



Maritime and Coastguard Agency

Roll-on/Roll-off Ships: Stowage and Securing of Vehicles

Notice to all Shipbuilders, Classification Societies, Ship Owners and Ship Managers, Shipmasters and Ship's Officers, Ship Safety Officials and Other Persons employed on Roll-on/Roll-off Ships, Securing Equipment Manufacturers, Port Authorities, Shippers, Forwarding Agents, Road Hauliers, Stevedores, Freight Vehicle Manufacturers, Insurers, Railway Operators and Packers of Containers and Vehicles at Inland Depots

This notice should be read with The Merchant Shipping (Carriage of Cargoes) Regulations 1999; MCA Roll-on/Roll-off Ships-Stowage and Securing of Vehicles Code of Practice and replaces Merchant Shipping Notice No. M.1445

PLEASE NOTE:-

Where this document provides guidance on the law it should not be regarded as definitive. The way the law applies to any particular case can vary according to circumstances - for example, from vessel to vessel and you should consider seeking independent legal advice if you are unsure of your own legal position.

Summary

The Marine Accident Investigation Branch (MAIB) 2009 report on the investigation of the shift of an articulated road tanker on board the HSS Stena Voyager in Loch Ryan raised the following concerns;

- Compliance of freight vehicles presented for shipment at UK ports with the MCA guidance on ferry securing arrangements;
- Compliance of Roll-on/Roll-off (Ro/Ro) vessels with regards to the numbers of lashing points on ship's decks as required by the UK Code of Practice;
- Compliance with the approved cargo securing manual; and
- Proper use of chocks on wheels

This MGN reminds industry of the various applicable Codes and Standards which should be followed.

1 Introduction/ Background

- 1.1 An articulated road tanker crashed through a stern door of the high speed service (HSS) vessel Stena Voyager shortly after the ferry had commenced a scheduled crossing from Stranraer, Scotland to Belfast, Northern Ireland. The vehicle's semi-trailer came to rest on the vessel's port water jet units; its tractor unit remained on the

vehicle deck. The ferry was quickly stopped and her crew were able to make the vehicle secure before returning to Stranraer.

- 1.2 This MGN is a reminder of the appropriate UK regulations and guidance that address the concerns raised by the MAIB report. Extracts can be found in the annex to this MGN.

2 MAIB – Summary of Safety Issues

- 2.1 Parking brakes, including the parking brakes fitted to semi-trailers, are the first line of defence to prevent a vehicle from moving. The most effective ways of ensuring that this important action has been taken is to either confirm its completion with each driver or to undertake physical checks.
- 2.2 Lashing points on both the deck of the vessel and the chassis of the vehicle should be in accordance with the requirements of the appropriate regulations.
- 2.3 The wheels of wheel-based cargoes should be blocked to prevent shifting. This can be achieved by proper use of suitable chocks.
- 2.4 There should be an effective maintenance programme for all the portable and fixed securing devices. Web lashings to be marked and limited to a maximum working life.

3 Conclusions

- 3.1 Ships should ensure that cargo is stowed and secured in accordance with the approved Cargo Securing Manual (CSM).
- 3.2 The crew should be familiar with the requirements contained within the CSM.
- 3.3 Ships' officers and managers should carry out occasional checks on lashings during audits and inspections to ensure that bad practices are not taking place, especially on ferries where operations are rapid and very repetitive.
- 3.4 The condition of lashing systems should be monitored closely.
- 3.5 Parking wheel chocks should be positioned effectively when they are required to be in place.
- 3.6 Loading officers/crew should ensure that parking brakes are on and tractor units are in gear as appropriate. Positive checks should be made by ships staff accordingly.
- 3.7 Freight companies are encouraged to fit parking brake alarms to the tractor units as appropriate. This is particularly important if regularly transporting vehicles at sea.
- 3.8 Where there is reason to suspect that cargo within any unit is packed or stowed in an unsatisfactory way, or that a vehicle is in a bad state of repair, or where the unit itself cannot be safely stowed and secured on the ship, and may therefore be a source of danger to ship or crew, such unit or vehicle should not be accepted for shipment.
- 3.9 The master should not accept a road vehicle for transport on board his ship unless satisfied that the road vehicle is apparently suitable for the intended voyage and is provided with at least the securing points specified in section 5 of the annex to resolution A.581(14).

More Information

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Annex – Extracts from relevant regulations and guidance

1 The Merchant Shipping (Carriage of Cargoes) Regulations 1999

1.1 Regulation 6, Stowage and Securing, states that the owner and master shall ensure that:

- Appropriate precautions are taken during loading and transport of cargo units on board ro-ro ships, especially with regard to the securing arrangements on board such ships and on the cargo units and with regard to the strength of the securing points and lashings;
- Cargo on board is stowed and secured throughout any voyage in accordance with the Cargo Securing Manual; and
- Cargo on board shall be stowed and secured in accordance with the Cargo Securing Manual before the ship leaves a berth.

