

MARS 200949

Sudden stoppage of steering motor

During open-sea navigation, both running steering motors were found stopped without any steering gear system alarm. The OOW was alerted to this abnormality when the autopilot alarm activated after the ship's head had wandered off course. During the few minutes it took for him to realise that there was no power supply to the steering motors, the ship had deviated about 20 degrees to starboard from the original course. Fortunately, no other ship was in the vicinity.

Failing to get a quick response to a telephone call to the engine control room (ECR), the OOW alerted the chief officer, who was with the chief engineer on the aft mooring deck. Both of them rushed down to the steering room and noticed that the pumps had indeed stopped. They restarted all steering motors from the local switchboard, and then thoroughly checked the steering gear. However, they could not find any abnormality on the steering system.

It turned out that just before the incident, the deck crew had been using the aft mooring winches. The deck rating who went down to switch off the power to the winches at the end of the task had mistakenly switched off the power to the steering motors, the two switchboards being located next to each other and identical in appearance.

Preventative action

1. The start/stop buttons of steering gear motors were taped over.
2. The steering system switchboards were clearly marked.
3. All crew were refamiliarised with the operation of the switchboards.

■ **Editor's note:** Solas Chapter II-1 Reg 29.5.2 states: 'In the event of a power failure to any one of the steering gear power units, an audible and visual alarm shall be given on the navigating bridge.' Reg 29.8.4 requires a similar alarm system for power failure to each steering control system.

The report states this alarm was not activated, as it should have alerted the OOW instantly, rather than the activation of the autopilot off-course alarm. Even if there is no 'blackout', even manually switching off power to a steering motor or control system from the switchboard must operate this 'zero-volt' alarm. The testing of these alarms must be included in pre-departure and pre-arrival checklists.

MARS 200950

Unsafe modification to lifeboat davit

During rough weather it was noticed that there was some movement of the lifeboat davit. The ship staff, without consulting the management, welded an eyepad on to the lifeboat davit arm, aligning it with a hole on the fixed access platform. A pin was passed through these holes to secure the life boat davit.

The danger of such an arrangement is that any deformation of the pin will prevent the quick removal of the pin in an emergency.

Results of investigation

1. This modification was not reported to the company. There was a failure in company's SMS reporting procedures.
2. Change management procedures in the company SMS were found to be inadequate.
3. No evidence of risk assessment for such modification recorded on board.
4. Despite the fall wires being fully tightened when the lifeboat was stowed, the weight of the boat was not adequately transferred to the suspension links on the davit arms, and the harbour pin could not be engaged.

■ **Item no. 4 above seems to suggest an incorrect length of fall wire(s), possible obstruction to the free movement of davit arm(s) or improper rigging of gripes: Editor**

Corrective actions

1. The unsafe securing arrangement was immediately removed.
2. This incident was conveyed to all vessels in the fleet.
3. The company's reporting procedures to be included in the SMS familiarisation and pre-joining briefing for masters and officers.



▲ Figure 1: View of modified eyepad and securing pin to secure lifeboat davit

4. The management of change procedures in SMS to be amended to define levels of authority for carrying out maintenance on, repair of, modification to, or approving change in operational status of critical equipment, including safety systems and appliances.

MARS 200951

Passing too close



▲ Figure 2: LPG carrier and OSV

During a recent visit on board a large LPG carrier at anchor, I photographed an offshore supply vessel passing very close across the bows of the ship. In fact there was plenty of sea room to go further out.

The captain of the LPG vessel was very unhappy about this incident. He felt that there was little observance of the proper exercise of good seamanship in taking such risks in passing too close to an anchored dangerous cargo vessel, where even a minor misjudgement in conning the vessel or the occurrence of a breakdown of critical equipment would seriously endanger both vessels, lives on board, port facilities and the environment.

■ **Editor's note:** In a near-reversal of roles, cases involving transiting merchant vessels passing too close to fixed structures and support vessels in well-charted offshore exploration and production areas have also been reported, often well inside the customary 500-metre radius safety zone that is normally established around every offshore installation. Entry into, and navigation within, this zone is prohibited for all vessels except for designated supply and support vessels approaching the installation for operations.

Even for such vessels, it is standard industry practice for both the installation and vessel to strictly follow various safety and communication procedures before the vessel is permitted to enter this zone. The *Mariner's Handbook* further elaborates under Section 3.163, 'National laws': 'Many coastal states have made entry into declared safety zones by unauthorised vessels a *criminal offence*.'

