ICHCA INTERNATIONAL

SAFE WORKING AT RO-RO TERMINALS

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Warning

This document provides an introduction to safe working at ro-ro terminals. For detailed advice it is necessary to read this in conjunction with the relevant national and international legislation and guidance.

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1. | INTRODUCTION

This publication is written as general guidance for use within all types of Ro-Ro terminals. It is recognised that it may not always been reasonably practicable to comply fully with this guidance, nevertheless it should form the basis of operational procedures within all such terminals.

The majority of serious accidents in Ro-Ro terminals are due to the mixing of people with heavy mobile machinery, the drivers of which often have restricted visibility. As a general basic principle, the aim should be to avoid the exposure of pedestrians to such plant. When this cannot be done, exposure should be minimised by separating them.

Shipboard accidents may be the result of defects on board ships such as inadequate lighting, defective equipment or poor access. Though these may be outside the control of the port or terminal operator, such defects should be brought to the notice of both the Master and the shipping line with a view to improvement. In all cases however the duty holder such as a port, terminal or service provider remains responsible for ensuring the safety of their employees and others who might be affected by their operations. In view of the mixed nature of groups working on Ro-Ro decks (seamen, lashers, cargo handlers, etc.), close co-operation between all parties is essential.

2. | GENERAL RESPONSIBILITIES

Terminal management should draw up rules for safe systems of work and operational procedures to ensure the health, safety and welfare of all their workforce and terminal users. The procedures should include contingency plans for any emergency.

Safety rules should be applicable to ALL people entering Ro-Ro terminals, not only terminal operation staff. These should include management maintenance and engineering staff, marine services staff. Customs, Immigration, Port Health, ships' crews, shipping agents, contractors and people in vehicles carrying goods to the ship in the form of stores etc.

Terminal management should ensure that Personal Protective Equipment (PPE) is worn by all employees and visitors where appropriate. Such PPE should be provided to all employees and to visitors as identified by suitable and sufficient risk assessment. It should include, but is not limited to, high visibility clothing, head, hand and foot protection. Employees and visitors should accept and wear such PPE in areas designated by management as guided by national legislation.

Employers should put into place a means by which employees and others can report any defect in plant or equipment. The reporting mechanism should be communicated to employees and any others who might need to use it. There should be a procedure to ensure that reports generated through the system are assessed and appropriate action is taken.

Terminal management should ensure appropriate first aid facilities are provided, bearing in mind national legislation and the possible effect on numbers of first aiders available caused by moving shift patterns, holidays etc.

Due to the difficulty of lashing on Ro-Ro decks arising from the construction of vehicles and the weight of lashing systems used, attention should be paid to the provision of manual handling training for the lashers and the possible need for them to be lashed and wear extra PPE (e.g. knee protection, lights on helmets etc).

Terminal management should also consider other occupational health concerns that may arise in connection with terminal operations. Such matters may include factors induced by shift patterns, hours worked and night work, plant ergonomics or the effects of leakage of dangerous substances. Any health related environmental monitoring that may be required should also be considered. For example, noise levels within the area of work (particularly relevant when good communication is necessary), exhaust fumes within Ro- Ro deck spaces or nuisance dust from neighbouring bulk cargo operations may need to be assessed and the effects controlled.

Terminal management should have a policy concerning substance, alcohol and drug misuse, as well as to the use of medicines that may affect safety performance. Alcohol should not be consumed or sold within terminals.

No employee should be permitted to start or continue work whilst under the influence of drink or drugs or continue to work if their ability to operate safely is impaired in any way. Drink and drug policies should take into account the fact that drugs used in medication may also impair judgement.

Only competent personnel should be used in RoRo operations. Training should take into account not only established working practice but also changes and new practices. It should also include the need for planning, safe systems of work and periodic re-assessment of personnel. Refresher training should be provided as appropriate.

Care should be taken to ensure that cargo transport units containing dangerous goods are correctly placarded, marked and signed, the contents are known and systems for control both on the terminal and for correct loading patterns are maintained.

No welding, burning or open flame cutting should be undertaken without permission from the terminal operator and/or Port Authority, as appropriate, such hot work may, in specified circumstances, require a 'Hot Work Permit'.

