

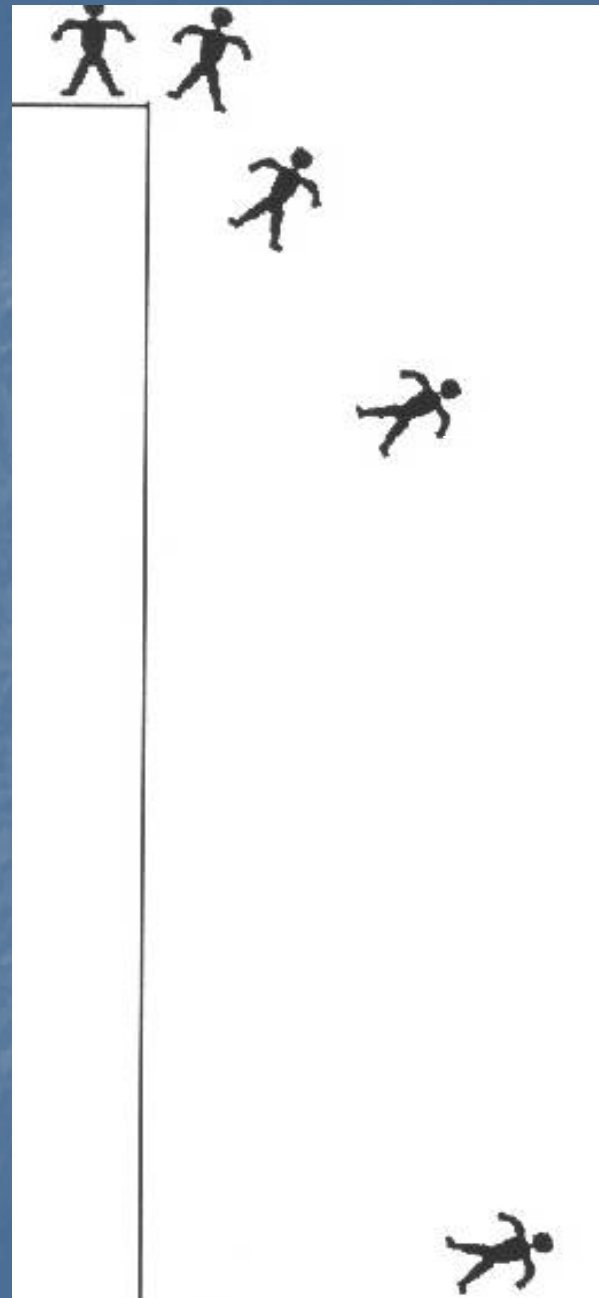
Introduction  
**Fall Protection**

***In the Telecommunications  
Industry***

Why Fall Protection?

Why Now?





