

Northern Arizona University Aerial Lift Program

Environmental Health and Safety

Aerial Lift Operator Safety Program **ALOSP**

IAW
29CFR1926.453, Subpart L,
29CFR1910.67, Subpart F,
ANSI/SIA A92.6-2006, Self-Propelled Elevating Work Platforms, and
ANSI/SIA A92.5-2006, Boom-Supported Elevating Work Platforms

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Table of Contents
Northern Arizona University Environmental Health and
Safety Aerial Lift Operator Safety Program

<u>Overview</u>	1
<u>Scope and Application</u>	1
<u>Roles and Responsibilities</u>	2
<u>Procedures</u>	3
<u>Training Requirements</u>	7
<u>Program Evaluation</u>	8
 <u>Appendix I: Aerial Lift pre-use inspection checklist</u>	
 <u>Appendix II: Performance test for Aerial Lift Operators</u>	
 <u>Appendix III: Examples of Aerial Lifts</u>	

Northern Arizona University Environmental Health and Safety Aerial Lift Operator Safety Program

Overview

Aerial lifts are commonly used in construction, inspection, athletic events and repair services to lift University employees to an elevated work position. Proper operation and use of aerial lifts can make completion of tasks at elevation, safer and more efficient. However, unsafe use, operation and aerial lift work practices can result in serious injury. This program has been developed due to the hazards associated with improper use and Northern Arizona University's or NAU concern for the safety of individuals in and around this type of equipment. In addition, this program outlines general, operating, maintenance, inspection and training requirements governing safe aerial lift use at the University.

Several OSHA regulations and ANSI standards apply to aerial lifts and include provisions for design, operator training, and safe operating practices, these include:

- 29 CFR 1910.67 (Vehicle Mounted Elevating and Rotating Work Platforms)
- 29 CFR 1926.453 (Aerial Lifts)
- 29 CFR 1926.451 & .452 (Scaffolds)
- 29 CFR 1926.20 (General Safety and Health Provisions)
- 29 CFR 1926.21 (Safety Training and Education)
- Section 5 of the OSHA Act, commonly referred to as the "General Duty Clause."
- American National Standards Institute (ANSI), A92.3, Manually Propelled Elevating Aerial Platforms
- ANSI, A92.6, Self-Propelled Elevating Work Platforms
- ANSI, A92.2, Vehicle Mounted Elevating and Rotating Aerial Devices
- ANSI, A92.5, Boom-Supported Elevating Work Platforms

Scope and application

Departments using aerial or scissor lifts must ensure that operators comply with all aspects of this program. All University employees and students must successfully complete a two-part training program provided by NAU EHS and receive passing marks prior to the operation of any lift. Contractors operating lifts on University projects are expected to meet or exceed the requirements found in this program, follow all University-specific rules, and comply with all applicable statues and regulations.

The purpose of this Program is to ensure that University personnel and students who operate aerial or scissor lifts have the knowledge and tools to work safely. This program applies to all University-owned or rented aerial platforms and scissor lifts designed to elevate personnel on a platform that is propelled by a powered lifting device, with the controls located on the platform itself. It applies to any department that owns or rents the equipment and the employees or students who use them.

This program has been developed to reduce the risk of physical injury or property damage in areas where aerial lifts are in operation. It also brings the university into compliance with federal, state, and local law.

Roles and responsibilities

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The overall responsibility to develop and implement occupational health and safety programs for the university falls with EHS. Although it is the overall responsibility of EHS to develop these programs, it is ultimately up to each department or unit supervisor to ensure that employees are provided the vital support and means to adequately carry out the provisions of each program and achieve regulatory compliance with all OSHA requirements. Responsibilities of EHS related to the ALOSP includes:

- Develop, implement, and administer the Northern Arizona University ALOSP.
- Identify atmospheric hazard classification where combustion engines aerial lifts are used to ensure and to determine the need for additional monitoring and/or the choice of appropriate aerial lifts.
- Monitor the effectiveness of program by receipt of copies of inspection by periodic audit.
- Observe the operation of powered industrial trucks, and report unsafe practices to the appropriate supervisor.
- Provide initial training as requested by university departments.
- Provide recommendations concerning the choice of aerial lifts.
- Review the ALOSP as necessary for compliance and effectiveness.
- Train employees on mandatory elements of the ALOSP.

