Hazard Recognition Workshop

Site Infrastructure & Utilities

Reducing “Walking Through Life” injuries through employee awareness.

Presenters

- **Rich Grantham – Technical Services Manager**
- **Curtis Henning - SI&U Safety Chair**
- **Henry Sparks – Safety Chair**
- **Jeff Simundson – Safety Manager**
- **Rocky Simmons – HAMTC Safety Rep**

Background

Why We Developed Hazard Recognition Training

- Our workforce was hurting themselves performing routine work.
- The training heightens awareness for common injury causes.
- The training was developed and presented by the employees, safety professionals and management.
- The entire organization ~ 850 employees were trained over a 3 month period.
- Following the initial presentation safety modules were presented at monthly meetings.

Workshop Agenda

• Introduction	10 minutes	Rich Grantham
• Hazard Recognition Overview	30 minutes	Rich Grantham
• Overexertion Injuries	20 minutes	Curtis Henning
• *Break*	10 minutes	
• Struck Against Injuries	20 minutes	Curtis Henning
• Falls Same Level Injuries	20 minutes	Curtis Henning
• Contact with Injuries	20 minutes	Henry Sparks
• *Break*	10 minutes	
• Environmental Exposures	20 minutes	Henry Sparks
• Caught Between Injuries	20 minutes	Henry Sparks
• Introduce SafetyStart	15 minutes	Jeff Simundson
• *Break*	10 minutes	
• SafetyStart Exercise	30 minutes	Jeff Simundson
• Summary/ Path Forward	15 minutes	Rich Grantham

Partnership between labor and management

Introduction

- **Our overall focus is to help you identify and avoid the crocodiles that are present as you walk through life.**
- **204 first aid injuries and 26 recordable injuries over the last 2 years**

Year	Work Related First Aids	Recordable Injuries	DAWR	Vehicle Accidents	Recordable Injury Rate	Recordable Injury Rate
2008	78	7	3	7	1.22	2.2
2009	73	12	3	17	2.43	2.45
2010	53	7	1	15	2.77	2.45

“Walking Through Life Injuries”

Objectives

- Return every employee back to their families each day injury free
- Increased employee understanding of the types of injuries that can result from working around and/or with safety hazards
- Increased employee understanding of how to anticipate, recognize, evaluate and control safety hazards
- Introduce how the *SafetyStart* job aid will help employee recognize safety hazards and avoid "Walking through Life Injuries"
- Reduction in occupational and non-occupational (i.e. 24/7) injuries and illnesses

What Is A Safety Hazard?

- **A source of danger to a person's safety or health**

- **Examples of safety hazards at Hanford:**
  - **Slippery work areas**
  - **Congested work environments**
  - **Using many layers of personal protective clothing and other PPE**
  - **Lifting heavy objects**
  - **Repetitively performing the same work in a contorted manner**

What Is A Safety Hazard?

- I like to compare these safety hazards to crocodiles…

What Is A Safety Hazard?

- Crocodiles have survived for millions of years
- Why?
- Because they wait in areas where animals, including humans, congregate, e.g., rivers, watering holes, etc.
- They just sit there, watching, waiting
- Waiting for an animal that is normally very cautious

What Is A Safety Hazard?

- Animal gets too comfortable
- Animal becomes complacent and think that things are okay
- And when they do…..

They Are History!!

What Is A Safety Hazard?

- **Sometimes the crocodiles are very obvious and easy to see …**

  They just JUMP out at you when you look at them!

What Is A Safety Hazard?

- **Other times they are only <u>somewhat</u> obvious … visible only when you really look closely at them and pick them out from their surroundings**

What Is A Safety Hazard?

Other times they are <u>not</u> very obvious at all …

What's Going On Here?

Identification of Hazards

- **Our ability to identify safety hazards is based on our individual:**
  - **Education or training**
  - **Personal knowledge or experience, especially as it relates to our current or previous work experience**
  - **Observation skills**
  - **Concentration, or the lack thereof, as we are walking through life**

Identification of Hazards

- **Our ability to identify safety hazards is based on our (cont):**
  - **Perception of what you are seeing and whether you have worked with the hazard safely before**
  - **Being able to identify more than one hazard at the same time**
  - **Can't "see the trees for the forest"**

Safety Hazards & Risk

- **OK, we said that safety hazards pose a risk to workers**

- **What are the potential results of working in and/or around a safety hazard**
  - **Nothing, the work gets done safely**
  - **A near miss**
  - **A first aid injury**
  - **A recordable injury**
  - **A Day Away From Work (DAWF) injury**
  - **Fatality**

What's Going On Here?

Responses to Safety Hazards

- **Recognize that the situation is hazardous, but do not take all of the appropriate precautions to work around the hazard safely, e.g., “familiarity breeds contempt”**

Responses to Safety Hazards

- **Recognize the hazard, but don't think that they will be injured, e.g., "I've been doing this for 30 years" or "Joe got hurt because he didn't know what he was doing. I do, and I won't be hurt"**

Responses to Safety Hazards

- **Accept the hazard as "a cost of doing business" or "We gotta get the job done". May also accept injuries as being okay**

Responses to Safety Hazards

- We identify the crocodiles
- We take measures to mitigate the hazards they present
- We complete the work

and

- We go back to our families each day injury free!

Injury Causes

- There are two major causes of injuries
  - Unsafe conditions
  - Unsafe acts or behaviors
- It is estimated that 5-20% of occupational injuries are caused by unsafe conditions
- It is estimated that 80-95% of occupational injuries are caused by unsafe acts or behaviors
- Further analysis of unsafe acts or behaviors show that 70% are likely due to organizational processes and/or values

Injury Causes

- **Definition - Unsafe Condition:**
  - **Any physical state that results in a reduction in the degree of safety normally present**

Injury Causes

- **Unsafe Condition: Examples**
  - Lack of adequate safeguards
  - Tools that lack guards, equipment that poses a hazard, or defects in objects
  - Poor housekeeping practices
  - The presence of flammables, fire and explosion hazards
  - Walking and working surfaces that are hazardous
  - Environmental hazards such as chemicals, radiation and noise
  - Placement of objects that protrude into aisles
  - Hazards created by machines or objects that do not warn of movement

Injury Causes

- **Definition - Unsafe Act or Behavior:**
  - **Ones action that creates unnecessary exposure to a hazard or reduces the degree of safety**

Injury Causes

- **Unsafe Act or Behavior: Examples**
  - **Failure to wear prescribed personal protective equipment**
  - **Improper lifting, carrying, loading, or sorting**
  - **Failure to use lockout/tagout procedures when working on equipment or devices**
  - **Use of defective tools or parts**
  - **Failure to abide by speed limits or loading limits**

Unsafe Acts or Behaviors

- **What Causes Good People To Act Unsafely?**
  - Individuals want be productive.
  - Individuals perceive hazards differently.
  - Individuals may accept working conditions as they are to get the job done.

- **Additional Considerations**
  - Good people make honest mistakes.
  - Individuals do not want to be injured or become ill.
  - Behaviors are influenced by organizational processes and values.

Unsafe Condition or Unsafe Act or Behavior?

Unsafe Condition or Unsafe Act or Behavior?

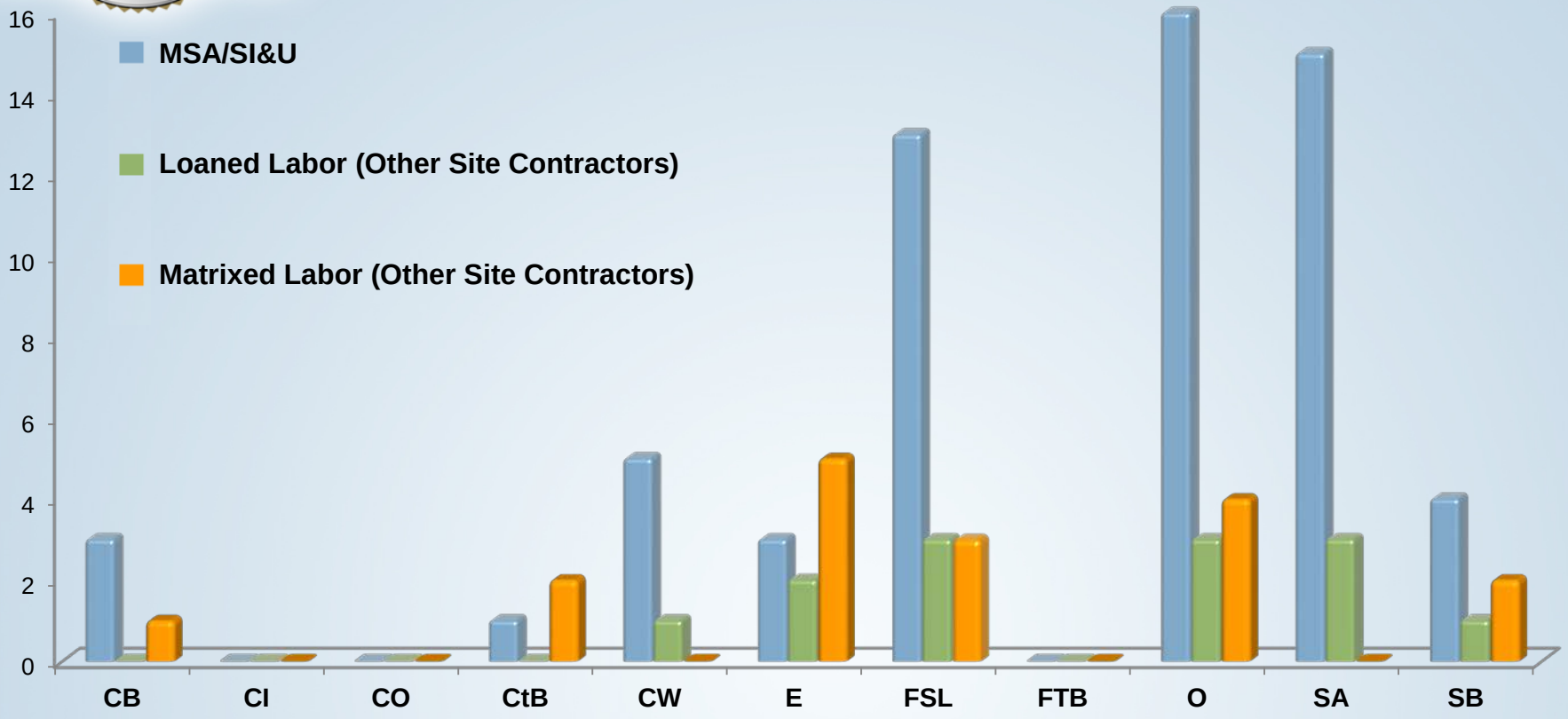
Unsafe Condition or Unsafe Act or Behavior?

What Causes Good People To Act Unsafely?

11 Common Sources of Injuries

1. Overexertion
2. Struck Against
3. Fall Same Level
4. Contact With
5. Environmental Exposure
6. Caught Between
7. Caught In
8. Caught On
9. Contacted By
10. Fall to Below
11. Struck By

SI&U Causes of Injuries



CB:	Caught Between	CtB:	Contacted By	FSL:	Fall Same Level	SA:	Struck Against
CI:	Caught In	CW:	Contact With	FTB:	Fall To Below	SB:	Struck By
CO:	Caught On	E:	Environmental Exposure	O:	Overexertion		

Common Sources of Injuries

- **This workshop will cover the following six sources of injury**

Note: These are the most frequently occurring in SI&U.

