



GUIDELINES TO SHIPPING COMPANIES ON VEHICLE DECK SAFETY

NATIONAL MARITIME OCCUPATIONAL
HEALTH AND SAFETY COMMITTEE

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1. INTRODUCTION

- 1.1 The vehicle deck of a ferry or a roll-on-roll-off ship is one of the most hazardous areas of a ship. Moving vehicles, lack of visibility, "blind spots", high noise levels, noxious fumes from vehicles, unclean surfaces and inadequate floor markings can all contribute to hazards. An unacceptably high number of workers have been injured in accidents on vehicle decks, sometimes fatally. These accidents also have a serious impact when passengers remain on the vehicle deck in contravention of vessel safety rules. This was evidenced in recent incidents where it was discovered that some drivers were remaining in their vehicles and thus sustained injuries when the vessel rolled. Similar hazards also exist in port areas where there is vehicle movement.
- 1.2 The social partners in the UK maritime industry have developed the following guidelines to shipping companies to draw their attention to the specific hazards present on vehicle decks. They recommend that operators of ships with vehicle decks review their safety policies, procedures and management systems to ensure that the advice that follows is reflected as appropriate.

2. AIMS

- 2.1 The guidelines aim to:
 - Promote the health, safety and welfare of seafarers
 - Contribute to safer and more effective shipboard environments
 - Eliminate accidents and injuries on vehicle decks and in port areas where there is vehicle movement
 - Encourage improvements in safety performance
 - Ensure that crew members receive training in safe work procedures on vehicle decks
 - Emphasise the importance of properly maintaining safety equipment
- 2.2 The guidelines should be read and considered in conjunction with other guidelines to shipping companies on health and safety issued by the NMOHSC, in particular the guidelines on behavioural safety systems.

3. CONSULTATION, COOPERATION AND CO-ORDINATION

3.1 Effective planning is one of the key elements of safe operations. Operations should be planned and executed in a way that minimises risks to all those involved in the operation. Cooperation and coordination between ship and landside operators are required on health and safety. Through two-way communication, concerns can be raised and resolved jointly and respective employers can cooperate effectively with each other.

4. HAZARDS ON VEHICLE DECKS AND PORT AREAS

4.1 The management of vehicle activities should be based on the provision and maintenance of safe workplaces, safe vehicles, safe drivers and safe work practices. Risk assessment is part of effective health and safety management and involves five stages:

- identify the hazards;
- decide who might be harmed and how;
- evaluate the risks and decide on precautions. Risks should be reduced to as low as is reasonably practicable by taking preventive measures in priority order of the "hierarchy of risk controls"
 - elimination of the hazard
 - substitution
 - engineering Controls
 - administrative Controls
 - personal protective clothing and equipment
- record the findings and implement them and
- review the risk assessment and update if necessary.

4.2 Accidents may result from inadequate segregation of workers and passengers and vehicles. Proper planning and design of vehicle decks and port areas may reduce the hazards. Effective controls over vehicle operations when loading and unloading ferries and other ro-ro ships can also reduce the likelihood of accidents.

4.3 Accidents often involve, but are not limited to:

- vehicles or their loads striking people, particularly when reversing and people are in locations where drivers cannot see them

- vehicles striking services and obstructions
- manufacturers' instructions for safe use being disregarded
- electrical hazards associated with plug in units
- hazards associated with breakdowns and jumpstarts
- inadequate training of drivers and signallers
- unsafe loading and transportation of materials on vehicles
- being struck by lashings that may spring back when applied, tightened, released or loosened
- falls from height:
 - when working or passing near to unprotected edges such as lift shafts, voids, deck openings and ship's internal ladders
 - resulting from failure to provide and maintain a safe means of access/egress
- degradation of PPE equipment impairing the safety of the crew
- poor levels of lighting affecting visibility and increasing risk
- slips, trips or falls while working on uneven, unstable or slippery surfaces
- crew being struck by quiet cars
- crew being struck as a result of vehicles exceeding recommended speed limits
- crew being exposed to noxious fumes due to inadequate or faulty ventilation
- noise and vibration from operating plant and equipment
- musculo-skeletal injury from handling lashings and trestles
- temperature extremes
- fatigue

4.4 The solutions that are proposed in these guidelines fall into five categories:

- Vessel design
- Human factors
- Technical
- Safe systems of work
- Crew training
- Procedures in company Safety Management System (SMS)

