



Work at Height Standard



MSW Process – Contractor Communication

**Thailand Profit Center
March, 2009**



Purpose, Objectives and Scope

■ Purpose

The purpose of this standard is to ensure that work at height is performed in a safe and controlled manner.

■ Objective

This standard establishes requirements for working at height to prevent falls and reduce the risk of injury at any Chevron Global Upstream facility or jobsite.

NOTE: Each Global Upstream strategic business unit (SBU) or location may have additional regulatory requirements.

■ Scope

This Work at Height Safe Work Practice standard covers work performed by Chevron employees and their delegates and contractors within Chevron Global Upstream Exploration and Production (GU) operational control.

This standard does **not** cover:

Rescue techniques for emergency response.

Safety nets or air bags.

Specialized techniques such as abseiling (also called rappelling).

Requirements

1. Exhaust all work-at-grade alternatives before beginning work at height.
2. Hazards associated with working at height shall be identified and mitigated prior to beginning work.
3. Fall hazards must be identified and personnel must be protected by fall prevention or fall protection systems.
4. Personnel performing work-at-height shall be competent in the roles for which they are responsible. Persons working at height must be trained in the proper use, maintenance and inspection of the equipment they will be required to use.



Requirements

5. Scaffolding must be designed, erected, inspected, labeled and dismantled by competent, trained persons.
6. Work-at-height equipment must be inspected periodically to ensure that it is safe to use.
- 7. Persons wearing fall-arrest systems must not work alone and must use 100 percent tie off.**
8. Rescue Personnel must be trained and competent and have the ability to perform their responsibilities. Rescue Personnel must also have the correct rescue equipment at the work location.



What is working at heights?

Work performed where **there is a potential for a person to sustain injury by falling** from one surface to another surface that is not at the same level.

Terms and Definitions

- **Fall Prevention** – A system designed to prevent a person from falling. Fall prevention typically involves the use of engineering controls, such as railings.
- **Fall Protection** – A method of mitigating the effects on a person who has fallen. Fall protection is typically accomplished through the use of fall-arrest systems. Other methods include safety nets and air bags. Use of fall arrest devices
- **100 percent tie off** – A control method whereby a person working at height is always connected to an anchor so that they are protected by their fall-arrest system or work-positioning system while ascending, descending, moving point to point, or conducting work activity.

Terms and Definitions

- **Fall-Arrest System** – A system designed to support and hold a person in the event of a fall. A fall-arrest system usually consists of an approved full-body harness, a shock absorbing lanyard or short restraining lanyards or self-retracting lifeline, self-locking snap hooks (or carabineer-type rings) and a number of secure anchorage points.
- **Rescue Personnel** – Personnel who meet certain competency requirements and who are on call to rescue employees who have fallen from height.

Roles and Responsibility

The following roles and responsibilities are specific to work at height and are further defined in the GU – Training Requirements Tool:

- Person conducting work at height
- Safety Standby for fall-arrest systems
- Rescue Personnel for fall-arrest systems



Standard Instructions

Working at heights requires

- personal fall protection,
- special procedures and equipment
- shall be performed only by personnel who are trained, equipped and knowledgeable in performing work at heights.

Where feasible, eliminate the need for elevated work through design or facility modifications or through the installation of permanent platforms with necessary fall protection provided (handrails, toe boards, drop bars, etc.). The [Chevron Safety in Designs Manual](#) (3.80MB) provides guidelines for safe facility design and cost-effective recommendations for meeting the guidelines.

Documentation

General Requirements

The hazard analysis shall identify control measures that reduce the potential for injury to personnel working at height. These control measures fall into two broad categories:

- Fall prevention- This is our first choice. Engineering and administrative controls
- Fall protection- When fall prevention is not available we shall rely on PPE.
- When feasible, fall prevention shall be used in place of fall protection to minimize the risk to personnel from falling during work at height. In all other cases, fall protection shall be used.

Other Work at Heights issues

The requirements for fall prevention and protection shall be also considered when:

- Working at the edge of or over an excavation or pit.
- Working at height on offshore/Over-Water facilities.



Assessing and Managing Hazards

Work at height must be permitted and managed in accordance with the *GU - Managing Safe Work Process*. The hazard analysis must be done regardless of whether fall protection already exists. The analysis must include, but is not limited to, the:

- Physical capabilities (and competency) of the workers.
- Likelihood of falling. If a fall is likely, then a means to prevent a fall must be put in place. If fall prevention is not possible, adequate fall protection must be provided.
- Risk of injury to a person if a person falls.
- Risk of falling objects to workers below.



