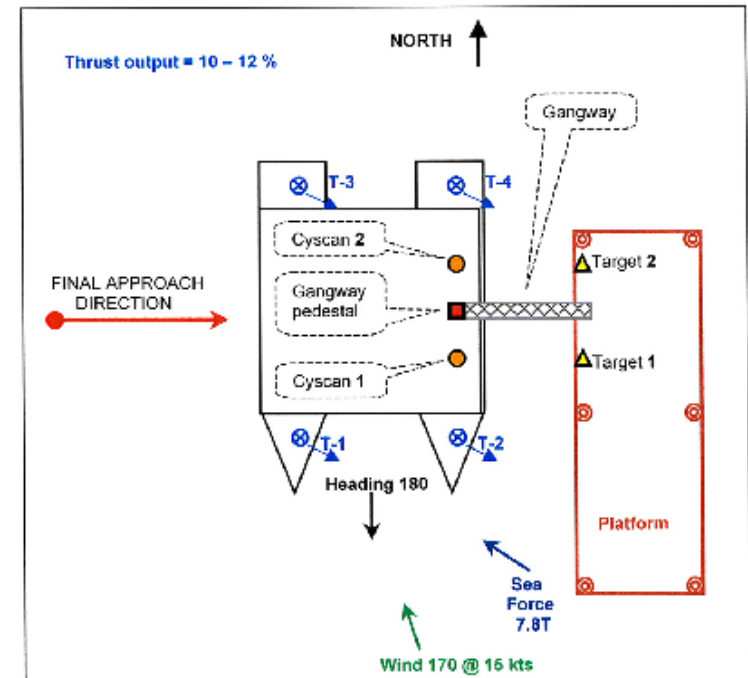
	available	selected
Gyro's	1 & 2	1 & 2
Anemometers	1 & 2	1 & 2
VRU's	1	1

PME's:

	available	selected
DGPS	1 & 2	1 & 2
Laser	1 & 2	1 & 2
Acoustics	N/A	
TW	N/A	
Gangway	Yes (not deployed)	

PME Weighting: manual / auto

Situation Diagram



Additional DP System Functions

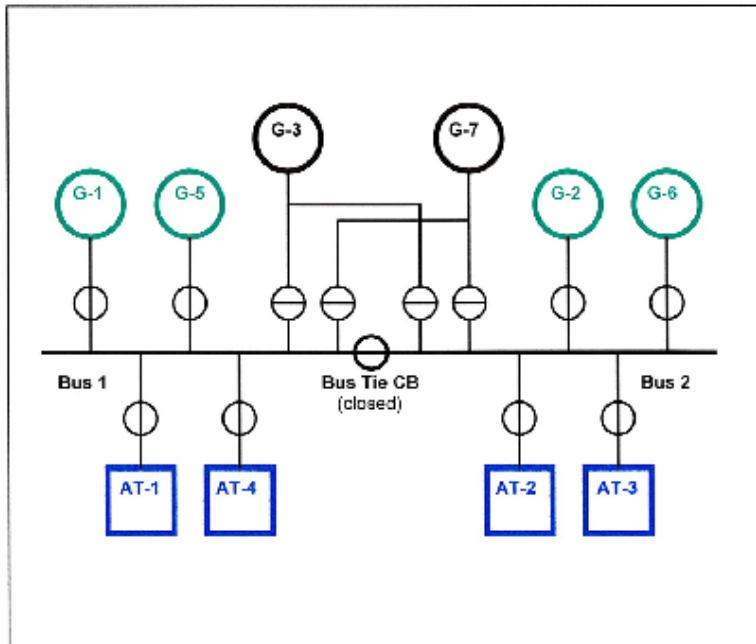
Environmental Force Fast Learn

Kalman Gain Settings

Minimum Power Mode

DPOS - 3

"Power Mimic"



DP Operational Situations (DPOS – 3) Written Exercise

While completing the DP checklist, you are notified by the Engineer that Generator 3 is in standby, and Generator 7 is down for maintenance (ETR one hour).

The following questions are regarding the "final approach" to the platform which takes place between 1200 and 1230 local.

- You are presently engaged in a "change position" maneuver and located approximately 40 m. from the structure. DGPS 1 fails due to position jumps outside the rejection limit. (failed median check). Which of the following would be the best course of action ?
 - Deselect DGPS 2, while continuing the change position maneuver.
 - Stop the vessel (present position), deselect DGPS 2, then continue change position maneuvers toward structure.
 - Continue change position maneuver toward the structure while monitoring the "Position Fix Repeatability".
 - Stop the vessel (present position), monitor DGPS 2 for several minutes on the "PME Median Check" mimic, and if good data, continue maneuvers toward structure while monitoring DGPS 2.

Additional remarks or comments:



The 1745 local time power plant and thruster status is as follows:

The Bus Tie CB is open. G-1 and G-5 are on line Kw load sharing at 39%, G-2 and G-6 are on line Kw load sharing at 46%. G-3 is in standby (engine not running). G-7 continues to be down for maintenance (ETR 18 more hours). Power plant "critical margin" is 10% of power available.

