



CONTAINER TERMINAL SAFETY

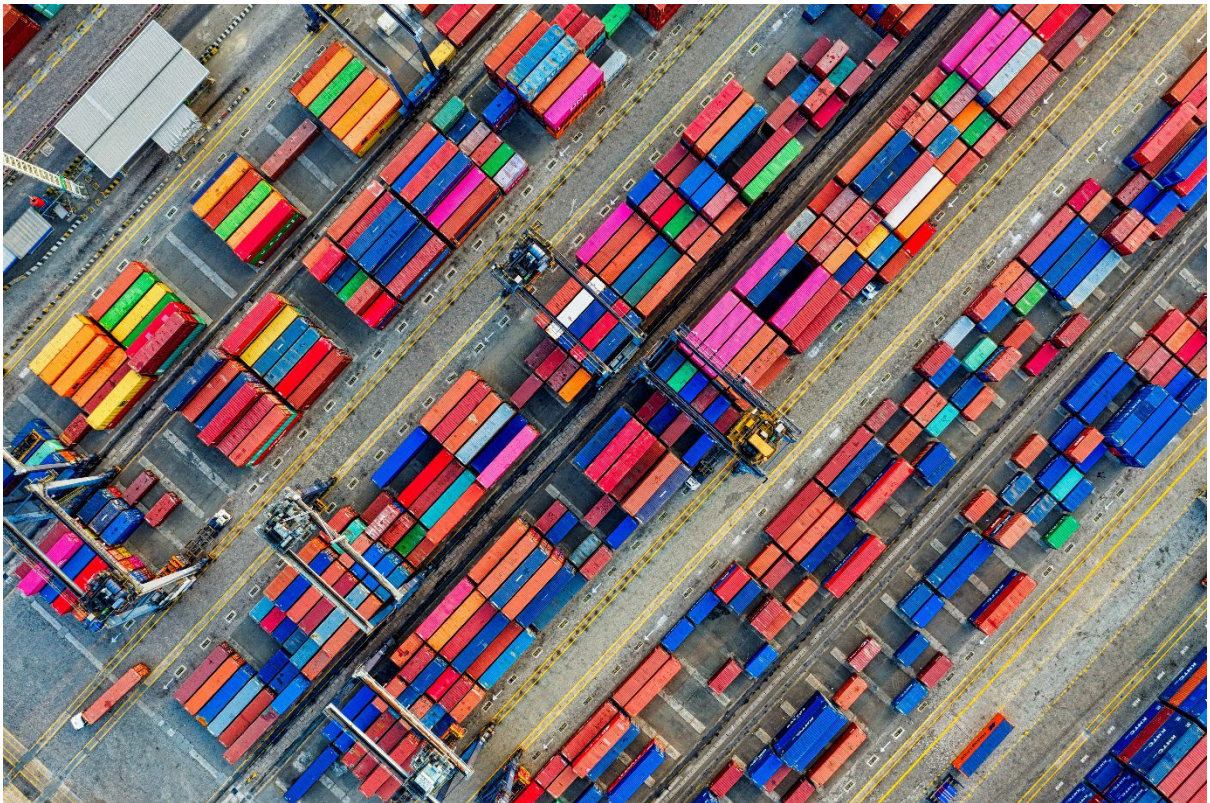


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Table of Contents

1. INTRODUCTION	4
2. GENERAL RESPONSIBILITIES	4
3. ENTERING AND LEAVING CONTAINER TERMINALS	5
4. CONTAINER RECEPTION	6
5. ROAD SYSTEMS AND LIGHTING IN OPERATIONAL AREAS	7
6. GENERAL SAFETY RULES	8
6.1. Communications	8
6.2. Drivers and Driving	8
6.3. Fuelling and Bunkering	8
6.4. Unserviceable Machinery and Equipment	9
6.5. Berthing	11
6.6. Stacking and Access to Stacks	11
6.7. Flatrack Containers	12
6.8. Tank Containers	12
6.9. Examination	13
6.10. Fumigation	13
6.11. Refrigeration Engineers	14
6.12. Bulk liquids carried in containers	14
7. OPERATIONAL SAFETY – STRADDLE CARRIERS PARKS	15
8. OPERATIONAL SAFETY – RUBBER TYRED/RAIL MOUNTED GANTRY CRANE PARKS	17
9. OPERATIONAL SAFETY – RAILHEAD TERMINALS	18
10. OPERATIONAL SAFETY – OTHER HANDLING METHODS	19
11. DANGEROUS GOODS	20
12. INCIDENT MANAGEMENT	20
ABOUT THE AUTHORS	22
INTERNATIONAL CARGO HANDLING COORDINATION ASSOCIATION	22
DISCLAIMER	22
FURTHER ADVICE AND INFORMATION	23

Warning

This document provides an introduction to Container Terminal Safety. For detailed advice it is necessary to read this in conjunction with the relevant national and international legislation.

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CONTAINER TERMINAL SAFETY

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1. | INTRODUCTION

This document is written as general guidance for use within all container terminals. It may not always be reasonable to comply fully with everything in this document; nevertheless the guidance provided should form the basis of operational procedures within all terminals, including railhead terminals. Relevant international as well as national regulations and guidance take precedence over the content of this publication.