Departments Assigned Aerial Lifts

- Ensure the operating and maintenance manuals are made available to each operator.
- Halt lift operations any time unsafe operations or conditions exist.
- Inform all users of any personal protective equipment or PPE requirements when working on the lift.
- Maintain written records of operator training on each model of aerial lift and the name of the trainer.
- Maintain written records of the frequent and annual inspections performed by the lift owner, including the date any problems found, the date when fixed, and the name of the person performing the repairs.
- Must adhere to and administer the ALOSP.
- Notify EHS of any changes, additions, replacements, or removal of lifts to ensure an accurate inventory for their area.
- Perform annual, or as frequently as recommended by the manufacturer, inspection of all lifts by authorized service personnel at the expense of the department that owns or rents the lift.
- Review the ALOSP as necessary for program for compliance and effectiveness.
- Resolve any safety issues that arise, during inspections or audits.
- Make recommendations for revisions if necessary.
- Verify that all employees who operate or work near AL are properly trained.

Supervisors

- Coordinate employee training and certify that all operators receive training.
- Ensure modifications are not made to aerial lifts without manufacturer's prior approval.

- Ensure no one under the age of 18 operates aerial lifts.
- Ensure that employees attend and complete all required training.
- Ensure that only trained and qualified individuals operate lifts.
- Observe the operation of lifts in your department, and correct unsafe practices.
- Provide specific operational training for each lift in their department.
- Verify employee compliance with the principles and practices outlined in the ALOSP.
- Inspect work areas and equipment when notified to provide the user training and to ensure safe operator practice is implemented and adhered to.
- Maintain training records of all aerial lifts' operators.

Operators

- Adhere to manufacturer specifications for the safe operation of all equipment.
- Attend and complete all required initial training.
- Attend refresher training every three years.
- Complete a daily visual inspection and the Pre-start Inspection Checklist before operating any lift.
- Ensure signs, caution tape, barriers or fences and other means of diverting pedestrian traffic are in place prior to operating the lift.
- Immediately report worn personal fall arrest system components to the supervisor or Department Safety Contact.
- Maintain any PPE required to work safely while on the lift.
- Never override hydraulic, mechanical, or electric safety devices.
- Observe the operation of lifts in your department, and report unsafe practices to your supervisor.
- Read the Aerial Lift Safety Program.
- Report all accidents, regardless of fault and severity, to their Supervisor.
- Shall not wear any loose clothing or any accessory that can catch in moving parts.

Procedures

Pre-Use Inspection

- Any safety defects such as hydraulic fluid leaks; defective brakes, steering, lights, or horn; and/or missing fire extinguisher, lights, seat belt, or back-up alarm must be reported for immediate repair. They must also be locked and tagged and taken out of service.
- Prior to the operation of any aerial lift a Pre-Use Inspection Checklist must be completed. This applies at the beginning of every work period, and whenever a new equipment operator takes control of the powered industrial truck. Aerial lifts shall not be operated from trucks, scaffolds, or similar equipment.

General Safe Work Practices

- Aerial or scissor lift devices with noted, reported deficiencies shall not be operated until repairs are made and equipment is authorized for use.
- Articulating boom and extendable boom platforms, primarily designed as personnel carriers, shall have both platform upper and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.
- Before machine is started, the operator must walk completely around the machine to

ensure everyone and everything is clear of the machine.

- If the aerial or scissor lift becomes disabled, a “out of service” tag or equivalent shall be attached to the controls inside the platform in a conspicuous location.
- Modifications and additions that may affect the capacity or safe operation of an aerial or scissor lift are strictly prohibited without the manufacturer’s written approval. Capacity, operation, and maintenance instruction markings will be changed as necessary if the manufacturer approves a modification.
- Operators must report all accidents, regardless of fault and severity, to their Supervisor.
- Operators shall not wear any loose clothing or any accessory that can catch in moving parts.
- The insulated portion -if applicable- of an aerial or scissor lift shall not be altered in any manner that might reduce its insulating value. - Any signs, plates, or decals which are missing or illegible must be replaced.

