

Ergonomics in the Press Room

Precision Metalforming Association (PMA)

Eagan, MN

September 28, 2006

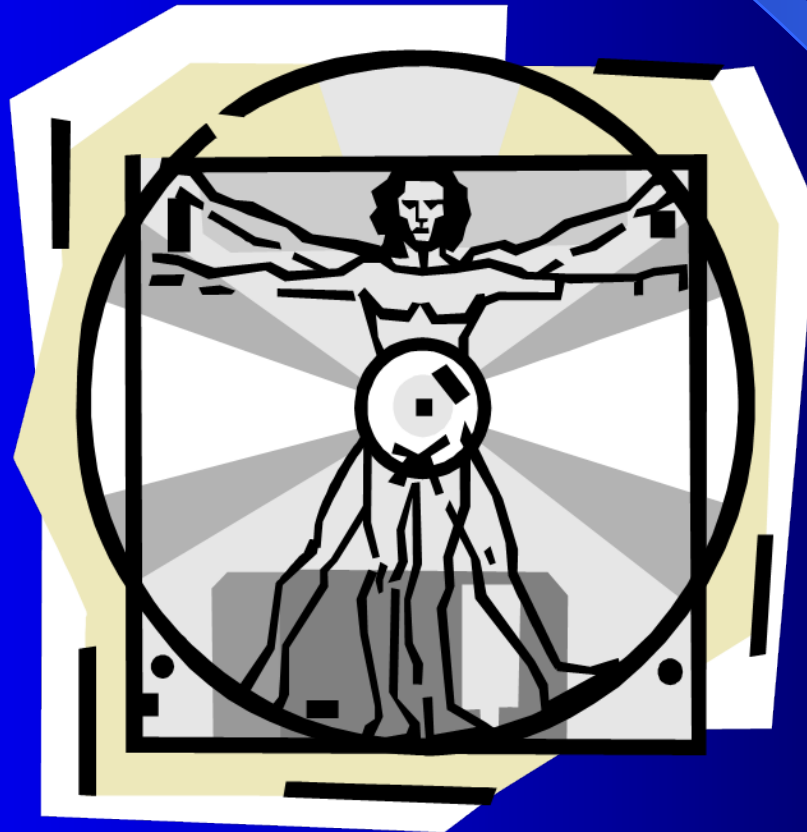


Occupational
Safety and Health
Administration

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Ergonomics

A Comprehensive Plan



My Background

- Mary Bauer, CIH, CSP
Certified Industrial Hygienist
Certified Safety Professional
- 21 years w/ OSHA
 - 20 Compliance Officer
 - 1 Compliance Assistance Specialist
 - All in Eau Claire, WI
- 1000 + Inspections
 - 150-200 w/ Metal Forming Equipment

ERGO In The PRESS ROOM

- Background to Ergonomics
- Status of OSHA Enforcement
- Essentials of an Ergonomic Program
- Risk Factors for Ergonomics
- Controls Measures
- Additional OSHA Information
- Question and Answers



Ergonomics: Definition

The science of fitting the job to the worker.

Ergonomics is the practice of designing equipment and work tasks to conform to the capability of the *worker*.

“Worker” : Vary Size, Shape, Ability



R.I.P

OSHA
ERGO
RULE

January, 2001

Signed into Law by
President Clinton

Rescinded Days Later by
President Bush

It's Not Dead Yet!



4/5/02 to Present

Strategy for Success:

- **Goals:**
 - **Decrease Ergonomic Hazards**
 - **Reduce Injuries and Illnesses**
 - **Ensure Flexibility and Encourage Innovation**
 - **Help Employers Prevent MSDs**

Comprehensive Plan on Ergonomics – A 21st Century Response:

- Industry and Task - Specific Guidelines
- Enforcement
- Outreach and Assistance
- Advancing Research



OSHA's Policy

- **Why Guidelines instead of a Standard?**
 - **Congressional Review Act, prohibits the agency from issuing a rule that is substantially the same as the former.**
 - Variety and Combination of Different Hazards;
 - Exposure to Hazards is not Readily Measured in Some Cases;
 - Exposure-Response Relationship is not Well Understood;
 - Cost and Feasibility of Abatement Measures Uncertain; &
 - Difficult to Prescribe Abating in a Single Rule.
 - <http://www.osha.gov/SLTC/ergonomics/faqs.html#Guidelines>