Thruster T-4 has been deselected and shut down for maintenance. T-1, T-2, & T-3 thrust demands are currently at 38%.

8. Based upon the time 1745 power plant and thruster status above, which of the following statements would be correct ?

- A. Should G-1 or G-5 fail, there would not be enough electrical power to provide the required thrust for T-1.
- B. Should G-2 or G-6 fail, there would be very little spinning reserve but no risk of "power chop" on Bus 2.
- C. There is enough "spinning reserve" on each Bus that any on line Generator failure would not create a station keeping problem.
- D. If G-2 or G-6 should fail, Bus 2 would "power chop" by about 40 Kw.

Additional remarks or comments:

9. Considering the above time 1745 power plant and thruster status, what would be the result of generator failures with the Bus Tie CB closed ?

- A. A single generator failure would provide a 188 Kw power excess over the critical margin.
- B. There would be no difference in power available for thrusters whether the Bus Tie CB is opened or closed.
- C. Two generators could fail and still provide a small excess of power over the critical margin.
- D. A single generator failure would result in power available of only 3760 Kw.

Additional remarks or comments:

10. Considering the above time 1745 power plant and thruster status, which of the following would be the safest power plant configuration while maintaining an "open" Bus Tie CB ?

- A. Shut down thruster T-3 to reduce load on Bus 2.
- B. Start Generator 3, place on line, with CB closed to Bus 2.
- C. There can be no safer power plant configuration until Generator 7 is available.
- D. Shut down thruster T-2 to reduce load on Bus 2.

Additional remarks or comments:

Course Subject Matter Outline



DAY THREE

➤ **DP System Simulator Exercise (6 hours)**

Exercise vessel and operation consistent with work experience.

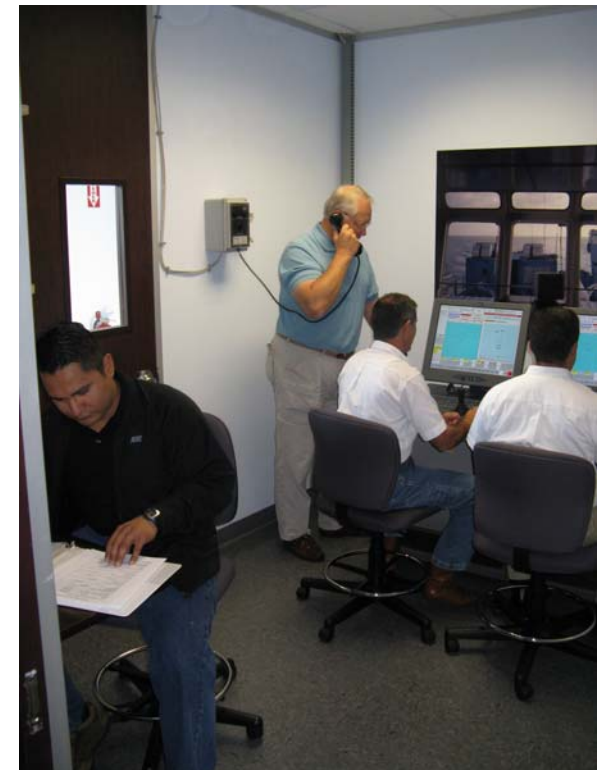
Operation Planning -- Conduct Exercise -- Critique

DAY FOUR

➤ **DP System Simulator Exercise (6 hours)**

Exercise vessel and operation consistent with work experience.

Operation Planning -- Conduct Exercise -- Critique





General Refresher Training

- ❑ Certified and Senior DP Operators.
- ❑ Captains or Mates providing temporary watch relief.

Standard Operations Training

- ❑ Reinforce international guidelines specific to type of DP operations.
- ❑ Promulgate company specific DP operations policy and guidelines.



Operation Specific Training

- ❑ DP operation containing higher than normal risk element i.e. SIMOPS, CLOSEOPS, etc.
- ❑ Simulator exercises structured to specific operation.



DP Operator Knowledge & Skills Assessment

- ❑ Shortened format – possibly one or two days.
- ❑ Prospective or newly hired operator personnel.
- ❑ Written and simulator exercise assessment.
- ❑ Proper input, guidance, and evaluation criteria from participating companies.



Conclusion



- ❑ **“Qualified,” “competent,” and “experienced” are subjective terms – no absolute standard by which any operator is measured.**
- ❑ **We still have DP “incidents” – most of the time a qualified, competent, and experienced operator is on watch.**
- ❑ **Large number of DP vessels are under construction – more in planning stage – new operator manning may be an issue – critical question is how competent are the certified DP operators who will train them.**
- ❑ **Advanced training programs for DP Operators do exist – It is now up to DP vessel owners and operators to take advantage of them !!**

Thank you for your attention

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