Safety Alert

Number: 24-06 **Published:** 26/08/2024

Subject: Vessel Allision with Installation

What Happened / Narrative

During a routine cargo handling operation alongside a North Sea offshore installation, a Platform Supply Vessel (PSV) experienced a loss of all Dynamic Positioning (DP) position reference systems (PRS) which resulted in the PSV contacting the installation, causing minor damage to the vessel and installation. There were no injuries or environmental damage.

The vessel's Dynamic Positioning System (DPS) and Power Management System (PMS) were operational for DP class 2 operations. One PRS – CyScan was not available. The vessel was operating under an Operational Risk Assessment (ORA) for this degraded condition, along with an amended Activity Specific Operating Guideline (ASOG). All required DP setup and 500m zone entry checklists had been completed and approved.

The vessel initially experienced Differential Global Navigation Satellite System (DGNSS) PRS signal instability. Before moving clear to investigate and stabilise the PRS, the DPO sent a RadaScan PRS responder via the crane to be installed on the installation as a second responder. The Master had not been informed of the developing situation as per the ASOG.

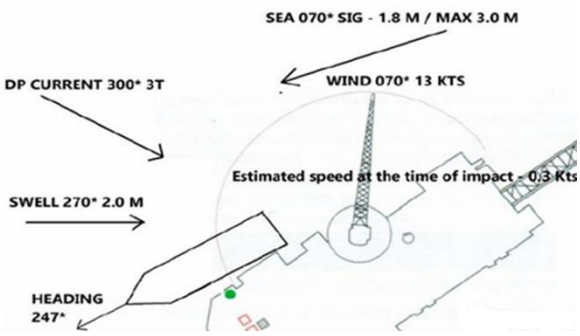
At the standoff location the DGNSS signal stabilised and the DPO configured the RadaScan unit to 'multi-target mode' (interrogating both responders on the installation). The vessel commenced moving back into the working location to continue cargo operations.

As the vessel approached the working location alongside, both DGNSS and RadaScan signals were 'lost' and the online PRS were rejected by the DPS. Subsequently, the DPS entered Dead Reckoning (DR) mode (DR mode uses a mathematical model to estimate position for several minutes without input from PRS's). The DPS calculated the 'mathematical model' position 3.4m to port of its current position and the deviation increasing up to approx. 8m (the model calculated the vessel to be off position by 3m and moving further away). The DPS attempted to reduce this calculated position 'jump' by thrusting the vessel to port (towards the installation).

The DPO visually observed the vessel's position loss and the DPS 'driving' the vessel towards the installation and intervened by taking control of the DPS in joystick mode with auto-heading and attempted to move the vessel away from the Installation.

A combination of vessel momentum to port, swell direction and reduced thrust allocation for positioning (due to the joystick auto-heading priority) resulted in the vessel contacting a jacket leg on the Installation.

The vessel exited the installation 500m zone to carry out a damage assessment and commence investigation.



Why Did it Happen / Cause

- DGNSS 1 and DGNSS 2 position references onboard the vessel were significantly degraded during close approach due to the platform elevation blocking signals from available satellites, thus impacting the overall reliability and position quality of DGNSS as a position reference.
- Differential corrections for both DGNSS 1(AORET) and DGNSS 2(EMSAT) onboard the vessel were broadcast from the same 25° East satellite.
- The RadaScan positioning reference system became unreliable whilst operating in 'multi- target mode'. The RadaScan system experienced a software sensor error not known to the operators, effectively making the RadaScan sensor unreliable as a PRS.
- The increased risk of vessel collision during the operations was not recognised by the DPOs. They had been operating without a CyScan (under an ORA - operational risk assessment) for 5-months due to a long lead time for parts following a failure.
- When the initial degradation of PRS occurred, the master was not informed as detailed in the ASOG.

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Key Learnings

Independent Position Reference Systems:

- DP Class 2 and DP Class 3 vessels must have at least three independent position references of which two must be based on different measuring principles (DGNSS systems are all considered to be based on the same measuring principle, regardless of the selection of signals and services). Additionally, for DP Class 3 at least one position reference system must be separated from the main DP system by a suitable fire subdivision.
- If a planned change in mode of positioning is required, or the DP system is affected by PRS instability, the vessel shall return to the final set-up area before making any change.
- With early versions of RadaScan Maxi and Mini RadaScan, and when more than one transponder is placed on the installation and Multi target Tracking is utilised, make sure that software is upgraded due to possible "DP telegram" error. Ref. Wartsila Alert 230001.

Operator awareness and understanding of PRS:

- Each DPS manages, processes and displays PRS data differently. In this event the differential signals were lost, however the DP continued to display a 20% quality of the DGNSS. A 20% for DGNSS is not a reliable nor accurate PRS for DP and should not be used in normal operations that require accurate positioning.
- When selecting PRS the requirements of DP equipment class within IMO guidelines must be taken into account.

Dead Reckoning mode:

- All vessel DR accuracies are different, and it is important the operator understands that the accuracy of the model is time limited when relying on the mathematically generated model (DR mode).

Activity Specific Operating Guidelines (ASOG):

- The ASOG contains information pertinent to station keeping from the operational procedures developed to execute the specific mission. When changes in DP status/condition occur (advisory, yellow or red) the Master should be notified as per the approved ASOG table.

Training, Familiarisation & Competence not adequate:

- All DP personnel should be fully trained and certified for the type of vessel and DPS in use.
- DP drills should cover not only DP emergencies (loss of position) but DP failures (WCF). For most of the DP incidents, an adequate response to a DP failure can avoid a DP emergency.

Drift on/off requirements:

- The preferred positioning of a vessel alongside an asset is in a drift-off position wherever possible. In this case the vessel had been working in a drift-on position however the installation had not been made aware of this and a drift-on risk assessment had not been completed or approved by the OIM.