.33sec./2 feet

.67 sec./7 feet

1 sec./16 feet

2 sec./64 feet

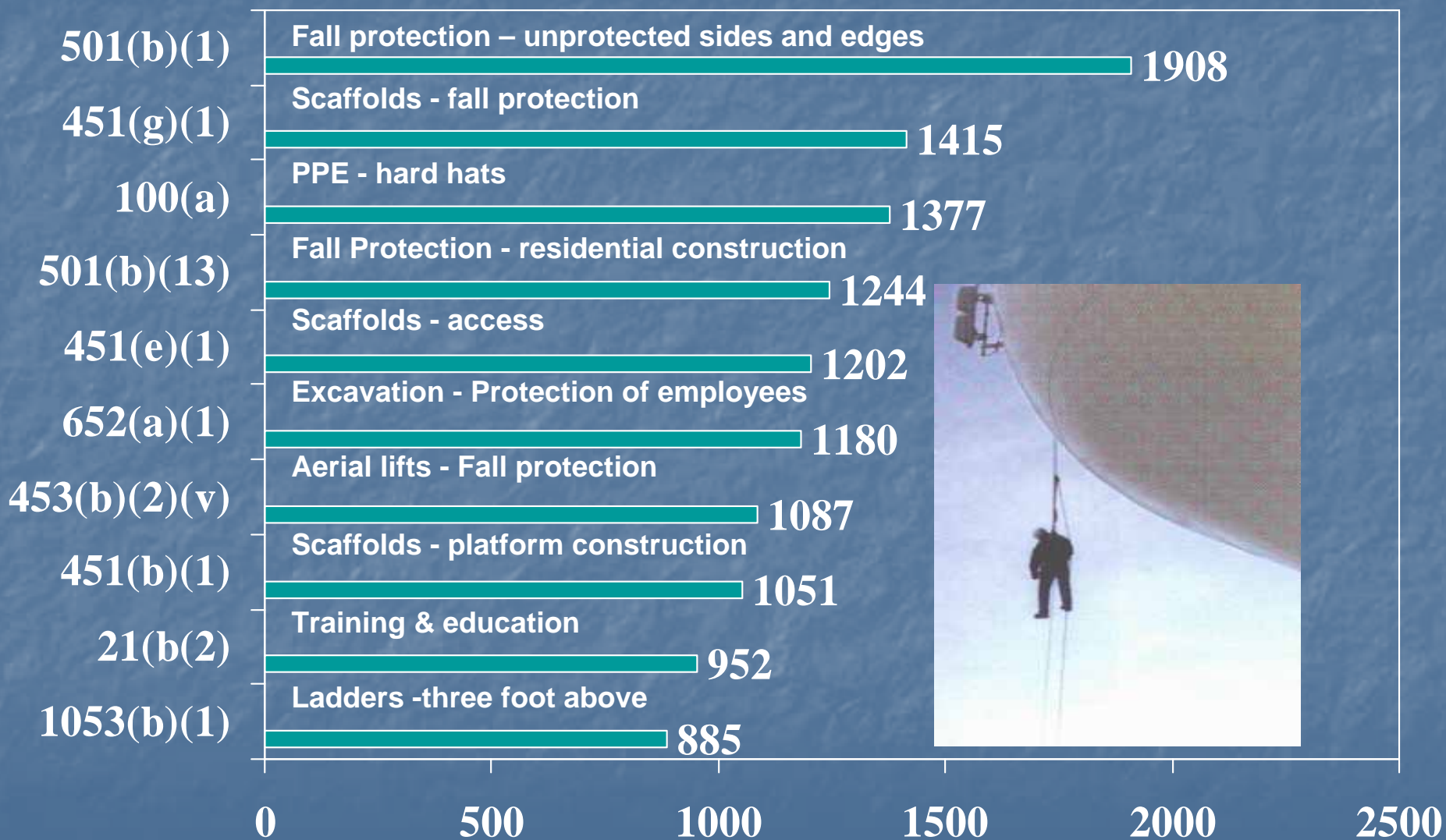
# Anatomy of a Fall

- It takes most people about 1/3 of a second to become aware.
- It takes another 1/3 of a second for the body to react.
- A body can fall up to 7 feet in 2/3 of a second.