Safe Work Practices Before Operation

- Aerial lifts shall not be operated from trucks, scaffolds, or similar equipment.
- ANSI and OSHA standards specify minimum safe distances that are to be maintained while working in an aerial lift, as indicated in the table below. If these distances cannot be achieved, do NOT use the equipment.
- At 25mph wind speeds or anticipated gusts, lifts will be grounded.
- Boom and platform load limits specified by the manufacturer shall not be exceeded. - Before moving an aerial lift for travel, the booms shall be inspected to see that it is properly cradled and outriggers are in stowed position -if equipped.
- Consideration shall be given to the amount of wind. Follow the manufacturer's instruction regarding operation in windy conditions. As a general rule aerial lifts shall not be operated in winds exceeding 25mph although this can vary depending on the model of equipment.
- Consideration shall be given to the protection of bystanders via barricading, having another employee keep bystanders at a safe distance or by other means.
- Guardrails must be installed and access gates or openings must be closed before raising the platform.
- If at any time, video personnel/staff feels unsafe in lifts, they may make decision to ground the lifts and cease with videotaping games or practices...no questions asked.

Voltage Range	Minimum Safe Approach Distance
< 50 KV	10 ft
50 - <199 KV	15 ft
200 - <349 KV	20 ft
350 - <499 KV	25 ft
500 – 749 KV	35 ft
750 – 1000 KV	45 ft

Safe Operation

- Aerial lift devices shall not be operated on grades, side slopes or ramps that exceed the manufacturer's recommendations.
- Aerial lift shall not be placed against another object to steady the elevated platform. - Aerial lift shall not be used as a crane or other lifting device.
- All equipment must be secured on the inside of the aerial lift.
- An aerial lift shall not be moved when the boom is elevated in a working position with employees in the basket.
- Attention shall be given towards the direction of travel, clearances above, below and on all sides.
- Booms and elevated platform devices shall not be positioned in an attempt to jack the

wheels off the ground.

- Employees shall not sit or climb on the guardrails of the aerial lift.
- Planks, ladders or other devices shall not be used on the work platform.
- Operators are to call for assistance if the platform or any part of the machine becomes entangled.
- Speed of aerial lift devices shall be limited according to the conditions of the ground surface, congestion, visibility, slope, location of personnel and other factors that may cause hazards to other nearby personnel.
- Stunt driving and horseplay shall not be permitted.
- The area surrounding the elevated platform shall be cleared of personnel and equipment prior to lowering the elevated platform.
- The brakes shall be set and outriggers, when used, shall be positioned on pads or a solid surface.

Safe work practices After Operation

- Aerial lifts shall be shut off prior to fueling. Fueling must be completed in well ventilated areas free of flames, sparks or other hazards which may cause fires or explosions.
- Safe shutdown shall be achieved by utilizing a suitable parking area, placing the platform in the stowed position, placing controls in neutral, idling engine for gradual cooling, turning off electrical power, and taking the necessary steps to prevent unauthorized use.

Fueling – Appropriate personal protective equipment shall be worn

- Fuel tanks may not be filled while the engine is running. Avoid spillage.
- Spillage of oil or fuel must be absorbed using oil dry or vermiculite, the affected area carefully washed, and the fuel tank cap replaced before restarting engine.
- Contact EHS Environmental Affairs for proper disposal of any spill clean-up debris.
- No aerial lift can be operated with a leak in the fuel system.
- Open flames are not to be used when checking electrolyte levels in storage batteries, or gasoline levels in fuel tanks.
- Shut off the engine while refueling and set the parking brake and put the controls in neutral.

Changing / Charging Storage Batteries - Appropriate PPE Shall Be Worn

- A carbon filter or siphon must be provided for handling electrolyte.
- A conveyor, overhead hoist, or equivalent material handling equipment must be provided for handling batteries.
- Battery charging installations must be located in areas designated for that purpose.
- Care must be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) must be open to dissipate heat.
- Distracted operating such, but not limited to, cell phone use is prohibited.
- Employees charging and changing batteries shall be authorized to do the work, trained in the proper handling, and required to wear protective clothing, including face shields, long sleeves, rubber boots, aprons, and gloves.
- Facilities must provide for: flushing and neutralizing spilled electrolyte, fire protection, protection of charging apparatus from damage by trucks, adequate ventilation for dispersal of fumes from gassing batteries.
- Precautions must be taken to prevent open flames, sparks, or electric arcs in battery charging areas.
- Reinstalled batteries must be properly positioned and secured in the truck.

- Smoking is prohibited in the charging area.
- Tools and other metallic objects must be kept away from the top of uncovered batteries.
- Trucks must be properly positioned and brake applied before attempting to change or charge batteries.
- When charging batteries, acid must be poured into water. Not water into acid.

