

DP2 cargo vessel

DP Event • Published on 22 April 2021 • Generated on 28 January 2026 • DPE 01/21

This case study demonstrates the risks of undertaking DP operations with degraded or a complete lack of redundancy.

Overview

A DP2 platform supply vessel (PSV) was approaching the field and preparing for cargo operations on location. The current at the time of the event was 1.2 knots – 355 degrees and the wind force was 10 knots – 278 degrees.

During setting up to commence DP operations, the crew were unable to select the Starboard main propellor into DP control despite a number of attempts and a number of resulting alarms. Despite being unable to select the propellor to DP mode, the vessel continued to approach the platform for “urgent” cargo operations with the remaining Port propellor and two Bow thrusters (one tunnel thruster and one azimuth thruster) online.

Shortly after arrival, the Port main propellor suffered a failure resulting in a loss of DP station keeping capability. The uncontrolled movement of the vessel was almost 50 metres. The crew switched to manual mode and manoeuvred the vessel outside the 500M exclusion zone to a safe location.

At the time of the event, the vessel was being operated on automatic DP2 mode, with 2 of 4 generators and 3 of 4 thrusters online. The main switchboards were being operated with closed bus tie; the station keeping event report detailing that this was not according to “normal” operating conditions as a result of a faulty generator. The power and propulsion arrangement was such that each side of the main switchboard powered one forward and one aft thruster as per the proven redundancy concept.

The station keeping event report did not detail any investigation process or outcomes.

Lessons learned

- The decision to proceed to conduct cargo operations despite the failure of the Starboard propellor meant that the vessel was not being operated with sufficient redundancy in place (no redundancy) at the vessel's stern. Operating in this way is in contravention of all industry and regulatory guidelines from an equipment class 2 (DP 2) perspective. Industry recognised guidance on operational planning is available, reference Guidance on operational activity planning (IMCA M220). Also, reference, The training and experience of key DP personnel (IMCA M117).
- Although the station keeping event report discusses an “urgent” cargo operation requirement, it is not known if the urgency was safety orientated or commercially orientated. Either way, this event highlights that the resultant loss of station keeping control had the potential for a far worse incident than experienced in this case.
- It is unknown from the station keeping event report whether or not the following factors were robustly considered:
 - Prior to arrival in field, the vessel was already in a degraded state with a generator being out of service. The report highlights that as a result the switchboard configuration was changed from open bus tie to closed bus tie. It is not known if this change in operating mode had been fully considered and if the closed bus mode was a stated mode of operation within the vessels DP failure modes and effects analysis (FMEA) and associated documentation for example DP operations manual. Reference: Guidance on failure modes and effects analysis, FMEA (IMCA M166).
 - There is no evidence within the station keeping event report that field arrival trials / checks were conducted. The purpose of field arrival trials / checks is to ensure satisfactory operation of the DP system and they should include

- full functional checks of the operation of the thrusters, power generation, auto DP and independent joystick (IJS) and manual controls. The checks also ensure that the DP system is set up correctly and that the manning is adequate. Reference: Guidelines for The Design and Operation of Dynamically Positioned Vessels (IMCA M103).
- The use of decision support tools is not mentioned within the station keeping event report. The use of decision support tools is a specific requirement of IMO MSC.1/Circ.1580 Guidelines for Vessels and Units with DP systems which requires that, before every DP operation, the DP system should be checked according to applicable vessel specific location checklist(s), and other decision support tools such as Activity Specific Operating Guidelines (ASOG), in order to make sure that the DP system is functioning correctly, and that the system has been set up for the appropriate mode of operation. It should be noted that section 4 “Operational Requirements”, applies to all new and existing vessels and units. Reference: Guidance on operational activity planning (IMCA M220).

Conclusion

This case study demonstrates the risks of undertaking DP operations with degraded or a complete lack of redundancy. This event had the potential to have a significantly worse outcome for both the vessel and the receiving platform.

The decision-making process related to proceeding to undertake the cargo operation was lacking and it is unknown if commercial or other pressures played a part of the cause.

The case studies and observations above have been compiled from information received by IMCA. All vessel, client, and operational data has been removed from the narrative to ensure anonymity. Case studies are not intended as guidance on the safe conduct of operations, but rather to assist vessel managers, DP operators, and technical crew.

IMCA makes every effort to ensure both the accuracy and reliability of the information, but it is not liable for any guidance and/or recommendation and/or statement herein contained.

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