# Boston Region VPPPA Conference May 2025

*Stephen Gauthier*
*CMFS*

OSHA Training Institute Education Centers®

# Workers Memorial Day

**Honoring those we've lost and supporting those left behind.**

**April 24, 2025**

osha.gov/workers-memorial

# Prevention through Design
# “Moving from Risk Management to Hazard Elimination”

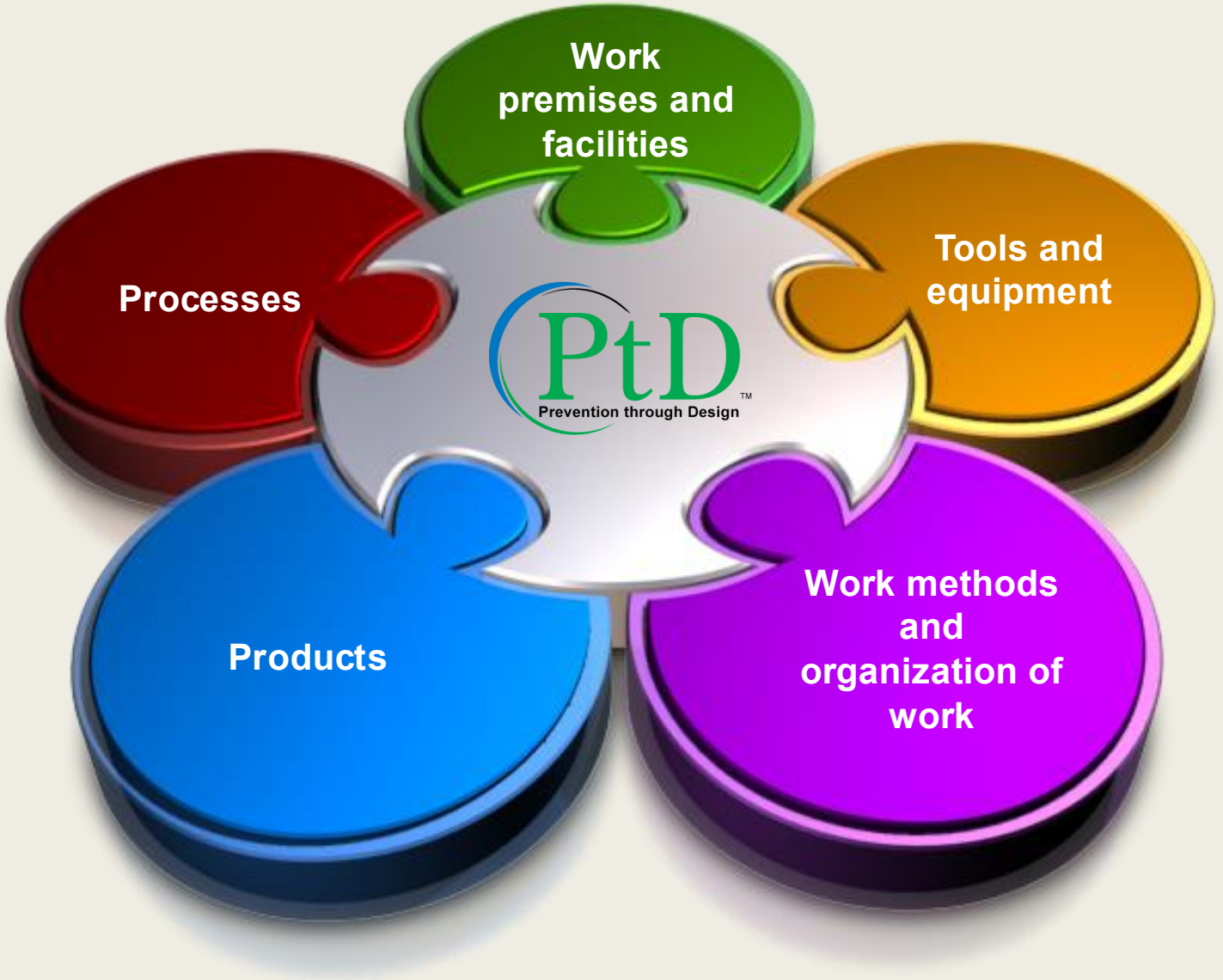
See, managing your safety management program as a journey.
A path where every challenge becomes an opportunity when unified under one platform.

# PtD Defining terms

- According to NIOSH, PtD encompasses all of the efforts to anticipate and design out hazards to workers in facilities, work methods, operations, processes, equipment, tools, products, new technologies, and the organization of work. The focus of PtD is on workers who execute the designs or have to work with the products of the design.

- The initiative was developed to support designing out hazards, which is the most reliable and effective type of prevention. PtD is important to keep in mind in all business decisions, and it requires planning and buy-in from the top-down for the most effective implementation.

**Mission:** To prevent occupational injuries, illnesses, and fatalities through the inclusion of prevention principles in all designs that impact workers



# Opportunity


**Abstract:** The opportunity approach to compliance focuses on understanding how rule-breaking behavior takes place and then tries to reduce the factors that enable rule breaking.

**Approach: R**outine activity theory and situational prevention.

- The assessments empirical evidence as to whether policies based on these theories can reduce rule-violating behaviors. Moreover, it discusses the extent to which the opportunity approach can result in displacement and adaptation effects.
- Fact finding not Fault-finding, autonomy and freedom of choice

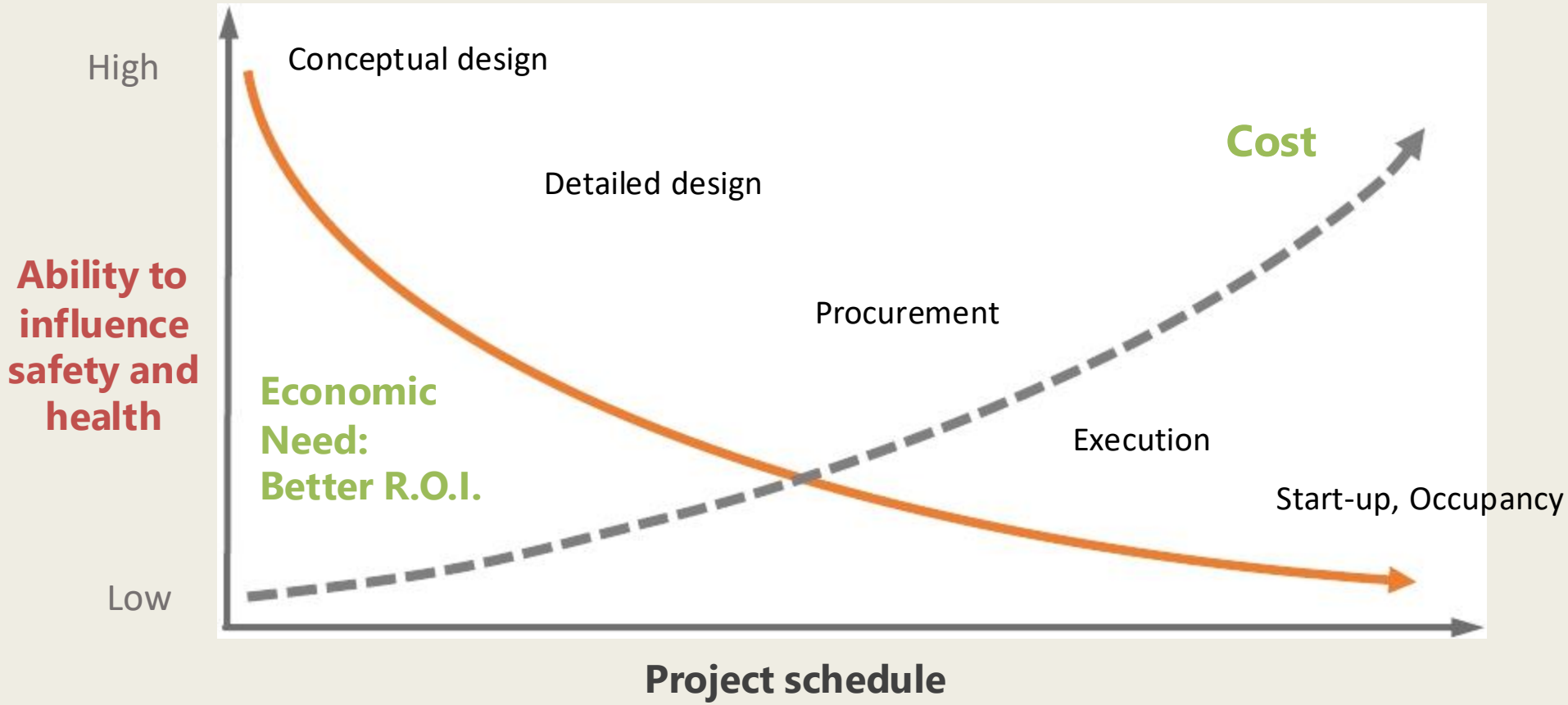
# Incentives

- PtD provides a framework to deliver on the vision of an injury and illness-free workplace
- Planning for success by integrating EH&S with key business processes
- Limited resources drive the need for increased efficiency and cost effectiveness
- PtD lays the foundation for EH&S ***sustainability (cradle to grave)***

# Benefits of PtD

- Reduced site hazards and thus fewer injuries
- Reduced workers' compensation insurance costs
- Increased productivity
- Fewer delays due to incidents
- Reduced absenteeism
- Improved morale
- Reduced employee turnover
- Increases a company's **Competitive Advantage**

# The NEED: Return on Investment




(Adapted from: Szymberski, R., "Construction Project Safety Planning." TAPPI Journal, Vol. 80, No. 11, pp. 69-74.)

# Costs Associated with a Workplace Incidents -/+

**Direct Costs:**

- ✓ MEDICAL EXPENSES
- ✓ WORKERS' COMPENSATION PAYMENTS:
- ✓ LIABILITY CLAIMS AND INDEMNITY COSTS

**Indirect Costs:**

- ✓ LOST PRODUCTIVITY
- ✓ HIRING AND TRAINING REPLACEMENT WORKERS
- ✓ INVESTIGATION AND ADMINISTRATIVE EXPENSES
- ✓ PROPERTY DAMAGE OR EQUIPMENT REPAIR
- ✓ INCREASED INSURANCE PREMIUMS:
- ✓ DECREASED MORALE AND INCREASED ABSENTEEISM
- ✓ NEGATIVE PUBLICITY AND REPUTATION DAMAGE

**Medical Avoidance Cost:**

- ✓ REVIEW PREVIOUS INTENDENTS RECURRING.
- ✓ PERSONAL PROTECTION EQUIPMENT
- ✓ ADMINISTRATIVE CONTROLS
- ✓ MEDICAL PROGRAM REQUIREMENTS

# Integrating Occupational Safety and Health

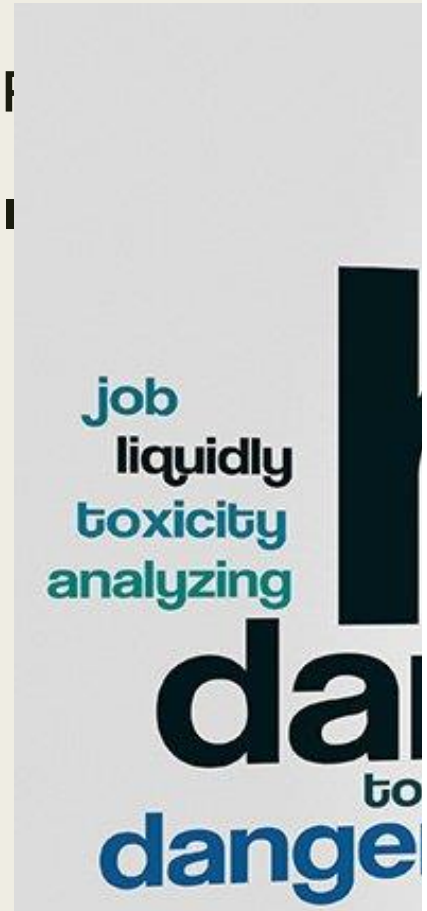
| Stage | Activities |
|---|---|
| **Conceptual design** | Establish occupational safety and health goals, identify occupational hazards |
| **Preliminary design** | Eliminate hazards, if possible; substitute less hazardous agents/processes; Establish risk minimization targets for remaining hazards; assess risk; and develop Risk control alternatives. Write project specifications. |
| **Detailed design** | Select controls; conduct process hazard reviews |
| **Procurement** | Develop equipment specifications and include in procurements; develop “ checks And tests "for factory acceptance testing and commissioning |
| **Commissioning** | Conduct “checks and tests,” including factory acceptance; pre–start up safety reviews; development to standard operating procedures (SOPs); risk/exposure assessment; and management of residual risks |
| **Start up operate / occupy** | Educate; manage changes; modify SOPs |

# The Power of Procurement

**Pre-specification Meeting**

- The most important stag chine tool is the technical specificati rements and options the team has ide aterials or machine tool for the com ...
- Product Stewardship:
  - ✓ is *a concept where thos , sale, use, and disposal) share the resp d ensuring safe use*

# Take account of the following:




# Hazards to take into consideration prior

- Electrical - capacitors; high voltage; static
- Hydraulics - high pressure fluids
- Pneumatic - high pressure steam, gases, vapors
- Engulfment - oxygen deficient atmospheres; radiation
- Fire/explosion - extreme heat/cold; noise; vibration
- Work at Height – gravity - falls
- Weather;
- Ergonomics;
- Visibility

***Competent Person: someone with the necessary knowledge, training, and experience to identify and address workplace hazards, and who has the authority to take corrective actions.***

# Emergency **Safe Stop**

Safe Stop is probably the most one important safety action of all when operating self-propelled machinery such as:

- Tractors
- Cranes
- JLG’s boom lifts
- Powered industrial trucks
- Trucks
- Fishing boats, gear hauling winches

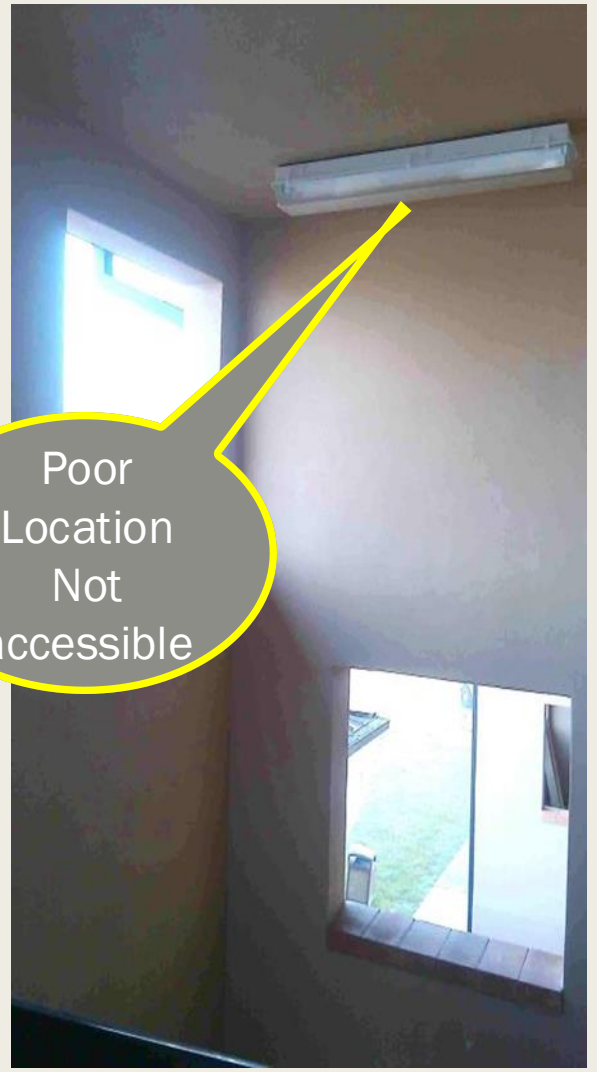
These essential simple steps can be applied across all industries.

# Not Focusing on Design is a Risk Factor

Australian Study, 2000–2002

- Main finding: design contributes significantly to work-related serious injury
- **37%** of workplace fatalities are due to design-related issues
- In **another 14%** of fatalities, design-related issues may have played a role

[Driscoll et al. 2008]



# Not Focusing on Design is a Risk Factor

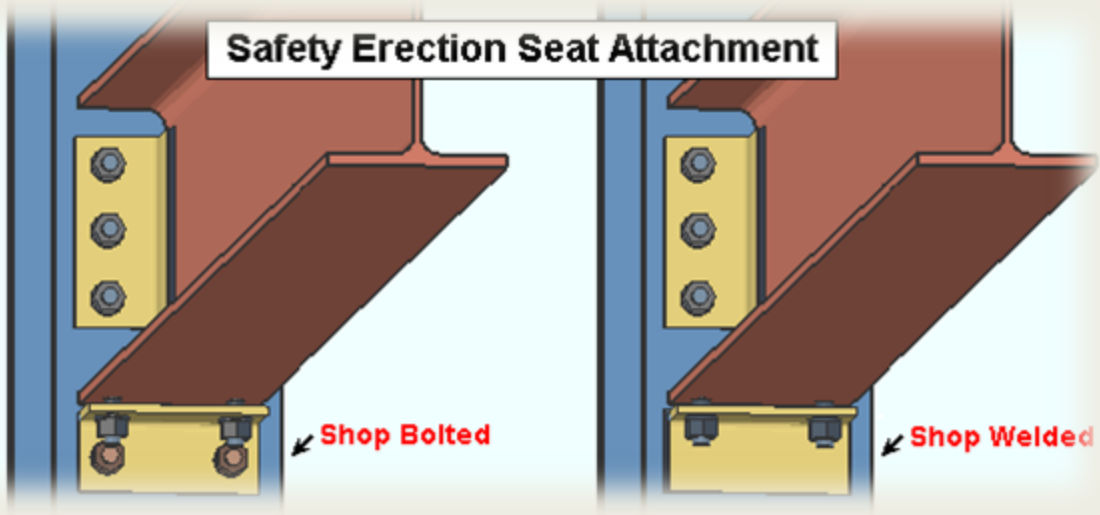
**HAZARDS: FALLS FROM STRUCTURAL STEEL**

**Predrilled Steel:**

- Specify holes in columns at 21 and Design at column 42 inches above the floor slab.

**This predesign connections.**

- The safety seats feature makes it easy and safer to install hanging connections



# Focus on The Installation Phase

**Create the Machine Tool Installation Specification:**

- The *Machine Tool Installation Specification* is a document that details the agreed upon items to install the machine tool to Original Equipment Manufactures (OEM) standards by the buyer or an independent installation company.
- *Develop a Product Stewardship process with suppliers as part of PtD*

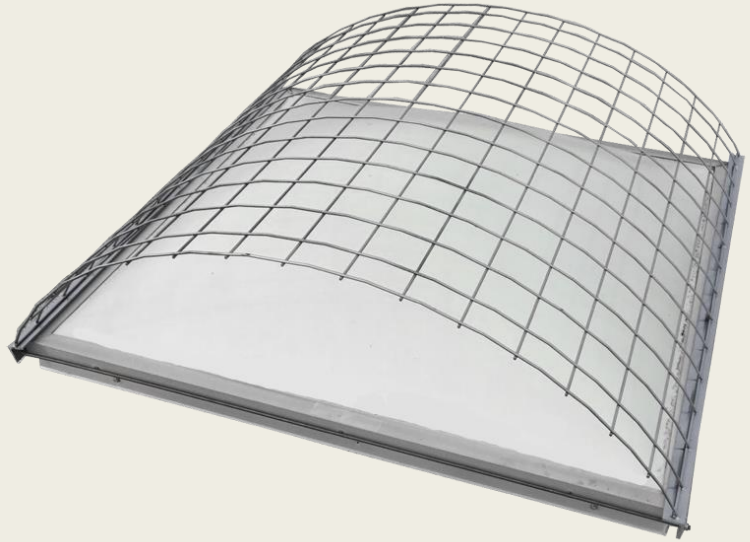
# Personal Protective Equipment, With Warnings!

**Appropriate (PPE) must be available and used.**

- Many entanglement accidents occur because of loose clothing or gloves coming into contact with rotating parts, tools and movement of the machinery.
- Often maintenance work increases the risk level e.g., dust exposure levels may be significantly higher for maintenance workers meaning respiratory protective equipment is required.

# The Power of Additional Contract Provisions

- In the event the contractor must work on a roof or similar exposure they are required to guard all existing skylights to prevent falls.
- If skylights are installed or replaced, they must be designed to support a person's weight.



# Restricted Vision Rough Terrain Lifts


**John J. Hanson Sr.**

**Obituary**

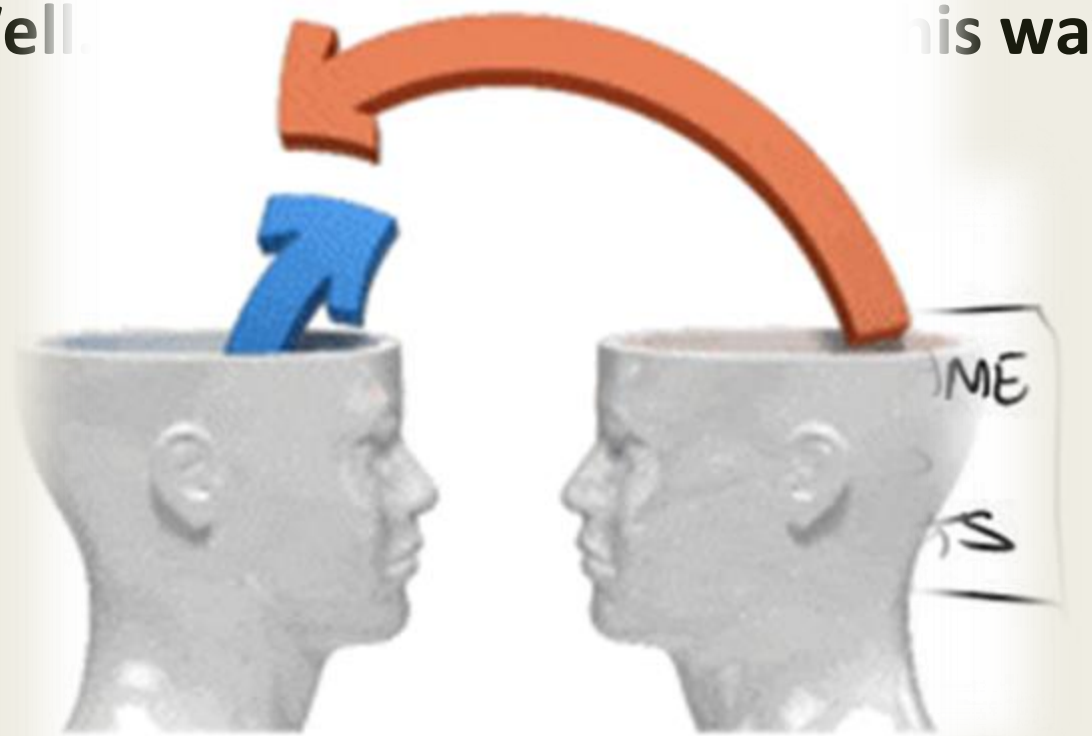
THOMAS P. MOONEY FUNERAL HOME
11 Elm Street
Nassau, NY 12123
(518) 766-3626

Hanson, John J. Sr. CASTLETON John J. Hanson Sr., 82, passed away suddenly Friday, October 7, 2011. Born March 20, 1929 in Old Chatham, N.Y.,

All Powered Industrial Trucks (rough terrain) must be designed to allow operator unobstructed vision to the left and the right.

# Redesign and Rethinking
# Some Examples

**“Well … is way…”**



# Conventional Table Saws

## $1.5 Million Award in Table Saw Injury Lawsuit

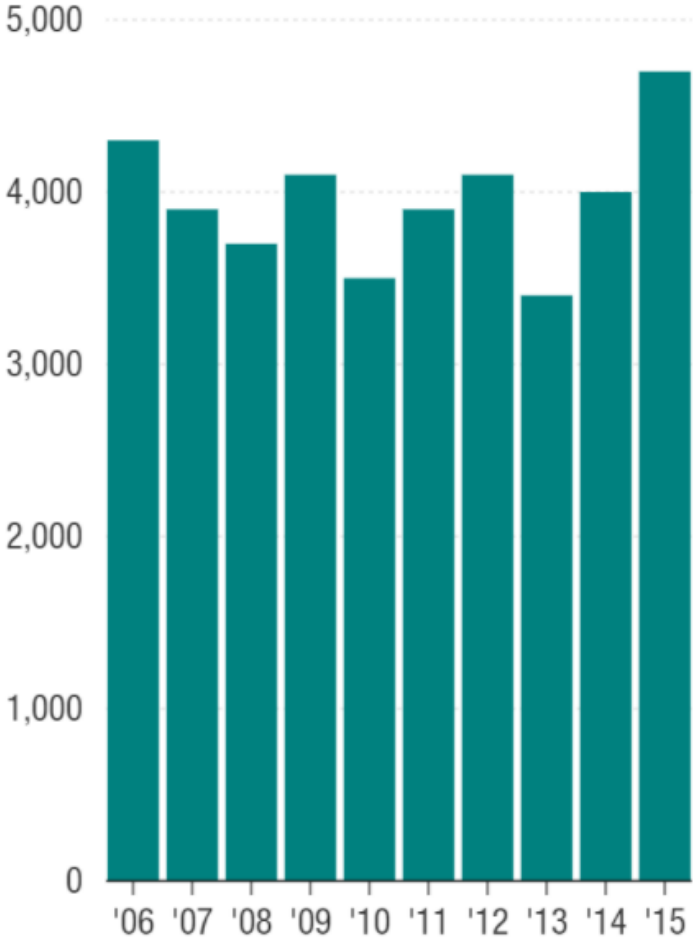
In March 2010, a jury awarded Carlos Osorio $1.5 million in damages he suffered after using a table saw. He filed a table saw lawsuit after his lawyer saw a demonstration of the SawStop, a safety device that can detect when the blade comes in contact with flesh, and stops the blade. The table saw lawsuit was filed against One World Technologies, Inc., the makers of Ryobi table saws.

Table Saw Injury Lawyers - Ferrer, Poirot & Wansbrough
https://www.lawyerworks.com/personal-injury/table-saw-injury-lawyer/ If you or someone you love suffered **table saw** injuries, the **lawyers** at Ferrer, Poirot & Wansbrough want to help you get the compensation you deserve for your medical bills, lost wages, and pain and suffering. We know that many **table saw** manufacturers often put profits over safety when designing their products, and we ...

Striving For A Safer Table Saw : NPR
https://www.npr.org/series/137392806/striving-for-a-safer-table-saw
Table saws are the country's most dangerous commonly used power tool. Forty-thousand Americans end up in emergency rooms every year with injuries — 4000 of them suffer amputations, according to the Consumer Product Safety Commission. Safety advocates say a new technology could prevent most of those injuries.

# Table Saws

| WORKER – FINGER AMPUTATIONS BY TABLE SAW | COST |
|---|---|
| Direct Cost to Business Region | $504,846.00 |
| Total Profit for Project | $3,309.00 |
| Cost of one SawStop© Table Saw | $1,779.00 |
| Additional Sales Needed to Recover Injury Cost | $16.8 Million |




The industry's efforts to date have failed to reduce serious injuries. So the Consumer Product Safety Commission staff says a new rule is needed to make table saws safer.

*NPR/Consumer Product Safety Commission*

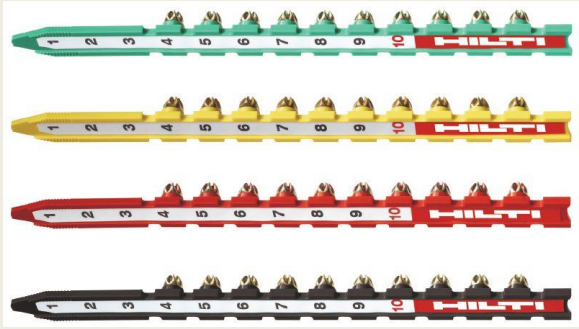
"To this day the company says SawStop has never been involved in a serious table saw accident and has documented more than 5,000 'finger saves.' He estimates his saws are '99 percent' effective at preventing injuries."

*Morning Edition*, NPR, August 10, 2017

# Powder Actuated Tools

**“**The results suggest an oversight in health information. Currently, many workers may be overexposed to lead from these tools. The tools have been used for decades without protective equipment; overexposures likely occurred. Moreover, the results indicate that workplace parties should question the accuracy of health information on SDSs.”

“…exceeding the TLV by 7.0 and 4.3 times”




Clean-Tec

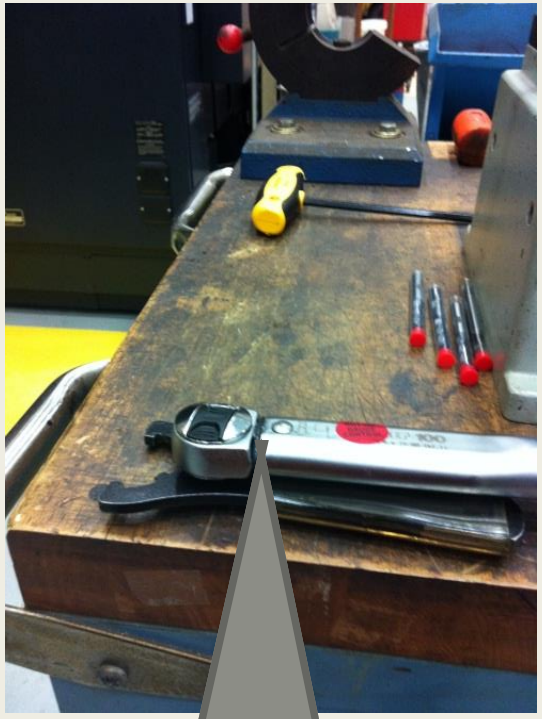
“Features - Free of lead and other heavy metals”

# PtD Intervention: Manufacturing Tooling

## MSD's Repetitive Motion

### Product Stewardship Deliverers New Tooling

Short Handle provides poor leverage and inconsistent tightening

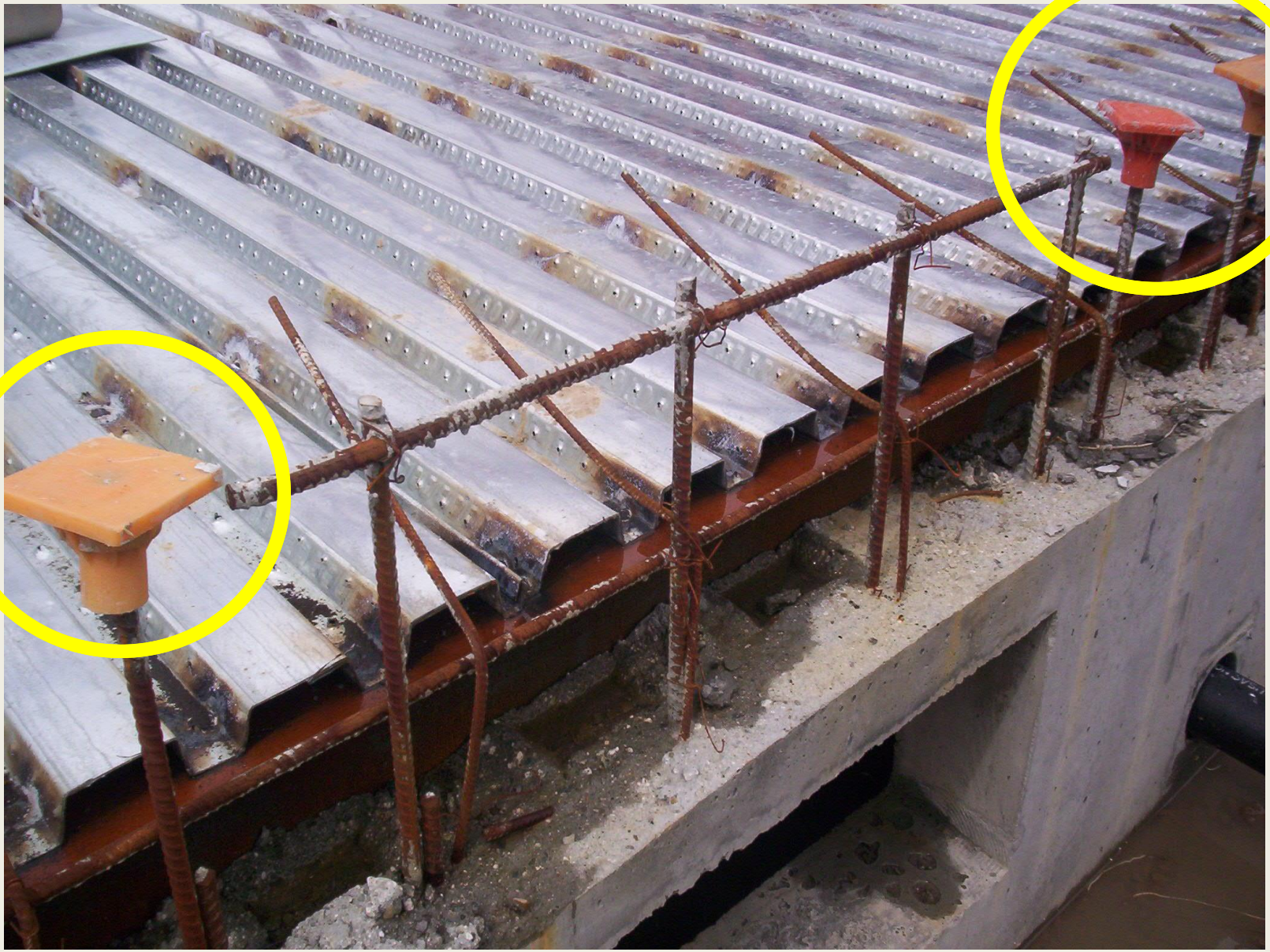


Spanner wrench had provision for added torque wrench

Torque wrench provides greater leverage and consistent tightening

# Rebar Protection/ROI as the Motivator

Rebar impalement refers to the hazard of workers being impaled by exposed or protruding rebar (reinforced steel bars) on construction sites. This can occur when workers fall onto, stumble, or are otherwise exposed to the sharp ends of rebar. To prevent this, OSHA requires that rebar and other projections be guarded to eliminate the impalement hazard.



Lattice Protection

Rebar Caps (few in the area) and ineffective addition of a horizontal bar – requires labor, materials and maintenance- hazard exists during final pour for the impalement still exists. Other hazards are these are often cut to length at the site using gas-powered chop saws or torches introducing hazards

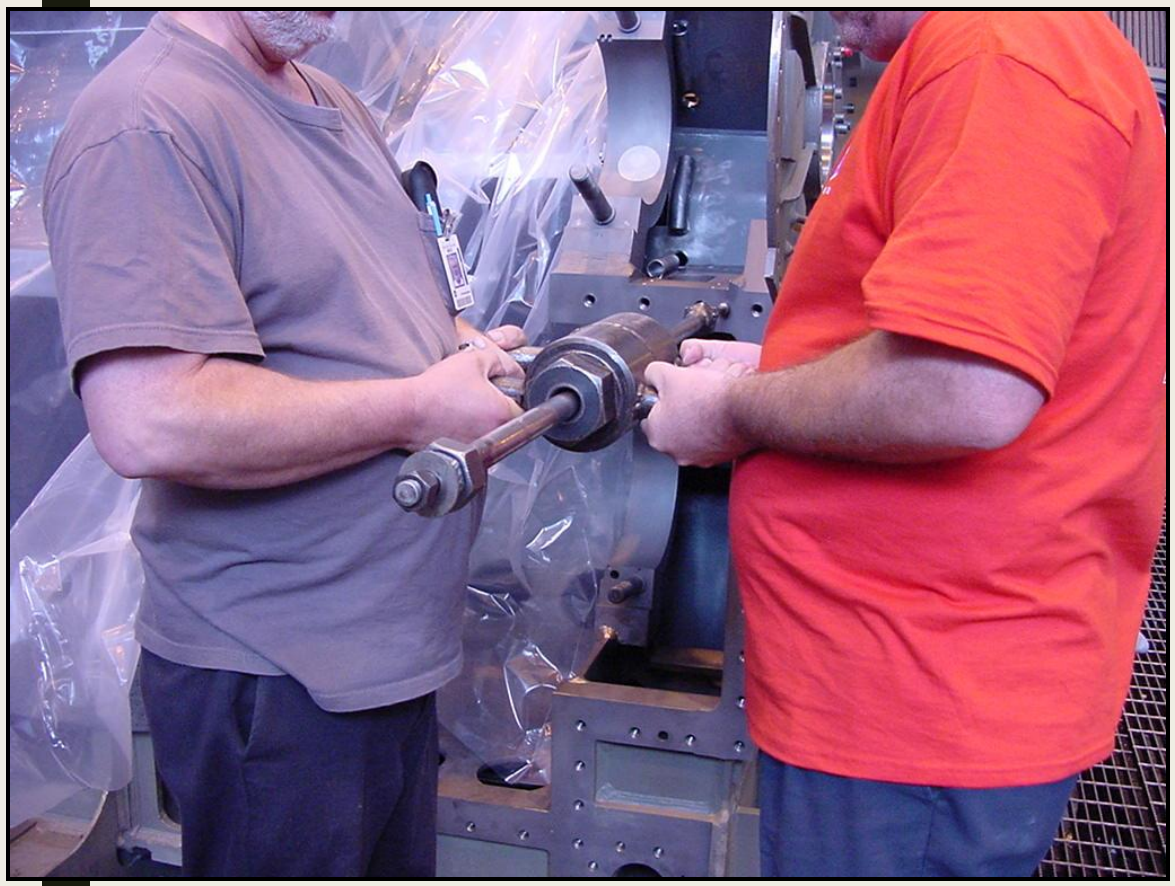

Carnie Caps (Manufactured)

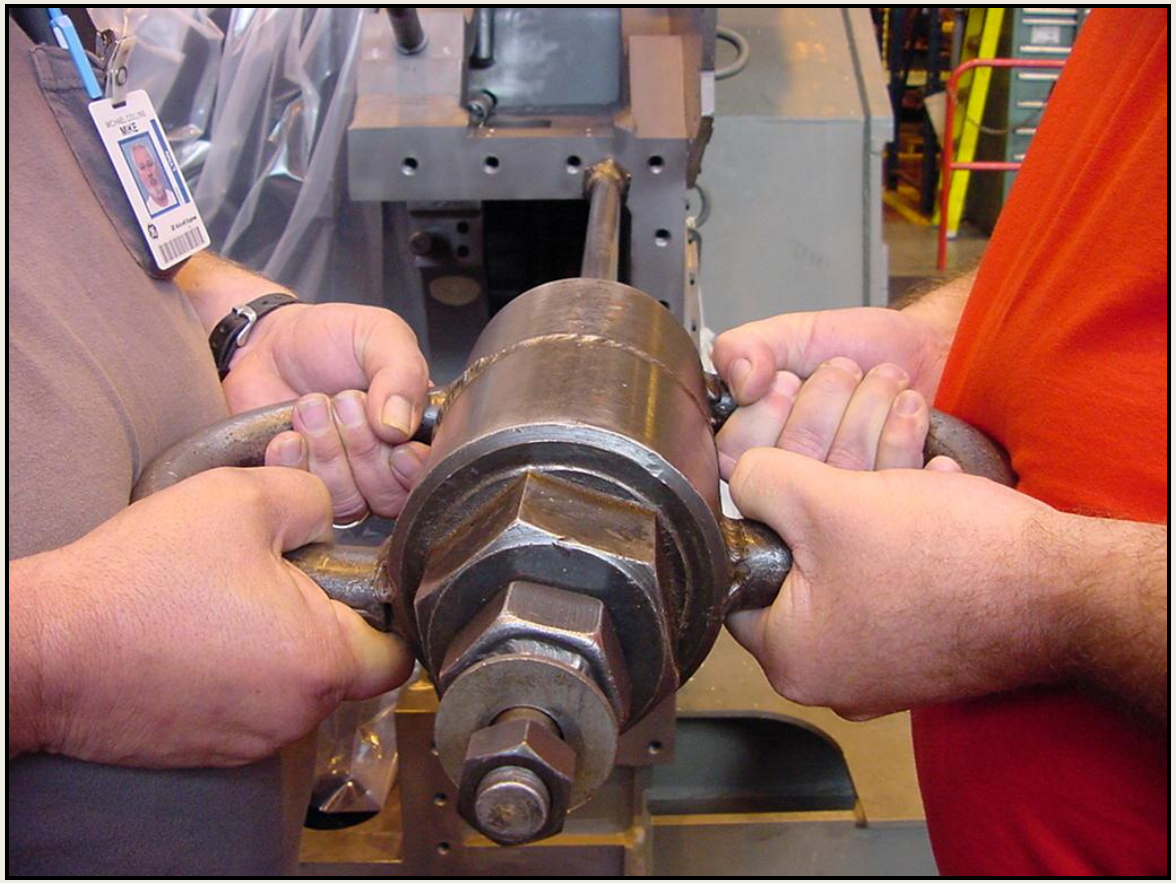

Common Trough Covers


Candy-Cane Protection


| *16' -2 rows of 24 (48) Impalements (initial cost) | Candy-Cane | Carnie Cap | Wood Trough | Rebar Cap |
|---|---|---|---|---|
| Device or fasteners | $0.51 | $12.04 | $1.00 | $60.00 |
| Lumber needed | | $13.04 | $42.16 | |
| Labor (55/hr)install/Remove/Store or assemble | $0.35 | $21.84 | $15.90 | $25.48 |
| Total Cost | $41.28 | $46.92 | $59.06 | $85.48 |
| **Cost per impalement protected** | **$0.86** | **$0.97** | **$1.23** | **$1.78** |
| | 0.00% | 12.00% | 43.00% | 106.00% |

