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**Oman LNG L.L.C.**

# Procedure For Working at Height

This document contains 14 pages

## Documents Classification:-

### Risk Classification

Critical

### Security Classification

Unclassified

Document No:	QHSE-P209	Page	Page 1 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



## Table of Contents

1. Purpose.....	4
2. Scope.....	4
3. Definitions.....	4
4. Responsibilities.....	4
4.1 QEN/1 .....	4
4.2 QEN/2 .....	5
4.3 QHSE/2.....	5
4.4 All Users .....	5
5. Procedure .....	5
5.1 Rules for working at height.....	5
5.2 Planning and organizing for work at height.....	6
5.3 Training and competency for persons involved in working at height .....	6
5.4 Equipment for working at height .....	8
5.4.1 Mobile elevating work platforms.....	8
5.4.2 Scaffolding .....	8
5.4.3 Ladders.....	8
5.4.4 Safety Harness with double lanyard .....	9
5.5 Rescue from Height .....	11
5.5.1 Equipment for Rescue from Height .....	12
5.6 Controlling risks when working at height.....	13
5.6.1 Tie-off .....	13
5.7 Controlling risks from falling objects .....	13
5.8 Controlling risks from roof access including fragile surfaces .....	14
6. References.....	15

Document No:	QHSE-P209	Page	Page 2 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



## ISSUE HISTORY

Changes from previous issue are indicated in the table below

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1	Comments included – authorized for issue	30/10/2006
2	Periodic review	30/11/2008
3	Periodic Review and alignment with HSSE Control Framework section for Working at Height	29/11/2011
4	Normal update	10/05/2015
4a	Minor change in 5.1	16/04/2017
5	Periodic review	17/05/2018

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## 1. Purpose

The purpose of this procedure is to prevent falls and reduce the Consequences if a fall occurs when working at height.

## 2. Scope

This procedure is applicable to all OLNG Sites including HAS, STO and Muscat Head office.

This procedure covers:

- work at height from which workers can fall 1.8 metres or more from where they stand or sit to perform work, this includes potential falls to lower levels;
- gaining access to the work at height; and
- Employees and Contractors.

This procedure does not apply to:

- buildings having facilities that are designed to take into account Working At Height, for example stairways and walkways with handrails.
- The following special situations of Working At Height are handled differently: Rope access work and abseiling, or steeplejack work is done by specialists who have specific skills, Procedures, equipment and rescue plans to manage the Risk of Working At Height.

## 3. Definitions

- **MEWP** – Mobile Elevating Work Platform
- **AE** – Authorized Engineer
- **AGSI** – Authorized Gas Safety Inspector
- **HAS** – Hay Al Shurooq housing complex
- **NIB** – Non Industrialized Building
- **Working at Height** - Describes any activity where there is a Risk of injury from falling. These circumstances arise, but are not restricted to situations where people are performing work with a potential fall distance of 1.8 metres or more.

## 4. Responsibilities

### 4.1 QEN/1

- Training the users of the MEWP
- Storage and issue of Harnesses, Double Lanyards and Fall Arrest equipment
- Maintenance of MEWP

Document No:	QHSE-P209	Page	Page 4 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



- Arranging inspection and certification of MEWP by 3<sup>rd</sup> party inspectors
- Ensure that persons working at height are trained and competent ;
- Ensure that persons who may have to construct, put in place and/or inspect structures and equipment to facilitate work at height are competent

#### 4.2 QEN/2

Identification and periodic inspection of harnesses, lanyards, and shock absorbers according to [QEN-P203 Procedure For The Inspection And Testing Of Lifting And Hoisting Equipment](#)

- Ensure that equipment used specifically for working at height, or associated with working at height, is in good condition, and is properly identified; inspected and maintained

#### 4.3 QHSE/2

- Organization of Rescue from Height Training through NGH/1
- Ensure that persons who may have to perform rescues from height are trained and competent

#### 4.4 All Users

- Must have attended the OLNG HSE induction
- Shall inspect all equipment for working at height prior to use.
- Being aware of the proper usage of fall arrest equipment.
- Shall be aware of appropriate permits to work are available prior to working at height.

### 5. Procedure

Working at height involves controlling a number of hazards of which the most serious are:-

- Fall of person(s).
- Falling objects: -
  - Dropped by person(s) working at height
  - Falling due to inadequate storage of objects at height including overloading of work platforms.
  - Poor housekeeping
  - Inadequate fall protection or arrestors.

#### 5.1 Rules for working at height

- Working at height must be properly planned and organized.
- It must take into account weather conditions.
- Those involved must be trained, competent, and in good health.
- Equipment for working at height must be appropriately inspected.