Principles Behind the Strategy

- **Injury Prevention**
- **Sound Science**
- **Incentive Driven**
- **Flexibility**
- **Feasibility**
- **Clarity**

Industry and Task-Specific Guidelines:

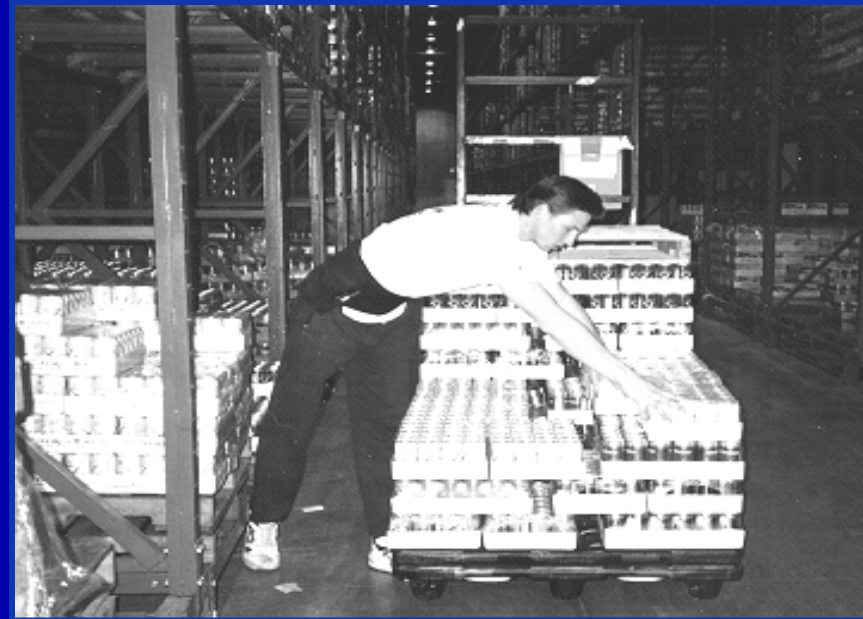
- **Work with stakeholders to develop industry and task-specific guidelines for industries and particular hazards.**
- **Poultry**
- **Nursing Home**
- **Retail Grocery**
- *****Shipbuilding*** Under Contest**

Enforcement:

- **Crack down on bad actors by coordinating inspections with a legal strategy**
- **Plan designed to target prosecutable ergonomic violations**
- **Special ergonomics inspection teams that work closely with DOL attorneys and experts to successfully bring 5(a)(1) prosecutions**

OSHA Inspections

- General Duty Clause Citations
- Ergonomic Hazard Alert Letters (EHAL)
- Ergonomic Acknowledgement Letters



General Duty Clause Citations

- The General Duty Clause describes the employer's obligation to:
- "furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."
- This clause from the OSH Act is utilized to cite serious hazards where no specific OSHA standard exists to address the hazard, as is the case with ergonomic stressors.

Enforcement Elements of a 5(a)(1) Case

- **Is it a recognized hazard?**
- **Is it likely to cause death or serious injury?**
- **Is there a feasible means of abatement?**
- **Is there exposure to a hazard?**

Enforcement Focus of 5(a)(1)

The focus will not be on employers who have implemented effective ergonomics programs or who are making good-faith efforts to reduce ergonomic hazards.

Outreach and Assistance:

- **Provide tools to help workplaces reduce and prevent ergonomic injuries:**
 - **Provide expertise to assist businesses and workers**
 - **Support programs through training grants, curriculum development and other means**
 - **Design compliance assistance tools, new partnerships and recognition programs**
 - **Encourage others to develop best practices**

- **eTools for Ergo:**
 - **Alliances**



Outreach and Assistance: Alliances

- **Flexible w/ Few Formal Program Requirements**
- **Easy Implementation Over Shorter Time Frame**
- **Training and Education**
- **Outreach and Communication**
- **Promoting the National Dialogue on Workplace Safety and Health**

Outreach and Assistance: Ergonomics Alliances

- **Airlines Alliance**
- **American Meat Institute**
- **Printing industry**
- **Society of Plastics Industry**
- **American Industrial Hygiene Association**
- **American Society of Safety Engineers**



Outreach and Assistance: Strategic Partnerships

- **Industry Partners to:**
 - **Identify most Common Workplace Hazards and Risks Through Worksite Analysis**
 - **Prevent and Control the Hazards**
 - **Conduct Training**
 - **Measure Results**
 - **Publicize Best Practices**