The remaining 5 sources of injury will be addressed in follow-up safety discussions

1. **Overexertion**
2. **Struck Against**
3. **Fall Same Level**
4. **Contact With**
5. **Environmental Exposure**
6. **Caught Between**

Sources of Injury Modules

- **Selected source of injuries will be presented as separate modules**

- **Each module will cover the following information:**
  - **Definition of subject source of injury**
  - **Injury examples**
  - **Statistics & injury descriptions**
  - **What do you think photos (participation)**
  - **Suggested preventive measures**
  - **Video**

Overexertion Injuries

Definition: Overexertion Injuries

- **Overexertion (O) injuries result from too much strain on some parts of the body, or a person places themselves in an awkward position to complete a task. Typical overexertion injuries are caused by:**
  - **Manual handling of objects**
  - **Using extreme force on an object that may be stuck or frozen in place**
  - **Using an unsafe position while completing a task**
  - **Attempting to support or control product or equipment that is off balance or is falling**

Example: Overexertion Injuries

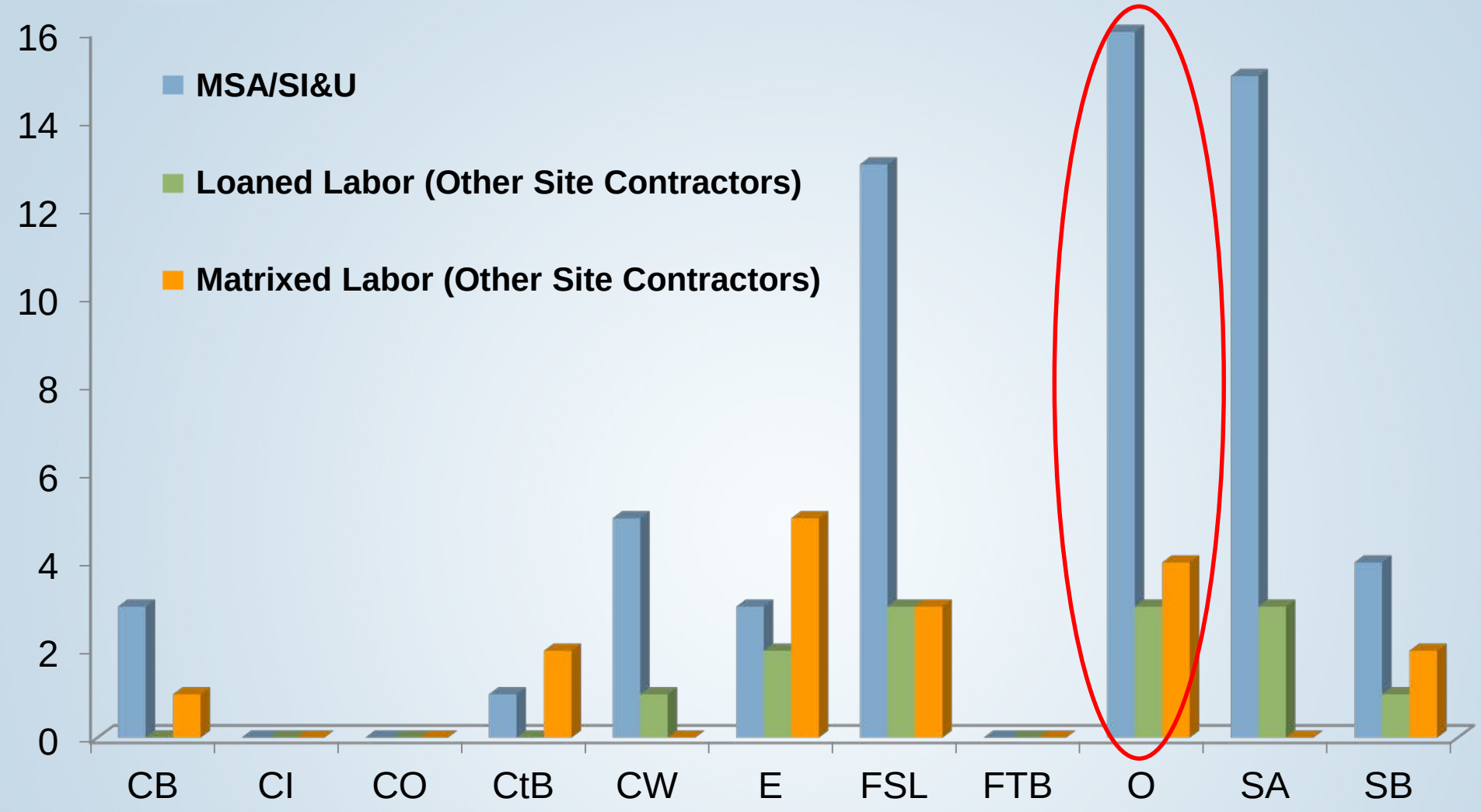
- **An employee suffers carpal tunnel syndrome as a result of an improperly designed computer work station. After surgery, the employee admits to having wrist pain for several months before finally telling their supervisor.**

Example: Overexertion Injuries

- A maintenance worker was trying to remove a bolt from an object. However, the bolt seemed to be frozen on the object. So he leaned into it and gave it all his might. After a few seconds, he felt a “pop” in his elbow and he was in agony. The doctor later determined that he had pulled a ligament off the bone…

What Do You Think?

SI&U Overexertion Injuries



SI&U First Aid
Overexertion Injuries

Date	Event Summary
10/27/2009	A Teamster felt pains in his back/legs after moving furniture.
11/16/2009	A Teamster reported right hand/wrist pain to his supervisor after working the morning in the lay down area moving empty over pack drums.
11/19/2009	A Crane and Rigging employee knelt down and injured his knee.
11/24/2009	An Electrician reported that he was experiencing back discomfort (stiff back) and requested to be taken to the site medical provider.
12/1/2009	A Painter lifted a box and felt a pain in his back.
1/18/2010	A Heavy Equipment Oiler felt his right knee pop while he was climbing into the cab of the Oiler Truck.

SI&U First Aid Overexertion Injuries

Date	Event Summary
2/2/2010	A Heavy Equipment Mechanic, while working at 506BA on an emergency generator, felt pain in his lower back and hip on the right side.
2/11/2010	A Carpenter injured his right heel when the employee was stepped from a JLG and felt a burning sensation on the back of his right heel which went away.
3/8/2010	An RCT opened a vehicle door when the wind caught the door and pulled his arm injuring his shoulder.
3/23/2010	A Janitor injured her back when putting away supplies (paper towels).
3/29/2010	A Light Duty Mechanic felt pain in his arm when the wind jerked the door out of his hands at 2711E.

SI&U First Aid Overexertion Injuries

Date	Event Summary
3/30/2010	A Light duty mechanic was attempting to start a Kawasaki 4-wheeler with the pull starter. The starter jammed and he felt a pain in his left forearm.
4/20/2010	A Rigger injured his left hand (tingling sensation) while erecting/dismantling scaffolding at 100K.
5/4/2010	A Teamster, in training at 2704HV, experienced back spasms.
5/5/2010	A Janitor began experiencing pain in both knees. Employee was evaluated at AMH and diagnosed with hyperextension of both knees.
5/7/2010	A Field Work Supervisor experienced a popping sensation and pain in his left elbow while washing the windshield of a truck in the 2266/200E parking lot.
5/10/2010	A Sheet metal Worker, complained of pain in his left elbow.

SI&U Recordable Overexertion Injuries

Date	Event Summary
11/9/2009	A Teamster pulled a muscle in his right leg while moving a file cabinet down stairs at 310 TEDF.
12/10/2009	An Electrician, installing heat trace underneath a water truck, received a lumbar strain as the employee exited from underneath the vehicle. As the employee was installing the heat trace, he crawled under the truck on his back, wiggled up into a tight space, and was installing the heat trace. As the employee was performing this activity he got stuck, felt claustrophobic, panicked and received a lumbar strain when he was removing himself from under the truck.
2/13/2010	Biological control employee was supporting 222-S tree removal activities. Employee was cleaning up cut up pieces of tree and was tossing a piece of wood weighed 10-15 pounds. Employee felt a ripping sensation in his right arm bicep.

SI&U Recordable Overexertion Injuries

Date	Event Summary
3/8/10	A Carpenter moving a cabinet from a connex box, stepped backward out of the connex and injured his right knee.
3/17/10	A Sheet metal Worker felt pain in his back upon removing his protective clothing after exiting a Beryllium Area in 234-5Z.
5/17/10	A Janitor, while working at PFP, tweaked her shoulder when opening the elevator door.

Overexertion Injuries

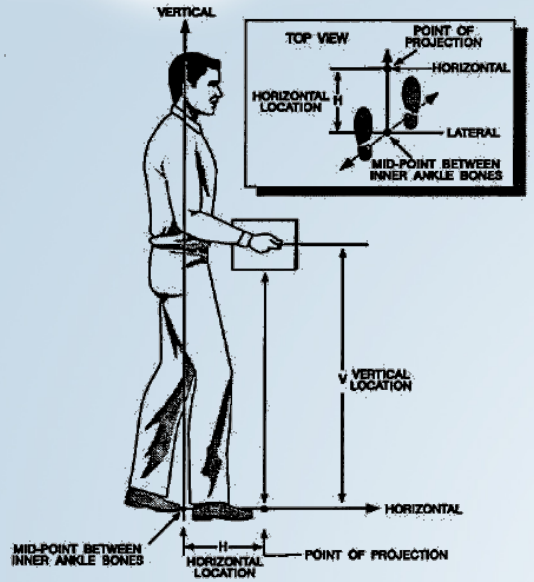
- **How much can a person safely lift?**
  - **Employees shall not attempt to singularly lift objects that exceed physical capabilities or are greater than 55 pounds (24.95 kgs) without a hazards analysis. (Reference: MSC-RD-8471, Rev. 5, Ergonomics)**

- **If material is too heavy or too awkward for one person to handle, additional personnel and/or equipment shall be made available**

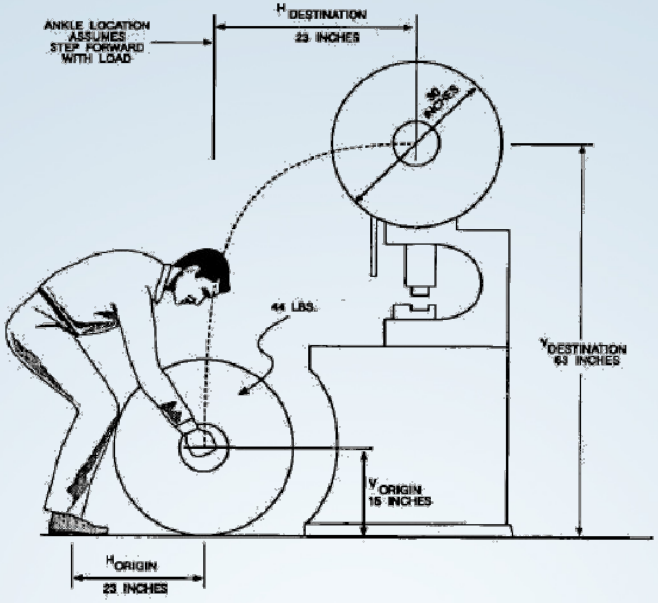
Overexertion Injuries

- Think of yourself as a crane when you lift an object
- The maximum lifting capacity of this crane is dependent on how the lift is performed
- The same is true with the human body

