

IMCA DP Station Keeping Event Bulletin 01/18

February 2018

The following event trees have been compiled from recent reports received by IMCA. The originators granted IMCA permission for the trees to be analysed and commented on by the IMCA Marine DP Committee. To ensure anonymity not all of the information contained in the original report was made available to the persons analysing these event trees.

Vessel managers, DP operators and DP technical crew should consider if these events and comments are relevant to their own vessel DP operation so that they can be used to assess and assist the safe operation of the vessel.

Any queries regarding this bulletin should be directed to IMCA Technical Adviser Andy Goldsmith (andy.goldsmith@imca-int.com). Members and non-members are welcome to contact Andy if they have experienced DP events which can be securely analysed and then shared anonymously with the DP industry.

Introduction

A summary of the DP station keeping reports that have involved an unintentional or accidental activation of any button that has influenced the DP control of the vessel has been reproduced from data collected over the previous three-year period.

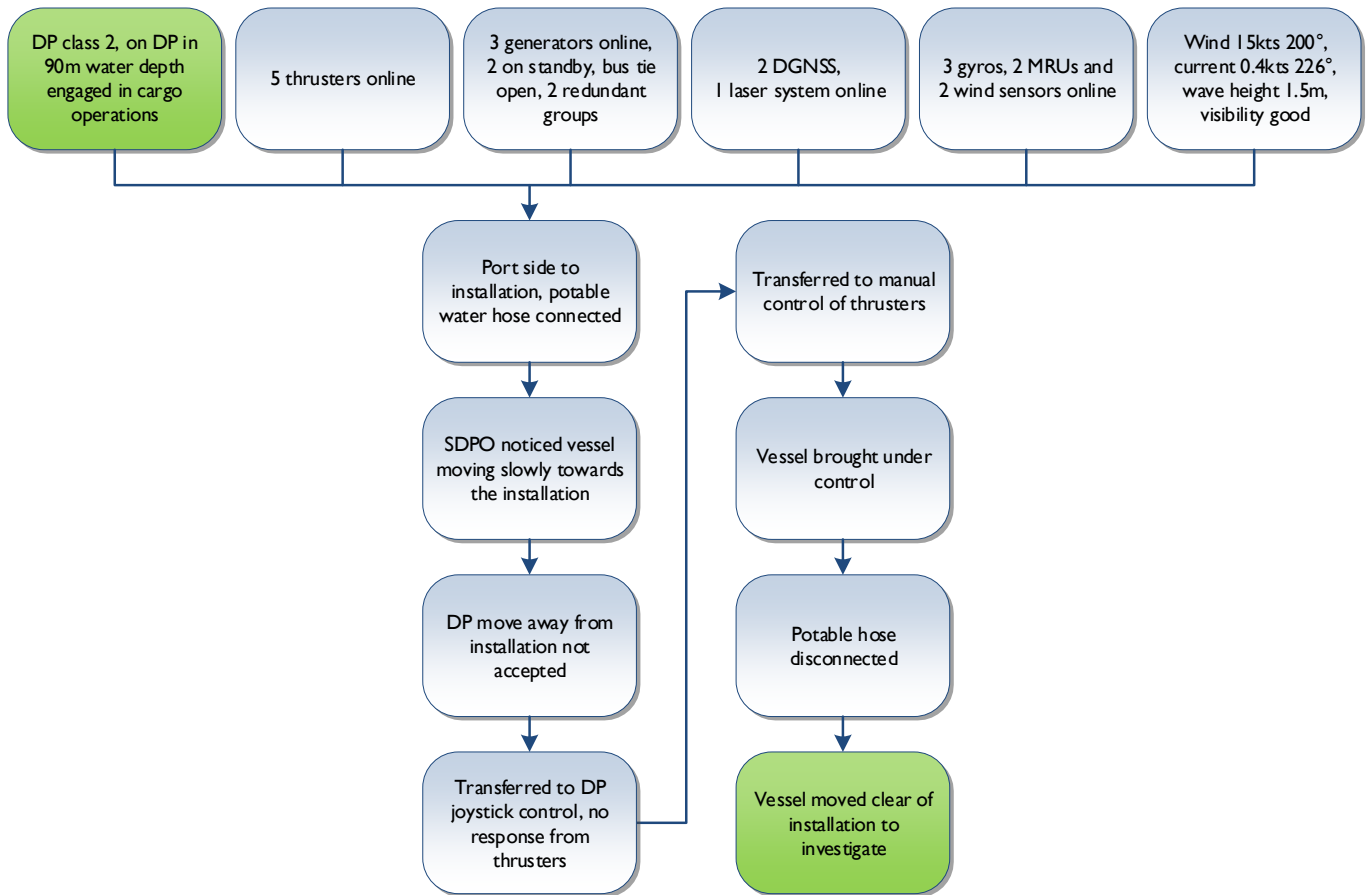
During 2015 IMCA received seven reports which involved the unintentional activation of a button. Five of these (1510, 1523, 1530, 1549 and 1563) involved the wrongful activation of a double press button on the DP control panel. The other two events (1511 and 1575) involved buttons with single press activation.

