Freeing jammed freight containers and container fittings on ships

HSE information sheet

Docks Information Sheet No 1 (Revised)

This information sheet is one of a series prepared by the Transportation Section of HSE's Services, Transportation and Safety Unit.

Introduction

One of the most important developments in the transport of cargo by sea has been the introduction of the freight container. While the use of freight containers has many advantages, some problems are associated with their use, particularly in connection with securing them on ships.

In most cases twistlocks, sometimes referred to as conlocks, are used to secure containers to the ship and to the containers immediately above or below them. Twistlocks or other fittings have been known to jam in the locked position and containers to jam in cell guides. Unless these situations are properly managed they can lead to serious, even fatal accidents.

Twistlocks

There are many different designs of twistlock. Over 20 designs of manually operated twistlock are known to be in use, together with at least 26 designs of semi-automatic twistlock. Semi-automatic twistlocks lock automatically when they enter a corner casting or deck fitting but have to be released manually. They are sometimes just referred to as automatic twistlocks. Twistlocks are usually the property of the ship and it is possible that ports may find themselves having to work with types of twistlock with which they are unfamiliar. More problems are likely to occur with semi-automatic twistlocks.

It is recommended that ports obtain information from shipping lines or agents on the methods of operation of semi-automatic twistlocks before a particular type has to be used for the first time. The information should include not only the normal method of use but also methods of freeing them if they jam. This can involve the use of simple, special-purpose hand tools or devices which may be carried by ships or made locally. Some of these devices may be screw operated. Use the information to develop trouble-shooting guidance for those who are likely to be involved.

Liaison with the appropriate deck officer of the ship on arrival is also recommended to find out if any problems have been experienced with the twistlocks in other ports and, if so, how they have been overcome. The ship may already carry devices for use in such circumstances. Information on dealing with jammed twistlocks or containers should be included in the ship's cargo manual.

Problems may also occur when 'rogue' twistlocks of a different design, particularly those which lock in the opposite direction, are included in the stack. These may be unknowingly left in the locked position for discharge and so lead to them jamming. Such twistlocks may have been inadvertently used during loading at another terminal, particularly if a cage used to take twistlocks up onto containers carried an assortment of twistlocks. These may have come from other ships being worked at the time or may have been left behind at the terminal by previous ships.

Basic requirements

Any safe method of work to free a jammed container, twistlock or other container-securing device should include the following basic elements:

- the operation should be controlled by a single identifiable person in direct radio contact with the crane driver;
- safe means of access should be provided to the location of the jam;
- the people actually carrying out the operation should work from a safe location where they are unlikely to be struck by the movement of the container, eg if it is released suddenly or swings after release;
- everyone not involved in the operation is kept at a safe distance away from it.

The system of work will necessarily be particular to an individual port or terminal. However, consider the following matters when drawing it up.

Communication

The person in charge of the loading or unloading operation (the supervisor) should be informed of any significant problem with a container or container-securing device as soon as practicable.

On being informed of a problem, the supervisor should immediately advise the relevant crane driver (preferably by radio) that there is a problem and that any further crane movements in the vicinity of the container may be made only under the direct instruction of the supervisor or other named person until further notice.

The crane driver should confirm that the instruction has been received and understood.

The supervisor should ensure that all personnel in the vicinity are told there is a problem with the particular container or fitting.

The supervisor should ensure that the appropriate ship's officer is informed of any serious problem and liaise as necessary.

Identification of the problem

Before approaching the area, the supervisor should ensure that everyone in the vicinity is in a safe position.

If a spreader is locked onto the container, the supervisor (or previously named person) should instruct the crane driver to land the container back on the deck or the container below and release any tension in the hoist system. The spreader should then be unlocked from the container but may be left in place on it.

Excessive slack rope should be avoided. However, if the container is jammed in cell guides, particularly if this occurs near the top of the guides during loading, **no** slack should be allowed in the hoist system. You need to make sure that excessive tension does not build up in the hoist system due to movement of the ship (see below).

The supervisor should examine the problem area or areas before any attempts are made to deal with them. Some of the most common problems are:

- twistlocks inserted incorrectly, upside down or back to front;
- rogue twistlocks of a different design operating in a different manner;
- faulty or damaged twistlocks;
- the locking of less than four semi-automatic twistlocks, this might be due to misalignment of adjustable deck fittings or distortion of a container;
- unlocking of semi-automatic twistlocks due to crane spreader vibration.