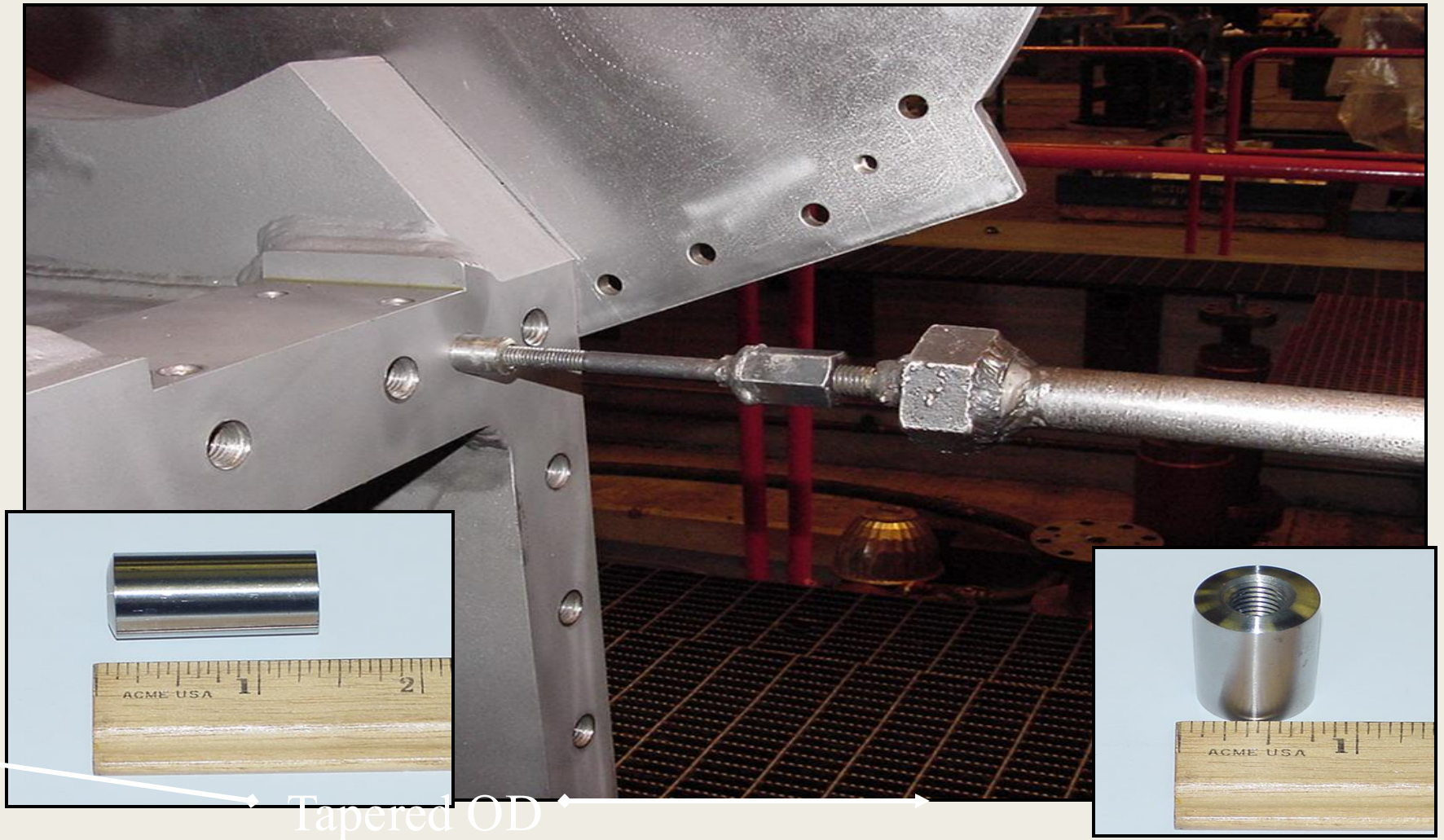
# Tapered Pin Puller:

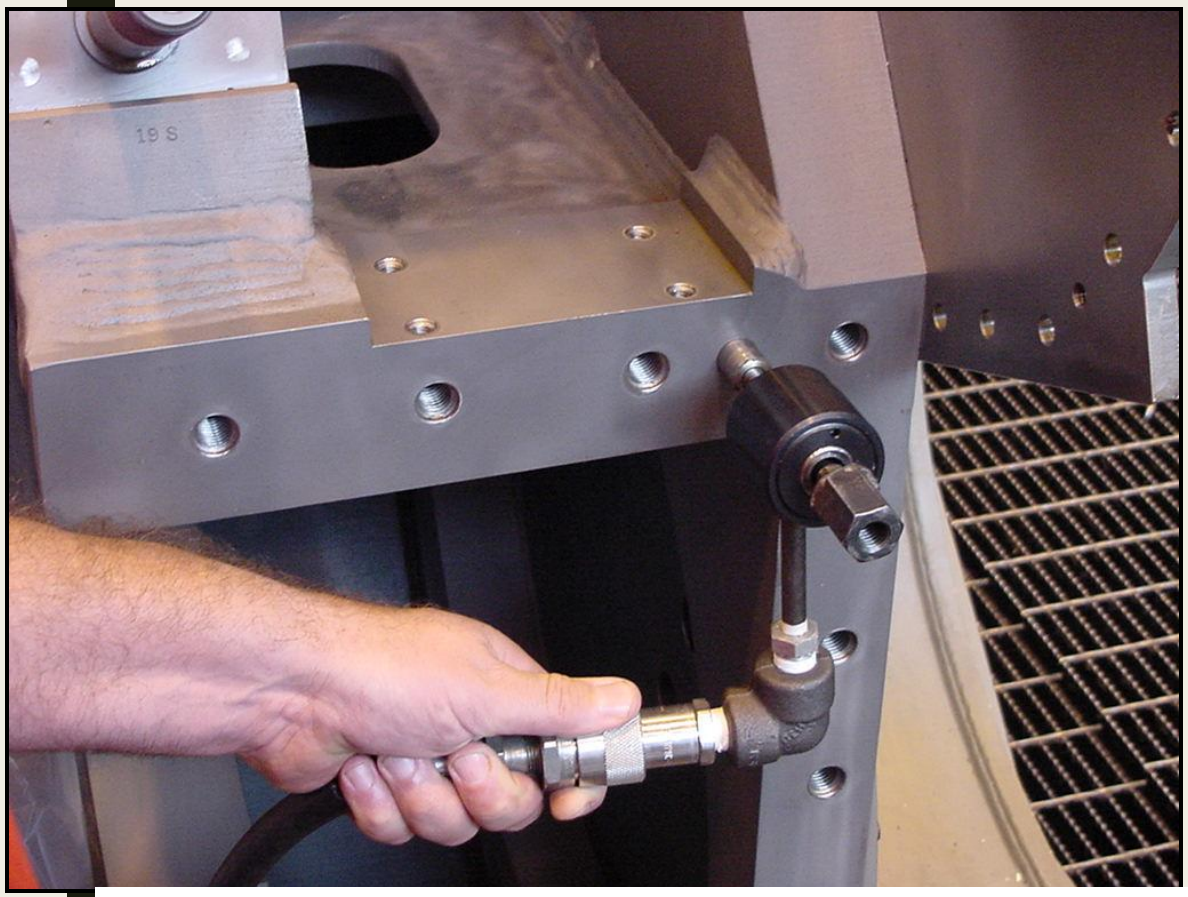


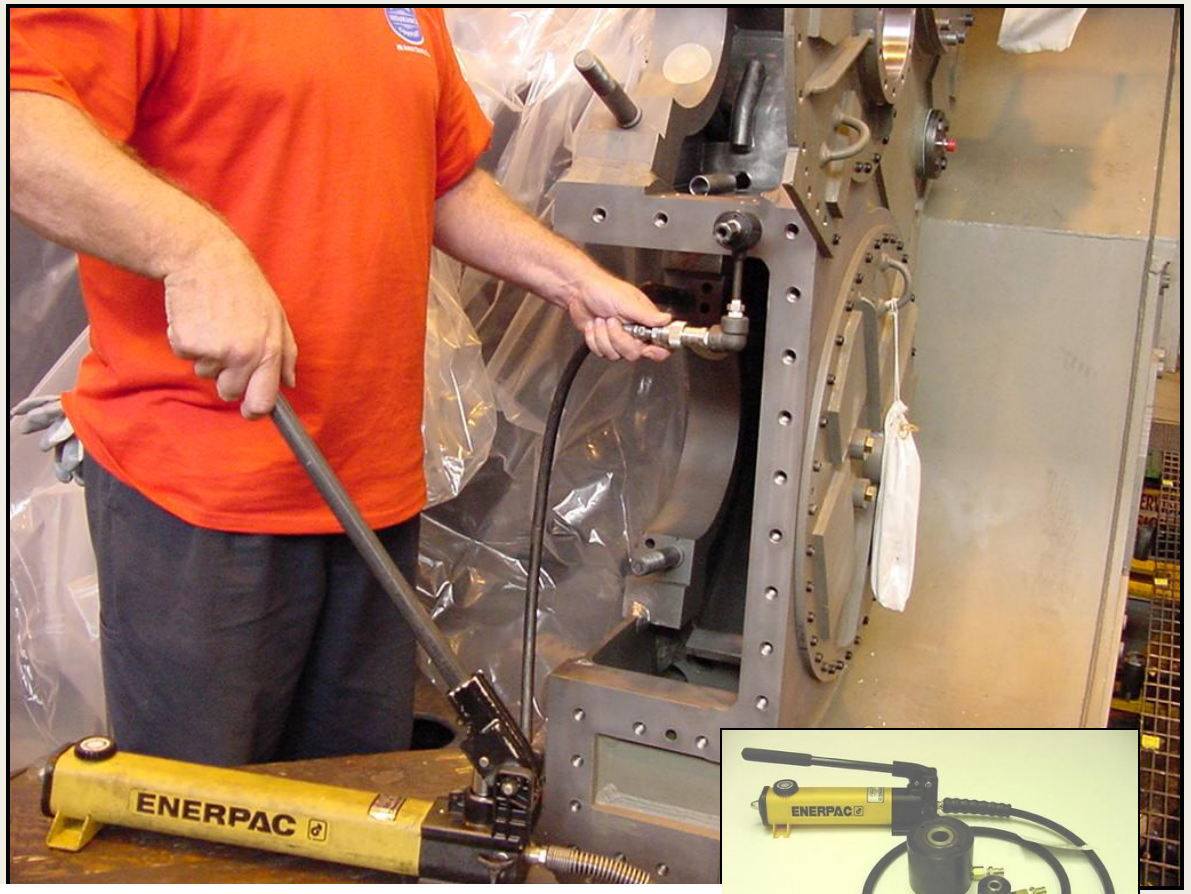


Homemade Tapered Pin Puller 56 lbs.

# Case and Pin puller











Jergens Industrial Supply

#121-060404 Cylinder, ½ Hollo-Rod Thru Hole Single-Acting .24 Stroke

# Steel Studs

- “Employee was receiving a piece of spiral duct work that was being passed from a lower level up to him. The duct work made contact with the employee’s forearm resulting in a laceration requiring stiches”
- “Employee cut his hand when he dropped a bracket and went to grab it. His hand hit stud.”


“The EDGE™ keeps injuries down and my crews working. Injuries cost money and this is the safest drywall stud I’ve ever handled.”
*-Nick Latino, Owner of Drywall Specialties, Inc. (New Orleans, LA)*
“The rolled edge combined with milder steel makes The EDGE™ safer and easier to work with than any other product we’ve tried.”
*-John Punis, Vice President of Prince Carpentry, Inc. (Manhasset, NY)*

An electrician cut his arm on a metal stud while relocating a fire phone on the 2nd floor near the elevators. The employee received stiches.

# Effectiveness of PtD Intervention

Once a problem has been identified as needing intervention, the process of designing an intervention can be broken down into these crucial steps:

(1) Defining and understanding the problem and its causes;

(2) Identifying which causal or contextual factors are modifiable: which have the greatest scope for change and who would benefit most;

(3) Deciding on the mechanisms of change;

(4) Clarifying how these will be delivered;

(5) Testing and adapting the intervention; and

(6) Collecting sufficient evidence of effectiveness to proceed to a rigorous evaluation.

Keene STATE COLLEGE

Wisdom to make a difference.

**Course Description:** What you'll learn in this course will save lives. Prevention through Design (PtD) is best defined as designing out or eliminating safety and health hazards associated with processes, structures, equipment, tools, and/or work organization.

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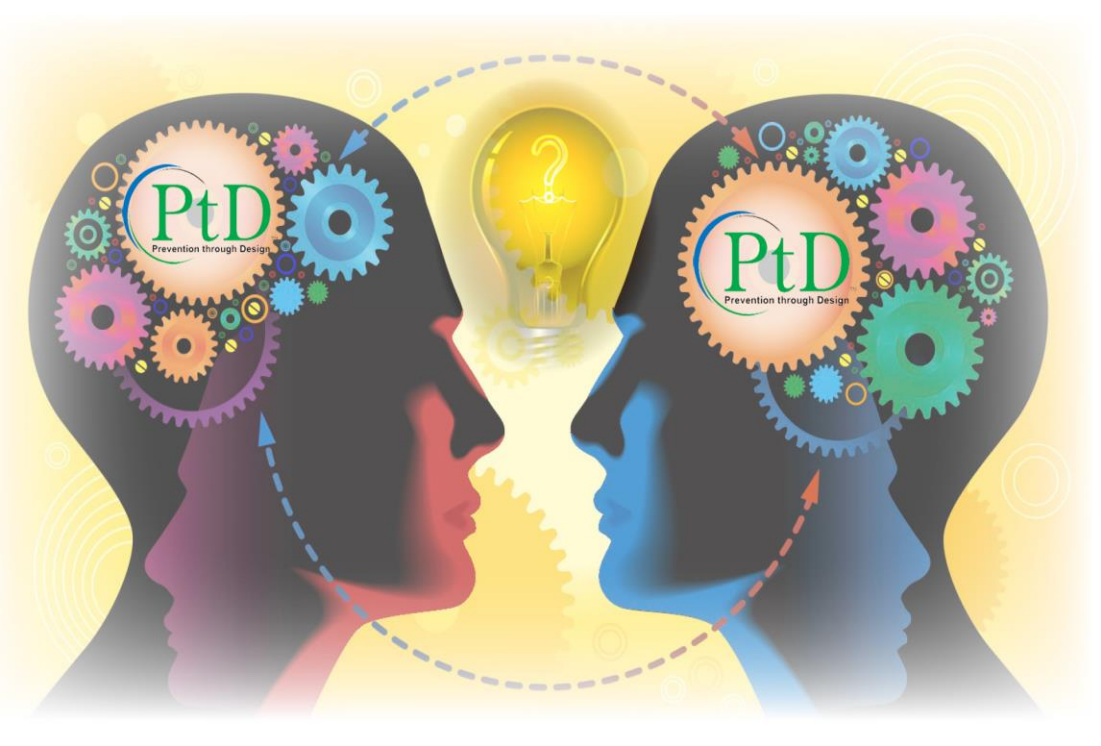
# NCSH 488:
# Prevention Through Design

*Moving From Risk Management to Hazard Elimination*



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