

Fall Protection Practice

Content Owner	Health & Safety Solutions		
Custodian	H&S Programs and Projects		
Program	Fall Protection		
COMS	See COMS Standards		
Document Number	CEN-EHSEHS038		
Version	3.0	Review Cycle	3 years
Revised Date	December 7, 2015	Issued Date	October 10, 2006

Version	Description	Date	Sign Off		
			Originator	Reviewer(s)	Approver
2.3	Included section on protection from falling objects	July 8, 2013			
3.0	Updates related to the fall protection LSR and continuous improvement	Dec. 7, 2015			

Table of Contents

1.0 Purpose4

2.0 Scope4

3.0 Process Requirements Practice4

 3.1 Fall Protection Requirements.....4

 3.2 Fall Protection Hazard Management5

 3.3 Fall Protection Systems7

 3.4 Anchors and Anchorages12

 3.5 Fall Protection Equipment and Components13

 3.6 Ladders18

 3.7 Boom-supported Work Platforms and Aerial Devices19

 3.8 Fall protection on Vehicles and Loads20

 3.9 Use, Care and Maintenance of Fall Protection Equipment/Components20

 3.10 Protection from Falling Objects21

4.0 Roles and Responsibilities22

5.0 Training and Competency26

 5.1 Training26

 5.2 Competency Verification27

6.0 Quality Assurance27

 6.1 Performance Measurement.....27

 6.2 Management of Change27

 6.3 Practice Verification27

7.0 Glossary28

8.0 References30

 8.1 External Documents.....30

 8.2 Internal Documents30

Appendix A: Example Clearance Distance Calculation31

Appendix B: Harness Suspension Trauma32

Appendix C: Selection of fall protection system to be used with work positioning 32

List of Figures

No table of figures entries found.

List of Tables

Table 1: Roles and Responsibilities.....22

Table 2: Fall Protection Training Elements.....26

Table 3: Terms and Definitions28

Table 4: Acronyms, Initialisms and Abbreviations29

Table 5: External Document References.....30

Table 6: Internal Document References30

1.0 Purpose

The Fall Protection Practice has been developed to assist Cenovus employees and contractors in identifying fall protection requirements that can be used to manage the risks of falling. This practice is also designed to align with OH&S legislation in Alberta and Saskatchewan and industry best practice.

2.0 Scope

This Practice applies to all Cenovus worksites and encompasses all Cenovus work activities.

Contractors who execute work whereby a person may potentially fall are expected to meet the requirements of this practice and develop their own fall protection practices, procedures and plans.

Exceptions:

- Rescue personnel involved in training or in providing emergency rescue services may use equipment and practices other than those specified in this practice or Alberta and Saskatchewan OHS regulatory requirements.
- This Fall Protection Practice does not address the requirements for high-angle rescue, industrial rope access, suspended personnel baskets, stationary mobile cranes, and bucket trucks.

3.0 Process Requirements Practice

3.1 Fall Protection Requirements

- a) Workers must use a fall protection system if there is a possibility they can fall:
 - More than 1.8 metres, or
 - Less than 1.8 metres, when there is a possibility that a worker could sustain injuries more serious than those likely to result from landing on a solid, flat surface, or
 - Into or onto a hazardous substance or object, or
 - Through an opening in a work surface (e.g. stairwell, elevator shaft, caisson hatch, etc.)
 - Over a guardrail if the person's centre of balance can shift (e.g. leaning over a guardrail)
- b) The fall distance must be measured from the position of the feet (if the worker is standing) to the lowest level, or the closest part of the body to the lowest level object, that can be contacted by falling
- c) When working at heights workers will be required to complete a hazard assessment and mitigate the hazards following the hierarchy of hazard controls as per section 3.2.2 of this practice

- d) All permanent work platforms or structures must have guardrails installed to protect workers from falling if there is a possibility for a worker to fall a vertical distance of more than 1.2 metres.

3.2 Fall Protection Hazard Management

3.2.1 Hazard Assessment

- a) A hazard assessment must be completed for all work activities whereby there is a potential for a worker to fall
- b) All affected workers (i.e. the work crew) must be included in the hazard assessment process and have the opportunity to fully participate in identifying, assessing and eliminating or controlling the hazards. In addition, all other workers at the worksite or work area impacted by the work or hazards identified in the hazard assessment must be informed of the hazards and the controls.
- c) When determining hazard control elimination of the hazard(s) shall always be considered first. If elimination is not reasonably practicable the hazard must be controlled based on hierarchy of hazard controls.

3.2.2 Hierarchy of Hazards Controls

- a) The preferred fall protection method is to eliminate a fall risk by removing the fall hazard. This can be done by bringing work to ground level or modifying designs to prevent working at heights. All work must be planned in a manner that can eliminate fall risks. However, if it is not reasonably practicable to eliminate the fall risks, physical barriers must be used.
- b) Physical barriers such as guardrail systems are the next best hazard control to elimination. The use of guardrails must be considered in the planning of all work activities where permanent guardrails do not exist. Also, manufactured fabric or netting panels can be used for leading edge protection.
- c) If the use of guardrail or engineered leading edge system is not practicable, a travel restraint system or work positioning system must be used to prevent a worker from falling.
- d) If a travel restraint system is not reasonably practicable, workers shall use a personal fall arrest system
- e) If the use of a personal fall arrest system is not reasonably practicable, an equally effective fall protection system that meets the requirements of the applicable OHS legislative requirements may be considered. This will include, but is not limited to, establishing control zones.
- f) Procedures are the last resort if the above systems are not practicable and may only be developed in Alberta for the following situations:
 - Installation or removal of fall protection equipment
 - Roof inspection

- Emergency repairs
- At-height transfers between equipment and structures if allowed by the equipment manufacturer's specifications
- Situations in which a worker must work on top of a vehicle or load

3.2.3 Fall Protection Planning

- a) A fall protection plan must be developed whenever a worker is not protected by guardrails and is required to use fall protection equipment. This includes the following activities:
- Working 1.8 metres or higher as described in section 3.1 of this practice
 - Working on a boom supported elevating work platform, boom-supported aerial device or forklift truck work platform
 - Working near water bodies where there is a risk of falling in
 - Working in a personnel basket (see Crane Operations Practice for more information)
 - Working near tank opening where there is a possibility a person can fall
 - Leaning over guardrails where there is a risk of falling
 - Working near excavations, trenches or underground structures (e.g. caissons, sewers, sumps, etc.) where:
 - there is a fall risk of 1.8 metre or more
 - a risk a person can fall into a hazardous substance or object
- b) The fall protection plan must be developed by the supervisor and workers executing the work.
- c) An unique fall protection plan must developed for each working at heights scenario. As the work scope and environment changes, so can the hazards and therefore the hazard controls.

