

WORKING AT **HEIGHT**

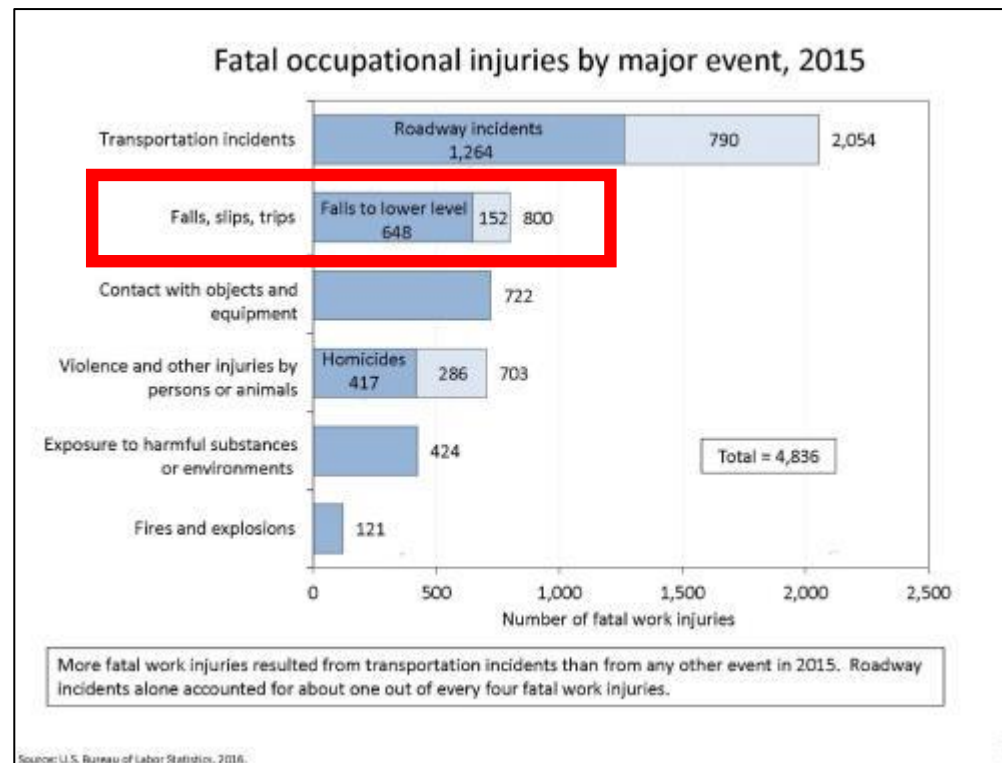
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IRIMEE

Introduction

- Slips, trips, and falls make up the majority of general industry accidents
- Are second only to motor vehicle crashes



Introduction

- Unless working on a ladder, scaffold or scissor lift, OSHA requires fall protection when exposed to a 4-foot fall or greater.



Risk & Risk Assessment

Risk - a situation involving exposure to danger.



Risk Assessment?

A risk assessment is nothing more than a careful examination of what, in your work, could cause harm to people, so that you can weigh up whether you have taken enough precautions or should do more to prevent harm. The aim is to make sure that no one gets hurt or becomes ill.

5 steps of Risk Assessment

Step 1: Identify hazards, i.e. anything that may cause harm
Physical, Mental, Chemical, Biological

Step 2: Decide who may be harmed, and how.
Review routines at work locations

Step 3: Assess the risks and take action
must consider how likely it is that each hazard could cause harm

Step 4: Make a record of the findings.
This record should include details of any hazards noted in the risk assessment, and action taken to reduce or eliminate risk.

Step 5: Review the risk assessment.
ensure that agreed safe working practices continue to be applied



A person enters into the cage and is feeding the lion

Possibility: 5

Severity: 5

Possibility X Severity = 25

EXTREME RISK



A person wearing protective devices enters into the cage and is feeding the lion

Possibility: 5

Severity: 4

Possibility X Severity = 20

MODERATE RISK



A person is feeding the lion through a specially designed feed opening

Possibility: 3

Severity: 3

Possibility X Severity = 9

TOLERABLE RISK



A person is feeding the lion in a specially designed feeding cage

Possibility: 0

Severity: 0

Possibility X Severity = 0

ZERO RISK

UNSAFE

SAFE

- NO SAFETY HELMET**
- NO EYE PROTECTION**
(WHEN NECESSARY)
- NO EAR PLUGS**
(WHEN NECESSARY)
- NO DUST MASK OR GAS**
(MASK WHEN NECESSARY)
- LOOSE, DAMAGED SHIRT**
- WEAR SAFETY GLOVES**
(WHEN NECESSARY)
- SHORT PANTS**
- SANDALS OR FIELD SNEAKER**