Foundry Partnership

- **6 Foundries in Northeastern, Wisconsin: 2003**
- **Significant Reductions in:**
 - WC Costs: 2 Foundries > 75% (\$ 115,000 Saved!)
 - Injury/Illness Rates: 36 Months w/o Lost Time Case
- **Ergo Improvement Costs were Off Set by:**
 - Higher Productivity
 - Employee Morale Improved
 - Less Personnel on Some Jobs
- http://www.osha.gov/dcsp/success_stories/partnerships/region5/261_fep_success.html

Research

- **Establish a national advisory committee and work with NIOSH to address research needs**
- **Identify gaps in research related to the application of ergonomic principles in the workplace**
- **Work with NIOSH and through the NORA process to encourage research in needed areas**

Ergonomic Management Program

- Mgmt Commitment & EE Involvement
- Worksite Analysis: Identify Problems
- Hazard Controls: Implement Solutions
- Training
- Medical Surveillance

Benefits to Employers

- Compensation Costs Lowered
- Productivity
 - Decreased Defective Parts
 - Decrease in Personnel Needed
- Morale increased – HR Concerns
 - Employee Injuries Reduced
 - Employee Turnover Declined
 - Absenteeism Reduced
 - <http://www.osha.gov/dts/osta/oshasoft/safetwb.html>

Management / Labor

- Top Down - Bottom Up Approach
- Many Times the Worker Knows Best
- Workers Accept Changes When Involved
- Employee Involvement:
 - Committees
 - Informal Conversation
 - Questionnaire
 - Symptom Survey

Kaizen Event

- The company had incorporated the Japanese concept of Kaizen (meaning "gradual, orderly and continuous improvement") into the workplace in the 1970's. The Kaizen concept focused on continuous improvement of the workplace by eliminating waste in all systems and processes. The ergonomics training was viewed as an effort to reduce "wasteful motion in work activities."
- Focused Task Force of All Affected Parties
- “Work Smarter – Not Harder”

Who Needs to be Involved?

- Purchasing
- Sales / Bidding
- Engineering
- Maintenance
- Tool & Die Makers / Designers
- Production Leads
- Production Workers

Worksite Analysis Statistics and Planning

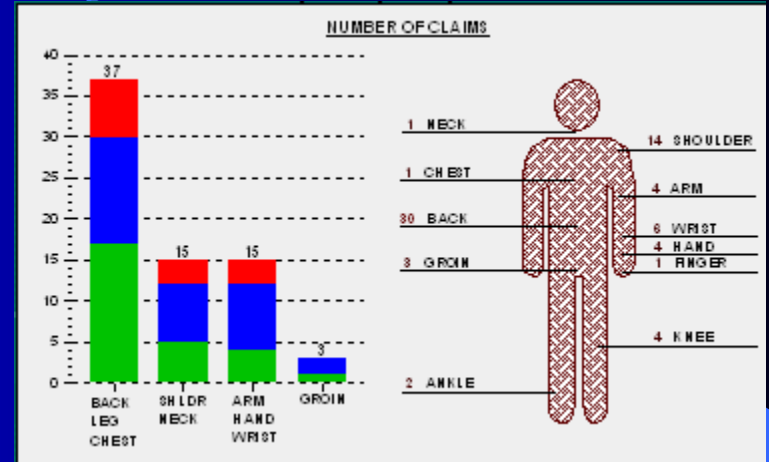
- **Identify Problems**

- Reactive
 - Trends, Injury Rates

- **Proactive**

- Site Survey for Risk Factors
- Planning and Designs for New Work Cells
- Re-Evaluations

- **Benchmarks & Measurable Goals**



Work Site Analysis

Breakdown Task / Body Parts

- Tasks/Duties in the Press Room
 - Die Setting
 - Part to the Machine
 - Part Processed
 - Part to the Next Step
 - Scrap / Lubricating / Debris / Clean Up
 - Maintenance

Ergonomic Risk Factors

- Forceful Exertions
- Repetitive Movements
- Static or Confined Postures
- Non-Neutral Postures
- Over Shoulder Work
- Heavy Lifting
- Vibration

