IMCA DP Station Keeping Event Bulletin 03/17

July 2017

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 DP Focused Workgroup. 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.

It is important to provide as accurate a report as possible. As witnessed by the events covered in this bulletin, reports can contain ambiguous information or not enough detail. Learning opportunities are still possible but the true nature of the problem might not be identified.

The DP station keeping event workshop held at the recent IMCA Marine Technical Seminar in Amsterdam, the Netherlands, provided some useful outcomes.

1. Food for thought:

"The point of an investigation is not to find where people went wrong – it is to understand why their assessments and actions made sense at the time"

(Sydney Dekker 2002)

2. Key personnel and references when compiling information

- Key personnel:
  - Named functions in ASOG
  - ISM – DPA, internal distribution list such as the company DP authority, other technical specialists and as per internal instructions
  - Local authorities when applicable, external distribution list in line with project and internal instructions
- Compiling information:
  - DP data recorder, DP history station, PRS data logger, printouts
  - Activity specific operating guidelines (ASOG)
  - Logbooks
  - Project plan, project risk assessment, vessel/DP operations manual, checklists
  - CCTV data, VDR, PMS data
  - Interviews, statements
  - Contact supplier/manufacturer
  - Familiarisation records, training records, competence assessment
  - Site maps
  - DP capability calculations, weather reports, simulator
  - FMEA, annual trials, entry into field trials
  - IMCA DP station keeping event report, company reporting form

3. Actions to further promote DP station keeping event reporting

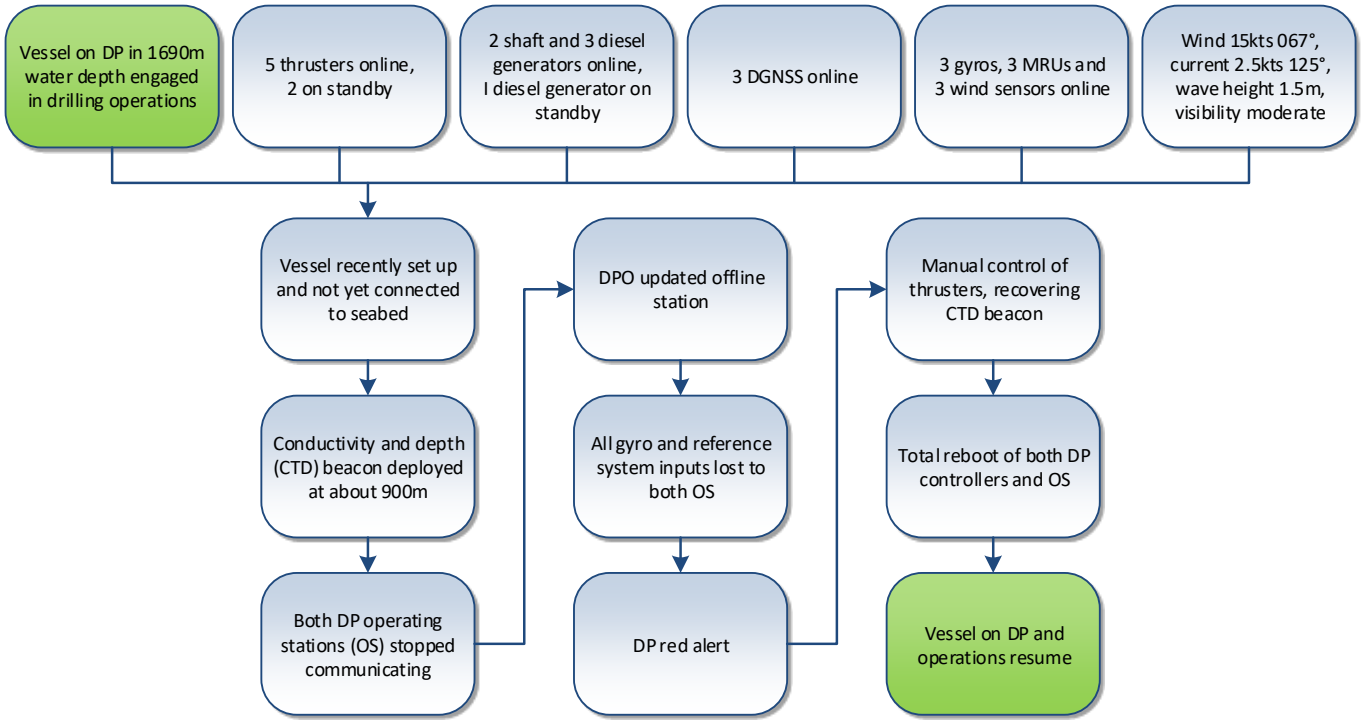
IMCA:

- Promote reporting of all DP events, not only the ones that have affected DP station keeping capability
  - DP incidents
  - DP undesired events
  - DP observations
- Distribute the annual IMCA DP station keeping review to DP vessel operators and DP training establishments
- Distribute the IMCA DP event bulletins to DP vessel operators and DP training establishments
- Distribute the IMCA certificate of participation to DP vessel operators who contribute to the scheme and promote its use with clients

DP vessel operators:

- Establish clear company procedures for DP station keeping event reporting
- Promote reporting of all DP events, not only the ones that have affected DP station keeping capability
  - DP incidents
  - DP undesired events
  - DP observations
- Distribute the annual IMCA DP station keeping review to DP vessels
- Distribute the IMCA DP event bulletins to DP vessels
- Display the IMCA certificate of participation on company DP vessels
- Promote the issue of IMCA certificate of participation to clients
- Include the IMCA DP station keeping event spreadsheet as part of the company safety management system annual review

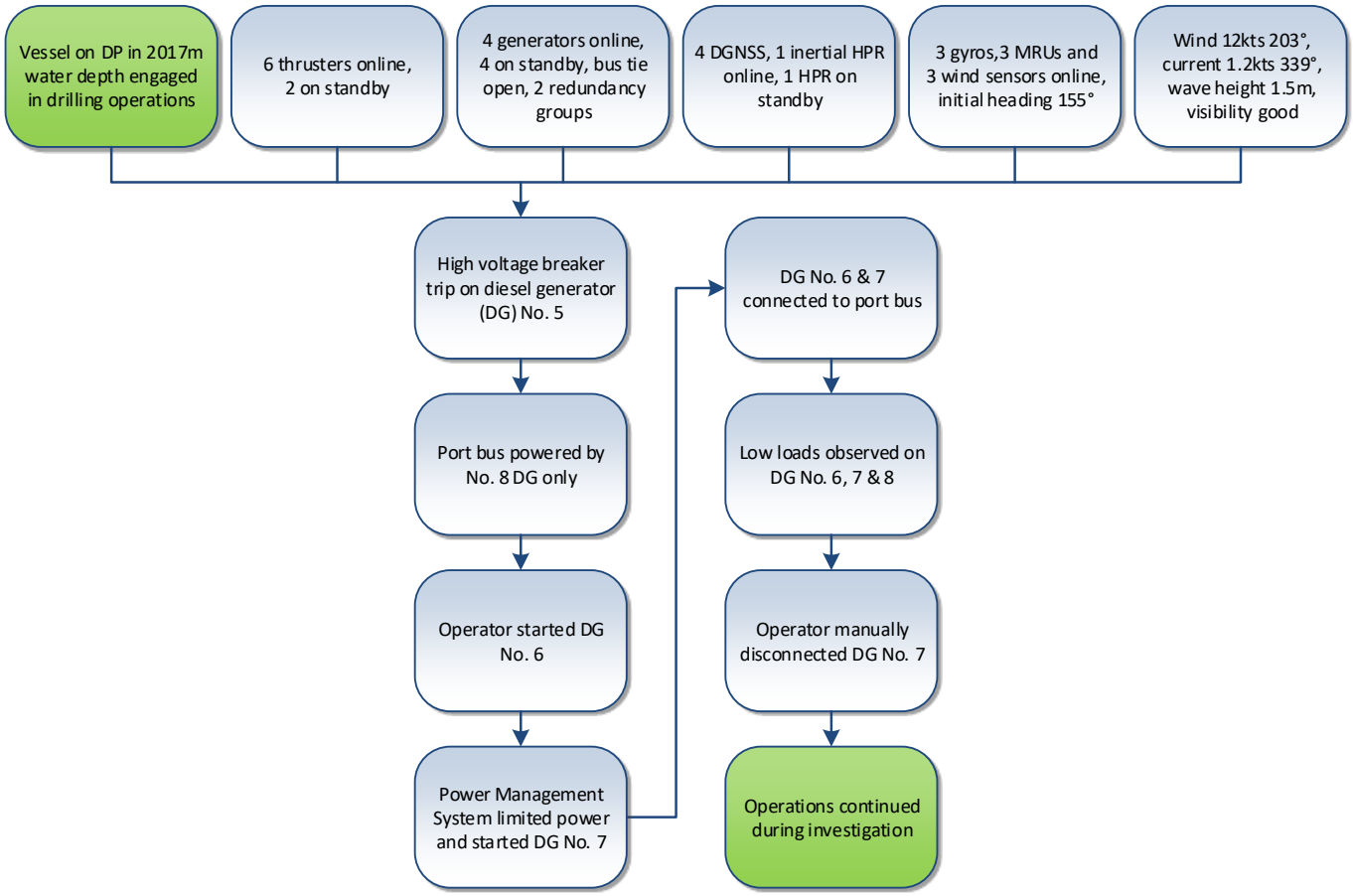
Both DP Operating Stations Stopped Communicating – DP Incident



