Tug and barge matters

A focus on some of the issues surrounding tug and barge fleets in the P&I world
Tug operations

There are a number of different types of tugs in use worldwide. The conventional tugs with the propulsion aft, the azimuth stern drive tug and the tractor tugs which have the propulsion unit nearer the bow. During the past two decades the average bollard pull of harbour tugs increased from 30 tons bollard pull (BP) to 60 or even 80 tons BP. Harbour tugs of 100 tons BP are now coming into service. All tug operations require careful planning if accidents are to be avoided.

Joining the tug

Boarding a tug requires caution.

Due to design the tugs are not normally equipped with, or have suitable arrangements for an accommodation ladder or safety net. Boarding arrangements can be even more difficult when tugs are moored as shown below and your tug is the outboard one.

A typical boarding problem may be the excessive distance between the jetty and the tug.

The temptation may be to jump from the jetty onto the tugs gunwale. This is a bad practice and should not be attempted.
Not the safest way to board a tug: The above are high risk examples of boarding

Case study:
A seaman was stepping off the bow of a tug over the bulwark rail. He slipped and fractured his knee. The bulwark had not been painted with non-slip paint.

Cause of accident: Lack of duty of care – no safe boarding brow.

Cost to seaman: Severe pain – period of invalidity with seafarer unable to work.

Cost to tug’s reputation: Adverse publicity.

Safe access can be enhanced if a small portable, lightweight brow is supplied, complete with permanent rails and side screens. The rigging of a safety net on tugs may prove to be more of a hindrance and totally impractical. A number of tugs have a gate access in the gunwale which has assisted safe boarding.

Good practice

Although the above arrangement is considerably safer than jumping onto the tug, the risk of an injury can be further reduced if a small bridging brow is used, similar to that used by deep sea vessels.

If the tug is not supplied with a portable gate, alternative arrangements may consist of portable steps on the quay and small steps that hook over the tugs gunwale.

Other boarding arrangements consist of a portable brow that hooks over the tugs gunwale. Whichever method of safe boarding is considered, consideration must be given to the rise and fall of the tide.
An example of a safe portable brow complete with non-slip treads and a turn table base

**Boarding between tugs**

It is common practice to use the tugs ladder.

Some tugs have the ladder fixed to a secure part of the deck, other tugs use portable ladders. If portable ladders are used it is essential to have the ladder secured at both extremities or have personnel situated at the foot and head of the ladder to support the ladder and prevent it from slipping.

When using a ladder to board a tug both hands should be used to grip the ladder and to maintain a steady balance. Any documents should be transferred by other means. It is bad practice to board a tug one handed.

**Case study:**

It was raining, and a seaman was returning from ashore after shopping in the local supermarket. He was using the tugs ladder to transfer between tugs. Ascending the ladder using one hand, he lost his footing and fell sideways onto the tugs gunwale. He sustained serious head, back and leg injuries and was fortunate not to be killed.

Cost to seaman: Hospital, serious injuries, unfit for duty.

**Movement around the tug**

To reduce the risk of slips, trips and falls it is good practice to highlight the top and bottom steps of all ladders (some tugs highlight all the steps) and have the steps non-slip. Environmental working conditions would suggest that it is prudent practice to have all the deck, bulwarks, steps and ladders on a tug non-slip. This can be achieved by the use of non-slip tape.

**Good practice: The steps on this tug are an example of good highlighting**
Slips, trips, and falls cost the seafarer pain, the owner loss of reputation, and the P&I Club loss of money.

Slips, trips, and falls can be reduced by highlighting risk areas and having non-slip on all mooring areas and common walkways. Non-slip work areas and a clear deck help to provide a safe working environment.

**Below: Clear safe working steps**

Corroded or damaged steps should be repaired or replaced as soon as possible to reduce the risk of a leg injury.

**Bad practice:** These damaged steps should have been reported and repaired BEFORE highlighting. This suggests lack of communication on board—which can result in accidents or incidents.

Examples of tugs steps and vertical ladders that should be highlighted to reduce the risk of a slip trip or fall. It is considered good practice to have the area immediately at the top or bottom of any stairs made non-slip. This can be achieved by the use of non-slip deck tape.