- WEAR SAFETY HELMET**
- WEAR EYE PROTECTION**
(WHEN NECESSARY)
- WEAR EAR PLUGS**
(WHEN NECESSARY)
- WEAR DUST MASK OR GAS**
(MASK WHEN NECESSARY)
- FASTEN CHIN-STRAP**
- WEAR FITTED WORKING CLOTHES**
- WEAR FULL BODY HARNESS**
(WHEN NECESSARY)
- WEAR SAFETY GLOVES**
(WHEN NECESSARY)
- WEAR SAFETY SHOES**

Common Fall Hazards

- Overhead Platforms
- Overhead Runways
- Elevated Work Stations



Source of photos: OSHA

Common Fall Hazards

- Floor Openings/Pits
- Wall Openings
- Shelving Units



Source of photos: OSHA

Common Fall Hazards

- Stationary Storage Tanks
- Tanker Trucks
- Industrial Production Units



Source: WVU



Source: OSHA



Source: OSHA

Fall Hazard Controls

Hierarchy of Fall Hazard Control:

- First line of defense
 - **Eliminate** the fall hazard
- Second line of defense
 - **Prevent** the fall
- Third and last resort
 - **Control** the fall

Fall Hazard Controls



Source: WWU

Eliminate fall hazards –
work from the ground

- Gauge at top of tank moved to ground level
- Use drone, equipped with camera, for inspections at heights

Fall Hazard Controls

Eliminate fall hazards – hole covers/grates



Source: WVU

- Very effective way to eliminate a fall hazard.
- Designed to withstand intended load.
- Secured-bolted, hinged, latched, locked

Fall Hazard Controls



Source: OSHA

Prevent the fall – guardrails

- Standard railing
 - Top rail, mid rail, and posts
 - Height from upper surface of top rail to floor level is 42" (+/- 3")
 - Mid-rail height is 21"
- Standard toe board
 - 3.5" high
 - Not more than ¼" clearance above the floor

Fall Hazard Controls

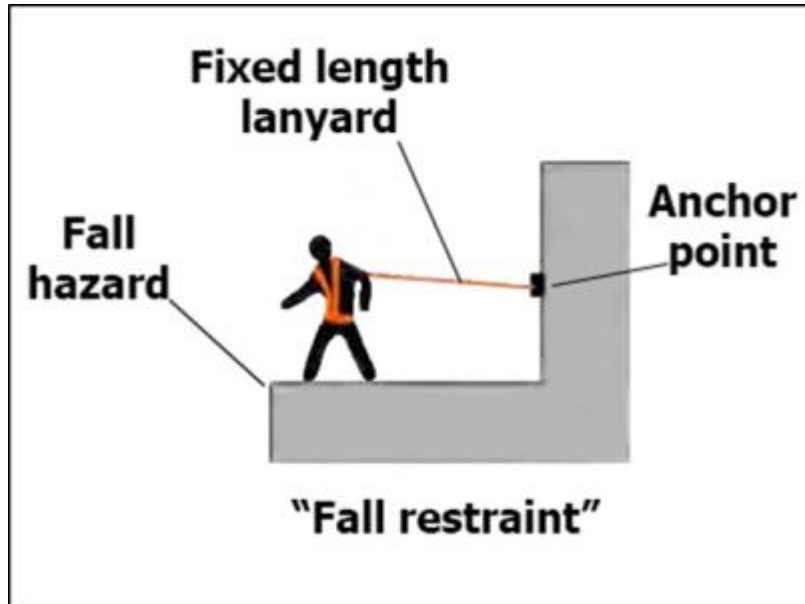


Source: WVU

Prevent the fall – fences and barricades

- Prevents unauthorized employee exposure to fall hazard
- Employer authorizes access
- Authorized personnel must then be protected from the fall hazards within

Fall Hazard Controls



Source: OSHA

Prevent the fall –
personal fall restraint

- Prevent falls by keeping worker from reaching fall hazard
- Comprised of a body belt or body harness, an anchorage, connectors
- Often used when section of guardrail or hole cover is temporarily removed

Fall Hazard Controls



Source: Honeywell/Miller; used with permission.

