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MARS 200942
Overheating in auxiliary engine

At around midnight, the engine room fire detection panel alarm sounded, indicating a fire on the third deck. This was shortly followed by an alarm for the second deck as well.

The master immediately mustered the emergency parties. The main engine was stopped and the machinery space ventilation shut down. The emergency team that made a controlled entry into the engine room reported thick smoke issuing from one of the running auxiliary engine's crankcase end cover.

(Though the report does not specifically mention it, it is reasonably presumed that the auxiliary engine involved was quickly taken off load and stopped by ship's staff: **Editor**.)

Result of investigation

The investigation revealed that due to a substandard and worn-out tab washer, the nut securing the driven gear on to the shaft of the cooling water pump of the auxiliary engine had became slack. This had resulted in friction and created a localised hot spot – sufficiently hot to cause a significant volume of smoke. Potentially this could have resulted in a serious crankcase explosion in the auxiliary engine.

Root cause/contributory factors

1. Inadequate instruction: the engine maker's manuals did not give specification or define the period for renewal of the tab washer of drive gear securing nut;

2. Inadequate alarm system design: the auxiliary engine abnormal condition alarm was not activated, due to drive gear overheating;

3. The crew was unable to determine the integrity of all parts to be reused during the last routine overhaul of the pump.

What went right

1. Prompt actions by the master, chief engineer and ship's crew in assembling at their muster stations, closing down machinery space ventilation and preparing for entry in self-contained breathing apparatus contributed significantly to the successful outcome of this incident.

Lessons learned

Routine overhauls must be conducted diligently. The importance of what may appear to be insignificant components must be recognised.

Corrective/preventative actions

1. Recommendation to fleet that tab washers should always be replaced with new ones during maintenance;

2. Recommendation to fleet that crew members be closely supervised and well trained in carrying out overhauls;

3. Company should look into the installation of auxiliary engine crankcase condition monitoring devices, and this should be linked to the emergency trips.

MARS 200943
Exhaust manifold bolts sheared off

The newbuilding that I commanded on her maiden voyage was finished to a fairly good standard: engine vibrations at full sea speed could be described as normal, for example. However, the fact that even on a well-found ship, the unreliability of 'minor', yet critical components, each of which could potentially place the vessel in serious danger, was amply demonstrated in this incident.

Each of the main engine's eight cylinders' exhaust outlets was connected to the exhaust manifold by means of a short bellows, with each flange held tight by about 40+ high-temperature bolts and nuts. Steaming at full sea speed with the main engine producing about 49,000 kW, and some 10 hours before the vessel was due to transit a narrow strait, the engine room fire alarm activated. Within a few minutes, the bridge was informed that exhaust gas was leaking from at least three manifold couplings due to the sudden shearing off of numerous flange bolts.

The main engine was immediately stopped and the difficult task of replacing the broken bolts commenced. With the ship rolling about 20 degrees in a heavy beam sea and swell, crew members had to perch precariously in the crevice between the very hot bellows and the manifold, carefully retrieve the two halves of each sheared bolt, and push in a new bolt and tighten the nut. There was very little room for proper access or an extension lever on the wrench.

Over the next few days, a great many of the original bolts sheared off at regular intervals, forcing frequent engine stoppages and bolt renewals, so the maiden voyage was completed at reduced speed. As stocks of spare high-temperature bolts ran out, ordinary mild steel bolts had to be used as temporary substitutes.

The shipbuilder air-freighted a full replacement set and spares (about 400 sets?) to the next port where, with the

assistance of shore labour and sympathetic commercial interests, all bolts were renewed. It is suspected that an inherent metallurgical or forging process defect in the bolts was to blame for the brittleness.

Had this incident occurred during the transit of the congested strait some hours later, with a near gale pushing the vessel on to a rocky lee shore, the stresses on the hull (and my cardio-vascular system) would have been catastrophic to say the least.

MARS 200944
Near collision in anchorage

Our vessel was anchored in a crowded anchorage in a major port, where it is customary for anchored ships to be located about two cables apart. A proper anchor watch was maintained throughout and the positions of other anchored and moving vessels in the vicinity were closely monitored.

After our ship had been in this position for a few days, an inbound vessel 'A' with pilot embarked was noticed to be heading for the anchorage at high speed. With 'A' about five cables away and closing rapidly, we tried contacting her on the VHF, but she did not respond. Port control intervened and informed us that 'A' had lost her engines. We immediately called anchor stations, readied our engine and mooring equipment and started heaving in our anchor chain.

When 'A' was just three cables away, she let go both anchors but due to her headway, she continued to close with our vessel, while we tested our engine and continued to heave in our anchor cable.

When 'A' was just two cables away, her engine became operational. The pilot was able to check her advance and informed the port and all vessels in vicinity that situation was under control. Eventually, 'A' weighed both her anchors and proceeded to anchor about five cables away, escorted by the emergency tugs that had been sent by the port.