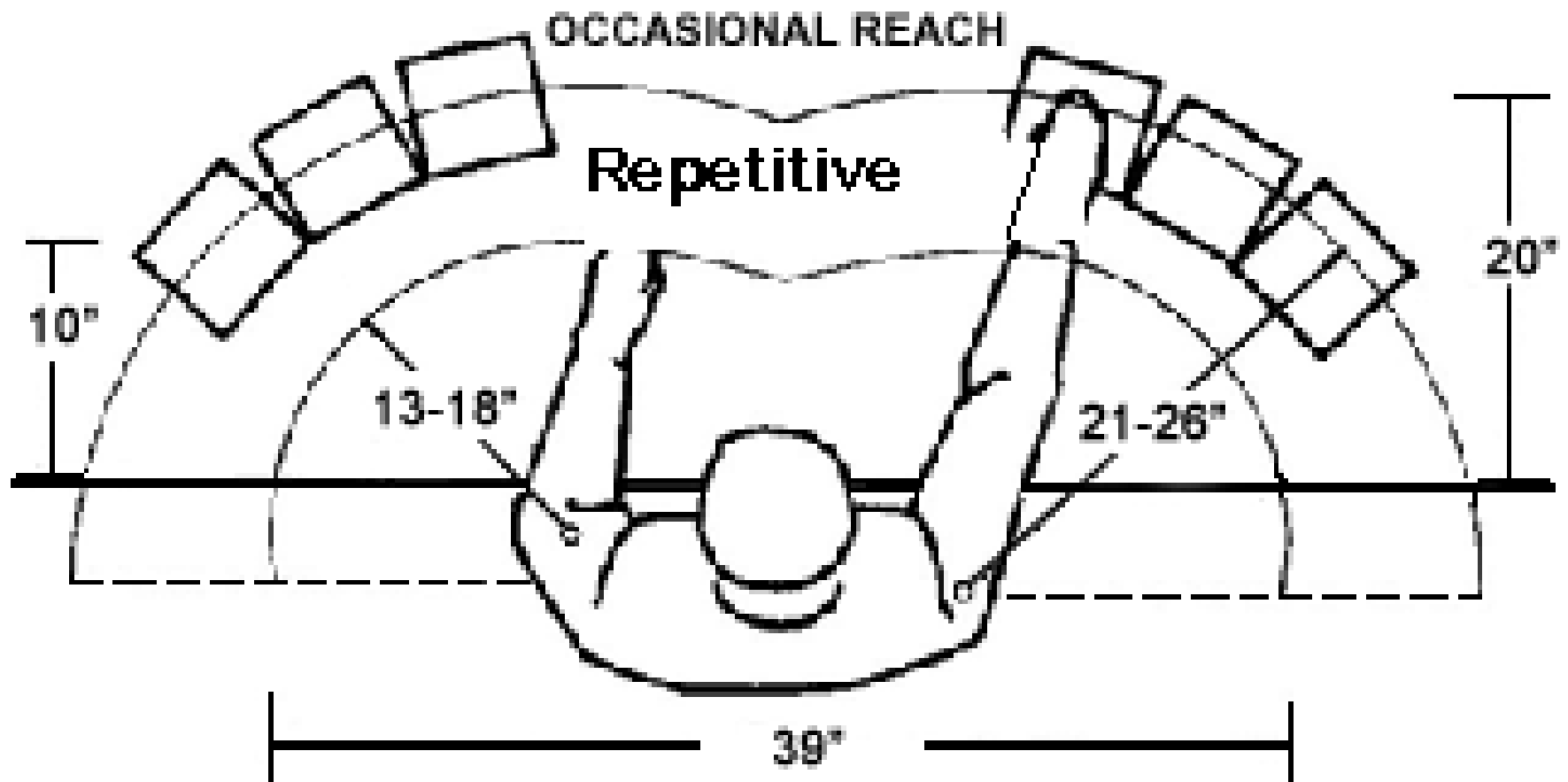
Ergonomic Risk Factors

- Force
 - Lifting/Lowering
 - Pushing/Pulling
 - Insertion Tasks
 - Carrying
- Awkward Positions
 - Above Shoulders
 - Below Knuckles
 - Reach
 - Obstacle Clearances



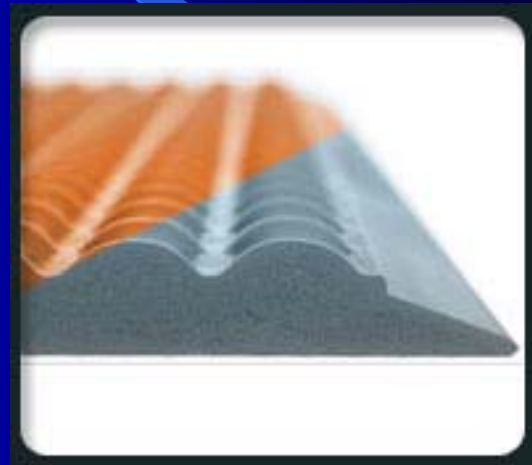
**Example of pinching grip.
Notice pressure on thumb and
index finger.**

Ergonomic Risk Factor Reaching Envelope



Ergonomic Risk Factors

- Posture
 - Prolonged Standing
 - Forward Bending
 - One leg – foot control
- Repetition
 - “How often.....?”
- Duration
 - “How long....?”



Anti-Fatigue Mats

Controls: Implementing Solutions

- Engineering
- Work Practice
- Administrative
- Any Combination of the Above

Hierarchy of Controls

- Engineering Controls
 - Eliminate or Minimize Hazard
- Work Practices
 - How the Job is Done
 - Parts in Larger Bins or in Smaller Bins?
 - Tools
 - Maintenance of Tools and Tooling

Hierarchy of Controls

- Administrative
 - Duration
 - Employee Rotation,
 - Overtime,
 - Rest Breaks
 - Frequency
 - Number of Cycles
 - “Repetitive” = Palm Buttons $> 1X/5 \text{ Min}$

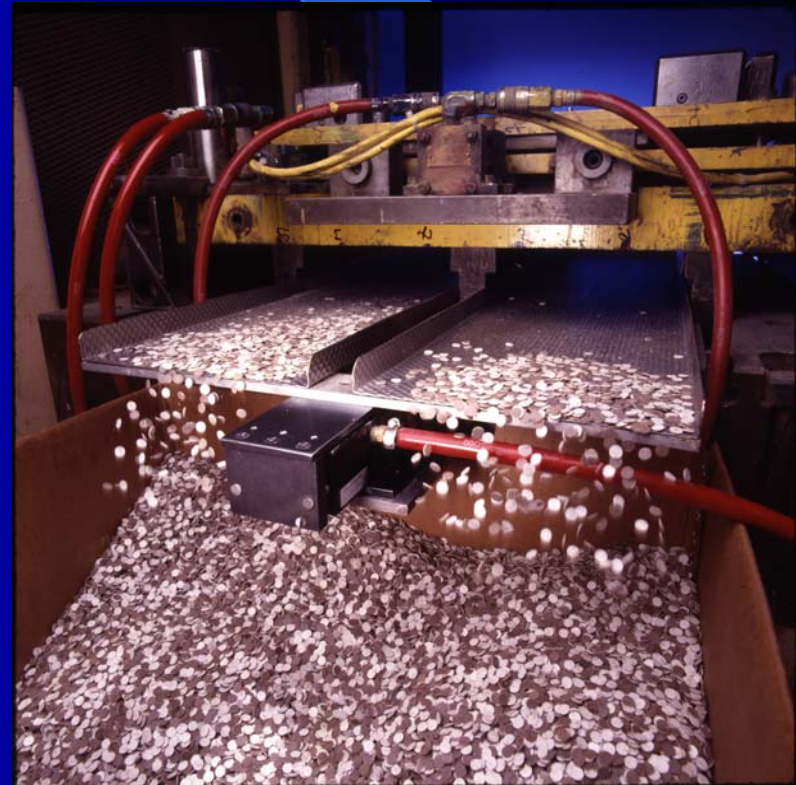
Hierarchy of Controls

- PPE: Personal Protective Equipment
 - LIMITED Effectiveness for Ergo
 - Gloves: Pros/Cons
 - Fit
 - Material Appropriate (increased grip force)
 - May need for cut protection when handling parts
 - Vibration Padding
 - Back Belts
 - Inconclusive Studies

Engineering Controls

Automation: Eliminates Hazard

- Self Feeders: Servo Motors
- Robotics
- Parts Ejectors
- Conveyors
- Lubrication Systems
- Slug/ Debris Removal



Automation: Servo Feed to Press





Automation: Suction Cups

- This linear-motor-powered stacking system, which replaced older pick-and-place robots, removes and stacks blanks produced by an oscillating shear. Using suction cups, the system can handle ferrous and nonferrous material.