**Vertical ladders**

The rungs on vertical adders may be slippery if they have recently been painted with gloss paint or if the weather is wet or humid.

To reduce the risk of a slip on vertical ladders, they should be fitted with non-slip tape and highlighted (yellow non-slip tape is available).
Ladders should be kept clear of any obstructions, such as buckets, mops and brooms

Access to the crows nest (upper navigational control area)

The steep caged ladder to the upper navigational control area should be painted white rather than black.

During hours of darkness the black steps will not be conspicuous and the risk of an accident, while ascending and descending from the upper navigational control area will be increased. The ladder steps should be fitted with non-slip tape and a spring loaded safety gate fitted at the top of the ladder

Bad practice: Ladder painted black and ladder steps are not non-slip

Good practice: The access to this crows nest (upper navigational control area) is painted white, the ladder steps are non-slip and it has a clearly marked spring loaded gate fitted at the top of the ladder

Ladders should be painted a conspicuous lighter colour and the edges of the steps highlighted, so that the seafarer is aware of the change of height.

These steps, although recently painted a lighter conspicuous colour, require highlighting and made non-slip. It has been found that when the paint coating is new, it is smooth and slippery. This increases the risk of slipping

Engine room safety

Steps in the engine room are a high risk area, especially when a thick coating of paint covers the non-slip chequered plate. The fitting of strips of non-slip tape on each step and at the top and bottom of the steps will reduce the risk of slips trips and falls. The edges of the steps should be highlighted (painted yellow).
Any mats in the engine room must be non-slip and they should not be used on the lower plates. Mats on the lower plates are a fire hazard. Non-slip mats, if considered essential, should only be used on the top deck, at the entrance to the engine room compartment. The area at the bottom of ladders can be made non-slip by the use of non-slip tape strips.

**Bridge safety**

The steep stairs to the bridge require highlighting and subdued lighting fitted. It would be good practice to fit a spring loaded safety door or a safety bar at the top of the stairs to prevent personnel falling down the stairs when the tug is in adverse weather.

**Bad practice**

Bad practice: The edges of the steps should be highlighted

Bad practice: These mats are a fire hazard

The steps to the engine room should not be painted black. In the event of a power failure, with only emergency lighting illuminating certain areas, it is safer to descend or ascend a ladder that is painted a light colour. It is suggested white hand rails and light grey steps would reduce the risk of a fall. The steps should also be highlighted. The area at the bottom of the ladder should be non-slip.

**Mooring areas**

Mooring areas need to be kept clear. It is not acceptable for ropes to be left flaked on the deck as they can result in a slip trip or fall. If the ropes are left flaked on the deck and used as a carpet, the ropes can sustain damage to the fibres. The ropes flaked on deck are a trip hazard.

It is safer if ropes are coiled on to a pallet in a suitable safe area.
Bad practice: Trip hazards often involve mooring lines and deck equipment not highlighted. These ropes are a trip hazard and the mooring horns and other obstructions should be highlighted.

It is of paramount importance that the total mooring / working area forward and aft and other common walk way areas on deck are made non-slip. These are high use areas that may be continually wet or damp. Trip hazards should be clearly marked. Mooring areas are danger areas and should be considered as restricted areas to non essential personnel.

**High risk areas**

A well-maintained, non-slip aft deck and/or fore deck will help to reduce the risk of accidents.

**Good practice**: The total mooring deck area should be non-slip. Areas of non-slip paint that are breaking down need to be repaired.

Good practice: The towing gear should be sheathed and protected from any possible abrasions.
When the tug is involved in towing or pushing an oil barge all ropes should be in good condition and sheaved to avoid chafing damage. Personnel should be aware of the dangers and keep well clear of the towing areas and snap back zones.

Case study:
A seaman standing on the oil barge had just made the tug line fast. The tug started to take the weight on the two lines, when one of the lines parted and snapped back towards the barge. The seaman had not followed the tug masters instructions to stand well clear. He tried to get out of the way but slipped on the wet deck. The mooring line struck the seafarer and broke both his legs. He also sustained spinal injury. No snap back zones marked on the tug. The area around the mooring station was not non-slip.

Cost: A considerable time in hospital; three operations; confined to a wheelchair.