Assessing and Managing Hazards

- Work activity (the proposed work at height).
- Obtaining access to, or egress from location (for the proposed work at height).
- Equipment to be used (for example, ladders or MEWPs) and the hazards associated with using it.
- Duration of the work.
- Location of the work activity (to determine the presence of hazards).
- Work environment (weather conditions, lighting, space, etc.).
- Condition and stability of the existing work surfaces.
- Potential fall path.



Assessing and Managing Hazards

- Proximity to electrical conductors. Overhead power lines pose a risk of electrocution to personnel who inadvertently touch the conductors or who simply work too close to them. For unqualified electrical persons, the limited approach boundary distance for 230 kilovolt (kV) conductors is 13 feet (4 meters). For up to 72.5 kV conductors, the limited approach boundary distance is 10 feet (3 meters).
- Load-bearing capacity of roofs.
- Hazards introduced by the use of control measures must also be considered.
- Emergency procedure(s) required in the event of an incident.



Assessing and Managing Hazards

Elimination of hazards is the most desirable method of hazard control, and passive controls are preferred over active controls. The preferred order is as follows:

- **Elimination** – for example, performing work at ground level instead of at height.
- **Substitution** – for example, using a MEWP instead of a ladder.
- **Engineering controls** – for example, installing stairs instead of using vertical ladders or safety railings.
- **Administrative policies and procedures** – for example, requiring a person to act as a Safety Standby when the person who is working at height is wearing a harness.
- **Personal protective equipment (PPE)** – last resource – for example, providing fall-arrest systems.

Assessing and Managing Hazards

The hazard analysis shall identify control measures that reduce the potential for injury to personnel working at height. These control measures fall into two broad categories:

- **Fall prevention (engineering control)**
- **Fall protection (PPE)**

When feasible, fall prevention must be used in place of fall protection to minimize the risk to personnel from falling during work at height. In all other cases, fall protection must be used.



Fall Prevention Requirements and Risks

Fall Prevention is any system designed to prevent a person from falling. Fall prevention typically involves the use of engineering controls, such as railings.

- Scaffolds
- Mobile Elevating Work Platforms (MEWPs)
- Skylight Barricading and Guarding
- Openings in Decks/Floors
- Accessing Storage Tank Roofs



Fall Protection Requirements and Risks

Fall-arrest systems are designed to support and hold a person in the event of a fall. They are not designed to support a person while working.

This standard prohibits the use of body belts for fall-arrest purposes.

Fall-arrest systems must always be used as a last resort. These systems require a high level of training to set up and to use. Fall-arrest systems shall be used only if personnel have been fully trained in their use, and emergency rescue procedures are in place.

Fall-Arrest Protection System Inspection



There shall be a system for ensuring that fall protection equipment is fit for use and that all of the following occur as needed or within the time frame specified:

- Equipment testing and certification for use is performed and documented by a competent person and occurs every two years, or more frequently where required by local regulations.
- Equipment is inspected by the user before use.
- Equipment is inspected, tested and recertified for use by a competent person after a fall has occurred.
- Equipment is repaired or destroyed when inspection has shown evidence of excessive wear or mechanical malfunction.

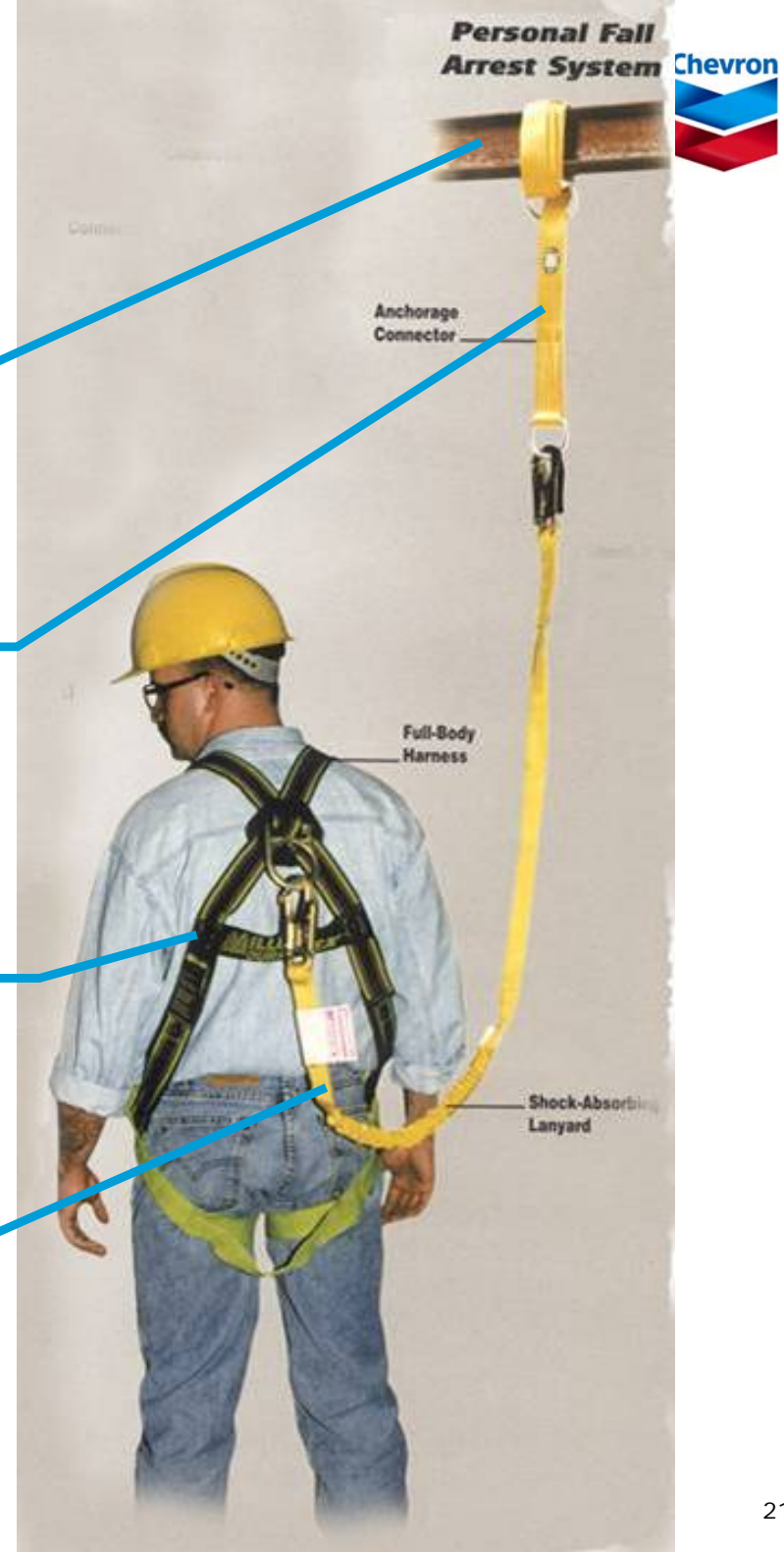
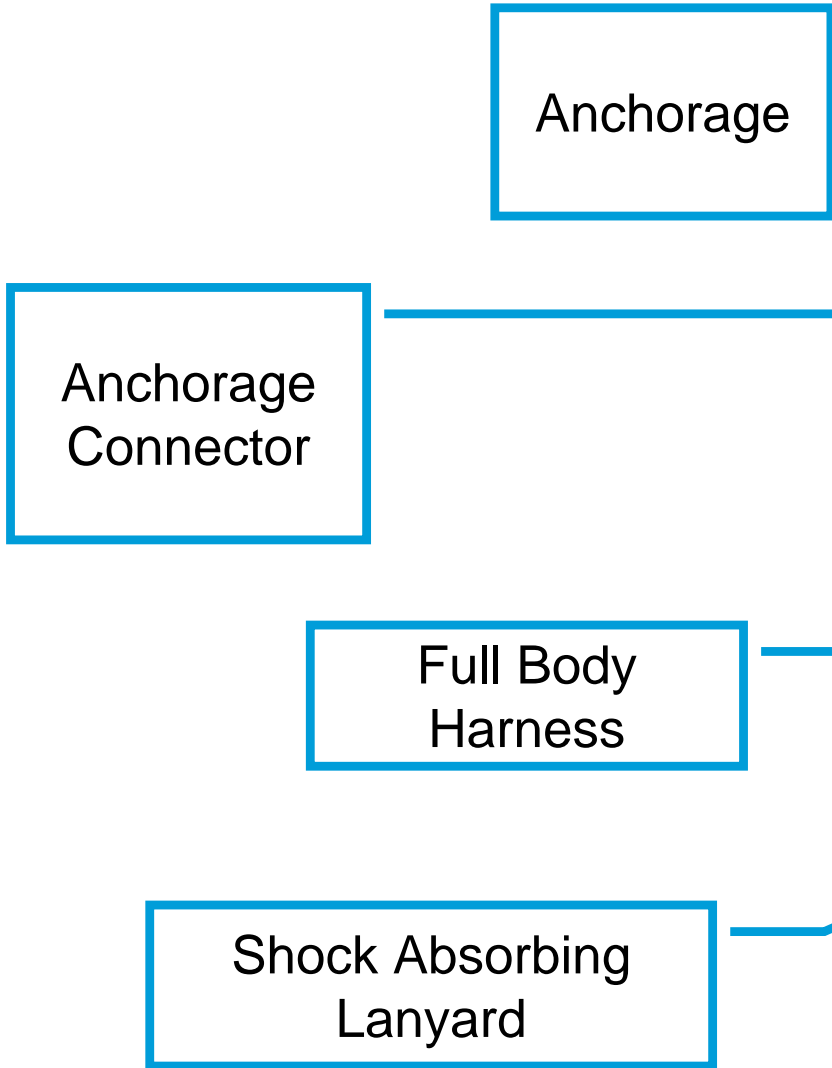
Personal Fall Arrest Systems (PFAS)

- The anchorage shall withstand **5,000 lbs** for each employee. Can the anchorage point support a Volkswagen?



At the work site, think – **Would you let a family member use this anchorage point?**

The Personal Fall Arrest System (PFAS)



Common Equipment for Fall Arrest Systems



Shock Absorbing Lanyard



Self Retracting Lifelines



Rope & Cable Grabs



Carabiners



Cross-Arm Strap



Full Body Harness



Anchor Point

Anchorage points for fall-protection devices shall be, where practical, above the head of the worker.

The anchorage point must ensure that, in the event of a fall, the path below will be free of obstacles or other hazards, and the worker will neither swing nor touch the ground.

Anchor Point

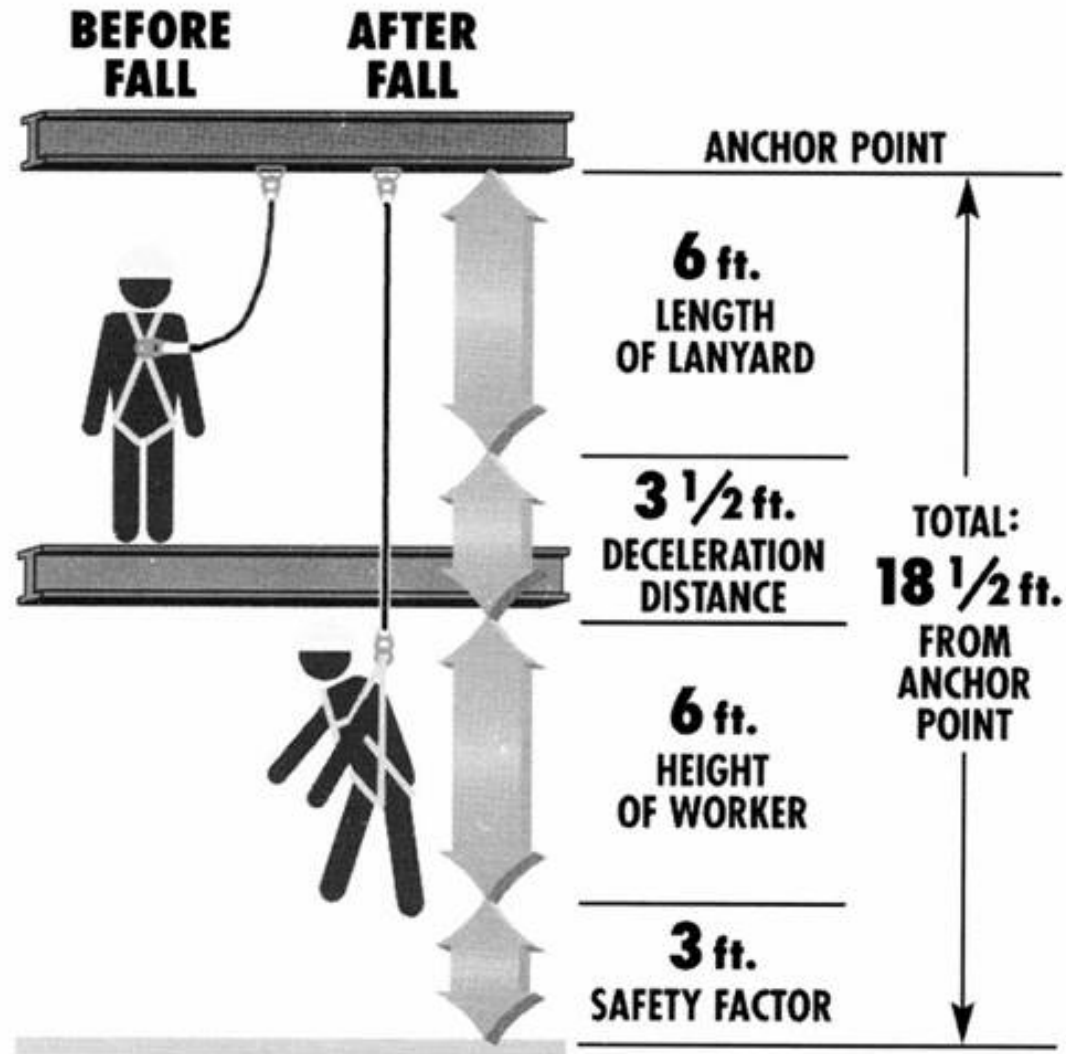
■ Anchorage Point Testing

- There must be a system for ensuring that anchorage points are tested in accordance with a recognized standard and/or **approved by a competent person** to ensure that the points are secure and can hold the required load.
- The anchorage shall be under the supervision of a qualified person.

■ Never Work Alone Using a Fall Arrest Protection System

■ Requirement for 100 Percent Tie Off

Fall Clearance



Risks Associated with Fall-Arrest Systems



- Worker does not tie off
- Worker does not tie off correctly, and the structure is unable to take the load
- Worker does not tie off overhead and then swings into an object during a fall
- Worker is not wearing the harness correctly and slips through the harness
- Worker is hanging in a harness and suffers suspension trauma
- Worker does not calculate distance required to arrest fall correctly and hits ground or structure below

Mobile Elevating Work Platforms (MEWPs)



- MEWPs, also known as power-operated elevating work platforms, are designed to provide a temporary working platform which can be easily moved from one location to another.
- A competent person shall be designated to operate the work platform, scissor lift, cherry picker, crane lift platform, building maintenance unit or man lift.
- A fall-arrest system (such as a fall-arrest harness and lanyard) shall be used in conjunction with a MEWP.
- MEWPs shall be used, maintained and inspected in accordance with [Power-Operated Elevating Work Platforms](#) (261KB).

Ladders

Although ladders are not classified as fall prevention or fall protection devices, they are included here because they are commonly used for working at heights.

Portable Ladders

For some jobs of short duration, such as those in which work is within easy reach and can be carried out with one hand, a portable ladder may be the only practical means of access. Working while on a portable ladder shall only be considered if there are no other practical means of performing the work



