MARS

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MARS 202528

One grounding not enough to warrant attention

While still highly condensed from the original, the report which follows is somewhat longer than is typical in MARS. The importance of the context and the lessons learned has made this choice unavoidable.

A RoRo passenger vessel was underway in coastal waters. An OOW and a crew member acting as lookout were on the bridge continuously. The vessel's route and position were displayed on the ECDIS, and the helm was on autopilot.

The weather during the voyage was relatively calm, but with increasing fog and rain during the night. At 02:00, there was a change of watch. The routine was that each officer did a 12-hour watch, so 12 on, 12 off.

At the time of the handover, the vessel had started a slow turn to port to follow the planned route. Several alarms were sounding, warning of a fault in the GPS receiver. This caused the navigation equipment to lose its positioning signal. Although the GPS was lost, the ECDIS and one of the radar units continued to estimate the vessel's position using dead reckoning (DR).

The officer being relieved was aware that the GPS receiver had, at that time, lost its positioning signal, but noticed that the other GPS receiver was operational. He had experienced similar problems previously, and assumed that the relieving officer was also aware of the cause of the alarm and what actions to take to restore the GPS receiver if the positioning signal was not restored automatically. However, he did not confirm this with the relieving officer before leaving the bridge. Over a ten-minute period, the alarm signals were repeated on several of the navigation systems but after acknowledgement were silent. No further action was taken.

As the vessel came onto a course of 010°, the vessel's true drift of two to three degrees to port of the course was not showing. Instead, the ECDIS showed that the vessel was sailing with a drift of two degrees to starboard, as it was on DR mode. This meant that the vessel was gradually moving to the west of the planned route. The deviation between the planned route and the actual route is shown on the chart overleaf. The OOW was oblivious of this variation because his attention was exclusively on the ECDIS display.

At 05:13 the vessel passed on the wrong side of an eastern cardinal mark that marks a shoal. The first grounding took place at this time. As the vessel passed over the shallow area, its speed decreased from 17 knots to 9 knots and there were strong vibrations, which continued for around 20 seconds. The chief officer, now on the bridge, observed that the X-band radar was missing a GPS signal and the OOW responded that this issue had persisted since the watch change. Once the vessel had passed the shoal and entered deeper water, speed increased again to 17 knots. The crew made no adjustments to the engine controls during the grounding because they did not realise they were off track and had touched bottom.

The Master, having felt the vibrations, came to the bridge. When he arrived, the vibrations had stopped; the OOW was unperturbed and the Master's initial concerns were assuaged. The Master asked the bridge crew what had happened, but he did not receive an explanation for the vibrations. He checked the vessel's position on the ECDIS, which showed that the vessel was following the planned route. The S-band radar also showed the DR calculated position, albeit

with the position indicated in a different colour and the note 'Dead Reckoned'. However, the radar image itself was not affected by the error.

At this point, the Master took over responsibility for the navigation and preparations for arrival began. The crew members on the bridge discussed whether the vessel had run over something, or if there were other possible causes for the vibrations. The bridge called the engine room to ensure that there was no problem with the engines. The response was that everything was in order.

Engine personnel then called back and informed the bridge that an overfill alarm had been activated in several bunker tanks and a level alarm had been activated in void tanks. The chief engineer called in extra engineering personnel to conduct tank soundings.

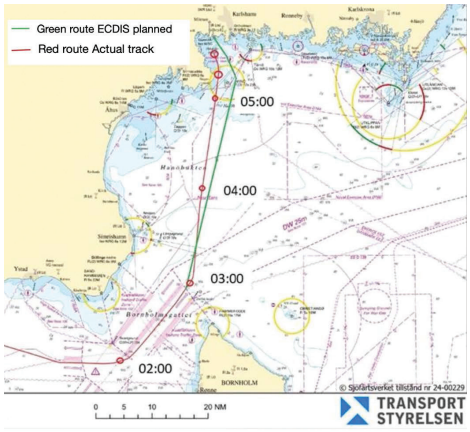
The Master engaged hand steering and ordered a heading of 345°, intending to steer the vessel towards the fairway of the arrival port. The ECDIS was still operating on DR and indicated that the vessel was following the planned route. However, the actual position was substantially further to the north-west, and the new heading took the vessel towards shallow water. Nobody on the bridge had double checked the position using other instruments.

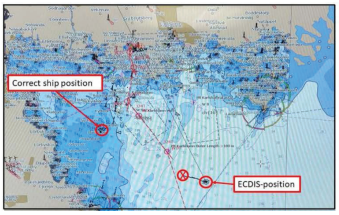
When the vessel entered shallower water, the vessel speed decreased and a second grounding occurred at 05:24, with strong vibrations again occurring. The vibrations ceased when the vessel came to a stop, but the bridge team were still unaware that the vessel had grounded. The engine controls were reduced to slow and the engine room crew assured the bridge team that the engines were functioning normally. The Master decided to continue the voyage into port, so he increased the engine control, but the speed remained at zero. He interpreted this as the vessel having lost propulsion, but the chief engineer assured him that the engine was functioning as expected.

On the vessel's bridge there was confusion about what had happened. The ECDIS showed that the vessel was in water 30m deep and drifting at half a knot in an easterly direction. The crew were still unaware that the vessel had run aground.

