

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 1 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

1. Purpose

Historically falls are the leading cause of workplace injuries, including fatalities. The University of Alaska Anchorage (UAA) recognizes that incidents involving falls are generally complex events, frequently involving a variety of factors. Consequently, this program for fall protections deals with both the human and equipment-related issues in protecting people from fall hazards.

2. Objective

UAA, in its continuing effort to provide employees with safe, healthful working conditions, and to comply with the Occupational Safety and Health Act is implementing the following program for fall protection to protect people working at the University, by helping employees, student workers, faculty, staff, and outside contractors better understand fall hazards and methods of fall prevention.

3. Scope

This policy applies to UAA employees, student workers, faculty, staff, and outside contractors working on at UAA facilities who work at heights of greater than 4 feet.

4. Definitions

Anchorage - a structural member which provides a secure point of attachment to which the fall protection system is ultimately connected.

Anchorage Connector - an independent component of subsystem which couples the fall arrest system to the anchorage if direct attachment is not possible.

Competent Person - a person who is capable of identifying existing and predictable hazards in any personal fall protection system or any component of it, as well as in their application and uses with related equipment, and who has authorization to take prompt, corrective action to eliminate the identified hazards.

Deceleration Device (Shock Absorber) - a device which serves to dissipate a substantial amount of energy during a fall arrest or otherwise limits the energy imposed on the body during fall arrest.

Fall Prevention - used to stop the initiation of a fall to a lower level, designed so that the employee cannot reach the unprotected edge. Also called "Fall Restraint".

Fall Protection - the use of passive equipment designed to stop and/or control the free fall once a fall has been initiated. Also called "Fall Arrest"

Free Fall - the act of falling before the personal fall arrest system begins to apply force to arrest the fall.

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 2 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

Free Fall Distance – vertical distance the D-ring travels from the onset of a fall to the time when the fall arrest system begins to apply force to arrest the fall. This excludes deceleration distance and any system elongation.

Full Body Harness – straps that secure about the employee in a manner to distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, with a means for attaching the harness to other components of a personal fall protection system. In addition, the work positioning and travel restraint attachment elements (D-rings) must be capable of sustaining a minimum tensile load of 5,000 pounds .

Note: Body Belts are prohibited for use as fall protection.

Lanyard – a flexible strap with a connector at each end for connecting to the full body harness at one end and an anchorage or anchorage connector at the other. There are several configurations:

Dual – designed with two straps in a "Y" configuration but with a single point of attachment to the body harness.

Traditional – single strap with end connectors, normally 6 ft in length, but available in various lengths.

Lifeline – a flexible line for connection to an anchorage at one end to hang vertically (vertical Lifeline) or for connection at both ends to stretch horizontally (horizontal lifeline) and to which other elements of a fall arrest system are attached.

Self-Retracting Lifeline/Lanyard – a deceleration device containing a drum-wound line that can be slowly extracted from, or retracted onto, the drum under slight tension during normal movement by the employee. At the onset of a fall, the device automatically locks the drum and arrests the fall.

Personal Fall Arrest System – a system used to arrest an employee in a fall which consists of an anchorage, locking connectors, deceleration device, full body harness, and a lanyard, lifeline, or combination of these.

Positioning Device System – a system rigged to support or suspend an employee on an elevated vertical surface and work with both hands free while leaning. They are not designed to withstand shock loads and must not be used as fall protection.

Qualified Person – a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project

5. Authority and Responsibilities

In addition to the roles and responsibilities outlined in the UAA Training Program, the following apply to the Fall Protection Program.

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 3 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

EHS/RM

- Provide support upon request to assist in the determination and applicability of fall protection
- Assist departments with the selection of fall protection equipment
- Create, track, and/or conduct inspections on fall protection equipment where applicable with this standard

Supervisor

- Ensure all affected employees are aware of the locations or equipment where fall protection measures are required
- Ensure appropriate fall protection equipment is available for affected employees
- Provide alternative access when an employee determines use of fall protection can be avoided by providing other means of access or workspace operations such as a scaffold, lift pod, or bucket truck
- Ensure employees are properly trained in this fall protection program and the use of the fall protection equipment to be used
- Perform and assist in inspections of fall protection equipment

Department Safety Coordinator

- Assist in the determination of required fall protection and potential alternatives
- Periodically observe the use of fall protection in the assigned department
- Assist in the selection of fall protection to provide employees when needed
- Perform and assist in inspections of fall protection equipment

Employees

- Conduct inspections of fall protection equipment prior to each use
- Promptly notify supervisor and remove any damaged or defective fall protection equipment from use
- Assess planned work to determine if fall protection should be worn, and seek alternative access or work-methods to avoid the use of fall protection whenever possible
- Use other methods of access such as a scaffold, lift pod or bucket truck when they provide a safer alternative

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 4 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

Outside Contractors

- Perform all work in compliance with the company’s fall protection program, which will be reviewed and approved by the EHS/RM department. If the company does not have a standard, they must comply with this program.

