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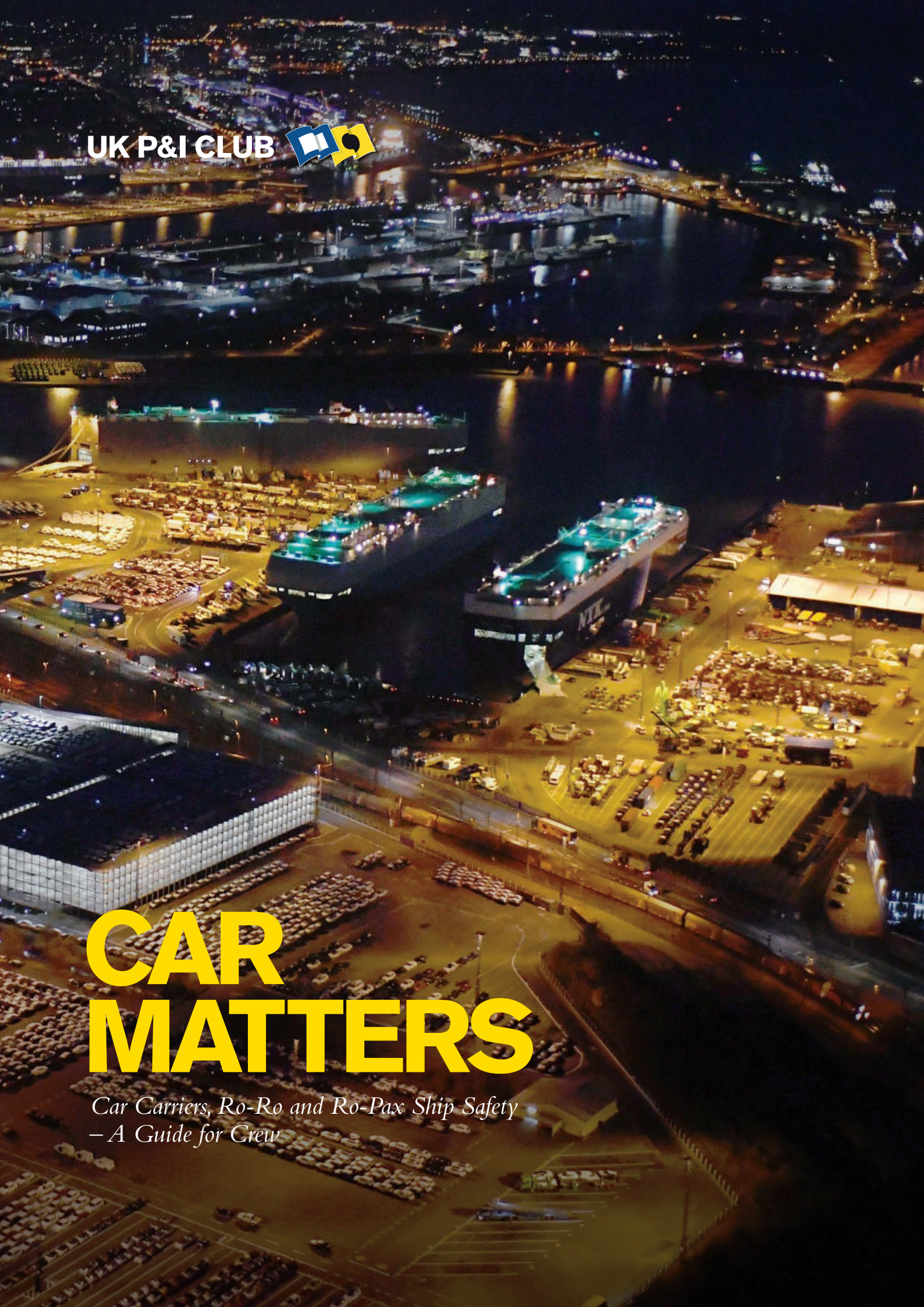


CAR MATTERS

Car Carriers, Ro-Ro and Ro-Pax Ship Safety – A Guide for Crew

CONTENTS

Car Carrier Incidents – a catalyst for change

This publication highlights some of the issues specific to car carriers, how those risks can be addressed, and provides helpful and practical advice for all seafarers and ship operators, or managers working with these ships.

There have been a number of serious incidents involving car carriers and other Ro-Ro passenger ships over the years. These incidents were the catalyst for a number of radical changes to the way that these ships are operated and new design features to improve the stability and safety.