5. VESSEL DESIGN

5.1 The following actions are recommended for consideration:

- Wherever practicable, remove humans from the situation
- Ensure that there is sufficient space for manoeuvring
- Remove any unnecessary physical obstacles, in order to reduce the need to manoeuvre
- If it is not possible to remove physical obstructions that are actually or potentially dangerous, ensure that these are conspicuously marked
- Install crash barriers and protected safety zones
- Ensure that lanes for vehicles and passengers are clearly marked and
- Ensure that entry to the vehicle deck from the centre casing is not permitted
- Ship design features, including deck layouts that might make parking and stowing of vehicles safer.

6. HUMAN FACTORS

6.1 The following actions are recommended for consideration:

- Have an effective communication strategy in place – keep staff informed of the dangers of accidents on vehicle decks. Use standard signalling and phrases for vehicle deck operations. Issue safety bulletins highlighting lessons learnt
- Effective teamwork; have clear roles and responsibilities. Conduct team briefings and debriefings as part of everyday operations
- Monitor fatigue as part of the overall management
- Resource Management – optimise the use of your workforce with proper planning. Wherever practicable, remove humans from any hazardous situation
- Situational Awareness, always be aware! Run awareness campaigns periodically
- Integrate the human element “deadly dozen” (MGN 520) in the vehicle deck Statements of Practice (SOPs)
- Include human factors in the risk assessment; distractions, fatigue, lack of situational awareness, lack of teamwork, lack of effective communication etc

7. TECHNICAL

7.1 The following actions are recommended for consideration:

- Use of low-level lighting, or lighting embedded in the deck, to guide drivers, rather than a banksperson or signaller
- Use of LEDs / boldly painted lines as above
- Improved lighting all round to avoid dark areas
- More use of cameras
- Use of rear looking camera on side of / rear of tractor / tug, mounted low enough to see under the trailer (note that monitoring the screen could be a distraction)
- Use of rear looking camera on trailer
- Use of robots (with cameras) to replace humans on the vehicle deck
- Radio Frequency Identification (RFID) tags to be worn by all personnel on the vehicle deck to facilitate an alert system
- Improved use of mirrors
- Review methods of lashing of vehicles, with a view to identifying quicker and simpler designs and methods
- Ensure vehicles have lash points by refusing carriage to vehicles without adequate lashing points, especially if carrying dangerous cargoes. The company's policy should be included in its standard conditions of carriage, or otherwise be made clear at the time of booking
- Light beams to act as tractor / tug stops when broken
- Discuss with Tug/MAFI unit operators the feasibility of fitting and installing:
 - Sound emitting parking sensors to Tug/MAFI units for use during stowage operations
 - Pre-programmable limit switches/speed governors by TUG manufacturers to restrict speed once entering vehicle decks
- Magnetic loop and headphones as a means of communication by all parties, in preference to using whistles
- Follow CIBSE levels of lighting to ensure that there is an appropriate level of lighting

8. SAFE SYSTEMS OF WORK

8.1 The following actions are recommended for consideration:

- Remove the human from the hazard completely where possible
- Whether the use of a whistle blow as a stop signal is appropriate. Would a routine stop be differentiated from emergency stop? Is a whistle signal audible above engine noise when drivers are wearing ear protection?
- Management should ensure procedures are contributed to by those who are required to follow them
- Ensure roles and responsibilities are clear
- Provide good quality safety literature with clear messages and graphics
- Involve crew, stevedores, bankspeople / signallers and other involved staff in safety workshops
- Ensure tool box talks or pre-loading briefings take place between all involved
- Seek out ideas to improve; move up the hierarchy of controls, i.e. remove the hazard from the human or remove the human from the hazard
- Initiate annual programme of vehicle deck audits – focusing on safety of operations including ship-shore interface
- Look for the leading indicators – unsafe acts and conditions – and act on them
- Look for different communication channels to get the safety message out
- Tug / tractor speed to be monitored / regulated; weather may demand lower speed limit
- Procedure should require that banksperson / signallers, when guiding a vehicle, are visible to the driver at all times, otherwise the driver must stop.
- Require freight operators to confirm when making bookings that the company's standards for lashing are met
- Run speed assessments on vehicles manoeuvring on the deck
- When possible work to align the ship board signage with those of the ports if working on fixed routes.

