



Marine Notice 18/2015

## Failure of Lifting Wire Ropes

### Purpose

Ship operators, masters and crew are reminded they have a responsibility to ensure the safe operation of lifting appliances and associated equipment.

To meet these responsibilities, ship operators, masters and crew are urged to review and familiarise themselves with all the requirements of Marine Order 32. In order to ensure compliance with the Marine Order and to ensure safe operations, it is necessary to regularly inspect the condition of lifting appliances and associated equipment, including crane wire ropes.

**Note:** *Marine Order 32 (Cargo handling equipment) 2011 defines "lifting appliance" as "a stationary or mobile cargo-handling appliance used on board a vessel for suspending, raising or lowering or moving loads from one position to another while suspended or supported, including a crane, a derrick crane, a derrick, a cargo lift and a mechanical ramp".*

### Concerns with crane wire ropes

AMSA has received a number of incident reports involving crane wire ropes. These incidents involved the failure of lifting wire ropes, improper securing of wire ropes and operator error. Such incidents present risks of serious injury, fatality and/or damage to the vessel.

Of great concern is the sudden failure of a crane wire rope under load, resulting in uncontrolled dropping of the load. Analysis of incidents related to wire rope failure has identified a number of factors including:

- the age of the wire rope;
- inadequate care and maintenance;
- inadequate inspections to verify the condition of wires before use; and
- failure to consider the usage history.

### Marine Order 32

*Marine Order 32 (Cargo handling equipment) 2011 (MO32)*, details Australian requirements for the maintenance, inspection and testing of cargo handling equipment, including crane wire ropes. MO32 gives effect to parts of the following instruments of the International Labour Organization (ILO) that apply to machinery, appliances and equipment that belong to a vessel and are used for loading or unloading the vessel:

- Convention No. 27, Marking of Weight (Packages Transported by Vessels), 1929;
- Convention No. 152, Occupational Safety and Health (Dock Work), 1979;
- Recommendation No.160, Occupational Safety and Health (Dock Work), 1979; and
- ILO Code of Practice Safety and Health in Ports (the ILO Code), 2005.

MO32 Schedule 4 provision 8.2 outlines the requirements for the inspection of wire ropes while Schedule 5 provision 2 outlines conditions that a wire rope used in loading or unloading must comply with.

Ship operators, masters and officers are urged to familiarise themselves with the requirements of MO32 and the associated ILO instruments.

### Guidance on the use, inspection and maintenance of wire ropes

The ILO Code, MO32 and referenced standards outline precautions in relation to the use of wire ropes. These precautions include:

- a) All wire ropes should be of sound material, of good construction and adequate strength for the service required and maintained in good condition.
- b) Before use, all wire ropes should be inspected and confirmed suitable for the intended working load and equipment on which they are to be used.
- c) All wire ropes used for load-bearing purposes should be periodically inspected.
- d) When any wire rope has been lengthened, altered or repaired, it should be examined and tested before it is used again.
- e) When not in use, wire ropes should be stowed under cover in clean, dry and well ventilated places and should not be exposed to excessive heat, humidity or harmful chemicals.
- f) Care should be taken to avoid damaging or weakening a wire rope through:
  - excessive stress and strain;
  - rubbing or chafing against sharp objects;
  - passing it through too small a sheave or block; or
  - the formation of a kink in any rope under strain.

**Note:** *The ILO Code of Practice Safety and Health in Ports and referenced ISO standards contain guidance on the upkeep of wire and fibre ropes, particularly ropes used with lifting and other cargo-handling equipment.*

Masters are reminded that a wire rope should not be accepted for use on board unless it is accompanied by a certificate stating that it has been manufactured to a recognised national or international standard and which gives details of its construction, safe working load and minimum breaking strain.

Wire ropes should be regularly inspected for loose or broken strands or internal damage. It is recommended that special attention be paid to the condition of eye splices.

In considering the care of wire ropes the manufacturer's specified maintenance and care requirements should be complied with. Wire ropes used in lifting appliances should be treated at regular intervals with suitable lubricant, which is free from acid or alkali and is of a type recommended by the manufacturer.

When breaking a wire rope out of storage and before it is rigged as part of a lifting appliance, it should be thoroughly inspected for corrosion, broken strands or other damage that may render it unsafe. The rope certification should also be examined to ensure it has not exceeded any shelf-life, if one has been specified by the manufacturer.

Any wire ropes on lifting appliances, intended to be used for cargo operations in an Australian port that:

- have been in service in excess of 2.5 years, and/or
- appear in poor condition, and/or
- have been subject to particularly harsh operating conditions for an extended period,

should be inspected to ensure the lifting appliance is fit for use. It is recommended this be done by a competent person.

## Actions in the event of a wire failure

### Notification

If, in connection with the loading or unloading of a vessel covered by MO32, a component of 'material handling equipment' (which includes lifting appliances), fails in operation, whether or not any person is injured because of the failure, the Master, on advice from the person in charge, must notify AMSA, as required by MO32. Failure to provide notice in accordance with MO32 may result in a fine. Following notification, an AMSA Surveyor may attend the vessel.

### Further action

The Master is advised to cease cargo operations until such time as the safety of loading or unloading operations can be confirmed. Issues that may be considered in making such an assessment are:

- Safe Working Load or SWL of cargo handling gear and weight of load intended to be lifted;
- whether lifting appliances are being used in accordance with design specifications and/or manufacturer's recommendations;
- time in service of all wire ropes for each cargo lifting appliance that is intended to be used;
- records of certification and test for wire ropes and lifting appliance, including testing of limits and safety devices;
- whether the failure caused a shock loading to be exerted on the lifting appliance or otherwise caused damage to the lifting appliance or vessel; and
- the condition of wire ropes on other cranes that are intended to be used.

In making such assessment, the Master is advised that such inspections should be made by the ship's Responsible Person, or through engagement of a competent person as defined in section 6 of MO32.

Where a failure occurs and an AMSA Inspector is satisfied that the material handling equipment is defective, the inspector may prohibit the use of the material handling equipment for loading or unloading a vessel.

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