Deep sea towing gear

Deep sea towing equipment is continually exposed to the harsh environment and maintenance can be a problem. Tugs towing barges should ensure that their Orville hook is well maintained and all personnel engaged in the retrieval of a broken tow line are aware on how to use ‘Orville’. The screening of the ‘Orville DVD’ on a regular basis is recommended.

A well-maintained Orville hook – which can weigh upwards of 150 lbs and has to be manhandled using best lifting practices. Extreme care is required to prevent any injuries, especially a back injury.

When the tug is involved in deep sea towing it is important that the towing area is ‘out of bounds’. There should be clear signage indicating these restrictions.

Good practice: A well-maintained Orville hook

The after deck is normally awash and the towing equipment will require maintenance shortly after the completion of the tow.

Typical state of the towing gear after a long deep sea tow

Maintenance in port should be carefully controlled

Slack drive chains on towing gear are dangerous and cause serious injury. Slack chains should have sufficient links removed to ensure correct tightness. The temporary use of a G-clamp to ‘stretch’ the drive
chain is dangerous. An exposed chain drive is a danger to ships staff.

Bad practice

Bad practice: Gas bottles that have been left exposed to the weather with no flashback arrestors fitted. It is dangerous to use equipment in this condition

Burning and welding equipment on deck

Burning equipment (oxygen and acetylene bottles) should always be stowed in a well-ventilated area and protected from the weather. The burning equipment should not be stowed with general cleaning equipment, ie wet mops, buckets and brushes, or any other items such as drums of oil/paint/chemicals or near any source of ignition such as portable heaters.

Flashback arrestors are required on both the oxygen and acetylene bottles, to lessen the chance of a serious explosion. The Club has issued a Technical bulletin on this matter. It is important to apply flash back arrestor protection, not only to the fuel gas, but also to the oxygen (O₂). A flashback arrestor on the oxygen regulator can prevent oxygen from continuing to flow out in the case of fire, thereby not adding ‘fuel’ to the fire (Technical bulletin 26/2008).

Case study:

During a repair period at the tugs home base, an engineer was using the oxygen and acetylene equipment to free a section of the towing gear that had seized. Flashback arrestors had not been fitted to any of the gas bottles, which had been stowed on deck during the last sea passage. The pressure gauges were also cracked and damaged. However as the job would only take a few minutes the engineer thought “it will be okay”.

The burning gear was used for a short time then turned off. The flame went back along the rubber hoses and both bottles exploded starting a small fire in the drums of oil and paint that had just been stored temporarily by the gas bottles. The engineer received severe burns, loss of sight in one eye and was hospitalised for some time. The small fire caused extensive damage to the crews accommodation.

Cost to seaman: Severe burns and disfiguration; considerable time in hospital.
**Fire onboard**

A fire onboard the tug will require prompt action and it is essential that all fire flaps are inspected and tested on a regular basis. Poorly maintained or missing fire flaps may result in loss of life and also the loss of the tug.

**Bad practice:** Missing portable fire flaps and broken securing stud. A danger to both personnel and the tug.

**Good practice:** Excellent engine room fire flaps, well greased, and rubber gaskets in a good condition.

Fire flaps should be stencilled as to what compartment they serve.

**Fire prevention**

The engine room fire detector should be tested regularly as per the manufacturer’s advice. They should not be tested by using a burning oily rag in a can.

If the heads of fire detectors become discoloured they will not operate correctly and should be replaced.

**Fire risk**

Engine room fan area should not be used as storage areas. If the area is under maintenance the paint or cleaning materials should not be left overnight in the ventilation area. Missing fire flaps should be repaired/replaced. Poor housekeeping is the cause of many fires.
Bad practice: Exposed drive shaft. There is a high risk of somebody falling into the drive shaft well. All drive shafts should be covered either by a grating or a suitable chequered plate.

Case study:
During a ship berthing operation, the tugs fuel supply line to the main engine developed a leak. Fuel sprayed onto the generator and immediately ignited. Tug staff were unable to isolate the fire due to inoperative and missing fire flaps. The fire was eventually extinguished, but one man suffered smoke inhalation and the tug was severely damaged, which resulted in it being out of service for 10 days.
Cost to seaman: Treatment for smoke inhalation.

