Objectives

Forklift Trucks (Powered Industrial Trucks)
- Define forklift trucks
- Review basic forklift accident causes
- Review: What does OSHA find?
- Review a forklift traffic plan: Pedestrians vs forklifts
- Review an operator training program
- Review forklift inspection procedures

Objectives

Overhead Cranes
- Define overhead gantry, bridge and jib cranes
- Review common overhead crane accident causes
- Review:
  - Overhead crane operator training requirements
  - Inspection requirements
  - Slings and chains
Powered Industrial Truck (PIT) Definition

- A mobile, power-propelled truck used to carry, push, pull, lift, stack or tier materials. [American Society of Mechanical Engineers (ASME) definition]
- Excluded are vehicles used for earth moving and over-the-road hauling
- Commonly known as forklifts, powered industrial trucks, pallet trucks, rider trucks, fork trucks, or lift trucks
- Can be powered through electric or combustion engines

Components of a PIT
OSHA Forklift Fatal Facts

• 100 annual fatalities and 36,000+ serious injuries
• 20% of the accidents are caused by inadequate training
• The most common forklift-related accidents:
  – forklift tipovers (42%)
  – struck, crushed or pinned by a forklift (25%)
  – Employee struck by/run over by forklift (10%)
• The forklift, environment, and operator actions all contribute to fatal incidents
• Many workers and employers are unaware of proper safety procedures

Is This Real??
What Does OSHA Find?

- Written program deficiencies
- Lack of safe operating procedures
- Lack of safety rule enforcement
- Insufficient or inadequate training
- Equipment in poor condition

What Have I Found?

- Speed limit, seat belt and other safety violations
- Poor training documentation
- Many blind corners, mixed travel paths, lack of demarcation of travel aisles
- Lack of driver certification (Licenses)
Audit and Improve Paths of Travel

Potential problems to look for:
• Going from dark to light areas or vice versa; vision issue
• Pedestrian and forklift travel: Intersections, lack of travel path demarcation
• Blind spots: Walls, narrow aisles and entryways, corners
• Environmental issues: Noise, dusts, poor lighting

Audit and Improve Paths of Travel

Improvements:
• Convex mirrors and other aids for blind spots
• Walls, narrow aisles and entryways, corners: Avoid mixing pedestrian and PIT travel
• Improve lighting, correct other industrial hygiene problems
• Stop signs at dark to light conditions
Four major areas of concern must be addressed:

– General hazards that apply to the operation of all or most powered industrial trucks
– The hazards associated with the operation of particular types of trucks
– The general hazards of workplaces
– The hazards of the particular workplace where the vehicle operates

Operator Training Program

• The employer shall ensure that each PIT operator is competent by:
  – Successful completion of the training
  – Evaluation
Operator Training Program: Pre-Qualification for PIT Operators

- PIT Operators candidates requirements prior to starting initial or refresher training:
  - No adverse vision problems that cannot be corrected by glasses or contacts
  - No adverse hearing loss that cannot be corrected with hearing aids
  - No physical impairments that would impair safe operation of the PIT
  - No neurological disorders that affect balance or consciousness
  - No medication use that affects perception, vision, or physical abilities

Operator Training Program: Content

- Operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation in the employer’s workplace
  - Truck-related topics
  - Workplace-related topics
  - The requirements of the standard
Operator Training Program: Content

**Truck-related topics**
- Operating instructions, warnings and precautions
- Differences from automobile
- Controls and instrumentation
- Engine or motor operation
- Steering and maneuvering
- Fork and attachment adaptation, operation, use

**Visibility**
- Vehicle capacity and stability
- Vehicle inspection and maintenance
- Refueling / Charging / Recharging Batteries
- Operating limitations
- Other instructions, etc.

**Workplace-related topics**
- Surface conditions
- Composition and stability of loads
- Load manipulation, stacking, unstacking
- Pedestrian traffic
- Narrow aisles and restricted areas

- Operating in hazardous (classified) locations
- Ramps and sloped surfaces
- Potentially hazardous environmental conditions
- Closed environments with possible carbon monoxide or diesel exhaust buildup
Operator Training Program: Implementation

• Trainees may operate a powered industrial truck only:
  – Under direct supervision of a person who has the knowledge, training, and experience to train operators and evaluate their competence; and,
  – Where such operation does not endanger the trainee or other employees

Operator Training Program: Implementation

• Training shall consist of a combination of:
  – Formal instruction (e.g., lecture, discussion, interactive computer learning, written material)
  – Practical training (demonstrations and exercises performed by the trainee)
  – Evaluation of the operator’s performance in the workplace
Classroom Training Documentation