A fall protection plan can be standardized and reused only for recurring work activity that:

- repeatedly presents the same fall hazards and work scope
- requires the same fall protection systems (including equipment, connections and anchors)
- requires the same rescue procedures

A hazard assessment must still be completed to confirm the hazards and impacts are unchanged. If a change occurs in either the work scope or hazards the fall protection plan must be updated.

- d) A fall protection plan:
- must be available at the work site before work with a risk of falling begins
 - shall be reviewed and validated for accuracy before work commences
 - shall be periodically checked during the work to confirm that conditions affecting the plan have not changed. In the event that the work scope or conditions change, work must be stopped and the hazards reassessed, and controls implemented and documented on the fall protection plan.
- e) A fall protection plan shall specify:
- The work scope, location, date and time of the activity
 - The fall hazards
 - Type(s) of fall protection systems to be used including the components
 - Anchors and anchorages to be used during the work
 - Instructions and/or procedures for workers on how to inspect, assemble, use, maintain, disassemble the fall protection systems
 - The clearance distance requirements below the work area (if applicable) have been confirmed as sufficient to prevent a worker from striking the ground or an object or level below the work area. The clearance calculations must be documented in the fall protection plan. See [Appendix A](#) for an example of a clearance distance calculation.
 - Controls to prevent and/or to protect people below from falling objects
 - Instructions and rescue procedures on how to rescue a worker who has fallen and can't initiate self-rescue. General information on harness suspension trauma can be found in [Appendix B](#) to help with rescue planning.
 - Rescue procedures are not necessary when a travel restraint system is being used. This is due to the fact that a worker will not fall and be left suspended in the air. However, a fall protection plan is still required.

3.3 Fall Protection Systems

3.3.1 Physical barriers

- a) Guardrails are mandatory in the following areas:
- Along the exposed sides of permanent platforms
 - On the open sides of any stairwells that have four or more steps
 - Around floor openings, which are at least 30cm across or if there is potential for a person to fall through. Alternatively the opening must be adequately

covered with a securely attached cover designed to support the load and prevent a person from falling through.

- b) Standard guardrails, mid rails and toe boards must be positioned along the exposed sides of permanent platforms where the fall potential is 1.2 metres or more.
- c) Guardrails must meet the design requirements of OH&S legislation (Alberta OHS Code Part 22; Section 315)
- d) Toe boards must meet the requirements of OH&S legislation (Alberta OHS Code Part 22; section 321)
- e) Standard stair railings must be positioned on the open sides of any steps that have four or more risers.
- f) Fabric or netting panels can be used for leading edge protection. These manufactured system must be only used for leading edge fall protection and meet the requirements of OH&S legislation (Alberta OHS Code Part 9; Section 158). Workers will require training on the specific leading edge system.
- g) Ladder cages are not considered guardrails or a type of fall protection

3.3.2 Personal Travel Restraint

- a) Travel restraint systems offer a form of fall prevention by limiting the travel areas of the workers. The system must consist of:
 - A full body harness (*Note: Safety belts are prohibited)
 - A fixed distance of rope or lanyard that prevents workers from travelling to an unguarded edge
 - An anchor point that must have a minimum breaking strength in any direction in which the load may be applied of at least 3.5 kilonewtons (800 lbs) for each worker attached
 - An adequate anchorage (structure or part of a structure) that is capable withstanding any potential forces applied by the fall protection system
- b) Anytime guardrails or other suitable engineered physical barriers are not practicable, a travel restraint system must be considered.

3.3.3 Work Positioning

- a) Workers must wear a full body harness
- b) If a worker must use a work positioning system, the worker's vertical free fall distance in the event of a fall must be restricted by the work positioning system to 600 millimetres or less.
- c) If there is a risk a worker may fall more than 600 millimetres, the work positioning system can fail, or the work surface presents a slipping or tripping hazard because of its state or condition then a back-up fall protection plan is

required (see [Appendix C](#): Selection of fall protection system to be used with work positioning).

- d) Adjustable lanyards used in work positioning must meet the requirements of one of the following standards:
 - CSA Standard Z259.11-05, Energy absorbers and lanyards, as a Class F adjustable positioning lanyard
 - CEN Standard EN 358: 2000, Personal protective equipment for work positioning and prevention of falls from a height — Belts for work positioning and restraint and work positioning lanyards
- e) Rope adjustment devices used in work positioning must meet the requirements of one of the following standards:
 - CSA Standard Z259.2.3-99 (R2004), Descent Control Devices
 - CEN Standard EN 341: 1997, Personal protective equipment against falls from a height – Descender devices
 - NFPA Standard 1983, Standard on Life Safety Rope and Equipment for Emergency Services, 2006 Edition, classified as general or light duty

3.3.4 Fall Arrest

Fall arrest systems are designed to limit a person’s falling distance and prevent a worker from hitting a surface or object below. There are two common fall arrest systems:

3.3.4.1 Personal fall arrest

A personal fall arrest systems is designed to activate once a fall has occurred. It does not prevent a fall, but limits the drop distance and must prevent the worker from contacting the surface or an object below them.