Slips trips and falls
Poorly fitted or missing lower plates in the engine room are one of the causes of engine room accidents which results in slips trips and falls.

Bad practice: All the engine room plates should be in place and firmly secured. Plates not secured are trip hazards.

Good practice: No loose plates and fully covered drive shaft; less risk of an accident.
Good housekeeping

Good housekeeping reduces the risk of an accident or incident. Oil leaks from machinery are one of the main cause of accidents and incidents.

Poor housekeeping

Oil leaks may cause a slip trip or fall and also a fire. It is essential that all oil leaks are investigated and the leaks rectified. It is not good practice to leave drip cans full of oil around the engine room.

Bad practice: Oil leaks are an example of poor housekeeping

Good practice: There is no excuse for poor housekeeping

Poor housekeeping also includes the obstructing of the ship’s fire fighting equipment

In an emergency it would be very difficult to get to these fire extinguishers

Engine room tools

Engine room workshop grinders must have perspex protectors, tool guide supports and staff using the grinders must wear PPE, ie eye protection.
Bad practice: These grinders are unsafe to use

Case study:
An engineer was using a portable grinder without the safety guard. The grinding wheel split and a small portion of the grinding wheel flew off and hit the engineer in the eye. Safety goggles were being used, but they were shattered by the force of the piece of grinding wheel.

If the safety guard had been fitted (and not removed prior to use) the accident would have been prevented.

Cost to seaman: Severe head and eye injury; loss of sight; considerable time in hospital.

Use of chemicals onboard tugs

The use of chemicals in the marine industry is increasing. It is essential that warning labels and hazard data sheets are supplied with the chemicals and fully understood by the seafarers.

Appropriate PPE including approved rubber gloves, goggles and aprons should be available and used when handling dangerous chemicals.

Example of a chemical label

Bad practice: Portable grinder with no protective guard.

Good practice. This grinder is safe to use. It has a tool guide supports and Perspex eye protective guard

Portable grinders must be fitted with safety guards if accidents are to be prevented.

Bad practice: Portable grinder with no protective guard.

Good Practice: A portable grinder with the protective guard

Bad practice: These rubber gloves are approved for medical use and not for chemical use
Galley working

One of the most common accidents in the galley is cuts from sharp knives.

It is not safe to stow knives to a magnetic board. There is a high risk of the knives falling and causing an injury. The vibration of the tugs engines and loss of magnetic grip will shake the knives loose.

Sharp knives should be kept in a drawer or a wooden knife rack and segregated from other utensils.

Bad practice

Working on deck

Several accidents have happened during tugs making fast or manoeuvring and berthing ocean going vessels. It is normal practice for the tug to approach near the stern or bow of the ship prior to making fast. The ship normally sends down a heaving line or messenger on to the tug, prior to heaving up the tugs line or wire. The tugs line is inspected by a competent person on a regular basis to prevent accidents and incidents.

In some ports, it is a requirement that the ships mooring line or dedicated tow line is used. Ships should not use worn or damaged mooring ropes.

Ships heaving lines should not contain added weights, such as sand or steel bolts. The end of the heaving line should be a monkey’s fist.

The ship is carefully lowering down a heaving line

Safety checklist for tugs

- Good communication between tug and ship and all parties concerned
- Tug seamen wearing appropriate safety gear
- Tugs deck is non-slip and clear of trip hazards
- Good lighting on the tug deck (if appropriate)
- Written records of times making fast and letting go
- Tug seaman is clear of any pushing point.

When the tug is used for berthing assist – it is important that the tug is pushing at an approved and strengthened tug push point/position.

Gently pushing a ship alongside
Barge operations

Barges are an essential part of today’s marine industry. They are used for transporting both raw materials and consumer commodities inland via canals and rivers or on ocean passages to islands with restricted depths of water. The use of barges on waterways helps to reduce congestion on our roads and freeways and is helpful to protecting our environment. Barges do not pollute the atmosphere with harmful hydrocarbon gases.

Barge operations require highly skilled professional mariners who can work safely and have a full understanding of the risks involved. Barge work can be strenuous and safe working practices must be followed if accidents and incidents are to be reduced.

