



Oil Companies International Marine Forum

# ***Safe Access on Ships with Exposed or Raised Deck Structures***

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*The OCIMF mission is to be the foremost authority on the safe and environmentally responsible operation of oil tankers, terminals and offshore support vessels, promoting continuous improvement in standards of design and operation*

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## 1 **Introduction**

Over recent years the design and construction of product and chemical tankers has evolved and this has resulted in external transverse stiffening being present on the vessel's tank deck. This change in design was principally introduced to facilitate more effective and thorough cleaning and preparation of cargo tanks. However, it has also resulted in the deck areas of these vessels becoming more cluttered and in some cases less accessible. On many vessels the clear deck area adjacent to the ship's side has been reduced substantially and this has led to difficulty in landing shore gangways and positioning gangway bulwark ladders that are used in association with ship's gangways.

Another change that has resulted from these deep transverse stiffeners is the need to construct additional elevated platforms for access to key work areas. This is clearly seen in the ship's cargo manifold area. Many manifold working platforms are constructed at relatively high levels, sometimes in excess of two metres elevation and are not fitted with effective edge protection. There have been documented incidents of personnel falling from these elevated platforms resulting in severe personal injury.

This Information Paper has been developed to highlight the issues and risks associated with the changes to deck structure and how these risks might be mitigated to ensure safe access and working in the cargo deck area. The Information Paper is intended for the use of both ship and terminal personnel and will hopefully help to reduce the frequency and probability of accidents in this area.

## 2 **Raised Manifold Platforms – Access and Safe Working Arrangements**

### 2.1 **Manifold Working Platforms**

The ship's manifold working platform usually incorporates a drip tray/saveall with the working surface consisting of a steel grating. Until relatively recently this platform was constructed beneath the cargo manifolds close to deck level. The surface of the platform would be approximately 0.5 metres above the deck with a single step up for easy access. These low level working platforms have not presented a risk to personnel engaged in work at the manifold.

More recently, it has become common to find that the cargo manifolds and associated pipe work have been raised above the vessel's transverse deck stiffeners, thus avoiding interference with these. The cargo manifold working platforms have also been raised accordingly. Many of these elevated working platforms are at a height of between 1.5 m and 2.5 m above the vessel's maindeck and are accessed by various means, including vertical ladders.

### 2.2 **Manifold Access and Safe Working Arrangements**

In many countries Health and Safety Regulations apply to all work at a height where there is a risk of a fall liable to cause personal injury.

In the UK in 2010/11, falls from height accounted for 38 fatal accidents at work and 3,177 major injuries<sup>1</sup>. Falls from height remain the single biggest cause of workplace deaths and one of the main causes of major injury.

Elevated manifold platforms can pose a risk, particularly if the platforms are provided with no edge protection. In some cases edge protection is provided by stanchions and chains or wire but these may have to be removed to allow hoses or marine arms to be connected or disconnected, thus exposing personnel to risks of fall from height.

Where personnel are expected to work on elevated manifold platforms, the work should be properly planned, appropriately supervised, and carried out in as safe a way as is reasonably practicable. **Annex A** provides an example of a Check-List that may be used to assist with this planning activity.

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<sup>1</sup> UK Health and Safety Executive (HSE) Statistics

Supervisors and those in control of work at the manifold should assess the suitability of the manifold platform for safe working and in particular whether appropriate edge protection is provided that is substantial enough to prevent a fall from height. Where there is no edge protection or where this has to be removed to provide access for hoses and/or marine arms to be manoeuvred to and from the cargo manifold connection, alternative personal restraint measures may be required to prevent personnel accessing the edge of an elevated manifold platform. **Figure 1** depicts typical personal fall restraint equipment and **Annex B** provides an example of a flow chart that may be used to ascertain whether fall restraint should be used.



**Figure 1: Personal fall restraint with adjustable lanyard**

After hoses or marine arms have been manoeuvred, any removable edge protection should be replaced, if it is possible to do so without conflicting with the cargo transfer equipment.

Before accessing or allowing personnel to access an elevated manifold platform which has no, or limited edge protection, the following issues should be addressed:

- Has a risk assessment been conducted?
- have weather conditions been taken into account?
- are personnel trained and competent?
- has the work to be performed been properly planned and organised?
- is the work area clear of obstructions and trip hazards?
- has the use of safety harnesses and fall preventers been considered?
- if fall prevention lanyards are to be used, have suitable clip-on points been identified?
- can marine arms and/or flexible hoses be manoeuvred into position without removing

portable edge protection from the platform?

- can portable edge protection be replaced as soon as the marine arms and or flexible hose have been manoeuvred into position?

### **3 Use and Positioning of Ship and Shore Gangways**

#### **3.1 General**

Reference should be made to Section 16.4 of ISGOTT which addresses ship/shore access. This paper contains additional relevant information based on members' experiences that serves to complement the ISGOTT guidance.

It should be noted that "Means of embarkation on and disembarkation from ships" is now included in SOLAS under Regulation II-1/3.9 applicable to ships constructed on or after 1<sup>st</sup> January 2010. The regulation refers to:

- Guidelines for construction, installation, maintenance and inspection/survey of means of embarkation and disembarkation contained in MSC.1/Circ.1331 and
- falls or wires used to support any means of embarkation and disembarkation being maintained as specified in SOLAS Regulation III/20.4.

While the SOLAS Regulation and Guidelines have specific application their significance with regard to existing equipment on existing vessels should not be ignored.

Anecdotally, while there are more accidents associated with ship's portable gangways, shore-provided solutions are not without their problems. A shore gangway that is not in use for any reason should be clearly identified as such and effectively rendered inaccessible.