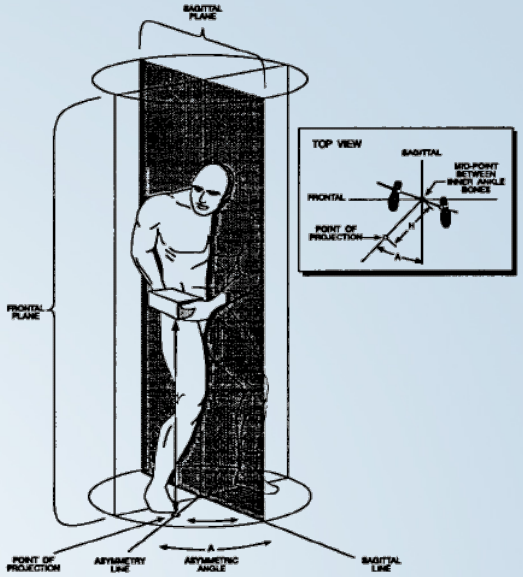
Overexertion Injuries



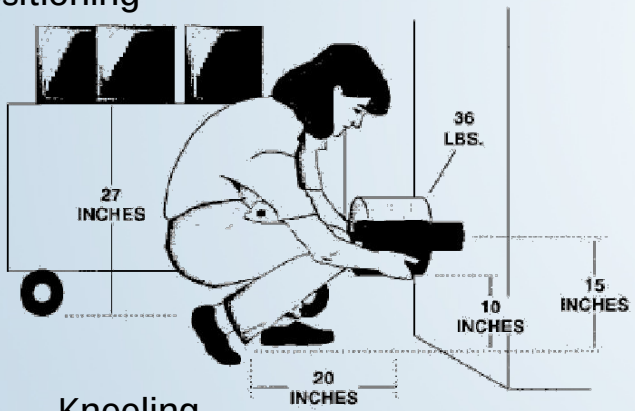
Vertical/Horizontal Positioning



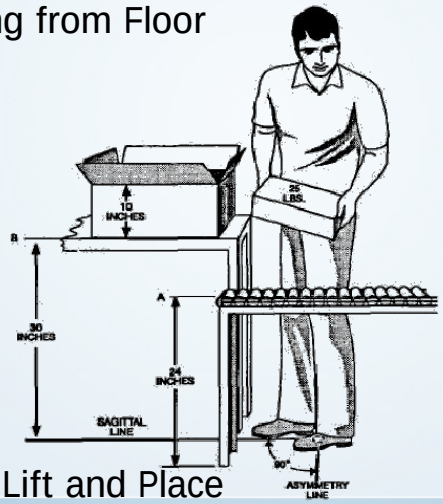
Lifting from Floor



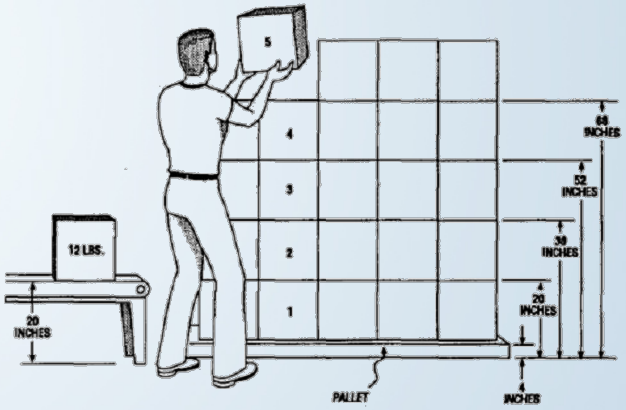
Rotation/Turning



Kneeling



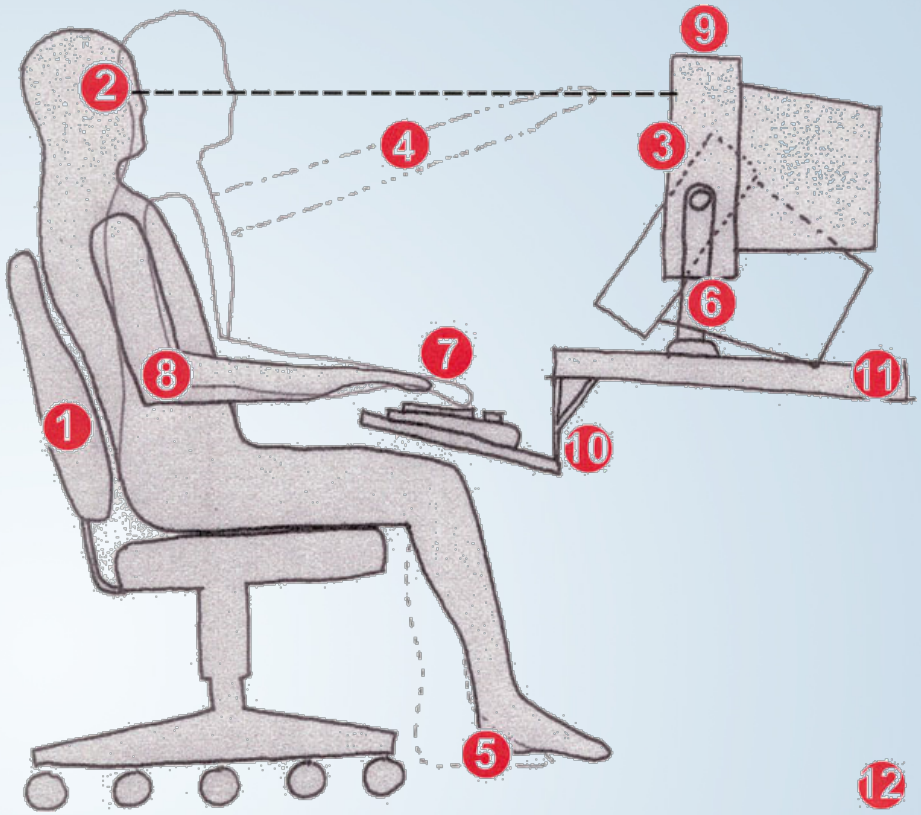
Lift and Place



Overhead Lifting

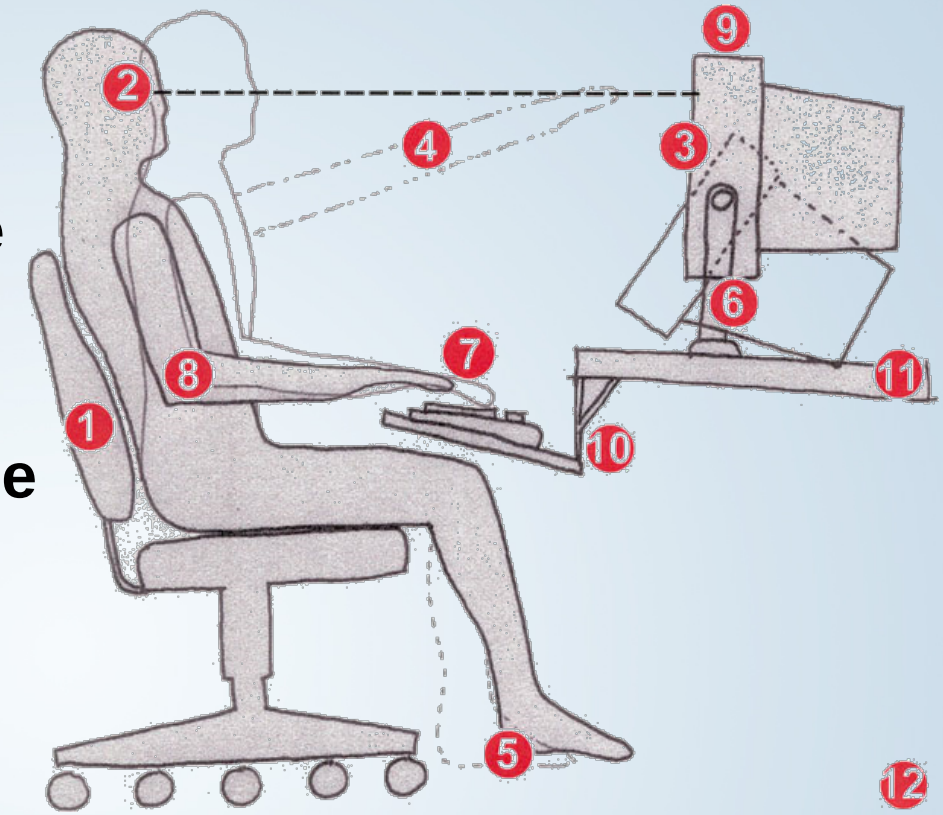
Overexertion Injuries

1. Use a good chair with a dynamic chair back and sit back in this
2. Top of monitor casing 2-3" (5-8 cm) above eye level
3. No glare on screen, use an optical glass anti-glare filter where needed
4. Sit at arms length from monitor



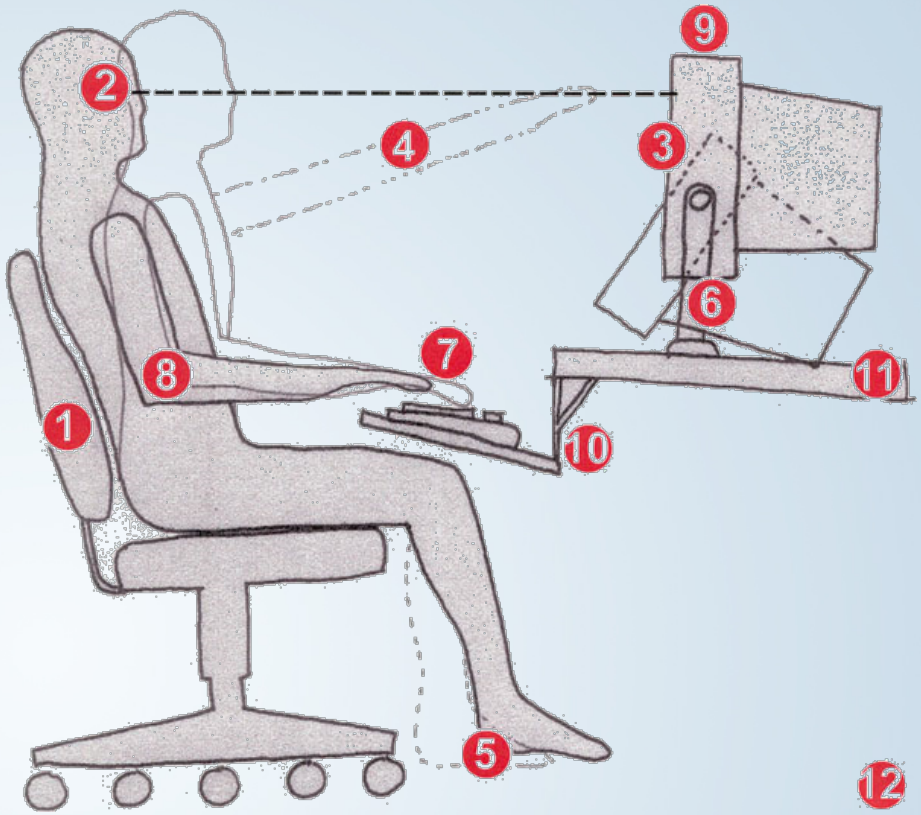
Overexertion Injuries

5. Feet on floor or stable footrest
6. Use a document holder, preferably in-line with the computer screen
7. Wrists flat and straight in relation to forearms to use keyboard/mouse/input device
8. Arms and elbows relaxed close to body
9. Center monitor and keyboard in front of you



Overexertion Injuries

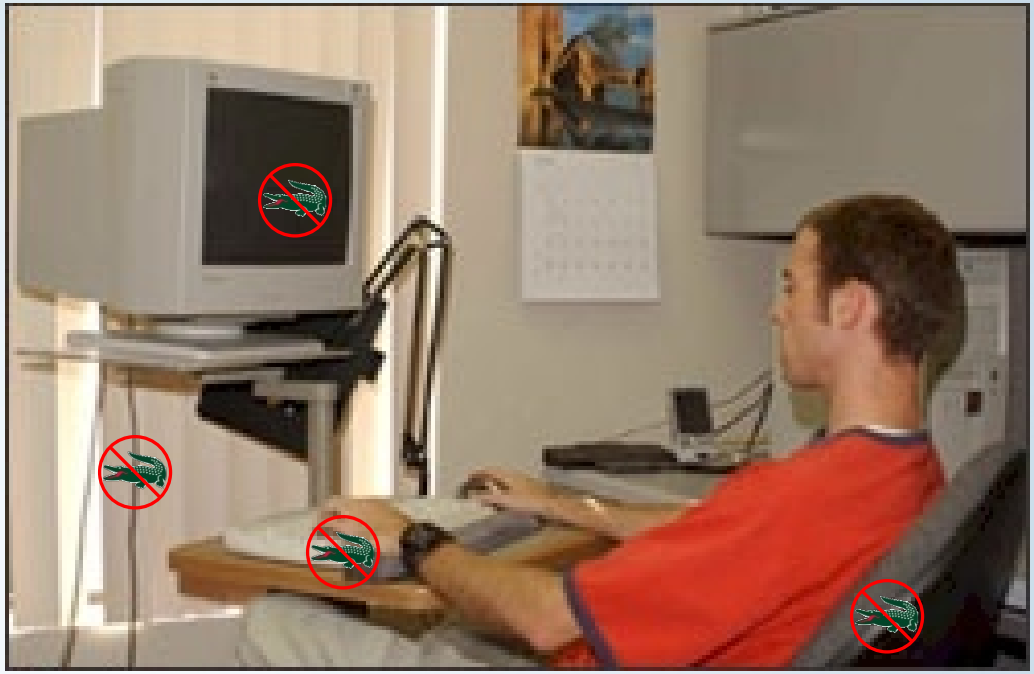
10. Use a negative tilt keyboard tray with an upper mouse platform or downward tiltable platform adjacent to keyboard
11. Use a stable work surface and stable (no bounce) keyboard tray
12. Take frequent short breaks (micro breaks)



What Do You Think?