When 'A' was safely anchored, we rendered our shortened anchor cable back to the original scope and stood down the engine and deck crew.

Lessons learned

1. Duty officer to be always alert on bridge.

2. Vessel to be in constant state of readiness for any emergencies. Realistic training should be carried out during routine drills.

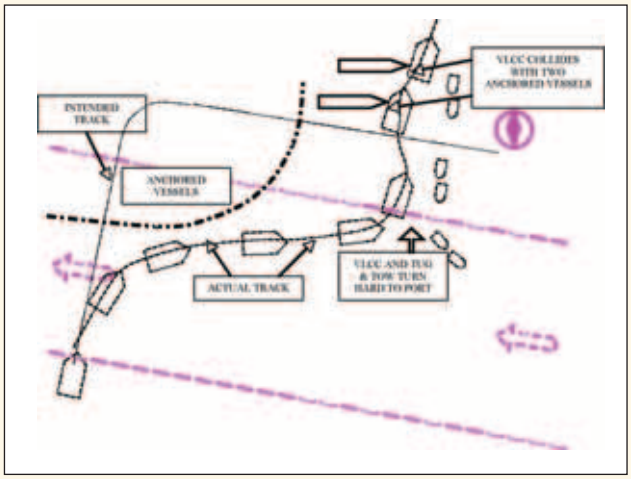
3. Vessel should not be complacent and always keep a sharp lookout on passing traffic and vessels anchored near own vessel.

4. Good listening watch to be kept on VHF and, in case of any doubt about intentions of another vessel, seek clarifications after positively identifying her and inform VTS/port control.

5. In congested anchorages, always have some staff on deck with walkie talkies, in order to mobilise resources promptly.

MARS 200945
Collision near pilot station

Arriving at a very busy tanker port, and with only three miles to go to the charted pilot station, a laden deep-draught VLCC,



displaying the appropriate signals for a vessel constrained by her draught (CBD), was crossing a west-bound TSS lane from south to north, making about three knots over the ground.

The passage plan envisaged a 90º alteration to starboard after the crossing and a track parallel to the TSS lane's northern edge leading to the pilot station. However, due to numerous vessels anchored within the traffic lane and obstructing her path along the crossing heading, she altered to an almost easterly heading within the west-bound traffic lane for safety (contrary to the general direction of traffic flow). She duly advised VTS of her predicament.

While on this course, a collision situation developed with a tug and tow, crossing from her port bow, on a southerly heading. The tug was not displaying signals to show that it was restricted in ability to manoeuvre (RAM), and despite being the give-way vessel, failed to take early avoiding action. At the very last minute, the tug suddenly altered hard to port and stopped her engine, and the VLCC, by now within one mile from the pilot station, also altered to port as an avoiding action.

However, due to the nature of the vessel's limited slow-speed manoeuvring capabilities under the prevailing circumstances, and possibly an adverse effect of sub-surface current, she drifted on to the vessels anchored close west of the pilot station and collided with two of them, causing hull damage to all the vessels involved.

The company's investigation listed the probable causes:

1. Colregs violation by the tug and tow in avoiding impeding the safe passage of a vessel CBD, exhibiting the signals in Rule 28;

2. Area of high traffic density;

3. Limitations of the VLCC's manoeuvring capabilities;

4. Vessels unlawfully anchored within west-bound TSS lane and close to the pilot boarding area, allowing insufficient sea room for approaching vessels to embark pilot;

5. Due to her deep draught, the VLCC may have been subject to underwater currents different from the anticipated surface currents;

6. Experience of the members of the bridge team could be a contributing factor in determining the risks involved and ship-handling capabilities;

7. Insufficient planning, bridge team management and situational awareness. The bridge was also short of an additional lookout, required under the company guidelines.

Corrective/preventative actions

1. Representation to be made to VTIS, to ensure that the safe passage of CBD vessels is not impeded by other vessels as far as is practicable;

2. Vessels violating Colregs should be reported;

3. Increased simulator training to be given to masters with seatime of less than two years in command;

4. There should be warning to mariners reflecting changes in currents that are different from the published data and which we presume are severely affected by reclamation of sea areas especially in congested surroundings.

5. The movement of vessels in and out of highly congested port areas to be more attentively monitored by VTIS.

6. Anchoring of vessels in the close proximity to pilot areas and traffic lanes, should be avoided;

7. The use of sea pilots, or an additional officer for vessels routinely engaged in transits through areas of high traffic density, is recommended.

Lessons learned

1. The navigator must have a good knowledge of the manoeuvring capabilities of the vessel.

2. A detailed risk assessment should be carried out before entering areas of restricted sea room and plans for contingencies must be in place.

3. Close monitoring of external factors such as currents, windage, shallow water effects on the vessel's manoeuvrability must be carried out.