The majority of serious accidents on container terminals are due to the mixing of people with heavy 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 and controlled.

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 container terminals including but not limited to management, maintenance and engineering staff, marine services staff, Customs, Immigration, Port Health, ships' crews, shipping agents etc.

Terminal duty holders should:

- provide Personal Protective Equipment (PPE) to all persons entering any area for which they have responsibility. PPE requirements should be identified by suitable and sufficient risk assessment in conjunction with regulatory requirements. PPE may include but is not limited to high visibility clothing, safety headwear and footwear, hand protection, eye and hearing protection. Duty holders should ensure that all persons wear the identified PPE. All persons should use PPE as directed by the duty holder in line with national legislation.
- should identify to employees and others entering the site the person(s) or method for reporting defects or unsafe conditions and acts, this may include but is not limited to notifying a supervisor or manager. Employees and others entering or working at the site should report any defect in plant, equipment or PPE or any unsafe act or condition via the designated route. The duty holder should ensure that appropriate action is implemented on the report being made.
- ensure appropriate numbers of first aid facilities are provided, bearing in mind national legislation, risks associated with operations and the possible effect on numbers of first-aiders caused by moving shift patterns, holidays etc.
- put into place means of managing occupational health risks that may arise due to terminal operations. This includes but is not limited to mental and physical health

related risks associated with shift patterns, hours worked and night work. It also includes health related monitoring that may be required, for example noise levels within plant (particularly relevant when good communication is necessary), fumes, such as those within quay crane cabs produced by funnel smoke, and the ergonomic factors of the design of cabs of plant and other seating.

- implement appropriate drug, alcohol and substance misuse policies in line with national regulations and guidance and in consultation with the workforce. Alcohol should not be sold within terminals.
- ensure that adequate information, instruction, training and supervision of personnel is provided
- ensure that all plant is properly maintained on a planned basis.
- put into place arrangements to adapt or suspend operations should circumstances give rise to risks that cannot be managed by standard operating controls. Taking as an example risks associated with high winds; arrangements should be made to monitor weather and establish action levels for wind speed and visibility. Actions may include but are not limited to additional anchoring of cranes and breaking down stows. Empty or part-loaded containers (particularly those under 10 tonnes) are more likely to be affected by wind.

3. | ENTERING AND LEAVING CONTAINER TERMINALS

Only authorised persons and vehicles should be allowed to enter a container terminal, and then only in compliance with the terminal safety rules and procedures. So far as reasonably practicable, pedestrians should not be allowed into terminals. If access by pedestrians is necessary, their number should be kept to the minimum and their activities should be controlled. When contractors are authorised to enter the terminal whether as pedestrians or in vehicles, they should be made aware of terminal rules and procedures, given guidance on the hazards with the authorization and appropriately supervised.

Children or animals should not be allowed onto the terminal.

All visitors should be given details of the terminal routes on entry along with relevant safety instructions including emergency procedures. Information provided should be appropriate to the needs of the visitor. Steps should be taken to ensure that the Master of every ship visiting the terminal has a copy of such terminal instructions, routes and walkways for the information of themselves and their crew.

Whenever practicable pedestrians permitted to enter the terminal should keep to pavements or designated walking routes.

No unauthorised person should be allowed to enter the operational area on foot or walk in it. Persons who need pedestrian access should first obtain permission. Such permission

should be controlled, recorded and operations suspended as appropriate. Any person entering under this arrangement should wear appropriate PPE which may include but is not limited to high visibility clothing, head and foot protection.

Terminal personnel should have means of reporting unauthorised persons to enable corrective action to be taken.

Vehicles entering the terminal should, if practicable, be equipped with a clearly visible flashing warning light, which should be used when passing through and working in container handling or stacking areas in the terminal. This requirement would not normally be applicable to visiting hauliers. If the use of such a warning light is not practicable, the use of dipped headlights, vehicle hazard lights or other suitable clear warning signal is recommended.

A separate area or part of a roadway should be provided for vehicles queuing to enter the terminal. The area or roadway should be clearly signposted and marked out and should not obstruct or be obstructed by other traffic.

Buildings or structures should not be erected at entry points in positions where they obstruct the vision of drivers at road junctions or rail crossings.

Pedestrians on the terminal, whether on pedestrian walkways or not, should always look out for moving vehicles and overhead cranes, and must give way to them at all times. Similarly drivers should be warned of the need for care especially in the vicinity of walkways.

4. | CONTAINER RECEPTION

A general risk assessment should be undertaken by each terminal to determine the safest way to handle, carry and stack the various design of container likely to transit the terminal.

Arising from that assessment, the terminal should have procedures for receiving and identifying such containers and how to handle them safely. The procedures should include ensuring that container handlers are provided with all relevant information, instructions and training for handling the various types of containers.

Training should be based upon the risk assessment and include alertness on the part of the drivers of lifting and carrying equipment in regard to the risks

On arrival containers should be inspected for:

- Apparent defects in structural members and fittings
- Compliance with the IMO International Convention for Safe Containers (CSC)
Containers should be fitted with
 - a valid CSC safety approval plate; and
 - either a next examination date or an ACEP reference number.

Note: The examination of containers is the responsibility of the owner or lessee and he should ensure the container is CSC plated. The packer of a container should undertake the responsibility for checking that the container has a valid CSC plate before starting to pack it and no terminal should knowingly handle a container with a CSC plate that is out of date.

- The appropriate and correct placards for containers carrying hazardous cargoes
- Any decal that identifies that the container is carrying bulk liquids in flexitanks or fumigated cargoes
- Correct stowage of cargo on flatrack and platform containers and tank containers are correctly filled.
- The correct seal

Containers that do not comply should be stopped and quarantined. The shipper / operator should be notified immediately for corrective action.

5. | ROAD SYSTEMS AND LIGHTING IN OPERATIONAL AREAS

Traffic management schemes should be applied to all terminals, making full use of one-way systems where space is restricted and two way traffic is impracticable. Signs and markings should be as close as possible to those that would be found on the public road systems.

Signs, signals or road markings instructing terminal road and pedestrian traffic to give way to mobile equipment should be placed and maintained at crossing points regularly used by straddle carriers or gantries.

Whenever practicable the layout of the terminal should avoid the necessity for vehicles to enter container stacking areas. This may be achieved by the use of a suitable exchange grid or grids where containers are loaded or unloaded onto or from vehicles.

Speed limits should be applied to all terminals. The speed limits should be clearly signed, observed and enforced.

Parking restrictions as indicated by notices or road markings should be observed and enforced.

Except at the quayside, the perimeter of container terminals should be fenced so that all people and vehicles only use effectively controlled entrances. The fencing should be of mesh, or other suitable construction, of adequate strength and permanency and be at least 2 metres (6ft 6ins) high.

Container blocks and rows should be clearly identified by ground or other markings, which should be properly maintained.

All areas in which mechanical handling appliances are operated should be kept level, free of rubbish, potholes (as much as possible based on surface condition) and unnecessary obstructions. Differences in levels should be avoided as far as practicable. Where necessary they should be minimised and ramped or chamfered. Excessive accumulation of oil or other agents likely to cause a slippery surface should be removed from all ground surfaces or otherwise neutralised. Particular attention should be paid to maintenance areas. Areas with higher potential risk such as operational areas under maintenance, should be effectively marked off with suitable means, which may include but is not limited to barriers and warning lights.

Lighting that is both suitable and adequate should be provided in all operational areas and access to them. Work should cease if visibility is adversely affected by fog, snow or any other cause to such an extent as to make working conditions unsafe. Standards of lighting should follow national guidelines. If none are available industry guidance is for at least 50 lux (5 foot-candles) in operational areas and 10 lux (1 foot-candle) in access areas.

Walkways for pedestrians should be clearly defined and marked. Standard international signs should be provided to guide pedestrians to walkways.

6. | General Safety Rules

6.1. Communications

Management should provide and maintain radio links or other equivalent means of communications between mobile plant and control. Control should check the links at the start of each shift. Mobile plant should not be used if radio equipment is defective unless such plant can be deployed in an area of operations where radio communication is not necessary.

Drivers of radio-linked plant should not switch off the radio link when the plant is in use.

6.2. Drivers and Driving

No persons should be allowed to operate any crane, tractor unit, lift truck or other type of mobile container handling equipment unless authorised to do so by his employer. Such authorisation should only be given to persons who are at least 18 years of age and have been suitably trained and tested on the type of equipment they are to operate or are being trained and are under appropriate supervision. Such authorisation might include a driver licensing system operated by the employer.

All authorised drivers should be medically fit for their task. Such fitness should be monitored at regular intervals according to their age.

Authorised drivers should also be monitored for competence. Reassessment and retraining should be carried out as appropriate.

Unauthorised passengers should be strictly prohibited from riding on any plant, equipment or vehicle. Where it is necessary to carry authorised passengers, e.g. instructors, a proper seat or safe position should be provided.

No person should be permitted to be within the terminal under the influence of alcohol or drugs. Alcohol and drug policies should take into account the fact that drugs used in medication may also impair judgement.

6.3. Fuelling and Bunkering

Whenever practicable, fuelling operations should not take place in operation areas.

If it is necessary to carry out fuelling operations to terminal plant in an operational area, the tanker driver should not enter the area or commence fuelling without permission from operations control. Permission should not be given until the environment is assessed to be safe for the fuelling operation to commence. Fuelling operations (including but not limited to delivery pipe connection and fuel transfer) should not start until:

- the plant is safely parked and brakes or other appropriate means of securing the plant in parked position are activated
- the engine is stopped
- access to the fuelling point is free from obstruction
- the plant operator/driver has left the plant and given permission for fuelling to begin
- appropriate firefighting equipment is readily available
- tank fuel gauges, emergency stop-buttons or call-back systems have been checked for defects (any defects should be immediately reported to operations control and fuelling should not commence until authorised to proceed by a competent person)

Any spillage of fuel which could constitute a fire-risk or a danger to personnel should be immediately reported to operational control.

During fuel transfer the tanker driver should not be in the tanker cab.