Maintenance

- Any aerial lift not in safe operating condition must be removed from service.
- Authorized personnel shall make all repairs.
- Those repairs to the fuel and ignition systems of lifts that involve fire hazards must be conducted only in locations designated for such repairs.
- Lifts in need of repairs to the electrical system must have the battery disconnected before such repairs.
- Only use replacement parts that are currently recommended by the manufacturer.
- Lifts must be examined before being placed in service, and must not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination must be made at least daily. Where lifts are used on a round-the-clock basis, the lifts must be examined before each shift. Any defects must be immediately reported and corrected.
- When the temperature of any part of any lift is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the lift shall be removed from service and not returned to service until the cause for such overheating has been eliminated.
- Lifts shall be kept in a clean condition. All loose and non-essential materials shall be removed immediately.

Training requirements

Employees who are authorized to operate aerial lifts must receive training prior to engaging in their duties, and at least every three years thereafter. The training is to ensure that the Aerial Lift Safety Program is understood. The supervisor will also ensure that authorized aerial lift operators have acquired the necessary practical skills required for safe operation. Training is offered by EHS and the department in possession of the lift. EHS or the department will perform an operational training with each employee to determine if operators have the knowledge, training, and skills necessary to use the aerial lift. Operational training will consist of a combination of general safety instruction, practical/operational training (demonstrations performed by the trainer, and practical exercises performed by the trainee), and evaluation of the operator's performance in the workplace. All operational training must be conducted under close supervision.

Initial Training

- All training and evaluation must be completed before an operator is permitted to use a lift without continual and close supervision.
- Be informed of the lift operating limitations and restrictions as defined by the manufacturer.
- During operational training, trainees may operate a lift only under the direct supervision of authorized trainers, and where such operation does not endanger the trainee or other employees.
- Prior to operating any lift the trainee will read and understand the manufacturer's operating instructions and user's safety rules, or receive training by a qualified person on the contents of the manufacturer's operating instructions and users safety rules.
- Receive instruction on the intended purpose and function of each control.
- Required prior to operating aerial lifts.

- Understand by reading or having a qualified person explain all decals, warnings, and instructions displayed on the lift.

Re-Training is required when.

- A condition in the workplace changes in a manner that could affect safe operation of the truck.
- The operators appear unfamiliar with their equipment, procedures, or appear to have inadequate knowledge concerning what is required by this program.
- The operator has been observed operating the vehicle in an unsafe manner.
- The operator has received an evaluation that reveals that the operator is not operating the truck safely.
- There is a change in job assignments, change in equipment or process, or whenever there is a change in the aerial lift.
- To be conducted every three years.
- To be conducted after an incident with removal of operator license.

Training Records

Each department must maintain a record of all individual training, including:

- Date of training.
- Make, model and type of aerial lift.
- Name of individual trained.
- Name of supervisor or trainer providing the training.
- Subject matter of the training -classroom test, and obstacle course performance.
- Training records must be maintained by the department for a minimum of 5 years.

Program evaluation

The aerial lift program shall be evaluated as necessary for compliance and effectiveness utilizing the protocols set forth by EHS. The evaluation team will consist of a department representative and a designee from EHS. EHS will define the scope of the evaluation. The final report will be developed by the department representative and EHS utilizing the information received during the evaluation. The deficiencies determined in the report will be documented and corrective action plans will be developed.

