



## **FALL PROTECTION**



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## Purpose

The purpose of this program is to provide fall protection procedures to prevent injury to employees while performing work assignments at elevated levels.

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## Scope

This procedure applies to all Arrow S Energy Operating (the company) employees working at a height of 4 feet for oil and gas exploration operations, and 6 feet for construction operations where guardrails or nets are not utilized. This program may be adopted for use by contractors who do not have their own fall protection program.

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## Definitions

**Anchorage-** a secure point of attachment for lifelines, lanyards or deceleration devices.

**Buckle-** any device for holding the body harness closed around the employee's body.

**Carabineer-** same as Snaphook

**Deceleration device-** any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

**Deceleration distance-** the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of body harness attachment point (D-ring) before a fall and the location of that attachment point after the employee comes to a full stop.

**Lanyard-** a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage.

**Lifeline-** means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

**Personal fall arrest system-** means a system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.

**Positioning device system-** means a body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning.

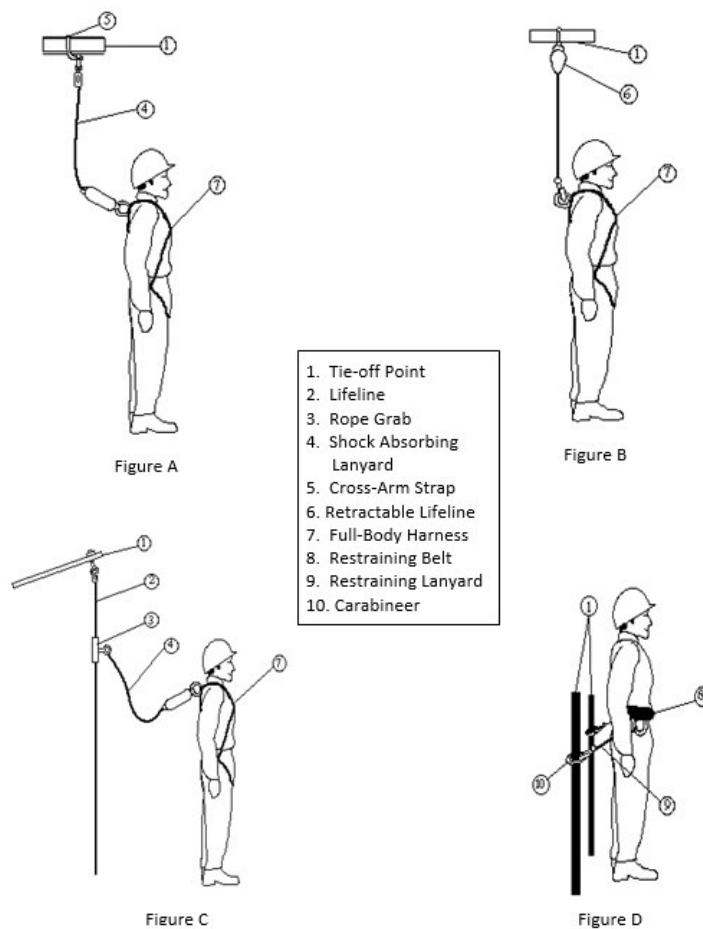
**Rope grab-** means a deceleration device which travels on a lifeline and automatically, by friction, engages the lifeline and locks to arrest the fall of an employee.



**Self-retracting lifeline/lanyard-** means a deceleration device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

**Snaphook-** means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object.

### Fall Protection Components





## Responsibilities

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### Supervisors

The Supervisor shall ensure that all persons assigned to work at elevated levels, exceeding 4 feet in all operations except construction where the rule is 6 feet or more above lower levels, and where guardrails or nets are not utilized, shall be protected by personal fall protection equipment.

- Supervisors shall make exposure determinations and consider the extent to which scaffolds, ladders or vehicle mounted work platforms can be used.
- Ensure that fall protection equipment is available and in safe working condition.
- Provide for emergency rescue in the event of a fall.

### Employees

Employees shall use the fall protection equipment as required by this program and:

- Understand the potential hazards of working at elevated levels as well as gaining access to and from elevated work locations.
- Inspect such equipment before each use and report defective equipment immediately to their supervisor.

## Procedure

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The following are minimum standards for employee personal fall protection systems:

- All D-rings must be a minimum of 2¼ inches (inside diameter).
- All snap hooks shall not allow pressure to be applied to the gate in the opening direction.
- No pelican hooks on lanyards should be used as a primary connection.
- Connectors shall be drop forged, pressed or formed steel, or made of equivalent materials.
- Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to interfacing parts of the system.
- D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds.
- D-rings and snap hooks shall be proof-tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or taking permanent deformation.
- Snap hooks shall be sized to be compatible with the member to which they are connected, to prevent unintentional disengagement of the snap hook. Only locking type snap hooks shall be used for fall prevention.
- Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system, which maintains a safety factor of at least two.
- Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds. Where vertical lifelines are used, each employee shall be attached to a separate lifeline.
- Lifelines shall be protected against being cut or abraded.
- Self-retracting lifelines and lanyards which automatically limit free fall distance to 2 feet or less shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.
- Self-retracting lifelines and lanyards which do not limit free fall distance to 2 feet or less, rip stitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.



- Anchorages used for attachment of personal fall arrest equipment shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or shall be designed, installed, and used as part of a complete personal fall arrest system which maintains a safety factor of at least two and under the supervision of a qualified person.
- Systems used by an employee having a combined person and tool weight more than 310 pounds shall be modified to provide proper protection for such heavier loads.
- The attachment point of the body harness shall be in the center of the wearer's back near shoulder level, or above the wearer's head, except when climbing.
- Body harnesses and components shall be used only for employee protection and not to hoist materials.
- Personal fall arrest systems and components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection until inspected and determined by a competent person to be undamaged and suitable for reuse.
- Provide for prompt rescue of employees in the event of a fall or shall assure the employees are able to rescue themselves.
- Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.
- Personal fall arrest systems shall not be attached to guardrail systems, nor shall they be attached to hoists unless prior approval is obtained from a competent person.
- When a personal fall arrest system is used at hoist areas, it shall be rigged to allow the movement of the employee only as far as the edge of the walking/working surface.