- a) Personal fall arrest systems consist of:
 - A full-body harness
 - Shock absorbing connecting device
 - Anchor point (anchorage connector)
 - Anchorage (tie-off point)
- b) A full body harness is connected to a connecting device (e.g. two leg shock-absorbing lanyard, a self-retracting lifeline with an integral shock absorber or separate shock absorber, shock absorbing lanyard attached to a rope/cable grab, etc.). Connecting devices are then connected to anchor points (anchorage connector) or directly to an anchorage, if permitted by the manufacturer of the connecting devices.
- c) The system must be arranged so that the worker cannot hit the ground or work surface or hazardous object below the work area

- d) Fall equipment selection must limit the maximum arresting forces on a worker to 6 kilonewtons (1350 lbs) unless the worker is using an E6 shock absorber, in accordance with the manufacturer's specifications, in which the maximum arresting force of 8 kilonewtons (1800 lbs)
- e) A fall arrest system without a shock absorber must limit a workers' free fall distance to 1.2 metres
- f) Fall arrest equipment and anchor selection must always consider minimizing the free fall distance and reducing the maximum arrest forces on the worker should a fall occur
- g) A worker must use the shortest length of lanyard that still allows the worker to perform their work safely and the connecting device must be attached to an anchor no lower than the worker's shoulder height
- h) If an anchor is not available at shoulder height, the connecting device must be secured to an anchor point as high as reasonably practicable
- i) If the above expectations cannot be met, a re-evaluation of equipment selection must be performed.

3.3.4.2 Safety nets

Safety nets are also considered fall arrest equipment. A professional engineer must approve the use of a safety net.

- a) Safety nets must meet the requirements of ANSI Standard A10.11-1989 (R1998), Construction and Demolition Operations – Personnel and Debris Nets,
- b) Safety nets must:
 - have safety hooks or shackles of drawn, rolled or forged steel with an ultimate tensile strength of not less than 22.2 kilonewtons
 - has joints between net panels capable of developing the full strength of the web
 - extends not less than 2.4 metres beyond the work area
 - extends not more than 6 metres below the work area, and
 - is installed and maintained so that the maximum deflection under impact load does not allow any part of the net to touch another surface.
- c) The supporting structure to which a personnel safety net is attached must be certified by a professional engineer as being capable of withstanding any load the net is likely to impose on the structure.
- d) All documentation related to a safety net must be made available at the work area

3.3.5 Control Zones

If a control zone is selected as the primary form of fall prevention, it must meet the following requirements:

- The surface must be level
- The level working surface on which work is being performed must be at least 4 metres wide
- The width of the control zone from the unguarded edge must be at least 2 metres
- Additional width must be added to allow for slippery surfaces or increased risk slip, trip or fall risk
- The control zone must be clearly marked with an effective raised line, flags or other equally effective method to warn workers of the zone
- The control zone must be clearly identified as a danger zone and only authorized worker may enter the zone
- Workers who cross a control zone must take the most direct route
- Workers who must cross the control zone to enter or leave the work area are not required to use a fall protection system
- Workers who work within the control zone must use a travel restraint system or guardrails must be installed
- A control zone cannot be used on a skeletal structure work area

3.3.6 Procedures

- a) In Alberta Procedures may only be used in the following situations:
 - Installation or removal of fall protection equipment
 - Roof inspection
 - Emergency repairs
 - At-height transfers between equipment and structures if allowed by the manufacturer's specifications
 - Situations in which a worker must work on top of a vehicle or load
- b) A procedure in place of fall protection equipment must be developed to meet the following requirements:
 - A hazard assessment must be completed before working at heights begins
 - The procedure to be followed while performing the work must be in writing, available to workers, and reviewed during the pre-job meeting before the work begins

- The work must be carried out in such a way that it minimizes the number of workers exposed to a fall hazard while the work is being performed
- The work is limited to light-duty tasks (e.g. visual inspections, estimating, or simple emergency repairs, etc.) that will take less than 15 minutes in duration to complete. While doing the task, the worker must not turn his or her back to the edge and should keep the edge in sight.
- The worker(s) performing the work must be verified competent to do it
- Inspections, investigations or assessment activities must take place prior to the actual start of work or after the work has been completed
- The procedure must not expose a worker to additional hazards
- The procedure must be approved by the Cenovus functional leader accountable for the work

3.4 Anchors and Anchorages

3.4.1 Fall Arrest Anchor Requirements

- a) In Alberta, anchors used for the attachment of a personal fall arrest system must have a minimum breaking strength of:
 - 16 kilonewtons (3600 lbs) or more per worker attached, in any direction required to resist a fall,
 - or two times the maximum arresting force per worker attached, in any direction required to resist a fall.
- b) In Saskatchewan, anchors used for attachment of a personal fall arrest system must have a minimum breaking strength of:
 - 22.2 kilonewtons (5000 lbs) or more per worker attached, in any direction required to resist a fall,

An anchor to which a personal fall arrest system is attached must not be part of an anchor used to support or suspend a platform.

3.4.2 Travel Restraint Anchor Requirements

- a) A temporary travel restraint anchor must have a minimum breaking strength in any direction in which the load may be applied of at least 3.5 kilonewtons (800 lbs) per worker attached
- b) A permanent travel restraint anchor must meet the force requirements for fall arrest
- c) The anchor must be installed, used and removed according to the manufacturer's specifications or specifications certified by a professional engineer

- d) All travel restraint anchors must be permanently marked "For travel restraint only."
- e) Travel restraint anchors must be removed from use on the earliest of:
 - the date on which the work project for which it is intended is completed
 - or the time specified by the manufacturer or professional engineer.