When delivering or removing bunker or waste oil from vessels by road tanker, in addition to the normal rules of entering and leaving the terminal, the following rules should apply:

- all road tankers should be fitted with gate or ball valves in good working order
- all flexible hoses, pipes, lines etc. should be of sound approved construction, free of leaks and defects and fitted with drip caps as appropriate
- all pumps, couplings and connectors should be free of leaks and defects
- all vehicles should carry spillage cleaning materials

In the event of spillage all pumping should immediately cease and operational control should be informed. Attempts to confine the spillage should only be made if it is safe to do so.

After completion all lines should be drained, caps fitted and tank valves shut before the vehicle moves.

6.4. Unserviceable Machinery and Equipment

All equipment used should be serviceable, suitable for the task and comply with all regulatory requirements for inspection and testing.

Unserviceable vehicles or plant should be immobilised and clearly marked to ensure that they are not taken back into use until they have been repaired.

Unserviceable vehicles, plant or containers should not be repaired in the container handling or stacking area unless it would be dangerous or impossible to remove the vehicle, plant or container. In such circumstances repair work should be carried out safely under controls

identified by risk assessment. Controls may include but are not limited to permit to work and suspending operations in the vicinity.

Care should be taken to establish a permit to work system when carrying out maintenance work on automated terminals and plant owing to the characteristics of such plant.

Before any 'Hot Work', including burning, welding use of naked flame, is undertaken in any part of the terminal, suitable and sufficient controls should be put into place. Control is likely to include permit to work with built-in positive checking that controls are in place and working as intended.

Before electrical work is carried out, suitable and sufficient controls should be put into place. Control is likely to include permit to work with built-in positive checking that controls are in place and working as intended.

Before any maintenance work is carried out on a quayside gantry crane, a procedure for engineering personnel attending should be drawn up. The procedure should cover both scheduled and unscheduled maintenance, taking in to account not only cargo handling operational requirements but also shipping movements. Particular attention should be given to communications between all those who may be involved or affected by the work.

A safe system of work should be produced to cover the moving of incapacitated cranes, including partially disabled cranes safely.

Other cranes should not be used to move incapacitated cranes, as this may overstress the crane's structure, gantry motors and braking systems. Suitable terminal tractors may be an appropriate method of producing both motive and braking forces.

A safe system of work for moving an incapacitated crane should take into account but not be limited to:

- potential need to raise the boom prior to the move and method of doing so
- the final required position of the crane to allow pinning down and minimising any further moves for operational requirements (e.g. shipping or other cranes)
- potential need for the presence of specialist competent persons such as terminal engineers and electricians to undertake specific operations such as releasing and re-applying crane brakes and the safe handling of high voltage cables, during the move
- an assessment of weather conditions prior to the move and ascertaining the need for a 'braking vehicle' and/or a 'towing vehicle'.

If terminal tractors are used for moving cranes, both vehicles should be weighted appropriately for traction. The braking terminal tractor should be configured for this purpose, for example by utilising a sufficiently loaded trailer to make full use of the trailer's air braking system. Braking and towing vehicles should be attached to anchorage points as physically low as practicable, on the outward end of the bogies. The crane should be moved in a slow and controlled manner to ensure that the crane does not run away. The crane should be fully pinned and braked at the end of the operation. In any case such an operation should

be planned and operated by competent persons based on suitable and sufficient risk assessment.

6.5. Berthing

When vessels are berthing or sailing from container berths, ship/shore quay cranes should be boomed up and parked:

- clear of the intended berth
or
- alongside a vessel already berthed
or
- if neither of the above are achievable, then in a position as near as practicable to the final midship position of the vessel when alongside.

Failure to take such precautions has resulted in serious damage to container cranes and ships.

6.6. Stacking and Access to Stacks

Stacking of containers should be carried out in such a way that they are not a risk to workers, for example in nearby buildings, cabins, operations or roadways, as a result of strong winds or container mishandling. Containers should not be stacked more than one high within 6 metres (20 feet) of such buildings. Where this is not practicable stacks should be stepped to prevent such incidents. Consideration should also be given to the sight lines of vehicles, particularly those driving from lanes to avenues between stacks.

Stacking containers relies on the integrity and strength of the units. For all designs, the corner post assemblies are the single assembly within the unit capable of withstanding stacking loads. These comprise of the corner post, normally a 6 mm (0.25") folded steel plate, a square steel tube or a hot rolled I beam and a top and a bottom corner fitting, normally cast. No other component or assembly on any freight container type is designed or tested to withstand stacking loads. Therefore it is essential that containers are stacked corner fitting to corner fitting.

All handling locations should have risk assessment driven procedures for receiving and identifying special containers such as tank and flatrack containers. The procedures may include special stacking requirements or segregation.

There are two important messages associated with stacking containers:

- not all containers have the same stacking capability as required by ISO
- all containers must be stacked corner fitting to corner fitting

The Dangerous or Non Regulated Goods Note should be supplied with the Maximum Superimposed Load shown. This value equates to the maximum load that can be placed on top of the container – often referred to as the stacking capability. For ISO series 1 containers the value will be at least 192,000 kg.