Place monitors directly in front of the user

What Do You Think?



Preventive Measures – (O) Injuries

- **Remove tripping hazards in path where materials will be carried.**
- **Use correct lifting procedures at all times.**
- **Use mechanical devices to lift, move, and position loads – work “smart”.**

Preventive Measures – (O) Injuries

- Evaluate the tasks performed and select ergonomically correct tools.
- Require the use of PPE to prevent injuries caused by product handling.
- Where possible, mark the weight on containers to prevent problems associated with lifting and handling. For loads being moved by hoists or cranes, identify the center of the load.

Preventive Measures – (O) Injuries

- **Design computer workstations to meet NIOSH guidelines.**
- **Use mechanical methods rather than brute force to remove objects that are stuck.**
- **Place parts in storage areas that can easily be accessed.**

Preventive Measures – (O) Injuries

Personal Experiences

Does anyone have a personal experience they would care to share involving an overexertion injury?

00:00

Break

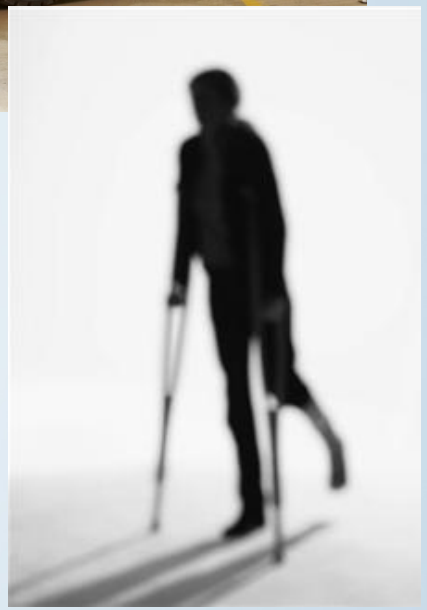
Struck Against Injuries

Definition: Struck Against Injury

- **A Struck Against (SA) injury is one in which the worker unexpectedly and forcefully makes contact with something in the worker's environment. Most of the time, the worker is in motion and strikes against a fixed object.**

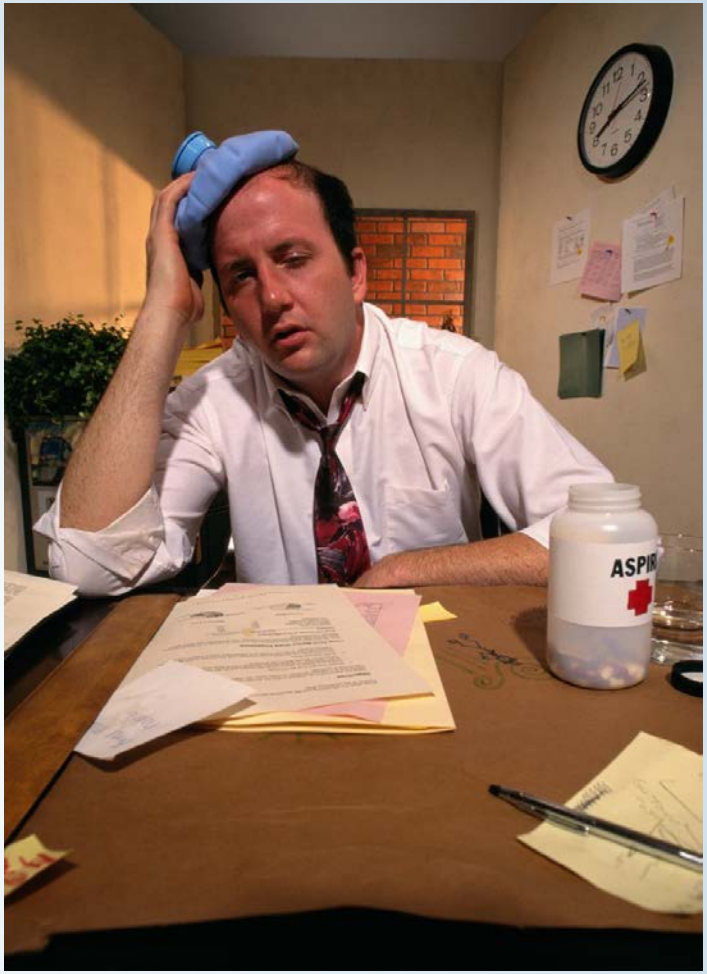
Example: Struck Against Injury

- **A forklift operator parks his truck near a doorway and leaves the forks at knee height instead of lowering them to the floor. A co-worker turns around quickly and strikes his knee very hard against the elevated forks. The result is a seriously injured kneecap.**



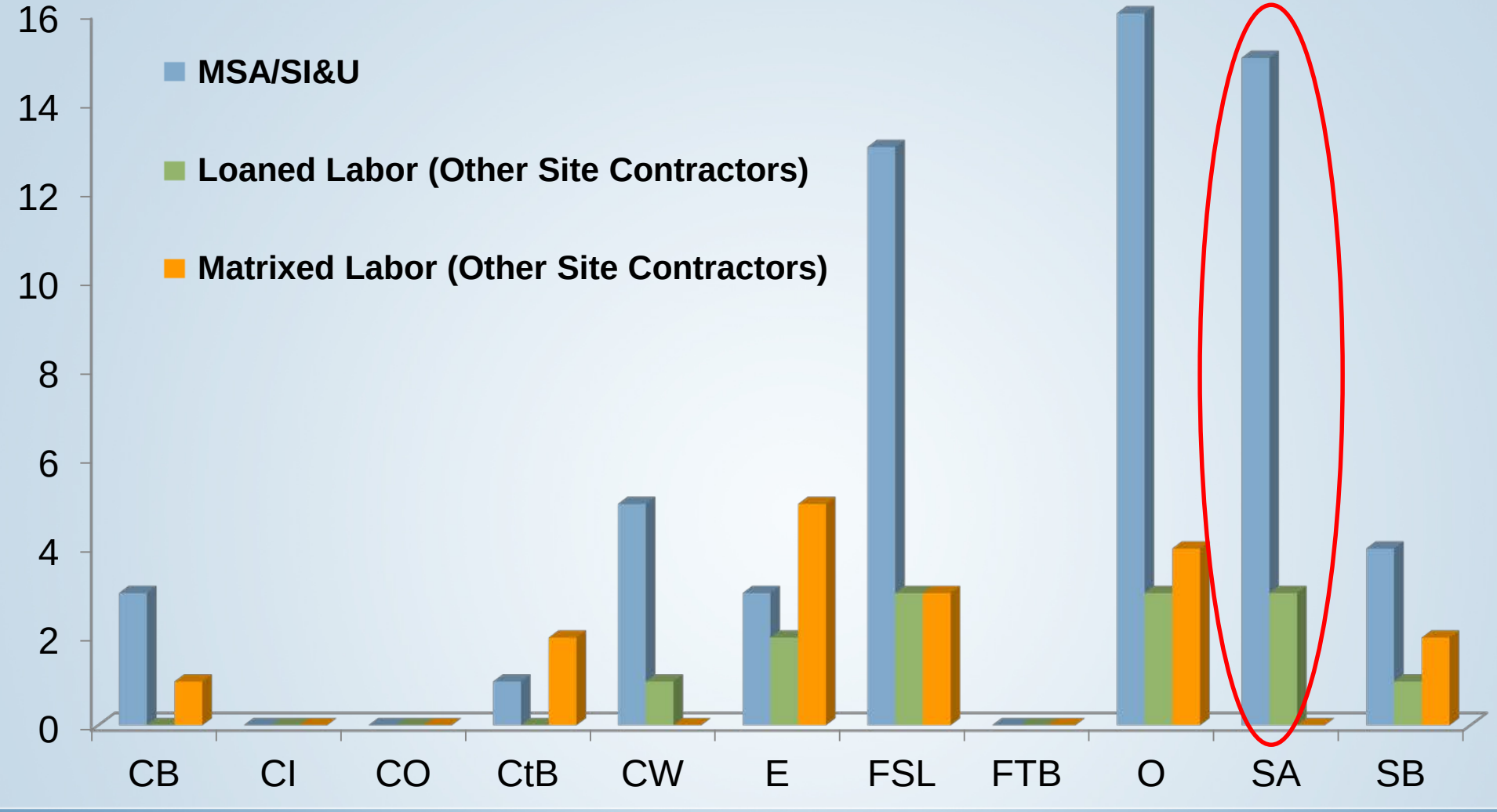
Example : Struck Against Injury

- An employee enters the locker room, bends over to get an item out of their locker, stands up, and whacks their head on the door of a locker that another worker forgot to close.



What Do You Think?

SI&U Struck Against Injuries



SI&U First Aid
Struck Against Injuries

Date	Event Summary
10/21/2009	A Rigger bumped his knee on the trailer hitch of a rigging truck at 6290/600.
12/14/2009	An Electrician working at 2751E, received a paper cut on the third digit (middle finger) on his left hand when opening up a cardboard box.
1/15/2010	A Sheet Metal Worker, performing work on a metal shear in 2266E/200E, turned and bumped into a portable light fixture receiving a cut to the nose.
2/24/2010	A Laborer, while doing a wipe down in a CA, received a sliver in his finger.
3/1/2010	A Janitor cut her arm on a trash can while cleaning in MO971/200W.
3/9/2010	An RCT, working at B-Reactor, was climbing a ladder and bumped his head on a piece of angle iron.

SI&U First Aid
Struck Against Injuries

Date	Event Summary
3/26/2010	An Ironworker on loan to CHPRC, while working at 100K, bumped his shin on a piece of plywood.
4/21/2010	A Janitor working at MO388 cut her hand on a microwave oven.
5/5/2010	A Floor Serviceman, cut his right thumb with a scraper while removing Velcro tape from the bathroom floor.
5/17/2010	An Electrician, while working in the attic of the 6266 Building (WSCF), cut his left thumb on a metal light fixture.
5/19/2010	A Floor Service worker cut his left wrist while unplugging a cord to a piece of floor service equipment. As he was pulling out the cord his wrist rubbed against a metal burr cutting the workers wrist.
6/1/2010	A Fitter, while working on a toilet placed his hand on the backside of the toilet. The palm of his right hand came into contact with a screw that caused a small puncture.

SI&U First Aid
Struck Against Injuries

Date	Event Summary
6/2/2010	A Light Duty Mechanic was rolling up an exhaust hose at 273E when a tension wire on the hose cut his left hand.
6/7/2010	A Boilermaker, while doing his 360 check of company vehicle in the parking lot of 2266E, bumped his right leg against a truck hitch.

SI&U Recordable Struck Against Injuries

Date	Event Summary
3/11/2010	A Light Duty Mechanic (2711E/200E) cut his finger.

What Do You Think?

Preventive Measures – SA Injuries

- Change work environment or procedure
- Use of signs or warnings
- Wear PPE
- Maintain tools and equipment in good repair so that they don’t slip or move while in use
- Use the right tool for the job to prevent slipping or movement of any kind
- Use a correct stance to apply pressure to a wrench in such a manner so as not to be at risk of losing your balance

Preventive Measures – SA Injuries

- Never use cheater bars for leverage
- Use heat, rust removers, and the use of a hammer to tap a nut or bolt loose.
- Look before you walk so that you can see things ahead of you and above you.
- Keep work areas well lit so that hazards can be detected more readily.

Preventive Measures – SA Injuries

- Use warning signs, lights, or rope off areas that could contribute to SA hazards
- When possible, relocate or remove valves or other fixtures that may be located in walking zones.
- Apply yellow paint or otherwise identify low-access areas that present a SA hazard

Preventive Measures – SA Injuries

- If possible, reposition machines or operator workstations to alleviate tight quarters
- Wear appropriate PPE where there are SA against hazards, e.g., wear a hard hat where there is an overhead hazard

What's Going On Here?