During 2016 two reports were received involving the unintentional activation of a button. One of these (1609) involved the wrongful activation of a double press button on the DP control panel. The other event (1630) covered the misunderstanding of how the DP control switching arrangement worked.

During 2017 only one event (1787) was attributed to wrongful activation of a double press button on the DP control panel.

The reduction of recorded events of this type over the three-year period is encouraging. However, in the first month of 2018 another event of this nature has been reported to IMCA. Therefore, this DP event bulletin reproduces the two most recent events. Readers are reminded of the importance to assess and guard against the vulnerability of this type of event occurring onboard their vessel.

Unintentional Selection of Manual Mode – DP Incident



Comments from the report:

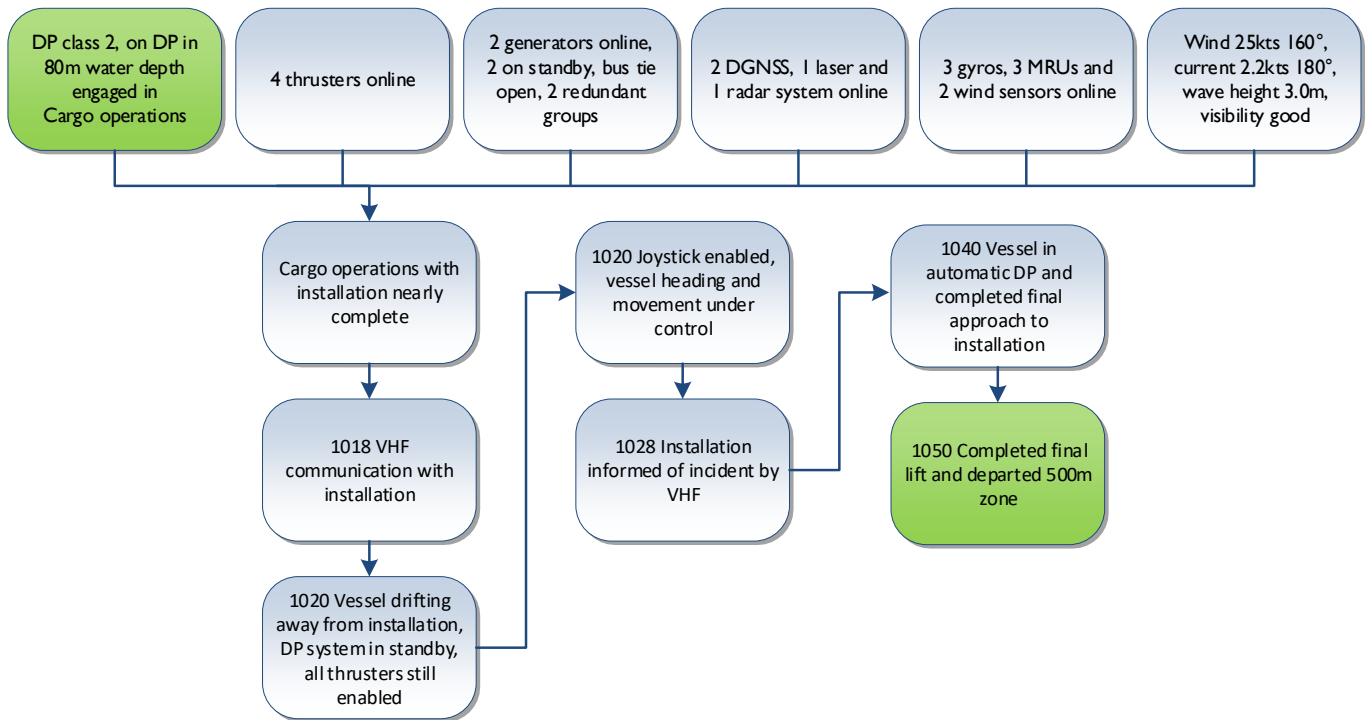
- ◆ **Initiating event:** Inadvertent selection of manual mode whilst in full DP mode
- ◆ **Main cause:** Human factor – The vessel mode of operation was changed from automatic DP mode to manual DP mode by a double press of the DP manual position button
- ◆ **Secondary cause:** Computer – No additional barrier (e.g. notification) when manual position selected