Case study:
A seaman working on a cargo barge (log towing) strained his back and damaged multiple discs in his spine.
Cost to seaman: Considerable pain; off work for an extended period; hospital treatment.

Oil tank barges

These barges are used for bunkering foreign going ships with both heavy oil (low sulphur) and diesel / gas oil. When not alongside the oil terminal or a ship, it is the normal practice of the trade for the barges to be either tied up alongside each other in the river estuary or double berthed alongside a suitable jetty. When in the river estuary two or three seafarers will normally be living on one of the barges with the responsibility of professionally monitoring all the barges.
Mooring problems

When moored in tandem it is prudent practice to ensure that there is no mooring rope chafe between the barges. The risk of mooring rope chafe increases when one barge is fully loaded and the adjoining barge is in a light ship condition. The easiest way to prevent rope chafe is by fitting a canvas sleeve over the rope chafe area, or purchasing ropes with protective sleeves.

Bad practice: Ropes without protection (risk of chafe)

Securing barges

Mooring arrangements should be completed using a round turn followed by figure of eights. It is advisable to use the full depth of the mooring bitts.

Good practice: Rope with a protective sleeve

When an empty barge is secured to a fully loaded barge, in addition to the mooring chafe problem, access between the barges can be difficult. Safe boarding will require a small portable brow.

Example of a loaded barge secured to an empty barge

Mooring arrangements

It is common practice for a group of barges to be moored to a single point mooring. It is important that the condition of the single mooring rope is in a good condition, of sufficient strength and regularly checked.
by the barge staff. If adverse weather is expected, then two lines should be used.

The mooring of barges alongside each other or to the quay should be completed using figure of eight turns with one rope or wire on each set of bitts. The mixing of ropes and wires on the same set of mooring bitts is bad practice and may result in an accident. Mooring areas should be non-slip and kept clear of excess ropes and wires. This may be accomplished by coiling the surplus ropes on pallets away from the bitts. Ropes left lying on the decks may result in a trip hazard. There is a risk of the flaked ropes being used as a carpet. This will result in damage to the mooring ropes.

Poor mooring practices and poor housekeeping

Try not to mix ropes and wires or use one set of bitts for two mooring ropes. Keep working areas clear. Ropes should be coiled on to a pallet or clear of the working area. Good housekeeping is essential in mooring areas.

Good mooring practice

Ropes that are not in use and exposed to the weather will deteriorate, resulting in expensive replacements. In this situation ropes should be protected by a canvas cover to shield the ropes from the sun’s UV rays.

Case study:
A seaman working in the mooring area was walking backwards on the barge while hauling in a mooring line. The seaman tripped over a wire that had been left lying on the deck.
Cost to seaman: Nerve injuries to back and shoulder.

Good mooring practice and clear decks reduces accidents

Boarding a group of barges from a tug

Boarding a group of barges requires the greatest of care, especially in a choppy sea. It is important that all personnel boarding the barges from the tug are wearing PPE or lifejackets. It would assist safe boarding if a small set of non-slip steps were available, thereby reducing the need to jump from the tug onto the barge. The tugs bulwark should be non-slip.
Barge staff assisting must wear lifejackets or buoyancy aids as they may be required to stand near the edge of the barge and risk falling overboard.

**Boarding a loaded barge (low freeboard) from a tug – no boarding steps available**

If the barges are empty, the freeboard will be considerably higher and other boarding arrangements will have to be considered. There are two alternatives, both of which require utmost care.

**Boarding an empty barge with a high freeboard – using the tug’s ladder**

Most barges have support rails fitted on the deck to assist boarding procedures. The barges emergency towing wire will be situated at the top of the pigeon holes and good seamanlike practices will be required if the towing wire is not to cause an obstruction or a trip hazard.

It is suggested good practice if the towing wire is sheathed with a strip of yellow plastic, or highlighted in this area, warning personnel of the danger.

**Pigeon holes and the emergency towing wire**

Modern tugs anticipating this problem have a ladder, which is normally fixed to the tugs deck, so that it will not topple or slip. The boarding ladder has two rope supports fitted to the top of the ladder. Wooden skids are fitted on the underside of the ladder, to prevent the ladder sliding on the barges steel hull.

