

# LOADING OF LOGS IN NEW ZEALAND AND AUSTRALIA



*Typical Handysize vessel of about 28,500 dwt loading logs at Port Chalmers, New Zealand*

## INTRODUCTION

Forest products from both New Zealand and Australia are exported in many forms, such as woodchips, plywood and other reconstituted wood panels, paper and paper pulp etc. However, the focus of this article will be on the export of shipments of softwood logs in Handysize and Handymax bulk carriers which are specially log fitted and carry logs in holds and on deck. However, some logs are also exported in 20' and 40' containers. Between 40 and 50 Handysize vessels load complete cargoes of logs in NZ every month and it is estimated that another 5 - 6 such vessels load in Australia in the same period. In the following Loss Prevention article the Association would like to advise Members with the following :

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## NEW ZEALAND LOG EXPORTS

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New Zealand has a significant softwood log export business that is sustainable for the foreseeable future.

- Current log export volumes are around 14 million m<sup>3</sup> per annum, all from plantation forests.
- In 2012, New Zealand had a plantation forest estate of around 1.72 million hectares, with an average standing volume of 284m<sup>3</sup>, giving a total estimated stock of wood fibre of around 488 million m<sup>3</sup>.
- By 2025, it is thought possible that NZ softwood log exports could exceed 20 million m<sup>3</sup> per annum.

New Zealand does not export any native timber species. Australia does, but such extractions are carefully controlled and licenced to ensure that they are environmentally sound.

By far the most common species (over 90%) is Pinus Radiata, otherwise known as Californian pine, or Monterey pine. Other species grown for export and domestic use are Douglas Fir, Eucalypts, Macrocarpa and some other pine/fir species.

The largest single export port is currently Tauranga, but every NZ port (except Auckland) has a significant log export operation.



*Fully loaded vessel leaving Tauranga, New Zealand for Incheon, Korea*

## AUSTRALIAN LOG EXPORTS

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Australia also has about 1.7 million hectares of plantation forests, the majority of which are planted in softwood species. The most common species is radiata pine, although an increasing percentage of hardwoods are also being planted and harvested. Australia exports about 2 million m<sup>3</sup> of logs annually and this has strong potential to grow in coming years.

Australian plantations are concentrated in coastal areas near ports, with Portland Vic, currently the largest export log port. However, other export operations have been/are still operating from ports in Victoria, Tasmania, NSW, Queensland and Western Australia.

## LOG IMPORTERS

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The largest buyers of NZ and Australian logs are located in China, but significant volumes are also exported to Korea, India and Japan. Shipments are also made to Taiwan and the Philippines, but these are typically part shipments on deck, with the rest of the cargo (in holds) going on to some other destination further north.

All log imports into China, India and Taiwan have to be fumigated prior to arrival, but in Korea and Japan fumigation is carried out during or after discharge. Alternatives to fumigation are to de-bark or heat treat all the logs before loading. However, fumigation is the most common solution. Fumigation procedures are referred to later in this paper.



*Typical vessel discharging logs at LongWu terminal, Shanghai PRC*

## REGULATIONS AND LEGISLATION GOVERNING THE CARRIAGE OF LOGS BY SEA

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There are many international and national rules, regulations and laws which apply to vessels involved in the trade, but the most important are the following:

1. **IMO pub. 1048(27)**, the Code of Safe Practice for Ships Carrying Timber Deck Cargoes, the 2011 TDC (Timber Deck Code)
2. **IMO pub. MSC 267(85)**, the International Code on Intact Stability, (The 2008 IS code), with amendments
3. **The Load Line Regulations 1966**, as amended by the Protocol of 1988 and the 2003 amendment.
4. **Solas 1960**, with various amendments up to 2013
5. **The NZ Maritime Transport Act 1994**, together with **Maritime Rules** which are promulgated from time to time
6. **The Australian Maritime Safety Act 1990**, together with **Maritime rules** and subordinated **State legislation** in the various Australian states.

Canada, USA and some other countries have their own rules and regulations, but we are not aware of any such regulations being in conflict with the main precepts of the IMO and other International legislation listed above.

Every ship proceeding to a port to load log cargo should have on board a current copy of the 2011 TDC and the 2008 IS Code, and the Master and Officers should be reasonably familiar with the contents of these documents. Brokers and operational managers in shipping companies ashore who have responsibilities in log trades should have similar or equivalent knowledge of these publications.

## IMPORTANT SECTIONS OF REGULATIONS ALL SHIPS MUST OBSERVE

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The most important sections of the Regulations which must be observed in all ships carrying timber deck cargoes are as follows:

1. **Deck Openings covered by timber deck cargo:** Openings to spaces below the freeboard deck must be securely closed and battened down. Hatchway fittings must be in place, and hold ventilators adequately protected.
2. **Stowage:** The cargo must be compactly stowed, lashed and secured; it must not interfere with the navigation and work of the ship, or with the provision of a safe margin of stability at all stages of the voyage.
3. **Protection of crew and access to machinery spaces:** Safe and satisfactory means must be provided at all times to enable the crew to get from the quarters to machinery spaces and all parts of the vessel. Deck cargo in way of all openings giving access to such spaces must be stowed so as to permit such openings to be closed to prevent the entry of water.