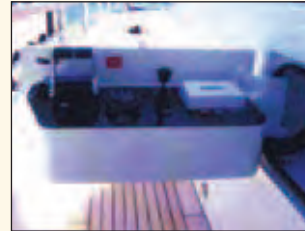
MARS 200952

Fatal accident during mooring operations

Official report: from Cayman Islands Shipping Registry

A large yacht was berthing at a marina. Wind and tidal conditions were benign and the arrival and mooring procedures followed the yacht's normal routine. During the

mooring operation, the yacht was being manoeuvred from the port bridge wing control station. When not in use, this station folds into the bridge house for storage. Due to the design of the bridge wing control station, it was necessary to put the engine controls in the 'full ahead' position before the control station could be closed.



▲ Figure 3: Bridge wing control station in extended position



▲ Figure 4: Bridge wing control station being folded into storage recess. Due to limited size of the opening, the engine control levers have to be moved down to full ahead position for storage.

After the yacht had completed mooring with four lines ashore, a crew member placed the bridge wing controls in the full ahead position and closed the control station. When the control station was closed, the yacht's engines were running with control still at the port bridge wing station.

With the engines engaged, the yacht continued to move ahead and wrenched three of the mooring points from the quay. Two bystanders on the quay were struck by flying debris and/or recoiling mooring ropes. One person was struck on the legs, fracturing them. The other person sustained serious head injuries. Both were evacuated to hospital. The person with the injuries to the legs underwent reconstructive surgery and was expected to make a full recovery; however the person struck on the head remained in a critical condition and died five days later.

Immediately after the accident, control was taken to the main bridge manoeuvring station. The yacht was brought under control and safely moored back alongside the quay.

Safety issues

The risks in conducting mooring operations must be assessed rigorously and safe working practices developed. Each vessel should have a set of guidelines for achieving a safe mooring which can be modified to suit operational or environmental circumstances. Where novel or unusual designs introduce additional risks, these should be properly assessed and appropriate control measures introduced. Removal or elimination of such risks should be considered in preference to introducing procedural controls aimed at reducing or mitigating the risks.

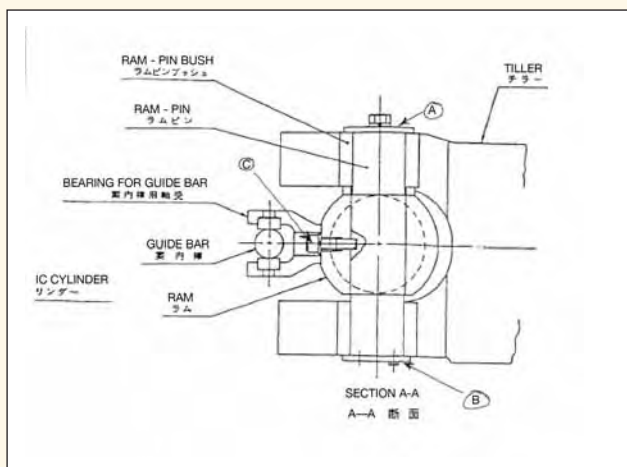
When choosing suitable mooring points ashore for the vessel (bollards, cleats etc) both the normal mooring loads and exceptional loads associated with emergency situations should be considered. Mooring operations are potentially hazardous where large amounts of stored energy can be instantaneously released if mooring equipment fails. This can result in serious injury and death.

Persons not involved in mooring operations should be kept at a safe distance until the operation is complete.

Detailed information and guidance on mooring operations is available in publications produced by The Nautical Institute, the UK Maritime and Coastguard Agency (MCA) and the Oil Companies International Marine Forum (OCIMF).

MARS 200953

Loss of steering – tiller disengaged



▲ Figure 5 and 6: How the tiller became disengaged.

While at sea, the steering gear ram-pin locking bolts worked loose and the cylindrical collarless pin fell off, causing the rudder tiller to disengage from the ram and swing 90 degrees, clear of the ram. Had the slew angle gone beyond this angle, the rudder could have potentially fouled the propeller rotating at full speed, with disastrous consequences.

Fortunately, due to prompt actions by the ship's engineers, a major accident involving extensive damage to the propeller and rudder was averted.

Instructions have been circulated to the fleet to verify that the ram pin locking arrangements are intact during every steering check.

The side elevation of ram/tiller connection seems to show that the ram pin is collarless and held in place only by plate washers and keeper bolts at positions A (above) and B (below).

