

IMPROPER USE OF ECDIS LEADS TO GROUNDING

A 43,472 GT BULK CARRIER RAN AGROUND ON A CHARTED SHOAL WHILST ON PASSAGE BETWEEN THE PHILIPPINES AND AUSTRALIA. THE INCIDENT OCCURRED AFTER THE VESSEL DRIFTED FROM THE TRACK, WITH NO AUDIBLE OR VISUAL WARNINGS GIVEN TO THE OFFICER OF THE WATCH (OOW). THE AMENDED PASSAGE PLAN PASSED 0.3NM FROM THE SHOAL WITH THE ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM (ECDIS) NOT SET UP WITH SUITABLE SAFETY SETTINGS. FOLLOWING THE GROUNDING, THE MASTER WAS ABLE TO EXECUTE THE EMERGENCY RESPONSE ACTIONS AND THE VESSEL WAS LATER REFLOATED WITH THE RISING TIDE, HAVING SUFFERED ONLY SLIGHT DAMAGE TO THE BOTTOM SHELL PLATES.

WHAT HAPPENED

Before the vessel left port, the master requested that the second officer (2/O) alter the original passage plan to make use of the recommendations provided by the owner's weather routing service. These amendments were made, however, the amended passage plan was presented to the master for his approval, whilst it was incomplete.

As part of the preparations for the vessel's departure, the 2/O completed the Company's pre-departure ECDIS settings form, this form noted the following settings:

- Safety depth and safety contour – 20m
- Shallow contour – 15m
- Deep contour – 50m
- Danger detection sector (DDS) – 5.0nm 090 across the bow
- Each leg of the route, which had a default cross-track limit (XTL) setting of 0.50 nm, had been visually checked.

At 0800, once on passage, the chief officer handed over the watch to the additional second officer (OOW) and left the bridge. Throughout the watch the master, chief officer and 2/O joined the OOW on the bridge at various times to conduct different administrative tasks. The OOW discussed with the 2/O, who was calculating the next voyage's bunker requirements, that he was unable to take a line of position from an ECDIS charted feature that appeared ahead, 0.30 nm north of the vessel's track. The 2/O replied that the object was a shoal and that he should keep clear of it. The OOW interrogated the feature, however, he did not check whether the depth was safe, in relation to the ship's draft (4.85m forward and 7.44m aft).



FIGURE 1 VESSEL IMAGE
SOURCE FLEETMON



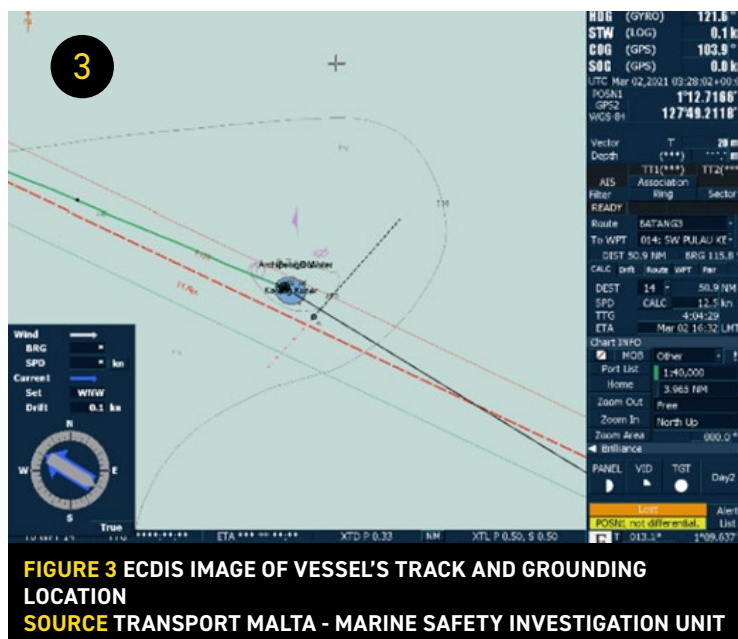
FIGURE 2 LAYOUT OF BRIDGE CONSOLE
SOURCE TRANSPORT MALTA - MARINE SAFETY INVESTIGATION UNIT

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WHAT HAPPENED (CONTINUED)

The OOW then began preparing the vessel's pre-arrival documents for the next port, as the vessel began to drift gently. This drift to port was not detected by the OOW and at 1155 the vessel crossed the 5.0m depth contour and ran aground, as shown in **FIGURE 3**. Following the grounding, the master acted quickly to stop the main engine and reported the incident to the owner, before acting as per the vessel's emergency response plan, with tank soundings confirming the vessel's watertight integrity remained intact. The vessel was then deballasted to allow floating on the rising tide.