Car carriers and Ro-Ro ships are characterised by their extensive covered cargo lanes above the main deck, each of which extends over a large area where any water ingress will rapidly affect the transverse stability. Similarly, any cargo shift can also reduce the available intact stability and the safety of the ship.

More recent incidents have demonstrated that despite developments and improvements, issues remain. Any problems concerning operations, stability and cargo securing should be considered carefully to ensure that risks and hazards are identified, recognised and mitigated.

CASE STUDIES – see pages 4-7

The following case studies have been selected to demonstrate specific issues that relate to these particular types of ships, and the way that how the various incidents have identified issues. Despite many controls and procedures being implemented following an accident, they have continued to occur.

'HERALD OF FREE ENTERPRISE'

- Ro-Pax – capsize due to loss of stability from water ingress through open bow doors.

'MODERN DRIVE'

- Disabled due to cargo shift and fire as a result of heavy weather.

'COUGAR ACE'

- Car carrier – loss of stability through incorrect ballasting exchange operations.

'RIVER DANCE'

- Ro-Ro – loss of stability through cargo shift in heavy weather.

'HERALD OF FREE ENTERPRISE'

Date: 6 March 1987 (30th Anniversary 2017)
Location: Zeebrugge, Belgium
Ship Type: Ro-Pax ferry
Fatalities: 193

'HERALD OF FREE ENTERPRISE'
(www.shipspotting.com – Chris Howell)

SUMMARY

'HERALD OF FREE ENTERPRISE' was a modern Ro-Ro car and passenger ferry built in 1980 to serve the Dover to Calais route. Loading of vehicles to the main vehicle deck was through watertight doors located at the bow and stern. The doors hinged to the ship's side on a vertical axis, which meant that they were not visible from the bridge when open. Loading of the upper vehicle decks was through a weather-tight door at the bow and open portal at the stern. Two decks could be loaded simultaneously at Dover and Calais using double deck link spans.

On the day of the incident, 'HERALD OF FREE ENTERPRISE' was operating on the route between Dover and Zeebrugge where there was only a single link span. This resulted in only one deck being able to be loaded at a time, however the shore ramp was not high enough to reach the upper vehicle deck. To solve that problem, the ship was ballasted and trimmed by the head so that the ramp could be used on the upper vehicle deck. The tanks were not de-ballasted before departure, due to the time constraints imposed to leave port at the earliest on completion of loading and/or discharge. This resulted in the ship leaving port trimmed by the head.

The first officer and the assistant boatswain were normally responsible for the closing of the bow doors prior to departure. On that occasion, the first officer returned to the bridge prior to letting go the moorings leaving the closing of the doors to the assistant boatswain. The assistant boatswain was however asleep in his cabin at the time of departure. The Master, who could not see the bow doors from the bridge, assumed that they were closed and so proceeded to sail from port with the bow doors open.

As the ship cleared port and increased her speed a bow wave developed. With the bow almost a metre lower than normal and the bow doors open, water rapidly entered and flooded the main car deck. The ship initially listed to port, briefly recovered and then capsized to port within 90 seconds of clearing the breakwater. Of the 460 passengers and 80 crew there were 193 fatalities.

Immediate Causes:

- Failure to close the bow doors
- Loss of stability following ingress of water and flooding of the main car deck

Underlying Causes:

- Ineffective communication
- Failure of crew to understand responsibilities
- Failure to correct trim prior to sailing
- Master sailing without confirmation that bow doors were closed
- Design of the ship with no watertight subdivision on the open car decks

Root Causes:

- Inadequate procedures in place
- Crew not following established operational procedures

'MODERN DRIVE'

Date: 26 May 2001
Location: 26 miles south-south west of East London, South Africa
Ship Type: Car Carrier
Fatalities: None

'MODERN DRIVE'
(www.cargolaw.com)

SUMMARY

The car carrier 'MODERN DRIVE' was on a voyage from Abu Dhabi to South America. During the passage around the South African coast, the ship encountered heavy weather and sea conditions.

The ship was reported to be rolling and pitching heavily in the rough seas and as a result, the lashings securing one of the ship's forklifts parted, allowing it to move across the vehicle deck. As a result, severe damage was caused to the cargo of cars and larger vehicles stowed on that deck. The fuel tanks of some of the vehicles were ruptured, which then resulted in a fire within the cargo space.

As black smoke entered the engine room, the crew believed that they were dealing with an engine room fire and the crew activated the engine room CO^2 firefighting system. With the main engine shut down, the ship drifted beam-on to the prevailing sea and swell, resulting in more cargo breaking loose and shifting causing a heavy list.

