



The Nautical Institute Marine Accident Reporting Scheme

MARS Report No 187 May 2008

MARS 200833 Major gas leak

Official report: MAIB www.maib.gov.uk/publications/investigation_reports/2007/ennerdale.cfm

A fully pressurised gas tanker experienced a major leak of liquefied propane during loading from a shore terminal. The leak was sealed 29 hours later, after an estimated 66 tonnes of propane had been lost to atmosphere.

After completion of loading, a cargo surveyor boarded to take samples of the cargo. In order to ensure a truly representative sample, the chief officer arranged to keep the cargo in circulation during the sampling, using the tank's deep well pump.

After having taken the first tank's sample, and while the chief officer was engaged in securing that tank, the cargo surveyor proceeded to the second tank. As he turned the ship's connection to engage his sampling device, the sampling valve assembly came off in his hand, causing free release of pressurised gas from the open end of the branch pipe.

The chief officer saw and heard a leak and activated the emergency shut down (ESD) system. As gas continued to escape, it soon became apparent that the ESD valve before the detached sampling connection was not completely shut.

The ship's crew made several attempts to refit the sampling valve, but due to the high pressure of the escaping gas and the formation of ice on the pipe, these were unsuccessful.

The emergency services arrived promptly and maintained a continuous water spray on the deck to disperse the gas cloud. Soon afterwards, a decision was taken to close the port to all traffic, and other vessels at the terminal were moved to safety.

The following day, the port reopened to traffic, and with a safety zone maintained around the still-leaking gas tanker, a shore-based team managed to drill into the cargo pipework and inject a sealing compound to stop the leak of gas. The ship was allowed to sail after class approved the temporary repair.

Result of investigations

1. The regulatory requirements for gas carriers include very little guidance on cargo sampling, with no unified standard.
2. The assembly used for gas sampling was originally designed as a drain point for the cargo pipework system, but had come to be used for cargo sampling when the original arrangement provided for this was deemed unsuitable.
3. Past inspections of the vessel had not highlighted any concerns with the sampling arrangement.

Seaways May 2008

4. Inspection of the ESD valve that failed to fully close revealed that it had been jammed open by a small burr.

5. Although the closure timings of the ship's ESD valves were regularly tested and found to be satisfactory, these were primarily based on observations of indicators, rather than by actually confirming each valve's operation.

6. Although some ESD valves appeared to have been pressure tested by ship's staff, those on the cargo discharge lines were not, as there was no readily available method to do so.

7. There were no records of when the faulty ESD valve was last inspected, tested or overhauled. Furthermore, there is no clear regulatory requirement for ESD valves to be tested or internally examined at periodic intervals, or industry standard for regularly testing of ESD valves in service.

Recommendations:

1. Society of International Gas Tanker and Terminal Operators (SIGTTO) Chemical Distribution Institute (CDI) and Oil Companies International Marine Forum (OCIMF) were approached to provide industry guidance on sampling arrangements and procedures.
2. Lloyd's Register to make two proposals to the International Association of Classification Societies (IACS) regarding the standard of sampling connections, ESD valve design and periodic testing.
3. Consideration should be given to replacing the tapered threads in existing piping with parallel threads, and additionally, using either o-ring or bonded seals.
4. Consideration should also be given to the provision of a mechanical locking device to prevent rotation of the assembly. This could be in the form of, but not limited to, a right-angled bracket attached to the flange securing bolts or locking wire to prevent the rotation of the valve body.
5. Painting of the valve assembly should be avoided as it prevents thorough inspection during routine maintenance.

Probable cause

- The rotation of the valve (unscrewing of the valve due to vibration / operation of the valve) while in situ, or
- Inadequate tightening of sampling valve on branch pipe.

MARS 200834

Rupture of economiser with fatalities

Official report: IMO Sub-Committee on Flag State Implementation – 11th Session

An economiser (waste heat boiler) on a passenger ship

ruptured during sea trials after a repair period. Two people died from steam burns and three others were injured as a result of the failure.