3.4.3 General Anchor and Anchorage Requirements

- a) All temporary or permanent anchors must be certified by a professional engineer and meet the applicable requirements of CSA Standard Z259.16-04, Design of Active Fall Protection Systems and Alberta or Saskatchewan OHS regulations
- b) Temporary anchors must be installed, used, and removed according to the manufacturer's specifications or specifications certified by a professional engineer. They must be removed from use when the work is completed or at the time specified by the manufacturer or by a professional engineer.
- c) A damaged anchor must not be used. The anchor must be repaired, replaced, or re-certified by the manufacturer or a professional engineer
- d) Anchors must be easily accessible, located directly above the worker and work surface, and positioned high enough to prevent a lower level from being struck if a fall occurs
- e) Always inspect anchors prior to attaching a fall protection equipment components for corrosion, cracks, looseness or any other type of damage or deterioration
- f) Anchorage points must support the minimum required provincial OH&S legislative breaking forces/strength for fall arrest and travel restraint anchors
- g) Guardrails, electrical conduit, cable trays, floor gratings, scaffold members, plastic or insulated pipe or fire suppression piping shall never be used as anchorage points

3.5 Fall Protection Equipment and Components

3.5.1 Full Body Harness

- a) All workers must wear a full body safety harness whenever a travel restraint or personal fall arrest system is used
- b) A full body harness must be approved to one of the following standards and standard organization's label clearly identified on the harness:
 - CSA Standard CAN/CSA Z259.10-06, Full Body Harnesses
 - ANSI/ASSE Standard Z359.1-2007, Safety requirements for personal fall arrest systems, subsystems and components

- CEN Standard EN 361: 2007, Personal protective equipment against falls from a height — Full body harnesses
- c) A full body harness must be inspected for damage and confirmed functional before use
- d) The harness must be worn, used and maintained as per the manufacturer's specifications and instructions

3.5.2 Lanyards and Shock Absorbers

3.5.2.1 Lanyards

- a) Lanyard must be approved to one of the following standards:
 - CSA Standard Z259.11-05, Energy absorbers and lanyards
 - ANSI/ASSE Standard Z359.1-2007, Safety requirements for personal fall arrest systems, subsystems and components
 - CEN Standard EN 354: 2002, Personal protective equipment against falls from a height — Lanyards
- b) General lanyard requirements:
 - The type of lanyard selected for use must be made of wire rope or another material (rope, web or cable) appropriate to the hazard. The lanyard selected must be designed not to sever, abrade or burn through its application.
 - Lanyards made of conductive materials must not be used near energized conductors or sources
 - Use only a single lanyard between the worker and anchor point
 - Lanyards must not be tied back onto themselves
 - Lanyards must not be used for hoisting equipment, materials or any other purpose than fall protection
 - The shortest lanyard length must be chosen to effectively and safely complete a work task/activity
 - Personal fall arrest systems must always include a lanyard equipped with a shock absorber or similar device, unless the workers' free fall distance is less than 1.2 metres
 - Lanyards must be attached to an anchor no lower than a worker's shoulder height, except as specified in section 3.3.4.1

3.5.2.2 Shock-absorbers

A shock-absorber must be approved to one of the following standards:

- CSA Standard Z259.11-05, Energy absorbers and lanyards
- ANSI/ASSE Standard Z359.1-2007, Safety requirements for personal fall arrest systems, subsystems and components
- CEN Standard EN 355: 2002, Personal protective equipment against falls from a height – Energy absorbers

3.5.3 Connectors, Carabiners & Snap Hooks

- a) Connecting components of a fall arrest system (e.g. carabiners, D-rings, O-rings, oval rings, self-locking connectors and snap hooks) must be approved, as applicable, to one of the following standards:
 - CSA Standard Z259.12-01 (R2006), Connecting Components for Personal Fall Arrest Systems (PFAS),
 - ANSI/ASSE Standard Z359.1-2007, Safety requirements for personal fall arrest systems, subsystems and components
 - CEN Standard EN 362: 2004, Personal protective equipment against falls from a height – Connectors, or
 - CEN Standard 12275: 1998, Mountaineering equipment – Connectors – Safety requirements and test methods.
- b) Carabiners and snap hooks must be:
 - Self-closing and self-locking
 - Designed to be opened by at least two consecutive deliberate manual actions (requires two separate actions to open the hook or gate) that will to prevent rollout, accidental disengagement or opening of the gate mechanism
 - Marked with its breaking strength in the major axis and the name or trademark of the manufacturer
- c) Only steel carabiners are permitted and must have a load capacity of 22.2 kilonewtons (5000lbs) and identified as such.
- d) Carabiners and snap hooks must be visually inspected for damage and confirmed that the device is functioning correctly before use.

3.5.4 Anchor Slings

- a) Anchor slings must be approved to one of the following standards:
 - CSA Standard Z259.12-01 (R2006), Connecting Components for Personal Fall Arrest Systems (PFAS),
 - ANSI/ASSE Standard Z359.1-2007, Safety requirements for personal fall arrest systems, subsystems and components

- CEN Standard EN 362: 2004, Personal protective equipment against falls from a height – Connectors, or
 - CEN Standard 12275: 1998, Mountaineering equipment – Connectors – Safety requirements and test methods.
- b) Anchor sling general requirements:
- If approved by the manufacturer a sling may be permitted to be wrapped multiple times around an anchor in order to raise the height of the anchorage connector. If this is done a maximum angle of 45° shall not be exceeded at the connection point.
 - A wire rope sling used as an anchor must be terminated at both ends with a flemish eye splice rated to at least 90 percent of the wire rope's minimum breaking strength.
 - Avoid using anchor slings on an anchor point with sharp edges and use padding to protect the slings from damage.
 - Slings must be visually inspected for damage and confirmed that the device is functioning correctly before use.

3.5.5 Prusik and Similar Knots

Workers shall only use a Prusik or similar knot in place of a rope grab during emergency situations (includes training simulations).

These knots must only be used by experienced and competent rescue personnel.