The Master called the coastal Joint Rescue Coordination Centre (JRCC) to inform them of the situation. The JRCC operator checked the vessel's AIS track and realised there was an error. He informed the Master of the vessel's true position. After a second call, the Master checked and found they were truly aground and not in deep water.

Passengers were then evacuated from the vessel. The salvage operation lasted 11 days and included a third grounding before it was successful. Heavy fuel oil had escaped from the vessel and the environmental response was a protracted, complicated affair involving several organisations.





Lessons learned

- OOW handover must be complete and detailed. In this case an important navigation alarm was not properly investigated nor communicated to the handover watchkeeper.
- Never rely on a single navigation appliance! The bridge team, even the Master, were fixated on the ECDIS display. A simple position check, ideally using two distances on a radar, would have shown their true position.
- If you see a 'dead reckoning' notification appear on your radar or ECDIS, immediately do a position check.
- Navigate your ship! In this case the vessel grounded twice; the first time 11 minutes before the second. Vibrations were felt and a large reduction in speed experienced, yet these unusual signs were not enough to convince the Master or OOW to verify their position by alternative means. Had they done so the second grounding (and the third, and the pollution) could have probably been avoided.
- 12-hour navigation watches are, by any standard, much too long for safety.

Editor's note: ECDIS has undoubtedly increased a mariner's situational awareness to a point far exceeding anything achievable in the past. When correctly set up with the proper safety depth, reliable GPS input and up to date chart corrections, among other things, ECDIS is a

wonder to behold. Yet, by virtue of its efficiency and reliability, it may have unwittingly caused mariners to become too complacent. At the risk of sounding old fashioned, radar, depth sounders, and visual observations are the complementary tools that must always be leveraged for safe navigation.

As edited from SHK (Sweden) report 2025:03e

MARS 202529

Wake up with a bump

A small passenger vessel offered overnight tourism trips from a home port. It took various routes depending on the conditions at the time, but all were well known to the Master. Each day, a new group of passengers boarded for a 24-hour overnight cruise. The Master and crew worked this routine for seven days before being relieved by another crew in rotation.

In this instance, the Master and crew were in their sixth day of work in a seven day 'swing rotation'. The Master's workday started at around 0600 and finishes at about 2200. This ostensibly allowed for about eight hours of overnight rest. Yet, the quality of sleep is difficult to determine; sole-charge Masters bear full responsibility for their vessels and their sleep may be broken by any number of interruptions, including changes in weather and vessel movements.

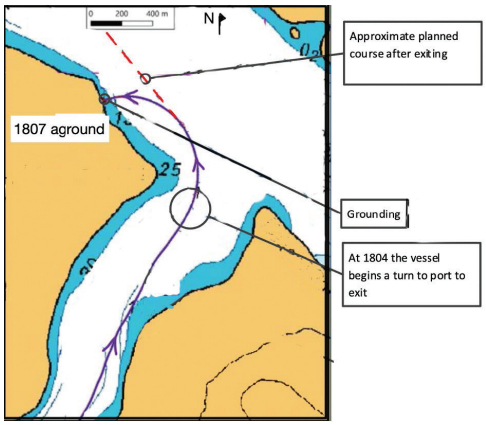
On this day, the Master had awoken at 0545. By 1430, a new group of passengers had boarded and the vessel transited to an area where passengers could participate in water activities. By 1740, the anchor had been weighed and transit began to a new location. The vessel was being conned by the Master, alone in the wheelhouse as was the usual practice.

At approximately 1804 the Master began a turn to port. Three minutes later the vessel ran aground while at a speed of about 10 knots. Sitting in the conning chair, the Master woke from a micro-sleep when the vessel came to a sudden stop. The situation was quickly assessed and emergency response was begun; passengers were mustered using the public address system and the onshore manager was called to alert them to the accident.

The crew reported to their muster stations. Two crew were assigned to damage assessment and one to operate the bilge pumps. The remainder had roles mustering passengers and assessing them for injuries. The vessel damage included a small hole below the waterline, but the rate of water ingress was not a material threat to the safety of the vessel. The use of a small bilge pump was enough to clear incoming water.

By 1920, the tide had risen enough to lift the vessel off the rocks and enable the stricken vessel to get underway. The passengers were transferred to some fishing vessels and departed for the home port at about 2000. The stricken vessel began making way for the home port by 2230 and was alongside near midnight.

The investigation found, among other things, that the Master was very likely suffering from workload-induced fatigue that had not been recognised or mitigated by the operator's safety management system (SMS). The fatigue may have been compounded by a potential drowsiness side effect from a prescribed medication the Master was taking, but it was not possible to make a positive determination on this hypothesis.



Lessons learned

- Micro-sleep exists, even while undertaking an active manoeuvre. If you can fall asleep at the wheel of a car, you can fall asleep at the con of a vessel.
- Sitting while navigating is one step towards further relaxation. Standing and moving (between navigation instruments?) means you are unlikely to experience a micro-sleep and may help your situational awareness.
- 'Sleep hygiene' is a critical element of safety in the transportation industry, yet one that is mostly self-managed. Take it seriously.
- Be aware of the potential side effects of certain prescription medications and how they can affect your performance.

As edited from TAIC (New Zealand) report MO-2024-201:03t

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