**Prevention of accidents in High Risk Machinery including lifting machines**

The High Risk Machinery (Pressure Vessel & Lifting Machines) is covered under the Occupational Safety and Health Legislation (Factories Ordinance) in Sri Lanka.

The responsibilities of the safe operation & maintenance of the same is relying on the occupier or the owner of the same.

Industrial Safety Division of the Department of Labour has appointed Authorized Person to test (examine) and issue certificates for the pressure vessels under the Factories Ordinance.

The recent Lifting Machines accidents in Sri Lanka could have been prevented by periodic maintenance, testing and examination of the same.

**Legislation**

**High Risk Machineries** are covered by section 27 to 29 and 34 to 38, under the Factories Ordinance in Part III, SAFETY (GENERAL PROVISIONS) in Sri Lankan legislation.

There are eight (08) categories of **high risk machineries** under the Factories Ordinance, shall be thoroughly examined and certified and test certificate entered in or attached to the **General Register** available in the factory.

**High Risk Machinery:**

Steam boilers - Section 34  
Steam receivers and steam containers – Section 35  
Air receivers - Section 36  
Gas receivers - Section 36A  
Gasholders – Section 38  
Hoists and lifts - Section 27  
Chains, ropes and lifting tackle - Section 28  
Cranes and other lifting machines - Section 29

**Pressure Vessels:**  
**(Fired & Non fired – Authorized Persons were appointed to test & certify)**

Steam boilers - Section 34 (Periodic test - **12 months**)  
Steam receivers and steam containers – Section 35 (Periodic test - **24 months**)
Air receivers - Section 36 (Periodic test - 24 months, Solid drawn - 48 months)
Gas receivers - Section 36A (Periodic test - 12 months)
Gasholders – Section 38 (Periodic test - 24 months)

Lifting Machines:
(Competent persons can test & certify)

Hoists and lifts - Section 27 (Periodic test - 12 months)
Chains, ropes and lifting tackle - Section 28 (Periodic test - 6 months)
Cranes and other lifting machines - Section 29 (Periodic test - 14 months)

Hoists and lifts

Section 27. (1) Every hoist or lift shall be of good mechanical construction, sound material and adequate strength, and be properly maintained.

(2) Every hoist or lift shall be thoroughly examined by a competent person at least once in every period of twelve months, and a report of the result of every such examination in such form and containing such particulars as may be prescribed shall be signed by the person making the examination and shall within fourteen days be entered in or attached to the general register.

(3) Every hoist way or lift way shall be efficiently protected by a substantial enclosure fitted with gates, being such an enclosure as to prevent, when the gates are shut, any person falling down the way or coming into contact with any moving part of the hoist or lift.

(4) Any such gate as aforesaid shall be fitted with efficient interlocking or other devices to secure that the gate cannot be opened except when the cage or platform is at the landing and that the cage or platform cannot be moved away from the landing until the gate is closed: Provided that, in the case of a hoist or lift constructed or reconstructed before the appointed date which it is not reasonably practicable to fit with such devices as aforesaid, it shall be sufficient if the gate is provided with such arrangements as will secure the aforesaid objects so far as is reasonably practicable, and in any event is kept closed and fastened except when the cage or platform is at rest at the landing.

(5) Every hoist or lift and every such enclosure as aforesaid shall be so constructed as to prevent any part of any person or any goods carried in the hoist or lift being
trapped between any part of the hoist or lift and any fixed structure or between the counterbalance weight and any other moving part of the hoist or lift.

(6) There shall be marked conspicuously on every hoist or lift the maximum working load which it can safely carry and no load greater than that load shall be required or permitted to be carried on any hoist or lift.

(7) The following additional requirements shall apply to hoists and lifts used for carrying persons, whether together with goods or otherwise:-

(a) efficient automatic devices shall be provided and maintained to prevent the cage or platform overrunning;

(b) every cage shall on each side from which access is afforded to a landing, be fitted with a gate, and in connection with every such gate efficient devices shall be provided to secure that, when persons or goods are in the cage, the cage cannot be raised or lowered unless the gate is closed, and will come to rest when the gate is opened: Provided that, in the case of a hoist or lift constructed or reconstructed before the appointed date in connection with which it is not reasonably practicable to provide such devices as aforesaid, it shall be sufficient if such arrangements are provided as will secure the aforesaid objects so far as is reasonably practicable, and in any event the gate is kept closed and fastened except when the cage is at rest or empty; and

(c) in case of a hoist or lift constructed or reconstructed after the appointed date, where the platform or cage is suspended by rope or chain, there shall be at least two ropes or chains separately connected with the platform or cage, each rope or chain and its attachments being capable of carrying the whole weight of the platform or cage and its maximum working load, and efficient devices shall be provided and maintained which will support the platform or cage with its maximum working load in the event of a breakage of the ropes or chains or any of their attachments.

(8) In the case of a continuous hoist or lift, subsections (3) to (7) inclusive of this section shall not apply and in the case of a hoist or lift not connected with mechanical power subsections (4) and (7) shall not apply.

(9) For the purposes of this section, no lifting machine or appliance shall be deemed to be a hoist or lift unless it has a platform or cage the direction of movement of which is restricted by a guide or guides.
(10) Every teagle opening or similar doorway used for hoisting or lowering goods or materials, whether by mechanical power or otherwise, shall be securely fenced, and shall be provided with a secure hand-hold on each side of the opening or doorway. The fencing shall be properly maintained and shall, except when the hoisting or lowering of goods or materials is being carried on at the opening or doorway, be kept in position.

(11) If it is shown to the satisfaction of the Commissioner that it would be unreasonable in the special circumstances of the case to enforce any requirement of this section in respect of any class or description of hoist, lift, hoist way, lift way, or teagle opening or similar doorway, he may by order direct that such requirement shall not apply as respects that class or description.

**Chains, ropes and lifting tackle**

Section 28. (1) The following provisions shall be complied with as respects every chain, rope or lifting tackle used for the purpose of raising or lowering persons, goods or materials:-

(a) no chain, rope or lifting tackle shall be used unless it is of good construction, sound material, and adequate strength and free from patent defect;

(b) a table showing the safe working loads of every kind and size of chain, rope or lifting tackle in use, and, in the case of a multiple sling, the safe working load at different angles of the legs, shall be posted in the store in which the chains, ropes or lifting tackle are kept, and in prominent positions on the premises, and no chain, rope or lifting tackle not shown in the table shall be used, so, however, that the foregoing provisions of this paragraph shall not apply in relation to any lifting tackle if the safe working load thereof or in the case of a multiple sling, the safe working load at different angles of the legs is plainly marked upon it;

(c) no chain, rope or lifting tackle shall be used for any load exceeding the safe working load thereof as shown by the table aforesaid or marked upon it as aforesaid;

(d) all chains, ropes and lifting tackle in use shall be thoroughly examined by a competent person at least once in every period of six months or at such greater intervals as the Commissioner may by order prescribe;
(e) no chain, rope or lifting tackle, except a fiber rope or fiber rope sling, shall be taken into use in any factory for the first time in that factory unless it has been tested and thoroughly examined by a competent person and a certificate of such a test and examination specifying the safe working load and signed by the person making the test and examination has been obtained and is kept available for inspection;

(f) every chain and lifting tackle except a rope sling shall, unless of a class or description exempted by certificate of the Chief Factory Inspecting Engineer upon the ground that it is made of such material or so constructed that it cannot be subjected to heat treatment without risk of damage or that it has been subjected to some form of heat treatment (other than annealing) approved by him, be annealed at least once in every fourteen months, or in the case of chains or slings of half-inch bar or smaller, or chains used in connection with molten metal or molten slag, in every six months, so however, that chains and lifting tackle not in regular use need be annealed only when necessary;

(g) a register containing such particulars as may be prescribed shall be kept with respect to all such chains ropes or lifting tackle, except fiber rope slings.

(2) In this section the expression “lifting tackle” means chain slings, rope slings, rings, hooks, shackles and swivels.

(3) If it is shown to the satisfaction of the Commissioner that it would be unreasonable in the special circumstances of the case to enforce all or any of the provisions of subsection (1) in respect of any class or description of chains, ropes and lifting tackle, he may by order direct that such provisions shall not apply as respects that class or description.

**Cranes and other lifting machines**

Section 29. (1) All parts and working gear whether fixed or movable, including the anchoring and fixing appliances, of every lifting machine shall be of good construction, sound material, and adequate strength and free from patent defect, and shall be properly maintained.

(2) All such parts and gear as aforesaid shall be thoroughly examined by a competent person at least once in every period of fourteen months and a register shall be kept containing such particulars of every examination as may be prescribed.
(3) All rails on which a travelling crane moves and every track on which the carriage of a transporter or runway moves shall be of proper size and adequate strength and have an even running surface; and any such rails or track shall be properly laid, adequately supported or suspended, and properly maintained.

(4) There shall be plainly marked on every lifting machine the safe working load or loads thereof, except that in the case of a jib crane so constructed that the safe working load may be varied by the raising or lowering of the jib, there shall be attached thereto either an automatic indicator of safe working loads or a table indicating the safe working loads at corresponding inclinations of the jib or corresponding radii of the load.

(5) No lifting machine shall, except for the purpose of a test, be loaded beyond the safe working load as marked or indicated under the last foregoing subsection.

(6) No lifting machine shall be taken into use in any factory for the first time in that factory unless it has been tested and all such parts and working gear of the machine as are specified in subsection (1) of this section have been thoroughly examined by a competent person and a certificate of such a test and examination specifying the safe working load or loads of the machine and signed by the person making the test and examination has been obtained and is kept available for inspection.

(7) If any person is employed or working on or near the wheel-track of an overhead travelling crane in any place where he would be liable to be struck by the crane, effective measures shall be taken by warning the driver of the crane or otherwise to ensure that the crane does not approach within twenty feet of that place.

(8) In this section the expression “lifting machine” means a crane, crab, winch, teagle, pulley block, gin wheel, transporter or runway.

Reference: The Factories Ordinance No. 45 of 1942 and subsequent amendments.

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