Document No:	QHSE-P209	Page	Page 5 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



- Risks from fragile surfaces must be controlled.
- Risks from falling objects must be controlled.
- All safety helmets for personnel working at heights shall be fitted with chin straps. A chinstrap is to prevent a helmet to fall off a person's head and maybe falling down and therefore the wearer to put on chin strap while working at height or ascending / descending a ladder.

## 5.2 Planning and organizing for work at height

Before carry out any work at height the following decision hierarchy must be followed beginning with the first Control, assess each in turn to select a Control that is reasonably practicable for the task: -

- **First:** Eliminate the work at height.
- **Second:** Work from a permanent work platform with guardrails and toe boards.
- **Third:** Work from a temporary work platform (scaffold) or mobile work platform with guardrails. Consider the Hazards of installing, operating or maintaining the work platform when deciding whether it is reasonably practicable.
- **Fourth:** Use personal fall-protection equipment.
- If risk of fall is high; then a rescue plan must be in place prior to the commencement of the work. The rescue plan must consider the effects of suspension trauma.

## 5.3 Training and competency for persons involved in working at height

The following persons must be trained and assessed as being competent:

Skill pool	Responsibility
Scaffolders	OGMS Contractor Management
Crane drivers	OGMS Contractor Management
Inspectors of lifting equipment	QEN/2
Riggers	OGMS Contractor Manager
Users of ladders for temporary access (part of HSE Induction)	QHSE/2
Operatives of MEWP	QEN/1
Wearers of fall arrest equipment	QEN/1

Document No:	QHSE-P209	Page	Page 6 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



Inspectors and certifiers of MEWP, Harnesses, Double Lanyards, Fall arrest equipment	QEN/2
Rescue from height	QHSE/2 in conjunction with NGH/1

A record must be kept of the training received.

Document No:	QHSE-P209	Page	Page 7 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



## 5.4 Equipment for working at height

This equipment comprises: -

### 5.4.1 Mobile elevating work platforms

Cherry picker and scissor lifts normally kept at the workshop yard for working at height activities.



Figure 1: Cherry Picker



Figure 2: Scissor Lift

The equipment must be maintained in accordance with the manufacturer's instructions.

The equipment must be operated only by trained and certified persons.

The hazards and controls are described in the [QHSE-P221 Qalhat safety regulation for work under permit](#)

### 5.4.2 Scaffolding

Two types of scaffolding are used at OLNG.

- Standard scaffolding erected with poles, wooden boards and clips. (used exclusively on the plant and NIBS)
- Pre assembled mobile scaffolding towers – Used at HAS complex.

The controls for these types of scaffolding are contained in the [QHSE-P221 Qalhat safety regulation for work under permit](#)

### 5.4.3 Ladders

Oman LNG uses six types of ladder.

- Wooden ladders used on the plant to access temporary platforms e.g. scaffolding.
- Permanent steel ladders either for access or escape from fixed platforms on the plant.
- Aluminium ladders; can be used only in gas free environment.

Document No:	QHSE-P209	Page	Page 8 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	





- Small portable stepladders for use in the plant by Operations staff
- Rope ladders for vertical vessel access / egress.
- Oman LNG also has aluminium stepladders for use in NIBs

Ladders / step ladders should be used only for low risk, short duration and light work. They must be in good condition, prevented from slipping, and only used by competent people. There should always be a handhold available.

The controls for ladders are contained in the [QHSE-P221 Qalhat safety regulation for work under permit](#)



Figure 3: Portable step ladder used by Operations staff on the plant



Figure 4: Portable stepladder used by engineering staff in the workshop



Figure 5: Portable stepladder used by staff in warehouse



Figure 6: Standard Wooden Ladder used in the plant for temporary access

**Note:**

Chain or rope (including rope ladders) is prohibited unless all other means of accessing the work area have been considered and are not possible. If a chain or rope ladder is used, also use an inertia reel fall arrestor.