2 MCA - Roll-on/Roll-off Ships – Stowage and Securing of Vehicles Code of Practice

2.1 This Code, which includes the standards developed by IMO, provides guidance and information on safe procedures to be followed during Roll-on/Roll-off operations to reduce the risks to persons and ships.

2.2 This Code covers health and safety matters in addition to guidance on the stowage and securing of vehicles and incorporates appropriate IMO resolutions.

2.3 All parties associated with the design or operation of ro/ro ships, the design of vehicles, the safety of loads on vehicles and the stowage and securing of vehicles on Ro/Ro ships should take account of the Code of Practice to enhance the health and safety of persons and the safety of ro/ro ships.

3 IMO Resolution A.714(17) - Code of Safe Practice for Cargo Stowage and Securing

3.1 This Code applies to cargoes carried on board ships (other than solid and liquid bulk cargoes and timber stowed on deck) and, in particular, to those cargoes whose stowage and securing have proved in practice to create difficulties.

3.2 Chapter 4, Semi-standardized stowage and securing, states that:

- Ships intended for the carriage of certain specific cargoes such as road vehicles, systemized cargo-carrying roll-trailers and automobiles on ro-ro ships, etc., should be provided with securing points spaced sufficiently close to each other for the intended operation of the ship and in accordance with section 4 (Securing points on ships' decks), of the guidelines for securing arrangements for the transport of road vehicles on ro-ro ships, resolution A.581(14);
- Road vehicles intended for transport by sea should be provided with arrangements for their safe stowage and securing, as detailed in section 5 (Securing points on road vehicles) of the annex to resolution A.581(14);
- Vehicles should be stowed and secured in accordance with sections 6 (Lashings) and 7 (Stowage) of the annex to resolution A.581(14). Special consideration

should be given to the stowage and securing of roll-trailers carrying systemized cargo, road tank-vehicles and portable tanks on wheels, taking into account the effects of a tank's high centre of gravity and free surface; and

- The master should not accept a road vehicle for transport on board his ship unless satisfied that the road vehicle is apparently suitable for the intended voyage and is provided with at least the securing points specified in section 5 of the annex to resolution A.581(14).

3.3 Annex 4, Safe stowage and securing of wheel-based (rolling) cargoes, states that:

- When in stowage position, the brakes of a wheel-based unit, if so equipped, should be set;
- The wheels of wheel-based cargoes should be blocked to prevent shifting; and
- Cargoes stowed on wheel-based units should be adequately secured to stowage platforms or, where provided with suitable means, to its sides. Any movable external components attached to a wheel-based unit, such as derricks, arms or turrets, should be adequately locked or secured in position.

4 IMO Resolution A.489 (XII) - Safe stowage and securing of cargo units and other entities in ships other than cellular container ships

4.1 Guidelines on the safe stowage and securing of cargo units and other entities in ships other than cellular containerships states that:

- Cargo units and other entities should be stowed in a safe manner and secured as necessary to prevent tipping and sliding. Due regard should be paid to the forces and accelerations to which the cargo units and other entities may be subjected;
- Ships should be provided with fixed cargo securing arrangements and with portable securing gear. Information regarding technical properties and practical application of the various items of securing equipment on board should be provided; and
- Where there is reason to suspect that cargo within any unit is packed or stowed in an unsatisfactory way, or that a vehicle is in a bad state of repair, or where the unit itself cannot be safely stowed and secured on the ship, and may therefore be a source of danger to ship or crew, such unit or vehicle should not be accepted for shipment.

4.2 The information contained in the Cargo Securing Manual should include the following items as appropriate:

- Details of fixed securing arrangements and their locations (padeye, eyebolts, elephant- feet, etc.);
- Locations and stowage of portable securing gear;
- Details of portable securing gear including an inventory of items provided and their strengths;

- Examples of correct application of portable securing gear on various cargo units, vehicles and other entities carried on the ship; and
- Indication of the variation of transverse, longitudinal and vertical accelerations to be expected in various positions on board the ship.

5 IMO MSC/Circ.745 - Guidelines for the preparation of the Cargo Securing Manual (CSM)

5.1 Guidelines for the preparation of the Cargo Securing Manual states that:

- The Cargo Securing Manual is required on all types of ships engaged in the carriage of all cargoes other than solid and liquid bulk cargoes;
- It is important that securing devices meet acceptable functional and strength criteria applicable to the ship and its cargo;
- It is also important that the officers on board are aware of the magnitude and direction of the forces involved and the correct application and limitations of the cargo securing devices; and
- The crew and other persons employed for the securing of cargoes should be instructed in the correct application and use of the cargo-securing devices on board the ship.

6 IMO Resolution A.533(13) - Elements to be taken into account when considering the safe stowage and securing of cargo units and vehicles in ships

6.1 General elements – It is of utmost importance to ensure that:

- Cargo units including vehicles intended for the carriage of cargo in sea transport are in sound structural condition and have an adequate number of securing points of sufficient strength so that they can be satisfactorily secured to the ship. Vehicles should, in addition, be provided with an effective braking system; and
- Cargo units and vehicles are provided with an adequate number of securing points to enable the cargo to be adequately secured to the cargo unit or vehicle so as to withstand the forces, in particular the transverse forces, which may arise during the sea transport.