3.5.6 Vertical Lifelines

Vertical lifelines must:

- Be approved to CSA Standard CAN/CSA-Z259.2.1-98
- Have a breaking strength specified by the manufacturer of at least 27 kilonewtons (6000 lbs) or as required by regulations
- Have anchor points must include anchor points that comply with the breaking strength required by Alberta, B.C., and Sask. The anchor point must not be used to suspend any platform, another worker, or any other load.
- Be installed and used in a manner that minimizes the swing-fall hazard and must extend to within 1.2 metres of the ground or safe work surface.
- Be protected at the lower end so it cannot be fouled by any equipment.
- Be free of splices and knots except at the terminations and is protected by padding where the lifeline passes over sharp edges. It must be protected from heat, flame, or abrasive or corrosive materials during its use.
- Only be used by one worker at a time, unless it is part of a ladder safety device as per the manufacturer's specifications and certified by a professional engineer

3.5.7 Horizontal Lifelines

- a) Flexible and rigid horizontal lifelines must meet the requirements of:
 - CSA Z259.13-04 Flexible Horizontal Lifeline Systems, or
 - The applicable requirements of CSA Standard Z259.16-04, Design of Active Fall-Protection Systems.
- b) A horizontal lifeline must be designed, installed, and used in accordance with:
 - The manufacturer's specifications, or
 - Specifications certified by a professional engineer
- c) Before a flexible or rigid horizontal lifeline system is used, a professional engineer, a competent person authorized by the professional engineer, the manufacturer, or a competent person authorized by the manufacturer certifies that the system has been properly installed according to the manufacturer's specifications or to specifications certified by a professional engineer.

3.5.8 Safety Belts

Safety or body belts are prohibited at Cenovus worksites and shall not be used as part of a fall protection system.

3.5.9 Fall Arresting Devices (Rope/Wire Grabs)

Fall arresting device or fall arrestor must meet the requirements of one of the following standards:

- CSA Standard Z259.2.1-98 (R2004), Fall Arresters, Vertical Lifelines, and Rails
- ANSI/ASSE Standard Z359.1-2007, Safety requirements for personal fall arrest systems, subsystems and components, or
- CEN Standard EN 353-2: 2002, Personal protective equipment against falls from a height – Part 2: Guided type fall arrestors including a flexible anchor line

3.5.10 Self-retracting Devices

- a) Self-retracting devices used with personal fall arrest systems must meet the requirements of CSA Standard Z259.2.2-98 (R2004), Self-Retracting Devices for Personal Fall-Arrest Systems.
- b) A self-retracting device must be anchored above the worker's head unless the manufacturer permit the use of a different anchor location.
- c) The device must all be used in a manner that minimizes the hazards of swinging and limits the swing drop distance to 1.2 metres if a worker falls

3.5.11 Descent Control Devices

Automatic or manual descent control device used with a personal fall arrest system must be approved to one of the following standards:

- CSA Standard Z259.2.3-99 (R2004), Descent Control Devices
- CEN Standard EN 341: 1997, Personal protective equipment against falls from a height – Descender devices, or
- NFPA Standard 1983, Standard on Life Safety Rope and Equipment for Emergency Services, 2006 edition, classified as general or light duty.

3.6 Ladders

3.6.1 Fixed Ladders

- a) Fixed ladders and cages must be constructed to Process Industry Practices (PIP) Standard STF05501 - Fixed Ladders and Cages, for the design and construction of fixed ladders
- b) A ladder attached to a scaffold or tank must extend at least 1 metre above the uppermost working level of the scaffold or tank top to provide workers with handholds when getting onto or off of the ladder.
- c) When working from or on a fixed ladder at a height of 1.8 metres or more and there is no protection by a guardrail, continuous protection from falling must be provided by equipping the fixed ladder with an integral fall protection system that meets the requirements of:
 - CSA Standard Z259.2.1-98 (R2004), Fall Arresters, Vertical Lifelines, and Rails
 - ANSI/ASSE Standard Z359.1-2007, Safety requirements for personal fall arrest systems, subsystems and components

Or an alternate fall protection system must be evaluated and installed.

- d) Fall protection is not required when climbing a fixed ladder of unbroken length less than 9.0 metres in Alberta or 6 metres in Saskatchewan, if the worker maintains 3-point contact at all times. However, if the worker stops on a fixed ladder to perform work and can fall a distance of 1.8 metres a fall protection system must be used.
- e) A ladder cage is not a type of fall protection. It serves only to support a worker if the worker needs to rest against a barrier.

3.6.2 Portable Ladders

- a) Workers who may fall a distance of 1.8 metres or more while working on a portable ladder must use a fall arrest system. If it is not reasonably practical to use personal fall arrest system a person may work without fall protection if the:
 - Work is a "light duty task" (e.g. visual inspections, estimating, caulking, touch-up painting, changing light bulbs, etc.). Light duty tasks must be identified through the hazard assessment process.
 - Work is of short duration and is less than 15 minutes in length
 - Worker's centre of balance is at the centre of the ladder at all times even when working with one arm extended beyond the side rails of the ladder
 - Worker maintains three-point contact whenever the worker extends an arm beyond a side
- b) If one of the above conditions cannot be met then some form of fall arrest protection is required.
- c) Portable ladders must:
 - Be secured against movement (e.g. braced or tied off) and placed on a base that is stable
 - Be no further from the base of the wall or structure than one-quarter of the distance between the base of the ladder and the place where the ladder contacts the wall while inclined
 - Have the side rails extended at least 1 metre above a platform, landing or parapet if the ladder is used as a means of access to the platform, landing or parapet.

3.7 Boom-supported Work Platforms and Aerial Devices

3.7.1 Boom-supported Work Platforms

- a) Personnel working on a boom-supported elevating work platform, boom-supported aerial device, or forklift truck work platform must use a personal fall arrest system connected to:
 - an anchor specified by the manufacturer of the work platform, aerial device or forklift truck, or
 - if no anchor is specified by the manufacturer, an anchor point certified by a professional engineer that meets the requirements of CSA Standard Z259.16-04, Design of Active Fall-Protection Systems.
- b) When connected to the anchor, the lanyard must be short enough to prevent the worker from being ejected from the work platform or aerial device, but long enough to allow the worker to perform his or her work. This must be documented in the fall protection plan.

3.7.2 Scissor Lifts & Elevating Work Platforms

- a) Personnel working on a scissor lift or on an elevating work platform with similar characteristics must use a travel restraint system consisting of a full body harness and lanyard:
 - Connected to an anchor specified by the manufacturer of the scissor lift or elevating work platform, and
 - When connected to the anchor, the lanyard must be short enough to prevent the worker from falling out of the scissor lift or elevating work platform, but is long enough to allow the worker to perform his or her work
- b) The use of a travel restraint system and fall protection plan is not required on a scissor lift or elevating platform when the following two criteria are met:
 1. The manufacturer specifies that the guardrails are sufficient as the only form of fall protection available, and
 2. The scissor lift is operating on a firm, level surface.