Appendix I

Aerial Lift Pre-Use Inspection Checklist

AERIAL LIFT PRE- USE INSPECTION CHECKLIST

Operator Print Name and Sign			Aerial or Scissor Lift ID#		
Unit Type	Scissor Lift <input type="checkbox"/>	Articulating Boom <input type="checkbox"/>	Man Lift <input type="checkbox"/>	Date	Location of Use
<input type="checkbox"/> Other _____					
#	Section 1: Inspection Item and Description:				P/F/NA
1	Operating and emergency controls are in proper working condition, EMO button or Emergency Stop Device				
2	Functional upper drive control interlock (i.e. foot pedal, spring lock, or two hand controls)				
3	Emergency Lowering function operates properly				
4	Lower operating controls successfully override the upper controls				
5	Both upper and lower controls are adequately protected from inadvertent operation.				
6	Control panel is clean & all buttons/switches are clearly visible (no paint over spray, etc.)				
7	All switch & mechanical guards are in good condition and properly installed				
8	All Safety Indicator lights work				
9	Drive controls function properly & accurately labeled (up, down, right, left, forward, back)				
10	Motion alarms are functional				
11	Safety decals are in place and readable				
12	Guardrails and anchor points are in place, and in good condition				
13	Work platform & extension slides are clean, dry, & clear of debris				
14	Work platform extension slides in and out freely with safety locking pins in place to lock setting on models with extension platforms.				
15	Inspect for defects such as cracked welds, fuel leaks, hydraulic leaks, damaged control cables or wire harness, etc.				
16	Tires and wheels are in good condition, with adequate air pressure if pneumatic				
17	Braking devices are operating properly				
18	The manufacturer's operations manual is stored on AWP (in all languages of the operators)				
19	Oil level, Hydraulic Oil Level, Fuel Level, Coolant Level				
20	Battery Charge				
21	Outriggers in place or functioning. Associated alarms working				
Section 2: Safety Precautions (Have, Look For, or be Aware of)					Check to Confirm
Personal Fall Arrest and Protective Equipment. (Harness, lanyard, hardhat etc.)					
In windy conditions see manufacturer guidelines or if not in guidelines then...if lift begins to rock in the wind lower the lift					
Floor conditions: Drop offs, holes, uneven surfaces, and sloped floors.					
Housekeeping: Debris, floor obstructions, cords, construction material and supplies.					
Electrical power cables or panels, (minimum 10 feet away). If larger lines or wet conditions contact EH&S or the Electrical shop for guidance. Insolated small lines in dry conditions 3 feet away.					
Chemical lines, gas lines, drain lines, and utilities.					
Overhead obstructions					
Loads (do not exceed capacity)					
Watch for vehicular and pedestrian traffic. Set up barricades if necessary.					
Comments					
<p>IF THE AERIAL LIFT FAILS ANY PART OF THIS INSPECTION, REMOVE THE KEY AND REPORT THE PROBLEM TO YOUR SUPERVISOR. DO NOT ATTEMPT TO MAKE REPAIRS UNLESS YOU ARE A TRAINED AND AUTHORIZED SERVICE PERSON. ALL SERVICE IS TO BE DOCUMENTED. IF ANYTHING HAS BEEN JERRY-RIGGED NOTIFY YOUR SUPERVISOR AT ONCE.</p>					

Appendix II

Performance Test for Aerial Lift Operators

Performance Test for Aerial Lift Operators

Ratings:	✓ = SATISFACTORY	X = UNSATISFACTORY	N/A = NOT APLICABLE
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Operator:	Department:
Equipment Manufacture:	Date:
Model:	

- ___ 1. Checked all items on pre-use inspection checklist (shows familiarity with the controls).
- ___ 2. Knows equipment operating and manufactures instructions, and limitations.
- ___ 2. Fall Protection (guardrail system in place, fall arrest system).
- ___ 3. Inspected work site for hazards (drop-offs, floor obstructions, electrical hazards, etc.).
- ___ 4. Function test of lower control stations.
- ___ 5. Planned route ahead, checked doorways.
- ___ 6. Kept clear view of direction of travel and surrounding area.
- ___ 7. Verified lift balance and stability.
- ___ 8. Barricade work area.
- ___ 9. Boom up, down, in and (fully extend lift while maintain safe control of operation).
- ___ 10. Turn lift 360 degrees right and left.
- ___ 11. Maneuvered the lift if equipped with proper wheel drive train.
- ___ 12. Turn off lift using the emergency stop function.
- ___ 13. Lowered the basket for attempting to move the lift.
- ___ 14. Maintained 3 point contact when entering and exiting (two hands, one foot, or two feet, one hand).
- ___ 15. Deploy/setup and store outriggers (Refer to owner's manual).
- ___ 16. Followed proper procedure at both start and finish.

Comments:

Operator: _____ Signature: _____

Evaluator: _____ Signature: _____

Appendix III

Examples of Aerial Lifts

Examples of Aerial Lifts

<p>1. Vehicle Mounted Aerial Lift or Bucket Truck: The lift platform is an integral part of an over the road vehicle.</p>	
<p>2. Articulating Boom Aerial Lift: This aerial lift has at least 2 hinged sections which are used to increase mobility.</p>	
<p>3. Man Lift or Cherry Picker: This piece of equipment lifts personnel vertically, but not horizontally.</p>	
<p>4. Scissor Lift: This piece of equipment lifts personnel vertically, but not horizontally.</p>	
<p>5. Extendable / Telescoping Aerial Lift: This aerial lift has a boom that extends horizontally and vertically.</p>	