6. Hazards Associated with Work at Height

Hazards and factors that affect the risk from working at height include:

- Vertical distance of fall
- Fragile working surfaces
- Voids
- Slope of the work surface
- Unprotected edges
- Poorly maintained equipment
- Adverse weather conditions

The primary hazard is injury, including death, sustained from an uncontrolled fall.

7. Engineering Controls

Engineering controls are design plans or changes to the working environmental to prevent or reduce employee exposure to potential fall hazards.

The following example engineering controls should be considered in area design to reduce the risk of falls.

- Proper construction of elevated locations
- Use of hand, knee, and toe rails where required
- Proper design of fixed ladders and stairs
- Adequate lighting in areas

8. Administrative Controls

Administrative controls are safe work practices and procedures designed to reduce the risk of fall. Example administrative controls include the following:

- Training for employees who work at elevated locations
- Routinely inspecting ladders, stairs, walking and working surfaces

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 5 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

- Following good housekeeping practices
- Initiating prompt cleanup of material spills

9. Hierarchy for Employee Protection

Fall hazards should be addressed in the following sequence:

1. Eliminate the need for the elevated work
2. Change work practices to eliminate the need for elevated work
3. Provide fall protection

The first level of the hierarchy is normally applied during the design of new projects although there may be situations where fall hazards in existing facilities could be eliminated through relocation or automation of equipment. This should be evaluated for feasibility prior to going to the next level.

If neither of the first two levels are practical or feasible, then fall protection meeting the remaining requirements of this standard is required.

10. Fall Protection

According to OSHA, in general industry, fall protection is required if the employee is working 4ft above an approved walking/working surface. The bottom of the employee's feet must be at or above the 4ft mark for this to take effect.

Components of Personal Fall Arrest Systems

- Body Harness
- Anchorage
- Connectors

NOTE: All three of the above must meet the requirements detailed in section 10

Removal from Service

Components of a fall protection system must be tagged and immediately removed from service if:

- Subjected to fall forces
- Upon inspection failure prior to each use
- Upon failure of annual inspection
- After a period of time determined by the manufacturer. This is usually indicated on the harness label

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 6 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

Exclusive Use

- Fall protection or positioning body devices, lanyards, lifelines, and anchorage connectors are to be used only for personal protection.
- Any such equipment or component which could be used for other activities (such as slings, chokers, carabiners, etc.) must either be tagged or otherwise identified as fall protection equipment (a vendor or ANSI tag suffices).

Storage

- Fall protection equipment not being used must be stored in an area away from exposure to extreme heat or other weather effects and chemical effects.
- Fall protection equipment must be stored in a manner that does not damage or contort the equipment.

Prior to Use Inspections

- Fall protection equipment must be inspected by the user prior to each use.
- Do not use equipment which does not pass this inspection, or which has passed its date for its next required inspection by a qualified person (noted on the attached tag, by color code, etc.).
- If this is the case, return the equipment to the area supervisor or departmental safety coordinator for inspection and remarking.

Inspections of Mounted Equipment

- Permanently installed equipment must have a documented inspection initiated by the Department Safety Coordinator or Area Supervisor annually.
- Some components of these systems may be returned to the manufacturer for coordination of the inspection, such as self-retracting lanyards that are part of a tank truck load station. However, the EHS/RM is responsible for ensuring inspection of the remaining components of the system (trolley, beam, etc.). Information may be required from the qualified person who designed or installed the system in order to perform an adequate inspection (i.e. designed angle of sag and number of connecting clips for a horizontal lifeline).
- If any deterioration is found, the system must not be used until repaired or replaced.

Inspections of Portable Equipment

- Portable equipment (lanyards, harnesses, retractable devices, etc.) will also be inspected by qualified personnel defined by the EHS/RM at the frequency specified by the manufacturer (some equipment is semi-annual, others annual).

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 7 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

- There must be some indication on the equipment by which the user can determine if the equipment is overdue for this inspection (tag, color coded tape, etc.).