The ship was subsequently towed to Port Elizabeth where the damaged cargo was discharged.

Immediate Causes:

- Engine stopped due to CO^2 being released into engine room
- Heavy rolling due to rough sea and swell

Underlying Causes:

- Failure of cargo lashings
- Insufficient analysis of incident by crew
- Incorrect corrective action implemented

Root Causes:

- Failure to follow emergency procedures
- Failure to follow procedures or recommendations for securing of cargo

'COUGAR ACE'

Date: 23 July 2006
Location: 230 miles south of Aleutian Islands, North Pacific
Ship Type: Car carrier
Fatalities: 1 member of salvage team

'COUGAR ACE'
(image – U.S. Fish and Wildlife Service)

SUMMARY

'COUGAR ACE' was en route from Japan to the USA with a cargo of 4,812 vehicles. During the voyage the crew were carrying out ballast water exchange operations (BWE) in preparation for entering US waters. During that process, the ship's starboard ballast tanks failed to refill, which reduced the GM to zero. Loss of stability and wave action caused the ship to assume an angle of loll of 60 degrees to port, which meant that the propeller and rudder were no longer submerged. Sufficient righting moment remained at that angle of heel, due to the ship's large freeboard, and further listing to port and possible capsize was prevented.

The ship was salved and towed to the Aleutian Islands where portable pumping equipment was used to first increase the bottom weight within the ship. Once sufficient stability had been regained, it was brought upright again.

Immediate Causes:

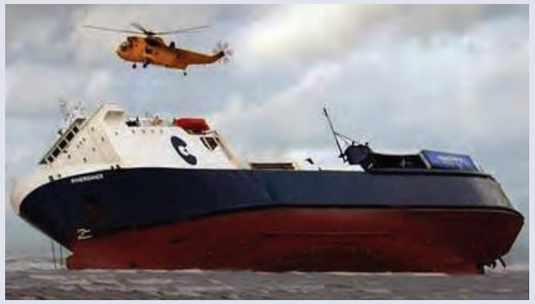
- Inadequate stability when carrying out the BWE
- Insufficient water maintained in the ballast tanks

Underlying Causes:

- Improper planning, monitoring and execution of BWE operations
- Lack of awareness of the situation

Root Causes:

- Failure to plan BWE properly
- Failure to monitor the ship's condition to ensure that adequate stability was maintained throughout BWE operations
- Insufficient guidelines concerning BWE operations in shipboard procedures



'RIVER DANCE'

Date: 31 January 2008
Location: Irish Sea
Ship Type: Ro-Ro passenger ferry
Fatalities: 0

'RIVERDANCE'
(image – www.fortunes-de-mer.com)

SUMMARY

'RIVERDANCE' was a Ro-Ro cargo ship that was certified to carry 12 passengers. The ship was operating on the route from Heysham to Warrenpoint in the United Kingdom. The cargo was predominantly self-drive trucks and freight trailers.

The ship departed Warrenpoint when weather forecasts predicted gales of force 8 to storm force 10 conditions in the Irish Sea. Departure draughts were read but no stability calculation was made prior to departure. Despite the prevailing weather conditions, the ship was noted to be only rolling gently due to her good seakeeping characteristics. However, as the ship approached shallower water of Heysham, the sea state worsened and the roll motion increased, resulting in some of the cargo shifting and causing an eventual list to port of around 35 degrees. The ship drifted towards the shore and eventually grounded with a list of about 5 degrees.

Various ballasting operations were carried out to prepare for a refloat attempt which failed and resulted in the ship grounding again with a 30 degree list to starboard. The ship was finally declared a constructive total loss and scrapped in situ.

Immediate Causes:

- Heavy rolling due to adverse weather
- Cargo shift

Underlying Causes:

- Departing berth in forecasted storms
- Internal cargo securing in taught liners was inadequate for forces experienced during sea passage
- True weights/centres of cargo unknown
- Stability not calculated before departure
- No consideration given to taking on ballast to improve seakeeping in bad weather

Root Causes:

- Inadequate procedures to ensure cargo properly secured
- Deficiencies in Safety Management System (SMS), with audits carried out by inexperienced personnel

Specific Features of Car Carriers/Ro-Ro and Ro-Pax Ships

Design Features of Car Carriers/Ro-Ro Ships

Car carriers and Ro-Ro ships have a number of design features specific to these types of ship. An awareness of these features and their influence in the context of ship safety is helpful when considering best practices for operating these ships.