4. **Lashings:** A complete system of overall lashings of ample strength with releasing arrangements must be provided to give effective security throughout the length of the timber deck cargo, and the releasing gear must be accessible at all times.
5. **Uprights:** When the nature of the logs or timber is such that uprights at the sides of the ship are necessary, they must be of adequate strength. The spacing of the uprights must not exceed 10 feet (3 metres) and must be suitable for the length and character of the timber, efficient means being provided for their security.
6. **Construction of the Ship:** The ship must have sufficient strength for deeper draft to be allowed, and for the weight of the deck cargo.
7. **Superstructures:** The vessel must be protected with a forecastle of at least standard height and at least 7% of her length. In addition a poop, or raised quarterdeck, or aft accommodation block must be fitted aft.
8. **Double Bottom Tanks:** Where fitted within the midship half length of the vessel, these must be provided with at least one watertight longitudinal division.
9. **Bulwarks:** The ship must be fitted with steel permanent bulwarks at least 3' 3" (1 metre) high and adequately stiffened on the upper edge with strong and effective stays attached (welded) to the deck in way of the beams. They must be fitted with a sufficient number of freeing ports to allow deck water to clear quickly. The bulwarks are designed to be stronger than the stanchions so that, in an extreme emergency, the stanchions will bend and break before the bulwark. This may result in the loss of the deck cargo, but the ship might still survive, provided the bulwarks, sheerstrake and deck stringer are not broken or opened to the sea.

*The above provisions concerning the construction of the ship are detailed in the Load Line Regulations, and form part of the basis of the vessel's Load line Certificate.*

10. **Stowage:** The logs or timber should be stowed as compactly as possible, and reach a minimum height equivalent to one standard superstructure over the whole length of the deck. (In a Handysize bulk carrier, the height of a standard superstructure is usually about 3.5 metres. Actual heights vary somewhat and are mainly calculated depending on the length of the vessel. For a specific vessel they are contained in the detail of the ship construction rules maintained by Classification Societies)
11. **Uprights:** For the purpose of securing the uprights (stanchions) required on all ships carrying timber deck cargoes, strong angles or metal sockets shall be fitted and welded to the stringer plate and the uprights should also be secured athwartship by lashings of ample strength (hog lashings)
12. **Over all lashings:** Independent overall lashings, spaced not more than 3m apart, or such lesser spacing as may be contained in the vessel lashing plan provided by the shipbuilder and approved by Class, must be provided for efficiently securing the deck cargo to the deck, throughout the length of the vessel. They must always be in good condition and may consist of close link chain or flexible wire rope of equivalent strength, fitted with slip-hooks and turnbuckles (bottle screws), which must be accessible at all times. *(In very recent times, fibre lashings have been introduced and several ships of about 39,000 dwt have now completed log voyages successfully, using fibre lashings only)*
13. **Lashing plans:** Plans showing the complete arrangements for stowing and securing the timber deck cargo must be submitted to the Assigning Authority for approval at the same time as application is being made for assigning a freeboard. On acceptance, these plans are stamped and approved by

class and become part of the ship's standing operational procedures, in the form of a "Timber Deck Cargo Manual", or be included as part of the "Cargo Securing Manual" (CSM). If a deck cargo of logs or lumber is loaded, but not in accordance with this lashing plan, the vessel is no longer "In Class" and has no right to use the Timber Load line.

## LOADLINES

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Most, but not all vessels fitted for the carriage of logs on deck, will be surveyed for a Lumber Load Line. In the past, the lumber marks allowed the ship to load to a deeper draft than the ordinary load line, but this is no longer the case. The problem is that amendments and enhancements to international construction and measuring rules for ordinary bulk carriers has progressed faster than amendments to the rules governing the assignment of lumber load lines. This is an anomaly that may be removed over time, but currently we have the situation where many vessels have a set of lumber marks which mean the vessel can carry less cargo when loading logs, than when carrying an ordinary bulk cargo, such as coal, ore, sugar, etc.

1. The original premise (going back 80 years or more) under which vessels were allowed to load to a deeper draft when carrying timber deck cargo was that Log ships have to comply with all the same rules as for ordinary ships, plus some extra standards, more than for other bulk carriers of a similar size and purpose.
2. The basic principle of the rules permitting the deeper immersion of ships carrying timber in any uncovered space on the freeboard deck is that a *'solidly stowed deck cargo increases the ship's reserve buoyancy in the same way as increasing the lengths of superstructures. It does not matter if the timber has a specific gravity greater than 1.0 or not – a properly stowed deck cargo is effectively like building an extra deck house on the ship and this effectively increases the freeboard'*. Specific Regulations as regards the carriage of timber deck cargoes are defined in Statutory Instruments and in IMO Regulations.