If the supervisor decides that it is necessary to use the crane to take the weight of the container so that the problem can be examined further, the examination should be made from a safe position. You should also ensure that all other personnel continue to keep well clear of the container until the tension in the hoist system is released and it is established that the container is in a stable condition again.

Remedial action

Once the necessary action has been decided the supervisor should give clear instructions to everyone in the vicinity on the action to be taken to remedy the problem. These should include ensuring that there is safe means of access to the work site, that the work will be carried out from a safe position and that anyone not involved remains well clear of the operation at all times.

The need for safe access and a safe place of work will be particularly important if a container is jammed in cell guides or where the jammed container is above first tier height on deck, particularly on single stacks.

Use of the crane

If it is decided that it is necessary to use the crane to attempt to free the jam, the hoist system should be as near plumb as practicable. If the jam is freed with the hoist system out of plumb the container or spreader is likely to swing unexpectedly when it is released. This may also occur even if the hoist system is plumb but one or both of the twistlocks at only one end of the container are jammed.

Power should be applied to the hoist system for the minimum length of time necessary to take the weight and freely support the container, typically 1-2 seconds.

Tension should not be allowed to build up in the hoist system. Whenever practicable, after each attempt to release the jam the container should be lowered back down and a small loop of slack hoist wire generated as produced during normal operation. Unless a further attempt to release the jam is to be made straightaway, the spreader should be unlocked from the container.

The supervisor should be alert to the fact that the ship is liable to move while attempts to free the jam are under way. Such movement while the hoist system of the crane is under tension can be highly dangerous and result in failure. The movement may be gradual or sudden. The causes of such movement include:

- tidal movements, particularly on the ebb;
- ranging of the ship at her moorings, particularly when another ship passes;
- ballasting of the ship;
- loading or discharging of the ship by other cranes.

Small ships, such as feeder ships, are particularly vulnerable to sudden movement and on such ships it may be advisable to suspend all movement of cargo until the jam is cleared. Sudden movements may also occur on larger ships when heavy containers are loaded or discharged at outboard rows.

If at any time tension in the hoist system of a crane cannot be released, for example owing to a crane malfunction, engineering staff should be contacted **urgently** by the fastest practicable means. Failure to do this on a falling tide has led to the collapse of a container crane.

It should be remembered that twistlocks are not certified lifting plant and that they must never be used as such.

Use of hand tools and devices

If it is decided to use hand tools or devices to free the jam the spreader should first be removed from the container, providing this can be done safely. The crane driver should be instructed to ensure it remains clear of the area, unless the spreader cradle is to be used for access.

If safe access to the problem area is not practicable from the deck, appropriate access equipment should be used. When positioning the access equipment and using hand tools or devices care should be taken to anticipate any movement of a container or fitting when the jam is released. Additional support or restraint should be used where necessary.

Under no circumstances should an attempt be made to free jammed twistlocks with hand tools while a container is being supported by the crane.

Use of cutting or burning equipment

As a last resort it may be necessary to use cutting or burning equipment to free a jam. This should be done only by agreement with the appropriate ship's officer and taking the normal precautions in connection with such hot work. Particular attention should be paid to where hot slag from any cutting operations is likely to land and to the presence of any open topped or dangerous goods containers in the vicinity. Where appropriate, a permit to work for the operation should be issued.

Action after release

Once the jam has been released and container or other equipment involved has been moved to a safe place, the crane driver may be instructed by the supervisor (or other named person) to return to normal working. However, if the jam involved the cell guides of a container ship, further operations in that cell should take place only by agreement with the appropriate ship's officer after the guides have been checked. The container that has been released may be distorted and should also be checked.

Any other equipment involved should also be examined to determine the cause of the jam. If the jam involved the malfunctioning of equipment such as semi-automatic twistlocks, it is recommended that the suppliers, as well as the appropriate ship's officer, should be informed.

Further information

Additional advice and information may be obtained from your local HSE office, via the HSE Infoline, or by email to docks@hse.gsi.gov.uk.

HSE Docks webpage: www.hse.gov.uk/docks/index.htm.

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This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

This information sheet can be found at: www.hse.gov.uk/pubns/dis1.pdf.