3.8 Fall protection on Vehicles and Loads

- a) If a worker must climb onto a vehicle or its load at any location where it is not reasonably practicable to provide a fall protection system for the worker:
 - Steps must be taken to eliminate or reduce the need for the worker to climb onto the vehicle or its load, and
 - Procedures must be developed as described in Alberta OHS Code Part 9; Section 159 (2) and this practice.
- b) A worker must never climb onto a load if the load is not secured and verified secure against movement

3.9 Use, Care and Maintenance of Fall Protection Equipment/Components

3.9.1 Manufacturer Specifications and Instructions

- a) The manufacturer's specifications and instructions for fall protection systems, equipment, components and anchors must be followed at all times.
- b) Manufacturer user manuals must be readily available to the workers using fall protection systems, equipment, components and anchors.

3.9.2 Inspections and Maintenance

All fall protection systems, equipment and components must:

- Be inspected prior to use as per the manufacturer's specifications and instructions
- Kept free from substances and conditions that could contribute to deterioration or failure of the equipment
- Re-certified as specified by the manufacturer.

3.9.3 Removal From Service

- a) All fall protection equipment that is found to be defective in condition or function must be tagged, removed from service, and either returned to the manufacturer for testing or destroyed.
- b) If the fall arrest equipment has been utilized to stop a fall, the entire fall arrest system must be:
 - Removed from service, and
 - Not returned to service until it has been inspected and re-certified as safe for use by the manufacturer, its authorized agent, or by a professional engineer.

3.10 Protection from Falling Objects

- a) For all elevated work activities, including routine tasks, a hazard assessment must be completed that evaluates the risk potential for dropped or falling objects. The assessment shall identify all potential objects that may fall from the work space and include a hazard control strategy to protect workers below. Examples of elevated work locations that require an assessment of falling material include: scaffolds, permanent platforms with handrails, stairs, ladders, mechanical aerial/elevated work platforms, pipe racks, drilling rig derricks/elevated rig floors, roof structures and storage tanks.
- b) A dropped or falling objects hazard assessment can be documented on the CEN729 - Field Level Hazard Assessment (FLHA) for elevated work that does not require a fall protection plan. For work activities that are covered under a fall protection plan the assessment must be documented on the CEN487 Site Specific Fall Protection Plan. The CEN 759 - Cenovus Dropped Items Checklist can also be used to guide workers through the hazard review and worksite inspection process.
- c) Supervisors and workers must take steps to protect people and equipment from being struck by falling objects. Control measures may include:
 - Pre-planning the job with the workers to ensure only the necessary items are brought to an elevated work space
 - Encouraging workers to conduct as many tasks at the ground level as possible
 - Reinforcing the use of securing devices such as tool lanyards, tethers and belts
 - Securing debris nets under your work area to catch falling material
 - Using debris chutes to dispose of large amounts of waste material from elevation
 - Installing overhead protection to protect workers below
 - Designating specific hazard zones using barriers (e.g. warning signs, flagging/tape and tags, fencing) that prevent worker entry
 - PPE (e.g. hard hat) is considered the last line of defence against falling materials. PPE alone does not offer adequate protection from falling objects.

4.0 Roles and Responsibilities

The following responsibilities apply to this practice:

Table 1: Roles and Responsibilities

Role	Description
Management	<ul style="list-style-type: none"> • Communicate and implement this practice within their function • Demonstrate ownership and leadership by actively setting a positive example • Allocate and make available the necessary financial and human resources that are required to functionally implement this document • Ensure that the designs for new or modified structures, buildings and equipment include an assessment of fall protection risks • Implement a technical process that ensures fall risks are eliminated or mitigated with engineered hazard controls • Monitor compliance with fall protection requirements during routine walkabouts, planned inspections and other formal reviews • Ensure suitable inspection and maintenance procedures are established

Role	Description
Front Line Supervisor	<ul style="list-style-type: none"> • Confirm all workers are aware of their roles and responsibilities outlined in the process requirements section of this document • Confirm workers are trained, knowledgeable, experienced and competent on this subject • Coach and correct workers who do not understand or comply with the requirements of this document • Participate in hazard assessments • Ensure affected works participate in the hazard assessment and developing fall protection plans • Participate in the development of fall protection and rescue plans • Confirm fall protection plans are documented • Verify appropriate fall protection hazards control are implemented • Confirm fall protection plans are in place and being followed • Confirm all components of a fall protection system are compatible with one another and with the environment in which they are used • Authorize the start of work • Confirm inspection and maintenance procedures are being followed • Monitor compliance with fall protection requirements during routine walkabouts, planned inspections and other formal reviews

Role	Description
Worker (Fall Protection End User)	<ul style="list-style-type: none"> • Must be trained, knowledgeable, experienced and competent in the use of the fall protection systems, equipment and components to be used • Must use or wear the fall protection system/equipment that is required to prevent or safely limit a fall • Always follow the manufacturer’s specifications and instructions of fall protection systems and equipment • Participate in the hazard assessment and fall protection planning • Document the hazard assessment and fall protection planning • Request and/or receive approval from their supervisor before starting work • Choose the appropriate equipment based on the hazards that will prevent a fall or reduce the fall distance and arresting forces • Use the appropriately rated anchors and anchorage points Confirm that accurate information on anchors and anchorage points is available • Confirm all components of a fall protection system are compatible with one another and with the environment in which they are used. • Conduct pre-use visual inspections prior to using fall protection systems or equipment • Keep equipment and components free from substances and conditions that could contribute to deterioration of the equipment • Properly store equipment when not in use. • Remove from service any damaged or defective equipment • Report all incidents and unmitigated hazards immediately to supervisor

