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INTERNATIONAL SAFETY PANEL

BRIEFING PAMPHLET SERIES #27

SAFE WORKING WITH PALLETS

BY PETER BAMFORD ASA, HMT

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Studies are undertaken and reports are periodically issued on a wide range of subjects of interest and concern to members and their industry.

ICHCA International Limited
Suite 2, 85 Western Road,
Romford, Essex, RM1 3LS
United Kingdom

Tel: *+44 (0) 1708 735295*
Fax: *+44 (0) 1708 735225*
Email: *info@ichcainternational.co.uk*
Website: *www.ichcainternational.co.uk*

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No. 2 Ships Lifting Plant (*revised)*
No. 3 The International Maritime Dangerous Goods (IMDG) Code (*revised)*)
No. 4 Classification Societies (*Revised*)
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This publication is one of a series developed by the International Safety Panel ("Safety Panel") of ICHCA International Limited ("ICHCA"). The series is designed to inform those involved in the cargo-handling field of various practical health and safety issues. ICHCA aims to encourage port safety, the reduction of accidents in port work and the protection of port workers' health.

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ICHCA International Limited - INTERNATIONAL SAFETY PANEL

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ABOUT THE AUTHOR

Peter Bamford is an Executive Director of Safe-Net International, a Maritime and Railway Transport consulting firm, an Accredited Safety Auditor, as well as the Canadian Employer Representative for Occupational Health and Safety within the North American Agreement on Labour Cooperation as determined by the North American Free Trade Agreement. He has 20 years experience in Health, Safety and Emergency Management within the transportation sector of North America. He is currently employed by Safe-Net International which resources and consults railway and maritime operations and advises companies on the human factor approach to safety and accident prevention. He currently resides in Surrey, British Columbia, Canada. E-mail: Bamfordpeter@shaw.ca

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SAFE WORKING WITH PALLETS

"They are stacked in a corner and not used except as a last resort when there are no good ones left. Too many times we hear that a pallet has broken and the freight has fallen to the floor. This not only causes freight damage but can also result in equipment damage--or worse yet, in employee injury or death."

1. INTRODUCTION

1.1 Webster's dictionary defines a pallet as a "support for freight." The introduction of pallet use for the shipment of cargoes has predominately been a widely used practice for many years throughout the world shipping communities. As a "support for freight", it has the potential to take a lot of abuse hence old and/or damaged pallets are often not discarded when they should be, thereby creating the potential for accidental injury and untoward incidents leading to damage and loss.

1.2 A pallet is "a horizontal platform of minimum height compatible with handling by pallet trucks, and/or fork-lift trucks and other appropriate handling equipment, used as a base for assembling, storing, handling and transporting goods and loads"; as defined in BS 6637/ISO 445.

Note: BS (British Standards) 6637 is a "Glossary of Terminology for Pallets for Materials Handling" and as such is currently a "Withdrawn Standard" per 1985. Further, ISO/R 445:1965 the "Vocabulary of Terms relating to Pallets" was withdrawn December 01, 1984. Hence the above definition, although appropriate for the intent of this guideline, was referenced from Standards currently in "Withdrawn" status with both the British Standards and the International Organization for Standardization.

1.3 When it comes to cargo shipment via the use of pallets, many cargo handling manuals offer little in the way pallet use can be safely accomplished. This holds particularly true with respect to stevedoring operations at port facilities throughout the world. Quite often the material handling device known as the pallet does not undergo a pre-use inspection, handling and maintenance routine as should be listed in any Occupational Health and Safety Standard for the Industry, thereby placing stevedore personnel and crew at risk. It has been noted that these risks stem from a variety of causes such as; poor pallet design and construction, unsuitable use, improper handling, using a previously damaged pallet or use in an unsuitable environment or for an unsuitable commodity of which the particular pallet was not designed. This pamphlet is intended to fill that gap.

2 LEGISLATION

2.1 ILO's Convention 152 is concerned with dockworking and one of the lifting terms it uses is "lifting device forming part of the load". A load in this context is the load to be lifted and, therefore, this includes the pallet placed underneath the cargo.

2.1.1 Such lifting devices must be of good design and construction, of adequate strength for the purpose for which it is used, maintained in good repair and working order. Furthermore, it should be used in a safe and proper manner and, in particular, shall not be loaded beyond its safe working load or loads (except for testing purposes as specified and under the direction of a competent person.

2.1.2 In a further Article, the Convention states that pallets and similar devices for supporting loads shall be of sound construction, of adequate strength and free from patent defects liable to affect their safe use.