Acceleration = 32 ft/sec<sup>2</sup>  
Deceleration = 0 ft/sec<sup>2</sup>



# 2003 Most Frequently Cited Construction Standards



Plus 1,192 General Duty Clause Citations

# Philosophies of Fall Protection

**Stop/Prevent The Fall**

Restraint/Positioning

Guardrails

Warning Lines

Controlled Access Zones

Controlled Decking Zones

Safety Monitors

**Catch The Fall**

Fall Arrest

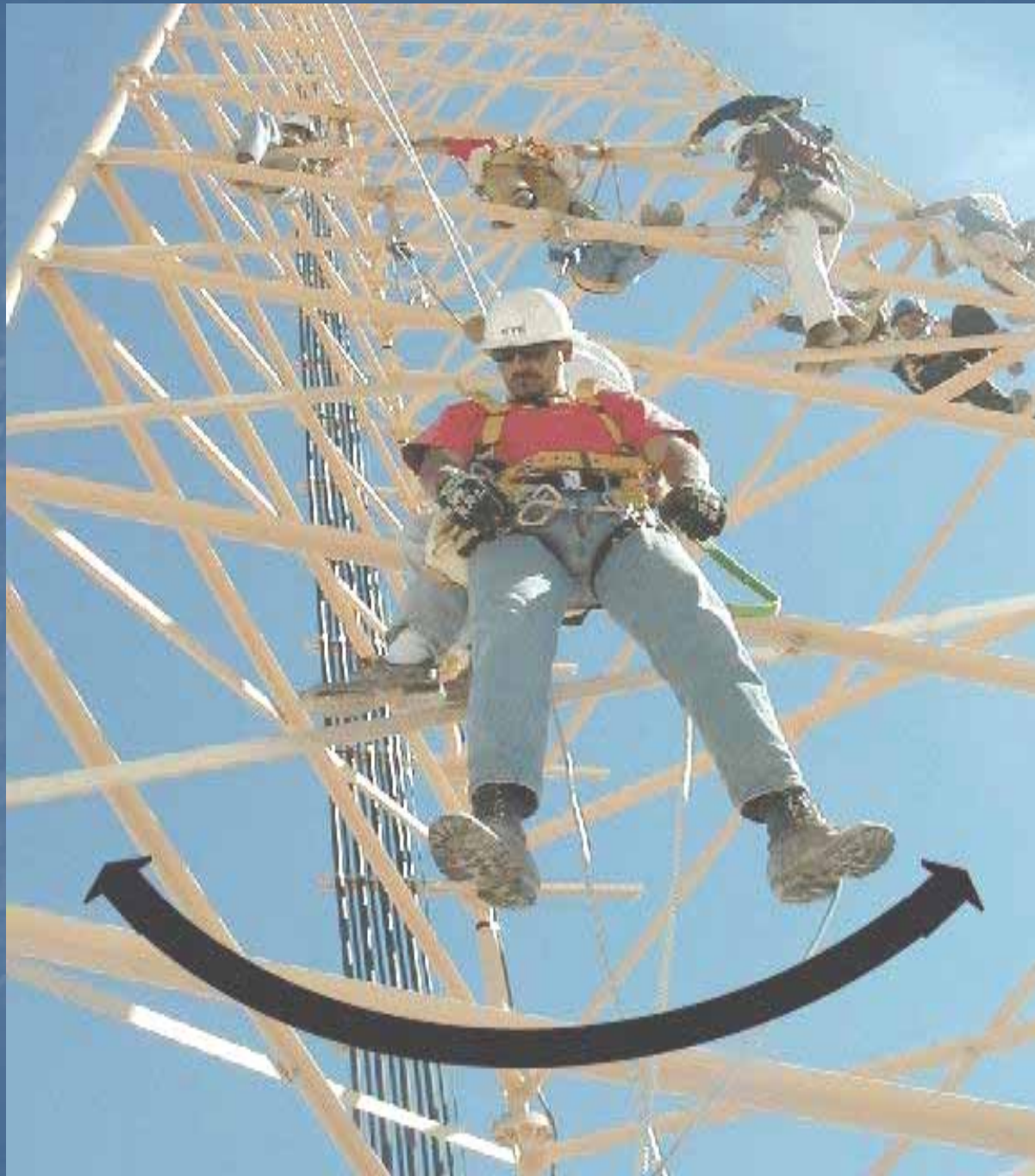
Safety Nets

Catch Platforms

Do these stop/prevent the fall?

# Controlling Fall Exposures

- Select fall protection systems appropriate for given situations.
- Use proper construction and installation of safety systems.
- Supervise employees properly.
- Use safe work procedures.
- Train workers in the proper selection, use, and maintenance of fall protection systems.
- Evaluate the effectiveness of all steps



# By the Numbers

Some of the Applicable Triggers

# Falls onto dangerous equipment

- 0' Allowable Fall Distance
- (You Must Be Protected)

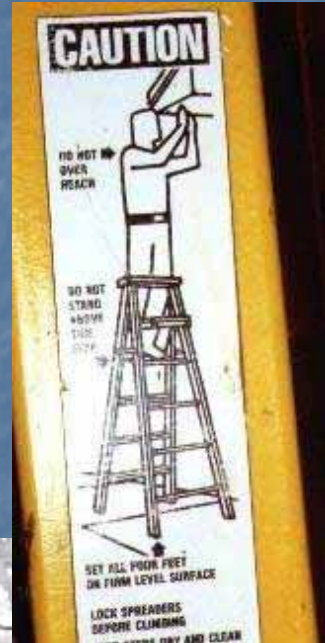


# ENVIRONMENTAL CONDITIONS



# Ladders

- Extension
- Step
- Vertical Fixed
- Job-built



# Ladders

- Extension



# Aerial Work Platforms

- Boomlifts
- Scissorlifts
- Boom Trucks (Cherry Pickers)
- Mast Climbers



# Personal Fall Arrest Systems

## *Primary Concerns*

- Impact Force to the Body Less Than 1800# (with a harness)
- Maximum 6' Free Fall Distance
- May Not Hit Structures Below
- Maximum Weight of Individual w/Tools of 310#