Personal Experiences

Does anyone have a personal experience they would care to share involving an struck against injury?

Fall To Same Level Injuries

Definition: Fall To Same Level Injuries

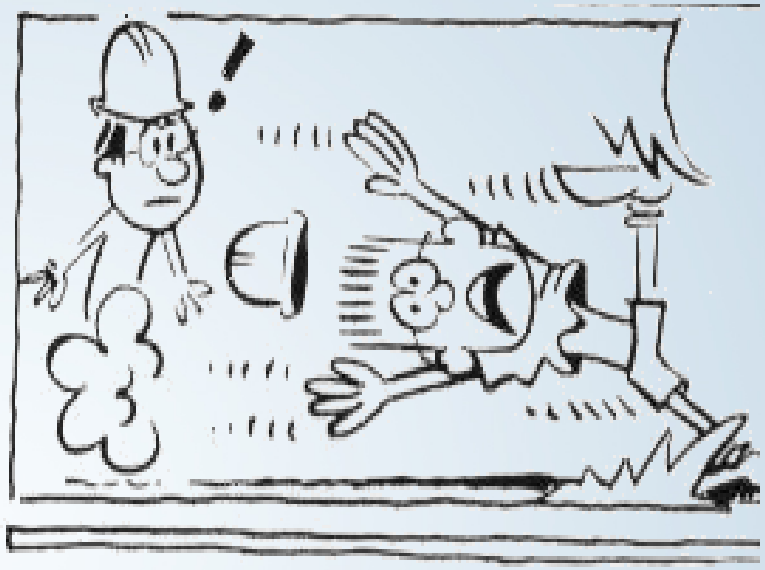
- **Fall to Same Level Injuries (FSL) are slip/trip/fall accidents due to slippery conditions, walking surfaces that are in poor condition, personnel running in walkways and then tripping, etc.**

Example: Fall to Same Level Injury

- An engineer is walking to the bathroom while reading a magazine (he just couldn't wait to read the latest Engineering News Report). He fails to notice the sign just inside the door reading "Caution – Wet Floor". He slips on the floor and falls on his backside. He looks around but still can't figure out what happened. But it *was* a good edition of the ENR…

Example: Fall to Same Level Injury

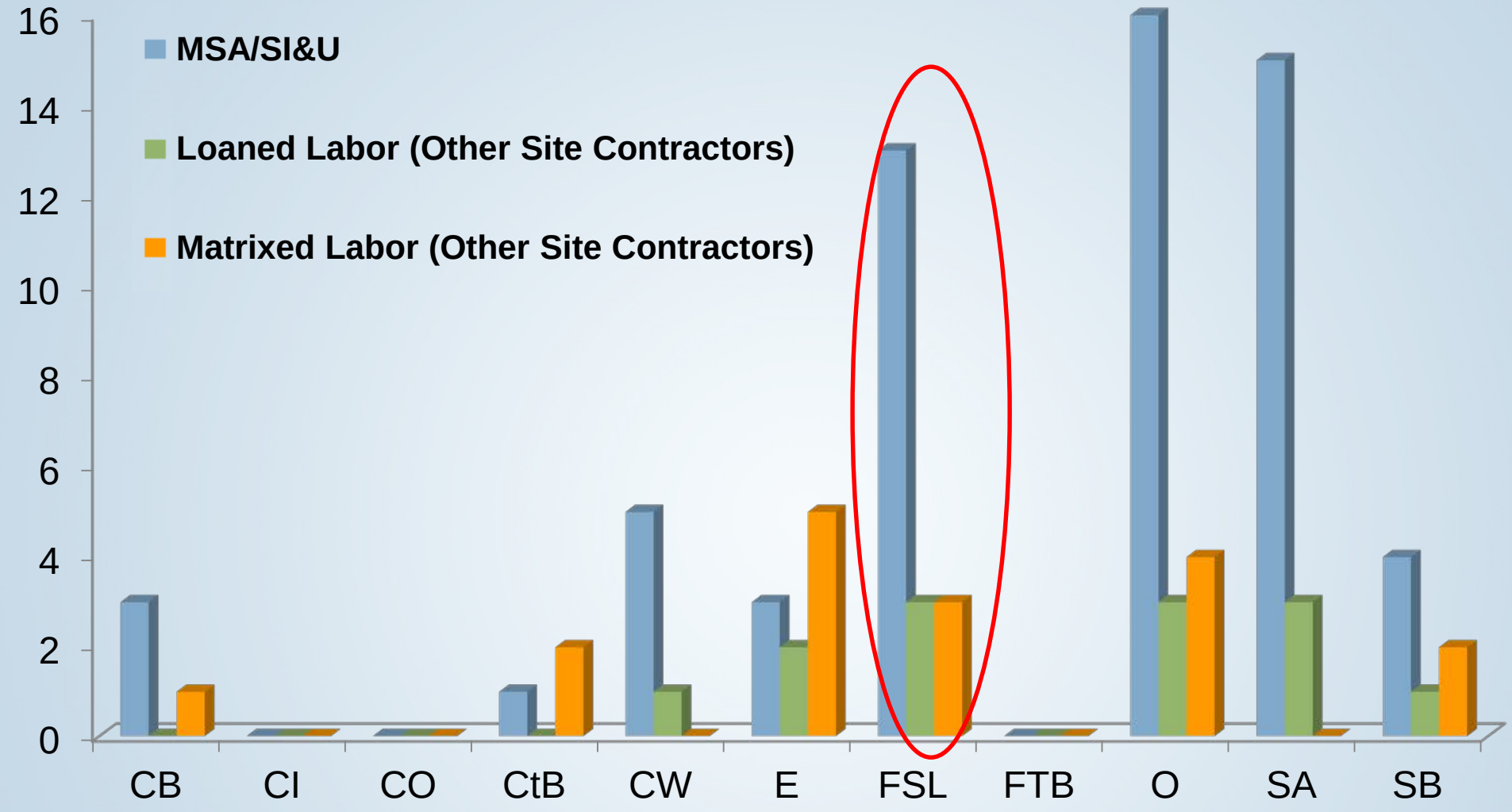
- **A forklift has been leaking hydraulic fluid from a hose for several weeks. However, since pre-shift inspections have not been conducted for several weeks, nobody is aware of the leak. While walking past the forklift, a supervisor slips on the hydraulic fluid, and fractures his elbow when he lands on the floor.**



Example: Fall to Same Level Injury

- An office worker fails to close a drawer file while accessing documents. A co-worker rounds a corner and fails to see the open drawer. The employee strikes the door, falls forward, and receives a elbow fracture.

SI&U Fall To Same Level Injuries



SI&U First Aid
Fall To Same Level Injuries

Date	Event Summary
10/15/2009	A Painter reported to his supervisor that he was experiencing pain in his neck and shoulders and was having trouble opening and closing his left hand.
10/21/2009	A Truck Driver supporting ERDF stepped out of his truck onto a rock and rolled his ankle.
11/3/2009	A teamster/driver hauling Roll-Off Cans to ERDF fell to the ground when exiting the cab of the truck.
11/5/2009	A Teamster working at Pit 6 exited a pickup, on gravel surface, and felt a twinge in her left knee.
11/16/2009	A Light Equipment Mechanic slipped from a truck and injured his left knee and calf muscle while working at the 273E/200E Area Shop.
11/16/2009	A Janitor working at MO2114 was walking up a flight of stairs, mis-stepped and injured her right foot.

SI&U First Aid
Fall To Same Level Injuries

Date	Event Summary
11/19/2009	While performing work at the 283W Water Utilities Filter Plant an employee twisted her ankle.
11/19/2009	A Rigger working for CHPRC was pulling scaffold material through an opening at the evaporator when he slipped and fell injuring his back.
12/16/2009	A Chemical Tech was exiting a locker room into a hallway in 6266E (WSCF) and rolled left ankle.
12/28/2009	An employee slipped (on ice and snow) and fell outside of 2101M while getting out of a truck.
1/12/2010	A Carpenter injured his right ankle while accessing the back of a utility van. As employee stepped on the step to access the van the step collapsed.
1/21/2010	A Carpenter was taking measurements for a set of steps and deck when he tripped and fell striking his left knee on a rock.

SI&U First Aid
Fall To Same Level Injuries

Date	Event Summary
1/22/2010	A WU employee was flushing Fire Hydrant 3WA located at the 272WA Facility when he stepped on an area where the sub surface soil was saturated with water and immediately sank to his left knee, lost his balance and fell forward. The event resulted in multiple injuries and bilateral eye irritation.
2/24/2010	A Janitor while working at B-Reactor, fell and scrapped her knee.
3/9/2010	An RCT, working at B-Reactor, slipped on wet paint and bumped her knee.
3/31/2010	An Iron Worker/Rigger twisted his left knee while walking up stairs at PFP.
4/6/2010	A Janitor was moving a buffer inside 222S when he stumbled and ran into the buffer handles injuring his ribs.

SI&U First Aid
Fall To Same Level Injuries

Date	Event Summary
4/19/2010	A Teamster stepped on a rock outside of 2750 and rolled his ankle.
4/23/2010	A Truck Driver working in the 1100 Area felt his left leg pop as he stepped into a truck.
6/15/2010	An Iron Worker Rigger, while working on a crane at the CSB Facility, Bldg 212H, tripped over a 2x4, fell and scrapped his knee.

What Do You Think?

What Do You Think?

What Do You Think?

What Do You Think?

What Do You Think?

What Do You Think?

Preventive Measures: FSL Injuries

- Keep oil, grease, and other fluids off the floor.
- Use good housekeeping practices and clean up spills as they occur.
- Clean up debris, etc., after completing projects.
- Put tools and materials back in their original places.
- Use shelving, racking, tubs, containers, brackets, pegboards, etc. to store work items.

Preventive Measures: FSL Injuries

- Install non-skid flooring on stairs, landing, and slippery surfaces. Anchor loose carpeting.
- Place wires, cables, hoses, and cords overhead rather than on walkway levels. Where it is not possible to re-route fixed trip and fall hazards, identify them by painting them yellow and using signs or flashing lights.
- Maintain walking areas when there is snow and ice on the pavement – use deicer.

Preventive Measures: FSL Injuries

- Maintain your shoes in good condition. Loose soles can easily cause a trip and fall incident. Wear footwear appropriate for the weather condition.
- Maintain proper lighting in the facility. Replace defective bulbs and reflector shades to maximize the lighting.
- Patch holes & cracks in pavements, floors, parking lots, and roadways.

Preventive Measures: FSL Injuries

- Utilize safe walking practices.
  - Stay focused on where you are going
  - Do not run
  - Utilize handrails on stairs and entry ramps
- Practice good vehicle entry and exit techniques.
  - Watch where you step
  - Maintain three point contact
  - Retrieve belongings after you are out of the vehicle
  - Place belongings into the vehicle before you enter it

What's Going On Here?

Personal Experiences

Does anyone have a personal experience they would care to share involving a fall to the same level injury?

Contact With Injuries

Definition: Contact With Injuries

- **Contact With (CW) Injuries mostly involve someone making contact with something hot, a chemical, or electricity. Contact with is usually non-forceful, and is one of the major causes of dermatitis in the workplace.**

- **Contact injuries also occur when a worker makes contact with something sharp or something sharp that is in motion.**

Example: Contact With Injuries

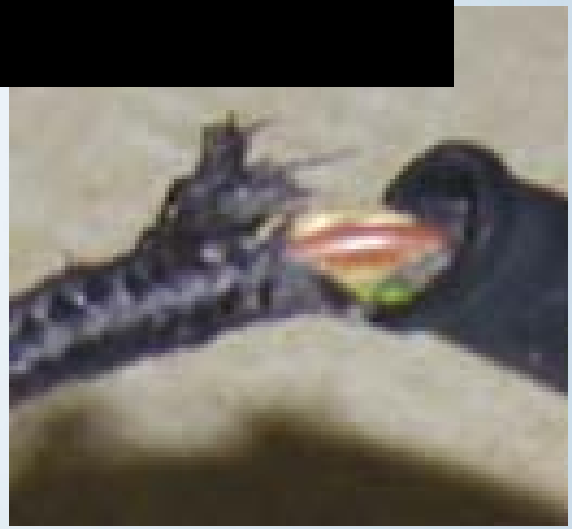
- A maintenance worker is changing a battery in a truck and the terminals and cables are heavily corroded. He works without gloves and removes the battery. With the corrosion on his hands, he rubs his eye and causes an injury.