## PREPARING FOR THE CARGO VOYAGE

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There are more than ten exporters currently active in Australasia. The two largest export upwards of 5 million m<sup>3</sup> each and the third largest exports about 2 million m<sup>3</sup> pa. The remaining exporters might average about 300,000 m<sup>3</sup> each. As mentioned above, the great majority of log exports are carried in Handysize or Handymax log bulk carriers. In most cases, the vessel will be chartered on a voyage basis, with freight paid on a lumpsum or "per cubic meter" basis. Again, in most cases, the vessel will arrive at first load port in ballast.

**Prior to arrival** in either New Zealand or Australia, the vessel must ensure the following:

- It must exchange all ballast in an approved manner in deep ocean water and complete the relevant forms detailing this ballast exchange.
- It must also have conducted a thorough search of the vessel for Asian Gypsy Moth and be certain that no such moths or egg masses exist on board.
- It must also be free of residues from previous grain cargoes. Even a few grains might be enough to get the ship rejected by Quarantine officials, especially in Australia.

**While on the ballast leg**, the following should be ensured:

- The crew should check all lashings on deck, checking their condition and fitness for use.

- All components of the overlashing system must be certificated and marked so that an inspector can match any particular certificate to the relevant wire, chain, shackle or turnbuckle.
- Hog lashings and the joining pennants (also known as “span wires”) do not have to be certificated, but have to be “fit for purpose”.
- If weather conditions allow, the collapsible stanchions should be raised to check that they work and that they stand vertical in their correct place. As soon as this is verified, they can be lowered again, but it is a good idea to give them a good washdown while they are raised, as dirt and foreign matter often gets trapped between the stanchions in the collapsed position. Such foreign matter can become a problem during inspections by Quarantine officials, especially in Australia.
- Master and Chief Engineer should consider which fuel tanks should be used during the ballast leg, with a view to arriving with minimum free surface in fuel tanks.

## Other preparatory measures

The fastest loading ports are Gisborne and Tauranga in New Zealand, where it is quite common to fully load a 28,000 tonnes log cargo within 3 days.

The holds might be completed in less than 2 days, and the deckload in less than 1 day. Other ports tend to be a bit slower, perhaps because all the cargo has not been assembled on the berth, or because there are only 2 or 3 gangs available, with an average of 5-6 days being the norm.

Even so, once loading has started, crew have very limited time and ability to do the preparation listed below, because all the cranes are needed by stevedores and because crew are busy raising stanchions, fitting hog lashings and the like.

Therefore, the following preparatory measures should be undertaken prior to arrival at the first load port:

### 1. Hold cleanliness:

- For *New Zealand*, holds should be swept clean and free of residues from previous cargoes. There may be an inspection of holds on arrival conducted by a surveyor or supercargo appointed by the shippers, but this is usually a quick visual inspection only and it is almost unheard of for a vessel to be found unfit to load a logs cargo. Not impossible, but unlikely.
- For *Australia*, a much higher standard is required and there will be a thorough survey of all holds by AQIS before the vessel will be allowed to load. The standard is “Grain Clean”, which is a very high standard and could be considered unreasonable by some, but this is the standard according to Australian law.

### 2. Equipment and machinery:

- For both Australia and New Zealand it is necessary to check that all cranes are working properly, that limits are set correctly, cargo blocks are in good condition and are clearly marked, cargo hooks are easy to remove (in some ports, stevedores will not use the hooks) and that hoist and luff wires are in a good condition.
- The last “Thorough Annual Inspection” must have occurred within the last 12 calendar months (no exceptions) and a clear entry stamped by Class be made in the Chain and Gear Register. The last “quadrennial” and certificates of last proof load testing of cranes must also be in date and available for inspection.

- In the crane control cabin there must be an appropriate fire extinguisher that has been checked within the last month, a proper seat with a backrest, clean windows and a working window wiper. There should also be a working fan and a heater, although these latter two are not always checked or used.
- If the cranes have been manufactured by IHI-WMMP (IHI design, built by Wuhan Marine Manufacturing Plant Limited), then the cargo blocks will be inspected and must have been strengthened by one of the three approved methods that have been published by IHI and approved by Class. In the absence of such modification, log stevedores will not use these blocks.