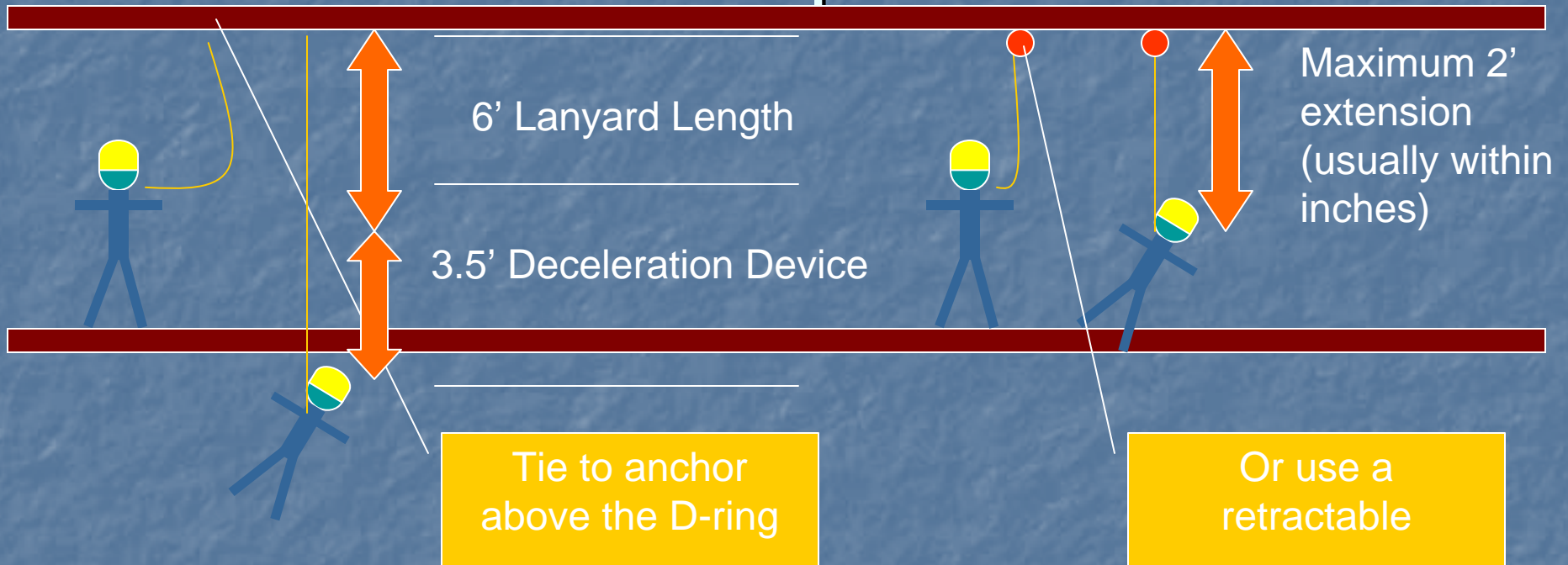
# Impact Force

- Minimize Fall Distance
  - Tie off at or above D-ring height wherever possible
- Use Shock Absorbers
- Choose appropriate harnesses, and wear them properly

# Impacting Structures Below (Total Fall Distance)

- Consider:
  - anchorage point location in relation to D-ring height
  - lanyard length,
  - harness elongation,
  - shock absorber opening length,
  - body below D-ring
  - body viscosity (soft tissue injuries!)

# Minimizing Free Fall Distance or “Vertical Displacement”



Using an anchorage above the D-ring and a standard lanyard may still allow an employee to fall a distance that may be difficult to rescue from. Using a retractable minimizes forces on the body, and may make rescue easier (and therefore more timely)

*All distances are approximate, and shown for illustration only. This is why it is critical to maintain the safety factor distance!*

# Personal Fall Arrest Systems

- Anchorage
- Body
- Connector



**Lanyards**



**Harnesses**



**Beam Wraps**



**Caribiners**



**Rope Grabs**



**Positioning**

# Anchorage

- Must support 5000# per employee attached,
  - Or as part of a complete personal fall arrest system which maintains a safety factor of at least two
  - Or 3000# when using fall restraint or a Self-Retracting Lifeline (SRL, Retractable, or "yo-yo") which limits free fall distance to 2 feet
- Should always be at or above D-ring height