When developing stacking plans considerations should be given to the following (this list is not exhaustive):

- Ground surface
- Surroundings
- Segregation
- Stack height
- Visibility
- Stability
- Local weather conditions
- Human factors

6.7. Flatrack Containers

Flatrack containers with collapsible end walls should never have a container loaded above until it has been confirmed that the locking pins are correctly located.

Care must be taken when stacking any type of container above a flatrack container that the corner fittings are properly aligned.

6.8. Tank Containers

The ILO Code of Practice on Safety and Health in Ports states:

“Wherever practicable tank containers should only be stacked one high. When it is necessary to stack tank containers more than one high it is recommended that stacking cones be used in view of the differences of tank container frame designs. Tank containers carrying highly volatile substances should not be stacked over the pressure relief valves of highly volatile flammable substances.”

Tank containers may be stacked higher if adequate precautions are taken to prevent falling from the stack. This would be determined by carrying out a risk assessment of the area and securing equipment to be used.

There are a number of tanks containers designs each slightly different. When preparing a risk analysis for stacking containers on top of a tank container, the operators should consider the risk associated with each design. Failure to stack a container correctly above a tank container, i.e. corner fitting to corner fitting, may result in the stack toppling. Tank containers without full length top rails, such as the Collar and Frame designs, may appear to hold a greater risk of toppling however top rails of tank containers are not designed to support a fully laden miss-stacked container

If access to the tops of container stacks on shore is necessary, a safe means of access should be used. Portable ladders of sound construction, adequate strength, free from defect and properly maintained may be used to gain access to stacks of two high. Effective measures to prevent ladders slipping should be taken. Ladders should be long enough to provide a hand hold at least one metre above the place of landing. If stacks are three or more high, specialist

equipment should be provided and portable ladders should only be used where no safer means of access is reasonably practicable. Appropriate protection should be provided to prevent the fall of persons from the tops of containers. The suitability of access equipment should be established by risk assessment.

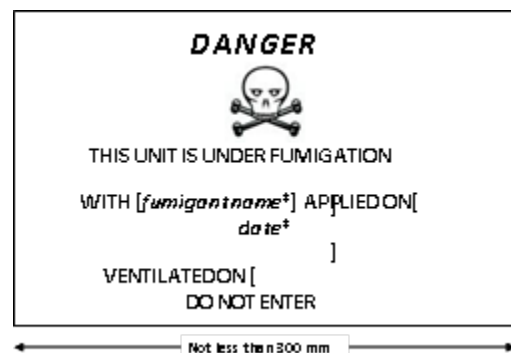
6.9. Examination

Safe areas should be made available for the examination and sealing of containers, by authorised bodies and/or personnel. Safe means of access should be provided to the areas. All such examinations should normally be carried out in designated areas. Examination within the stacking or operational areas should only be carried out when removal of a container to an examination or sealing area is impracticable; such as an emergency. If a vehicle or container on a vehicle has to be examined or sealed in an area that is not designated for such a purpose, the duty holder should put into place suitable and sufficient controls for the task to be undertaken safely. This may include but is not limited to suspending other operations and preventing the movement of any vehicle in proximity to task.

Due regard should be taken to the possible hazards of contents falling outwards when container doors are opened and methods of restraint used if appropriate.

6.10. Fumigation

The marking of the proper shipping name (FUMIGATED UNIT) and the UN Number (UN3359) is not required on fumigated units. It shall be marked with the warning sign as shown right, affixed in a location where it will be easily seen by a person attempting to enter the interior of the unit. The most common location on freight containers is across the middle of the two doors, so that the mark has to be broken in order to open the doors.



The marking shall remain on the container until the following provisions are met:

- the fumigated unit no longer contains harmful concentrations of the fumigant gas/products
- the fumigated goods or material has been unloaded.

Containers that require fumigation for the duration of the time the container remains on site must be clearly marked.

Containers suspected or known to contain goods under fumigation should only be opened in a controlled manner so as to prevent exposure to health risks such as respiratory injury.

No person should enter a container that has an intact or broken fumigation mark unless or until the container has been confirmed as safe to enter. This may be by suitable and sufficient

ventilation combined with appropriate atmospheric testing. Any procedure for confirming that a fumigated container is safe to enter should take into account the potential for remaining gas pockets or other hazards associated with fumigants.

The fumigation mark shall remain on the container until the container has been thoroughly washed. Once it has the fumigation mark must be totally removed.

6.11. Refrigeration Engineers

A safe means of access to, and exit from, gantry outlet banks should be provided.

Where appropriate, parking spaces should be set-aside for refrigeration engineers. These should be as close as practicable to reefer connection points and clearly marked.

Reefer gantry outlet banks should be equipped with flashing lights, or other warning devices that will ensure drivers of container handling plant are aware of the presence of engineers.

All electrical cables to connect to containers should

- be to a standard appropriate for the type of operations and environmental conditions to which they might reasonably foreseeably be exposed
- maintained in good condition

Electrical connections to containers should be protected by suitably rated residual current devices.

A safe system of connection and disconnection should be devised by the terminal for refrigeration engineers. This should include a defect reporting procedure, and provision for a suitable and sufficient space between the gantry and containers to make and break connections. Such a system should include clear markings.