Large external doors close to water line are a necessary feature in order to facilitate loading and unloading of vehicles but inevitably this results in an inherent risk of water ingress should there be any issue relating to the watertight integrity of these doors.

Large open decks and few internal bulkheads are required to allow for the efficient movement and stowage of vehicles. The inherent risk with this aspect of the ship arrangement is the rapid loss in stability due to very large free surface moments, should these decks become flooded.

Movable internal decks provide flexibility to accommodate various size cargoes, i.e. more automobiles can be carried with the moveable decks in place. The decks can be raised to allow for larger vehicles, such as mobile cranes or earth moving equipment, which are significantly greater in height than the average car or truck, to be loaded and carried as cargo. Such cargo can result in a high vertical centre of gravity which can lead to these ships operating close to the minimum requirements for stability.

A high, wall sided design is utilised to completely enclose and protect cargo spaces, but this results in large windage areas which can result in lists developing when manoeuvring, especially if the GM is low.

Stabilisation Systems

Passive Tank Stabilising System

These work by controlling the motion of water sloshing in a single tank so as to counteract the roll motion of the ship. The tanks are fitted with baffles, or narrowed sections, in order to slow the rate of flow of water from port to starboard, and vice versa, so as to effectively trap a large amount of water on the higher side of the ship and hence reduce the roll motion. The effect of passive roll tanks is essentially the opposite of the free surface effect. Passive stabilisation systems do not require a power supply or control system.

Passive roll tanks generally utilise a U shape, the two side tanks connected by a narrow duct below and sometimes an air duct above. The benefits of this arrangement are the high centre of gravity provided by the side tanks, the control over flow of water via the ducts (using valves and pumps) and the positioning of the system away from the usable cargo space of the ship.

Other passive systems include bilge keels and fixed stabilisation fins.

Active Stabilisation Systems

Active systems all require a power supply and a control system in order to respond to act against the rolling of the ship.

Active roll tank systems use a pump to force water from one side of the ship to the other rather than the passive system that just allows the water to slosh from side to side.

Active stabilisation fins use a gyroscope system to detect the roll motion of the ship and then send a signal via an actuating system, to the fins to adjust their position so as to counteract the roll motion. The fins are usually located at the turn of the bilge so as to provide the maximum righting moment to act against the roll moment.

Operational Good Practice

Cargo Information

Details of the cargo offered for shipment should be accurately described by the shipper, all details including the dimensions, weight, nature of the cargo, IMDG class and UN number, in the case hazardous cargoes, should be provided to the Master well before loading.

Special instructions should be provided for the cargo where relevant, including, for example, set temperature for temperature controlled goods or special stowage instructions for dangerous cargoes.

Shipper's Responsibilities

The Shipper has responsibility for providing the following:

- Suitable freight vehicle or cargo transport unit (CTU), clean, certified and free of any residues or noxious material.
- Vehicles that are structurally sound, free of defects, in good working order and have effective braking system.
- Cargo suitable for sea transport with an adequate number of securing points of sufficient strength to ensure proper securing of vehicle with cargo lashing equipment provided on board.
- Details relating to the cargo as provided by consignor and packer.
- Cargo properly stowed and secured with suitable lashing equipment within the CTU, flat bed trailers.

For stowage of vehicles / containers reference can be made to the IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units (CTU Code) which was approved by the IMO MSC.1/Circ 1497 on 23 May 2014.

The code of practice for packing of CTUs. The CTU Code (2014) replaces and updates the 1997.

IMO/ILO/ UNECE guidelines for packing of CTUs. Although non-mandatory, the CTU Code provides comprehensive information and references on all aspects of loading and securing of cargo in containers and other intermodal transport, taking into account the requirements of all sea and land transport modes.

Carrier's Responsibilities

The carrier is responsible for the safety of the cargo from the port of loading to the discharge port as per the agreed contract of carriage.

It is also the carrier's responsibility to ensure that the cargo offered for shipment is properly cared for during the voyage, this includes ensuring that the cargo is properly stowed, handled, secured and monitored during the voyage.

Depending on the duration of the voyage and the prevailing weather encountered, periodic checks should be carried out on the cargo lashings to ensure that lashings have not slackened due to vibration.

Regular rounds of the cargo decks should be carried out to ensure that no flammable or hazardous liquids have leaked from cargo.

Implementation of any special requirements, which have been advised by the shipper, such as temperature monitoring and control are also the responsibility of the carrier.

Cargo Stowage

The movement, stowage and securing of cargo should be supervised by a responsible ships officer.