Ladders

What are some common types of Ladders?

They can be made of wood, aluminum and fiberglass. Portable ladders shall meet the requirements of [Portable Ladders](#) and be used, maintained and inspected in accordance with this standard.

Live electrical wires are in contact with the ladder.

Destroy and dispose of faulty ladders.

Portable Ladders

What are some Risks with Portable Ladders?

- Overreaching and tipping the ladder.
- Not using three points of contact when ascending or descending, losing balance and falling, for example, when hand-carrying tools. (Tools should be raised and lowered using a hand line.)
- Unstable footing, causing the ladder to tip.
- The base of the ladder is either too close or too far from the building. (The correct angle for a ladder is one unit of measurement out at the base for every four units of height.)
- The ladder is damaged or inappropriate for the task.
- An extension ladder or folding ladder is not locked in position.

Portable Ladders

- Working while on a portable ladder shall only be considered if there are no other practical means of performing the work.
- Portable ladders must meet the requirements of [Portable Ladders](#) (131KB) and be used, maintained and inspected in accordance with this standard.

Emergency Rescue

- An emergency rescue plan shall be in place prior to work commencing.
- Rescue services or teams, either onsite or offsite, that are adequately trained and equipped to perform work-at-height rescues of the kind needed at the facility and that can respond in a timely manner.
- **Suspended workers** shall be rescued as quickly as possible because they are at risk of suspension trauma. **Suspension trauma is potentially life-threatening.** Suspended workers with head injuries or who are unconscious are particularly at risk.

Work at Height Review Checklist

- A checklist is provided in Appendix B: Work at Height Review Checklist to enable users to quickly perform a site analysis of any work-at-height setup.
- This checklist is a tool to assist in the analysis and cannot be used as a substitute for conducting a full hazard analysis as required in section 5.1 – Assessing and Managing Hazards.

What Can Leaders Do to Support Working at Height SWP?



- Reinforce 100% Tie Off
- Make proper fall protective equipment available for workforce
- All personnel should receive Working at Height awareness training
- Ensure personnel who need to wear fall harness have received proper training
- Ensure rescue personnel are competent and rescue plan in place
- Provide "Suspension Trauma" training