Considerations from the above event:

- It is possible that as the vessel was only recently set up on DP, field arrival trials had not yet been completed.
- The use of DGNSS as the only position reference system for DP equipment class 2 operations is not good practice, however it is recognised that deployment of the CTD beacon could be in preparation for initiating a DP acoustic system.
- It is not clear, from the information provided, of the exact sequence of events: sensors and position reference systems are hard wired to the DP controller or Fieldnet connections, located in the DP controller cabinet, they are not connected directly to the DP OS and therefore position keeping capability should not have been affected by the OS not communicating.
- One possibility is that it was the DP controllers that stopped communicating and caused the problem; if this was the case the question should have been asked how this single point failure could have happened.
- The vessel would probably be controlled better using the independent joystick rather than individual manual control of the thrusters.
- The report suggests the possibility that the vessel returned to operations without sufficient testing to find the root cause of the problem.

High Voltage Breaker Trip – DP Observation



Comments:

Investigation started at the breaker for DG No. 5 in the port switchgear room. The breaker showed tripped and there was a fault present on the auto voltage regulator (AVR). DG No. 5 was locked out and investigation continued, the AVR breaker 'S1' was found tripped. Further investigating found that one of the wires from this breaker had chaffed on the inside of the box and resulted in a short and evidence of arcing to ground. The damaged wires were replaced and the rest of the wires in the junction box adjusted to avoid future problems.