Once the vessel had been refloated the vessel proceeded to port to conduct Class damage surveys, where buckling / deformation of the vessel's shell plating was observed.



BRITANNIA COMMENTARY ON INCIDENT

THE FOLLOWING COMMENTARY IS PART OF THE CASE STUDY MATERIAL AND HAS BEEN PREPARED TO CONSIDER SOME OF THE KEY ISSUES. THIS WILL SUPPORT REFLECTIVE LEARNING AND ENABLE DISCUSSION OF SOME OF THE CONTRIBUTORY FACTORS AND LESSONS LEARNED WITH PARTICULAR REFERENCE TO BEST PRACTICES.

GROUNDINGS AS A RESULT OF THE INCORRECT SETUP OF ECDIS ALARMS AND SAFETY SETTINGS IS NOT UNCOMMON. THE INCIDENT REPORT FROM THE TRANSPORT MALTA – MARINE SAFETY INVESTIGATION UNIT, HIGHLIGHTS NINE CASES FEATURING ECDIS-RELATED SAFETY INVESTIGATIONS ON MALTESE REGISTERED VESSELS. COUPLE THIS WITH AN INCOMPLETE, NON-VERIFIED PASSAGE PLAN AND THE LIKELIHOOD OF A NAVIGATIONAL INCIDENT INCREASES CONSIDERABLY.

THE INVESTIGATION AND RESULTING CASE STUDY IDENTIFIED A NUMBER OF FACTORS AND LESSONS LEARNED AS DISCUSSED BELOW.

PASSAGE PLAN

According to SOLAS Chapter V, it is required that the passage plan is appropriately prepared and verified by the master prior to undertaking any voyage:

"Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned, taking into account the guidelines and recommendations developed by the Organization."

The final passage plan should be reviewed by all the deck officers prior to departure. Had the master insisted on reviewing

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BRITANNIA COMMENTARY ON INCIDENT (CONTINUED)

the entire passage plan before departing, he may well have noted that the vessel was due to pass within 0.3 nm of the shoal and that this navigational hazard was not marked as a 'no go zone' on the chart. SOLAS Chapter V also states that the voyage plan shall identify a route which: 'anticipates all known navigational hazards and adverse weather conditions.' Critical points of the voyage are required to be highlighted within the passage plan and these areas are highlighted during watch handovers. The Safety Management System should contain suitable procedures with regards to passage planning and bridge watch handover procedures. These procedures are expected to be robust and specific to the vessel. Navigational officers should be suitably familiarised with them, and appropriate records maintained of the same.

[IMO guidelines](#) for passage planning define four stages for effective passage planning, the fourth of these is monitoring. Monitoring involves checking the position of the vessel, along the pre-planned track, using all available means. This monitoring ensures that the vessel remains within a safe distance from any hazardous areas. The OOW in this incident did not follow the principles here, with the report finding that there was limited interaction with the navigational equipment whilst on passage. The wording in the IMO guidance "of all available means" is important in that it encourages the OOW to use all navigation aids, rather than becoming fixated on one, or in this case, using none of them. The reasons for the distraction whilst on watch are discussed later.

Further, more general guidance on the topic of passage planning can be found in the Club's [Loss Prevention Insight](#) on the topic.

ECDIS SETUP

For this voyage, the route check function in ECDIS was not enabled. ECDIS can be operated without certain safety critical functions, such as the route check function, being activated. If the operators are not aware that these functions are inactive, they may expect to be alerted to dangers on the route, which can lead to a false sense of security. The route checking function built into ECDIS to check and monitor a route for dangers is a key safety feature for navigational officers. It provides a vital function in the passage planning stage, ensuring that the route planned is suitable and compliments the visual check of the route. The visual check that was conducted by the OOW in the development of this passage plan was cursory, and did not consider the proximity to the shoal. Had the route check function been activated, it would have highlighted the shoal as it fell within the 0.5 nm safety corridor setup by the OOW.

In addition to the route check function, the route monitoring, or, 'look-ahead' zone, should also have been properly setup. The look-ahead zone should be set at an appropriate size for the prevailing circumstances, if the area is too long, numerous alerts may distract the navigator, which could contribute towards alarm fatigue. If this feature was properly in use, the OOW would have been given an audible and visible alarm that the vessel had drifted to port and was heading for the shoal, with enough time to safely manoeuvre away from the shoal. IMO performance standards for route monitoring state that: "ECDIS should give an alarm or indication, as selected by the mariner, if, within a specified time set by the mariner, own ship will cross the boundary of a prohibited area or area for which special conditions exist." This highlights the requirements for this feature to be in place on the ECDIS system, and emphasises that the function's effective operation is entirely determined by the mariner.