The vessel operator reported that there was an upgrade available to warn the DPO of the change of DP control status and therefore provide additional protection against accidental change of DP control status. The report concluded that all company vessels would be upgraded to include this function.

Considerations of the IMCA Marine DP Committee from the above event:

- ◆ It is important that DPO training focuses on good practice, an action should be followed up continuously to verify the intention of the action is reached or being executed
- ◆ This type of event has happened on other DP vessels, it is noted that some vessel operators have fitted a cover or made 'mode of operation' buttons stand out from others
- ◆ The incident highlights the importance of vessel operators risk assessing the operation of the DP control station and taking appropriate action as required
- ◆ Consideration should always be given to using joystick auto heading, which can provide tighter control of the vessel, prior to switching to individual manual control of the thrusters

Unintentional Deactivation of the DP System – DP Incident



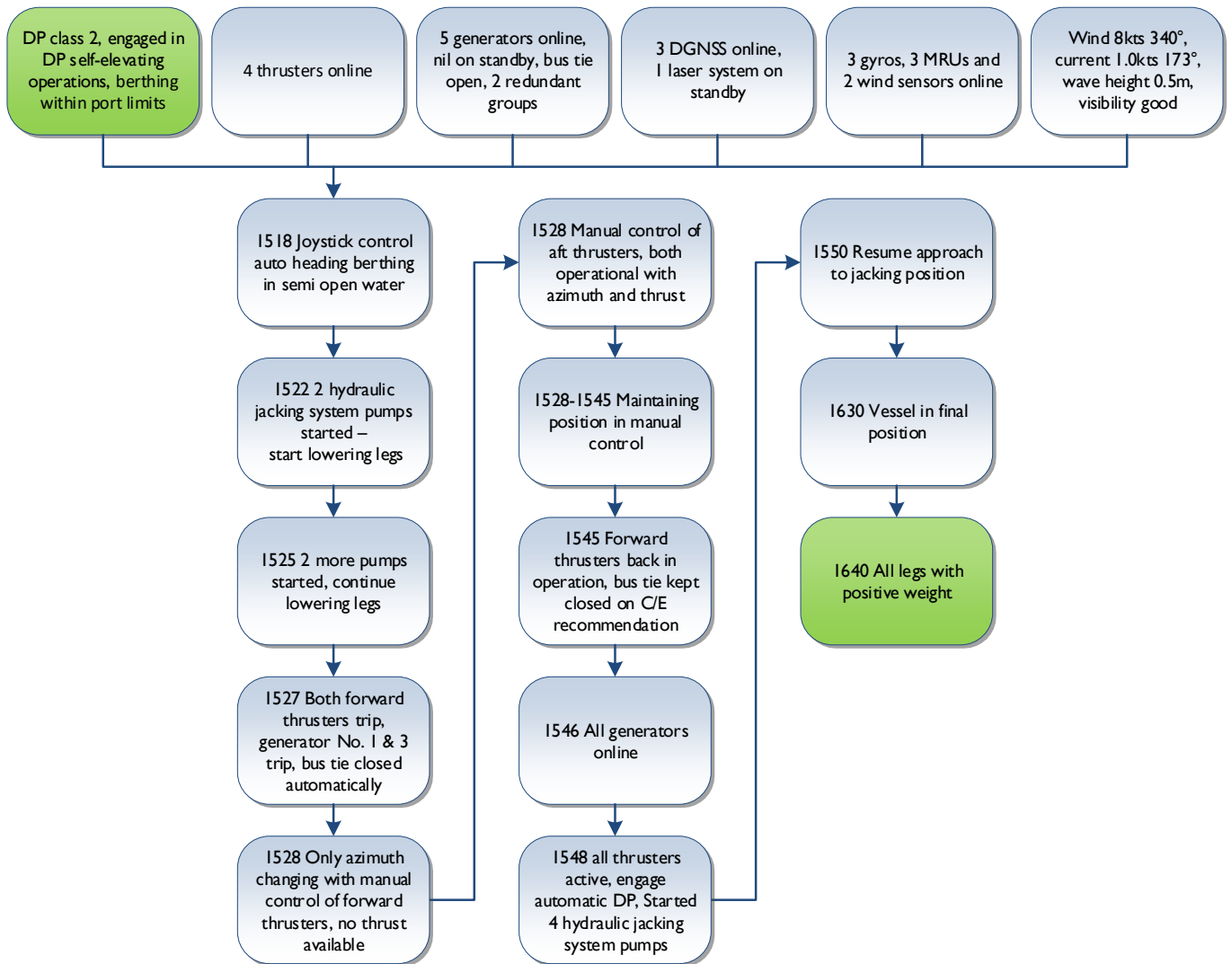
Comments from the report:

The initiating event was the unintentional activation of the DP standby button whilst in Automatic DP control. The radio used to call the installation control was situated over the DP control panel. In order to put the DP system in 'Standby Mode' it required the operator to Press the 'Standby' button twice. There were no alarms generated during the incident. After leaving the 500m zone attempts were made to re-enact the situation of the VHF radio handset pressing the button but this failed to put the system in standby. Follow Up – Information was sent to the DP system supplier including export files from the operator station. It was proven that the 'Standby' button was activated. The time difference between double taps was so small it was almost 1 single tap, this could explain activation by the VHF handset. To stop this from happening again, a clear flip top button cover will be fitted to both DP operator stations and a procedure initiated that the handset must be placed back in its cradle after each use.

Considerations of the IMCA Marine DP Committee from the above event:

- ◆ It is poor design that makes it necessary to lean over the DP control panel to use the VHF
- ◆ Vessel operators are reminded of the critical nature of DP mode selection buttons and should assess if the DP system is susceptible to unintentional deactivation of any critical mode
- ◆ If so, appropriate action should be taken without delay
- ◆ Recent action that the Committee is aware of is:
 - The fitting of a plastic flip cover to protect mode selection buttons
 - Installation of an additional function that requires the operator to confirm the mode change via a pop up window on the operator station
- ◆ A very short time period was allowed for DP stabilisation following the incident, the system had been switched to standby therefore time was required to build up the mathematical model.

Lack of Maintenance Caused a Problem Involving the Bus Tie Breaker – DP Undesired Event



Comments from the report:

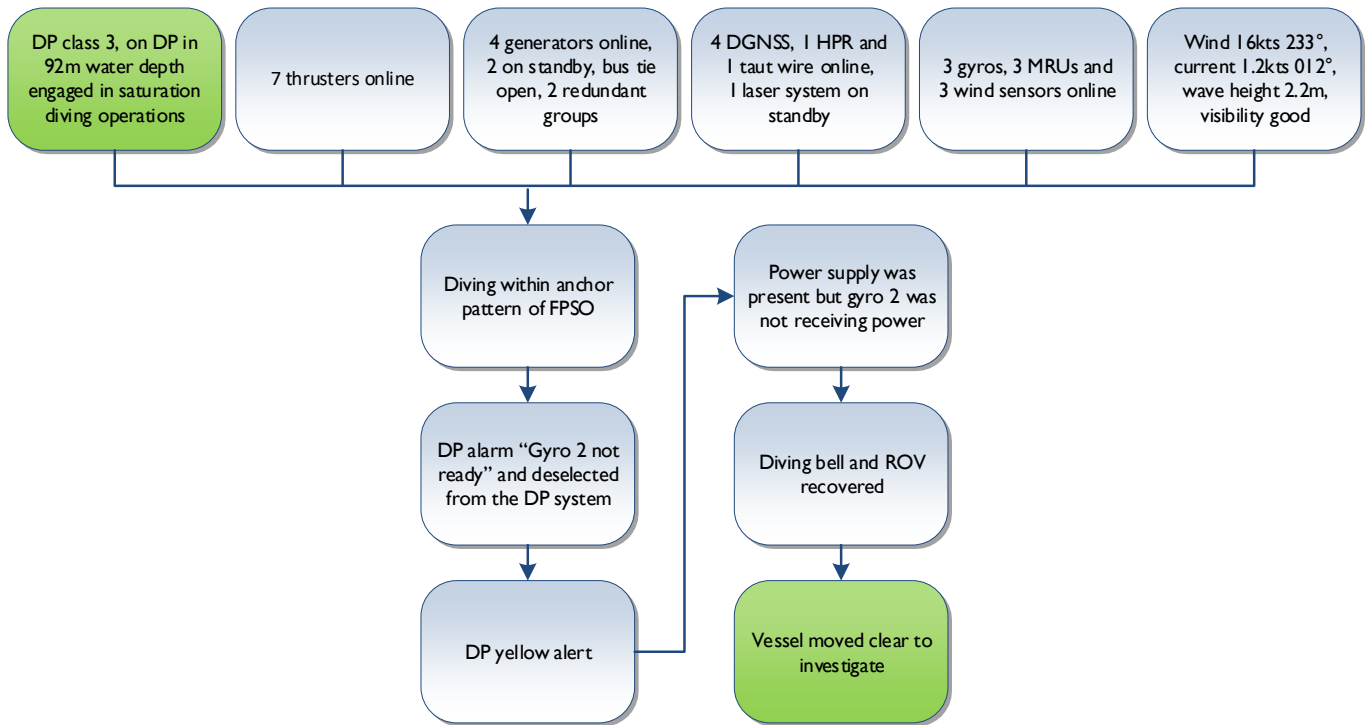
The power management system was set for semi-automatic mode as required for DP2 operations. Uncontrolled and unsynchronised closure of the bus tie breaker resulted in simultaneous trip of DG1 and DG3 with a consequence that the forward thrusters tripped. Based on conclusions from the technical analysis the primary reason (root cause) of the event had been identified as lack of maintenance of the DP critical system(s) more precisely the bus tie breaker. The ship was provided with a computerised planned maintenance system (PMS) which should cover all maintenance activity on board. The maintenance requirements of some major DP components were not included in the PMS.

Considerations of the IMCA Marine DP Committee from the above event:

- ◆ From the information supplied there was minimal DP stabilisation period allowed for at the start of the operation or following recovery when the vessel again engaged DP control
- ◆ It took 18 minutes to restore both forward thrusters – could this have been achieved more quickly?
- ◆ It is assumed that a partial blackout occurred, causing loss of both forward thrusters – normally the thrusters would be arranged such that the worst case failure (WCF) would cause the loss of one forward and one aft thruster

- ◆ It appears that the control of the thrusters was taken manually, however it should be questioned whether the automatic DP system or JSAH would have maintained the vessel in position
- ◆ While post-failure recovery time is definitely an issue, it seems that vessel design and operating configuration could be the root causes
- ◆ The event does highlight the importance of identifying and maintaining all items of critical operational equipment.

An Unassociated Failure of One Part of a Gyro System Affected the DP System – DP Undesired Event