Loading procedures should be adhered to and cargo should only be moved if directed by a Ships Officer or a person trained in vehicle deck operations.

Communication channels between the ship and stevedores should be agreed prior to loading and drivers should be warned of potential hazard, a high pitched whistle may be useful for attracting attention on the cargo decks.

Generally, stowage should only be in the fore and aft direction. If athwartships stowage is necessary then this should be discussed with the Master.

Stowage should not obstruct any equipment, controls for access doors, access to sounding pipes, stairways or controls for deck scupper valves.

Where there is a low degree of frictional resistance, as found with tracked vehicles stowed on deck, special consideration is required and soft board, plywood, dunnage or rubber mats should be deployed prior to being secured.

International Maritime Dangerous Goods (IMDG) Cargo

Detailed guidance is provided by MSC.1-Circ.1440 – Illustrations of Segregation of Cargo Transport Units on Board Containerships and Ro-Ro Ships (1 June 2012). The following main points should be considered by way of a summary;

- IMDG cargo should be properly labelled, segregated, declared in accordance with the IMDG Code.
- The correct dangerous goods labels should be clearly visible on the outside of containers or vehicles.
- Vehicles carrying dangerous goods should be inspected for damage or leakage prior to loading, if damage is found the vehicle should be rejected for shipment and the Master informed.
- Further reference should be made to the MCA Marine Guidance Note 21 (MGN 21) – The Carriage of Dangerous Goods in Ships with Ro-Ro Cargo Spaces.

Cargo Securing

The following notes provide some guidance as to some of the important considerations when securing cargo:

- Cargo should always be secured in accordance the approved cargo securing manual (CSM).
- Cargo securing equipment should be well maintained and certified as per requirements of CSM or SMS.
- Vehicles should be properly parked, the engine switched off and the brakes applied prior to being secured. Wheels should also be chocked.
- Cargo should preferably be secured in the fore/aft direction.
- Lashings on vehicles should all be under equal tension.
- Special consideration should be made for large vehicles, tracked vehicles and any cargo with high centre of gravity with additional lashings applied.
- Consideration should be given to weight of cargo, dimensions, expected sea conditions and stowage position on the ship (e.g. high outboard cargo will be subjected to higher accelerations).
- Fragile cargo should be stowed towards the centreline of the ship and on lower decks.
- Where cargo is stowed at the ends of the ship and on the upper cargo decks additional precautions should be taken when lashing to minimise the large forces that will act on cargo in a heavy sea due to pitching.
- Securing should be completed prior to leaving berth.
- For further guidance see MCA MGN 418 -Roll-on/Roll-off Ships: Stowage and Securing of Vehicles. (28 July 2010).

Ships Equipment

The following guidance notes refer to the use of the ships equipment:

- Only authorised, properly trained and competent personnel should operate ships equipment such as forklifts, moveable decks, car platforms and cargo ramps.
- Equipment used for cargo operations should be fit for purpose, tested, certified and not subjected to more that its certified safe working load (SWL).
- Loose equipment should be stowed and lashed prior to departure.
- Emergency equipment to handle leaks and spillages should be available on all car decks.
- Cargo securing gear should be of sufficient strength for cargo carried.

Safe Access

Safe access to cargo spaces is essential both during loading and discharge operations but also when underway in order to check lashings. The following points should be referred to in this respect:

- Emergency escape routes, walkways and doors should not be obstructed by either cargo or cargo lashings.
- Walkways should be well marked and illuminated.
- If cargo ramps are used for personnel access to and from the ship special consideration should be made and separate walkways demarcated by barriers should be used, this is especially important if simultaneous cargo operations are ongoing.
- Access doors and hatches required for cargo operations should be checked and fully operational, those accesses not required should be closed and protected against use.
- Safe access must be maintained in order to check lashing arrangements when underway.
- On Ro-Pax ships no drivers or passengers should remain in vehicles during passage and drivers should spend as little time as possible on the car decks prior to disembarkation.

Ventilation

Vehicle decks should be adequately ventilated at all times; this may require ventilation fans to be operated continuously during short passages to remove the accumulation of hazardous gasses and fumes.

Officers should pay particular attention during loading or discharge when there may be an accumulation of fumes on the vehicle decks, in addition the carriage of flammable gasses or liquids will require additional ventilation.

General Safety Precautions

Crew working on vehicle decks should wear appropriate personnel protective equipment (PPE) at all times including high visibility vests.