Navigational audits are a proactive tool to verify that ECDIS use and passage planning is being conducted in line with company procedures, and may also highlight areas within the procedures that need developing. It is recommended that these audits are conducted on a regular basis, or following a related incident. The OOW showed signs that he may not have been fully familiar with the operation of the ECDIS, and this should have been addressed during his ECDIS familiarisation. There are a plethora of different ECDIS manufacturers, all with different user interfaces, and until [the IMO Guidelines For The Standardisation Of User Interface Design For Navigation Equipment](#) come into force in January 2024, the ECDIS familiarisation remains vital to ensure that the operator knows how essential information is presented and used to perform key navigation safety functions on their onboard system.

Further examples of lessons learned from ECDIS related incidents can be found in the following [article](#).

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BRITANNIA COMMENTARY ON INCIDENT (CONTINUED)

BRIDGE DISTRACTIONS

[MGN 315 – Keeping a Safe Navigational Watch on Merchant Vessels](#) advises that the OOW should not undertake any other duties that would interfere or compromise the keeping of a safe navigational watch. In the lead up to the incident, the OOW was distracted from navigating by calculating the next voyage's bunker requirements and failed to monitor the progress of the vessel along the planned track. The 2/O warned the OOW that the shoal was ahead and that he should keep clear of it, but the OOW allowed himself to become absorbed in the bunker calculations and ignored the warning. The OOW should have remained focussed on navigating while the vessel approached a known navigational hazard.

SITUATIONAL AWARENESS

The OOW displayed signs that he lacked situational awareness. He did not know that the charted feature he was trying to take a line of position off was a shoal, and when he interrogated the feature he did not check the depth was safe in relation to the draft of the vessel. The 2/O also warned the OOW that he should keep clear of the shoal. Had the OOW properly checked the depth of the shoal, and appreciated the dangers of navigating within close proximity to shallow water, he would likely not have undertaken non-watchkeeping tasks until the vessel was well clear of navigational hazards.

EMERGENCY PREPAREDNESS

The report mentions that the master acted quickly and in accordance with the vessel's emergency response manual following the grounding. It is difficult to establish if the master's quick actions, such as activating the emergency response procedures and coordinating the response of the crew, contributed to the relatively minor impact of the incident. However, it is encouraging to read that the master and crew were clearly well-versed in their emergency response procedures and were likely well-drilled in their actions, which led to their rapid response to the grounding.

Britannia hosted a webinar discussing different aspects that need to be addressed following a marine incident. A recording of this webinar, as well as the presentation slides, can be found on [Britannia's website](#).

REFLECTIVE LEARNING MATERIAL ON NEXT PAGE

REFLECTIVE LEARNING MATERIAL - IMPROPER USE OF ECDIS LEADS TO GROUNDING

THE QUESTIONS BELOW WILL HELP YOU TO REVIEW THE INCIDENT CASE STUDY EITHER INDIVIDUALLY OR IN SMALL GROUPS. IF POSSIBLE, DISCUSS YOUR CONCLUSIONS WITH OTHERS, AS THIS IS AN EFFECTIVE WAY OF THINKING ABOUT THE ISSUES IN MORE DEPTH.

PLEASE USE THE INFORMATION PROVIDED IN THE CASE STUDY TOGETHER WITH YOUR OWN EXPERIENCES AND THOUGHTS, TO REFLECT ON THE INCIDENT AND HOW THE ISSUES IDENTIFIED MIGHT RELATE TO YOUR OWN SITUATION.

WHAT DO YOU BELIEVE WAS THE IMMEDIATE CAUSE OF THE INCIDENT?

WHAT OTHER FACTORS DO YOU THINK CONTRIBUTED TO THE INCIDENT?

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WHAT DO YOU BELIEVE WERE THE BARRIERS THAT SHOULD HAVE PREVENTED THIS INCIDENT FROM OCCURRING?

WHY DO YOU THINK THESE BARRIERS MIGHT NOT HAVE BEEN EFFECTIVE ON THIS OCCASION?

WHAT IS YOUR COMPANY POLICY FOR PASSAGE PLANNING, INCLUDING UKC LIMITS AND LIMITS ON NAVIGATING NEAR NAVIGATIONAL HAZARDS?

IMPROPER USE OF ECDIS LEADS TO GROUNDING

WHAT DO YOU THINK WERE THE IMMEDIATE BARRIERS THAT COULD HAVE PREVENTED THIS INCIDENT?

WHAT ARE YOUR COMPANY REQUIREMENTS FOR ECDIS SAFETY AND ALARM SETTINGS?

WHAT IS YOUR COMPANY'S POLICY REGARDING CONDUCTING NON-NAVIGATIONAL DUTIES WHILST ON WATCH?

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