6.12. Bulk liquids carried in containers

Bulk liquids can be carried in dry freight containers fitted with flexitanks or IBCs, tank containers, or in tanks or bowsters (containment device) mounted on platform or flatrack containers.

The free surface effect is one of several mechanisms where a craft, including an incorrectly filled containment device on a rail wagon or chassis / trailer, can become unstable and roll-over. It refers to the tendency of liquids to move in response to changes in the attitude of cargo holds, decks, chassis, wagons or liquid tanks in reaction to operator-induced motions.

ADR, IMDG, UN all have recommendations about the filling of tank containers and the same rules would apply to other containment devices carried within or on containers. All containment devices should be filled to comply with these regulations and therefore the surging of the cargo as the container is moved should not adversely affect the cargo handler.

Containers which are loaded correctly in line with the degree of filling will not be affected by free surface effect. However drivers of tractor / trailer combinations carrying a container with

a high centre of gravity should be especially careful when changing lanes and turning tight corners especially if travelling relatively fast or making sharp manoeuvres.

Drivers of cargo handling equipment and transport will experience:

Dangerous surging of the cargo tank container will be unstable once it is in motion	• containment device filled between 40 and 60%
Severe surging of the cargo	• containment device filled between 60 and 70%
Noticeable surging of the cargo	• containment device filled between 70 and 80%

7. | Operational Safety – Straddle Carriers Parks

In terminals where straddle carrier operations are carried out hauliers and their vehicles should not be permitted to enter container stacking areas. A suitably local grid or grid system should be provided where containers can be transferred to or from road vehicles.

Straddle carrier/road haulage interface systems should be so designed that straddle carrier approach is always from the rear of the road haulage vehicle.

Control systems for grid movements should be designed to obviate the need for operational pedestrian staff on the ground.

The slots of the grid should be spaced at not less than 6m centres and should be clearly marked out. The distance between slots should be determined in the light of allowing an access area between slots, the width of straddle carriers and other operational factors.

The entry of road vehicles to the grid slots should be controlled to ensure that the grid does not become a road vehicle waiting area. Waiting areas that do not obstruct other facilities should be provided for such vehicles.

The number of vehicles allowed on each grid at any one time will vary according to the number of straddle carriers in use. The ratio of road vehicles to carriers should not normally exceed 3 to 1.

To reduce as far as possible the number of people at risk, Control staff should ensure that:

- Any passengers carried in visiting container lorries alight from the lorry before it is driven onto the grid slot and that the passengers wait in a waiting-room or other safe place provided by management
- Container securing equipment or twistlocks are released, in a safe place, before the lorry moves on to its grid slot and are not re-secured until the lorry has left the slot
- The haulier/lorry driver leaves the cab and stands a safe distance from the vehicle and forward of the cab, or in a clearly marked safe area before the unloading and loading of the containers begins
- The haulier/lorry driver remains in that position until the straddle carrier has left.

No other personnel should be permitted to enter the container stacking area either in vehicles or on foot during operation. It is, however, recognised that there are occasions where access is necessary and in these circumstances arrangements, based on suitable and sufficient risk assessment, should be put into place for the activity.

Access to the container stacking area must be authorised by a Shift Manager or similar designated person. All staff requesting access onto (or moving within) the straddle carrier working area must be identified and be in communication with operational control by suitable means such as a radio on a safety channel.

Permission on an identifiable basis must be requested before entering (or moving within) an operational area and operational control must log each access (or movement) request and limit such concurrent requests to site where the activity of one operation might affect the safety of another. All personnel must wear suitable PPE which at a minimum is likely to include but is not limited to high visibility clothing and head protection.

Operational control should communicate safety arrangements to all persons, such as straddle carrier operators in the area, ensuring that arrangements are in place and working prior to entry. Such arrangements may include the suspension of all operations in the affected area.

Once confirmation is received persons may be permitted to transit the controlled area.

If personnel need to remain on site whilst operations are re-started, they must go to and remain in a terminal a "Safe Area". This may be a permanent location or a temporary arrangement. A temporary safe area might for example be bounded by vehicles showing flashing lights, illuminated trailers or barrier boxes. The safe area boundary should be designed such that vehicles cannot enter the area from any direction without encountering a boundary marker. Such a "Safe Area" should be set up and personnel located within it BEFORE operations re-start.

When staff need to move from "Safe Area" they must request permission from operational control who will arrange the move by implementing control arrangements.

Only authorised vehicles, such as specialist vehicles displaying hazard warning lights, should be allowed in Reefer Straddle Carrier Operating Area when Straddle Carriers are working. These lights must be working at all times when the vehicle is on site.

Particular attention should be paid to the traffic management and control of straddle carriers. Tight turns, excessive speed and the carrying of containers at high levels have all contributed to straddle carriers overturning.

Drivers have a restricted view of end frame and corner fittings of containers onto which another is being placed and when stacking a container onto certain types of containers (e.g. open top, flatrack and tank containers) require accurate placement to ensure that the container is safely stacked.