Trailer or other repair work which has to be carried out for reasons of safety on the terminal should only be carried out in an area allocated for such work after authorisation by the terminal operator or Port Authority.

3. | TERMINAL ACCESS AND EGRESS

Where practicable a Ro-Ro terminal should be fenced off and access controlled at the gate. The terminal access/egress road should be fitted with gates or barriers and controlled by a responsible person in the employ of the port authority or terminal operator. Surveillance may

also be used and, for example, the waterfront area can be guarded by means of video cameras with 360° capability and which switch over to infra-red at night.

No persons or vehicles should be allowed into the terminal without authorisation of the terminal operator or the port authority, as appropriate.

Persons and vehicles having received authorisation to enter the terminal should be directed along a safe route or be escorted by a responsible person. Some terminals issue a terminal map with driving and safety instructions and an identification code to enter/leave the terminal. This code will only be valid for a limited period of time. Some terminals do not allow the private cars of stevedores, terminal operators or forwarders onto any part of the terminal.

(Fig 1) Signposting a walkway

Within the area of the terminal, bridge or ramp and ship, all vehicular traffic should be driven at a safe speed, identified by risk assessment and communicated to all drivers. Speed limits should take into account potential for changing conditions.

It is the driver's/haulier's responsibility to ensure that their trailer is safely and correctly parked on the indicated slot and braked before leaving it.

Adjustments should not be made to such items as lighting or sheeting of trailers in bays on the park. This should be carried out in a safe area elsewhere. There should be no unauthorised working or walking in the trailer parking area.

No private cars, cycles, motorcycles, taxicabs or deliver vans, e.g. ships' chandlers, laundry or repairers should be allowed on the quayside unless special arrangements have been made with Operations Control or an escort is provided.

4. | PASSENGER SAFETY

All foot passengers should be kept segregated from vehicular traffic. They should board or leave the ship by a fit for purpose passenger gangway and cross operational areas by suitable accessways.

If vehicular passengers are required to leave their vehicles on the terminal for any reason, e.g. for customs checks or security searches, they should only do so in a controlled area.

For the safety of all, attention should always be paid to security at terminals handling passenger traffic as such terminals may be considered possible targets for extremist groups.

Sufficient marshals and signing should be provided to ensure the safe transit of passenger driven vehicles to and from terminal gates and their designated parking area on board the ship.

Safe systems and routing should be put into place to allow passengers to cross car decks between their vehicles and the passenger accommodation. The systems should address the range of likely passenger access needs including but not limited to age and ability.

Attention should be paid to the embarkation/disembarkation of passenger coaches where large numbers of people are involved. This may be better carried out on shore and such persons treated as foot passengers.

5. | QUAYSIDE SAFETY

A clear approach area of adequate size as determined by risk assessment should be maintained at the landward end of each Ro-Ro bridge. This area should be marked by painted hatched lines and "Keep Clear" notices should be erected and maintained – No vehicles should be parked in such areas.

If a quarter ramp ship is worked and such marking is not possible, the approach should always be monitored by the terminal in accordance with instructions from the gate or control. In such circumstances, a similar clear zone should be provided to guarantee a safe site for all vehicles going into/out of the ship. Enough free space should be left at all times around and near the ship's ramps to maintain this safe site and it should be regularly monitored.

Control should be maintained at each bridge or ramp head to prevent unauthorised access/egress to the bridge or ramp during the process of loading or unloading.

6. | SHIP ACCESS AND EGRESS

All ships should provide and rig gangways and safety nets or provide an alternative safe means of access/egress. This should then be the only means of access/egress used by pedestrians.

Only persons engaged in the process of loading or discharging cargo, including self-drive passenger traffic, should be allowed onto the bridge or ramp. All other persons including ship and terminal personnel, passengers and visitors wishing to board or leave the ship should use the ship's gangway, where provided.

Where the layout of the Ro-Ro berth and/or the construction of the Ro-Ro ship does not allow the use of gangways for pedestrian access to the ship and the pedestrian access has to be via the ship's vehicle ramp, the terminal bridge should provide for safe pedestrian access (of passengers, crews, workers and others authorised to board the ship) by means of a raised walkway, or where this is not practicable by areas marked (in painted hatched lines) and signposted for the exclusive use of persons crossing on foot. Consideration should be given to prohibiting vehicular traffic movement during pedestrian movements and vice versa , e.g. by a traffic light system or manual control.

Access to the bridge or ramp during loading operations should be controlled by a responsible person stationed at the landward end of the bridge; it may be advisable in certain circumstances (e.g. if the ramp or bridge is exceptionally long) to place a second responsible person to control access on the ship-side of the bridge.

Suitable warning notices should be posted at the bridge/ramp identifying control.

Where reasonably practicable, pedestrians and vehicular traffic should also be segregated on the ship. If practicable, this may be by stanchions and ropes.

Controls should be put into place to prevent pedestrians boarding or leaving the ship via the ramp, stepping into the flow of vehicular traffic on the ramp or bridge.

7. | BRIDGES AND RAMPS

Bridge, bridge plates and ramp levels should be co-ordinated between the ship and shore to ensure the bridge or ramp gradient remains suitable at all times.

Bridges and ramps should only be used, after ensuring that vehicles can be braked sufficiently and trailers do not touch any ground structure of the ramp.

It is the ship's responsibility to adjust mooring ropes as necessary.

Bridges and ramps should be kept clear of all obstacles. It is recommended that they should have slip-resistant surfaces.

To ensure the safe passage of vehicles on the ramp and bridge a traffic flow system should be established. All personnel involved in the operations should be kept informed of the system in use and of any intended changes.

On dual lane bridges and ramps precedence of movement of vehicles on the bridge and ramp should be given to loaded vehicles. Alternatively, some other form of traffic flow control system should be used which is appropriate to the width of such bridges or ramps.

On single lane bridges and ramps a vehicle entering the bridge or ramp from the quayside should stand clear and give way to any vehicle leaving the ship.

8. | ABNORMAL LOADS ON RO-RO RAMPS

Before loading on discharging abnormal loads, an assessment should always be undertaken by a competent person (before starting). Such an assessment should:

- check that the dimensions of the load will allow entry onto the ramp, paying particular attention to potential obstructions
- ensure the load is securely lashed
- assess the total gross weight of the load to be moved
- examine the ramps for oil and grease or any other contaminant that may affect tyre adhesion and, where necessary, have ramps suitably cleaned
- access the ramp's angle of incline or decline before establishing a method of work
- check tidal/weather conditions to assess whether load movement needs to be postponed until conditions and ramp angle improve.

Based on the above assessment criteria a judgement should then be made regarding the system to employ and whether the load should be moved tug or load first.

In addition, the towing and braking capability of the tug needs to be assessed. If there is a need for additional power either for towing or braking, a second vehicle may need to be considered as a last resort. In this case the operation should only be carried out under close supervision, with suitable means of communication (e.g. radio) established between both operators and the supervisor.

In extreme circumstances it may be necessary to use a piece of heavy plant (such as a heavy forklift truck) as a braking vehicle. Such an operation should be risk assessed and planned by a competent person. Factors including, but not limited to, tyre adhesion, braking capacity and incline, operator competence, supervision, manufacturer's specifications and national legislative guidelines should be taken into account. Such a manoeuvre should be considered as an operation of last resort.

If it is considered necessary to use chains, wire ropes or any other tackle, they should only be used within their Safe Working Loads (SWLs).

Restraining chains attached to goosenecks may have been designed for safety when towing empty flats on internal roads only. If used for restraining loaded flats, SWLs of chains should always be considered, especially if the flats are used on sloping ramps.

When manoeuvring wide vehicles on the ramp and in the ship, one or more person(s) may be needed to guide the vehicles into their final position on board. Such persons should be provided with:

- a safe system of work devised and supervised by the dutyholder or other appropriate entity
- instruction, information and training
- PPE such as high visibility garments and protective head, hand and footwear

In this type of operation the safe system of work should take into account the bottom (bumpers etc), top and sides of vehicles, especially when entering the ship.

When handling tracked vehicles, attention should be paid to avoid slipping on the ramp.

9. | SAFETY ON RO-RO DECKS

The duty holder should ensure that all personnel involved in loading and discharging Ro-Ro ships, particularly lashers, signallers and ship's crews, have a safe system of work. Risks should be reduced to the lowest reasonably practicable level by taking preventative measures, in order of priority. The duty holder should consider the headings in the order shown, and **not** simply jump to the easiest control measure to implement.

Hierarchy	Example
1. Eliminate the hazard by redesigning the job.	Avoid working at height where practicable
2. Substitute or replace the material or process with a less hazardous one Ensure that the alternative is safer than the original.	Use a mobile elevating work platform to access work at height instead of step ladders.

Hierarchy	Example
3. Engineering controls, work equipment or other measures to manage risks. Give priority to measures which protect collectively over individual measures.	Use work equipment to prevent falls when working at height cannot avoided. Install or use additional machinery such as local exhaust ventilation to control risks from dust or fume. Separate the hazard from operators by methods such as enclosing or guarding dangerous items of machinery/ equipment.
4. Administrative controls, identify and implement the procedures needed to work safely.	Reducing the time workers are exposed to hazards (e.g. by job rotation); prohibiting use of mobile phones in hazardous areas; increasing safety signage, and performing risk assessments.
5. Personal Protective Equipment. Only after all the previous measures have been tried and found ineffective in controlling risks to a reasonably practicable level, must personal protective equipment (PPE) be used.	Where the risk of a fall cannot be eliminated and work equipment or other measures cannot be used to minimise the distance and consequences of a fall (should one occur)… PPE should be selected and fitted by the person who uses it. Workers must be trained in the function and limitation of each item of PPE.

It is not necessary to implement every measure. For example, in the case of a fully boarded and guarded scaffold, workers would not normally be expected to wear personal fall-arrest equipment

table summarised from: HSE

In the case of PPE for RoRo operations, this should typically include but not be limited to high visibility outer clothing with retro-reflective stripes as well as other protective clothing and equipment necessary for health and safety, e.g. head, hand, foot, knee and hearing protection.

Personnel lashing/unlashing vehicles or trailers on the ship should work in pairs or in sight of one another. On leaving the ship for breaks and on completion of work, a check should be made to ensure that all personnel are accounted for.

There should be a system to prevent, as far as practicable, unauthorised persons being present on any deck whilst Ro-Ro operations are being carried on.

Only competent operators should be permitted to drive mechanical plant and equipment used in the process of handling or moving cargo and vehicles.

Supervisors should always take reasonable steps to ensure that drivers of plant and vehicles forming part of cargo are capable of driving such plant or vehicles safely. Some of these vehicles represent very large and awkward loads with which cargo handlers may have no direct familiarity. In practice it is not possible to train all person to drive all types of vehicles. In such cases, vehicles should not be loaded or discharged unless or until the designated driver assesses that they are in a position to safely control the vehicle.

Adequate lighting should be provided by the ship in covered decks to ensure visibility for the drivers of vehicles. Defects to lighting should be immediately reported via a pre-determined process which should include the notification of a responsible officer of the ship.

The safe system of work should prevent persons standing between a vehicle moving into position and another vehicle or bulkhead.

Where a person needs to be in the vicinity of the vehicle, the safe system of work should ensure that they:

- stand at the side so as not to become trapped
- never stand in darkness
- can be clearly seen by drivers or that a reliable alternate means of communicating between pedestrians and the vehicle driver is in place

Hand signals should always be clear and unambiguous. The same signals should be used by all persons involved in the cargo operations including crew members.

10. | STO-RO OPERATIONS

In general, the guidance for safety on Ro-Ro decks also applies to STO/RO operations. However, with STO/RO operations there is the additional hazard of using either large lift trucks or clamp trucks in the paper trade, to load from the deck, normally to roll trailers.

Lift or clamp trucks should be suitable for the space where the work takes place. Training should address factors such as height, width and weight of the trucks as well as risk of contact with overhead obstructions such as lift cables, electrical wiring and equipment.

The dutyholder should establish procedures for if/when reversing when under load is permitted. Reversing under load may be necessary where forward vision is obscured by the load and it is not safe for a signaller to be in position. Industry practice is normally to avoid

reversing up a ramp. However if this becomes necessary controls such as clearing the working space down the ramp should be considered as part of a planned safe system of work.

When operating forklift trucks on the ramps of ships procedures should take into account:

- the need to select the correct gear before moving on the ramp
- travelling with load uphill where possible
- not using the inching pedal on the ramp
- adjustment of the height of the load to clear both ramps and deck head when there is a change of gradient

Controls should be in place to avoid pedestrians, especially when reversing.