FORMAL INSTRUCTION TRAINING FOR AUTHORIZED OPERATOR TRAINING DOCUMENTATION

Employee’s Name: ___________________ Department: ___________________
Class: ___________________ Date of Training: ___________________

Training Performed By: ___________________ Title: ___________________

This is to certify that the above individual has attended the above training program. This program has been designed to comply with OSHA’s required “Formal Instruction” on Forklift Safety. The individual shall receive a certificate of completion bearing the signature of the individual and the authorized instructor(s). The individual is now considered an authorized forklift operator. It is the employer’s responsibility to provide hands-on “Practical Training.” Without practical training, an individual is not considered to operate a forklift.

These following topics are included in this training:
* Operating instructions, warnings, and precautions for the types of trucks the operator will be trained to operate
* Difference between truck and the walkable
* Pre-trip checklist and instrumentation
* Engine or motor operation
* Steering and directional
* Stability
* Fork and attachment adjustment
* Vehicle capacity
* Vehicle stability
* Vehicle inspections
* Refueling, bleeding, and recharging
* Operating techniques
* All other operations, instructions, warnings, or precautions listed in the operator’s manual for the type of vehicle that the employee is being trained to operate

Employee Signature: ___________________ Date: ___________________
Teacher’s Signature: ___________________ Date: ___________________

Practical Training Documentation

FORMAL INSTRUCTION TRAINING FOR AUTHORIZED OPERATOR TRAINING DOCUMENTATION

Employee’s Name: ___________________ Department: ___________________
Company: ___________________
Date of Training: ___________________ Date of Evaluation: ___________________

Training Performed By: ___________________ Title: ___________________

This is to certify that the above individual has attended the above training program. This training has been conducted in addition to “Formal Instruction Training” for the employee and designed to ensure that the individual is a forklift operator. This training is conducted by the forklift operator’s employer or a qualified employee representative.

These following workplace-related topics are included in this training:
* Stability conditions where the vehicle will be operated
* Components of legs to be examined
* Leveling, checking, and inspection
* Road traffic in areas where the vehicle will be operated
* Negative sides and other restricted areas where the vehicle will be operated
* Hazards of elevated locations where the vehicle will be operated
* Range and other side surfaces that could affect the vehicle’s stability
* Obstacles, uneven surfaces, and other areas where unexpected vibrations or poor vehicle maintenance could cause a variance in motion or cause a vehicle to stall or stall
* Other changes or potentially hazardous environment conditions in the workplace that could affect safe operations

Employee Signature: ___________________ Date: ___________________
Teacher’s Signature: ___________________ Date: ___________________
Operator Training Program: Refresher Training and Evaluation

• Refresher training shall be conducted to ensure:
  – The operator has the knowledge and skills to operate the PIT safely

• Refresher training required when:
  – Unsafe operation
  – Accident or near-miss
  – Evaluation indicates need
  – Different type of equipment introduced
  – Workplace condition changes

Operator Training Program: Refresher Training and Evaluation

• An evaluation of each powered industrial truck operator’s performance must be conducted:
  – After initial training
  – After refresher training
  – At least once every three years
Operator Training Program: Avoidance of Duplicative Training

• Training can be avoided if:
  – An operator has previously received training in the topic(s)
  – The training is appropriate to the truck and working conditions encountered
  – If the operator has been evaluated and found competent to operate the truck safely

Editorial Note: Verify operator competence, and when in doubt, TRAIN

Certification

• The employer shall certify that each operator has been trained and evaluated as required by the standard
• Certification shall include:
  – Name of operator
  – Date of training
  – Date of evaluation
  – Identity of person(s) performing the training or evaluation
Forklift Inspection Procedures: Repairs

- If a PIT is found to be in need of repair, it must be taken out of service until repairs are made.
- All repairs should be documented by authorized personnel.
- If there are multi-shift schedules, the forklift will be inspected prior to each shift.
- Forklift manufacturer’s inspection and maintenance process should be followed.
Reminder: Enforce Safety Rules

Remember that enforcement of your safety policies and rules are your key to success.