2.1.3 The Convention is supplemented by a Code of Practice and that recommends that decks should be at least 35mm thick with the space between the decks being sufficient to allow easy access for forks or arms of other pallet lifting devices. It also gives information on types of equipment used for lifting pallets, inspection criteria and use advice and all of that is incorporated in this pamphlet.

2.1.4 ILO Conventions are ratified by governments and given legal force by national legislation (see BP#1 for further information on the ILO Convention).

3. TYPES OF PALLETS

3.1 There are many types of pallets in use today within the shipping industry sector. The standard wooden pallet is most common yet it is produced in a variety of sizes (European vs. UK Standard for example) and some wooden pallets are designed for specific cargoes.

Figure 1

Figure 2

3.2 A variation sometimes found in ports are wing pallets. They should be at least 100mm deep and are designed to be used with pallet bars

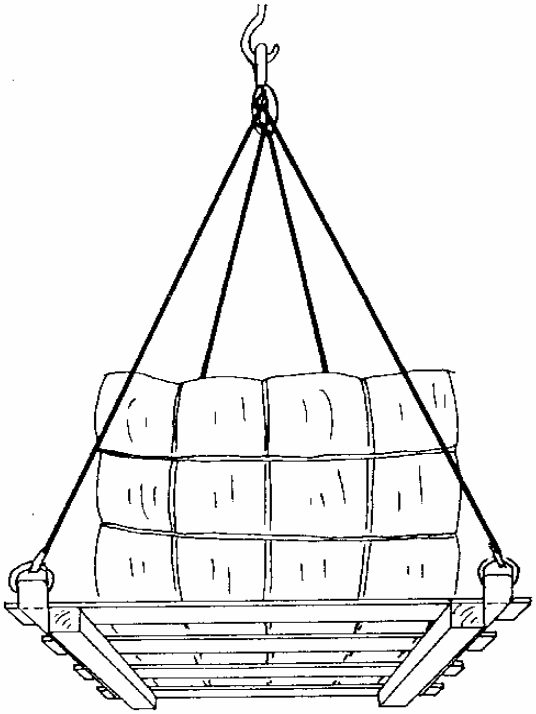

Figure 3

3.3 Thirdly there is the pallet type used for the handling of baggage and supplies in cruise vessel operations which are generally of a metal construction and designed for the specific ergonomics of baggage handling and ship supply transfer tasks.

Figure 4

Figure 5

3.4 Finally, one of the more common types of pallets is made of polycarbonate or plastic construction. These are used primarily to handle cargoes of corrosive chemicals for example, or where wood pallets in international shipment service may require fumigation. It should be noted that most plastic pallets have slippery surfaces and extra effort may be required to secure the goods on the pallet for transport and/or racking or storing of the loaded pallet. The plastic pallet handling by fork-lift truck also warrants special attention as they are extremely slippery and could be unstable on the tines of the fork-lift.

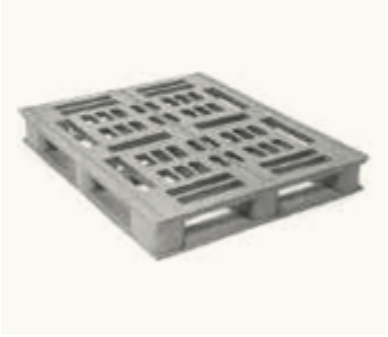

Figure 6

Figure 7

3. PRE USE INSPECTION OF CARGO PALLETS

3.1 Current Standards and best practices determine that all pallets, regardless of type, should be inspected prior to each use ensuring they are in a safe condition.

3.2 Wooden/Timber

Wooden/timber pallets should be inspected before each use for broken, splintered or missing members. Inspection should include ensuring the base is fastened at each end with two or more nails, the boards are of sound material and construction and of equal thickness with nails not pulled through and not projecting from the deck boards, the boards are not split or loose and do not have extensive bark or knot inclusions, blocks are not damaged, the surface nails are not projecting and the pallet is clean and not contaminated by corrosive or flammable substances.

3.3 Metal

The metal pallets are more expensive, but last far longer and do not present a fire hazard in use or storage. Metal pallets should be inspected for broken components, extreme bends in the structural members, missing or unsecured parts and components, corrosion and weld cracking, permanent deformation, and free from distortion caused by mishandling or use.