Personnel on the barge must be in attendance wearing full PPE or lifejackets.

The other method of boarding a barge is via the pigeon holes marked on the side of the barge. These pigeon holes are footsteps cut into the barges hull.
Embarking a barge using the pigeon holes is normally fairly straightforward if safe working practices are observed. The problem is when somebody is disembarking. The first foot hold (pigeon hole) is always arranged for the left foot and it is good practice for a suitable sign reminding staff that it is always left foot first painted onto the non-slip deck of the barge.

**Left foot sign and emergency towing wire obstruction**

It is suggested good practice if additional clear lettering LEFT FOOT FIRST is stencilled by the foot sign.

A number of older barges do not have hand rails to assist boarding via the pigeon holes. It is suggested good practice if the barge staff pre-fabricate boarding assist rails.

**Bad practice: The left foot first sign is missing**

Damaged handrails. Missing ‘left foot’ sign could result in an accident

Good handrails but a poor left foot first sign

**Case study:**
A seaman was descending from an empty barge using the pigeon holes and lost his footing. He fell backwards onto the tug and sustained severe multiple injuries.

Cost to seaman: Pain and suffering; multiple operations; unable to work.

**Movement between barges**

It is good practice if access between barges is via a portable brow, complete with sturdy handrails. The brow should be landed clear of any obstructions and any trip hazards should be painted yellow. It is.

Hand rails are essential for safe boarding and if damaged, they should be repaired as soon as possible. Damaged hand rails and no left foot first sign or protection over the emergency towing wire are a hazard.

Shore brow between barges. The pipes are a trip hazard. They should be highlighted
considered good practice if a safety net is fitted beneath the shore brow to reduce the risk of personnel falling between the barges.

**Shore brow between barges, but no steps or safety net. Personnel have to jump onto the deck. Risk of a leg or ankle injury**

**Trip hazards**

Slips trips and falls cause considerable pain to the injured party and loss of revenue to the owner. The main deck arrangement of an oil or gas barge has numerous trip hazards. To reduce the risk of an accident, it is suggested good practice if the trip hazards are clearly marked and painted yellow.

**Trip hazards not clearly defined**

All ladders should be kept clear of any obstructions or trip hazards. Ropes should not impede the safe walkway. Steps should be highlighted and deck areas at the top and bottom of the steps made non-slip. Steps painted black are a hazard at night, especially if the deck lighting is poor. The top and bottom of the steps should be painted yellow and the handrails painted a lighter colour.

**Trip hazards**

Below and next column: Good trip hazard marking

At night, in poor lighting, this is a hazard
Trip hazards are not confined to deck areas. Trip hazards can also be found in the generator and pump rooms.

Tanker barge practice

It is good tanker practice if valves on an oil or gas barge are lashed when in the closed position and unlashed when the valve is open.

Valve closed and lashed

It is good practice if tank valves are lashed in the closed position. However it is also good practice if all the valves are clearly marked, i.e. have a stencil marking on the deck indicating the tank they refer to. This will help reduce the risk of an incorrect valve being operated.

Good valve lashing

Poor valve lashing

Tank valve lashings should be checked on a regular basis.

Barge fenders

A number of barges have portable fenders that can be manually lowered. It is good practice if these fenders are regularly inspected and maintained.

Fender in stowed position
Fender lowered

In addition to the portable fenders, some oil barges have rubber tires around the sheer strake. The rubber tyres are secured to the deck via a chain and steel lugs. It is good practice if the steel deck lugs are maintained and clearly highlighted.

Good practice – good fender wire

A well-maintained fender

Poor maintenance

The portable fenders are secured to a winch drum by means of bulldog gripes or wire clamps. The wire and the clamps should be regularly inspected, maintained and replaced as necessary.

Bad practice – poor fender wire

Leaking flanges

A small oil leak from a flange will cause problems and may result in a pollution fine. Diapers or drizit pads are a temporary solution and the small leak, which in time will get worse, should be investigated and repaired as soon as possible. It is common practice for drip cans to be placed under manifold connections. However once the bunker hoses have been disconnected any ‘oil drips’ in the cans should be removed and disposed of in an approved manner.
**Bad practice:** A leaking flange

**Bad practice:** Drip can filling with rain

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**Oil samples**

Oil samples are an important part of bunkering procedures. These samples may be required in a court of law as evidence of ‘correct produce’ being supplied. The samples should be stowed in a segregated safe area clear of any ignition sources, paint or chemical hazards. It is not good practice to have the oil samples thrown onto a shelf or into a box as shown below. The seals may be damaged and the contents may leak out causing a pollution and slip trip and fall hazard.