Result of investigations

1. The shipboard economisers were not to be pressurised for the sea trials. The necessary steam was to be provided by a temporarily installed oil-fired boiler.
2. The engineers decided not to drain the water from the economisers. Instead, they intended to vent them by using the hand easing-gear to lift the economiser safety valves from their seats.
3. They did not realise that the safety valves on the port economiser had corroded in the closed position and that they were not venting the economiser despite the position of the indicators on the hand easing-gear.
4. When sufficient pressure developed, the port economiser ruptured at a circumferential welded joint.
5. The safety management system (SMS) did not contain adequate procedures to ensure the maintenance and safe operation of the steam generating plant.

Lessons learnt

1. The preoccupation of the engineering staff with the shipboard repairs and sea trials might have prevented them from thoroughly considering the consequences of not draining the economisers.
2. The heavy workload during the trials might also have interfered with the engine room staff's making appropriate engine room rounds to verify that the economiser was actually being vented.
3. This incident might have been prevented by adequate risk assessment of boiler safety devices, alarms, means of control and indication; also strict adherence to sea trials procedures.

MARS 200835

Loss of both anchors with chain

One of our vessels lost both anchors and chain while attempting to anchor offshore in deep waters. Investigations indicated that correct anchoring procedures were not followed for such an operation.

With the echo sounder reading 90 metres, the port anchor was 'walked back' to 2.5 shackles and let go. The anchor along with the entire cable was lost when the bitter end parted under the shock load. Thereafter the starboard anchor was walked back to 4.5 shackles, and the process repeated with the same result. Unfortunately, in both incidents, the clear written procedures in the company's safety management system (SMS), below, were not followed, with serious operational and financial losses.

In the words of the SMS:

'Extreme precautions are to be observed while dropping anchor in deep waters. The following guidelines are to be considered on such occasions in order to avoid loss of anchor:

'a) Ensure that windlass brake linings are good and the bottom band stopper arrangement is properly adjusted.

b) Ensure while anchoring, the entire cable is walked out under power.

c) While lowering, vessel should be fully stopped with no speed over ground.

d) After laying about 1-2 shackles on sea bed, use very short bursts of engine not more than dead slow astern / ahead to range cable and pay out required length.

e) After the vessel is brought up, put guillotine bar and lock. Tighten brake full and then release gear.

'Needless to state, the vessel should be wind / tide rode prior lowering anchor.'

■ **Editor's note:** In general, company procedures for anchoring may consider being more specific when referring to 'deep water' and suggest a depth of about 40-50 m as a benchmark. It may also be useful to use the term 'anchoring' rather than 'drop anchor' to avoid misunderstanding.

MARS 200836

Anchors dislodged at sea

Three of our vessels reported that their bower anchors were dislodged from the stowed position during bad weather. In one case, an anchor along with the chain was lost. In the other two cases, the anchors and chain were recovered due to prompt action taken by the ships' staff. Regardless of the circumstances, such incidents are a direct result of inadequate precautions and lashings taken for sea passage in heavy weather conditions.

The following procedures must be considered to be the minimum:

1. Brakes are to be tightened and the operating handle lashed to prevent the brake from working loose;
2. A minimum of two wire rope strops of appropriate strength and in good condition, led through different links on the chain, must lash each anchor and be tightened to equal tension, with independent turnbuckles;
3. Each bow stopper must be fully seated with locking bolt secured in place;
4. If appropriate, the windlass gear may be engaged after housing and lashing the anchors, taking care that only the brake, lashings and the bow stopper are all bearing equal stress;
5. The brake system must be regularly checked for proper condition and optimum adjustment;
6. Finally, the anchor lashings must be checked at sea daily, especially prior to encountering bad weather.

MARS 200837

Garbage fines

Two of our vessels were fined heavily at different North American ports for improper storage of garbage on board. Typical deficiencies were:

1. Garbage container on deck found leaking;
2. Egg shells found on deck;
3. Dry meat pieces found on deck barbecue grill;
4. Pieces of egg shells found in discarded (empty) egg crates in the dry garbage bin.