Role	Description
Health & Safety	<ul style="list-style-type: none"> • Conduct worksite observations and inspections on a regular basis to verify compliance with the expectations described in this document • Assist with the implementation and communication of the documented requirements • Provide feedback to the document owner or representative concerning proposed changes or improvements to this document • Monitor and collect feedback related to this document to verify program effectiveness • Lead document reviews and revisions as per the expectations described in this document • Provide subject matter expertise when requested by functional teams
Supply Chain Management	<ul style="list-style-type: none"> • Purchase only fall protection systems, equipment and goods that comply with Alberta and Saskatchewan OHS legislation and this practice • Communicate with contractors Cenovus’s fall protection requirements
Engineering	<ul style="list-style-type: none"> • Assess the fall risks in the design of buildings, structures and process equipment • Include fall protection specifications in the design of buildings, structures and process equipment
Learning Solutions	<ul style="list-style-type: none"> • Source, select and coordinate fall protection training for Cenovus employees

5.0 Training and Competency

Competency describes the knowledge and skills required to successfully perform the technical aspects of a job. A worker must be able to demonstrate competency in safely performing work tasks or using equipment.

5.1 Training

All workers who are required to use a fall protection system must be trained in the use of the system, the associated equipment and procedures. Workers must also be verified by a competent person that they have adequate knowledge, ability and practical skills to safely use a fall protection system.

The target audience includes personnel who perform or supervise work in which a fall protection plan and fall protection equipment is required.

Table 2 highlights the minimum fall protection training elements that must be covered in a fall protection course.

Table 2: Fall Protection Training Elements

Training Requirements	
<ul style="list-style-type: none"> • Identification of fall hazards and information about the effect of a fall on the human body, including: <ul style="list-style-type: none"> ○ maximum arresting force ○ the purpose of shock and energy absorbers ○ swing fall ○ free fall • Review of applicable provincial legislation pertaining to fall protection • Fall protection plans and planning including hazard identification, assessment and control techniques • Fall protection systems <ul style="list-style-type: none"> ○ Guardrails ○ Travel Restraint ○ Fall Arrest ○ Work positioning ○ Control Zones ○ Safety nets ○ Fall protection procedures • Fall protection equipment and components and manufactures instructions • Assessment and selection of specific anchors • Instruction on the correct use of connecting hardware 	<ul style="list-style-type: none"> • Installation of equipment and components • Pre-use inspection of the system, equipment and component • Fall arrest force, swing and & clearance calculations • Inspection, maintenance and care of fall protection systems, equipment and components • Emergency response procedures to be used at the work site • Practice in <ul style="list-style-type: none"> ○ inspecting, fitting, adjusting and connecting fall protection systems and components, and ○ emergency response procedures <p>Proficiency testing that must include:</p> <ul style="list-style-type: none"> • Knowledge evaluation through a write examination • Practical testing to verify workers: <ul style="list-style-type: none"> ○ inspect, don, doff and store equipment properly ○ controlled weight transfer of their body weight to the full body harness

- Instruction must meet applicable provincial OH&S requirements.
- Courses must include both a classroom component (theoretical instruction) and a hands-on practical exercise.
- Fall protection re-certification will be required **every three years**.

5.2 Competency Verification

Practical skill assessments of task completion and equipment use must be conducted by a competent supervisor or mentor.

Workers may be required to attend additional training sessions or complete further on-the-job training if performance deficiencies are identified through formal assessments.

All practical skill assessments must be documented and retained in the worker's personnel file. Records may be maintained in hard copy or electronically.

6.0 Quality Assurance

6.1 Performance Measurement

Compliance with this practice and program effectiveness shall be assessed through program assessments and internal audits, or other measurement criteria as specified in the COMS Assurance Standard. Measurement can also be accomplished through the tracking of appropriate Key Performance Indicators (KPI).

Business functions or departments impacted by this practice must include compliance and program effectiveness verifications in their business assurance program. Performance will be monitored and reported within the responsible departments at least every three years.

Health and Safety Solutions will review Cenovus-wide program KPIs at a minimum every three years in conjunction with program review and update activities.

6.2 Management of Change

Proposed changes to this practice can be directed to H&S Programs and Projects.

6.3 Practice Verification

The document owner will complete and document reviews of this practice, as follows:

- At minimum once every three years
- If there is a significant regulation or industry best practice change that indicates the need for review
- If an incident investigation indicates the causes were related to unclear or inadequate written instructions described within this practice

If frequent and multiple variances to this practice are requested due to operational needs, the reason(s) will be investigated and the document owner will determine if there is a business need to update the practice.

If submitted MOC requests indicate gaps or significant improvement opportunities, the document owner will determine if there is a business need to update the practice.

7.0 Glossary

Definitions and acronyms for safety documents are described in CEN-EHS243, H&S Definition and Acronym Standard. The following definitions and acronyms are specific to this document:

Table 3: Terms and Definitions

Term	Definition
Anchor	An engineered component for coupling a fall arrest or travel restraint system to an anchorage
Anchorage	A structure, or part of a structure, that is capable of safely withstanding any potential forces applied by a fall protection system
Carabiner	<p>A connecting component that:</p> <ul style="list-style-type: none"> (a) generally consists of a trapezoidal or oval body with a self-locking gate that requires at least two consecutive, deliberate actions to open to permit the body to receive an object and that, when released, automatically closes and locks to prevent unintentional opening, and (b) has an ultimate tensile strength of at least 22.2 kilonewtons (6000 lbs)
Control zone	The area within 2 metres of an unguarded edge of a level, elevated work surface
Fall arresting device	Means a part of a worker’s personal protective equipment that stops the worker’s fall and does not allow the worker to fall farther
Fall protection system	<p>A Fall Protection System means:</p> <ul style="list-style-type: none"> (a) a personal fall arrest system (b) a travel restraint system (c) fabric or netting panels intended for leading edge protection (d) a safety net (e) a control zone (f) use of procedures in place of fall protection equipment (g) another system approved by a Director of Inspection from Alberta OH&S
Free-fall distance	The vertical distance between the point from which a worker falls to the point at which deceleration begins because of the action of a personal fall arrest system.