*There have been about 15 instances where the cheeks of these blocks bend outwards, thus allowing the trunnion assembly to drop out (and of course, dropping the sling of logs into the hold). These blocks will bend open if any lateral pressure is applied to the block, which tends to happen when the stevedores are pulling out their wires. It is fair to say that stevedores should not allow lateral forces to act on the blocks, but they argue it is a long-standing practice of the trade and every other type of block can withstand such handling – it is only these particular blocks that bend. Who is right is a moot point – but the reality is that stevedores will not use these blocks unless they have been modified – period.*

### 3. Approved gangway:

- In the fully loaded condition, the main deck will be about at the level of the wharf at low tide, so the main accommodation ladder cannot be used. However, in both New Zealand and Australia it is a regulation that there must be an approved gangway giving access to and from the vessel at all times, so if there is a short gangway on board, this should be made ready in some convenient place, near where it is to be fitted. (Bear in mind that when there is a full cargo of logs on deck, shifting things like a spare gangway is a much more difficult task than when the decks are clear.)
- If there is no spare gangway on board, an appropriate alternative gangway can be provided by the port authorities, at a (usually) modest daily charge.

### 4. Rope ladders to read draft marks:

- Finally, it is a good idea to place a rope ladder (not the pilot ladder) at the ship's side near the midship draft marks, for use in reading the sea-side draft marks during loading. It is almost unknown for a boat to be available for reading drafts, so this ladder is essential. Again, it is much easier to place it where it is needed before there are logs covering the deck.

### 5. Other preparations:

- Prior to arrival at the loadport, it is a good idea to remove any exposed fire hose boxes bolted to the bulkheads of masthouses or crane pedestals and also the 6-man liferaft that can often be found stowed on deck forward of No 1 hatch. (Until the vessel is actually alongside, these fittings have to remain in the allotted places, but if they have been freed-up, then they can be quickly moved before loading starts).
- Similarly, if there are any exposed ladder platforms on the plate bulkheads (fwd end of No 1 and after end of No 5 holds), it is a good idea to remove these too, as they are likely to get damaged when logs are stowed in those holds. Generally, however, if the vessel has been properly constructed as a logger, these ladders will have substantial steel bar protection and can remain in situ.



→ If the ship has a supply of long aluminium ladders which are stowed in the foc'sle, get them out and stow them in the cross decks well before loading on deck starts. (With modern B60 vessels, the only access to the bosun's store is through a door at the forward end of No 1 hatch; when there are logs on deck at No 1, you are severely limited in the length of items that can be manoeuvred out through this door)

## 6. Competent crew:

→ For Australian and New Zealand logs cargoes, all opening and closing of hatches, raising and lowering of stanchions, lashing and unlashings of the deck cargo and removal of bark from the holds, is done by crew.

→ In North America, most of this work (but not all) is carried out by longshoremen.

## 7. Intermediate lashing:

→ It is also quite common for a ship to load at 2 or 3 ports. Usually the deck cargo is all loaded at the last port, but occasionally the shipper will load some deck cargo at the second or some intermediate port. In such cases, the crew have to temporarily lash the deck cargo for the coastal trip, unlashings and then re-lashing these decks in the final port.

## MEASUREMENT OF LOGS

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### Jasm3 method

All logs from Australia and New Zealand are measured, sold and shipped by the "Jasm3" method. "JAS" means "Japan Agricultural Standard" cubic meter. This is a method of measuring a log, originally invented in Japan but now used widely around the Pacific. In simple terms, it is determined by taking two measurements of the small end diameter of the log (and averaging these), multiplying by the length to give the cubic measurement. The resulting measure is not exactly the same as the measurement of a cylinder ( $\pi r^2 h$ ), because there is a taper factor in the log and this is allowed for in the JAS formula. However, over a whole shipment of (say) 30,000m<sup>3</sup>, the Jasm3 and true m<sup>3</sup> will be somewhat similar.

In New Zealand and Australia only the "Jasm3" system will be encountered. All logs are exported under this measure, so pre-stow plans, stevedore's reports, Mate's receipts, B/L's and manifests, will refer to the Jasm3. Weight and "number of pieces" may be recorded on some documents, but these are only for statistical purposes, and (in the case of the weight) to enable the Supercargo and Chief Officer to properly plan draft, trim and stability values. However "weight" and "number of pieces" is of no commercial importance whatsoever.

### Scribner method

In the USA and Canada, the Scribner method is generally used. This is a more arcane method and will not be addressed in this article.

### Other methods

Elsewhere in the world, other methods of measuring the log are used. The author is aware of about 13 different methods, and there are probably several more. Amongst the measures that a seaman might

encounter are “Haakondahl”, “Japanese Haakondahl”, “GOST2708-75”, “South Seas Log or Brererton Scale”, “Klemme” and “Hoppus”, amongst others.

## CONDITIONS OF CARRIAGE

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The standard B/L used in the trade is the Congen B/L, and this means that disputes arising from “shortlanded”, or “overlanded” tallies are matters that have to be settled directly between shippers and receivers. The Master is not responsible for the tallies and cannot (in the ordinary course of events) be held liable. Owners might be liable if there is loss of deck cargo, or broaching of cargo for whatever reason.

We are aware of at least two vessels over the past 25 years that have run aground while on passage with a full cargo of NZ logs, but it is our understanding that the cargo from both these vessels was saved (as were the vessels themselves) and was eventually landed in the correct port.

Instances of vessels losing all or part of their deck cargo while on passage across the North Pacific from North America to Japan/Korea/China are relatively common, as are similar instances with smaller vessels sailing northwards from South Seas Islands, and from the Baltic down to the Mediterranean.

## MSDS FORMS

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Shippers from New Zealand will routinely provide the Master with a MSDS form and PSC inspectors in the load or discharge port have been known to ask to see a copy. This form is not normally provided by Australian shippers, although one could be, if the Master requests it.

*Note:* In the sample form below, take special note that logs stowed in holds deplete the oxygen content and this can fall to dangerous levels quite rapidly after holds are closed.

**FORM FOR CARGO INFORMATION - For solid bulk cargoes**

BCSN:	Wood Products General	
SHIPPER:	[REDACTED]	CONSIGNEE: Various, As Per Manifest
PORT/PLACE OF DEPARTURE:	Timaru	
GENERAL DESCRIPTION OF CARGO:	Wood Products General	GROSS MASS: As Per Manifest
SPECIFICATIONS OF BULK CARGO:	STOWAGE FACTOR: 1.75-1.85jas/cbm ANGLE OF REPOSE: N/A TRIMMING PROCEDURES: Load to vessel's capacity, as per IMO Code CHEMICAL PROPERTIES: MHB(IMO CLASS) / UN Number is n/a	
GROUP OF THE CARGO:	B	
RELEVANT SPECIAL PROPERTIES:	REFER SHIPPING DECLARATION	
TRANSPORTABLE MOISTURE LIMIT:	N/A	
DECLARATION:	NAME/STATUS/COMPANY/ORGANISATION OF SIGNATORY: [REDACTED] SIGNATURE ON BEHALF OF SHIPPER: [REDACTED] PLACE AND DATE: [REDACTED]	

**SHIPPING DECLARATION - NEW ZEALAND LOGS/WOOD PRODUCTS**

Solid Bulk Cargoes (other than grain)

Declaration by Shipper

TO THE MASTER	M/V	[REDACTED]
PORT OF LOADING:	Lyttelton / Timaru	
COMMODITY:	WOOD PRODUCTS GENERAL	APPROXIMATE QUANTITY: AS PER MANIFEST

The above mentioned commodity is to be shipped on your vessel and the following properties (where applicable) have been ascertained by the use of appropriate recognised international procedures.

**PHYSICAL PROPERTIES (Estimate Only)**

Stowage Factor	1.75-1.85jas/cbm	No special stowage requirements.
BCSN (Bulk Cargo Shipping Name)	WOOD PRODUCTS GENERAL	
Cargo Group - IMSBC Code	B	IMP Class - IMSBC Code MHB

**HAZARDS**

These cargoes are liable to cause oxygen depletion and increase of carbon dioxide in the cargo space and adjacent spaces.

**PRECAUTIONS**

Entry of personnel into cargo and adjacent confined spaces shall not be permitted until tests have been carried out and it has been established that the oxygen level is 21%. If this condition is not met, additional ventilation shall be applied to the cargo hold or adjacent enclosed spaces and remeasuring shall be conducted after a suitable interval. An oxygen meter shall be worn and activated by all crew when entering cargo and adjacent enclosed spaces.

**VENTILATION**

Ventilation of enclosed spaces adjacent to a cargo hold before entry may be necessary even if these spaces are apparently sealed from the cargo hold.

**CERTIFICATION**

It is certified that, for bulk cargo nominated in this declaration, any relevant hazards attendant upon its marine transportation have been properly described, based upon the latest available information.

[REDACTED]  
Shipper

\_\_\_\_\_  
Captain / Master

## FUMIGATION

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- 1. Discharge in India:** If the cargo is destined for India, the holds will be fumigated prior to arrival. For Indian cargoes from Australia or New Zealand, fumigation of the holds is done with methyl bromide at the time when holds are full of logs, but there is no cargo on deck. The deck cargo is fumigated onshore prior to loading. Fumigation of holds takes 36- 40 hours, with the majority of the crew living ashore for this time. A few crew, usually about 6 persons, remain on board.
- 2. Discharge in China:** If the cargo is destined for China, the holds will also be fumigated prior to arrival. For Chinese cargoes from Australia – the procedure is the same as described in the Discharge in India section above. China cargo loaded in New Zealand is fumigated while the ship is underway, using Phosphene. A New Zealand fumigator travels with the vessel to monitor the fumigation.
- 3. Discharge in Taiwan:** Cargoes for Taiwan are normally carried on deck only, in which case they have to be fumigated immediately prior to loading. However, a high percentage of Taiwan logs are de-barked, which means they are exempt from fumigation.
- 4. Discharge in Korea or Japan:** If you are discharging in Japan or Korea, fumigation of holds will be done after the vessel has arrived in the discharge port.

## LOADING PROCEDURES

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1. Logs are brought to ships side on the back of trucks, or by large log handling machines that drop the logs into bunks. In some ports, the logs are loaded directly from the trucks, in others the logs are loaded from the bunks.
2. Logs are loaded with wire slings that are attached to a patent device which allows for automatic release (*see pictures below*). The only person in the hold is the driver of the “digger” machine, a modified type of excavator which is used to stow the logs. This driver is protected by special heavy steel guarding around his cabin. Most diggers have a grapple device at the end of the boom, although in some ports, “push-plate” diggers are still used.
3. During loading, the ship will list from time to time, but at the end she should be upright. Getting absolutely perfectly upright is not always possible, but the list must be less than 0.5 degrees on completion, and should preferably be less than 0.2 degrees. To check the list and to advise stevedores which side to favour when the last slings are being loaded, the vessel needs a good inclinometer in an accessible place. Most have one in the ship’s office, but approximately 50% are useless, either because of poor design, or inaccuracy. If the ship has a useless inclinometer, the Chief Officer should make his own using a long cord with a decent weight on one end, nailing it to the bulkhead somewhere near the centreline and calibrating it prior to loading when the ship is known to be upright, and with graduations for 5° either side of upright. At no stage should the list exceed 5°, and most often not more than 3°. The sea water density should also be checked regularly and if more or less than 1025, appropriate steps should be taken to not exceed the correct summer timber marks. In several NZ ports and in Portland in Australia, the density is typically 1026, and sometimes as high as 1028. At some berths, there is a difference in density between high water and low water, being about 1021 at low water and 1026 at high water.

4. If there is more than one consignee, the various consignments are “marked-off” in the holds with paint and/or tape. Marking of the logs used to be done by crew under the direction of the stevedores, but nowadays this work is done by the stevedores.
5. Loading operations continue 24 hours per day, 7 days per week, throughout the year. Loading continues in all weathers and is only suspended for safety reasons if the crane drivers cannot see clearly (in heavy rain) or if the slings are swinging and spinning (in extremely strong winds). Delays from these causes are rare.

## WEIGHT AND STOWAGE

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Statistics show that softwood logs loaded in Australia and New Zealand will lose weight during the voyage. The logs in holds seem to remain the same, but the logs on deck will lose weight (on average 1.72%). So, a deck cargo that weighs 8000 tonnes on departure will weigh 135-140 tonnes less on arrival at the first discharge port.



*Typical sling of de-barked logs being loaded. Every log has a bar-coded ticket affixed to the small end of the log. The big end has the shipper's logo and grade marks.*



*Typical “digger machine”, usually around 15-17 tonnes, with a rotating grapple attachment for handling the logs individually, or in packets of 2-4 pieces.*



*General view of a vessel loading logs on deck. Note the “bunk” alongside and the digger on deck. Just above the bunk we can see a gap in the stow in way of the permanent stanchions. This was left to give crew access to sounding pipes and ballast valves at the ship’s side, and to allow access for the fumigators to reach the hold manholes, to insert the phosphine blankets, just prior to sailing. Also, the top of the stow on deck is slightly “crowned”, to ensure that overlashings touch approx. 80% of the logs. This makes the lashing more effective and secure.*

### Time and compliance with STCW requirements

In Australia and New Zealand, all lashing is done by crew. This includes the hog lashing as well as the overlashing. The period during which some lashing is carried out (hog wires as well as final lash) is never less than 12 hours and can be as long as 36 hours, so management of crew work and rest periods need to be addressed well in advance to ensure compliance with STCW regulations and sensible management of crew fatigue. The final lash might easily take 12 continuous hours. This is always a period of high activity for the deck crew and there needs to be a plan where each man can have a decent break at an appropriate time. There are various ways to achieve this, and each Chief Officer and Bosun will know what is the preferred method for his particular ship.

Many charterparties stipulate that the crew have 2 hours per hatch to complete the lashing. For a well organised crew on a well-found vessel this is possible, but it is becoming more and more frequent that these deadlines cannot be met. Also, the STCW rest periods used to be advisory, but they are now mandatory and can be checked by PSC inspectors. So far, we are only aware of one vessel that has been detained for 12 hours because one officer and some crew had not had sufficient rest prior to sailing, but it seems inevitable that similar detentions will become more common in the future. Most shippers, agents and owners are very strict about reducing the lashing time, to the extent that Masters are faced with a dilemma that has no easy solution.