■ **Editor's note:** This report does not explain why this crucial pin did not have a collar at the top, which would have prevented the tiller from disengaging. Ship staff should familiarise themselves thoroughly with the tiller/ram connection on board and ensure they are failproof.

MARS 200954

Fatality due to asphyxiation

Fearing possible liquefaction of the copper concentrate, a group A cargo in the BC Code which can liquefy if moisture content nears transportable moisture limit (TML), the chief officer of a bulk carrier decided to get the ship's deck cadet to enter no. 1 hold from the forward access, to view and report on the state of the cargo. Upon opening the hold access located in the fore peak store, the officer reportedly instructed the cadet to prepare portable lighting while he himself went to get a self-contained breathing apparatus (SCBA) set. Unsupervised, the cadet apparently entered the hold wearing a heavy-duty dust mask which he could have mistaken for an emergency escape breathing device (EEBD). After reaching the top landing platform of the hold ladder, four metres below the upper deck, he collapsed and lost consciousness.

Almost 15 minutes were lost before a properly equipped rescue attempt could be made by persons wearing SCBA, and all efforts to revive the cadet proved unsuccessful.

In-house investigation findings

1. Safety management system procedures for entry into enclosed space were not followed.
2. The access trunk had not been ventilated and tested for oxygen or toxic gases.
3. The enclosed space checklist had not been completed.
4. There was no strategy, planning or briefing carried out before proceeding to attempt to enter the hold.
5. There was a lack of skill in dealing with an emergency situation: the crew took too long to launch a rescue operation.
6. Subsequent measurements at the top landing platform showed an oxygen concentration of 3.2 to 4.4 per cent: certain to result in instantaneous asphyxiation.

Corrective actions

1. Entry into loaded cargo holds with main hatch covers closed is prohibited at all times other than in an extreme emergency. This is applicable for all cargoes at all times: many bulk cargoes have the potential to deplete oxygen or to emit poisonous and or explosive gases.
2. If entry into an enclosed space is unavoidable because of an emergency situation, an SCBA must be used by the person making entry.
3. Cadets on board are trainees, under the supervision and observation of senior officers. They are not to be assigned jobs of a hazardous nature under any circumstances.
4. Mast houses or store spaces which have booby hatch access to cargo holds must also be treated as confined spaces on loaded passages.
5. Tests for oxygen content in an enclosed space must be attempted only after good ventilation with an instrument capable of testing the atmosphere from outside the space.
6. A pre-loading cargo meeting must be conducted onboard and all crew members informed of the hazards associated with the cargo being loaded. Material safety data sheets (MSDS) for the cargo should be obtained from shippers.
7. Any dust/gas masks available on board must be clearly identified and labelled in languages understood by the crew detailing their limitations and with 'not to be used in oxygen deficient atmosphere' on them.



▲ Figure 7: 'Heavy duty' dust mask which the cadet could have mistaken for an EEBD. Such masks should be clearly marked 'Not for use in oxygen-deficient atmosphere' in a language understood by the crew.

8. Risk assessment and detailed discussion about any hazardous jobs must always be carried out in consultation with the safety officer before the job commences.
9. A copy of this report should be circulated in the company.
10. Training needs for all staff on the dangers of entry into enclosed spaces must be reviewed, taking into consideration their level of responsibility on board and experience.
11. A supply of compressors to recharge SCBA bottles on board should be considered. Ships' staff are reluctant to use SCBA sets for training and for access into enclosed spaces as they fear that the air in the bottles will be used up and not available for emergencies or PSC inspections. Refilling is also difficult at many ports.
12. All personal safety devices must be suitably labelled to avoid misuse.
13. Material safety data sheets (MSDS) must be obtained from the shipper prior any cargo loading.

■ Erratum:

The August MARS report was incorrectly numbered '201'. The correct number of the report was 202. Apologies.

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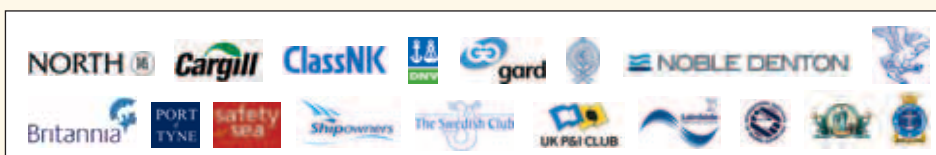
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