6.2 “Elements to be considered by the shipowner and shipbuilder” states that:

- The ship should be provided with an adequate number of securing points of sufficient strength, a sufficient number of items of cargo securing gear of sufficient strength and a Cargo Securing Manual.

7 IMO Resolution A.581(14) - Guidelines for securing arrangements for the transport of road vehicles on ro-ro ships

- 7.1 Shipowners and shipyards, when designing and building ro-ro ships to which these Guidelines apply, should take sections 4 (Securing points on ships' decks) and 6 (Lashings) particularly into account.
- 7.2 Manufacturers, owners and operators of road vehicles which may be transported on ro-ro ships should take sections 5 (Securing points on road vehicles) and 7 (Stowage) particularly into account.

8 Department for Transport Code of Practice – Safety of Loads on Vehicles

- 8.1 When a vehicle is carried on a ship, as in roll-on, roll-off ferry operations, the vehicle and its load will be subject to forces due to the rolling and pitching motions of the vessel. A restraint system that is suitable for road use will not necessarily be adequate at sea.
- 8.2 Vehicle operators intending to use ferries should ensure that their load restraint systems are capable of withstanding forces likely to be encountered at sea.
- 8.3 The securing of the vehicle to the ship is important and the vehicles should be fitted with lashing points that are of adequate strength to withstand the forces likely to be encountered at sea. The lashing points should be easily accessible to deck crew and not obstructed by fuel tanks, batteries etc. If necessary, advice on this latter point should be sought from the ferry operators.
- 8.4 The maritime rules also apply to domestic open water crossings such as the UK mainland to the various islands around it.

9 British Standard BS EN 29367 – Lashing and securing arrangements on road vehicles for sea transportation on Ro/Ro ships – General requirements

- 9.1 Part 1: Commercial vehicles and combinations of vehicles, semi-trailers excluded:-

This part of the standard specifies the minimum requirements to allow efficient lashing and securing of road vehicles on board Ro/Ro ships, indicating in particular the lashing arrangements on the vehicle and the securing methods to be used. It also gives, in Annex A of the standard, for information to vehicle designers, the securing point arrangements generally used on Ro/Ro ships as laid down by IMO recommendations.

- 9.2 Part 2: Semi-trailers:-

This part of the standard specifies the minimum requirements to allow efficient lashing and securing of semi-trailers on board Ro/Ro ships, indicating in particular the lashing arrangements on the semi-trailer and the securing method to be used. It also gives, in Annex A of the standard, for information to semi-trailer designers, the securing point arrangements generally used on Ro/Ro ships as laid down by IMO recommendations. In the Annex B of the standard, it gives for information some design indications to decrease damage during handling.

10 British Standard BS EN 12195 – Load restraint assemblies on road vehicles

- 10.1 Part 1: Calculation of lashing forces:-

This part of EN 12195 specifies acceleration coefficients for surface transport. It also gives methods of calculation of lashing forces acting on load carriers, Lorries, trailers and swap bodies, either on road, on vessels or by rail and /or combinations thereof for different types of load and different types of lashing.

10.2 Part 2: Web lashing made from man-made fibres:-

This part of EN 12195:

- specifies safety requirements for web lashing made from man-made fibres with flat woven webbings for multiple uses and of lashing combinations with woven webbings for the safe surface transport of goods on road vehicles, e.g. trucks and trailers which are used on roads or located on vessels or on rail wagons and/ or combinations thereof;
- includes only tensioning devices to be hand driven with a maximum hand force of 500 N;
- specifies methods for testing of web lashing for securing of loads;
- deals with the significant hazards which could occur when web lashings are in use as intended and under conditions foreseen by the manufacturer; and
- includes composite load restraint assemblies also for the same purpose as above.

10.3 Part 3: Lashing chains:-

This part of EN 12195 specifies safety requirements for lashing chains and lashing combinations with chain for the safe surface transport of goods on load carriers, e.g. trucks and trailers which are used on roads or located on vessels or on rail wagons and/or combinations thereof. The standard includes only tensioning devices to be hand driven with a maximum hand force of 500 N. It does not give requirements for multi-purpose lever blocks other than to the type of fine tolerance chain and the additional marking of the maximum hand-operating force.

This part of EN 12195 deals with hazards which could occur when lashing chains are in use as intended and under conditions foreseen by the manufacturer.

10.4 Part 4: Lashing steel wire ropes:-

This part of EN 12195:

- specifies requirements for lashing steel wire ropes and flat lashing steel wire ropes and lashing combinations with lashing steel wire ropes for the safe surface transport of loads on load carriers, e.g. trucks and trailers which are used on roads or located on vessels or on rail wagons and/or combinations thereof;
- stipulates procedures for testing lashing steel wire ropes and flat lashing steel wire ropes; and
- deals with hazards which could occur when lashing steel wire ropes and flat lashing steel wire ropes are in use as intended and under conditions foreseen by the manufacturer.