Masters and the ship's garbage management officer should ensure that all personnel involved in storing and handling garbage are familiar with the various garbage types and follow proper storage and segregation procedures laid down in the ship's garbage management plan. Garbage storage receptacles on deck must be regularly checked for signs of damage and renewed as necessary. Drums must be kept covered tight at all times so that spillage does not take place due to the action of birds, seas or weather.

All shipboard personnel and, in particular, the deck department, must be advised to report any deficiencies immediately. It must be emphasised that even though the violations mentioned may be related to very small quantities, they are often taken up very seriously by some enforcement authorities.

■ **Editor's note:** Often the ship's crew themselves are guilty of disposing of garbage improperly after consuming food or drink on deck. Inspectors have identified some typical locations: under gratings or platforms, inside savealls, deck fire hose boxes and weather-tight electrical switch receptacles. Commonly, food waste and other garbage left behind by shore personnel in the previous port is to blame – but shore authorities will still penalise the ship. The deck crew must be thoroughly drilled on proper garbage collection, segregation, storage and disposal procedures. They must be constantly reminded to search the ship carefully for discarded garbage after departing from each port and dispose of these articles in accordance with regulations.

MARS 200838

Colregs violation

As master of the ship, I was keeping the 08.00 to 12.00 watch on a clear day, steering 053°T; speed 15 knots. I observed by radar, a crossing target (later seen to be container vessel) on my port bow, bearing approx 020°T; distance 12 miles, on a collision course. There was no other vessel in the vicinity and the other vessel's identity was verified on the AIS.

I watched as the other vessel continued to approach, still on a collision course. When she was about 3.5 miles off, and was taking no avoiding action, I called her on VHF16. When I received a response to my second call, I asked for the container vessel's intention. The officer's reply was for me to keep clear as he did not want to carry out a large alteration of course, of about 50 degrees. I advised him that under the Colregs it was his duty to keep clear. The officer instantly became abusive and 'ordered' me to keep out of his way. I reminded him that we were on VHF 16. He then agreed to alter course. After altering, the officer of the container vessel advised me in a very haughty voice that he was the master – I would have thought the master of a ship would be more likely to follow the Rules. I advised him that I, too, was the master of my vessel. After passing clear, the master (?) of the container vessel asked me sarcastically if I was satisfied with his actions. I am afraid that this sort of reaction from so-called certificated officers is becoming far too common.

I appreciate that there is a shortage of officers these days, but this is not an excuse to hire the unruly and defiant. I recommend that crewing / marine departments of companies regularly impart Colregs training to bridge watchkeepers and verify their knowledge of the same.

MARS 200839

Chain mail gloves for galley

Source: UK P&I Club: www.ukpandi.com/ukpandi/infopool.nsf/HTML/LP_Init_LPIdIdeas

Chain-mail gloves, which are easy to clean in hot soapy water, are a good idea particularly when cutting meat. Ships' officers are advised to procure these in consultation with their management offices. These gloves are regularly used ashore by butchers, and in the meat-packing industry, by scuba divers and by animal control officers (against animal bites).



▲ Chain-mail gloves

MARS 200840

Damage to underwater cables

Arriving about a week early for her loading, a general cargo ship that had almost arrived at the pilot station, was instructed to wait off-limits. After hastily consulting the charts and publications, and being aware of hi-jacking and piracy threats in the region, the master selected an offshore anchorage just outside the 12 mile line, but within visual range of the signal station.

After turning the ship around in heavy traffic and steaming back about 15 miles, the master anchored in the chosen spot in depths of about 25 m, paying out five shackles. During the final approach to the anchorage, he noted charted submarine cables in the vicinity and, perhaps due to the subconscious feeling that he was anchoring in 'high seas', coupled with a momentary lapse of concentration, he mistakenly interpreted each one-cable division on the large scale chart's latitude scale as one mile. As a result, the master was under the impression that he was four miles clear of the nearest submarine cable, but, in fact, had anchored 0.4 miles from it.

