

IMCA DP Station Keeping Event Bulletin 02/18

May 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.

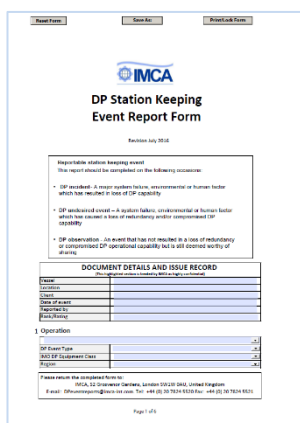
Vessel managers, DP operators and DP technical crew should consider if these events and comments are relevant to their own vessel DP operation so that they can be used to assess and assist the safe operation of the vessel.

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

The IMCA Marine DP Committee noted that none of the events covered in this bulletin involve loss of automatic DP control. It is stressed that the publication of such reports is for learning purposes only and the Committee applaud the crew and management of the vessels providing reports for their contribution to safe and efficient DP operations.

Vessels are reminded that in some areas of the world signals from Global Navigation Satellite Systems (GNSS) can be interrupted for extended and unpredictable periods for both military and political reasons.



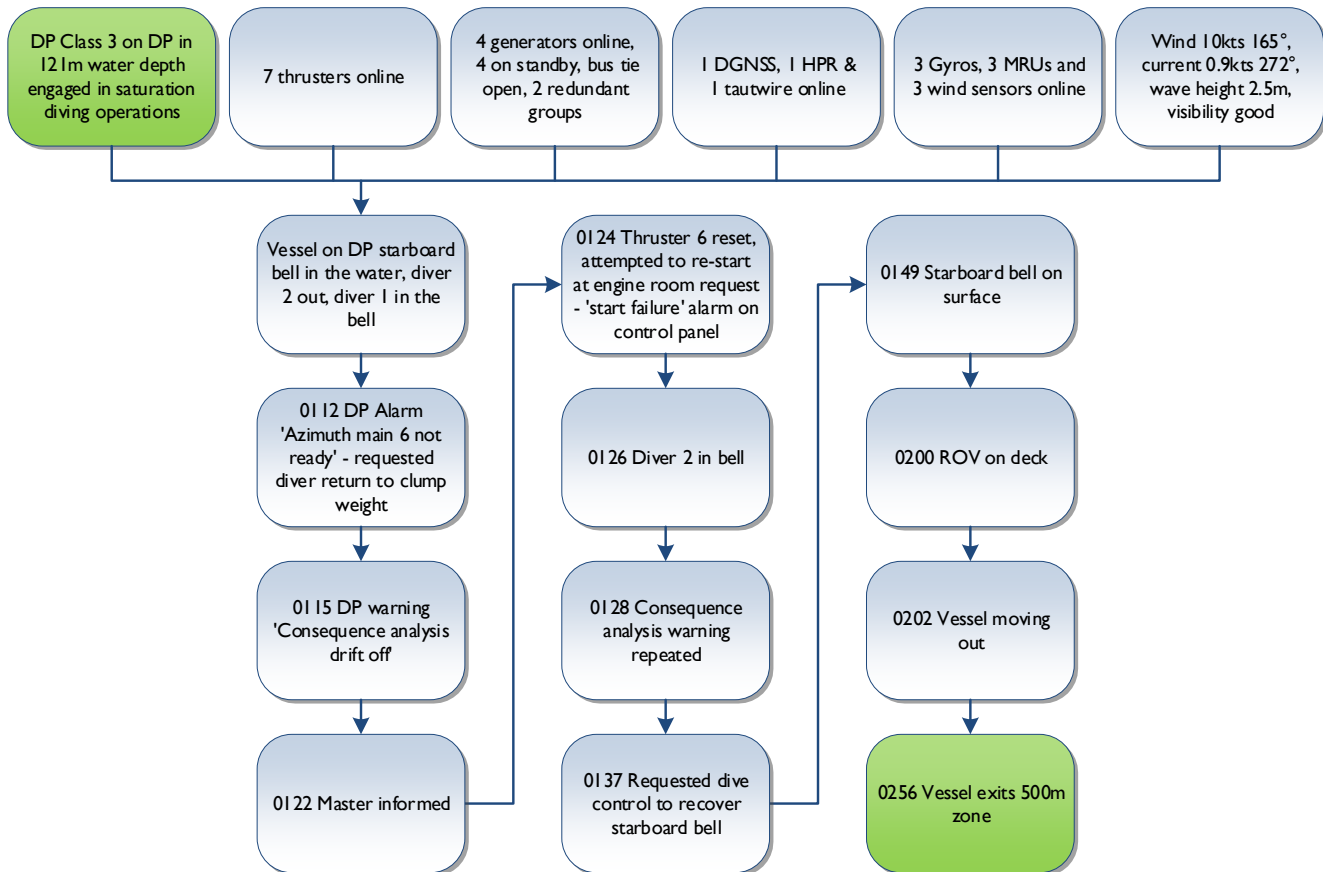
The screenshot shows the 'DP Station Keeping Event Report Form' with the IMCA logo at the top. It includes a 'Reportable station keeping event' section with three bullet points: 1) DP incident - A major system failure, environmental or human factor which has resulted in loss of DP capability; 2) DP unauthorised event - A system failure, environmental or human factor which has resulted in loss of redundancy and/or compromised DP capability; 3) DP observation - An event that has not resulted in a loss of redundancy or compromised DP operational capability but is still beyond authority of steering. Below this is a 'DOCUMENT DETAILS AND ISSUE RECORD' table with columns for Name, Date, Status, and Issue. At the bottom, it lists contact information for IMCA, 12 Dominion Centre, London EC2D 2HQ, United Kingdom, and provides an email address and phone number.