Large lift truck drivers should be in reliable communication (e.g. by radio) with the load/discharge controller in order to be aware of traffic movements that may affect them.

Lift trucks when parked on ships, even for short periods, should have their hand-brakes applied and forks lowered, or if clamps, with them lowered and the blades fully closed.

In all cases when discharging, the condition of the stow should be checked before lifting; it may well have shifted in a seaway.

11. | SAFETY ON LARGE CAR CARRIERS

In general the recommendations for safety on Ro-Ro decks are also applicable on large car carriers as on any other Ro-Ro ship. However due to the large number of decks (often in double figures), the lack of headroom in some areas, the potential speed of modern vehicles and the large amount of exhaust gases that may be generated, additional precautions should be considered.

Routing of loading/discharging should be planned. Use may be made of deck marking, and/or traffic cones to produce one-way systems of vehicle control, whilst traffic controllers at junctions can assist both safety and efficiency.

Crew buses when used to return drivers to the ship after discharge can also be used to 'lead' convoys of trade vehicles off the ship to physically control speeding.

The loading operation is typically slower than discharging due to:

- the need for 'checkers to log vehicle numbers
- the parking process

The checking procedure should be so designed as to ensure that checkers are safe from the risk of being struck by moving vehicles.

Due to the low height of some decks, large multi-seated estate cars may be more efficient than the use of mini-buses.

Head protection should be worn on such decks.

Vehicles should always use headlamps during loading/unloading operations. This is preferable to the use of hazard lights.

A number of rules relating to car handling should be applied. Some relate to personal health and safety and others to car care. They are:

- No eating, drinking or smoking in cars, multi-seated estate cars or in cargo holds
- No sitting or leaning on cars
- No hands on hoods, fenders or trunks
- No objects or lashing materials on cars
- No marking on cars
- No using the cargo for personal transport or as a means of towing other cargo
- Avoid unnecessary contact with the cargo
- Never drive over lashings
- Never take away identification stickers or other markers
- Radios to be switched off at all times

Exposure to respiratory hazards on board the vessel should be controlled. Though most modern car carriers have efficient exhaust ventilation systems, air sampling should still be undertaken for reasonably foreseeable respiratory risks. Results of monitoring should be evaluated with action taken as necessary and records kept. Hold ventilation should be initiated sufficiently ahead of the planned start of work. The inertia of the air in the holds means that an amount of time will be needed before a satisfactory air flow is established throughout the holds. Work should not commence until the atmosphere is assessed as safe to proceed.

Certain tasks such as 'breaking out' vehicles from the stow may carry increased respiratory risk. Again, a hierarchy of controls approach should be applied for such operations. Occupational health/lung function monitoring should be implemented to ensure that controls are working correctly and to quickly identify any failures.

12. | SAFETY AND HANDLING CASSETTES

In general the recommendations for safety on Ro-Ro decks also apply to the handling of cassettes. However certain additional points should be considered due to the specific design of large cassettes and their handling capacity.

Cassettes can be of variable size and design. Figure 2 shows a 16 wheel steerable translifter used in cassette operations capable of carrying a cassette, carrying heavy loads. Such a cassette may carry loads of up to 60 tonnes and on a smooth ground, in good conditions, may be capable of being driven forward at 10 kilometres per hour.

When approaching a ramp or bridge, the cassette should always be as nearly in line with the ramp as practicable. Speeds when going up ramps should take local conditions into account. If the speed is too high when the cassette comes onto the ramp, the load is likely to move

and/or the attachments will slacken. The goods should be lashed to the cassette with proper angle lengths and cassette strapping bowsed tight by ratchet, so that there is no movement.

Cameras are often fitted to cassette transporters in a protective rear pocket. If cameras are fitted, the dutyholder should identify if cassettes may be pushed safely without a traffic controller.

Figure 2 - 16 wheel steerable translifter

Goods loaded on a cassette should always be placed so that they are inside the cassette's sides. If over width loads are to be placed on the cassette, the load on the driver's side should always be inside the cassette's side so that the driver can see forward when pushing the cassette.

As one of the reasons for using cassettes is to obtain the maximum use of the height of the Ro-Ro deck, factors affecting the height of the load are critical. In particular factors affecting the height of the load that should be considered are:

- the ratio of the load height to breadth (stability of load)

- the intent to make loads as uniform as practicable to enable safe lashing to cassette
- the loading height of the ship
- inclination of any ramps etc for upper decks
- the location of the centre of gravity of the load
- the driving speed when loading.

In order to minimise stresses in cassettes, it is preferable to lift them such that the frames remain horizontal during lifting, either by lifting both ends at the same time or by lifting the ends a little by turn.

On discharge the cassette should always be left on ground that is both even and hard. The tractor and cassette should always be stationary while a loaded cassette is lowered. If a loaded cassette is grounded whilst it is moving, the cassette will stop but the load is likely to continue through its own momentum breaking lashings and collapsing the stow.

13. | SHIP'S CARGO LIFTS

A vehicle or trailer should have its brakes firmly applied whilst it is being carried on a lift.

No persons should travel on a cargo lift platform. However, where the dutyholder permits, a driver may remain at the controls of their vehicle. In these circumstances, the driver should remain in the cab the whole time the vehicle is on the lift.

It is industry good practice that, where reasonably practicable, ships' cargo lifts are gated and fitted with safety interlocking systems.

Cargo lifts should normally be operated by the ships' crew and there should be an operator on each deck being worked. If dock workers are required to operate such lifts, due regard should be paid to the competence of the operator and the condition of the lift.

14. | SECUREMENT AND LASHING/UNLASHING

Lashing should not start until parking has been completed and brakes applied or in the case of STO/RO operations, the cargo has been properly stowed.

Wherever practicable each vehicle or trailer should be secured before another trailer is positioned immediately behind it in the same rank.

All chains and gear in connection with lashing of cargo should be kept well clear of any working area. Vehicles should not be allowed to drive over such equipment.

Lashings should use, so far as is practicable, designated lashing points, both on the vehicle and ship. Bumpers, brackets etc should not be used. Air lines and cables should not be fouled.

Lashings should be equally tensioned and not over taut

They should make an angle with the deck of between 30° and 60° and lashing arrangements should balance each other in both fore and aft and athwartships directions.

It is recognised as bad practice to

- secure rear lashings of trailers before fifth wheel tractor units have been lowered
- to cross lashings as this may allow trailers to tip in a seaway.

A procedure should be established and used for releasing any lashing suspected of being over tensioned.

Good Lashing Practice

Bad lashing Practice

Crossed lashings are acceptable if the angle is between 30^0 and 600 but offer very little tipping restraint if the vessel is rolling

Good

Bad

Angle of securing chain to deck

Lashing Point
Good

Bad

Vehicles with independent air suspension should not be lashed until fully lowered and the system bled and locked. If this is not practical, lashings should be checked and tightened as necessary after completion of loading.

Two Lashings per side

Three Lashings per side

Four Lashings per side

Care should be taken when lashing steel tracked vehicles on steel decks. Damage, old ropes or rubber tyres will be required to chock and avoid possible slipping/movement when at sea.

It is industry good practice that the first vehicle to be discharged should be the last one unlashed. Unlashing should start with the last vehicle to be discharged.

Some incidents on ships at sea result from loads shifting off the trailer whilst the latter remains securely lashed to the ship's deck. The dutyholder should put in place a procedure to address such circumstances identified during operations. This should include what the workers should do on discovery and a requirement to notify a responsible officer of the ship.

During the unlashing of cars, the dutyholder should have in place a safe system of work that addresses but is not limited to the following:

- appropriate PPE
- handling and storing of lashings e.g. not attempting to move bundles of lashing, not throwing lashings between vehicles
- arrangements for carrying lashings safely and to prevent damage to vehicles
- use of equipment to safely move lashings to the ship's side
- practices to avoid vehicle damage e.g. not climbing, sitting or placing objects on vehicles
- prevention of lashings hanging or falling down to decks below or other areas through lashing holes or other openings in vessel decks

15. | FUMES ON RO-RO DECKS

Inhalation of exhaust and other fumes poses a potential risk to persons and should form part of the risk assessment. The dutyholder has a responsibility to ensure that exposure to hazardous materials is managed in line with relevant regulations. They should use the hierarchy of controls approach to – at a minimum - keep exposure to levels below any applicable legal exposure limits. Additionally the intent should be to maintain exposure to as low as practicable below legal limits. Legal limits are limits, not targets. Controls can include but are not limited to:

- minimising the number of vehicles with engines running at any one time
- minimising the numbers of people exposed and time of exposure
- timely and effective maintenance of company vehicles to reduce emissions
- monitoring air quality and setting action levels for hazardous substances
- ensuring that the vessel's ventilation systems are operating correctly
- having a procedure in place if:
    - the atmosphere hits pre-determined action levels
    - safety controls e.g. ship's ventilation system are failing to operate as intended

If exhaust fumes or other hazardous gases hit action levels the dutyholder should take corrective action which is likely to include removing personnel from the affected area until the situation is once again under control.

If any doubts are raised as to the operation of the ship's ventilation systems, Supervision should immediately refer the matter to the ship's officers for resolution.

It is recommended that regular monitoring of air flows and fume emissions are undertaken on an individual ship basis with a view to building profiles of regular callers. At all times there should be an objective of maintaining oxygen and carbon monoxide levels at the applicable national standard.

APPENDIX 1

The following content is intended to be adapted by the dutyholder and incorporated as appropriate into procedures and learning materials based on the specific needs of the terminal or operation.

CHECK EVERY TURN OF DUTY

Before starting work, vehicles should be examined for damage and oil leaks. Checks should include but not be limited to:

- The engine (fuel, oil water)
- Hydraulic oil level
- Power steering oil
- Brake fluid oil level
- Tyres
- Lights
- Horn

Then the engine should be started and checks made on:

- Brake air pressure
- Transmission oil level

The vehicle should be test driven for checks on:

- Steering
- Brakes
- All other controls

REPORT FAULTS

If faults are found or develop during work drivers themselves should **not** try to rectify them. They should be formally reported through the approved reporting procedure. Management should arrange for them to be attended to by competent persons. Such faults may include any damage to the trailers and their support legs. Failure to report faults can result in injury to persons and extensive damage as well as delays to operations.

NO PASSENGERS

Single-seater vehicles are not designed to carry passengers. so additional persons should not be allowed to endanger themselves by riding on such units.

COUPLING TO A TRAILER

Before a vehicle is coupled to a trailer it should be ensured that:

- the trailer brake is properly applied
- the front height of the trailer is sufficient for effective coupling
- the 5th wheel is at the correct height for good contact with the trailer rubbing plate

After coupling it should be ensured that the coupling is effectively engaged and that the trailer handbrake is released for moving off.

PICKING UP LOADS

If a vehicle is coupled to a trailer in the process of being loaded, it should be ensured that the trailer support legs are down until loading is completed. The legs should then be lifted before moving off.

When picking up loads in the terminal area or on the ship, it should be ensured that all persons are clear, that the trestle and securing chains have been removed and both air brake lines are connected before moving off.

When trailers are parked in confined spaces checks should be made around them before coupling and moving off.

DRIVE CAREFULLY

Vehicles should be driven carefully at all times, particularly when reversing with a load and drivers should be alert for visual or audible signals directing or warning them.

Travel should be at a safe speed bearing in mind speed limits, the state of the load, traffic conditions and the ground surface. Signals should be given when turning, slowing down or stopping.

- sharp braking on wet or slippery ground may result in skidding and jack- knifing
- overhead obstructions may affect carrying containers and high loads
- neither lift the 5th wheel too high because of the risk of collision with overhead obstacles, nor lift too low because of the risk of grounding of the load

TRAFFIC RULES

The traffic rules and flow system should be observed.

REVERSING INTO POSITION

When positioning vehicles on the ship, drivers should be guided if travelling in reverse.

The person guiding vehicles into position should give signals to the driver (the level of noise on the ship is frequently such that shouted instructions cannot be heard). If whistle signals are used, care should always be taken in choice of ear protection to ensure correct attenuation levels.

Persons should never stand between the vehicle or trailer and bulkheads or other trailers, where crushing could occur.

DETACHING LOADS – TRAILER LEGS

Uncoupling at an angle should be avoided where practicable. Before uncoupling it should be ensured that the trailer legs are down on good ground (using timbers as necessary) and that

the trailer front is high enough for connection by another vehicle. The trailer brake should be put on and the air lines disconnected.