The risk of fire on a vehicle deck is a real possibility given the nature of the cargo, ship's crew should enforce the 'NO SMOKING' rules and ensure that signage is clearly visible. In addition, the location of fire-fighting equipment should be clearly marked and all apparatus checked on a regular basis. The stowage of cargo should not obstruct the access to fire hydrants of fire-fighting equipment at any time during loading or discharge.

Lighting on the vehicle decks and accesses should be checked regularly.

Any spillage of either oil of fuel from vehicles should be cleaned up immediately, if necessary cargo operations should be suspended until the area is considered safe.

Safe access to the ship should monitored during cargo operations, all cargo ramps and pilot/ personnel access doors should be provided with a lifebuoy and a self-activating light while the ship is alongside.

Safety rails and nets should be correctly positon prior to the commencement of cargo operations and maintained in place for the duration of operations.

Stability

The importance of ship stability should not be underestimated.

The Chief Officer, or Officer responsible to the Master for the ship's stability, should ensure all the relevant information relating to the cargo both discharged and loaded in the current port is provided to the Master. The Chief Officer should also ensure that the Master is aware of any cargo that has been shifted within the ship during cargo operations as this will have an effect on the final distribution of loads within the ship and the final departure condition.

The ship's actual tank condition should be accurately checked by soundings and recorded prior to the departure condition for the ship being calculated, this should include all fuel oil and water ballast tanks. It is also important to ensure that the ullage within the tanks is minimised to reduce any free surface effect on the ship's stability. If sounding gauges are not available then manual soundings should be taken to confirm tank contents. Inaccurate tank soundings can quickly add up and lead to critical losses in stability which cannot be identified until the ballast arrangements are confirmed.

The stability calculation to determine the ship's departure condition should be carried out on completion of cargo operations and prior to the ship's departure. The calculation should take into account the actual tank conditions/soundings and be reconciled with the draught readings observed on completion of cargo operations. Any discrepancies between the loading computer/calculated results and the draughts/soundings should be investigated and clarified before departure.

Sufficient time should be allowed for the stability calculation to be completed following the completion of cargo operations and prior to the departure of the ship. The Chief Officer and Master should ensure that open communication is maintained to ensure that any issues can be dealt with as required.

The master should ensure that the ship's calculated stability meets or exceeds the IMO stability requirements for the entire duration of the intended voyage. If there is any doubt as to the actual stability condition of the ship then the departure of the ship should be delayed until such time that the Master is satisfied that adequate stability is demonstrated for the intended voyage.

Car carriers and Ro-Ro ships are inherently less stable than other ship types and this must be heeded when considering departure condition stability. The major incidents relating to these ships were all caused by stability problems either directly or indirectly.

Communication

The Master should ensure that prior to cargo operations commencing, a meeting is held between the ships staff responsible for cargo operations and the terminal/ stevedores responsible for loading the ship. This is to ensure that all parties understand their roles and responsibilities and that the ships requirements with regards to cargo operations are fully understood.

Clear lines of communication should be agreed to by all parties engaged in cargo operations.

Crew should remain vigilant throughout cargo operations and should be encouraged report any irregular observations or concerns to the cargo officer as soon as possible.

Personnel engaged with cargo operations should, as far as practicable, not be given additional duties which may interfere with their primary task.

All crew should be encouraged to openly discuss, to raise any concerns or issues that they have and that relate to safety on board, with a senior officer at any time.

The types of incidents that occur to car cargoes on PCCs

This guide aims to break down the of types of incidents that occur to car cargoes, listing the incidents, the cause of incidents, identifying any documentation needed and identifying any loss prevention steps that can be taken.

Key references to note

Sub-Contractor could be:

- The load port terminal
- The transhipment port terminal
- The discharge port terminal
- The stevedoring company

The Merchant under the bill of lading could be:

- The notify party
- The shipper
- The consignor
- The consignee
- The owner and receiver of the goods
- The holder of the original bill of lading
- Any other party acting on behalf of the holder

The mandatory Claim Documents should be:

- The statement of claim
- Copy of the original bill of lading
- Proof of title to the goods
- The commercial invoice
- The packing list
- An independent surveyor's/expert's report

