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WARNING OF THE DANGERS OF FATIGUE AND POOR BRIDGE PROCEDURES

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A GENERAL CARGO VESSEL RAN AGROUND ON SGEIR GRAIDACH SHOAL IN THE LITTLE MINCH ON THE WEST COAST OF SCOTLAND. LUCKILY THE CREW WERE SAFELY EVACUATED FROM THE SHIP BY THE LOCAL COASTGUARD, BUT THE VESSEL SUSTAINED EXTENSIVE DAMAGE AND WAS LATER DECLARED A CONSTRUCTIVE TOTAL LOSS. THE INCIDENT INVESTIGATION REPORT IDENTIFIED A NUMBER OF FACTORS CONTRIBUTING TO THE INCIDENT, WHICH PROVIDE VALUABLE INSIGHTS FOR MEMBERS. THE FACTORS INCLUDE FATIGUE, POOR BRIDGE PROCEDURES AND THE ISSUE OF SAFE MANNING LEVELS.

DEPARTURE

The 2175 GT general cargo vessel arrived at Drogheda, Republic of Ireland, to load 1927 tonnes of SRF (Solid Recovered Fuel) bound for Slite, Sweden. It took approximately two days to load the cargo, during which time the chief officer oversaw cargo operations. There were eight crew onboard; the master, chief officer, chief engineer, second engineer, an able seaman who doubled as a cook, plus three additional able seamen. On the day of departure, the chief officer was on deck overseeing the completion of cargo operations as he was the only other watchkeeping officer available. At 2030 the ship departed from Drogheda and made its way out into the Irish Sea, heading towards the Northern Channel between the Northern Irish and Scottish coasts.

THE INCIDENT

Later that evening the ship reached the Minches, a passage which runs between the inner and outer Scottish Hebrides and is made up of the Little Minch to the south, and the North Minch. The master was on watch. At 2024 he contacted Stornoway Coastguard Operations Centre (SCOC) to report having passed the southern limit of the Minches voluntary reporting system. At 2055 the ship entered the first of two Traffic Separation Schemes (TSS) in the Minches and reported in to the SCOC a second time.

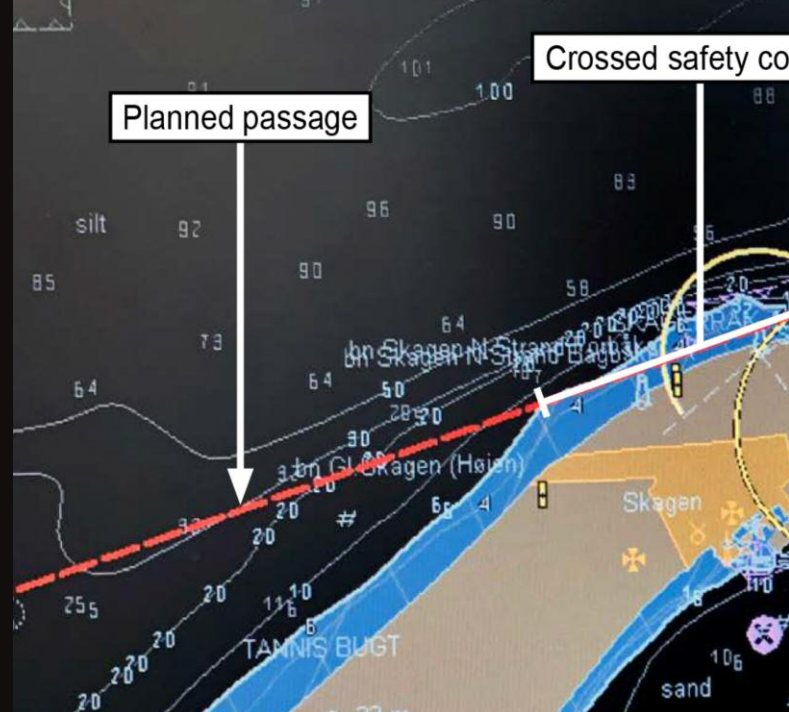
The master and chief officer shared the bridge watchkeeping at sea by way of a 7-hour watch and a 5-hour watch in each 24 hours, the master keeping watch 0700 to 1200, and 1700 to 0000. Shortly before the end of the master's watch, the chief officer arrived on the bridge with an able seaman. The weather had been steadily deteriorating and seas were rough to very rough with winds at Beaufort 6 – 9. Visibility was good.