3.4 Polycarbonate/Plastic

Plastic or polycarbonate pallets should be inspected for material degradation particularly in the support structure. Degradation may be by overall usage with machinery and/or types and weight of cargo used leading to a splitting or fracturing of the composite fibres. This could also occur as a result of the pallet used in extreme cold environments and handled carelessly. The deck and base should be inspected for wear and damage and permanent distortion due to chemical spillage and ultraviolet light. Upon inspection, if the pallet shows signs of white dusty surface deposits it should be taken out of service immediately.

3.5 Damaged Pallets

Any lack of structural integrity should be cause for rejection and the pallet should not be used. Damaged pallets should be taken out of service and either repaired or destroyed. All repairs should be the responsibility of the manufacturer or by the manufacturer's guidelines and repair procedures. In some cases depending on type of pallet, broken pallets can be recycled into mulch by use of a bowl shredder or similar device. One should recognize that the recycling of broken pieces as an environmental best practice should be incorporated wherever possible.

4 LOADING GOODS ONTO PALLETS

4.1 Pallets should be suitable for the intended load and method of handling. Accidents can occur if pallets are taken from a random selection of used pallets of unknown specification. Most pallets are designed to lift a uniformly distributed load. Unless the pallet has been specifically designed for point loading, the load should be distributed as uniformly as possible.

4.2 Loads should be built up on pallets in an appropriate pattern so as to be compact and stable. The overlapping of individual packages, the insertion of sheets of paper or cardboard between layers, and strapping the load to the pallet by metal or plastic tapes or shrink wrapping, are some methods of increasing stability.

4.3 Strapping which is securing loads to pallets should not be over-tensioned. Deck boards can pull away from the bearers if the straps are tensioned too excessively or the load is too small. Top boards should be used with small loads.

4.4 If pallets are to be stowed in the hold of a ship, it may be desirable for the load on a pallet to extend a short distance beyond the edges of the pallet, as this will allow them to be stowed compactly together, with little or no need for dunnage or inflatable cushions to block the stow.

4.5 The height of the load on the pallet should generally not exceed the longest base dimension of the pallet.

4.6 Pallets should not be loaded beyond their rated load

4.7 Dangerous goods should be stacked on a pallet with their hazard warning labels clearly visible. Shrink wrapping should not be allowed to obscure such warning labels.

4.8 Palletised loads that are to be transported in the same condition throughout the transport chain should be conspicuously marked with the gross combined weight of load and pallet.

5. HANDLING OF CARGO PALLETS

5.1 Empty pallets should be handled with care not to cause injury to personnel and to ensure that damage will not occur due to rough handling and/or placement for storage (see figure 8).

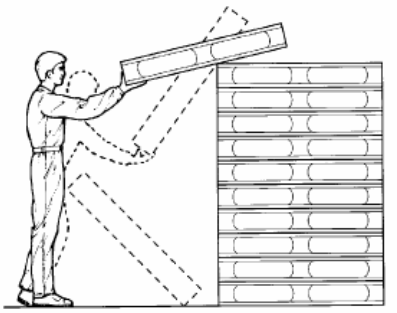

Figure 8

5.2 With Power Equipment

5.2.1 The safest way of lifting pallets is with pallet forks having a sliding centre of gravity. The tines of the forks should extend at least 75 per cent of the way under the pallet and be so spaced as to ensure that maximum support is given to the pallet when it is lifted.. These forks can be fitted with nets to prevent items falling from the pallet while in the air.

5.2.2 Other equipment includes spring-loaded pallet hoists which resemble a set of fork lift tines hung from the crane hook. The spring-loading enables the centre of gravity of the appliance to adjust itself and keep the forks horizontal, whether loaded or light. They can be adjusted for varying sizes of pallet.

5.2.3 Wing pallets have a pallet bar placed under each wing and attached to a four-legged wire rope sling (see figure 3). When the pallet is lifted, two workers should stand by and ensure that the bars stay under the wings.

5.2.4 If factory pallets are placed on stevedore or shipping pallets for handling, precautions must be taken to ensure that they do not slip or slide when being lifted.

5.2.5 Pallets should never be lifted by slings passed between the boards, as it is likely that one will slip to the centre and allow the set to fall over. If the centre of gravity is too high in the set, a slight displacement of goods will allow the set to capsize.

5.2.6 When pallets are to be handled by an overhead lifting device, such as a gantry or crane, they should only be lifted by suitable fork attachments, spreaders etc. depending on the type of pallet to be lifted.

5.2.6 When pallets are to be moved using a fork-lift truck the mast should be vertical when the fork tines are entering and leaving the pallet and the mast should not be tilted backwards until the fork tines are completely engaged within the pallet. The fork tines should be spaced allowing for maximum support to the pallet during the lift and handling.