### Hours of Rest and the Maritime Labour Convention 2006

Members will need to be aware of the fact that the Maritime Labour Convention has been ratified by Australia but not New Zealand. While there may be some differences, broadly speaking the MLC 2006 and SCTW 2010 cover the same ground with respect to hours of rest and the necessity to ensure that vessels comply in practice. Australia's AMSA has already shown a very rigorous approach to ensuring that vessels coming to its Ports do in fact comply with the MLC 2006, irrespective of whether the Flag of the vessel or the home of the crew have taken steps to ratify and implement the Convention. Additional detailed information on the MLC can be found in Skuld's dedicated Insight section here:

<http://www.skuld.com/topics/people/mlc-2006/insight/insight---mlc-2006/entry-into-force/>

### The importance of good rest and Seafarer Fatigue

Experience shows that a key issue for crew accidents, as well as long term health, is fatigue caused by insufficient quality rest, in particular uninterrupted periods of sound sleep. The Association has recently published the following for Member's reference on this issue :

*Seafarer Fatigue* : <http://www.skuld.com/topics/people/mlc-2006/mlc-2006/seafarer-fatigue-the-importance-of-a-good-nights-sleep/>

*Paris and Tokyo MOU Campaign* : <http://www.skuld.com/topics/voyage--port-risks/port-state-control-psc/campaigns/paris-and-tokyo-mou-psc-joint-campaign-on-stcw-hours-of-rest/>

*Solas* : <http://www.skuld.com/topics/ship/safety-of-life-at-sea-solas-1974/solas-noise-level-on-ships/>

## EQUIPMENT

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As with all shipboard work, it can be made easier and/or faster if the crew is experienced, if the equipment is in good order and has been greased and checked prior to arrival and if the crew have various tools and ancillary equipment to help them in their work. Amongst these aids are:

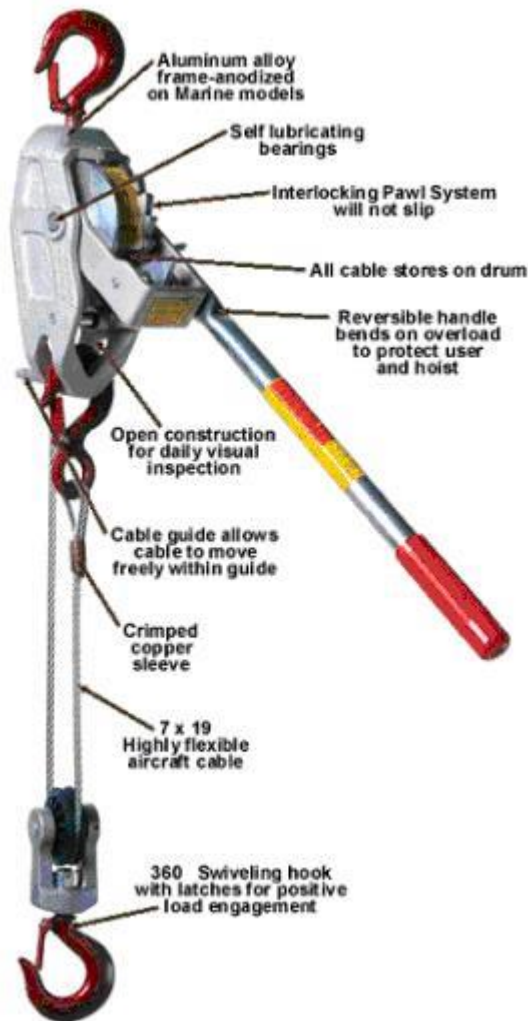
1. Motorised lashing machine: also known as a “cincher”. This is a modified chain saw that is used for tightening turnbuckles. Most have a slipping clutch that stops the device from turning when the chain has reached the correct tension. These machines can only be hired, but they are readily available at most load ports. The cost is about \$450-500 per usage.



*Motorised lashing machine*

2. Hand Winches: To assist with pre-tightening chains, there should be two or three sets of hand winches on board. These put a small tension on the chains before the turnbuckles are connected and made tight. If the pre-tightening is not done, the turnbuckles will be fully wound up before the chains are properly tight.





### Hand winch

3. Metal bars: After the turnbuckles have been fitted and are reaching the desired tension, the chain will twist unless it is prevented from doing so. This is done by inserting two metal bars or rods into the chain each side of the turnbuckle and jamming these between logs to prevent chain rotation. Bars about 400mm long and about 10mm diameter are quite sufficient.
4. Hog wire: These are fitted at an intermediate stage of the loading and are laid “hand-tight” only. The weight of logs loaded on top is what puts them under tension and allows them to give added support to the stanchions.
5. Wire clamps and spanners: If the ship is fitted with a “wobble wire” or “bonding wire”, rove through a series of snatchblocks connected to footwires, these have to be tightened with the crane. Then, while the crane is still maintaining tension on the wire, it has to be clamped with wire clips – minimum 3, preferably 4. Suitable adjustable spanners need to be on hand to tighten the wire clips. It is always desirable to have at least 3 spanners – if one is dropped between the logs or down onto the deck, use a spare to continue the operation and recover the lost one at some later time, thus minimising the time when the wire is being held by the crane.

