

DYNAMIC POSITIONING CONFERENCE
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TRAINING SESSION

The DP Power Simulator Training Concept



KONGSBERG

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Abstract

In an effort to meet the demands and challenges placed upon operators to effectively operate and manage today's advanced and complex integrated DP systems, Transocean and Kongsberg Maritime Inc have developed a new concept of training DP operators serving onboard DP drilling vessels. Transocean has identified a need to further develop and train their operators in the effective use of power management systems during critical situations and have solicited inputs from various DP manufactures to develop a DP power simulator to facilitate that goal. Kongsberg Maritime Inc has answered the call and collaborating with Transocean has developed a modeled training program that has the potential to meet the future training needs of operators in the deepwater exploration industry. This training concept represents a new phase in the continued development of operators managing the unique challenges in today's demanding offshore drilling environment.

Introduction

The Nautical Institute's DP Operator Certification scheme has served to give the prospective DP Operator candidate a level of training in the principles and practice of DP and is a standard that is recognized throughout the DP industry in a multitude of DP disciplines. This scheme when properly carried out by the prospective candidate and their respective employer has achieved good results as a whole and in some respects has served the DP Industry well.

Transocean Inc. being at the forefront of deepwater DP Drilling operations has also had the foresight to further develop and train their operators to handle and operate complex DP Integrated systems. In particular Power Management Systems. Their training needs involves that their operators have a good understanding of how power management systems when managed successfully can lead to minimize loss time in drilling operations. Their operators are responsible for not only operating DP systems but in addition complex vessel automation systems as well.

Kongsberg Maritime Inc. was consulted by Transocean Inc to develop a training program and simulator suited to satisfy Transocean's goal to train their operators in the concept of power management systems through simulation and instruction. This DP Power Simulator Training Concept is designed to not only complement the existing Nautical Institute DP Operator Training Scheme but to further enhance it and address the unique training needs in the effective applications of power plant theory and concepts through simulation.

DP Power Simulator Training Concept

The DP Power Simulator Training Concept was developed this year and we have achieved good results in the courses that were held at the Kongsberg Maritime Inc Training Center in Houston. The course of study is three days in duration and in general covers the following:

Power Plant Theory and Concepts

Course participants are given walk through and familiarization of the DP Power Simulator.

Review generic Well Specific Operational Guidelines and other pertinent documentation.

Simulations of some the following scenarios:

1. Fuel Rack Actuator Malfunction
2. Diesel speed control runaway and instability
3. Voltage Control Failure
4. Diesel Over Temperature
5. Thruster Over Temperature
6. Runway Thruster at a 100%
7. Sensor Drift

End of Course test to gauge the course participant understanding of concepts of operations with respect to DP Power Management Systems.

This new concept in training is to give the operator an appreciation for what's involved in operating and managing a DP power management system effective under simulated power and thruster casualties. We try to emphasize to the course participants a method of thinking through a problem and coming up with the appropriate responses to a given scenario problem. We try to shy away from the "cookie cutter" approach to this type of training in this course. We try to impress upon each course participant to take a systems approach in conceptualizing the DP Power Simulator. Even though the DP Power Simulator may not resemble any vessel automation system that they maybe accustomed to operating onboard their respective DP vessels, it is still an effective training tool for power plant concepts of operations

The **system fault assessment protocols** we try to emphasize to the course participant to use during the simulations are as follows:

1. **System Failure assessment:** Was it possible to assess the fault condition in a timely manner?

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2. **System Fault Isolation:** Were you able to take action isolate the fault condition and minimize the casualty?
 3. **Mitigate the consequence of the fault:** Were you able to take action to mitigate the effects of the fault condition and continue simulated DP drilling operations?
 4. **Workaround and ETR:** Were you able to find a satisfactory work around to the particular fault and the Estimated Time of Repair of the faulty equipment in question.

These proposed examples of system fault protocols just mentioned is in an effort to organize the thought processes of the course participants during casualty scenarios and to condition them to developing critical thinking skills in order to react positively to a simulated casualty scenario. After a while of "hammering" these protocols into the course participants during simulations they begin to see the value of assessment protocols in critical situations.

The end goal of this training is not to make DP operators as "experts" in DP power management systems, but come away from this training recognizing similar power casualty situations and what appropriate actions to take to mitigate and possibly restore the power system to a safe operational status.

Another goal of this course to allow the course participants to open up and be candid with the instructors about issues and incidents they may have experienced onboard their respective DP drilling vessels. This is in an effort to perhaps make the training as realistic as possible to what they may have experienced and possibly replicate the incident through simulation to correct any possible deficiencies noted during simulated incidents. The bottom line in any training environment is to key in on each course participant and use their individual strengths to build their respective skill sets during simulation.

For instance the group size in question would be ideally consist of four course participants and rotated them thru in the following positions: Captain, Senior DPO, Junior DPO and Communications officer. The Captain's main responsibility is to maintain overall the "big picture" during the given scenario. Also as the Captain it is implicit that the individual in this position is in charge of the team and accountable for the performance of the team as a whole. The Senior DPO is responsible for the safe operation of the DP Power simulator and the Junior DPO is charged to assist and support the Senior DPO in their responsibilities effectively. The Communications officer has an important role to play in the team and the individual in that role is responsible to keep a written log of the events and actions that occurred during the given scenario. Also the Communications officer is responsible for relaying information to other departments onboard (i.e., Drill floor, Offshore Installation Manager (OIM), Sub Sea Engineer and Engineer Control Room personnel) during the given scenario by direction of the Captain.

Again, the goal of this course as stated previously is to teach concepts of power management system operations, but the course is also designed to work the course participants as a team and build their team skills accordingly. This goal in itself poses a challenge because each group is unique with a lot of "moving parts" that need to be able to click into place so to speak and work together towards getting through a given scenario and getting benefit out of the course. The challenge in conducting a course like this is to keep things simple and yet maintain the group's focus during simulation.

Conclusion

In conclusion, Kongsberg Maritime Inc in partnership with Transocean has developed a course to further develop operators that are engaged in DP Deepwater Drilling operations in the effective use of complex Integrated DP systems. This concept represents a way forward in training DP operators and challenging them through DP Power simulation. The goal of this training is teach the course participant concepts of operating a power management system and apply what they have learned back onboard their respective DP Drilling vessels; irregardless of what type systems they are accustom to operating. All concepts taught in this course are germane to their vessel's operational situations.

This concept of training is a new phase in the progression and professional development of DP operators in the drilling industry and could lead towards potentially being modeled in principle like a well control course for drilling personnel that are required to maintain and demonstrate their skill sets to their employers.

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