NOTE: Some companies recommend disconnecting the air lines first. If in doubt check with the manufacturer.

STAYING WITH VEHICLES

Drivers should always stay with their vehicle at all times on the ship and on the bridge or ramp unless authorised to leave it.

PARKING

When parking a vehicle:

- It should be parked where it does not cause an obstruction
- Rail lines and working ways should be kept clear
- It should be left in neutral gear with the hand-brake on
- The engine should be switched off and the ignition key removed.

HIGH LOADS

Care should be taken with high loads and certain types of trailer which may become unstable when making sharp turns and with loads which are labelled as Dangerous Goods or Fragile.

CARAVANS

The correct ball-hitch attachments provided should always be used.

BRIDGE AND RAMP SURFACES AND FINGER PLATES

To avoid damage to bridge and ramp surfaces and ramp fingerplates, the trailer support legs should be kept well clear of the surface and gear changing avoided when on the bridge, especially when the incline produces an 'excessive' hump.

SMOKING

There should be no smoking on terminal areas or on vehicle decks. Smoking should only be permitted in specified areas.

ACCESS BETWEEN SHIP AND SHORE

At all times, only proper means of access between ship and shore should be used. Drivers when not in their vehicles should follow all procedures in place for the protection of pedestrians.

NOISE

The dutyholder should assess risks to hearing from operations and put into place controls as appropriate. Persons should wear ear protection in places where the dutyholder has identified such a requirement. In general if both vehicles and ships fans are operating on RoRo decks, it is likely that hearing protection will be required.

FORKLIFT TRUCKS

When operating forklift trucks on the ramps of ships care should be taken to:

- Select the correct gear before moving onto the ramp
- Always travel with load uphill where practicable
- Never use the inching pedal on the ramp
- Adjust the height of the load to clear both ramps and deck-head when there is a change of gradient.

APPENDIX 2

FURTHER INFORMATION

For more information and guidance on safety, reference may be made to the following documents and publications:

IMO Code of Safe Practice for Cargo Stowage and Securing

https://www.imo.org/en/OurWork/Safety/Pages/CSS-Code.aspx

ILO Code of Practice on Safety and Health in Dock Work (1979)

https://www.ilo.org/wcmsp5/groups/public/@ed_protect/@protrav/@safework/documents/normativeinstrument/wcms_107876.pdf

Ro-Ro Ships – Stowage and Securing of Vehicles – Code of Practice HMSO

https://www.gov.uk/government/publications/mgn-621-roll-onroll-off-ships-guidance-for-the-stowage-and-securing-of-vehicles

The Lashing and Securing of Deck Cargoes – Captain J R Knott The Nautical Institute

About The Authors

At the time of original publication, Jim Chubb, MNI, was a Master Mariner, whose sea-going career was mainly spent serving on either general cargo or container vessels. On coming ashore in 1978 he joined Associated Container Transport Services Ltd as a Marine Co-ordinator with responsibilities for stowage planning and shipboard container lashing systems.

In 1989 he was appointed Cargo Care Manager responsible for day-to-day cargo handling activities within Europe for Principals engaged in the container transportation of general perishable and dangerous goods. An important aspect of his work was the cleanliness of the containers.

Prior to joining the ICHCA International Safety Panel he undertook on their behalf a research study into "Semi-Automatic Twistlocks". The Research Paper was published in January 1994 and looked to identify the various types currently available and the working practices involved in their use.

He was a Director with BMT Murray Fenton Ltd, a leading firm of London based Marine Consultants and Surveyors, and is using his specialist knowledge of the stowage and securing of containers to expand the range of services offered by the Company.

International Cargo Handling Coordination Association

Established in 1952, ICHCA International is an independent, not-for-profit organisation dedicated to improving the safety, productivity and efficiency of cargo handling and movement worldwide. ICHCA's privileged NGO status enables it to represent its members, and the cargo handling industry at large, in front of national and international agencies and regulatory bodies, while its Technical Panel provides best practice advice and develops publications on a wide range of practical cargo handling issues. Operating through a series of national and regional chapters, including ICHCA Australia, ICHCA Japan and Correspondence and Working Groups, ICHCA provides a focal point for informing, educating, lobbying and networking to improve knowledge and best practice across the cargo handling chain.

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