The IMCA DP event reporting form is used by DP vessel operators for their own internal reporting needs and for reporting to IMCA. As mentioned previously, all reports are treated confidentially by IMCA and great efforts are made in this respect.

DP vessel operators that participate in the scheme by providing at least one report during the year are entitled to display a certificate of participation on each of their DP vessels.



Electrical Fault Causes Loss of Thruster – DP Undesired Event



Comments from the report:

One of the three frequency converters on the port azimuth thruster was found to be burnt out.

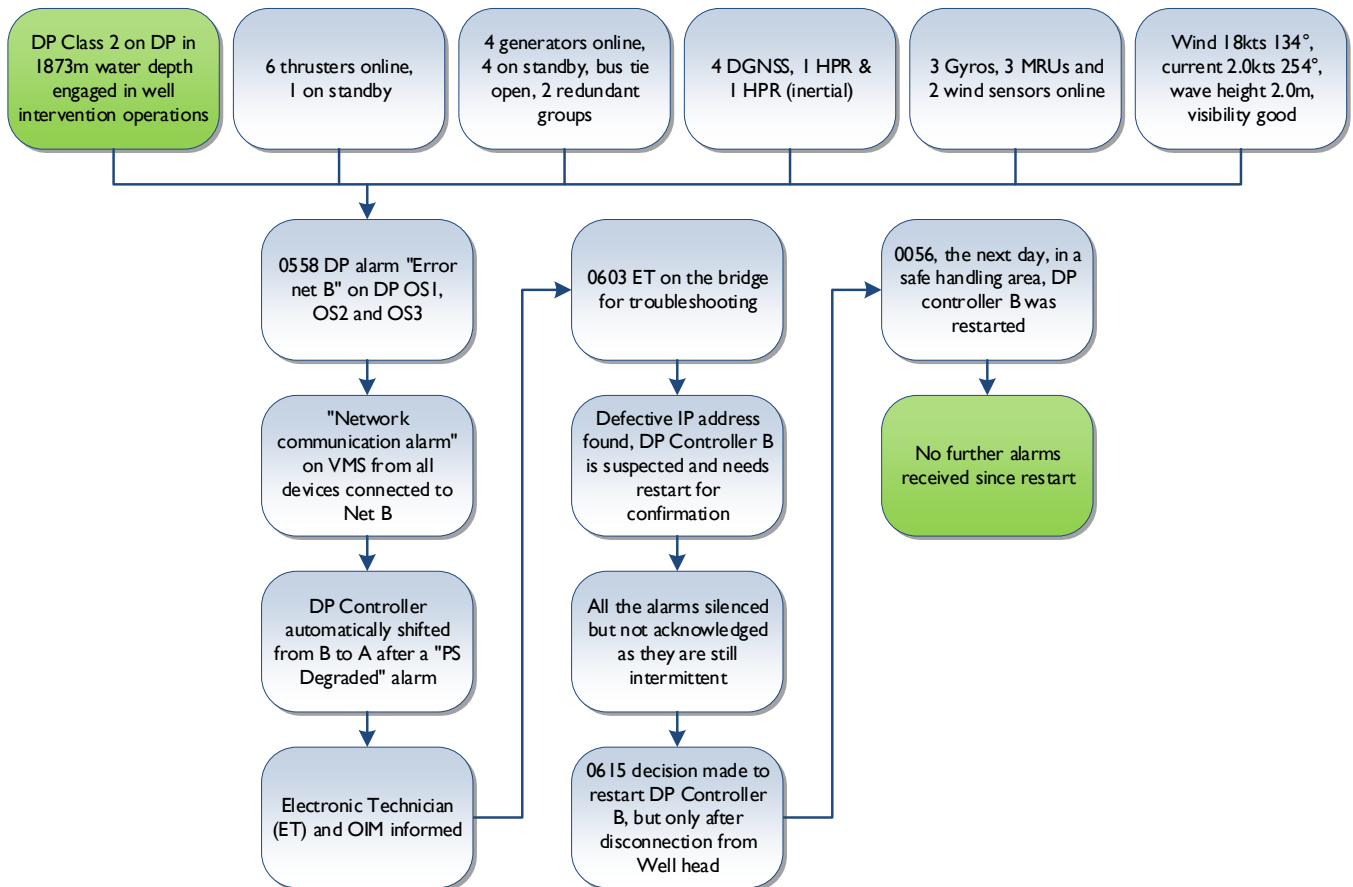
Initial actions:

- ◆ The thruster was isolated and faulty converter dismantled.
- ◆ Under the instructions from the manufacturer, the thruster was set up to work up to a maximum of 60% of the load.
- ◆ The activity specific operating guidelines (ASOG) was revised to reflect the new power limits on the main propulsions.

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

- ◆ The DP Yellow Alert should be initiated
- ◆ The vessel had lost redundancy, but was not losing position. It is highly likely the damage caused by the burnt-out converter would have been visible, so thruster 6 should have been checked prior to restarting.
- ◆ The best policy is often to take time and assess the situation prior to attempting a restart.
- ◆ Reducing the maximum power available from one azimuth thruster to 60% would require the capability plots to be revised in order to reflect this limitation in post failure position keeping ability. It is assumed that appropriate DP capability plots were produced to support the revision in the ASOG.

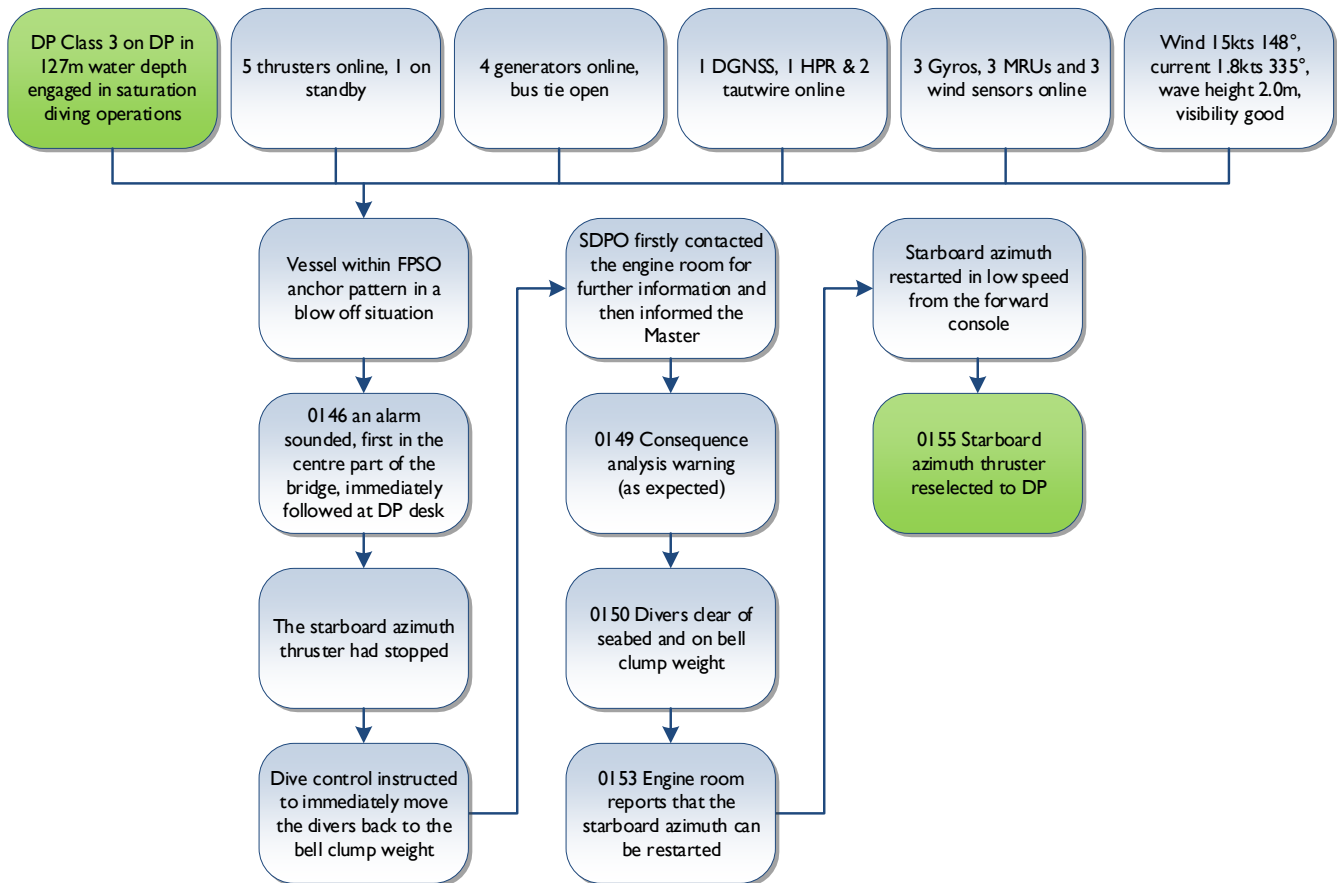
DP Controller Problems – DP Undesired Event



