Dynamic positioning – common incidents and mitigation

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Dynamic positioning systems are becoming more advanced and more common, as are the failures that arise when they are not managed correctly. This article looks at some recent incidents involving DP ships and how they would have been mitigated.

- Despite technological advances, we continue to see a number of DP related claims due to human error.
- DP systems used on board need to be fully integrated with training and simulation so that when faced with apparent conflicting information, the operators have proven options available to them.

Dynamic positioning (DP) utilises a computer-based control system to automatically maintain a ship's position and heading using data fed from the operator, environmental sensors and GPS. Recent advances in DP control systems, propulsion units, power generation and reference systems have enabled greater accuracy and reliability. DP enabled drilling ships can now hold position over a well with pin point accuracy, pipelayers can lay quicker and flotel units can move away from a site in the event of safety concerns.

Despite technological advances, we continue to see a number of DP related claims. DP systems are complex, their failure modes are difficult to identify, and they require active power and thrust to be available at all times. Reported incidents typically involve a near miss or actual contact with fixed or floating units, arising due to a loss of position or a drive-off situation.

Common incidents

A DP system, like all computer-based systems, is susceptible to failure, either through weather conditions masking a signal or because of an unnoticed software error. The human element is also a regular contributing factor.

In one recent case, a DP ship made contact with an offshore unit due to signal interference in the reference equipment. Between a fortnightly shuttle tanker service, a new lifeboat was fitted on an FPSO. During the next offtake, the shuttle tanker went into drive-off mode. It was later discovered that reflective tape on the lifeboat had interfered with the fanbeam signals.

Other incidents arise where a DP operator suspects a disparity between their visual assessment of the unit's position and the reference point when compared to the DP display. If an operator considers that the system is not functioning properly, attempts are made to gain manual control. The operator's reaction can be to apply 100% power, resulting in full thrust to force the ship into a manoeuvre. If uncontrolled, this can create excessive power demands on the DP equipment, leading to thrusters and generators being tripped and with a resulting loss of power or potential blackout.

Training and mitigation

As DP develops, the systems will continue to test their operators. We understand the importance of technically robust DP systems, but we also need to see these fully integrated with training and simulation, tailored to the as-built DP system on a particular vessel so that when faced with apparent conflicting information, the operators have proven options available to them. DP technology logs actions, similar to a ship's voyage data recorder, which could be effective in reducing incidents by enabling root cause analysis and allowing operators to train on real incident data.

Conclusion

The demand for DP operators is running at a premium and until systems become fully intuitive, intelligent and have adaptive functionality, the need for highly trained operators is paramount. DP may not be child's play yet, but our members and the industry as a whole recognise that at the core of DP systems must be the user.