**Bad practice:** Unsuitable stowage area for oil samples. Also a higher risk of a fire when stowed with paint and chemicals

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**Sounding pipes**

Sounding pipes on deck have a manual shut off handle and a snap on cap. It is good practice, when not in use, to keep the manual valve closed and the snap on cap in situ.

**Good practice**

Samples should be stowed on a shelf away from any heat source and sunlight, or any combustible material or liquids. Each sample stowed upright and clearly and correctly sealed.
Fire extinguishers

Fire fighting equipment onboard oil tank barges is normally maintained by an approved shore contractor. It is important that once serviced, the equipment is returned to its correct stowage position and any problems reported back to the barge representative.

**Good practice**

The extinguishers, shown in the above photos, had recently been serviced by the approved shore contractor, but only one extinguisher had been correctly replaced in its bracket. The other extinguishers would not fit into the wall brackets, because the extinguishers had not been returned to their correct stowage position. It would assist correct monitoring and correct stowage of FFE if both the extinguisher and wall stowage position were clearly labelled with a simple numbering system.

The return of fire fighting equipment should be supervised by the barge staff. Lives depend on it.

Fire extinguishers stowed on deck are exposed to the weather and the operating mechanism will rapidly deteriorate. It helps to protect the extinguisher if an easily removable red plastic or transparent cover were placed over the operating part of the extinguisher.

**Extinguishers on deck**

To protect portable fire fighting equipment from exposure to the weather, it is good practice, after use, to return the equipment to a safe protected stowage area.

**Deck cranes**

Most oil tank barges are equipped with a crane with two hooks. Both hooks are used to support the oil hoses during bunkering procedures. When not in use both hooks should be secured to the deck via a rope lashing. The hooks should never be left unsecured.
The care and maintenance of the barge crane and all associated equipment is of paramount importance. Any damage should be reported and repaired as soon as possible. Any damage to the crane head block require immediate repairs completed by a competent authority who will retest the block and issue a new test certificate.

Below: This head block damage had been caused by heaving the crane hook hard up to the cheeks of the head block.

To prevent head block damage a power cut off switch should be fitted or have a highly visible rubber or wooden bar fitted to the crane wire just above the crane counter weight. This will give early indication to the crane driver that he has approached the hook limit.

It is a statutory requirement that all lifting gear is inspected on a regular basis.

Case study:
A seaman had just completed a barge bunkering operation and was walking backwards – his back made contact with the swinging crane counterweight/hook, which had not been secured.
Cost to seaman: Pain caused by minor back injury, requiring hospital treatment and a period off work.

Warning signage
Highly visible and clear signage is important.

On a tank barge the use of mobile telephones and conventional cameras should be prohibited and all portable walkie talkies (two-way radios) should be intrinsically safe.

Good practice: Clear signage, but some items missing

Emergency stop signs
Emergency stop signs should be clearly indicated so that in the event of an emergency there is no confusion as to where the nearest emergency stop is situated.
Excellent clear marking

The midship’s emergency shut down on the tank barge, shown below, is poorly marked. It requires a large highly-visible 12 inch deck line (international orange or bright red) painted on the deck from port to starboard or large arrows and clear signage ‘Emergency Shutdown’ painted on the deck.

In an emergency it is important that the nearest emergency shut down is quickly located. The position shown below needs clear deck markings and the post painted a conspicuous colour.

**Bad practice:** Small signage makes it difficult to quickly locate the emergency stop. Large arrows on the deck will help.

**Bad practice:** There should be clear deck markings and with the post painted a conspicuous colour.

Poor indication and partly obstructed by a ladder

Small signage will not assist ships staff to quickly locate the emergency stop. Large arrows on the deck will help.

**Bad practice:** Shut down poorly marked

**Bad practice:** Small signage makes it difficult to quickly locate the emergency stop