Aerial Lift Safety in Construction

Michael McCann, PhD, CIH
Director of Safety and Ergonomics

The Center to Protect Workers’ Rights
mmccann@cpwr.com
Deaths from Aerial Lifts in Construction

- From 1992-99, there were 26 deaths per year from lifts in construction.
  - 18 per year from boom-supported lifts
  - 8 per year from scissor and other vertical lifts

- This is 3% of all deaths in construction
Causes of Death from Aerial Lifts in Construction, 1992-99

- **Electrocutions**: 11% (43% of Deaths)
- **Falls**: 26% (44% of Deaths)
- **Collapses/tipovers**: 17% (30% of Deaths)
- **Caught in/between**: 7%
- **Struck by/against**: 5% (9% of Deaths)

Boom-supported lifts = 144 deaths
Scissor lifts = 64 deaths

#Data for scissor lifts do not meet Bureau of Labor Statistics publication criteria

Source: U.S. Bureau of Labor Statistics data
Deaths from Aerial Lifts in Construction, by Trade, 1992-99

% of Deaths

- **Electrical workers**
  - Boom-supported lifts: 45%
  - Scissor lifts: 22%

- **Construction laborers**
  - Boom-supported lifts: 12%
  - Scissor lifts: 23%

- **Painters**
  - Boom-supported lifts: 7%
  - Scissor lifts: 16%

- **Carpenters**
  - 4%

- **Ironworkers**
  - 4%

- **Other trades**
  - Boom-supported lifts: 29%
  - Scissor lifts: 38%

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# Data from scissor lifts does not meet Bureau of Labor Statistics publication criteria
* Electricians, electrician apprentices, power installers, and their supervisors
** Structural metal workers and welders and cutters
*** Includes plumbers, pipefitters and steamfitters, brickmasons and stonemasons, drywall installers

Source: U.S. Bureau of Labor Statistics data
 Boom-Supported Lifts

- **Electrocutions** – almost all due to overhead power lines
  - 1/2 of electrocutions involved body contact with overhead power lines
  - One-third involved overhead power lines contacting lift booms or buckets

- **Falls**
  - 1/2 of fatal falls involved ejection from the bucket after worker or lifts was struck by vehicles, cranes or objects.
  - 1/6 occurred while transferring to or from the bucket at a height

- **Collapses/tipovers**
  - 2/5 of deaths involved collapse of boom
  - Almost one-third were due to tipovers.
  - 1/4 involved collapses of bucket
Boom-Supported Lifts (Cont.)

- **Caught in /between**
  - Most involved the worker getting caught between the bucket edge and a roof joist or beam.

- **Struck by/against**
  - Mostly involved workers being struck by collapsing materials, girders, etc.
Scissor Lifts

- **Falls**
  - 1/5 of deaths involved ejections, after being struck by object
  - Cause of fall unknown in 3/5 of deaths
  - Other causes included removal of chains, standing on or leaning over railings

- **Tipovers**
  - Caused almost 1/3 of scissor lift deaths
  - Mostly while elevated over 15 feet
  - 1/4 of tipovers occurred where lift hit a hole or curb while moving

- **Electrocutions**
  - 1/2 involved overhead power lines
Renting an Aerial Lift

- Get maintenance history of aerial lift
- Get operator’s manual and maintenance manual (if separate)
- Ensure a detailed maintenance check is done before rental
- Make sure operator controls are easily accessible and properly marked
Operator Training

- Training must be done by a qualified person experienced with the particular lift model
- Training must include:
  - Nature of electrical, fall, and other hazards involved in operating lift
  - Precautions for dealing with hazards
  - Rated load capacity for the lift (including workers, tools, materials, bucket liner, etc.)
  - Manufacturer requirements, as outlined in operator manual
  - Demonstration of skill and knowledge in actual operation of the aerial lift
Qualified Person Definition

- OSHA 1926.450(b)

  A qualified person ....by extensive knowledge, training, and experience can....solve....problems related to the subject matter....
Maintenance Requirements

- Training of mechanics should be done by qualified person experienced with lift model

- Maintenance should include:
  - Knowledge of manufacturer’s maintenance requirements
  - Frequent inspections of aerial lift by qualified mechanic
  - At least annual detailed inspections by qualified mechanic

- Insulated aerial lifts have special electrical test requirements

- De-energize and lockout/tagout aerial lift before conducting maintenance and repairs
Before Operating Aerial Lifts

- Do not modify aerial lift without written permission
- Check safety devices, operating controls before each use
- Check area in which aerial lift will be used for:
  - Level surface (Do not exceed manufacturer slope recommendations)
  - Holes, drop-offs, bumps, debris, etc.
  - Overhead obstructions and overhead power lines
  - Stable surface
  - Other hazards
- Set outriggers, brakes, wheel chocks
Preventing Electrocutions

- Non-electrical workers must stay at least 10 feet away from overhead power lines.
- Electrical workers must de-energize/insulate power lines or use proper PPE/equipment.
- Use insulated buckets near overhead power lines
- Regularly check insulation on buckets
Preventing Tip-Overs

- Do not exceed manufacturer rated load capacity limits
- Do not travel to job location with lift in elevated position.
- Set up proper work zone protection when working near traffic
- Positioning of lifts
  - Do not drive near drop-offs or holes.
  - Do not raise platform on uneven or soft surfaces.
  - Do not drive onto uneven or soft surfaces when elevated.
  - Do not raise platform on slope or drive onto slope when elevated.
  - Do not raise platform in windy or gusty conditions.
- Avoid excessive horizontal forces when working on elevated scissor lifts
Fall Protection

- OSHA regulates aerial lifts as scaffolds
  - 1926.453 Aerial Lifts only applies to bucket trucks
  - Fall protection is required (full body harness with lanyard or body belt with 2-foot lanyard as restraint device)
  - OSHA does not require harnesses and lanyards on other boom lifts and scissor lifts if there are guardrails

- Fall arrest systems (harness plus lanyard to stop a fall)
  - Can tip over some boom lifts and scissor lifts due to fall stopping force

- Fall restraint systems intended to prevent falls are preferred
  - e.g. Full body harness plus lanyard designed for size of lift platform

- Always close entrance chains or doors

- Stand on floor of bucket or lift platform
  - Do not climb on or lean over guardrails
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