Example: Contact With Injuries

- **A warehouse worker drops a carton of chemicals that are contained in glass bottles. The box hits the floor and some of the bottles break open. He cleans up the spill without wearing chemical-resistant gloves. His hands start burning….**

Example: Contact With Injuries

- A worker tries to disconnect a power tool by pulling on its extension cord. Unfortunately, his ungloved hand makes contact with an unnoticed bare wire and he receives a severe shock.



What Do You Think?

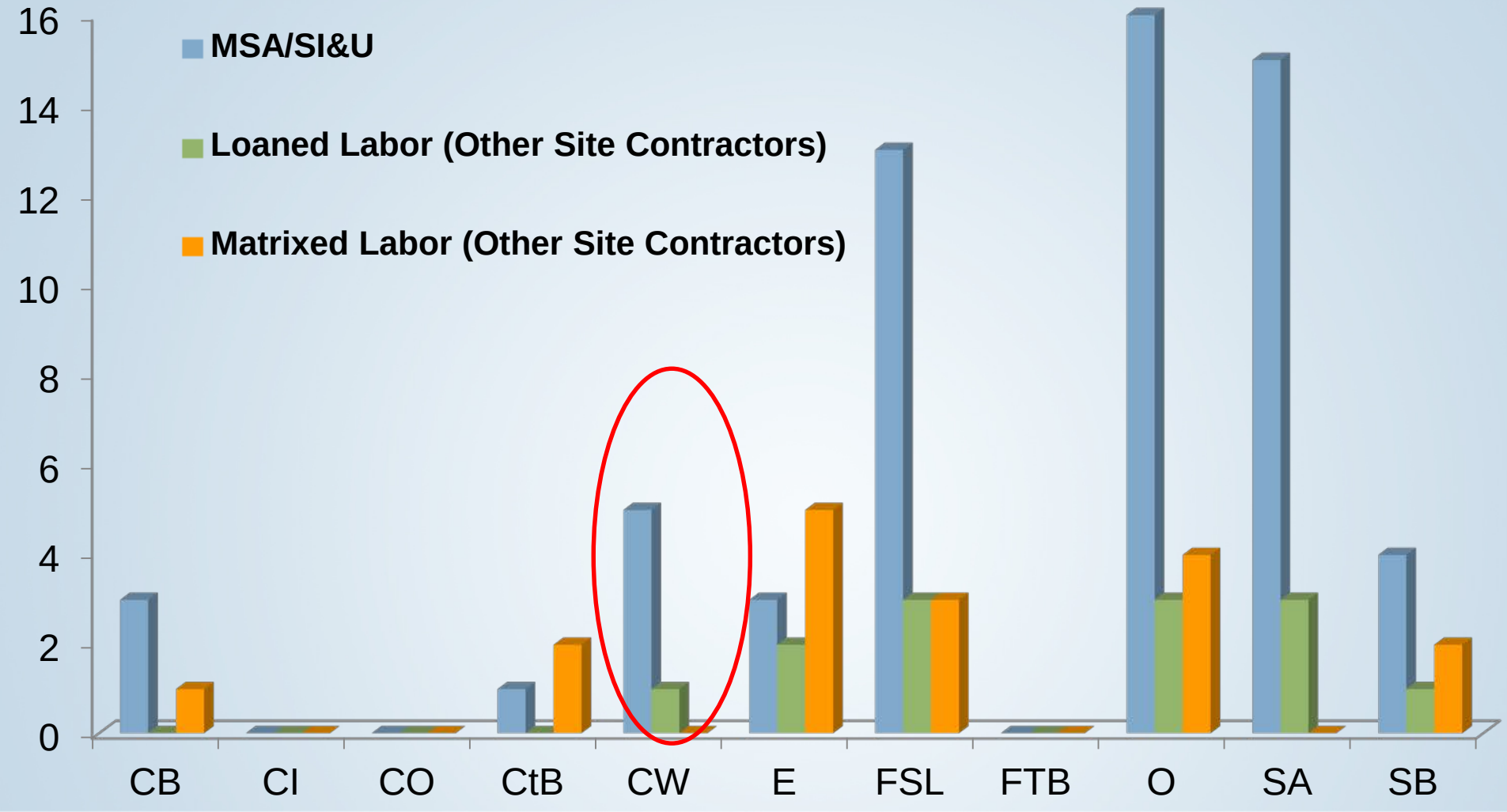
What Do You Think?

What Do You Think?

What Do You Think?

What Do You Think?

SI&U Contact With Injuries



SI&U First Aid Contact With Injuries

Date	Event Summary
11/16/2009	Oil splashed into the eyes of two Heavy Equipment Mechanics. The incident occurred when the employees were removing a hydraulic line from an excavator.
2/17/2010	A Teamster, while picking up some chemicals at 2230E in 200E area, received a bug bite on his neck.
2/23/2010	A Janitor, while working at 6290 building, sprayed himself in the eyes with a diluted disinfectant (NABC).
4/20/2010	A Janitor, working at 234-5Z, received a bug bite. Employee was taken to AMH for evaluation and returned to work with no restrictions.
6/10/2010	A Chemical Technician reported a few drops of Cat II sample had come in contact with the right thigh of their work pants in the 6267 Archive Facility.

SI&U Recordable Contact With Injuries

Date	Event Summary
12/16/2009	While performing a chemical extraction on a reagent, a chemist received minor chemical burns on his face and upper neck from contact with a Methylene Chloride and Sodium Hydroxide solution.

Preventive Measures: CW Injuries

- **Wear correct personal protective equipment.**
  - **Gloves, safety glasses, safety shoes, respiratory protection, radiation protective clothing, arc flash protective clothing, etc.**
- **Use lockout/tagout to keep live parts de-energized.**
- **Inspect electrical wires and cords and repair or replace as necessary.**
- **Provide rubber mats or ground-insulating mats to protect workers from potential electrical shock.**

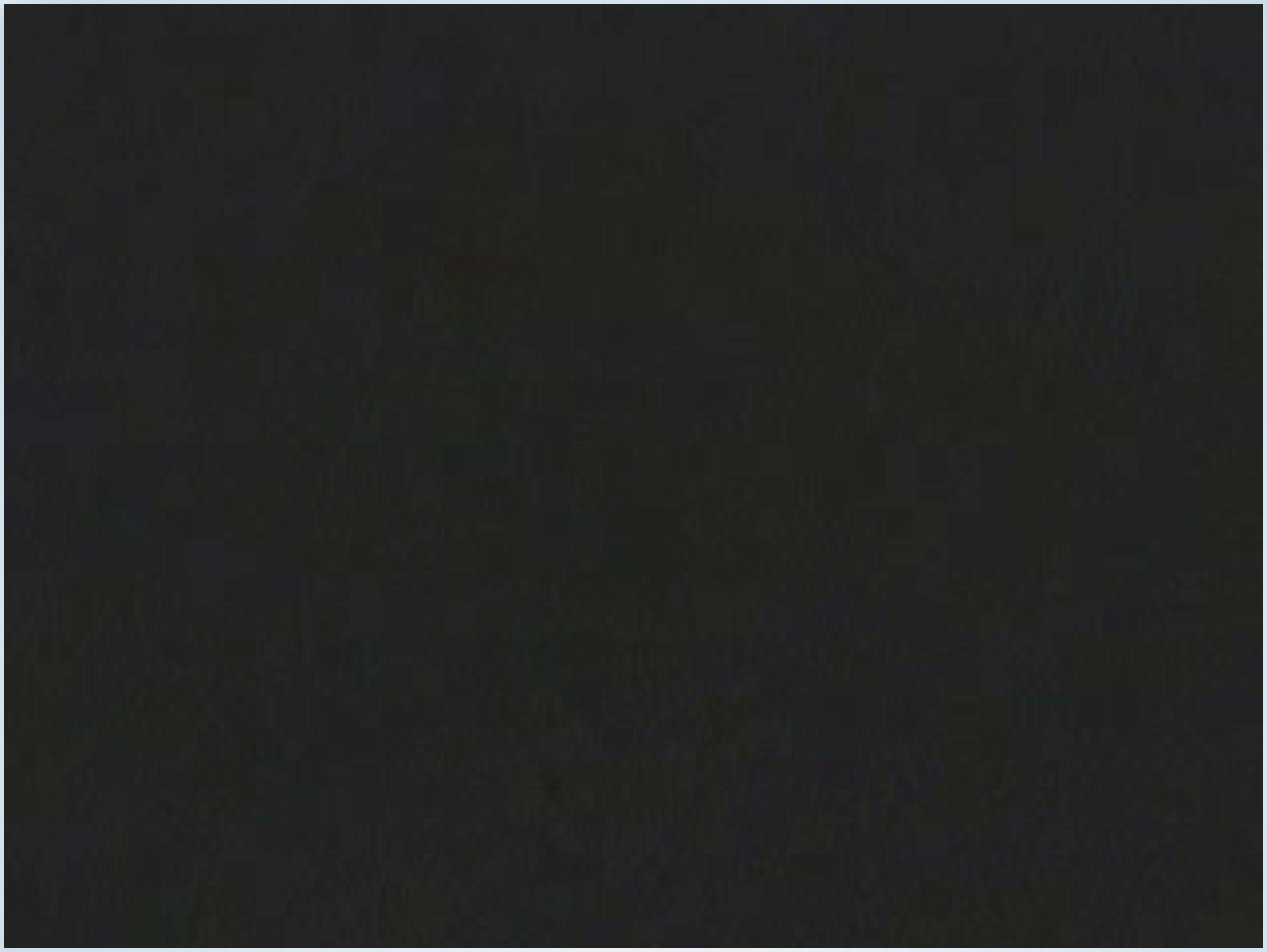
Preventive Measures: CW Injuries

- Wear special insulated shoes when working around electricity.
- Provide guarding or barriers to prevent contact with live current or hot parts.
- Provide the appropriate signs and warnings to alert others of hot surfaces or hazards associated with hot materials or electricity.
- Use emergency action plans for chemical spills, including clean up kits, proper disposal methods, PPE, neutralizers, training, and follow up drills.

Preventive Measures: CW Injuries

- **Search out potential electrical hazards or hot surfaces that could cause injury. Once discovered, correct the hazard.**
- **Utilize eyewash and whole body showers to provide safety measures in the event of a chemical splash incident.**

What's Going On Here?



Personal Experiences

Does anyone have a personal experience they would care to share involving a contact with injury?

