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# The delicate art of staying still

## As advances are made in dynamic positioning technology and its application, are we treading water in our understanding and prevention of incidents, asks Claire Boddy, Claims executive at The Standard Club.

► *Claire Boddy.*

**To stand still, you have to move fast. This is never truer than for dynamic positioning (DP) systems and their operators, as they control the location of our offshore vessels.**

DP uses a computer-based control system that automatically maintains a vessel's position and heading by using data fed to the system from the operator, environmental sensors, position and heading reference systems. The vessel, using its own power, propulsion and thrusters, can then achieve reliable position-keeping at sea. Whereas passive systems such as piles, legs and anchors are robust and do not require power, neither can they offer the flexibility for rapid or continual location changes that DP affords.

The market trend is for exploration to move further offshore into deeper and more challenging environments, such as the Arctic, or ultra-deep oil fields. This has led to a host of engineering challenges and at the forefront is how offshore vessels can maintain position where traditional fixed-point mooring systems are unworkable.

Dynamic positioning is not a new concept, but recent advances in DP control systems, propulsion units, power generation and reference systems have enabled greater accuracy and reliability. DP-enabled drilling vessels can hold position over a well with pinpoint accuracy, pipelaying vessels can lay quicker and faster, flotel units can move away from a site in adverse conditions, and installing offshore wind turbines through the North Sea winter is becoming a viable option.

Despite technological advances, DP class 2 and 3 vessels routinely collide with adjacent structures. As a P&I club insurer of offshore vessels, we continue to see a number of claims arising from DP incidents. DP systems are complex, their failure modes are difficult to identify and they require active power and thrust to be available at all times.

At the club, our members report incidents to us which typically involve a near miss or actual contact between a supply vessel and a fixed or floating unit, arising from a loss of position or a drive-off situation.

A DP system, like all computer-based systems, is susceptible to failure, either through climate-generated 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 vessel made contact with an offshore unit due to signal interference in the reference equipment. During the downtime between a fortnightly shuttle tanker service, a new lifeboat was fitted on a floating production storage and offloading (FPSO) vessel. 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.

Another incident involved the fitting of a new reference system. During DP trials, it was found that microwave signals were causing interference between the existing and the new reference system, meaning that only one could be used at any one time. Several months later and with a new crew on board, the DP operator selected both systems. The operator noted a significant offset between the two reference systems and deselected one – the new, untested, one. The DP system then demanded maximum thrust to move the vessel forward and sideways to a new position and, at less than 50m from the platform, contact was inevitable. It could be argued that had the operator been better trained, more aware of his surroundings and not so focused on the feedback from the equipment, evasive action could have been taken to avoid impact.

Other common events arise where a DP operator becomes concerned that there is a disparity between their visual assessment of the vessel's position and the distance from a unit when compared to the information being presented to them by the DP system.

If an operator considers the system is not functioning correctly, attempts are then made to transfer control from DP to either joystick or manual mode. As this transfer of command is normally a last resort, the operator's reaction can be to apply 100 per cent power, resulting in full thrust to force the vessel into a manoeuvre. If uncontrolled, this can create excessive power demands on the DP equipment; to avoid a vessel partial blackout, thrusters and generators can be tripped and go into shutdown mode with a resulting loss of full or partial power to the vessel.

As DP finds new applications, the systems will continue to test those that operate them. As a P&I club, we understand the importance of technically robust DP systems, but we also need to see these fully integrated with training and simulation, tailored to a particular vessel, so the operators have proven options available to them.

DP technology already embraces data historians with keystroke loggers. Using this, and/or linking DP directly to a vessel's voyage data recorder (VDR), could be effective in reducing incidents by enabling root cause analysis and enabling operators to train on real incident data.

The demand for DP operators is running at a premium and until DP systems become fully intuitive, intelligent and have adaptive functionality, the need for highly-trained operators is paramount.