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SETTING THE STANDARD FOR SERVICE AND SECURITY

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^ Contractor at work

IN FOCUS
THE MANAGEMENT AND CONTROL OF CONTRACTORS

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The club has seen a significant number of claims during recent years arising from contractors being injured, or worse, on-board ship. The employment and supervision of contractors working on-board ships is a subject rarely given much attention within the industry or addressed from a safety perspective. In any client-contractor agreement, both parties have obligations and a duty of care under health and safety law. In addition, guidance on how to control contractors used on-board should be available to the master through the safety management system (SMS).

Contractors hired to carry out cleaning, repairs or alterations on ships or offshore units have in some cases been the cause of serious injuries and sometimes fatalities to ships' personnel or have suffered serious injuries themselves through lack of proper supervision, and inadequate risk assessment procedures. Such incidents have also caused damage to equipment and on occasion have led to serious fires. The purpose of this article is to highlight these facts and identify key points to consider when using contractors.

Owners and operators who employ contractors and subcontractors have a responsibility to protect them from any dangers or risks that may be present on-board ship and to prevent them being a hazard to the ship and its crew. This primarily means that the SMS should address the procedures necessary relating to contractors. The SMS should provide guidelines for the master to ensure that contractors and subcontractors are adequately supervised and fully involved in the risk assessment process. Equally, contractors and subcontractors must co-operate with the master, ship's staff and the ship's safety procedures to ensure that they do not jeopardise their own safety or put others at risk.

^ Contractor at work

Offshore contractors

The purpose of this article is not to address the use of offshore contractors in the oil and gas industry. We do consider the lessons learnt from the failures in that sector to engage, monitor and manage contractors correctly and how these lessons should not be wasted in the merchant marine industry.

The management of contractors on offshore platforms is an extensive and integrated part of the health and safety risk assessment of a platform. Many of the well-known offshore disasters including Piper Alpha have been attributed to poor management of contractors. Some of these disasters have led to multiple fatalities, considerable pollution and significant cost, and have had an incalculable impact on the operating company's reputation.

HOW DO WE DEFINE A CONTRACTOR AND A SUBCONTRACTOR?

A contractor is a company or person who has been tasked under formal contract to conduct a specific job for the employing company or client. The job should be clearly defined within the terms of the contract, including stipulations regarding the supply of labour, materials, cost and the adherence to safety practices. Contractors may need to employ other companies to help with aspects of the job they are unable to do themselves; these companies or persons are defined as subcontractors – and the unmanaged use of subcontractors can present a serious risk on-board ships.

WHO AND WHAT ARE AT RISK FROM CONTRACTORS?

The majority of owners at some time employ contractors to conduct cleaning duties, repairs, maintenance, and testing of equipment and machinery on-board their ships. Contractors tend to work in constantly changing environments, where each task and situation is different, and must adapt to their surroundings. This can lead to contractors being exposed to a variety of risks and potential hazards themselves, and the possibility of putting the safety of other people, for example the ship's crew, in jeopardy.

Owners have a responsibility when employing contractors and subcontractors to protect them from potential risks or dangers as a result of their working environment. Contractors have their own responsibility to ensure they co-operate with the ship's master and crew so that they don't jeopardise their own safety or put others at risk. Owners will always be at risk from the consequences of any negligence or violations resulting from the actions of contractors on-board their ship. This is why it is important to have clearly defined procedures under the SMS for contractors.

SMS

The SMS should define procedures for the use of contractors on board and these should include:

- joining and familiarisation procedures, including emergency situations
- explanation of on-board risk assessment and permit to work system
- tool box talks
- lock-outs and safety tags
- contractor's duties, working conditions, hours of work and identity of their supervisor on-board
- health and safety on-board
- how to control hazardous and 'no-go' areas
- what equipment can or cannot be used
- whom the contractor reports to
- confirmation that the work is left in a safe and operational condition after completion
- procedures for testing after completion, if appropriate

^ Contractor conducting hotwork repairs

Contracting

It is usually the owner's technical or operational staff which draws up the contract. It is at this stage that risks may be introduced. This may be because the contract and scope of work are not specifically or properly defined, and do not address the standards of health and safety to which the contractor must adhere.