Following the watch handover, the chief officer positioned himself near the central conning position, with use of the starboard radar and back up ECDIS display. He had slept for 3 hours prior to the start of his watch, following a busy period in port supervising loading operations. The able seaman, who was required on watch in hours of darkness only, stood next to the main ECDIS screen on the port side of the bridge.

WARNING OF THE DANGERS OF FATIGUE AND POOR BRIDGE PROCEDURES

(CONTINUED)

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At 0058 the ship was making good a speed of 10.6 knots on a course of 032 degrees, approaching the reporting point for the start of the second TSS, near where the Little Minch ends and the North Minch begins. The chief officer contacted the SCOC to report the ship's position.

The International Maritime Organisation (IMO) recommends a route for north bound traffic within the TSS that passes between the islands of Fladda-chuain and Eileen Trodday. The ship's actual route was not the recommended route but instead followed a track running approximately 1nm north of the southern cardinal mark on Eugenie Rock (easily identifiable on the chart and positioned north of both the previously referenced islands).

At 0135 the chief officer received a VHF call from a nearby fishing vessel warning him that his ship was headed into 'shoal waters'. After switching to a working channel (67) the chief officer expressed thanks for the information received, confirmed he understood, and advised that he would be altering course in the next few minutes.

Shortly after ending the VHF call, in accordance with the passage plan and having reached his next waypoint, the chief officer altered course 10 degrees to starboard. At 0141 two heavy impacts were felt on board and the ship ceased forward motion. Realising that the ship had grounded, the chief officer turned on the deck lights and put the engine telegraph to 'stop'. The ship had grounded on Sgeir Graidach rock, a charted hazard.

In the minutes that followed the grounding, a second fishing vessel alerted the Stornoway coastguard. The master arrived on the bridge and the able seaman was sent to wake the rest of the crew. In a visual inspection with a flashlight, the chief officer was able to see rocks over the ship's port side. The forepeak tank, empty on departure from Drogheda, was sounded and brought back a reading of 3.5 meters, indicating water ingress. The master and chief officer continued to assess the damage as best they could. They determined that the bow thruster space was taking on water, but that the number 1 ballast water tanks port and starboard were likely still watertight.

The ship's movement on the rocks steadily worsened. Eventually, the master sounded the general alarm, calling all crew back to the bridge where they donned immersion suits and, unable to stand safely due to the violent movements of the ship, lay on the deck of the bridge awaiting rescue. At 0307 the master gave the order to abandon ship and by 0421 all the crew had been taken to Stornoway by coastguard helicopter 'Rescue 948'.

It was not until two days after the grounding that the first salvage crews were able to board the ship and a further ten days later the ship was re-floated and towed away for disposal. It was declared a constructive total loss.