Automatically Stacks Blanks onto Transfer Press



Automation: Under-Floor Scrap Removal



Automation: “Press-Tending Robot”



Engineering Controls

Minimize Hazards

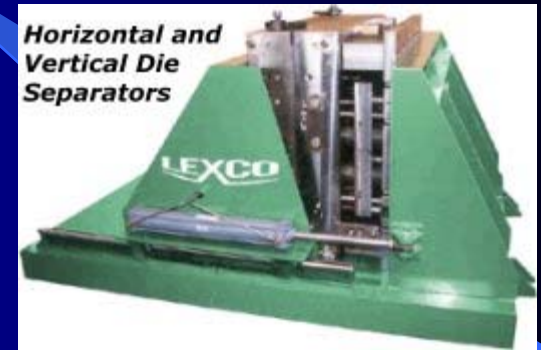
- Relief to Body
 - Sit/Stand Chairs
 - Anti-Fatigue Mats
- Reduce Size/Weight/#
- Tools:
 - Tongs, Air Wands
 - Weight and Lever
 - “Tennis Elbow”
 - Counterbalanced
- Mechanical Or Material Design



Engineering Controls

Dies: Moving & Maintenance

- Push / Pull
 - Die Carts
 - Powered Pallet Jacks
- Maintenance of Dies and Tooling
 - Prevent Stuck Parts
 - “Bathtub” Theory
 - Break-In/Wear Out Period





Engineering Controls Dies: Moving

- Loading Dies:
 - To and From Storage:
 - Hoist
 - Roller Conveyor
 - Mechanized Carts
 - Adjustable Height
 - Easily Moved: Light Weight, Wheel Condition, Maintenance, Correct Wheel for surface
 - Movement:
 - Roller Balls on Table
 - Mechanical Device





BEFORE



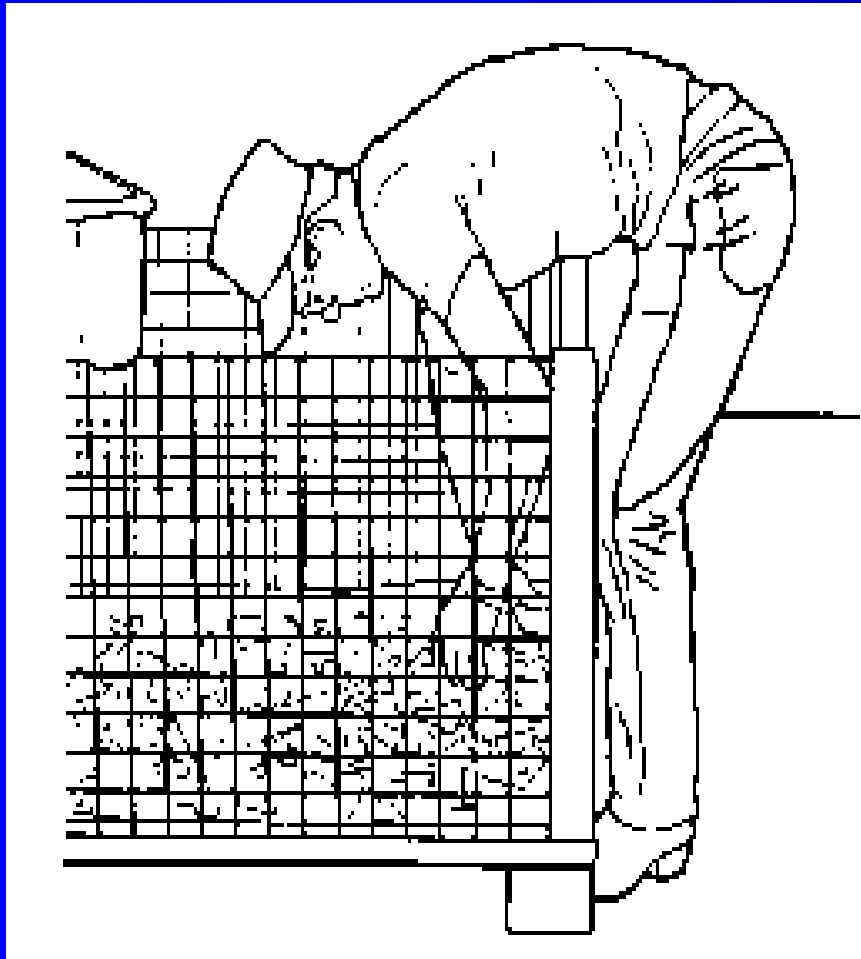
AFTER

PROBLEM: Employees throughout the plant used hand dollies to manually maneuver product throughout the plant.

SOLUTION: Power dollies have been purchased to reduce the amount of effort when moving product.

Other Issues: Floor Condition, Housekeeping, Maintenance of Wheels

Engineering Control: Material Handling/Delivery



- In a “butts up” posture, the spine is subjected to high compressive forces



BEFORE



AFTER

Employees throughout the facility were lifting castings (2-110 lbs) out of baskets. Lifting out of the baskets may require employees to lift while the back is bent at or over 90 degrees.

Engineering Control: Material Handling/Delivery



Which is Easier?

Engineering Control: Material Handling/Delivery

Pallet Containers: Side Drops Down



Engineering Control: Material Handling/Delivery

Lift & Tilt Tables

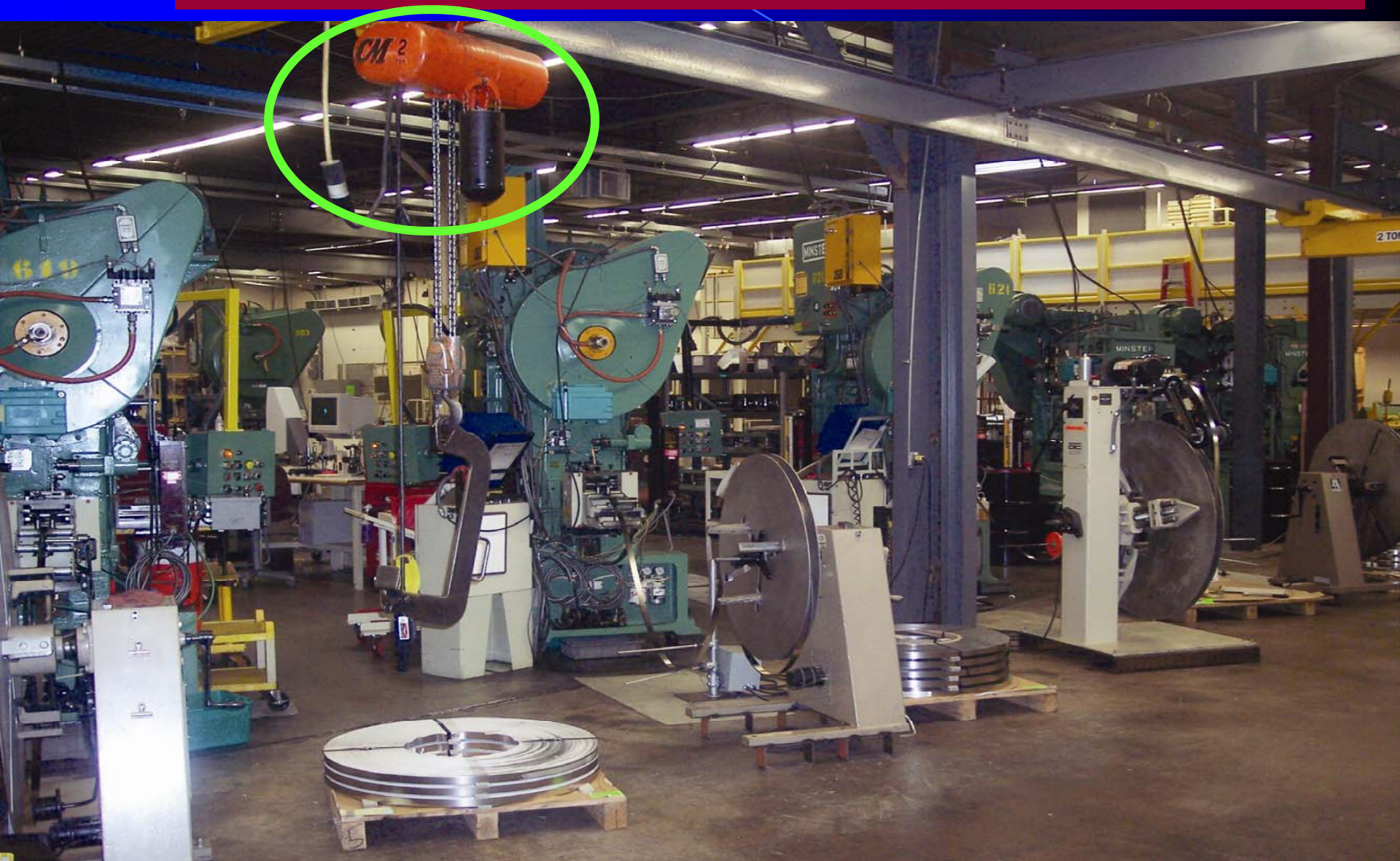


Engineering Controls: Lift Assists

- Vacuum Lifters
- Manipulators
- Jib Hoists