Term	Definition
Full body harness	A body support consisting of connected straps designed to distribute force over at least the thighs, shoulders and pelvis, to which a lanyard or lifeline or connecting component can be attached.
Horizontal lifeline systems	A system composed of a synthetic or wire rope, secured horizontally between two or more anchor points, to which a worker attaches a personal fall arrest system or travel restraint system.
Lanyard	A flexible line of webbing or synthetic or wire rope that is used to secure a full body harness or safety belt to a lifeline or anchor point.
Lifeline	A synthetic or wire rope, rigged from one or more anchor points, to which a worker's lanyard or other part of a personal fall arrest system is attached.
Shock absorber	A device intended to reduce the force on a worker when a personal fall arrest system is operating.
Swing drop distance	In a fall-arresting action, the vertical drop from the onset of the swinging motion to the point of initial contact with a structure.
Total fall distance	The vertical distance from the point at which a worker falls to the point where the fall stops after all personal fall arrest system components have extended.
Travel restraint system	A type of fall protection system that prevents a worker from travelling to the edge of a structure or to a work position from which the worker could fall.

Table 4: Acronyms, Initialisms and Abbreviations

Term	In Full
H&S	Health and Safety
KPI	Key Performance Indicators
OHS	Occupational Health and Safety

8.0 References

8.1 External Documents

The following external documents support this practice:

Table 5: External Document References

Document Type or Number	Document Title
OHS Legislation	Alberta OHS Act, Regulation and Code
OHS Legislation	Saskatchewan OHS Regulations

8.2 Internal Documents

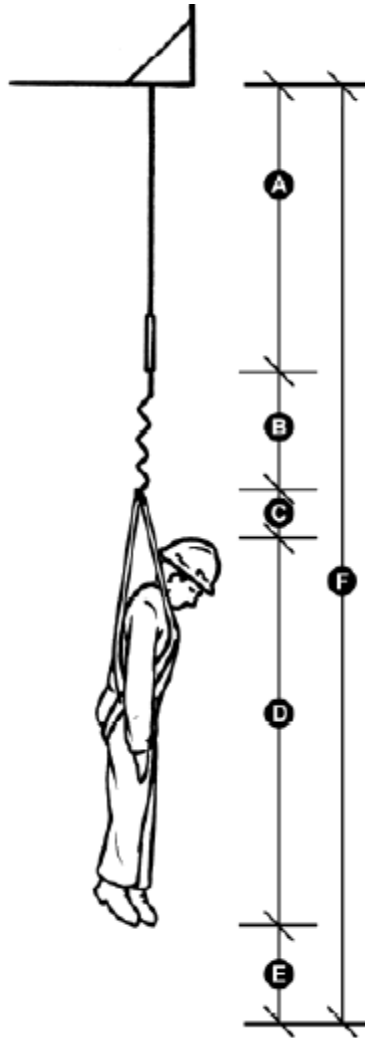
The following Cenovus documents support this practice:

Table 6: Internal Document References

Document Type or Number	Document Title
Policy	Corporate Responsibility Policy
CEN-EHSReg787	Regulatory Definitions and Acronyms
CEN487	Fall Protection Plan
CEN753	Safe Work Permit
CEN-EHS019	Hazard Assessment and Control Practice
CEN729	Field Level Hazard Assessment
CEN021	Hazard Assessment and Safety Meeting
CEN-EHS022	Risk, Risk Assessment and Risk Management Description
CEN-EHS759	Cenovus Dropped Items Checklist
CEN-EHS1600	Harness Suspension Trauma
CEN-EHS-LSR56	LSR FACT Working at Heights

Appendix A: Example Clearance Distance Calculation

The following is an example (copied from the Alberta Explanation Guide) of how to calculate the minimum clearance distance below an anchor point based on a worker's fall arrest system.



Assumptions:

The worker is 1.8 m (6 ft.) tall using a 1.8 m (6 ft.) long lanyard. The combined weight of the worker, clothing, and tool belt is at least 100 kg (200 lbs).

- A Length of lanyard – 1.8 m (6 ft.)
- B 1.1 m (3.5 ft) due to shock absorber pulling apart
- C Harness stretch plus D-ring sliding – 0.45 m (1.5 ft.)
- D Height of worker – 1.8 m (6 ft)
- E Safety factor – clearance below feet of 0.9 m (3 ft.)
- F A+B+C+D+E
Overall minimum clearance is 6.0 m (20 ft.)

This worker requires approximately 6 metres (20 feet) of clear space below the anchor point.

Appendix B: Harness Suspension Trauma

A worker suspended in an upright position with their legs dangling in a harness is subject to suspension trauma. Serious injuries, sometimes fatal, will occur if the worker is not rescued within minutes after the fall.

After the fall, while suspended the worker must:

- Try to move his legs in the harness and push against any footholds or stirrups in the body harness (if available)
- Attempt to get in a seated position
- Contract leg muscles to pump blood through the circulatory system

After the rescue a worker:

- Must sit or kneel down
- DO NOT lay the worker flat on the ground, as this can lead to fatal injuries
- Notify emergency medical services immediately

Appendix C: Selection of fall protection system to be used with work positioning

Class	Work surfaces and slope characteristics	Required back-up fall protection plan
I	Flat – with a slope of no more than 4 degrees	None, unless the worker’s centre of gravity extends beyond the edge, in which case a back-up fall arrest system is required.
II	Slight elevation gain or loss – slope angle varies from 4 to 8 degrees	None, unless the worker’s centre of gravity extends beyond the edge, in which case a back-up fall arrest system is required.
III	Sloping sharply enough that a person needs to touch a hand for balance	None, unless the worker’s centre of gravity extends beyond the edge, in which case a back-up fall arrest system is required.
IV	Hands and feet or the work positioning system is required to maintain the work position on a sloping surface	Travel restraint system unless the worker’s centre of gravity extends beyond the edge, in which case a back-up fall arrest system is required.
V	Vertical surface. Worker is suspended	Fall arrest system.

*Adopted from Alberta OH&S Code Explanation Guide: Part 9 Fall Protection; Section 160 Work Positioning