00:00

Break

Environmental Exposure Injuries

Definition: Environmental Exposure Injuries

- **Environmental Exposures (E) involve exposure to radiation, fumes, gases, mists, dusts, temperature extremes, oxygen deficiency, and noise. Does not include direct contact with liquid chemicals. Exposures come from welding fumes, carbon monoxide gas, paint thinner vapors, asbestos, cold storage warehouses or working outside in the cold, x-ray machines or other sources of ionizing radiation, etc.**

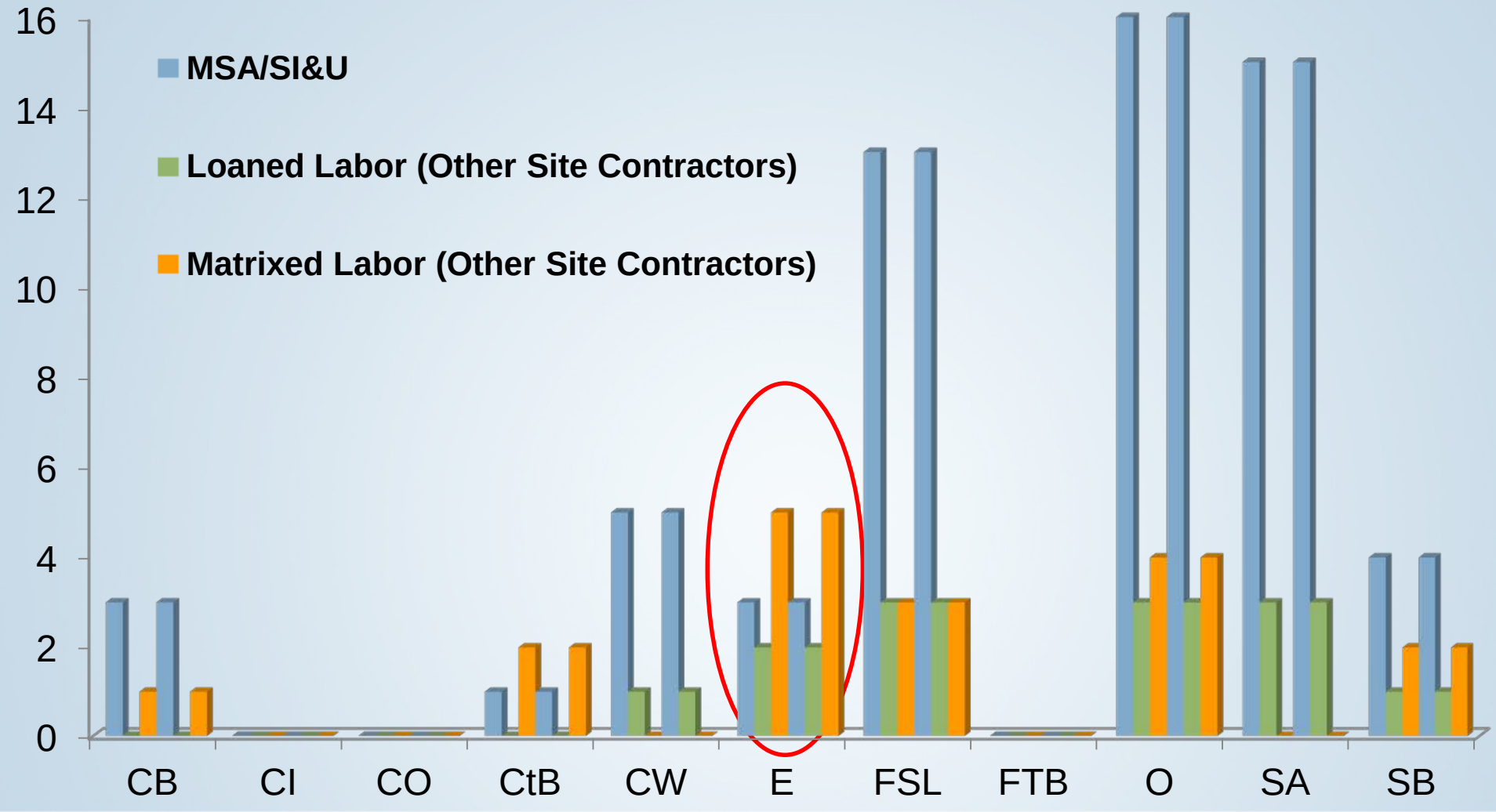
Example: E Injuries

- **Example: A forklift operator driving a propane-powered machine develops a severe headache and a feeling of nausea after lunch. It is discovered that his forklift was emitting high levels of carbon monoxide and he had been affected by the gas as he loaded and unloaded trucks.**

Example: E Injuries

- **Example: A worker conducting environmental remediation work becomes ill after wearing Level B personal protective equipment for 35 minutes. The outside temperature is 85°F and there is a full sun. The worker's core body temperature is 103°F and his heart rate is 153 bpm.**

SI&U Environmental Exposure Injuries



SI&U First Aid
Environmental Exposure Injuries

Date	Event Summary
2/1/2010	A Teamster was working at 218W-4B poked a glove box and inhaled something stale.
2/4/2010	While operating a track hoe at the TRU waste recovery trench, a crane operator smelled an odor. The job was stopped and the crane operator along with five other employees were taken to AMH where they were evaluated and released.
2/16/2010	A Pipefitter reported to his supervisor that he noticed engine exhaust entering his service vehicle. The employee stated that he had developed headaches last week while driving the vehicle.
3/11/2010	A Teamster was picking up piping and loading it into a truck, dirt and rodent dropping fell from the piping. The employee had a concern about exposure to the droppings and was taken to AMH for evaluation.

SI&U First Aid
Environmental Exposure Injuries

Date	Event Summary
3/18/2010	A Sheetmetal Worker removing glove boxes was wearing a tight fitting respirator and when he removed it, the FWS noticed his face looked flushed.
4/19/2010	An Ironworker/Rigger was potentially exposed to pigeon feces dust when undressing from a job performed at the 200 East Powerhouse earlier in the morning.
4/20/2010	A Teamster received a rash on his forearms and on top of his hands after working an overtime shift backfilling an excavation at 212 NP&R.
5/4/2010	A teamster smelled an ammonia odor as he stepped out of the truck at the back side of 271T/200W (T-Plant).

SI&U First Aid
Environmental Exposure Injuries

Date	Event Summary
5/6/2010	A Teamster smelled an ammonia odor as he approached the passenger side of a truck parked at the back side of 271T/200W (T-Plant).
5/27/2010	A Chemical Technologist experienced sensitivity to chemical fumes while performing work in a fume hood at the 6266 Laboratory/600 Area.

What Do You Think?

What Do You Think?

What Do You Think?

Preventive Measures: E Injuries

- Understand the hazards of the chemicals you use by reading MSDSs then using the proper PPE.
- Isolate and separate chemicals to prevent reactions that could explode or cause any type of incident. Store chemicals and evaluate them per manufacturers' recommendations.
- Substitute harmful chemicals with safer chemicals, where possible.
- Use engineering controls to minimize exposure to harmful chemicals, dust, fumes, etc.

Preventive Measures: E Injuries

- **Use signs and warnings to instruct and guide workers.**
- **Contact IHs or safety professionals to perform air and/or noise monitoring.**

What's Going On Here?

Personal Experiences

Does anyone have a personal experience they would care to share involving an environmental exposure injury?

Caught Between Injuries

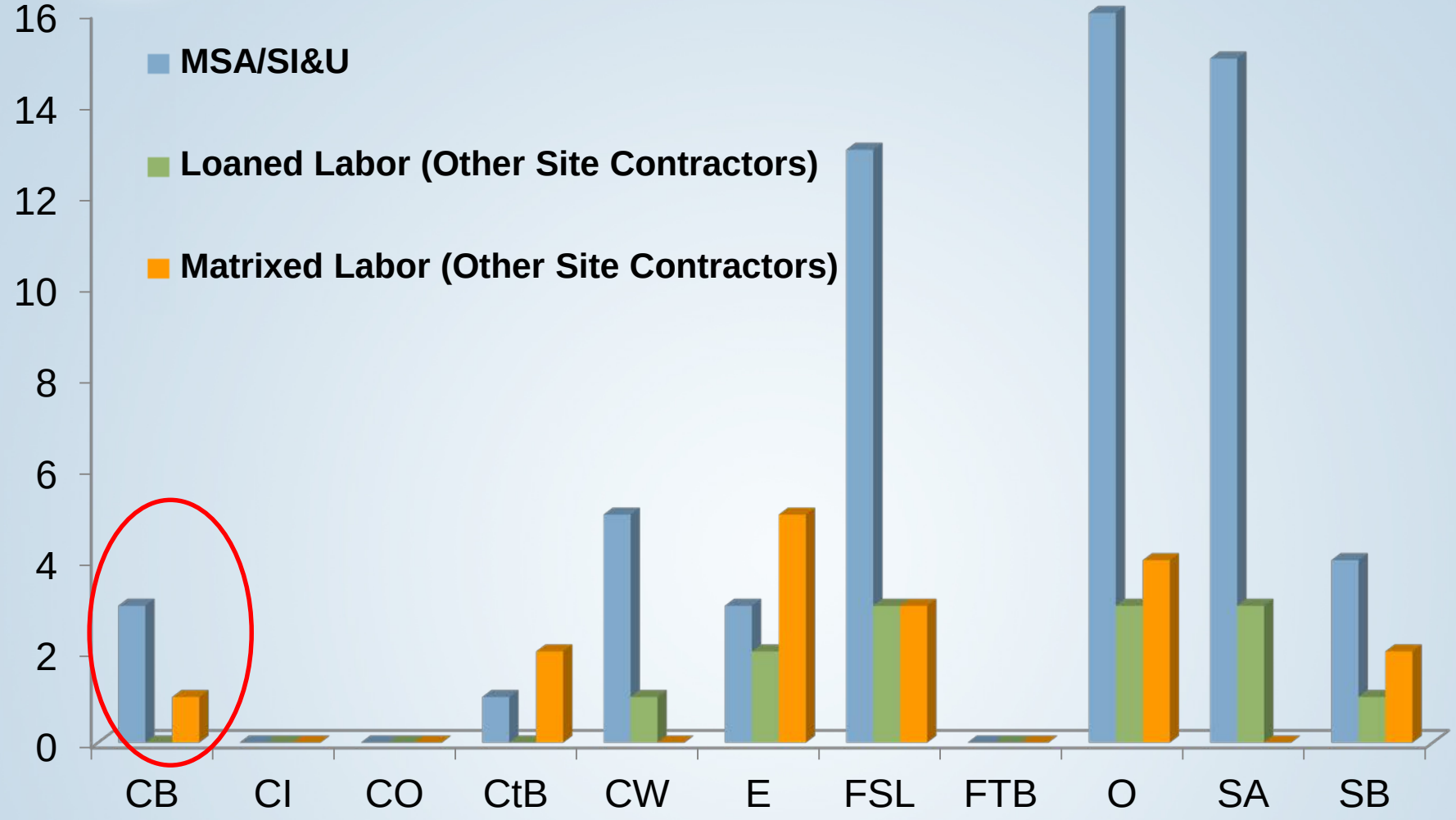
Definition: Caught Between Injuries

- **Caught Between (CB) injuries involve a finger, hand, arm, foot, leg, torso, or the entire body that gets caught in a pinch point.**

Example: Caught Between Injuries

- An employee in a warehouse is standing at a dock door directing a trailer that is backing up. His foot is on the edge of the dock when he leans out to give hand signals to the driver. The trailer makes contact with the dock bumpers and the employee's foot is caught between the dock and the trailer.

SI&U Caught Between Injuries



SI&U First Aid
Caught Between Injuries

Date	Event Summary
11/2/2009	A Driver working at 1724K, was loading metal flanges onto wooden pallets when his finger was pinched between a flange and the pallet.
11/3/2009	A Radiological Control Technician injured their left ring finger while closing rear door on a garbage compactor truck.
12/29/2009	An Electrician received a ¼ inch superficial cut to his left little finger when it got caught between the door edge and some conduit. The employee opened the door to the electrical closet in the 4707 Bldg while walking down a project.

SI&U Recordable Caught Between Injuries

Date	Event Summary
3/29/2010	Two employees were installing a lid on a cassion (valve pit) when one of them pinched their right index finger between the lid and cassion.

What Do You Think?

What Do You Think?

What Do You Think?

Machine Operator Dies of Crushing Injuries When Caught by a Bridle Roller on a Hot Tin Coating Line

On May 13, 2002, a 52 year-old male machine operator (the victim), who was employed by a copper manufacturing company, sustained fatal crushing injuries as a result of being caught by an ingoing pinch point on a hot tin coating machine (tinning line). The pinch point was created by a moving metal strip that was to be coated and a steel bridle roller that tensioned the strip on the tinning line. It appeared that the victim's left glove became caught between a bridle roller and the moving brass strip while he was wiping the bridle roller with a piece of sand paper. He was pulled into the line and sustained crushing injuries to his head.

What Do You Think?

Not following lockout/tagout procedures can be fatal.

A food production worker died after suffering a deep cut to his neck from a steel blade on a dough machine. On the day of the incident, the victim and a co-worker were assigned to clean the dough machine. The victim turned off the machine and locked the main power switch, but missed setting one of the three blade control switches to its lockout position. As the victim was cleaning a hopper above the blade, the co-worker asked him for his key to unlock the main power switch of the dough machine. The victim handed the key to the co-worker who turned on the machine. This caused the dough blade to go through its automatic cutting cycle, fatally injuring the victim. (Case Report: 02NY096)

What Do You Think?