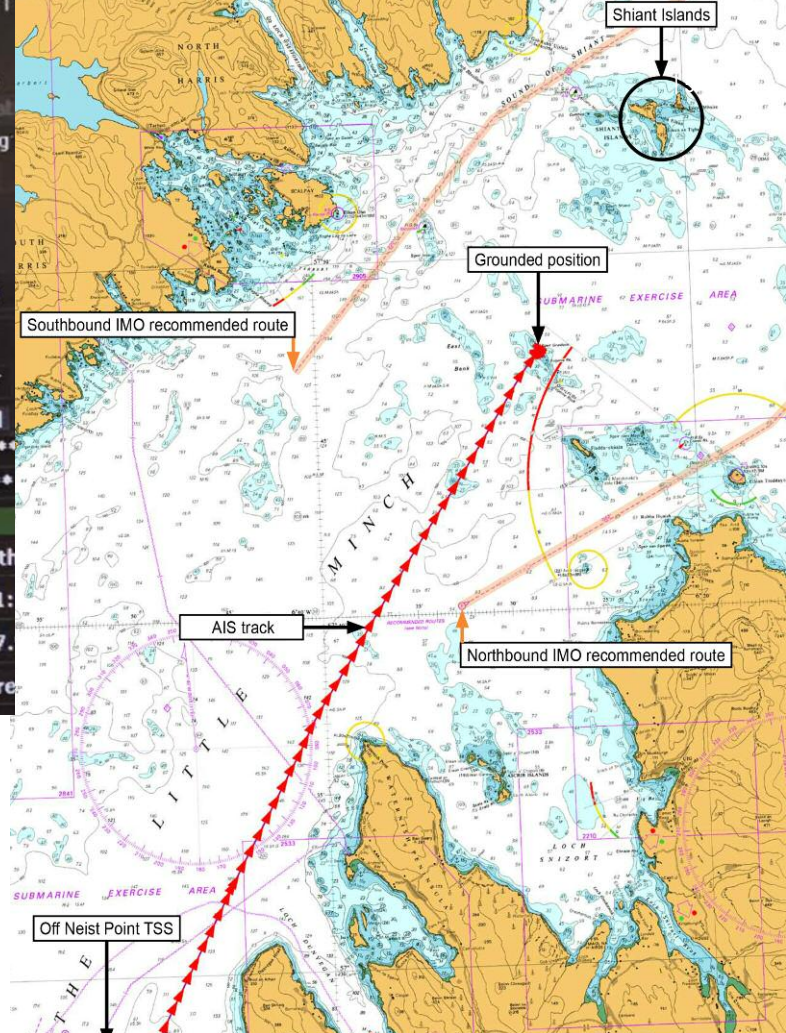
ANALYSIS

A full investigation was carried out by the UK Marine Accident Investigation Branch (MAIB) and we highlight some of the findings of this investigation below.

Both the master and the chief officer had the correct STCW certification and were experienced mariners. They had completed both generic and type specific ECDIS training. However, the passage plan in use at the time of the grounding contained significant errors across every aspect of the process, from the appraisal and the planning to the execution and monitoring of the plan.

Some of the points highlighted by the investigation are as follows:

- The ship commenced the voyage without a completed passage plan and there was no comprehensive appraisal of the plan nor had it been independently checked.
- The ship's SMS did not stipulate the minimum under keel clearance (UKC) or provide guidance on its calculation and in this case no minimum UKC had been calculated at all.
- All the alarm audio buzzers on the ship's two ECDIS units were set to level 0 (no sound) and whilst the depth settings had been set, the track still passed through more than one area without sufficient UKC.



- The electronic chart cell covering the IMO recommended route through the northern TSS was not loaded into the ECDIS system and the passage planning had been undertaken using incorrectly scaled ENCs.
- If a safety check of the route been carried out prior to departure (it is not known whether this took place or not) it would have shown up 479 separate errors. A safety check for the leg of grounding alone showed 15 errors, which included 2 hazards (isolated dangers) and the crossing of a safety contour.
- Although the ship had been manned in accordance with the Safe Manning Document, the levels of manning were found to result in fatigue and ineffective passage planning, which contributed to the incident.
- The lookout had not been effectively integrated into the bridge team, which left the C/O as the single point of failure.
- The ship's managers did not have the necessary experience or training to conduct audits effectively and also the findings of previous audits had not been used to improve the safety of navigation.

THE ROLES OF MASTER AND CHIEF OFFICER

In the ship's SMS, in a section below the title 'Job Instructions - Chief Officer', the company is called a 'flexible organisation' and states that 'each employee may be required to perform duties other than those included in the job instructions, depending on the company's requirements'. The master assumed that this paragraph allowed him to carry out the passage planning in situations where the chief officer was required on deck, in order to avoid any delay to the ship's departure.

However, the voyage planning guidance in the SMS, which reflects the requirement in SOLAS that the plan be cross checked by another officer (usually the master) was written with the interaction between officer of the watch and the master in mind. Whenever the master carried out the passage plan himself, no cross check by another watchkeeper was made since checking the master's work ran contrary to the dynamics onboard.

RECOMMENDATIONS

The incident serves as an important reminder of the disastrous effects of fatigue and inadequate bridge procedures. Various recommendations were made by the MAIB in response to this grounding including:

- To review the number of watchkeeping officers on board to ensure that sufficient personnel are available to conduct essential tasks and to protect the watchkeepers against the effects of fatigue.
- To review the company's SMS procedures covering voyage planning and use of ECDIS and amend the SMS to include clear guidance on calculation of safe UKC and safety depth along with the correct application of safety contours and alert limit settings.
- To ensure that if the voyage planning is conducted by the master there must be an independent check by another navigating officer and the company must allow sufficient time for developing and verifying the voyage plan on board.
- To ensure that the lookout is a fully integrated member of the bridge team.
- To ensure that all company auditors have an appropriate level of knowledge to identify any non-compliant use of the onboard ECDIS system during audits and that there is a system in place to make sure that all learning opportunities are followed up and implemented accordingly.

The full MAIB report can be accessed here:

<http://ow.ly/csVq30s8sNf>