#### **3.2 Provision for Ship's Gangways on Jetties**

Terminal designers, constructors and operators should make provision on jetties for landing a ship's gangway, where they are not providing a shore gangway. The area should be open, clearly identified and unobstructed with access to the area maintained clear.

Where practical, sufficient flexibility should be available to permit the gangway to be deployed at a gate in the ship's handrails.

If vessels are expected to berth either side to a jetty, sufficient space should be provided at either end of the jetty to accommodate the safe landing of the ship's gangway. This will ensure that the presented gangway can be positioned between the ship's accommodation block and her manifold area.

#### **3.3 Provision for Shore Gangways on Ship's Deck**

Naval architects, ship builders, owners and operators should consider the requirement for landing shore gangways on the decks of tankers. This is particularly relevant for large telescopic gangways with an end access ladder mounted on wheels when used in conjunction with externally framed ships. **Figure 2** illustrates the difficulty in landing a shore gangway on a vessel with above-deck transverse stiffening.

Deck areas clear of substantial obstructions need to be identified or designed to accommodate the reception of shore gangways. These areas need to be provided on either side of the ship both forward and aft of the cargo manifold area. Future ship design should take account of current limitations and endeavour to accommodate the landing of shore gangways in a safe and effective manner.

Straight shore gangways should not be landed on ship's handrails unless they are specifically designed for the purpose. When gangways are mounted on handrails, access steps with handrails (bulwark ladders) should be provided to enable safe ascent from and descent to the deck.

To overcome the problem of accessing a gate or landing the gangway on handrails, a possible solution has been developed with a mounting that straddles the handrails. **Figure 3** provides an example of this arrangement.



**Figure 2: Difficulty in landing a shore gangway**



**Figure 3: Shore gangway with supporting bulwark ladder arrangement**

### 3.4 Alternative Means of Ship/Shore Access

If circumstances are such that a practical and safe means of access cannot be provided directly between the ship and shore, the only safe alternative may be to use a boat to ferry personnel from the dock to the offside of the vessel making use of the ship's accommodation ladder. If this alternative means of access is used, an additional means of access and egress may also need to be provided for emergencies.

## 4 Safe Access on Deck and Around Sampling and Measurement Points

### 4.1 General

Access around deck in general and to sampling and measurement points in particular can be difficult on ships with above deck transverse stiffeners. In some cases this will result in having to climb over the stiffeners and cargo pipelines or crawl through lightening holes and under pipelines to facilitate access.

These activities can be arduous and unsafe, particularly in wet and inclement weather. Access to and egress from these areas in an emergency could also be challenging.

### 4.2 Design

Both SOLAS and ISGOTT address access to and from vessels but apart from access to and from the bows of tankers, no particular regulation or recommendations exist for safe access around the decks of tankers. As can be seen from the illustrations in **Figure 4**, safe access to and from sampling and measurement points can in some cases be almost impossible due to obstructions. In many cases, this is due to poor design.



**Figure 4: Examples of restricted access to sampling and measurement points**

### 4.3 Recommendations

Naval architects, ship builders, owners and operators should consider the requirement for safe access to all areas around ship decks where crew members and other personnel are routinely required to conduct work activities.

**Persons unfamiliar with the vessel should be accompanied when reaching the vessel and provided with a safe management during their stay onboard.**

Particular attention should be paid to providing safe access to sampling and measurement points as these may often need to be accessed by shore personnel who may not be familiar with the ship. Personnel accessing these areas will normally be carrying sampling and measurement equipment and additional allowances should be made for this.

Consideration should be given to raising the sampling and measurement points above the deck obstructions and providing safe access to these positions

In areas where there are deep transverse frames associated with other deck structures, there is a danger of creating semi-enclosed spaces which can be difficult to ventilate or may entrap cargo vapours in light wind conditions. Ship designers, owners and operators should be aware of this potential danger.

Emergency access and egress should also be considered as should the requirement on occasions for personnel to access these areas wearing breathing apparatus or other restrictive equipment.

# Annexes

## A An Example of a Pre-operations Check-List

<b>Pre-operations Check-List</b> Workplace Safety, Health and Environmental Check	<b>Team Members' Signatures:</b>	<b>Date</b>
<b>Ship Name:</b>		
<b>Jetty Number:</b>		

		Y/N or NA	Actions Taken to Minimise Risk
1	Is there safe access to and from the work location?		
2	Are you wearing the minimum PPE for this area?		
3	Are you aware of the hazards that could be present on board the vessel?		
4	Can other people's activities effect your own?		
5	Is the Ship/Shore gangway properly rigged and safe for access to and from the vessel? (condition, angle, net, bulwark ladder, etc)		
6	Is the work location tidy? (Poor housekeeping can cause slips trips and falls)		
7	Have you read and understood any additional assessment required for the task? (COSHH, Manual Handling, PUWER, etc)		
8	Have you taken account of the weather conditions and how these might impact access to and on the vessel?		
9	Are you using the correct tools for the task and are they in good condition?		
10	Have you assessed the suitability of the manifold platform for access and working? (elevation, edge protection, working area, etc.)		
11	Is it appropriate to wear a fall protection lanyard and harness for additional safety whilst working at the ship's manifold?		
12	Is a ship's crew member in attendance at the ship's manifold?		

<b>Signature:</b>	<b>Name:</b>	<b>Date:</b>
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**COSHH** Control of Substances Hazardous to Health Regulations 2002  
**PUWER** Provision and USE of Work Equipment Regulations 1998

## B Example Flow Chart to Ascertain Whether Fall Restraint Should be Utilised