# Horizontal Life Lines



- Provide maneuverability.
- Must be designed, installed and used under the guidance of a qualified person
  - This could be interpreted as requiring the use of manufactured systems, which is *recommended*



# Safe Climb Devices



# Body (Harnesses)

- Need to be inspected frequently (daily before use by the worker, at least monthly by a Competent Person)
- Should never be modified
- Should be taken out of service immediately if defective or exposed to an impact

# Harness Fitting

Chest strap tightened  
at mid chest

Proper snugness  
shoulder to hips

Leg straps snug but  
not binding



“D” ring between  
shoulder blades

Butt strap  
supports the load



- Harness must be sized for the worker

# Connectors (Lanyards)

- Inspect before each use
- Not tied back to themselves (unless specifically designed for such use)
- Worn with the impact absorber/shock pack at the d-ring
- Have the appropriate clip for the intended anchorage points

# Retractable Lifelines



- Very effective for vertical applications.
- Will normally lock up in 1 –2 feet, minimizing total fall distance and impact forces on the worker's body



# Positioning Systems

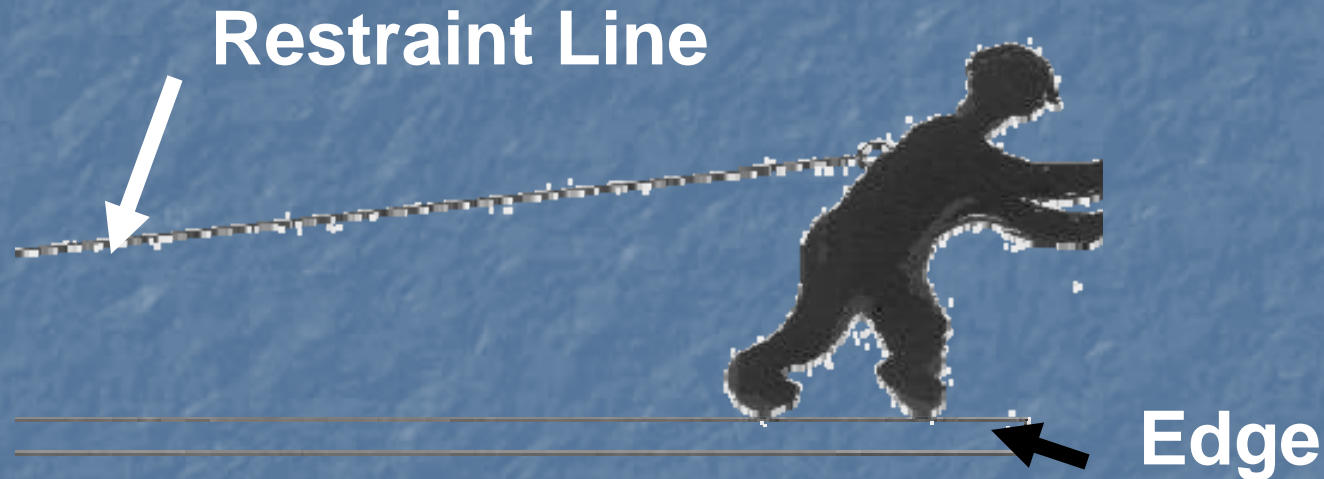
- Positioning Devices Provide Hands-free Work
  - Additional Fall Protection (tie-off) may be required to move or access



# Restraint Devices

- Provide Access but Prevent the Fall
- Limit anchorage requirement to 3000#
- May be more suitable for loading areas, scaffold erection and dismantling
- Should be installed and used under the supervision of a Competent Person

# Fall Restraint



- Fall restraint assumes the employee cannot reach the edge.
- He is basically on a short leash.
- If the employee could reach to the edge and fall over the edge, he must be in fall arrest.

# Planning For Rescue

Worst-case  
Scenario?



# Training

- The nature of hazards
- Appropriate systems and use
- Limitations
- Evaluate the site
- Re-training
- Documentation/Certification?

# Site Specific



# Planning for Fall Protection

- Best practice dictates that fall protection becomes an integral part of the project planning process, from constructability, to systems installation, to use and maintenance
- A project cannot be truly safe unless fall protection is incorporated into every phase of the process
- Planning will keep workers safe and minimize liability for all parties involved

**END**