For Safe use of ladders and stepladders please refer to the Health and Safety Executive guide provided in Appendix

**5.4.4 Safety Harness with double lanyard**

A personal fall arrest system/safety harness with double lanyard and shock absorbing device is required whenever the employee is exposed to fall from a height of 6 feet / 1.8 meter or more which include but not limited to,

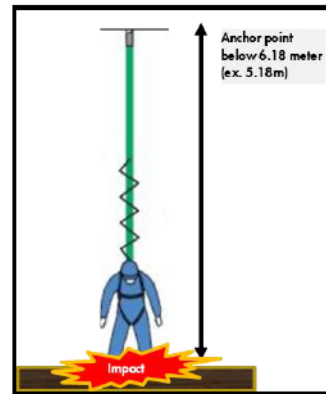
- working at height from an incomplete platform like scaffold not having valid green tag,
- a structural platform not protected by a guardrail system,
- personnel working at height during erection, dismantling and modification in scaffold,
- working around floor openings not protected by guard rail system,
- working on any roof without edge protection (guard rail system or equivalent height walls),
- Working from any aerial equipment that raises the employee like a MEWP, Man-Baskets etc. If the work at height is outside the boundaries of a properly constructed access platform (e.g. when building a scaffold) a proper fall restraint

Document No:	QHSE-P209	Page	Page 9 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	

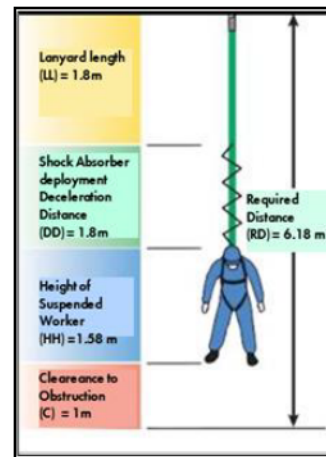



system should be in place, i.e. full body harness with double lanyard and shock absorbing device.

- For working at height (WAH) with anchor point less than 6.18m: Use fall arrest systems that consist of a full body harness with non shock absorber double lanyard, or better - dual self-retracting line (SRL) or personal fall limiter (PFL). The Risk in using a shock absorber in this case is that a lanyard equipped with a shock absorber requires a minimum height of 6.18m to arrest a fall. If an anchor point less than 6.18m above the ground is used, the worker will fall to the ground before the lanyard and shock absorber can fully function.
- For working at height (WAH) with anchor point more than 6.18m: Use fall arrest systems that consist of a full body harness and double lanyard with a single shock absorber, or better - dual self-retracting line (SRL) or personal fall limiter (PFL).



  
 Anchor point < 6.18m  
 (example at 5.18m)  
 (Lanyard with shock absorber)



  
 Anchor point above 6.18m

#### 5.4.4.1 Inspection of harnesses, lanyards with shock absorbers type

- Harness, lanyards shall be having shock absorber
- Must be uniquely identified, (all parts as one item) and having tag number engraved in metal plate.
- Must be inspected in detail on six monthly frequency by a qualified inspector and removed in case found defective/ damaged. The results of inspections must be recorded.
- Must be visually inspected by the user before each use and not use the safety harness if found defective / damaged and return it back to store by reporting it as defective / damaged..

Reference should be made to QEN-P203 Procedure For The Inspection And Testing Of Lifting And Hoisting Equipment,

A lanyard that has been used to arrest a fall should never be reused. It should be withdrawn from service immediately and destroyed or returned to the manufacturer.

Document No:	QHSE-P209	Page	Page 10 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



Figure 7: Shock Absorber with double lanyard



Figure 8: Safety Harness with shock absorber and double lanyards



Figure 9: Safety Harness plus with shock absorber and double lanyards



Figure 10: Lanyard showing unique identifier



Figure 11: Lanyard showing Colour Coding Tag – opposite side of identifier

## 5.5 Rescue from Height

Despite all precautions being implemented for work at height, there may be occasions when a rescue from height is required. For example this could arise from a worker:-

- being injured whilst working at height,
- suffering from sudden fear of height and “freezing”,
- suffering from a sudden illness such as heart attack whilst at height,
- falling from height and being suspended in their fall arrest equipment.

Although every case is judged on its merits the rescue must be performed only by competent persons mainly the First Intervention Team (FIT).

**NB: *Important! The casualty suspended in the fall arrest equipment SHALL never be immediately laid down after being rescued from the suspended position, not even in the recovery position.***

The casualty should be positioned with the upper body raised, i.e. in a seated, or possibly squatting or crouched posture. All restrictive belts and clothing should be unfastened.

Document No:	QHSE-P209	Page	Page 11 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



A doctor should be called immediately. Laying the casualty down horizontally could be life threatening. The blood that has accumulated in the legs flows abruptly into the heart creating a risk of heart failure due to overstrain. However, conditions other than suspension trauma should be borne in mind, e.g. hypothermia and dehydration.