Contamination		
Cause 1. Sand storms 2. Dust storms	**Documents needed** Bill of lading NVOCC if applicable Bill of lading Car manifest Cleaning invoices Mandatory claim documents (see above) Photographs Weather records Witness statement if any Ship incident report documents	• If decks are closed decks (i.e. ventilation is by mechanical means only), consideration to be given to stopping ventilation fans and for fan fire dampers to be closed. If accessible, fire dampers to be brushed clear of any sand/dust before restarting mechanical ventilation. • If decks are open decks, it may be possible to rig tarpaulins over the ventilation openings in an attempt to reduce the amount of sand/dust that may enter the deck. If this is a regular issue, consider fitting louvres in way of the vent opening but check that the Class designation of the deck is not affected by doing so. • Close scrutiny of weather forecasts is recommended to provide as much time as possible to carry out any precautions considered necessary.
Cause 3. Leakage from ship systems	**Documents needed** Deck inspection reports Deck maintenance records Ship incident report documents	• Decks to be inspected regularly when cargo is not loaded to check for pipe system leaks. Hydraulic oil is extremely aggressive towards some vehicle paints – pipework for such systems (for hoistable rampways, vehicle decks, etc.) should be regularly and carefully inspected for leakage. Any leakages found should be quickly repaired and any oil contamination of the deck should be cleaned using suitable detergents. • Sea water service systems and fire mains should also be regularly inspected for integrity. Leaking fire hydrants can lead to pooling in way which can then be disturbed by wind bowling through the deck leading to salt contamination of the paintwork and underbody of the vehicle.
Cause 4. Shipboard maintenance and operational activities	**Documents needed** Permit to work Risk assessment	• Prohibit paint application by spray throughout all the ship's vehicle decks when cargo is onboard. • Paint application by brush or roller should only be permitted on vehicle decks which are empty of cargo. • When decks are painted, suitable planning should be employed to ensure paint is fully cured before cargo loading operations are scheduled to commence (especially important when decks have been painted). • Use of angle grinders and similar equipment should not be permitted on vehicle decks carrying cargo. • Shipboard permits to work and risk assessments should consider potential damage to cargo as well as damage to the ship and injury to personnel. • Be aware of the location of all oil tank air vents and overflows. Although extreme care needs to be taken when filling oil tanks, additional care should be exercised when air vents are near to car decks. Consider the action of wind swirling causing oil particles to be taken away from the vent which may then be deposited on cars, if these vents are near to car decks.

	Cause	Documents needed	
Delayed car cargo delivery	**1. Collision** **2. Grounding** **3. Fire on board** **4. Engine failure** **5. Bad weather**	**Bill of lading NVOCC if applicable** **Bill of lading** **Car manifest** **Letter of protest by owners** **Letter placing Owners on notice** **Letter placing sub-contractor on notice** **Mandatory claim documents (see above)** **Photographs** **Relevant correspondence with the sub-contractor** **Sub-contractor's contract with Member** **Sub-contractor's damage/loss report** **Weather records** **Witness statement if any**	• These risks are generally outside of the control of the ship's crew except that with careful passage planning, bridge operational procedures, training and correct maintenance procedures most of these risks can be mitigated to some degree. • The use of weather routing passage guidance and analysis of weather forecasts (descriptive and map type) can reduce the probability of encountering poor weather sufficient to cause damage to the ship and cargo.
Dents and Scratches	**Cause** **1. Stevedore's improper handling of vehicles at the terminals**	**Documents needed** **Bill of lading NVOCC if applicable** **Bill of lading** **Letter placing sub-contractor on notice** **Mandatory claim documents (see above)** **Photographs** **Relevant correspondence with the sub-contractor** **Repair invoices** **Sub-contractor's contract with Member** **Sub-contractor's damage/loss report** **Witness statement if any**	• Control of stevedores driving cars on and off the ship is difficult – vigilance by ship's crew is essential such that any improper handling is noted and immediately reported to ship's command and to the terminal/stevedore managers. Consider issuing a Note of Protest. • Clearly identify structures within the cargo deck area (deck support columns, etc.) which may be occupied by vehicles with by high-vis paint, reflective warning markers, etc. • Apply cushioning tape or panelling on such structures to prevent damages to doors should these be opened when obstructed by the structure. • Ensure ramp way sides are clearly identified to ensure vehicles remain on ramp ways when loading or discharging. Consider fitting "kerbs" at the sides of the ramp way (for example C-section beam). Check that these will not obstruct vehicle skirts and valances. Check the overall weight of the ramp way after any additions remains within the SWL of the lifting arrangements. • Highlight deck head obstructions and areas where overhead clearance is marginal. The use of high visibility paints, fluorescent warning boards, flashing lights or lighting to illuminate and draw attention to the hazard should be considered. • Most cargo decks are painted which can become very slippery when wet (as does bare steel). To reduce the risk of cars sliding into deck structures, hull stiffening or each other, consider the application of non-slip deck aggregate (as used on roads to increase friction on corners and at traffic control lights).

