

KISH P & I LOSS PREVENTION CIRCULAR KPI-LP-71-2013
(Prevention of Losses due to Accidents involving Lifting Appliances)

► **Introduction:**

Various lifting appliances onboard vessels, such as cargo and other service cranes like bunkering & provision handling devices are important part of the operational equipment for cargo handling and the supply of goods, spare parts and food & faulty performance of these gears can easily lead to personal injuries, off-hire and loss of income for the vessel.

The existing international legislation covering the operation and safety of vessel's lifting gear does not provide sufficient details to ensure consistent enforcement by the various flag states. This is in contrast with other areas of the shipping industry where conventions such as SOLAS or MARPOL compulsorily apply a consistent practice where adopted.

In fact the lifting gear certificates or matters related to the so called "Chain-Register" are not obligatory requirements & are left to the administrations' decision & the ship-owners' needs. These can be incorporated in the various companies' safety management systems (SMS) in order to have a framework for the inspection and maintenance of lifting gear onboard their vessels.

► **Contents of the Chain Register (Register of the Lifting Appliances):**

It contains certificate of test annealing and all report of inspection and examination before the gears are put in use. In some administrations it used to be a blue colour booklet called form-99. It is divided into 4 parts:

Part 1: It is for the entries of five yearly (older days; this used to be four yearly) examination and annual examination of derricks (Cranes) and permanent attachment.

Part 2: It is for the entries of annual inspection of winches and gears, the derricks (Cranes) and their attachments.

Part 3: It is for the entries of examination of gears exempted from annealing.

Part 4: Record of annealing.

(The annealing part may not be used nowadays very often; the book serves as a record of tests & examinations on the lifting devices & should include the certificates as well)

► **Casualties & lessons to be learnt:**

In a reported incident; an entire crane cab, including the jib, separated from its pedestal and fell down into the cargo hold during operation. One person was seriously injured and disabled as a result of the accident. Investigations revealed excessive wear on and improper maintenance (greasing) of the slewing bearing. The manufacturer's revised maintenance instructions were not readily available onboard and the maintenance was not carried out as recommended.

An analysis of the quality of the grease in the slewing bearing or a proper wear-down measurement would have detected abnormal wear and could have prevented the accident.

Another accident with fatal consequences was caused by the stevedores manually overriding the safety monitoring system. During the lifting operation, the auto stop monitor of the boom/jib in lower position was disabled in an attempt to increase the reach of the boom for a specific lifting operation. The increased load on the equipment caused by this position of the boom caused a span rope to break and the derrick boom fell down onto the jetty and fatally injured personnel standing ashore.

**A crane lifted from slewing trunk
Damaged runner wires**



► **Some of the causes for lifting device failure in brief:**

- Heavy weather or inadequate lashing in situations such as typhoons, hurricanes, resulting in crane collapse, detachment or severe damage;

- Crane failure as in electrical fires in diesel generator or electrical room crane drive faults leading to free fall of load;
- Mechanical/electrical faults as in brake/pump/motor failures, damages wires/jibs, etc resulting in uncontrolled fall of load;
- Structural damage as in fatigue failure, poor workmanship or design;
- Inadequate maintenance;
- Mishandling or lack of familiarization for operating procedures &
- Overloading.

► Regulations:

The most commonly adopted legislation covering lifting gear is ILO convention no.152; Occupational Safety and Health in Dock Work of the International Labour Organisation.

Certification according to the ILO 152 is adopted and required by many national authorities, but it does not contain a detailed description of how the convention shall be enforced. The convention only requires a periodical thorough examination of the lifting gear with the service to be carried out by a competent person. A general definition of competent person is provided, but many flag state authorities leave it to the vessel's technical managers to identify and appoint such personnel.

Many companies use external inspection companies, but it is not unusual for chief engineers to be given this responsibility, even where no specific training is available. Considering the variety of design, make, age and functionality of the lifting gear, it requires in-depth training to achieve the competence required to perform this duty. Based on the current status of the international legislation it is not sufficient to rely solely on the individual flag states' enforcement of the regulations to ensure safe operation of lifting gear.

The best advice is to approach the classification societies for a proper certification during which a reasonable amount of requirements & recommendation will be fulfilled prior any test & document issuance.

► Recommendations:

1-Maintenance agreements:

Consider establishing a maintenance agreement with the manufacturers to execute an annual thorough examination and 5-yearly re-certification. The involvement of the manufacturers will ensure that service instructions and operational experiences are transferred to the crew and reflected in the procedures onboard.

2-Additional class notation:

Many classification societies are offering an additional notation covering cranes and lifting gear. Such a notation will, in addition to the above maintenance agreement, serve as a third party control and provide a survey regime

in accordance with a recognised set of industry rules and requirements.

3-Training and documentation:

The maintenance agreement with the manufacturers should include a training package and onboard training for execution and documentation of the regular maintenance to be carried out by the crew. A key issue is for the crew to gain knowledge and competence of the lifting equipment onboard. Knowing the limitations of the equipment and being familiar with the necessary safety checks of the lifting gear to be conducted prior to use will reduce the risk of failure. Since the operation of cargo handling cranes are very often left to stevedores it is vital that the crew is capable of ensuring that safety systems are functioning and that the operation instructions as prescribed by the manufacturers are available / posted prior to the stevedores operating the equipment.

4-Supervision on day to day practice:

It is very important to have regular checks on the lifting devices. That includes the smooth operation & running of the moving parts & the general condition of the accessories. It is also essential that the ultimate activity- that is the lifting- to be checked as frequently & as randomly as possible. The lifting device age should be put into consideration along with the number of operations/movements per a certain period; day/shift, etc. It is quite possible that the stevedores or even the ship's crew overload the equipment without understanding or realizing how that happened. There are occasions that the weight of the lifting chains/wires/accessories is not accounted for. This can be a large figure if the loads are heavy and can amount to about 10% of the load's gross weight. There is a possibility of making mistakes between gross & net weights as well.

On the other hand when the crane or lifting equipment is quite old; although it has been certified to lift such SWL; it is still recommendable not to go up to the end limit or if that is not avoidable; at least not as frequent as with lower loads & weights.

The maintenance is done very inefficiently & incorrectly at times. Using improper grease/oil or other lubricants may damage the running parts or have an adverse effect by getting accumulated or clogged. Too oily equipment can pose hazards with slips & falls for the personnel. This can be a major problem with many types of brakes as well.

The daily or before shift rounds can prevent many accidents & during the operation; abnormal noise, jerky movements, too fast or too slow motors, by-passed limit switches plus too high/too low or out of limit luffing/slewing actions & chafing the runner wires here & there are very common signs for a failure & should be tackled as soon as possible.

The engine staff as not very frequent workers with lifting devices; should be assisted & supervised actively during risky operations & any possible maintenance or overhauling of the lifting devices in their working area.