

Dynamic positioning must be resilient against human error

Since 2016, Australia's National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) has been raising concerns with the offshore petroleum industry regarding dynamic positioning (DP) systems, and the susceptibility of its 'auto position' mode to be inadvertently deactivated. This concern originated from a reported incident in June 2016 where a vessel facility drifted off location as a result of human error while a diver was working on the seabed. Nobody on board the vessel was aware that the DP system had been deactivated. Rather than being an isolated incident, NOPSEMA is now aware of 16 similar 'loss of position' incidents internationally and each of these incidents had the potential to result in loss of life or other major accident event.

Examples of loss of position incidents from around the world

1. The operator of the vessel's dynamic positioning system placed a notepad on the console which pressed down on the 'surge' button twice and unintentionally deactivated the auto-position mode. With the vessel crew unaware, the vessel drifted off location while a diver was working on the seabed. The diver alerted vessel personnel as he followed his umbilical and walked with the drifting vessel, avoiding obstacles on the way. It was determined the incident was the result of human error made possible by a weakness in the design of the DP system.
2. A drill ship unintentionally drifted off position while dealing with a well kick after the DP operator inadvertently deactivated the auto-position mode by accidentally double-pressing the manual button while reaching across the console. Upon realising the mistake, the operator re-engaged the auto-positioning to bring the ship back into position. The incident was the result of 'human errors with a mix of ergonomics'.
3. A semisubmersible drilling rig lost control of position for several minutes due to an accidental disengagement of the DP system while drilling. Although the loss of position was immediately noticed by personnel, it took them six minutes to realise the auto positioning system had been disengaged. In response to the emergency, the drill pipe was sheared and the lower marine riser package disconnected. Both the loss of position and inadequate initial crew response were attributed to the 'poor ergonomic design of the control system'.

What the industry should consider

Centralised control systems need to be resilient against human error. No single inadvertent act by an operator should lead to an emergency response situation where there is a high probability of fatalities. Control systems should also provide adequate feedback to operators to allow them to identify the issue promptly and take appropriate recovery action.

Facility operators are reminded to check their systems to ensure they are not susceptible to this design-induced human error and ensure that suitable controls are in place to prevent, identify and adequately recover from this type of error. Operators should discuss with DP manufacturers more robust controls in the design of their DP systems. For example, tactile differentiation (error prevention) of safety critical switches, action confirmation dialogue boxes, provision of a high visibility display (error identification and recovery) and audible alarms/warnings. Other industries may have systems that could provide solutions such as aircraft auto-pilot controls.

DP manufacturers are encouraged to review the built in safe guards of their systems to ensure they provide sufficient protection, feedback and recovery against this type of design-induced operator error, noting that all three incidents had a double-press requirement for deactivation of the safety critical auto position mode.



What is the IRF doing?

At the October 2017 IRF Annual General Meeting in Denmark, NOPSEMA presented the latest information on the risk posed by design-induced human error for DP systems. The presentation relied on publicly-available information which supported the view that the frequency of unintended and undetected deactivation of DP systems is significantly greater when it is viewed from an international perspective over that of a single jurisdiction.

From an international perspective, it is apparent that the risk of loss of life or other major accident event is also greater. NOPSEMA's presentation referred to research which showed measures to reduce risks are available, but are not necessarily widely known or adopted. As a result, these risks are not being reduced to a level that is 'As Low As Reasonably Practicable'. NOPSEMA has delivered the presentation at industry conferences in Asia and America. NOPSEMA has also written to DP system suppliers to make them aware of this work and has requested their responses as to how they are addressing this issue.

At the AGM, the IRF endorsed the need to maintain focus on this issue as well as the importance of sharing information on risk areas. NOPSEMA agreed to write to DP system suppliers and industry bodies to inform them of the outcomes of the AGM and IRF member countries agreed to take action appropriate to their regulatory regime.

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