8. | Operational Safety – Rubber Tyred/Rail Mounted Gantry Crane Parks

It is the haulier's responsibility to ensure that their twistlocks are:

- disengaged before unloading of containers begins
- engaged after loading

Both operations should be carried out in accordance with terminal rules. Whenever practicable this should be done away from the immediate operational area.

Hauliers/vehicle drivers should stay in their cabs during their time on the terminal, unless otherwise directed.

Hauliers/vehicle drivers who are required to leave their cabs in operational areas should only do so in accordance with a safe method of work. It is essential that the Rubber Tyred and Rail Mounted Gantry Crane (RTG/RMG) operator can see their whereabouts at all times. Unless they are in a safe haven hauliers/lorry drivers should wear PPE in accordance with terminal rules.

If it is necessary for a driver to enter a RTG/RMG's checkers cab, they should not board whilst the crane is moving. No more than one driver should enter at a time; others should stand at a safe distance from the RTG/RMG's operational area.

RTG/RMG drivers should take care to ensure that any lorry at which they are about to work is stationary and its cab is not under the lift. Whenever practicable containers should be transferred from the side of the haulier's vehicle not from the rear. Ultimate limit switches should not be deliberately used to stop motions. These are installed for emergency protection only.

Drivers of RTGs and RMGs should be instructed to exercise special caution when approaching any crossings used by other vehicles or by pedestrians.

Particular attention should be given to the maintenance of axles of RTGs. Periodic non-destructive testing is recommended.

The endeavour should be to keep the haulier/vehicle driver within their cab at all times when in an operational area and when their vehicle is on a grid, and make it unnecessary for them to speak to or otherwise contact the plant driver.

Handling and securing of containers should be carried out in accordance with international standards or other methods providing an equivalent standard of safety within the terminal.

9. | Operational Safety – Railhead Terminals

Due to the particular problems caused by rail traffic, in addition to other general and appropriate safety rules contained within this document, the following additional requirements should apply.

Proper liaison and safe systems of work should be agreed between terminal staff and personnel from any other companies involved in the rail operation.

Full written safe codes of practice should be produced for shunting, whether with a locomotive or other dock equipment, coupling and uncoupling, braking and brake testing, maintenance, derailment procedures, the operation at level crossing gates and all other rail associated operations.

All staff involved in the movement of rail vehicles, including the drivers of container terminal locomotives, should be trained in the safe methods of work and passed as competent. Their performance should be subject to monitoring.

All rail movements should be planned and communicated to the responsible supervisor or nominated person before the movement takes place. The agreed system should include terminal management and supervisors, rail traffic operators and any sub-contractors on the terminal who may be affected.

A clearway of 3 metres (10ft) should be allowed between the running rail and any adjacent vehicle roadway to provide a safe haven for persons involved in activities with the rail wagons.

Fouling points should be clearly indicated. They should be positioned so as to allow sufficient clearance for persons to pass safely between vehicles on adjacent lines at all points.

All parties concerned should be informed of any maintenance work to be carried out, or being completed to the track before any new personnel (e.g. change of shift) are deployed on the terminal. The person responsible for such maintenance work should arrange for each track affected to be protected in the direction or directions from which trains may approach. Protection should consist of a red banner flag or board by day or a red light during darkness.

Prior to commencing to load / discharge rail wagons, brakes should be applied and physically locked off to prevent accidental release and a suitable means of documented hand-over opened and exchanged.

Before rail movements restart after loading / discharge all lifting or loading operations have ceased within the immediate area of the rail movement and the documented hand-over completed and re-exchanged.

All audible and visual signals, including hand signals should be agreed between all parties and laid down within a written safe code.

If radio contact with locomotive drivers is made during shunting operations CONTINUOUS radio contact should be used. The word 'proceed' should be continuously repeated during any desired movement so that the integrity of the communication is continuously monitored.

Particular care should be taken during shunting operations to ensure both facing and trailing points are correctly positioned. Level crossings or unguarded openings should be supervised as appropriate. Consideration should also be given to rail conditions, e.g. ice, snow, fog, etc., when attaching the locomotive and during shunting operations.

No person should remain between vehicles during an ease-up movement.

Brakes should be applied to all wagons positioned in container terminals unless they are attached to locomotives.

Crossing the line by ducking under or passing between buffers should be strictly prohibited.

No person should go between buffers of rail vehicles less than 15 metres (50 feet) apart unless there is clearly no possibility of the vehicles moving.

10. | Operational Safety – Other Handling Methods

Containers should only be handled using approved methods identified in ISO 6346.

Large lift trucks (LLTs) used for this work include a truck fitted with an integral top lift spreader, a fork lift with forks/tines or a detachable top lift spreader or an empty container handler with a side lift spreader. Wherever possible LLTs should be used with an appropriate lifting attachment for container work, e.g. top lifting spreaders or side lifting frames (as appropriate).

A container should only be lifted by a fork lift truck if the container is designed to be so lifted, e.g. by the provision of fork/tine pockets.

40ft containers generally do not have fork pockets fitted, however certain dry freight and flatrack containers do have "empty lift only" pockets.

20ft dry freight containers carrying flexitanks should not be lifted or transported using the tines of fork trucks.