### 5.5.1 Equipment for Rescue from Height

Oman LNG has various equipments for rescue from height. This includes:

- Use of SKID stretcher.
- Use of Tripod rescue equipment.
- Use of Crane possibly with a man basket



Figure 12: Skid Stretcher



Figure 13: Skid in use with crane

Document No:	QHSE-P209	Page	Page 12 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



## 5.6 Controlling risks when working at height

All work at height should be assessed for risk. A Job Method Statement may be required. This process is described in [QEN-P116 Task Risk Assessment](#)

### 5.6.1 Tie-off

Personnel who gain access to and work at height must

- Tie-off 100% of the time when wearing personal fall protection equipment. The tie off includes moving to and from the work height, and when working on a roof or work platform without a guardrail.
- Visually inspect Fall Protection Equipment before each use. Tie off personal fall protection equipment to a stable and acceptable tie off point, using a fit-for-purpose harness and lanyard.
- Tie off personal fall protection equipment to a stable and acceptable tie off point, using a fit-for-purpose harness and lanyard. The tie-off point should be substantial enough to hold a 2270 Kg (5000-pounds) load. Never secure tie off to a hot surface or to any point where the nylon lanyard may be exposed to a chemical. Order of preference on tie-off points is as follows:
  - Structural beams
  - 4" or 6" overhead line
  - Life-line
  - Guard-rails

**Note:** Never use electrical conduits, PVC/GRE piping, wooden handrails, cable tray and process piping 2" or less as tie-off points.

- As much as possible, tie off above the shoulders or higher.
- The following fall protection requirements apply to the use of ladders:
  - Visually inspect ladders before each use
  - Fall protection is not needed when climbing up or down ladders less than 6.1 meters, using three points of contact.
  - Use a ladder climbing safety device, such as an inertial reel fall arrestor, when climbing up or down un-caged ladders 6.1 meters or longer.

## 5.7 Controlling risks from falling objects

Persons working at height shall ensure that the tools and materials with which they are working cannot be dropped to lower levels. The AE / AGSI should prescribe the most suitable controls in the Permit to Work. Such measures include:-

- Heavy tools shall be carried aloft separately in an appropriate container either by ropes, winches, cranes or other such means.
- Where tools are carried aloft, by the worker, they must be securely located in an appropriate tool harness / belt bag such that they cannot fall to lower levels.

Document No:	QHSE-P209	Page	Page 13 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



- Material stored at height must be stored away from edges of platforms and located such that it cannot be dislodged and fall to a lower level. Storage bins should be used for materials whenever possible
- Gratings should be covered with a tarpaulin to prevent small nuts, bolts, spanners etc falling from height.
- The weight of material stored at height e.g. on a scaffold, must not exceed the design limit of the platform upon which it is stored.
- All material / equipment that is either being lifted to a higher level or lowered from a higher level by use of a crane must be securely contained within lifting gear that has been certified in accordance with the Procedure for the Inspection of Lifting Equipment (Slings / Shackles / Eye Bolts etc) and the lifting must be supervised by a qualified crane driver and rigger.
- Where the weight exceeds 5 ton or where other hazards are present, a lifting plan is required in accordance with the Procedure for Heavy Lift.
- Whenever work at height is in progress, entry to the area directly beneath the work is forbidden. The area shall be cordoned off with hazard tape.
- When carrying out work at height, holes opened up into work platforms e.g. for the purposes of other access, are to be securely fenced and warning notices applied. Warning lights must surround the hole during darkness. Whenever possible, such holes shall be closed up when work is not in progress.

### **5.8 Controlling risks from roof access including fragile surfaces**

Access to roofs and fragile surfaces may occasionally be required. Such surfaces at OLNNG include but are not restricted to:-

- Warehouse roof
- Workshop roof
- Fire Station roof
- Roofs of Compressor Houses
- Roofs of AC units
- Roofs of FARS and Substations
- Roofs of buildings at HAS

Controls are described in the [QHSE-P221 Qalhat safety regulation for work under permit](#)

Document No:	QHSE-P209	Page	Page 14 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	



## 6. References

- [QHSE-P221 Qalhat safety regulation for work under permit Procedure for Heavy Lift.](#)
- [QEN-P118 Lifting](#)
- [QEN-P116 Task Risk Assessment](#)
- [QHSE-P219 PERSONAL PROTECTIVE EQUIPMENT](#)
- [QEN-P203 Procedure For The Inspection And Testing Of Lifting And Hoisting Equipment,](#)
- Shell HSSE & SP CF, Working At Height section; Version 4, February 2016

Document No:	QHSE-P209	Page	Page 15 of 15
Issue No:	5	Print Date:	
Issue Date:	17/05/2018	Hard copy only valid on print date.	