Safety rules must be reinforced on a day to day basis, and any violations dealt with through your progressive discipline procedures.
Objectives

Overhead Cranes
– Define overhead gantry, bridge and jib cranes
– Review common overhead crane accident causes
– Review:
  – Overhead crane operator training requirements
  – Inspection requirements
  – Slings and chains

Types of Overhead Cranes

☑ Gantry cranes
☑ Bridge cranes
☑ Wall and jib cranes
Types of Overhead Cranes

✓ Gantry cranes

✓ A gantry crane is an overhead crane with a bridge for carrying the trolley or trolleys and is rigidly supported on 2 or more legs running on fixed rails or wheels

Types of Overhead Cranes

✓ Bridge crane

✓ A bridge crane has a single or double girder with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure
Types of Overhead Cranes

☑ Jib or wall crane

☑ A jib or wall crane is a post mounted hoisting device that can be mounted on a wall or column or equipped with rail or wheels for movement

Common OH Crane Accident Types

• Contact with electrical power sources
• Overloading crane or equipment capacity
  – OSHA: 80% of all crane structural failures due to human error by exceeding crane capacity
• Material falling from overhead loads
What Does OSHA Find?

Frequently Cited Violations

- Signal person not qualified
- Materials not rigged by qualified rigger
- No documentation on operator and signal person training
- No annual (periodic) inspections by qualified person
- No operator’s manuals and load charts in cab at all times

What Have I Found?

From my surveys

- Employees observed under suspended loads
- Lack of documentation on daily/monthly/annual equipment inspections
- Slings, hooks and chains in use with obvious defects
- Equipment missing lift capacity information
Crane Operator Training Requirements

- CFR 1910.179 (General Industry) and 1926.21 & 1926.550 (Construction) and ANSI B30.2, as well as equipment specific standards
- Formal training must include all aspects of crane operation and completing OSHA required daily inspections
- Clear understanding of load dynamics, lifting capacities of cranes and slings/hooks, crane load charts
- Certification required for certain equipment: i.e., less than 2,000 pounds or less MFR rated capacity

OH Crane Operator Training Requirements

- Designated employees (i.e., tagline handlers, crane signalers) must also be trained
- All training must be documented
- Focus on expected behaviors:
  - Load calculations, check to see load is properly secured
  - No people ever under a suspended load
  - LO/TO any equipment that fails the inspection
  - Stay clear of any electrical equipment
  - (10 foot radius of power line is OSHA “danger zone”)
**OH Crane Inspection Requirements**

OSHA: Two general classifications (OSHA 1910.179):
- **Frequent**: Daily to monthly (Examples)
  - Daily:
    - Pre-shift inspection of the equipment by the operator
  - All functioning mechanisms
  - Lines, valves, pumps
  - Hooks, slings, chains
  - Monthly:
    - Hooks (Deformations)
    - Hoist chains
    - Running rope and end connections
    - Rope reeving: (As recommended by mfr)

- **Periodic**: One-12 month intervals (Examples)
  - A preventive maintenance program based on mfr.’s specifications must be implemented
  - Complete inspection of crane must be completed
  - Interval depends on amount of activity, severity of service, and environment
  - All inspections must be documented per OSHA and mfr.’s
OH Crane Inspection Requirements

• Note that many inspections must be documented and certified by the inspector including equipment inspected, date of inspection and signature of the inspector
• It is critical for management to be familiar with types and intervals of inspections required by standards, and ensure that inspectors are properly trained and certified to complete the inspections

Slings and Chains

Three most common types of slings:

**Chain**: Best choice if heat and hot materials are involved
Overloading or misuse can shorten useful life

**Wire rope and mesh**: Refer to ANSI B30.9 for use and safety guidelines
Wire rope can be damaged by exposure to rotation, crushing, corrosion, excessive bending and abuse
Wire rope needs to be lubricated regularly

**Fiber rope web (Natural or synthetic)**: Used primarily for temporary work such as painting or construction
Keep away from acids, caustics
Also can be cut, gouged or worn more easily
Slings and Chains

• Lifting capacity of slings will vary according type and size and the type of hitch used: (See OSHA 1910.184 and mfr. for charts and tables)

• Lifting angle from the vertical can affect sling capacity: ANSI B30.9 and OSHA 1910.184 makes reference to lifting angle charts

Slings and Chains

• All slings should be inspected prior to initial use, and prior to each shift

• **Best practice:** Document all pre-shift and initial inspections to ensure inspections are being completed

• Periodic inspections should also be performed on a regular basis based frequency of use, severity of service conditions, and nature and conditions of lift; These inspections must be documented
Forklifts and OH cranes can be useful in reducing potential material handling injuries.

They bring with them potential exposures to employees.

Management must ensure that safety requirements for operator training, inspection and maintenance are developed and enforced.

Safe operating rules for Forklifts and OH cranes must be reinforced and enforced as needed!

Periodic audits and observations of these programs should be conducted to ensure compliance.

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Thank you for joining us!