Tank containers are not fitted with fork lift pockets and lifting or transporting them using the tines of fork trucks is prohibited.

Large lift trucks and container stackers should be parked in nominated areas in the stacking area during breaks and at the end of work and immobilised. Forks/tines should be lowered to the ground. Other attachments should be left in accordance with the manufacturer's recommendations. A safe pedestrian route should be provided to and from the location where such trucks are parked after immobilisation.

The design of container parks to be operated by LLTs or container stackers should allow room to manoeuvre, separating all other work, including offices, huts etc. from the area and providing effective means to prevent personnel from mixing with machines. The presence of pedestrians should be strictly controlled. Any essential personnel within the park should be authorised from a control point, and wear appropriate PPE including but not limited to high visibility clothing and head protection.

As with other handling methods stacking areas should be clearly marked. The stacking policy should consider the effects of high winds and the need to segregate dangerous goods.

The visibility of LLTs and container stackers may be impaired by the load. LLTs and container stackers should be designed to enable drivers to see where they are going when travelling with a load and where the container is to be landed. The need for persons on the ground should be avoided where practicable. If the presence of persons on the ground is necessary a system of work incorporating recognised and agreed signals should be employed or radio communication provided.

Operating systems should be aimed to ensure that the SWL (Safe Working Load) of the LLT or container stacker is not exceeded, taking into account the possible maximum weights of containers to be lifted and the need to allow for the load centres of such containers.

11. | Dangerous Goods

Containers, including tank containers, carrying dangerous goods should not be accepted onto container parks without the correct documentation and placards.

Containers of dangerous goods should be stowed on the stacking area in accordance with segregation preferably based upon the IMDG Code, or other appropriate system.

Containers carrying class 1 (explosives) or class 7 (radioactive) cargoes should not be stood down on the stacking area. These should only be accepted onto the terminal as direct delivery to the vessel, or in accordance with local competent authority requirements.

No incompatible freight containers containing hazardous goods should be loaded onto the same trailer. Guidance for incompatibility will be found in national legislation or the IMDG Code.

Containers carrying dangerous goods should not be placed in a corner or end of a row stow where moving vehicles turn.

12. | Incident Management

All Terminals should develop emergency plans in conjunction with the port and emergency services. This plan should give guidelines as to the emergency capabilities of the port itself and lay down the command and control structure for an emergency incident as it passes from port control to emergency services control. The emergency plan should be tested and amended as a result of experience.

All emergency access and exit points should be kept free from obstruction and properly maintained at all times.

All lifesaving and firefighting equipment should be kept in good order and periodically inspected and their inspection recorded. Any defect noted should be reported and appropriate action taken. Similarly any fire extinguisher discharged should be immediately recharged or replaced.

No approach should be made to any container containing or suspected of containing hazardous goods that is leaking or smelling of fumes. Such situations should be referred to operational control, with the correct location, container number, and, if available, the UN number of the substance.

Operational control should take action after considering factors including but not limited to:

- wind direction
- Emergency Procedures or similar
- Material Safety Data Sheets (MSDS) including:

Appropriate action may include but is not limited to:

- Evacuate persons from the area and downwind as appropriate
- Ensure no smoking
- Ensure that all engines are stopped
- Ensure that any naked lights are extinguished

If the port/terminal facilities are unable to deal with the situation, operational control should refer the matter to the emergency services. If it is safe to do so any leaking container should be moved to a more appropriate or bunded (walled or dyked) area if available. It is important that those concerned are aware of the limits of their knowledge. In any case of doubt no action beyond that set out in the above paragraphs should be taken until suitable advice has been obtained.

In an emergency such as a fire or other incident, operational control should stop any operations according to the emergency response plan or as requested by the senior officer of the emergency services. The terminal controller should establish an early liaison with the senior officer in charge of the emergency and offer such services as are appropriate.

On the approach of emergency vehicles, terminal controllers should suspend operations in such areas as necessary to allow immediate access.

When emergency vehicles have reached their destination, and the terminal controller, in consultation with the senior officer in charge of the emergency services, deems it safe to do so, parts of the terminal may be returned to operational state.

About The Authors

Bill Brassington

Bill Brassington is an engineer who has worked within the freight container industry for over fifteen years, firstly working as the Global Maintenance Manager for P&O Containers.

Following his years with a Shipping Line, Bill joined Sea Containers as their Technical Services Manager. After the merger with Genstar to form GE SeaCo he was promoted to lead the Engineering and Technical Services Department responsible for all elements of container design, build and maintenance for all container types as well as providing Health, Safety, Security and Environmental advice to the company.

Bill now provides independent consulting services under the name of ETS Consulting to the freight container industry specialising on safety and container design. He continues to work closely with the IMO and other international bodies on safety issues. He is a designated Expert on the ISO Technical Committee 104 and its subcommittees with respect to container design standards and works with governmental offices and NGOs on transport issues. Bill was a founder member of the Container Owners Association (COA) and remains closely associated with them. Bill has been a member of the International Safety Panel for some years.

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The original publication was written by Bob Barnes who was the Head of Safety and Emergency Services at the Port of Felixstowe and who was also a member of the International Safety Panel.

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