What Do You Think?

Preventive Measures: CB Injuries

- **Place guards on or around moving parts of machines and processes.**
- **Ensure that guards removed during maintenance are replaced prior to placing the machine back into service.**
- **Highlight hazardous pinch point areas with yellow paint, black and yellow tape, signs, or other highly visible materials.**

Preventive Measures: CB Injuries

- Improve lighting where necessary to help workers identify pinch point hazards on their machines or at their jobs.
- Use lockout/tagout when performing maintenance or repair on a machine.
- Wear appropriate workplace attire in industrial areas, e.g., no long hair or jewelry, shirts tucked into pants, etc.
- Use flashing lights or alarms to warn everyone that something is in motion.

What's Going On Here?

Personal Experiences

Does anyone have a personal experience they would care to share involving a caught between injury?

Preventive Measures: CB Injuries

- **To help with hazard recognition and to reduce injuries that typically occur during simple/routine work activities we are implementing a *SafetyStart* aid.**

- **This aid helps integrate the techniques learned in this hazard recognition workshop, and supports ISMS and VPP.**

- **This aid complements the “Four Key Question” card you all received in the HPI training last fall.**

00:00

Break

SafetyStart

SafetyStart

To help with hazard recognition and to reduce injuries that typically occur during simple/routine work activities we are implementing a SafetyStart aid.
This aid helps integrate the techniques learned in this hazard recognition workshop, and supports ISMS and VPP.
This aid complements the “Four Key Question” card you all received in the HPI training last fall.

SafetyStart

- **The *SafetyStart* aid keys us to maintain a questioning safety attitude and will help us avoid hazards (crocodiles).**

SafetyStart

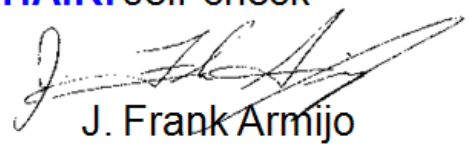
SafetyStart

Maintain Questioning Attitude

- Stay within scope of work
- Notify FWS / PIC of concerns or changes
- Stop the work if necessary

Double-check

1. Did you review your pre-job checklist?
2. Personal condition that may impact ability to work safely
3. Conditions are as expected
4. Right material, tools, & PPE
5. Hazards known & controlled
6. Mind and eyes on task
7. **S.T.A.R.** self-check



J. Frank Armijo
President, Mission Support Alliance

S.T.A.R. Self-check
before, during, and after performing task

***S*top *T*hink *A*ct *R*eview**

Stop before each step to…

Think about task and where the hazards are so you can …

Act within approved work scope, having no doubt hazards are known and controlled. When complete …

Review work by comparing what was done with what was asked for.

SafetyStart

- **The expectation is that the *SafetyStart* card be used by everyone to instill situational awareness for all the activities we do.**
- **Lets utilize the *SafetyStart* card in the following scenarios:**

Scenario #1:

- One of your coworkers was in the middle of a project repairing an HVAC unit on top of a mobile office. However, he had to leave early for personal business. You and your work partner are assigned to assist the remaining employee in completing the task. You are given a work package and told that all hazards are addressed.

- You go to the work site and utilize your SafetyStart card.

SafetyStart

What parts of the *SafetyStart* card applies? What are the hazards in the work area,? What controls are needed? What is your next step?

SafetyStart

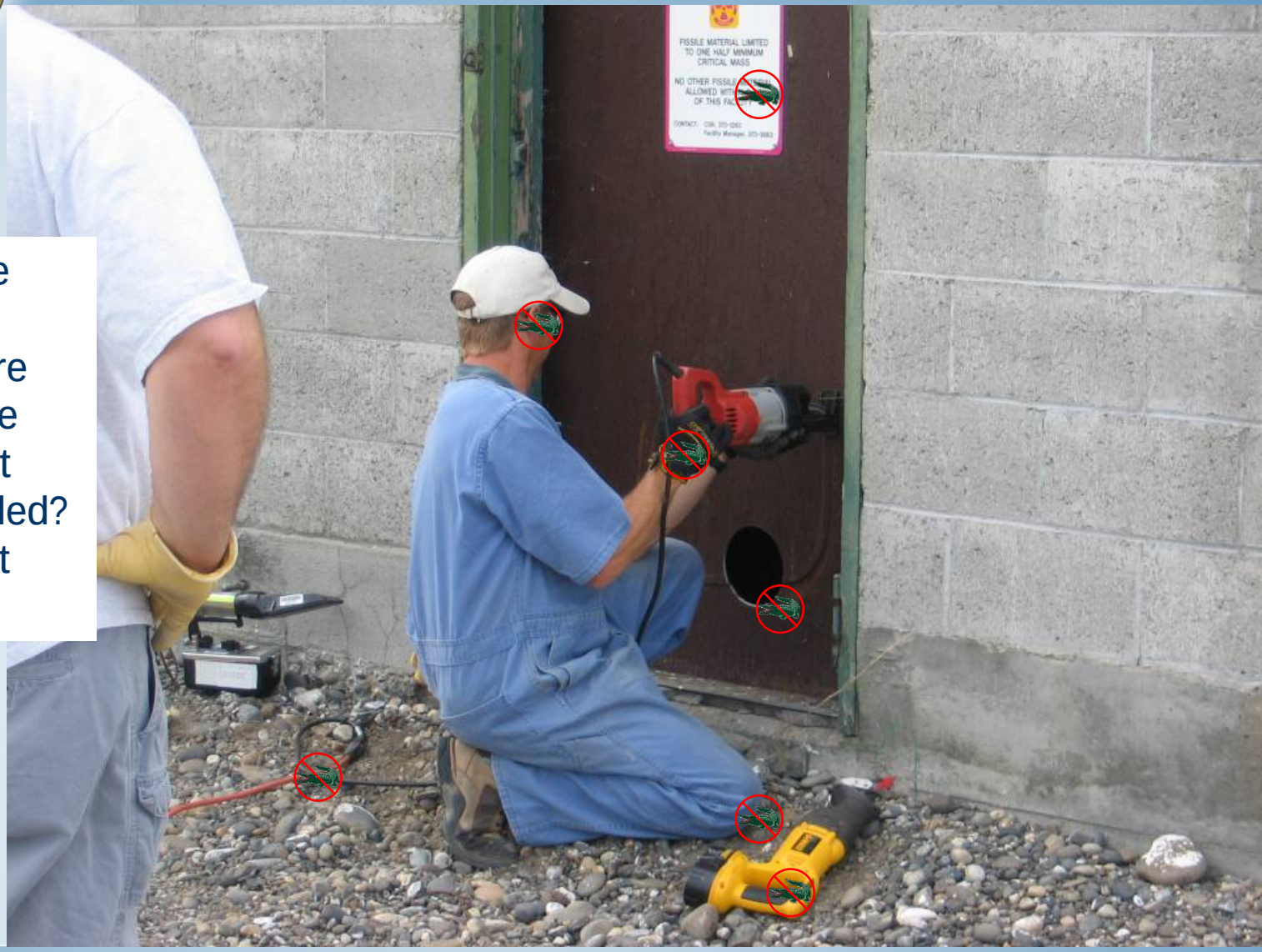
- **Applicable *SafetyStart* double-check items:**
  - **Conditions are as expected**
  - **Right material, tools, & PPE**
  - **Hazards known & controlled**
  - **Mind and eyes on task**
  - **S.T.A.R. self-check**
- **Next Step - Questioning Attitude Actions:**
  - **Pause**
  - **Notify supervisor of concerns.**
  - **Stop the work if necessary**
  - **Update AJHA if necessary.**

Scenario #2:

- You and your coworker are drilling and cutting a penetration in a door. You both participated in the AJHA and attended the pre-job. As you watch your coworker you are thinking about the hazards that he is exposed to and if they are adequately controlled.

- Review the conditions you find yourself in on the next slide.

SafetyStart



What parts of the *SafetyStart* card applies? What are the hazards in the work area? What controls are needed? What is your next step?

SafetyStart

- **Applicable *SafetyStart* double-check items:**
  - **Conditions are as expected**
  - **Right material, tools, & PPE**
  - **Hazards known & controlled**
  - **Mind and eyes on task**
  - **S.T.A.R. self-check**
- **Next Step - Questioning Attitude Actions:**
  - **Pause**
  - **Notify your coworker of your concerns.**
  - **Stop the work if necessary**
  - **Ensure that all the hazards are adequately controlled prior to restarting work.**

Scenario #3:

- **Your supervisor describes an upcoming work task. The task involves retrieving tools and sweeping the bottom of a metal container. You are asked to walk down the job so you can participate in an AJHA session.**

- **You go to the worksite and observe the conditions on the next slide.**

SafetyStart

What parts of the *SafetyStart* card applies? What are the hazards in the work area? What controls are needed? What is your next step?

SafetyStart

- **Applicable *SafetyStart* double-check items:**
  - **Conditions are as expected**
  - **Right material, tools, & PPE**
  - **Hazards known & controlled**
- **Next Step - Questioning Attitude Actions:**
  - **Review the scope of work and the necessary steps to complete the task.**
  - **Prepare for the AJHA Meeting using the *SafetyStart* double-check process**

Scenario #4:

- You have been assigned to inspect the top hatch of a water tank.
- The AJHA and pre-job briefing has been completed.
- Prior to staging your tools, you walk around the work location to determine if all the hazards have been identified and if the controls are adequate

SafetyStart

What parts of the *SafetyStart* card applies? What are the hazards in the work area? What controls are needed? What is your next step?

SafetyStart

- **Evaluate the work activities using the *SafetyStart* double-check process:**
  - **Conditions are as expected**
  - **Right material, tools, & PPE**
  - **Hazards known & controlled**
  - **Mind and eyes on task**
  - **S.T.A.R. self-check**
- **Next Step - Questioning Attitude Actions:**
  - **Pause**
  - **Correct unsafe conditions and acts.**
  - **Update AJHA if necessary.**

Scenario #5:

- **A 10 box order of copy paper has just arrived. While not assigned to do the job, you typically are the one to open the boxes and place the paper on a shelf. However, over the weekend you strain your back while skiing.**

- **You observe the conditions on the next slide and review your *SafetyStart* card.**


What parts of the *SafetyStart* card applies and what is your next step?

SafetyStart

- **Use the *SafetyStart* double-check process**
  - **Personal condition that may impact ability to work safely**

- **Next Step - Questioning Attitude Actions:**
  - **Let your manager know that your personal condition precludes you from safely performing this task.**

Scenario #6:

- You are preparing a work plan to repair a broken security gate hinge on the roof of 2721E. This facility has been used by patrol for many years.
- You access the roof to determine what is needed to repair the hinge.
- Review the conditions you find yourself in on the next slide.

SafetyStart

What parts of the *SafetyStart* card applies? What are the hazards in the work area? What controls are needed? What is your next step?

SafetyStart

- **Applicable *SafetyStart* double-check items:**
  - **Conditions are as expected**
  - **Right material, tools, & PPE**
  - **Hazards known & controlled**
- **Next Step - Questioning Attitude Actions:**
  - **Review the scope of work and the necessary steps to complete the task.**
  - **Prepare the work plan using the *SafetyStart* double-check process**

Summary / Path Forward

What's Next?

- **Issue Hazard Recognition exercises covering the remaining injury types:**
  - **Caught In**
  - **Caught On**
  - **Contacted By**
  - **Fall to Below**
  - **Struck By**

Take Away

- **Remember to look:**
  - **At the entire work environment in a holistic manner:**
    - **Area where the work will be conducted**
    - **The work process itself**
    - **The areas going to and from the work area**
    - **Other work that is ongoing in this area**

Take Away

- As you walk through life use the *SafetyStart* card
- Use the techniques learned in this workshop to identify hazards (crocodiles)
- Utilize preventive measures to mitigate hazards (crocodiles)

This will enable each of us
to return home to our families
injury free

Workshop Feedback

Please fill out a workshop feedback sheet before you leave.

Thank you for attending!

Have a great conference!