Know the A, B, Cs of Personal Fall Arrest Systems

- Anchorages
- Body harness
- Components
(connectors like snap hooks or Dee-rings, connection points, lanyards, deceleration devices, lifelines, etc.)

Installed, used, and maintained according to the manufacturer

Fall Hazard Controls

PFAS – temporary anchorage



Source of photos: Honeywell/Miller; used with permission.

Fall Hazard Controls

PFAS – permanent anchorage



Source of photos: Honeywell/Miller; used with permission.

Fall Hazard Controls

PFAS – full-body harness



Source of photos: Honeywell/Miller; used with permission.

Fall Hazard Controls

PFAS – connecting components



Source of photos: Honeywell/Miller; used with permission.

Fall Hazard Controls



Source: OSHA

Control the fall –
positioning devices

- Consists of a body belt and connecting device
- Keeps workers from falling, while allowing their hands to be free to perform work

Fall Hazard Controls



Source: OSHA

Control the fall – safety net systems

- Consists of specially designed mesh nets, panels, and connecting components
- Must be designed, installed and maintained properly

Employer Requirements



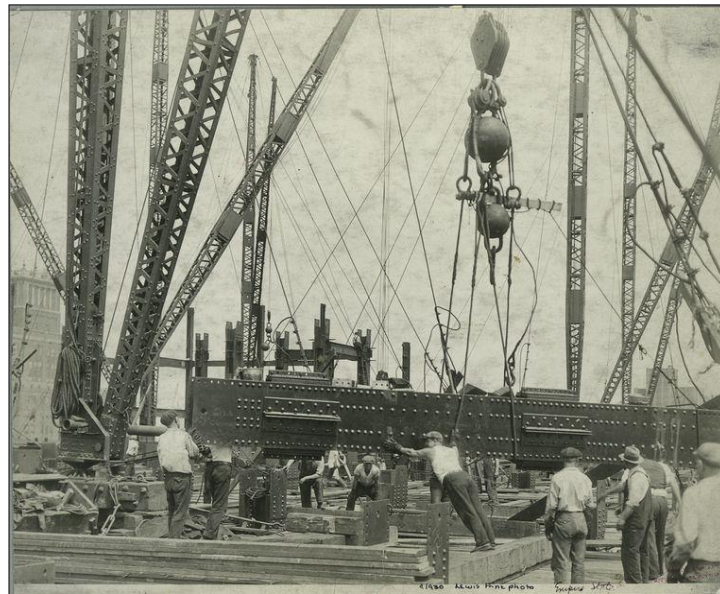
Source: OSHA

Rescue Relief Rehabilitation

- Personal Fall Arrest Systems require a rescue plan
- Employer must develop and communicate the rescue and relief plan to all involved
- Relief includes immediate hospitalization
- Rehabilitation is long term plan to get employee, "back on his feet"

BREAK OUT TIME

Empire State Building 1930.



BASICS OF CRANES



Types of Cranes

- GANTRY CRANE



- JIB CRANE



Types of Cranes

BRIDGE CRANE



MONORAIL CRANE



CRANE OPERATORS

HOIST OPERATOR



RIGGER



Section 32 in The Factories Act, 1948

32. Floors, stairs and means of access.—In every factory—

- (a) all floors, steps, stairs, passages and gangways shall be of sound construction and properly maintained [and shall be kept free from obstructions and substances likely to cause persons to slip], and where it is necessary to ensure safety, steps, stairs, passages and gangways shall be provided with substantial handrails;
- (b) there shall, so far as is reasonably practicable, be provided and maintained safe means of access to every place at which any person is at any time required to work. 2[(c) when any person has to work at a height from where he is likely to fall, provision shall be made, so far as is reasonably practicable, by fencing or otherwise, to ensure the safety of the person so working.]