11. Fall Protection Equipment Requirements

The following lists the requirements for Personal Fall Arrest Systems.

Anchorage

- The anchorage must be either capable of supporting 5000 lbs. for each person attached or be designed by a qualified person with a safety factor of two. If designing an anchorage point for a safety factor of two, consider the shock absorber dissipation of fall forces, total fall distance, number of persons using the anchorage, etc.

Anchorage Connectors

- Anchorage connectors are used when a fall arrest system cannot be directly attached to an anchorage. Examples of connectors are slings, carabiners, chokers, shackles, trolleys, or builders' grips.
- Connectors must meet the strength requirements of 5000 lb. per person or a safety factor of two designed by a qualified person.

Body Device

- When personal fall arrest systems are required, a body harness must be worn snug at the upper legs, with straps tucked in so as not to get caught. The chest strap must be between the chest and collarbone, and the rear D-ring between the shoulder blades.

| Location | Use |
|----------|-----------------------------------------------------------------------|
| Back | General Fall Protection (during climbing if using retracting lanyard) |
| Front | Fall Protection during climbing activities |
| Side | Positioning |
| Shoulder | Confined Space Entry or another Rescue |

Snaphooks

- Only self-closing, self-locking type snaphooks will be allowed for fall protection use to reduce the potential for accidental "roll-out".
- The snaphook must open and close freely and must be fully closed around the anchorage or anchorage connector. Two snaphooks must not be connected to each other.
- The snaphook must not be wrapped around the anchorage and reconnected to the lanyard unless designed to do so.

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 8 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

Deceleration Devices

- A deceleration device is required as part of an overall fall protection system. These may be incorporated into the overall system (such as the brake mechanism in a retractable lanyard or rope grab, the rip stitch portion of a lanyard, etc.) separate.

Ropes and Knots

- Natural fiber ropes are not allowed in fall protection systems.
- Knots are also not allowed in any load bearing lines as the knot may reduce the strength of the rope by over one half.

Lanyards, General

- The shortest length lanyard possible should always be used.
- Wear with the shock absorber at the harness D-ring end.
- Always use a separate lanyard per person.
- Use a softener (cut or heat resistant) if the lanyard may be exposed to abrasive edges or hot surfaces.
- When worn but not in use, ensure the lanyard(s) is wrapped or tucked in so as not to present a tripping hazard.

Dual Lanyards

- One strap of the lanyard must be secured at all times when exposed to the fall hazard, both if possible. If it is not possible to connect both lanyard straps, then the unused strap must not be left hanging or attached to the user's harness in such a manner that will entangle the user, but rather should be attached to the end eye of the attached strap's snaphook or otherwise stored in a non-hazardous manner.

Retractable Lanyards

- These devices are designed to arrest the fall within 2 feet.
- Never allow these devices to retract uncontrolled as the cable may become damaged or the uncontrolled cable may contact personnel in the area. This may require the use of a tag line to extract and retract the line. Be sure however, to remove the tag line or otherwise ensure it does not become a tripping hazard or become entangled while the device is in use.
- These devices must be used with the wearer at less than the angle specified by the manufacturer to avoid a potentially serious swing fall impact and ensure the brake mechanism is operating in a vertical plane.

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 9 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

Vertical Lifelines

- These must have a formed eye termination on one end for suspension from the anchorage point and must extend to below the lowest level of travel.
- The grab device must be compatible with the size and type of rope or cable used and should remain above the shoulders of the user. Some manufacturers require specific grade ropes (such as those with visible wear lines).
- Only short lanyards or simply shock absorbers should be connected to a vertical lifeline in order to ensure there is no more than a 6-foot free fall should the grab device be below the user's shoulder when a fall occurs.
- The lower end of the lifeline must be either attached to a second anchor point or be weighted down to provide stability. The weight may be attached with a knot in this case since at this point the rope is not load bearing.
- A separate vertical lifeline is required for each employee.
- Rope lifelines may have considerable elongation (up to 15 feet for 100 feet of nylon rope lifeline). This should be taken into consideration (use a minimum of 12 feet total fall distance if using rope) in ensuring the employee does not contact the next lower level should a fall occur.