Editor's note: Radar monitoring and, in good visibility, visual lookout would have shown the VLCC's bridge team that her planned track was indeed being obstructed by the vessels improperly anchored within a traffic lane. Accordingly, instead of being forced to navigate on a heading contrary to the general direction of traffic flow within that lane, which is itself a serious violation of Colreg Rule 10, she could have exercised prudent seamanship by amending the passage plan and proceeding further eastwards along the east-bound lane before crossing into the west-bound lane and back-tracking towards the charted pilot station. Timely and sensible routeing advice from the VTS could also have helped in this incident.

MARS 200946
Blower impeller disintegration

A large container vessel, like most motor vessels, was fitted with four large axial flow fans which were operated at full capacity when the main engine was running at full sea speed. The electrician's cabin was located adjacent to the trunking of the port forward fan – and after the following incident, he recalled that over the preceding day or two, he had noticed a slight change in the normal sound of the fan that he was accustomed to hearing from within his cabin.

During the night, when most of the ship's staff were fast asleep, the bearings of the port forward high-speed fan failed, and in an instant, the impeller rotating at nearly 4500 rpm, became unbalanced and, with a cataclysmic crash, it disintegrated. The electrician recounted that his body's reflex reaction to the shock impulse caused him to be tossed out of bed, luckily with only slight bruising to show for it.

On the bridge, the first assumption was that the vessel had collided with an unseen object, (or, according to the second mate, a die-hard sci-fi buff, a meteor or an alien spacecraft had hit the accommodation block…).

It took some minutes for the groggy engineers and crew – the engine room was on UMS operation – to realise what had occurred, and as a precaution, the main engine was slowed to dead slow ahead, while the trunking from the port forward fan was temporarily blanked off.

The full extent of the damage was revealed the next morning, when the master and chief engineer inspected the trunking internally. Pieces of the impeller were impaled on the inner surfaces and the wire mesh guard had all but disappeared. Evidence of hard scale was also seen above the fan impeller.

Probable cause

It is thought that, initially, small rust flakes were probably detached from above and struck the fast rotating impeller blades, disturbing the balance of the rotor. This vibration is thought to have slowly overstressed the bearings over a day or two, perhaps dislodging more rust flakes, and/or causing the impeller to disintegrate before or after contact with the casing. The final shock loads perhaps dislodged large wasted portions of the wire mesh guard, causing further secondary impact.

Repairs at the next port took more than a day's work. The company instructed all vessels to carry out the following:

1. At the earliest opportunity, stop each blower, secure impeller, descale trunking internally, and recoat surfaces;

2. Crop and renew wasted sections of wire mesh guards;

3. Increase the frequency of monitoring blower rotor vibration, bearing condition and motor on-load current and winding insulation.

Editor's note: Similar blower impeller failures can occur on passenger vessels and vehicle carriers (ro-ro and ro-pax vessels), with potentially far more damaging results, particularly if fragments of metal were ejected at high velocity into accommodation and cargo spaces. A 'stethoscope'-like listening device or electronic gadget, similar to the one automobile workshops use to balance wheel rims, may prove useful in early detection of bearing play or fatigue before the onset of damaging vibrations.

MARS 200947
Health hazard from beverage cans

How appealing is a cold drink in a chilled can, especially after a long, hard shift or watch? Most seafarers would scarcely waste time to bother with any niceties when faced with such temptation; they would simply pop the can open, put it to their mouths and pour the contents 'down the hatch' without the fluid even touching the sides of the throat.

Recent media reports, based on observations made inside some storage warehouses, have alleged widespread infestation and consequent contamination of stored cartons of canned beverages and foodstuffs. Rodents, in particular, have deposited urine and faeces atop cartons of cans, and there is

great risk of contracting life-threatening diseases like leptospirosis and typhoid as a result. If not pests, then pesticides used within the storage warehouses may also be present on the can's surfaces, and the unsuspecting consumer could ingest powerful toxins.

Suggested precautions for seafarers

1. Always unpack cartons containing canned beverages and foodstuffs, carefully rinse each can or container under running clean water (hot water is preferable) and store these in a protected, proven pest-free space until consumed.

2. Never drink or consume food straight from the can, even if the carton and can surfaces appear clean and bright. Always pour the beverage into a clean and clear glass, and consume only after confirming product quality by using sight, smell and taste. Exercise similar caution with canned foodstuffs.

3. Destroy/or properly dispose of contents of cans that appear to have been damaged, punctured or even soiled.

4. Question suppliers about the quality of the storage facilities they use.

MARS 200948

Unsafe hatch cover sweeping

Source: Mark Bull, Loss Prevention Manager, The London P&I Club

One of our inspectors has highlighted a dangerous practice aboard bulk carriers in some far-eastern ports. The

stevedores climb on top of the open hatch covers and shovel coal, which has spilt on to the top, back into the open hold. As you can see from the photograph, above, their only safety equipment is a rope joining them together. Should either one slip and fall into the hold or on to the main deck, it is doubtful such a system would arrest the fall. The stevedore on the hatch cover would find it hard to maintain his foothold on the coal debris, besides the dynamic jerk on the rope. A fall into a near empty hold would be fatal.