Before hiring a contractor, it is recommended that operational staff:

- review the contractor's health and safety and risk assessment procedures
- establish the training and competency level of its employees, for example:
  - are the contractor's personnel qualified and certificated?
  - have the contractor's personnel been trained in health and safety?
  - have the personnel carried out this kind of work before on-board a ship?
- check references from previous clients
- make the contractor aware of your risk assessment procedures and permit to work systems
- enquire whether the contractor is using its own personnel or is using subcontractors. If using subcontractors, has the contractor confirmed:
  - its formal procedure for selecting and employing subcontractors?
  - that subcontractors' personnel are qualified and trained in health and safety?

There is an increased risk when contractors use subcontracted personnel. These may be of an unknown quality and may lack the required safety training. They may not know the HQSE (health, quality, safety and environmental) culture of the main contractor.

When there is a large number of personnel from contractors, such as cleaners, they will require close supervision as they may be 'casual labour' and may not have formal safety training or instruction in the use of personal protective equipment (PPE).

Any contract between an owner and a contractor should specify the contractor's obligations with regard to health and safety and working practices. These may include a:

- description and scope of work, materials and personnel to be used
- confirmation that all terms also apply to subcontracted employees
- clear statement that the owner's SMS will be the minimum standard applied
- clear statement that the ship's SMS must be adhered to at all times
- clear statement that if there is a serious failure to adhere to the owner's SMS, this will lead to the removal from the ship of any person involved
- contractors to use only certified, approved and safe equipment, including electrical, pneumatic and hydraulic equipment

ARRIVAL OF CONTRACTORS AND SUBCONTRACTORS ON-BOARD

Depending upon the circumstances, the contractor's scope of work, their experience, and the location and duration of the work on-board, the following guidelines should be considered before work commences, conduct a familiarisation session and tour with all contractors' personnel, paying attention to these key points:

- ship's emergency alarms, their meaning and the required response
- the location and purpose of the muster station
- abandon ship procedures (if riding crew)
- risk assessment system on-board for work
- permit to work system
- location of life-saving appliances and fire fighting equipment
- on-board procedures if applicable for:
  - working at height
  - working outboard
  - hotwork
  - entering enclosed spaces
  - isolation of machinery
  - use of electrical equipment
  - isolation of electrical plant
- security policy
- environmental policy, particularly:
  - oil pollution prevention measures
  - proper handling and use of chemicals
  - disposal of oil, chemicals, used materials and garbage
- drug and alcohol policy
- ascertaining pre-existing medical conditions that may be pertinent
- housekeeping policies
- use of PPE
- 'no-go' and 'off-limits' areas
- guidance as to what equipment should not be touched without supervision
- who is the contractor's on-board supervisor and to whom he should report
- lifting gear guidelines

BEFORE BEGINNING WORK ON-BOARD

- responsible officer to be selected as the contractor's on-board supervisor, acting as manager and main point of contact with the contractor
- organise:
  - a risk assessment for the job required: include all hazards associated with the job and clearly describe to the contractors the risks involved, including control barriers to minimise risks, and isolation of equipment
  - a permit to work for the job – contractors should fully understand its use and purpose
- carry out a 'tool box' meeting including identification of:
  - the job requirements
  - desired outcomes
  - possible problems
  - equipment used in the job
  - contractor's equipment being properly certified and checked before use
- the job should be co-ordinated and controlled, with all parties aware of their responsibilities
- ensure contractors have sufficient PPE for the job and identify any additional equipment needed by means of the risk assessment
- establish a suitable timeframe for job completion, taking into account:
  - the dangers and risks associated with the job and the control barriers in place, which may increase the job time
  - working hours and breaks
  - critical points of time, such as departure or arrival
- maintain a good working relationship and communication with contractors
- maintain a record of the work activity, including times of completion of specific tasks

SUPERVISION OF CONTRACTORS

^ Supervision of contractors is essential to ensure safe working practices

It is crucial for the safety of all personnel that contractors are supervised while on-board. This does not mean that a person has to be standing over the contractor continuously. However, their work and working practices must be checked and these checks should include:

- ensuring contractors are supervised by a member of the ship's crew who is aware of his responsibilities
- ensuring contractors are conducting their work as per the specific job plan and not deviating without express permission from the on-board supervisor