PERSONAL PROTECTIVE EQUIPMENT for working at height

- Connectors (self-locking snap hooks)



- Retractable lanyard



- Full body harness



- Restraint line-lanyard



- Shock absorbing lanyard



- Rope grabs

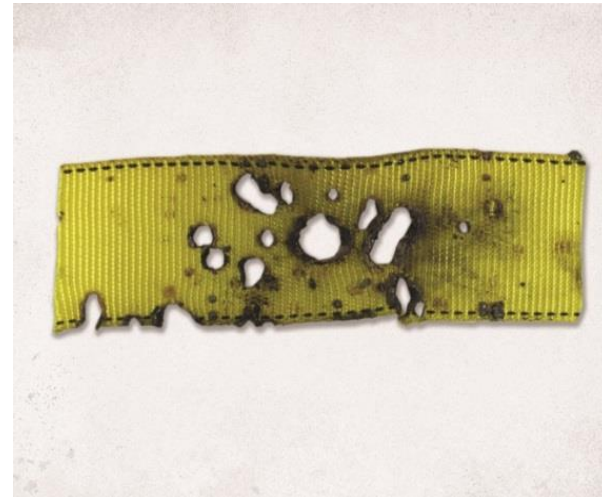


CHECK POINTS FOR PPEs

- Articulating man lifts provided with restraint systems and full body harness to anchor point below waist.
- Guardrails with toe boards.
- Personal fall arrest systems:
 - Anchor points (rated at 5,000 lbs.)
 - Connectors (self-locking snap hooks)
 - Retractable lanyard
 - Full body harness
 - Restraint line-lanyard
 - Shock absorbing lanyard
 - Rope grabs



- Full body harness to be used.
- Should be inspected before each use by user employee, looking for:
 - - Deteriorated areas
 - Excessive wear
 - Bent hooks/rings
 - Evidence of impact/damage



- Body harness before each use:
 - Ensure all grommets (if present) secure and not deformed from fall/abuse.
 - Ensure harness has no additional punched holes.
 - Ensure all rivets tight and not deformed.
 - Check tongue straps for excessive wear from repeated buckling.



STATUTORY NORMS REITERATED TO Be ENSURED IN RWF

Fencing of machinery- Section 21 of Factory Act

Work on or near Machinery in motion –Section 22

Lifting ropes, tackles and chains-Section 29

Floors, stairs and means of access- Section 32

INTERNATIONAL NORMS OF EOT CRANE INSPECTION

As per American National Standards Institute (ANSI),

Four categories for overhead crane inspections:

Initial, Functional, Frequent, and Periodic.

1. INITIAL INSPECTION

OSHA 1910.179: “Prior to initial use all new and altered cranes shall be inspected to ensure compliance with the provisions of this section.”

Initial inspection is a documented visual inspection that is required after installing a new crane or hoist, and for equipment that has been reinstalled after alteration, modification or repair.

For overhead cranes, ANSI B30.11 also requires a Rated Load Test:

“Prior to initial use, all new, extensively repaired, and altered equipment shall be tested and inspected by, or under the direction of, an appointed or authorized person, and a written report should be furnished by such person, confirming the load rating of the system. The load rating should be no more than 80% of the maximum load sustained during the test.”

2.FUNCTIONAL INSPECTION

FUNCTIONAL TEST INSPECTION

Before every shift, the functionality of crane must be tested.

OSHA mandates to visually test the following on a daily basis:

- 1.The functional operating mechanisms for any maladjustment interfering with proper operation;
- 2.Deterioration or leakage in lines, tanks, valves, drain pumps and other parts of air or hydraulic systems;
- 3.Hoist chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations.
- 4.This step also requires a monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection, and an identifier of the chain which was inspected;
- 5.Hooks with deformation or cracks. Like hoist chains, this also requires monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected;

3.FREQUENT INSPECTION

Frequent Inspections should include all aspects of the Functional Test Inspection

Particular attention to the hoist brake, wire rope, load chain, and listening for any abnormal sounds.

The hook and latch requires an inspection as well.

The frequency is based upon the usage of crane:

Crane which operates under “normal service” should be inspected monthly;

Crane in “heavy service” should be inspected weekly to monthly;

Crane in “severe service” should be inspected daily to weekly.

4.PERIODIC INSPECTION

Cranes used for “normal service” and “heavy service” should be inspected yearly.

Cranes in “severe service” should be inspected quarterly

Periodic Inspection should include checking for:

Deformed, cracked or corroded members

Loose bolts or rivets

Cracked or worn sheaves and drums

Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices

Excessive wear on brake system parts, linings, pawls and ratchets

Load, wind and other indicators over their full range, for any significant inaccuracies

ALL THE BEST