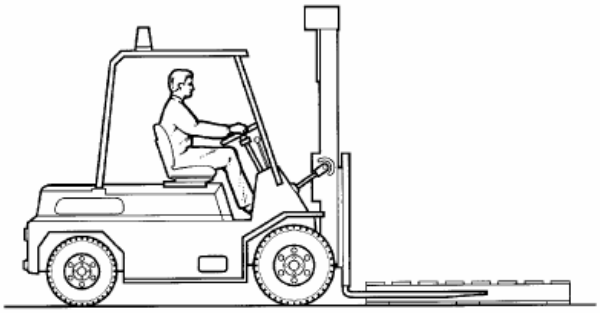

Figure 9

5.2.8 The small finger wheels of pallet trucks should not be allowed to damage base boards of pallets

5.2.9 Pallets lifted by crane should only be lifted by suitable fork attachments or, in the case of wing pallets, by bar springs with spreaders

5.2.10 Loaded pallets which on visual examination do not meet the requirements set out above should be secured onto pallets in good condition before being further handled. Alternatively, the load can be removed and placed on a satisfactory pallet.

5.3 Manual Handling and Placement

When using a manual wheeled dolly or a sack barrow pallets should not be handled by wedging the tine of the device between the top and bottom deck boards as damage will result.

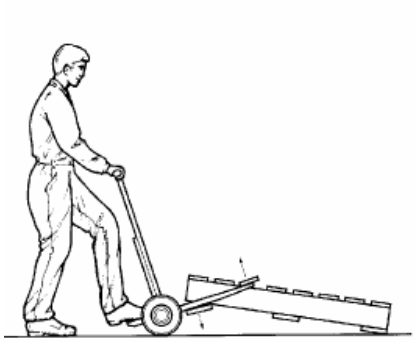

Figure 10

5.4 Empty pallets should be handled with care and should not be dragged or thrown down. They should not be handled by methods liable to damage or loosen them, such as the insertion of the platform of a sack truck between the bearers.

5.5 Pallets should never be used with a fork lift truck as an improvised access platform.

5.6 Pallets that are not in use should be kept in appropriately designated places that are protected from the weather.

6. MAINTENANCE OF CARGO PALLETS

Maintaining the pallets in good condition should avoid the use of a damaged or defective pallet which can have serious consequences. For example, it can cause a load to shift and fall, resulting in injury. It is an important and critical task to inspect the pallets before use. When damage affecting the structural integrity of the pallet is discovered, the pallet should not be used. Where repairs are possible these should be carried out by the manufacturer or specialist and only under the specifications for repair as stipulated by the manufacturer.

7. RECOMMENDATIONS

- Develop a pallet inspection program. Before using a pallet, inspect it for cracks, weaknesses and other damage. If damage is found, mark it unsafe for use until it is either fixed or thrown away. This can prevent a lot of potential problems.
- When loading or re-loading a pallet, make sure the load is centred and not out of balance.
- If the pallet is holding several loose items, make sure the entire load is secured with shrink wrap or banding.
- Exercise caution when stacking several pallets high. Make sure the stack is not leaning, because of weak or broken segments, which may cause the whole pile to fall over.
- Always know the load limit of the pallet jack or forklift being utilized. Neither the pallets nor mechanical lifting devices should ever be overloaded.
- Load limits should also be established and marked on warehouse floors--balconies, mezzanines, etc. Always comply with these.

- Make sure the forklift/truck has an overhead cage or screen to protect the driver from falling objects when merchandise is being stacked overhead.

- Never stand on, climb on or ride upon a pallet whilst being handled by a fork-lift truck or pallet mover.

- Always keep hands clear of hinges, latches and other pinch points when handling pallets with collapsible sides i.e. baggage pallets.

- Be careful when handling pallets that hands are not pinched between the pallet and another object.

- When manually loading a pallet, place heaviest loads at the lowest and centre part of the pallet.

- When moving a loaded pallet care must be taken at all times to prevent the pallet or load from falling. Care must also be taken when lifting or placing a loaded pallet to ensure that the pallet is clear of all other pallets or adjacent loads to prevent an unplanned toppling of these other pallets or adjacent loads by catching or snagging.

Remember--thinking ahead can save a lot of trouble. It is a waste of production time and effort to reload a pallet that has fallen. But, more importantly, an effective pallet/warehouse safety plan can prevent injuries and save lives!