### **Stopping a Fall**

The arresting force on an employee stopped by a fall shall be limited to a maximum arresting force of 1,800 pounds when wearing a body harness.

The fall arrest system shall be rigged such that an employee can neither free fall more than 4 feet, nor contact any lower level.

The fall arrest system shall bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet.

The fall arrest system shall have enough strength to withstand twice the potential impact energy of an employee free falling 4 feet, or the free fall distance permitted by the system, whichever is less.

### **Protection from Falling Objects**

When employees are required to work in the near vicinity of others working with materials, tools, or equipment at elevated levels, barricades around the immediate area of the overhead work shall be erected to prohibit employees from entering the barricaded area.

Employees performing work at elevated levels shall keep tools, materials, and equipment away from the edge to keep potential objects from falling over the side. Where practical, tools and loose items shall be secured with rope, wire, etc. to keep them from falling.

### **Portable Ladders**

Three-point climbing is required while ascending/descending ladders. While on ladders, both hands and one foot, or both feet and one hand shall always be in contact with the ladder.



Tools required to perform a task shall be transported by a mechanical carrier such as a tag line, suspended bucket or tool belt.

- Tools shall not be carried by hand while climbing.
- Hands must be free to grip the ladder.
- Tools shall not be carried in clothing pockets.
- Tools shall be pulled up to the job site only after reaching the area of work.

When work is to be performed from straight/extension ladders, fall protection shall be utilized when heights exceed 4 feet in all activities except construction where the rule is 6 feet.

Straight ladders shall be tied off at the top to prevent them from moving. A second person shall steady the ladder at the base while it is being tied off at the top by another employee. Do not tie off fall protection equipment to the ladder.

### **Storage**

A dedicated storage area shall be provided for the storage of fall protection equipment and all components. The storage area shall keep the equipment clean, dry, and free from oils, chemicals, paints, and excessive heat.

### **Inspections**

Fall protection equipment shall be inspected before each use for wear, damage, other deterioration, or other defects. The type of equipment that should be inspected includes but is not limited to:

- Full Body Harnesses
- Lanyards
- Tie Off Adapters
- Anchorage Plates
- Hooks and Carabiners
- Self-Retracting Lifelines

### **Elevated Personnel Platforms**

Work performed, regardless of the nature of the work, from personnel platforms raised by forklifts, cranes, scissor lifts, etc., shall require the use of a full body harness and shall be connected to the platform.

### **Prompt Rescue of an Employee in the Event of a Fall**

The supervisor shall provide for prompt rescue of employees in the event of a fall or shall assure the employees are able to rescue themselves.

The pre-planning stage prior to the beginning of each elevated work assignment shall be evaluated by the supervisor to provide rescue of employees involved in a fall.

### **Working Without Fall Protection**

This option is available only to employees engaged in leading edge work who can demonstrate that it is infeasible, or it creates a greater hazard to use conventional fall protection equipment. A Site Specific Fall Protection Plan shall be developed in such cases and conform to the following provisions, and be approved in writing by the HSE Director:



- The fall protection plan shall be prepared by a qualified supervisor and developed specifically for the site where the leading-edge work is being performed.
- The fall protection plan shall document the reasons why the use of conventional fall protection systems (guardrail systems, personal fall arrest systems, or safety net systems) are infeasible or why their use would create a greater hazard.
- The fall protection plan shall identify each location where conventional fall Protection methods cannot be used.
- These locations shall then be classified as controlled access zones.

### **Controlled Access Zones**

When used to control access to areas where leading edge or other operations are taking place the controlled access zone shall be defined by a control line or by any other means that restricts access.

When control lines are used, they shall be erected not less than 4 feet (1.8 m) nor more than 25 feet (7.7 m) from the unprotected or leading edge.

The control line shall extend along the entire length of the unprotected or leading edge and shall be approximately parallel to the unprotected or leading edge.

The control line shall be connected on each side to a guardrail system or wall.

- Control lines shall consist of ropes, wires, tapes, or equivalent materials.
- Each line shall be flagged or otherwise clearly marked at not more than 6-foot (1.8 m) intervals with high-visibility material.
- Each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m).
- Each line shall have a minimum breaking strength of 200 pounds.

Only employees engaged in the related work shall be permitted in the controlled access zone.

### **Safety Monitoring System**

When the use of conventional fall protection equipment is deemed infeasible or the use of this equipment creates a greater hazard, a safety monitoring person shall be assigned by the supervisor.

The safety monitoring person shall be a competent person to monitor the safety of other employees. The competent person shall be assigned to:

- Recognize fall hazards;
- Warn employees if they are unaware of fall hazard or are acting in an unsafe manner;
- Be on the same working surface and in visual contact of working employees;
- Stay close enough for verbal communication; and
- Not have other assignments that would take his/her attention from the monitoring function.

### **Training**

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Employees are provided training on fall protection. A training program shall be provided for each employee who might be exposed to fall hazards. Training shall enable each employee to recognize the hazards of falling and shall



train each employee in the procedures to follow to minimize these hazards and proper inspections and maintenance procedures.

Retraining is performed as necessary. Retraining shall be provided when the following are noted:

- Deficiencies in training,
- Workplace changes
- When fall protection equipment is modified.

Fall protection training is documented. Written certification records showing participants, training dates and signatures of attendees must be maintained.