- monitoring health and safety performance throughout and ensuring it is consistent with the ship's procedures; for example, hotwork and tank entry procedures, safe lighting and use of safe electrical equipment
- ensuring contractors are using personal protective clothing and equipment
- ensuring appropriate warning signs are posted; for example, no smoking, no naked lights, hazardous area
- ensuring contractors are taking appropriate rest breaks
- ensuring contractors do not use ship's equipment, including lifting equipment, without authorisation
- informing contractors of any other work being carried out on-board that may pose additional risks to their safety or have an impact on their tasks
- ensuring that in the event of a near-miss or an accident involving a contractor, evidence including photographs and documents, is taken and retained
- ensuring that if the work is carried out over one day or more, a meeting is held before recommencing work to review progress from the previous day and initiate a new risk assessment and permit to work, taking into account any new risks
- ensuring that contractors are included in the daily work meetings, particularly in a busy repair period or a drydocking
- **as using contractors to carry out hotwork appears to be a particular source of incidents, including explosions and major ship fires, hotwork should always be supervised**

COMPLETION OF CONTRACTORS' WORK

- upon completion, review the job and its quality
  - does it meet the desired outcome?
  - is testing, with the contractors' or ship's personnel in attendance, necessary to check that the task is completed and satisfactory?
  - was the job conducted in a safe and competent manner by the contractors?
  - are the contractors and subcontractors satisfied with the work done and the on-board procedures?
- check that the work area has been left in a safe, clean and operational condition
- consider establishing an approved list of contractors for future reference, based on the assessment of the contracting company, quality of work and safety performance

It can happen that contractors announce that the work has been completed, and no ship's staff is available to check that the equipment or area has been left in an operational or safe condition. Club condition surveys often find defects that have arisen because contractors have not left the equipment in a workable condition; for example, the servicing of CO_2 fixed fire-fighting systems. Club surveyors have found CO_2 systems that would fail to work after technicians have attended to carry out routine tests. Contractors may be prone to short-cuts and may have little appreciation of the consequences these can have. A fire resulted, for example, when lagging on hot generator exhausts was not replaced properly, but was hidden from view by shield plating. Valves were refitted correctly but were left in the open position when they should be closed. Sections of piping that should have been replaced were not, because the contractor forgot, or could not get the material.

Always check the work when completed and test if necessary; never assume that the contractor has left the job in a safe and operational condition.

The role of contractors on-board is normal for many ships, however, the risks arising from their use can be significant. These rusks must be effectively managed by the ships staff and to do that the SMS must include guidance on how contractors on-board should be managed.

^ CO_2 control station

KEY POINTS

- ensure the contract requires the contractors to comply with the ship's SMS as a minimum
- ensure that the contractors are familiar with the on-board environment
- ensure that the contractors are supervised
- ensure that the work is checked after completion

CASE STUDY 1 – TANK EXPLOSION

A crude oil tanker, while at anchor, needed maintenance on the cargo tanks, including repairs and testing of fittings, notably hydraulic systems and the tank gauging system. The work was contracted out to a local company that had previous experience in marine repairs and was well known to the owner. The contractor employed subcontractors to help with the workload, but the owner and master were unaware of this.

The cargo tanks went through a quick tank-cleaning programme followed by purging with inert gas to a level safe enough to dilute with air (gas freeing). A chemist from the local authority arrived on-board and inspected each cargo tank. After finding the tanks were safe for entry, the chemist certified all cargo tanks to be gas free.

The contractors arrived on the ship the next day and were given a safety briefing. A work schedule was established with the ship's crew in accordance with the work plan, including times for work and rest periods.

The contractors' work began at 0900 and was scheduled to finish at 2200. At 1700, all contractors took a meal break of one hour, except for two subcontractors who remained inside one of the forward cargo tanks. The ship's crew who were supervising the work also took their meal break at that time. It went un-noticed that the two subcontractors were missing from the meal break. At 1730, smoke was seen emanating from one of the forward cargo tanks by the chief officer on the bridge. The alarm was raised and the two subcontractors were found dead outside the tank near the manhole access hatch. It was later determined that hydrocarbons were still present in the forward cargo tank and their mixing with oxygen had created a flammable atmosphere. It is likely that a spark from a match or lighter caused the explosion, as cigarette ends were found in the tank during the investigation. The presence of hydrocarbons in the cargo tank was later identified as resulting from a leak from a cargo line that had not been properly flushed through during tank cleaning.