After about four days the ship, which was always wind-rod, slowly dragged anchor, snagged and damaged the submarine communication cable. Unfortunately, none of the bridge team realised the slow dragging of the anchor, having monitored the ship's position by distant radar ranges, which failed to change appreciably.

Root cause/contributory factors

1. Hasty, forced decision to select an anchorage offshore;
2. Wrong interpretation of distance scale;
3. Poor bridge team management, error chain not identified;
4. Inadequate clearance from submarine cable;

5. Inadequate scope of cable under prevailing conditions;
6. Ineffective anchor watch.

Lessons learnt

1. Harbour movement instructions for an inbound vessel must be communicated well in advance of her arrival.
2. The bridge team organisation must ensure that every action of one member is monitored and approved by another so that an error chain is not allowed to develop.
3. If there is sufficient room, a longer scope of cable must be paid out than the normal length of four to five times the depth.
 - As a further guide to mariners, here is a recent advisory from the West of England P&I Club:

07/03/2008 Underwater Cables and Pipelines

Damage to underwater cables and pipelines by ships' anchors continue to produce very large civil liability claims against shipowners, not only for repairs but also for the resulting interruption of production or supply of power, communications or products such as oil or gas.

It now appears that coastal state authorities may be taking a tougher line in respect of vessels damaging underwater facilities.

In certain jurisdictions, and as occurred recently in the Gulf, where a vessel is reported to have damaged a communications cable some distance away after dragging anchor in heavy winds, criminal proceedings may be brought against vessels' masters and they and/or crews may be arrested.

When anchoring, masters should ensure that the anchor is dropped well away from any underwater cables or pipelines, taking into account the local weather forecast and the likely track of the anchor if it starts to drag. Masters should also be mindful that ships may move a considerable distance very quickly in such circumstances unless the main engine is ready for immediate use.

Feedback

MARS 200769

Another lifeboat mishap/fatigue

In this incident, a lifeboat that had been successfully load-tested during a busy night in anchorage suddenly fell into the water as it was being secured in the davits, seriously injuring the lone crewmember inside.

I note root cause 3 as being poor work planning. I defy anyone to carry out similar operations in the time scale allowed without having a fatigued crew. I called at Singapore recently for stores / spares / crew change / LO / bunkers (FO and DO), all to be done overnight. Despite trying, it is seldom possible for all hands to arrive rested, having just navigated the Singapore or Malacca Straits with crew on anti-piracy watches as well as navigational watches and engines on stand-by. I note you make the point that surveys should not be carried out at night. I could not agree more. One of our ships did an external audit recently in the UK. The ship had recently arrived having navigated the English Channel and Thames approaches. The master was interviewed very late at night by the auditor and the audit was concluded in the early hours. The ship then sailed for Antwerp. It does not need too much stretch of the imagination to realise that the master could not possibly have been safely rested.

I honestly fail to see how any safety related survey or audit can be conducted at night, or at anytime when it is going to compromise the crew's rest hours. Generally, the master is faced with the choice of refusing to do the survey at that time, or doing it then delaying the ship's departure so that he and crew are rested (not much of an option really) or going ahead with it and hoping for the best. Owners should never put the master in such positions.

MARS: You can make a difference!

Can you save a life, prevent injury, or contribute to a more effective shipping community?

Everyone makes mistakes or has near misses but by contributing reports about these events to MARS, you can help others learn from your experiences. Reports concerning navigation, cargo, engineering, ISM management, mooring, leadership, ship design, training or any other aspect of operations are always welcome.

MARS is strictly confidential and can help so many – please contribute.

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The Nautical Institute gratefully acknowledges sponsorship provided by:

North of England P&I Club, The Swedish Club, UK P&I Club,

The Marine Society and Sea Cadets, Britannia P&I Club,

Lloyd's Register-Fairplay, Safety at Sea, Sail Training International

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