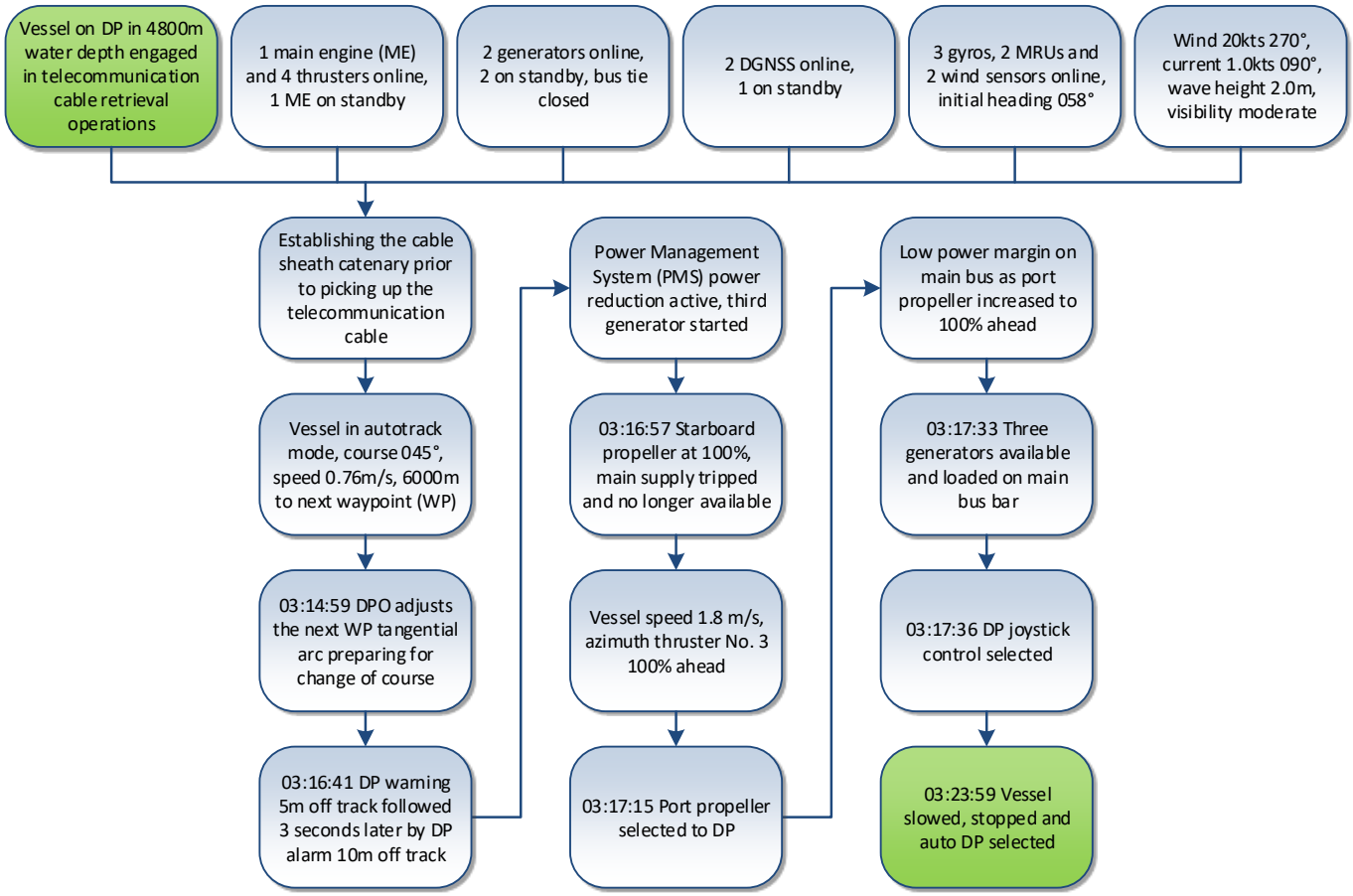
After replacing the worn wires and test running the engine it was noticed that the load indicator on the PMS panel was showing a negative reading, which was incorrect. This signal was a feedback from the breaker module and was in fact sending a false milliamp signal to the PMS. Racked the breaker out to perform a hard reset, the kilowatt signal from the relay went to zero.

DG No. 5 was run, tested and connected to the 11kV bus, all in proper working order.

Considerations from the above event:

- The investigation explained that the AVR breaker trip caused the DG No. 5 breaker to open presumably as a result of a reactive power (kVar) protection scheme. It seems from the investigation notes that there was no connection between the original fault and the negative active power (kW) signal.
- Similar wire checks should be made on all other engines.
- Having four DGNSS enabled in the DP controller is not a good practice as the total 'DGNSS weight' is reducing the 'acoustic weight' to insignificant.
- The DP alert status should be initiated in accordance with activity specific operating guidelines.

Following a Track on DP Causes Power Issues – DP Incident



Comments:

The report finding from the vessel concluded:

- The initiating event was a sudden increase of propulsion to full ahead.
- The main cause was attributed to the computer with unexpected thrust allocation.
- The secondary cause was human factor due to a slow reaction to switch to manual mode.

Considerations from the above event:

- This is an extremely deepwater operation, although margins are large, DP control is still desirable.
- The limitation of using DGNSS as the only position reference system should be known and acknowledged by those involved in the operation.
- From the information available it would seem this could be an operator initiated problem. Chosen settings of gain, corridor limits, rate of turn and speed of the vessel could all have contributed.
- The operator could have selected the 'Stop' function on the DP console to stabilise the situation, instead of selecting joystick.
- It is important that instructions for switchboard configurations are supplied and followed.
- The starboard propeller tripped at 100% load; this should not happen.