Dents and Scratches			• Although zinc silicate type paints give increased corrosion resistance they create a fine dust which reduces friction and can lead to vehicles sliding over the deck. The use of zinc silicate paints should therefore be carefully considered for coatings on vehicle decks. • Ensure lane markings and guidance arrows are painted on the deck in order that cars may be guided around obstructions and correctly parked. • Car deck maintenance work (such as "lamping up") should only be carried out when the deck is empty of cargo to reduce the risk of crew inadvertently damaging cars while transiting the deck or carrying out work in it. • Fire exercises for car decks to be restricted to discussion when cargo is loaded with opportunity taken to hold a more practical exercise after cargo has been discharged or on car decks that are empty of cargo.
	Cause **2. Movement of vehicles in a seaway**	**Documents needed** **Lashing equipment test certificates**	• Light vehicles (cars & small vans with mass <2 tonnes) may not be regularly lashed to the deck or to transverse lashing chains. For long sea voyages, the need to lash should be considered at each loading port. • Long range weather forecasts, predominant weather condition data, etc., for the voyage route to be consulted to assist in deciding if lashing is required. • For coastal voyages, weather forecasts should be consulted to provide assistance in making the decision to lash light vehicles. • The ship's lashing manual should consider this need and provide guidance accordingly. The lashing manual should always be complied with. • Vehicles with a mass >2 tonnes should always be lashed or as set out in the cargo securing manual. • Any loose items seen in car cargo should be securely stowed; details of such work to be recorded in deck/cargo log book. Care to be taken that security seals on doors, etc., are not compromised. • Lashing equipment should be regularly inspected and tested with records maintained of these inspections. Test certificates (normally batch type certification) provided on new supply and after periodical test to be kept on file.

Theft of car parts	Cause	Documents needed	
	1. Stevedores 2. Crew	Bill of lading NVOCC if applicable Bill of lading Letter placing sub-contractor on notice Mandatory claim documents (see above) Part replacement invoice. Photographs Relevant correspondence with the sub-contractor Sub-contractor's contract with Member Sub-contractor's damage/loss report Witness statement if any Confirmation that crew have been briefed on the penalties that will result from the theft of items from cargo	• Control of stevedores employed to drive cars on and off the ship is difficult, vigilance by ship's crew is essential such that any improper handling or suspected pilfering is noted and immediately reported to ship's command and to the terminal/ stevedore managers. Consider issuing a Note of Protest. • Owners to make clear to ship's crews the penalties that will result if theft from car cargo is suspected or proven.

SOLIS
MARINE CONSULTANTS

Solis Marine Consultants was established in the UK and Singapore in 2012 to provide independent expert advice on maritime and shipping incidents. A third office was opened in Hong Kong in 2013 to expand on operations in the region and to extend the range of services and expertise provided by the organisation.

Senior consultants have all given expert evidence in Court and Solis Marine also has three Special Casualty Representatives on the panel at Lloyd's who have been heavily involved in a number of high profile and politically sensitive wreck removal and salvage operations. Naval architects all have practical salvage and wreck removal experience working both on behalf of vessel owners / insurers as well as for salvors directly.

Expert reports have been prepared for court and arbitration hearings on collisions, groundings, tugs and manoeuvring, unsafe ports and berths, cargo issues, passage planning, personal injury, vessel operations, prudent seamanship and damage to submarine pipelines.

www.solis-marine.com

Richards Hogg Lindley

Richards Hogg Lindley, a world leader in the average adjusting profession, have an in-house team of marine engineers providing the adjusters and others in the insurance market with independent advice relating to the technical aspects of marine insurance claims. Our marine engineers also attend casualty sites to effect damage surveys from time to time.

RHL can trace its origins back to the early part of the 19th century at a time when maritime trade exploded with many commodities being shipped to differing markets around the globe. With this, accidents occurred, as they continue to do so today, that result in claims against insurance policies. But, unlike today, in the late 1700's there were very few professionals in the market with the ability and knowledge to apply the various policy clauses correctly.

This lack of readily available knowledge relating to the application of marine insurance policies was commented on in a book by a Mr Weskett leading to the emergence of the average adjusting profession with William Richards (the 'Richards' of Richards Hogg Lindley) being one of the first to refer to himself as an average adjuster.

Over the years RHL has gone from strength to strength and includes an in-house Marine Technical Services department being established many years ago. This department continues to expand at a steady pace providing advice to Richards Hogg Lindley offices worldwide and also to colleagues within the various departments of the now parent company of Richards Hogg Lindley.

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