Horizontal Lifelines

- These must be designed by a qualified person with a safety factor of two. Purchased systems have been designed by the manufacturer with the appropriate safety factor and must be used strictly in accordance with the instructions provided.
- If the span of the lifeline requires intermediate supports, these must be designed to allow freedom of movement throughout the length of the lifeline. If not, a dual lanyard will be required to maintain continuous fall protection.
- The maximum number of users as well as any other special requirements of any permanently installed horizontal lifeline (such as adjustable lanyard required to maintain less than a 6-foot free fall, etc.) must be posted at each access point to the lifeline.
- Proper job planning is required to ensure that the maximum number of users is not exceeded for temporary systems.

Safety Nets

- Nets cannot be used without prior approval by the EHS/RM department. All other forms of fall protection should be investigated prior to request to use nets.
- Only nets designated by the manufacturer as personnel nets may be used for fall protection.

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 10 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

These must be installed as close as possible to the work level, but in no case more than 30 feet (9.1 m) below such level, and extend outward from the surface.

- The net may have maximum 6" by 6" openings and must either pass a 400 lb. drop test prior to use, whenever relocated, after repair, and every six months if left in place or be certified by a qualified person. If certified, the most recent record of certification must be available on the job site and include the identification of the installation to which it pertains as well as the name of the qualified person making the certification and the date.
- Nets in use must be inspected weekly for wear, damage, and other deterioration. The net should remain free of materials and debris.
- The distance that the net extends outward is dependent upon the distance below the work surface:

| Distance Below | Distance Out |
|-----------------------|--------------|
| Up to 5 feet | 8 feet |
| Between 5 and 10 feet | 10 feet |
| Greater than 10 feet | 13 feet |

12. Scaffolding

Requirements for fall protection on scaffolds exceed 4 feet are described below.

- Scaffolds will be inspected by a competent person for each shift prior to use. Employees, student workers, faculty, staff, and outside contractors shall not work on scaffolds that have not been inspected prior to the start of their shift.
- The footing or anchorage for scaffolds shall be sound, rigid and capable of carrying the maximum intended load without settling or displacement. Unstable objects, such as barrels, boxes, loose brick, or concrete blocks shall not be used to support scaffolds or planks.
- Scaffolds and their components shall be capable of supporting at least *four times* the maximum intended load.
- Scaffolds shall be maintained in a safe condition and shall not be altered or moved horizontally while they are in use or occupied.
- Damaged or weakened scaffolds shall be immediately repaired and shall not be used until repairs have been completed.
- A safe means must be provided to gain access to the working platform level through the use of a ladder, ramp, etc.
- Overhead protection must be provided for personnel on a scaffold exposed to overhead hazards.

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 11 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

- Guardrails, midrails, and toeboards must be installed on open sides and ends of platforms more than 10 feet above the ground or floor. Wire mesh must be installed between the toeboard and the guardrail along the entire opening, where persons are required to work or pass under the scaffolds.
- Employees, student workers, faculty, staff, and outside contractors shall not work on scaffolds during storms or high winds or when covered with ice or snow.
- There are a number of scaffold types, and OSHA code 1910.28 should be reviewed carefully for special requirements that apply to each type.

13. Training

Supervisors and Department EHS Coordinators will identify employees whose job duties expose them to fall hazards, who will require fall protection training. Competent trainers will be determined by the EHS/RM department and may include area personnel dependent on training and experience in the subject matter. Training content will be provided by the EHS/RM department. Supplemental department specific training material may be added by the Department Supervisor/ Department EHS Coordinator if approved by EHS/RM dept.

14. Program Evaluation

The Fall Protection program shall be evaluated on an annual basis utilizing the protocols set forth by EHS/RM. The evaluation team will consist of a department safety coordinator and a designee from EHS/RM. EHS/RM will define the scope of the evaluation. The final report will be developed by the EHS/RM utilizing the information received during the evaluation. The deficiencies determined in the report will be documented and corrective action plans will be developed.

15. References

Several OSHA and ANSI guidelines and regulations apply to fall protection and include provisions for design, operator training, and safe operating practices, these include:

- OSHA 49 CFR 1910.25- 1910.27
- OSHA 49 CFR 1926.500-.503
- ANSI/ASSE Z359.1 for fall arrest

| | |
|---------------------------------------|------------------------------|
| University of Alaska Anchorage | Section EHS/RM |
| ADMINISTRATIVE SERVICES MANUAL | Statement |
| EHS/RM Programs | Page 12 |
| Title FALL PROTECTION | Effective Date 06/02/2021 |

16. Revision History

| Revision Number | Date Revised | Description of Change | Revised By | Approved By |
|-----------------|--------------|---------------------------------------------|------------|-------------|
| 0 | | Initial issue. Replaces all prior versions. | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |