



Seed Crushers'
and Oil Processors'
Association

Preventing Falls From Road Tankers

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The Seed Crushers' and Oil Processors' Association

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1 Introduction

Falls from a height, including falls from road tankers, comprise one of the three main causes of fatalities in the food and drink industries. This guidance document recommends best practices to help the edible oil industry in reducing injury risk further. SCOPA would like to thank The Scotch Whisky Association for allowing their industry guidance to be used as a model for this document.

Within the UK falls from the top of road tankers have resulted in numerous fatalities and major injuries. Given the high volume and routine use of these vehicles within the Edible Oils Industry to transport bulk Crude, Semi Refined and Refined vegetable oils, it is essential we ensure that the inherent risks are properly managed.

This document is therefore intended to:

- Provide clear guidance for the reader;
- Assist member companies to evaluate their existing arrangements; and
- Facilitate a future strategy to progressively lower the level of risk.

As the use of road tankers is well established and individual companies have, over time, developed their own access arrangements, a single solution was not feasible and a range of options have been addressed. Ensuring safe access is the responsibility of individual companies and is based on operational requirements and risk assessments specific to the premises.

Every care has been taken in the production of this guidance; however, site-specific circumstances may alter the effectiveness of the control measures. Each company must adopt control measures appropriate to local circumstances in order to meet the statutory duty to provide safe access.

2 Scope

The extended range of safety risks associated with road tankers is significant e.g. traffic management, roadworthiness of the vehicle, spillage and containment however; these are not addressed in this document. This guidance document focuses exclusively on the risks associated with falls from height whilst accessing road tankers to complete routine activities, i.e. filling, dipping, sampling, internal cleaning and discharging operations.

The scope addresses options to: -

- Eliminate or reduce the frequency of top access;
- Enable safe access via tanker stations and access gantries;
- Enable safe access by using fittings on the road tanker
- Increase level of safety by providing fall-arrest type equipment.

3 Definitions

Road Tanker: A vehicle that has a tank whose capacity is greater than 3m³ and which is structurally attached to or is an integral part of the vehicle.

Tanker Station: Free standing, custom-built facility designed to provide access and all other operational needs associated with road tanker loading and unloading activities.

Access Gantry: A simple structure, typically attached to an existing building, to provide access onto the top of a road tanker.

4 Risk Assessment

The typical hazards that would normally be recognised by risk assessments have been identified within this section. The assessment is generic and deals with the more foreseeable hazards. This list of hazards is not exhaustive given unforeseen circumstances that may exist at particular sites, so it is strongly recommended that individual sites complete their own risk assessments.

To facilitate risk assessment, it is important to secure cooperation between the road tanker operator, tanker station personnel (management and operators) and the owner of the product as appropriate. The need for good communication and planning between all parties before the delivery takes place is imperative if safety is to be ensured.

Typical Hazards – Loading/Unloading Road Tankers

Process Step		Fall Hazard	Control Measure (Section)
1.	Park/present road tanker	<ul style="list-style-type: none"> Positioned in a manner that compromises access arrangements 	7.2
2.	Immobilise road tanker	<ul style="list-style-type: none"> Road tanker being driven off unexpectedly Unplanned free movement of vehicle Landing legs of road tanker collapsing without warning 	7.2 & 9
3.	Access onto road tanker with tanker stations or access gantry	<ul style="list-style-type: none"> Unfenced openings on tanker station/access gantry Inadequate guarding provided whilst on top of tanker Absence of appropriate fall arrest equipment Overhead obstructions 	7.2 & 7.4
4.	Access onto road tanker without tanker	<ul style="list-style-type: none"> Inadequate access steps, handrails and/or walkways provided on the road tanker 	7.3 & 7.4

	station or access gantry	<ul style="list-style-type: none"> Absence of appropriate fall arrest equipment 	
5.	Breaking seals and opening top hatches	<ul style="list-style-type: none"> Walkway obstruction caused by top hatches 	7.3
6.	Inspection	<ul style="list-style-type: none"> Fall into vehicle Exposure to nitrogen could cause asphyxiation 	7.1 & 9
7.	Dipping	<ul style="list-style-type: none"> Increases the risk if the operators has to lean outside the safe area to reach the dipstick 	7.1 & 7.3 & 9
8.	Sampling	<ul style="list-style-type: none"> Increases level of risk due to need to carry containers whilst on the top of the road tanker 	7.1 & 9
9.	Top filling operations	<ul style="list-style-type: none"> Requirement to reach and handle pipes/hoses increases likelihood that operator will lose balance Trip hazard caused by filling equipment 	8
10.	Bottom filling operations	<ul style="list-style-type: none"> Hazard eliminated 	7.1
11.	Close/seal road tanker	<ul style="list-style-type: none"> No new risks, but increases the access frequency 	7.1 & 9
12.	Despatch road tanker	<ul style="list-style-type: none"> Road tanker being driven off unexpectedly 	7.2 & 9
13.	Use of hoses to clean road tanker internally	<ul style="list-style-type: none"> Weight and size of the hose causing the operator to overbalance 	7.1 & 7.2

5 Control Measure Hierarchy

Risk assessments must be carried out on a site by site basis. A key element of this exercise is the selection of appropriate control measures to reduce the level of risk to ***as low as is reasonably practicable***.

Achieving a safe standard will normally require the implementation of more than one risk reduction measure. In practice, this range of potential controls follows a hierarchy based on effectiveness.

Eliminate The most effective way to minimise the risks is to eliminate the need for access to the top of the road tanker. This solution may create practical problems, but it must be recognised as the best option from a safety perspective.

Reduce Reducing the number of visits to the top of the road tanker will achieve a corresponding risk reduction.

Control Engineering solutions fitted to the road tanker or the tanker handling facility intended to minimise the risk of falling.

Procedures	The development and adherence to safe operating procedures/work instructions that communicate how to minimise risks by adopting safe working practices.
Personal Protective Equipment (PPE)	Personal protective equipment can be justified under two circumstances: when all other control measures have been considered and a significant risk still exists; when it is used as a short term measure until a permanent solution is installed.
Discipline/Conduct	Working to safe operating procedures, work instructions and method statements. Consideration to be given to Human Factors.

6 Decision Tree – Prevention Measures against Falling from Vehicle

The decision tree will follow

7 Options

7.1 – Eliminate Top Access Requirements

General Description

Avoiding the need for access to the tops of road tankers will eliminate all risks associated with falls. However this requires all road tanker top activities to be substituted by alternative ground based work methods. Individual companies have often used ground level techniques but there are exceptions that still require limited top access.

Advantages

- Will completely eliminate all fall risks.
- Eliminates the need for an access gantry and tankers with in-built design for safe access.

Current need for top access:-

- Breaking seals
- Cleaning
- Tanker Inspection
- Sampling during loading
- Closing/Sealing
- Sampling before discharge
- Dipping

7.2 – Design of Tanker Stations/Access Gantries

General Description

Provision of a fixed access facility designed to provide a controlled working environment that minimises the risks of falls from height. This option is less effective than eliminating access from ground level as it controls rather than removes the risk of falls.

In practice, achieving a universal safe design of tanker station or access gantry is a difficult task given the range of road tanker designs that have to be accommodated. Older/obsolete tanker station/access gantries will frequently increase the level of risk, particularly where it prevents the use of road tanker handrails.

Advantages

- Road tanker stations already exist.
- The guarding is more robust than that provided on a road tanker.
- There are benefits other than fall protection e.g. spillage control; weather protection etc.

Limitations

- Cost.
- Difficulty in providing safe access for all tanker designs.
- Difficult to upgrade, modify or relocate.

Essential Safety Requirements:

Park/Present Road Tanker

Where alignment of the tanker and gantry is critical to ensure safe access, the roadway should be marked with alignment markings.

Immobilise Road Tanker

The road tanker must be immobilised to prevent unplanned movement. Means of immobilisation could include:

- Traffic light system.
- Road barriers e.g. free standing sign placed in front of tanker;
- A warning sign attached to the vehicle steering wheel;
- Supporting jacks in the absence of a tractor unit;
- Wheel chocks.
- Automatic Brake Interlock on deployment of handrails(s).

Best practice options for fixed gantries:-

Gaining Access to raised platform

A safe means of access must be provided to the gantry using access steps at a safe angle rather than a fixed ladder. The steps should have a non-slip surface

(preferably open mesh/mezzanine so that mud and oil can pass through the grate and away from the walking surface) and be fitted with handrails.

The gantry platform should be fitted with handrails at least 1100mm with a mid-rail and toe board. All gaps in the handrail should be guarded when not in use. This guarding should not be non-tensioned chain or rope. The gantry should have adequate headroom to prevent people striking their heads against overhead obstructions. All equipment that an operator is expected to use, e.g. valves, hoses, pipes etc. should be readily accessible.

Tanker Access

The arrangement for access onto the tanker itself should be via height adjustable bridge/steps so that safe access is provided across to all tankers using the gantry. The bridge should be aligned to give access to the most suitable part of the tanker, this could be directly to the hatch or it may be onto the tanker walkway. The bridge requires handrails to the same standard as the platform and the access guard could be interlocked so that access is only permitted when the bridge is located on the tanker.

Long Bridge

The increased width of the bridge overcomes some of the difficulties associated with aligning the bridge with the road tankers hatch or walkway.

Handrails around the Road Tanker Top

The tanker station/access gantry must provide adequate handrails to prevent falls from the top of the tanker. Handrails will normally be attached to the overhead structure. The handrails need to be provided wherever a person is likely to fall 2 metres or more. The maximum vertical spacing of the handrails up to a height of 1100mm above the tanker should not exceed 475mm. The handrails must be adjustable to prevent the maximum gap being exceeded where different tankers use the gantry.

Integrated Road Tankers and Tanker Access Gantries

In practice the standard of tanker top guarding specified for the tanker station can be achieved by utilising the handrails provided on the road tanker. In these situations it is essential that there is no conflict between the provisions on the tanker station and those on the tanker itself. A common example being road tanker handrails trapped under the bridge and therefore being rendered inoperative.

7.3 – Road Tankers that provide safe access from Ground Level

General Description

Road tankers that can provide a safe means of access without reliance on tanker stations or other means of access.

Advantages

- Safe access to the road tanker anywhere.

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- No need for tanker stations.
- Cost of implementing on new build equipment/tankers is minimal.

Limitations

- Reduction in the payload.
- Increased maintenance requirement due to moving parts.

Access onto Road Tanker

The access ladder from the ground must be of sound construction and positioned vertically or sloping inwards towards the top. The rungs should be of a diameter greater than 20mm and positioned at intervals not exceeding 300mm. Stiles should be at least 250mm apart and the clearance between the rungs and the tanker body should exceed 130mm. The construction materials should minimise the risk of slipping and include the provision of handrail(s). Access ladders can be fitted to the front, rear or side of the tanker. Side access ladders commonly utilise the crash rails as the lower steps.

Walkways should be constructed of non-slip material, typically metal mesh. The width of the walkway should exceed 350mm and extend to all areas of the tanker that require regular access. Potential obstructions, such as open hatches, should not obstruct or impede the walkway. Collapsible guardrails should be capable of being erected from ground level. Each guardrail must be at least 1100mm high and incorporate a rigid mid-rail. Deployment of rails should work in conjunction with a brake interlock facility to prevent vehicle movement.

Dipping

If the requirement for a dipstick is essential it should be located inside the tank. Some road tankers are fitted with an external keyway to store these devices when not in use. In practice, retrieving the dipstick from an external keyway often involves reaching and leaning outside the safe area.

Road Tanker Design

The wide variety of tank designs may mean that alternative tank top working configurations are possible which provide minimum levels of protection. It is acceptable to deploy these where risk assessments clearly demonstrate that at least the same level of protection is afforded. Different tanker designs include:-

- Hybrid Tanker
- 3 sided handrails
- Off-set walkway
- Crest of tank walkway
- Side access tankers

7.4 – Fall Arrest Equipment

General Description

The use of this option is limited to circumstances where it can be demonstrated that there are no “reasonably practicable” alternatives. This type of equipment consists of a harness or belt attached to a lanyard constructed and installed in a manner that would help prevent a fall from height. The option attracts a range of statutory requirements that are detailed within the Personal Protective Equipment at Work Regulations.

Advantages

- Selection of fall arrest type systems available that can be tailored to suit almost all operating environments.
- Typically lower cost and less inconvenience.
- Offers a reduction in level of risk where the site’s risk assessments indicate a level of risk that fails to warrant more extreme (and effective) measures.
- Provides a “quick fix” until a more permanent solution can be implemented.

Limitations

- Equipment needs to be used by trained operators e.g. trying to break a fall whilst attached to an inertial reel system may prevent its operation by slowing the rate of fall to a level below that which the inertia mechanism operates.
- Requires additional statutory duties e.g. servicing, inspection and storage.
- More likely to create behavioural issues associated with its use.
- The fall arrest equipment may leave the person suspended in mid-air.

7.5 Fall Arrest Equipment Supported by Overhead Structures

Overhead structures such as the canopy of a tanker station may offer a suitable attachment point for mounting a fall arrest system. Prior to fitting, it will be necessary to obtain confirmation that the supporting structure is capable of supporting the weight of the proposed system during normal operation and in the event of a shock-load following an incident.

These systems require a rail, track or cable to be secured to the overhead structure. The installation can accommodate situations where access is gained from high level gantries or platforms or from ground level. Systems can be designed for single person access or simultaneous access for more than one person. The selections of rails, cables or tracks each offer advantages and limitations that need to be discussed with a competent installer.

The individual is secured to the overhead structure by the use of a lanyard that has an integral shock absorber to prevent injury from the arresting forces. Where movement is limited to the horizontal plane e.g. direct access from a gantry at the same height, a lanyard of fixed length may be adequate. In situations where vertical movement is required e.g. access from ground level, an inertia reel needs to be added to the assembly. It should be remembered that inertia reel units result in the

lanyard recoiling into its high level housing. A low level mounting or convenient method of retrieving the lanyard from high level housing will be required.

The person on top of the road tanker will be required to wear a full harness. A properly fitted harness can be comfortably worn for prolonged periods.

Advantages/Disadvantages

This must be considered as the best Fall Arrest system available. However, many facilities may not have sufficient headroom to install or have structures of adequate strength to support such a system.

7.6 Fall Arrest Systems Where No Overhead Structure Exists

The absence of an overhead structure does not necessarily eliminate the use of a fall arrest solution, albeit that the installation costs will increase substantially. Supporting pillars can be placed into the ground to support the overhead assembly. This type of

Arrangement requires particular attention be given to the positioning of road tankers. Where the number of road tankers is limited, attaching the fall arrest equipment to the road tanker is a more cost effective solution.

Advantages/Disadvantages

Where no overhead structures exist, their fitment is likely to be too costly to be considered as a potential solution.

7.7 Fall Arrest Equipment Attached to the Road Tanker

This type of equipment can be used to assist access from ground level or tanker stations that fail to offer adequate protection from falls. Although the equipment is not widely used within the Vegetable Oil Industry, it does offer the benefit that the road tanker does not need to be located directly under a purpose built fall arrest system. Tensioned cables and a free running Lanyard is secured to the road tanker. Connection via a waist belt with a clip-on safety hook that allows 180° rotation. Unlike conventional handrails, the system is unlikely to be impaired when operating from tanker stations and gantries that prevent the erection of the road tanker handrails.

Advantages/Disadvantages

This can only be considered a solution if the Road Tanker has the free running Lanyard equipment incorporated in its design.

8 Selection of Top Filling Equipment

General Description

Top filling is normally achieved by the use of fixed loading arms / moveable pipework or flexible hoses. Careful selection of equipment will help minimise the risk of SCOPA Guidance Publication. Preventing Falls From Road Tankers.

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operators losing their balance while handling the filling head on top of the road tanker.

Flexible Hoses

Flexible hoses are the most common means of top filling road tankers. In most installations the type of hoses used increase the risk of falling while handling by being inflexible and difficult to manoeuvre. Potential solutions already in use within the industry include the use of lightweight hoses and the introduction of counterbalanced equipment.

Fixed Loading Arms / Moveable Pipework

These devices are the best technique for top filling. The equipment consists of permanent pipework directly connected to the loading facility. The loading arms can easily be raised and lowered into position by means of pneumatic or counter balanced weight control. The mechanism can incorporate operating valves and a high level cut out.

9 Safe System of Work

General Description

Providing road tankers and facilities to a standard that enables safe access is critically important, but on its own will not prevent accidents. Arrangements must be established to ensure that “safe” equipment is used, and used safely.

The arrangements will normally take the form of written safe systems of work. The safe system of work should describe the safe use of equipment and the operating procedures needed to control risks that cannot be controlled by hardware solutions alone. To be effective, adequate training must support safe systems of work.

Maintenance

All equipment – fixed and moveable should be regularly maintained according to the Ministry of Transport Regulations.

Hazards requiring the development of operation procedures typically include;

Hazard	Potential system of work
<ul style="list-style-type: none"> • Unauthorised access/access in an unauthorised location 	Restricted access arrangements.
<ul style="list-style-type: none"> • Out of spec/mismatched tankers 	Reject unsuitable Road Tankers that cannot be handled / loaded safely.
<ul style="list-style-type: none"> • Unplanned movement of road tanker 	Securing of vehicle keys until the operation has been completed. Disconnection of the vehicle’s airline, which will automatically apply the

- brakes.
Brake interlock when handrails deployed.
- Catastrophic failure of tanker landing legs
Leaving tractor unit attached or positioning of a safety jack(s) under the 5th wheel
- Additional hazards created by foul weather
Brushing/de-icing/prevention of access. Availability of a personal protective equipment/fall arrest if access is essential.
- Overhead obstructions that cannot be engineered out
Use of hard hats or bump caps. Clearly labelled and hazard marked overhead obstructions.
- Additional risks created by defective equipment
Defect reporting procedures.
- Poor housekeeping techniques
Ensure strict procedures are adhered to.
- Potential risks with slips/falls
Ensure correct safety equipment is in use including correct footwear