9. CREW TRAINING

9.1 The following actions are recommended for consideration:

- Ensure competencies are identified and documented
- Formal induction and on-the-job training for any new personnel, with an assessment of competency to do the job
- Training in lashing down to be included
- New staff to be mentored and chaperoned, with performance monitored,
- Training videos, regular talks and check lists; such training should be refreshed annually
- Rotate crew to different tasks
- Tractor / tug drivers to hold appropriate licence; formalised specialist training and certification proposed
- Annual review of tractor/ tug driver performance, perhaps in a simulator, to assess competence
- Port and ship staff to train together
- Non-drivers to ride in tugs / tractors and witness activity from that perspective
- More attention to be given to training lashing requirements
- Relevant crew to demonstrate awareness of safe operations the vehicle deck environment and/or be provided with hazard perception training
- Look at deploying training technology such as simulators / virtual reality
- Provide training in vehicle deck operations
- Human Element, Leadership and Management (HELM) training be part of deck training
- Coloured jackets to be used to identify new crew members, so experienced crew will know who to monitor (PPE (Tabard/Hi-Viz vest) of different colour so that drivers and contractors can identify those who are new to the role). Fire-fighting training to be enforced

10. PROCEDURES IN COMPANY SAFETY MANAGEMENT SYSTEM (SMS)

10.1 The following actions are recommended for consideration

- Remove the human from the hazard completely, where possible
- Companies to develop stronger safety culture; ensure human factors fully identified
- Ensure that high-level guidance produced by the International Chamber of Shipping (ICS) is accessible;
- Ensure that time pressure which is derived from commercial pressure does not compromise standards of securing or safety during loading
- Share ideas; safety is not something to compete on
- Pre-loading briefings to identify differences
- Ensure staff are trained, familiarised and competent
- Consider after discussion with TUG/MAFI drivers whether to amend policies and procedures with regard to hearing tests for TUG/MAFI drivers.
- Use and complete check lists and document activity as necessary
- Processes to be audited by third party

Additional resources

Videotel training films

Ro-Ro Cargo Handling: Part 1 - Vehicle Deck Safety

Using a combination of extensive live action and informative animation, this two-part training package looks in detail at the challenges faced by everyone involved in handling Ro-Ro cargo.

Designed as an introduction to the subject, the programmes will be of particular value to those new to the sector, whether they serve on ROPAX vessels on short sea routes or on board Con-Ros and PCTCs operating on deep sea trades.

'Vehicle Deck Safety' focuses on the working environment. It includes: the risks involved in Ro-Ro operations from the point of view of personal safety; the importance of being visible to the drivers of vehicles and operators of machinery, not taking risks, good housekeeping; the

Personal Protective Equipment (PPE) and other types of equipment that help protect against the risks of injury and breathing in vehicle exhaust fumes; how to communicate using internationally recognised hand signals.

Personal Safety on Car Carriers & Roros - Part 10

Car carriers and RoRos present special risks arising from their specific design features and cargo operations. For this reason, all personnel joining such trips must attend special training programmes.

The module stresses the importance and preparation prior to cargo operations and car deck inspections so that everyone is familiar with the process and their respective roles. Everyone working on board must extend a duty of care towards stevedores and drivers.

Also covered is the importance of regular deck inspections whilst at sea, ventilating the vehicle deck area before entering and checking for loose and protruding lashings. Semi-trailers and hazardous cargo containers are mentioned, as are the reasons for prohibitions of smoking and refuelling.

PSS SIP 010 - Guidance on Ro-Ro & Sto-Ro Operations

<https://www.portskillsandsafety.co.uk/resources/sip-010-guidance-ro-ro-sto-ro>

PSS SiP 012 - Guidance on Ro-Ro Passenger and Cruise Operations

<https://www.portskillsandsafety.co.uk/resources/sip-012-guidance-ro-ro-passenger-and-cruise-operations>

The current versions of these and other PSS Safety in Ports (SiP)

Guidance documents can be found at:

<https://www.portskillsandsafety.co.uk/resources>

Effective controls over vehicle operations when loading and unloading ferries and other ro-ro ships can also reduce the likelihood of accidents.

MGN 520 Human Element Guidance – Part 2 The Deadly Dozen - 12 Significant People Factors in Maritime Safety

<https://www.gov.uk/government/publications/mgn-520m-human-element-guidance>