LESSONS LEARNT

- always ensure that the contracting company's policy for selecting subcontractors is fully known to the owner, including details of the subcontractors' experience, competency, training, and health and safety policies
- never leave any contractors unmanaged
- all contractors should leave the work space during long breaks
- account for all contractors on-board at all times
- always ensure contractors follow the ship's SMS, particularly safety precautions with regard to naked lights and smoking on-board
- ensure that the atmosphere in enclosed spaces is tested at regular intervals as per the on-board risk assessment and permit to work procedure

CASE STUDY 2 – CONTRACTOR DEATH

A handy sized bulk carrier was undergoing repairs to the stern seal in a European port. To get access to the stern seal, the ship was trimmed down by the head. Subcontractors were contracted to build scaffolding around the stern and propeller blades in order to gain access to the stern tube seal.

At the same time, a second technician was contracted to carry out repairs and adjustments to the main engine controls in the engine room. To carry out this work, the technician required the turning gear to be rotated manually. As this was done, the propeller shaft turned, rotating the propellers, which knocked down the scaffolding. One of the contractors was killed by falling from the scaffolding.

The master and chief engineer were accused of negligence and ordered to attend a criminal court. They were given a prison sentence, although this was overturned on appeal.

The causes of the accident included these failures:

- there was no proper risk assessment of the tasks or any control measures implemented
- there was no permit to work system in operation
- there was no supervision of either set of contractors
- there was no planned organisation to minimise the risks as the two tasks were carried out
- there were no warnings given by the technician when testing the main engine equipment
- there was no lock-out or isolation of any systems that could affect the safety of the contractors – in this case, the turning gear
- personnel around the stern were not advised of the work on the main engine, and those repairing the engine controls were unaware of the scaffolding operation

LESSONS LEARNT

- always ensure contractors are properly supervised
- always ensure contractors are aware of other work planned or in progress
- always prepare required permits to work

CASE STUDY 3 – FALL FROM HEIGHT

A subcontractor was tasked with the maintenance and repair of bulk offloading gantry equipment on an offshore bulk cargo transfer ship. The man was working alone in tropical heat and was required to climb high fixed ladders and work at height. The work would take him several weeks to complete.

One afternoon, the man was either climbing or had started to work at height when he was heard to fall to the steel deck below. No-one saw him fall. He was soon pronounced dead. He was not wearing PPE or a fall arrester or preventer.

The causes of the accident included the failures that:

- the contract did not specify that he would have to comply with the ship's SMS as a minimum
- there was no supervision of the contractor
- the contractor was not advised of the permit to work systems operating on-board
- there was no requirement for the contractor to wear PPE

LESSONS LEARNT

- always ensure contractors are supervised
- always ensure contractors know the ship's SMS requirements
- always prepare permits to work

CASE STUDY 4 – OFFSHORE CASUALTY

An offshore construction ship was on a berth preparing to mobilise for the next contract for which a series of outriggers were to be deployed. These needed to be freed from their usual stowage positions.

The outriggers were normally lowered into position using a hydraulic power pack, which was part of the ship's equipment. The outriggers, when not in use, were permanently fixed in an upright position. They had to be freed by cutting the fixing struts using oxy-acetylene equipment.

Before the outriggers could be lowered, the hydraulic system had to be activated and pressurised ahead of removal of the holding struts. The chief engineer was tasked with powering up the hydraulic system.

A subcontractor was employed to cut the outrigger holding struts. The contractor was wearing full PPE and standing on the outrigger supports as the holding struts were being cut. As the weight came off the struts, the whole outrigger assembly fell into the water with the contractor and he drowned. The cause was put down to the fact that the hydraulic system had not been activated and therefore the outrigger was free to fall. There were no secondary safety devices for the outriggers, such as safety pins.

The causes of the accident included the failures that:

- the agreement with the contracting company did not specify that personnel should comply with the ship's SMS as a minimum
- there was no permit to work or risk assessment carried out
- there was no supervision of the contractor
- the contractor was not familiar with the potential hazards

LESSONS LEARNT

- always ensure contractors are supervised
- always ensure contractors know the ship's SMS requirements
- always prepare permits to work