(The need for a wiggle wire (bonding wire) is outmoded. Under the new 2011 TDC, this wire is no longer mandatory. Ships can now be lashed with individual chains or a combination of chains and wires, or even with fibre lashings. However, many ships still retain lashing plans approved by Class that call for a wiggle wire, so it has to be used. Fitting Wiggle wires is time consuming and is the most dangerous part of the lashing procedure. Using individual chains, wires or fibre lashings is much faster and safer for the crew. Some pictures of lashing arrangements appear below.)



*Lashing arrangement*

*(Note: the logs in this picture are debarked pruned logs and will probably be used for making plywood. The ones yet to be loaded are obviously going to some other customer, because these ones have been "marked-off" with red paint. Pruned logs are the highest value logs, but with the absence of bark are the most slippery and dangerous to walk on. Spiked overshoes are essential)*



*Completed vessel, fully lashed with a conventional lashing system, consisting of individual chains every 3 metres and a “wobble wire” system.*



*A closer view of a vessel lashed with individual chains and a “wobble wire” system.*



*Another ship, again conventionally lashed. This ship also has a wooden walkway the whole length of the vessel, as is done in North America. In New Zealand and Australia, crew fit a safety wire in lieu of a walkway and crew needing to go on deck wear harnesses with a lanyard that clips onto the wire at an appropriate point.*



*This ship is lashed with individual chains only, in which case the spacing of the chains should not exceed 1.5 metres. This uses more chain, but is much safer and quicker to fit. It also means that if any component fails (eg a turnbuckle or shackle), the ship has only lost one single lashing, which can be easily replaced at any stage of the voyage. If any component of a wiggly wire system fails, you lose 25% of the lashing system for that hatch, and you cannot replace it unless you can raise a crane, which is most unlikely if the ship is rolling or pitching.*



*Vessel being lashed with fibre lashings. These lashings comply with IMO regulations and are much easier and safer to fit. Quicker too, so the owner gets his ship to sea sooner.*



*Another view of the vessel lashed with fibre lashings.*

## DISCHARGING OF LOGS

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In general terms, discharge is a reverse of the loading procedure, but there are a great variety of systems between countries and even between ports in the same country. These vary from the highly efficient use of mechanical and motorised grabs, to gangs of men with crowbars and light wire slings, prising out individual logs, or groups of two or three logs, and discharging them. Stevedore performance varies from efficient and well thought out, to downright dangerous.

On completion of discharge, large volumes of bark will remain in the holds. Sometimes this is removed by stevedores and landed ashore in the discharge port, but in other places, this work has to be done by crew and the bark residues dumped at sea.

On completion of discharge, large volumes of bark will remain in the holds. Sometimes this is removed by stevedores and landed ashore in the discharge port, but in other places, this work has to be done by the crew. With respect to possibly dumping any leftover materials at Sea, vessels must keep in mind the requirements of both Marpol as well as local jurisdiction regulations before considering any such activity

## STEVEDORE DAMAGE

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During both loading and discharge operations, some stevedore damage is likely. Officers should be vigilant in noting such damages. Some stevedores will readily accept damages that are brought to their attention and which are clearly their doing, others will go to great lengths to avoid accepting any responsibility. In all cases, the Master must write a damage report and inform his owners and the local agent within 24 hours of discovering the damage and also try to get the stevedores to sign this report. If they will not, then the matter is passed to owners who will eventually settle the matter with charterers. Every charter party has specific clauses detailing how stevedores damages are to be resolved and Masters should be fully conversant with the content and meaning of these clauses. Good documentation of the damage is imperative to pass the claim up or down the charterparty chain and protect your interests.

Naturally, if the damages compromise the safety of the vessel and/or its seaworthiness, then they have to be repaired before leaving that port.

## CREW SAFETY

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### 1. Walking on the wharf:

- In almost all load ports, no crew are allowed to walk on the wharves because large log handling machines carrying logs have limited visibility. Crew going ashore are collected in vans or small busses provided by the port company. **Safety tip:** Officers who need to walk on the wharf to take draft readings and the like are all to be briefed on safety procedures and wear "hi-vis" (high visibility reflective clothing). Officers going overside to read the draft from a rope ladder should wear a slimline lifejacket. However, it is still a practice that is to be recommended, as is the practice of always having a watchman remaining on the deck while the officer is overside.

## 2. Falls:

→ The main danger to crew while loading logs is falling from a height during the raising of stanchions, or during the checking of stowage/stevedores damage, or during lashing. Such falls are usually serious and often fatal. Thankfully, such accidents are rare, but they do happen.

## 3. Safety tips:

→ All crew who have reason to go on deck when logs are being loaded need to be using spiked overshoes, sometimes called "corkers". These are readily available in the main loading ports, but in most log vessels there are sets already on board provided by the owners.

→ Crew also need a thorough briefing on the dangers of walking on logs and to be aware that some logs, although they look solid and secure might tip or twist under one's feet.

→ Crew should never take a chance and climb up or down a face of logs unless it is quite clearly safe to do so. If in doubt, wait for someone to bring a safety harness, or a ladder or some other safe means of proceeding.

## CREDITS

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