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

- ◆ Redundancy was lost; therefore, a yellow alert should be initiated.
- ◆ Good practice is to acknowledge and investigate the cause of alarms, even if they are intermittent, otherwise alarms can be missed.
- ◆ It should be noted that good practice is to restart the DP controllers as part of field entry trials and practice restart procedure during DP operational drills.
- ◆ The wisdom of having 4 DGNSS selected to the DP should be questioned. They are likely to be susceptible to similar faults and therefore provide a false sense of security. Also, the use of 4 position reference systems of the same type would create a bias and therefore dilute the effectiveness of the other selected systems.

Routine Maintenance Leads to Loss of Thruster – DP Undesired Event



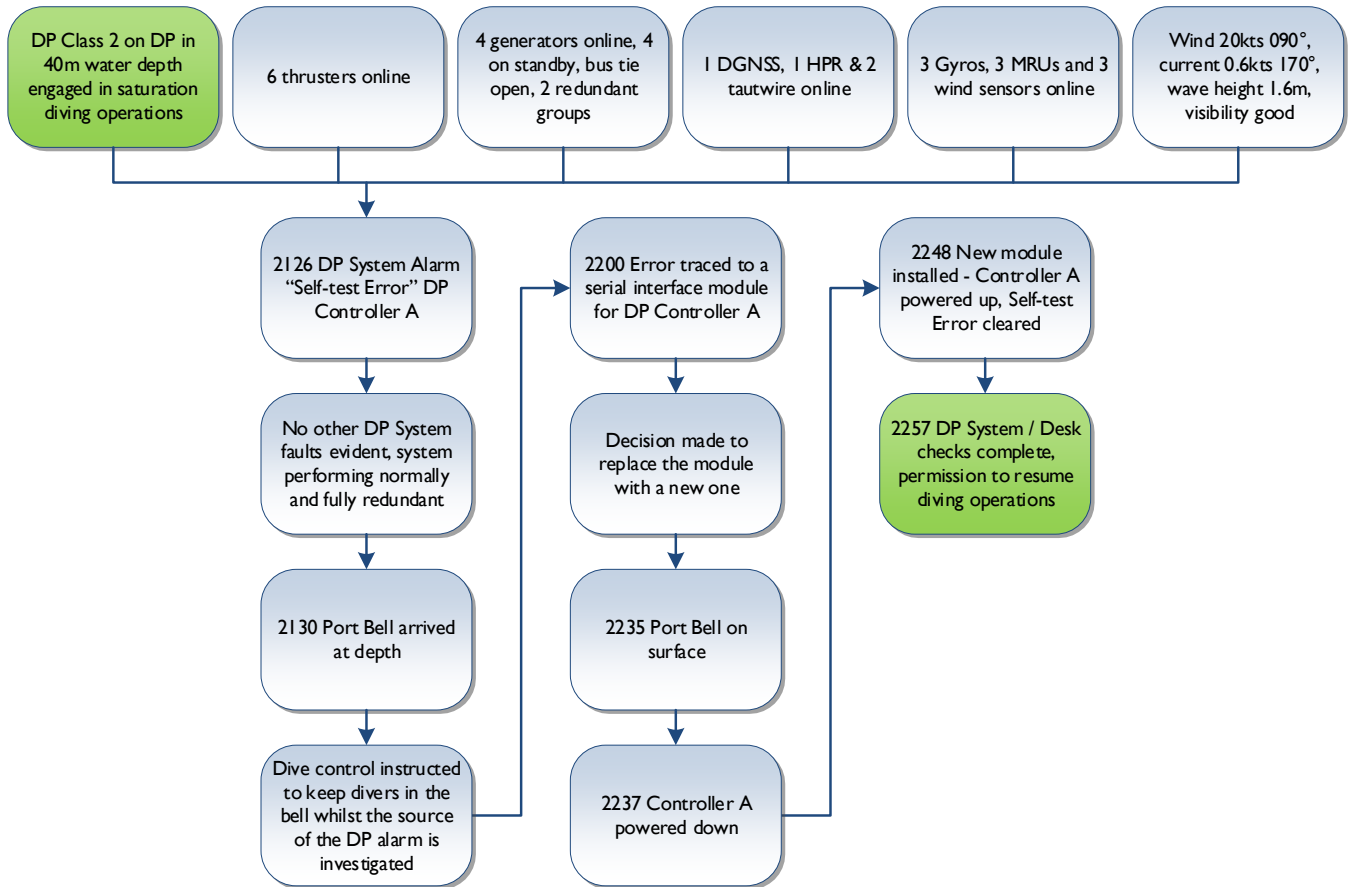
Comments from the report:

During a routine weekly maintenance operation, a ships engineer took an oil sample from the starboard azimuth thruster sample point, which is a small valve located on the line to the pressure switch. The location of the oil sample point on the line to the pressure switch creates a risk of inadvertently activating the switch if the sample valve is opened too much. When obtaining the sample, the valve was opened fully, reducing the pressure to the pressure switch. The pressure switch then tripped causing the thruster to stop; the oil pressure in the thruster was maintained and not at risk. Once the sample valve was closed the pressure on the line to the pressure switch returned to normal. The starboard azimuth was started back up in DP and, following a short investigation, pre-dive checks were carried out and the bell deployed to continue diving operations.

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

- ◆ The loss of redundancy should have initiated a yellow alert but this was not in the report.
- ◆ Planned maintenance of critical equipment should be controlled by a permit to work (PTW) system.
- ◆ It appears that during the event, co-operation between the bridge, engine room & diving departments was good.
- ◆ The event highlights a poor design, for example the sample point could have been down stream of the oil pressure sensor and in this situation, it would seem reasonable for an alarm to be triggered rather than the thruster shut down.