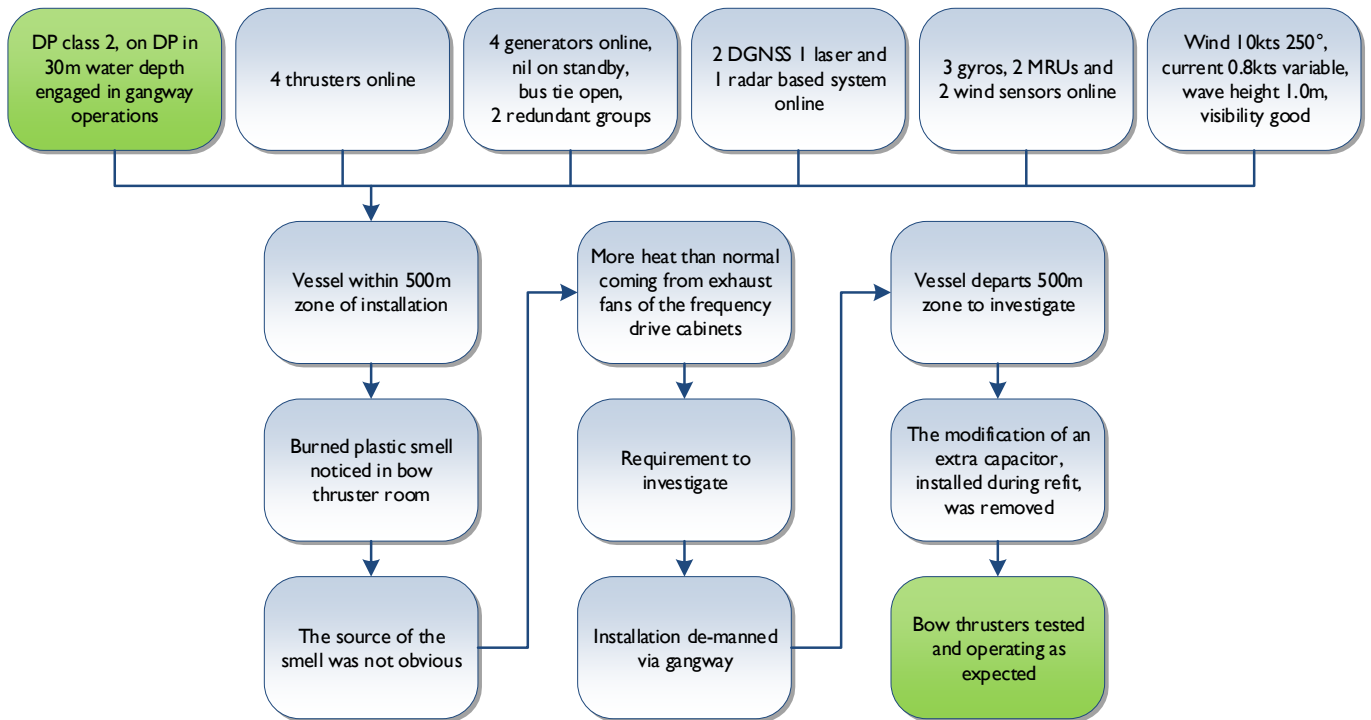
Comments from the report:

A new gyro was installed as a replacement but failed to start with first attempt. Further investigation revealed that the 'Gyro 2 remote control unit' located on the forward bridge had a fault, failure of it caused Gyro 2 to shut down. When the 'Gyro 2 remote control unit' was disconnected the new gyro was switched on with no further problems. After a stabilisation period the Gyro was tested, found operational and the signal to DP reinstated. DP operations were resumed. In conclusion the original Gyro 2 was and remains healthy.

Considerations of the IMCA Marine DP Committee from the above event:

- ◆ It can be assumed that good operational activity planning took place and the ASOG indicated a yellow alert to be activated with the loss of one gyro
- ◆ The logic of systems connected to the DP system need to be fully understood so that a failure in one part of a connected system does not affect the DP system
- ◆ With the availability of so many position reference systems it may be better to use 2 DGNSS and keep the other 2 DGNSS as monitoring
- ◆ It is unclear what the gyro 2 remote control unit is required for, but it appears to have introduced an additional failure mode of the gyro and should have been identified in the DP FMEA.

A Retrofitted Capacitor Caused a Bow Thruster Frequency Drive to Overheat – DP Observation



Comments from the report:

A wrongly installed extra capacitor at the bow thruster frequency drive caused overheating of this equipment. The extra capacitor was installed by the electrical designer and supplier of this equipment. It was also removed following consultation with the original equipment supplier.

Considerations of the IMCA Marine DP Committee from the above event:

- ◆ Further investigation should be initiated, including the supplier/manufacturer, as to why the extra capacitor was installed and whether another solution is required to ensure the thrusters function correctly in the future
- ◆ Vessel operators should ensure that a robust management of change procedure is followed
- ◆ A good response and sequence of events taken to minimise escalation
- ◆ A good choice and use of position reference systems is noted.