Good Practice Following System Self-Test Alarm – DP Observation



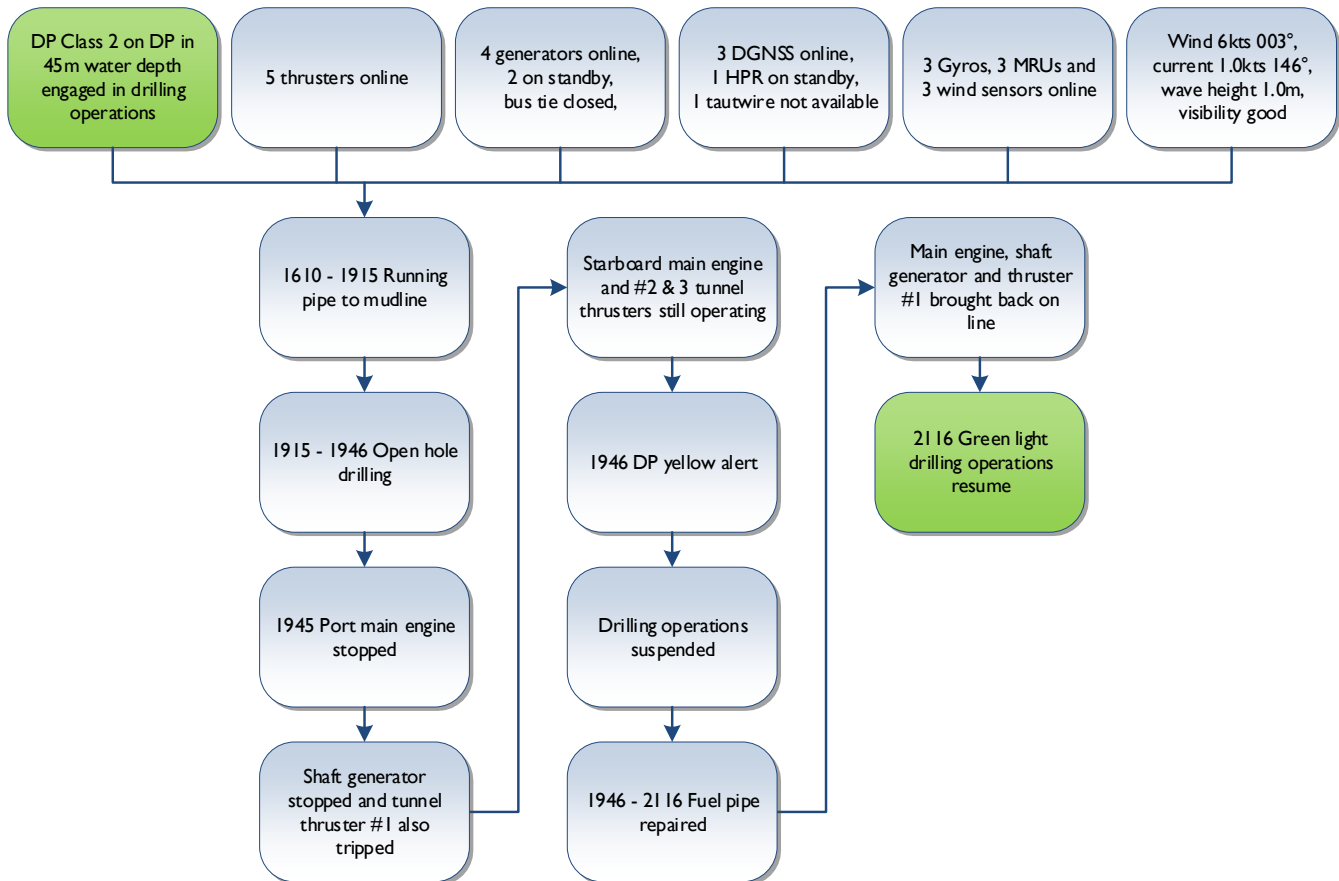
Comments from the report:

The error was traced to a serial interface module for DP Controller A and confirmed that the red error lamp on this module was illuminated. Whilst indicating an error, the module was still performing correctly in so far as there was no effect with its data feeds. The decision was made to replace the module with a new one, dive control was requested to recover the bell to surface and hold it there whilst replacement was carried out.

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

- ◆ The actions taken were all in accordance with good practice.
- ◆ 40m water depth only provides for a small envelope for seabed based position reference systems (PRS).
- ◆ In these depths of water, it is advisable to make use of surface based PRS, in this instance DGNSS was used.

Leak in Fuel Supply Line Causes Engine to Shut Down – DP Undesired Event



Comments from the report:

The vessel was employed within the renewable energy sector, no details were given of the drilling activities.

A fuel leak developed in a corroded supply pipe to the port main engine. This caused air to be drawn into the system and the engine to shut down. Redundancy worked as designed. The split fuel system ensured that only the port side of the engine room was affected and operations were suspended due to loss of redundancy.

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

- ◆ It was noted that 3 DGNSS were selected to DP; clearly this is not in accordance with DP equipment class 2 that requires position reference systems to have at least 2 different principles of operation.
- ◆ The vessel was operating closed bus and while the failure did not exceed the vessel's designed worst case, a different fault on the electrical system may have resulted in a more significant DP system failure.
- ◆ Water depth of 45m only provides a small envelope of operation.
- ◆ Actions taken in response to the failure appear to be appropriate and in line with good practice.
- ◆ The planned maintenance system (PMS) for critical piping systems should be reviewed. For an F.O. supply line to fail due to corrosion should warrant complete inspection of the rest of the system, and a review of past inspections/maintenance so that similar faults are not missed in the future.