Engineering Controls: Cranes to Lift Coils in Place



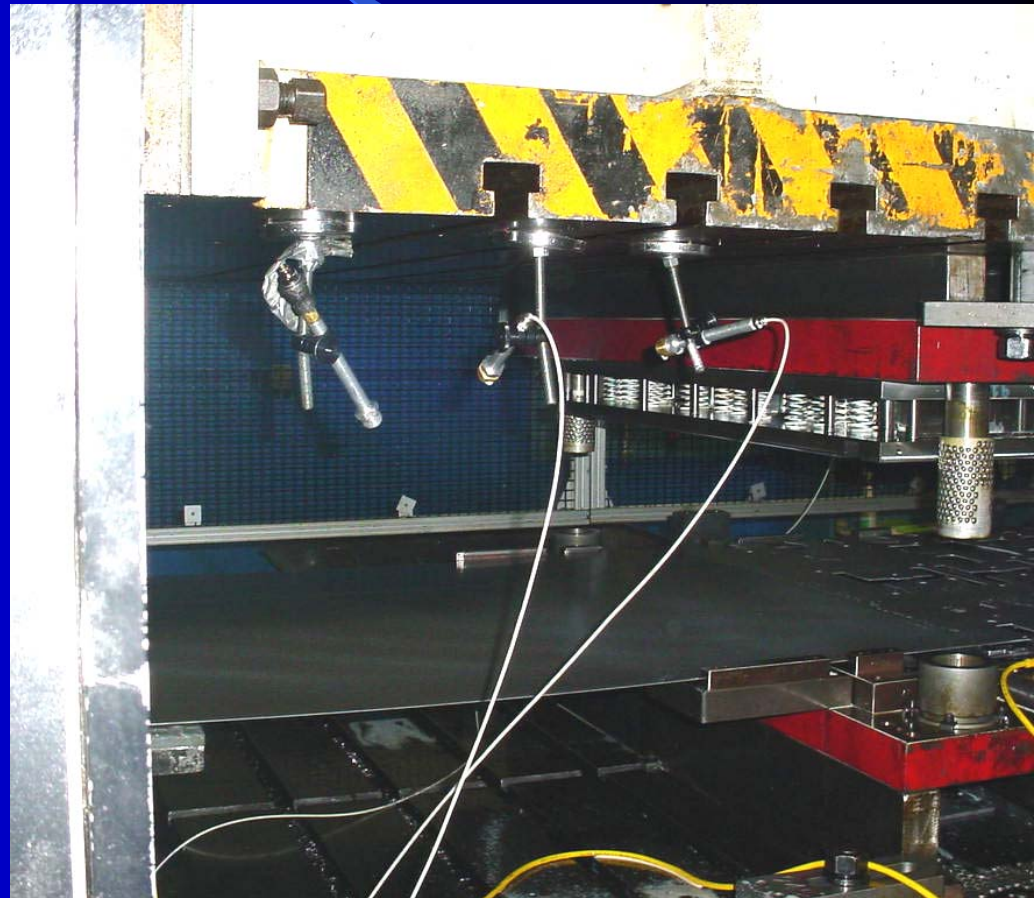
Engineering Control: Work Station Design

- Adjustable To Worker
- Platform that Flips Up when Not Needed
- Used by Shorter Workers or When Extra Reach is Needed to the Back of the Die.



Engineering Control: Automatic Lubrication of Die

- Before



AFTER

Engineering Controls: Actuation Buttons

- Reduce Force in Actuation Buttons
- Eliminate Foot Pedal Actuation
- ANSI B11.TR1-1993: Annex G
- ANSI B11.TR1-2004: Annex E



Engineering Controls: Actuation Buttons

- Three Major Ergonomic Issues:
 - Ring Guard
 - Button Location: Waist Height–Angle Forearm
 - Button Force: Less than 5 lbs
- Proper Actuation: Flat of Hand
- Improper Actuation:
 - Heel of Palm
 - Finger Tips
 - Thumbs Only



Engineering Controls

Work: Position / Location

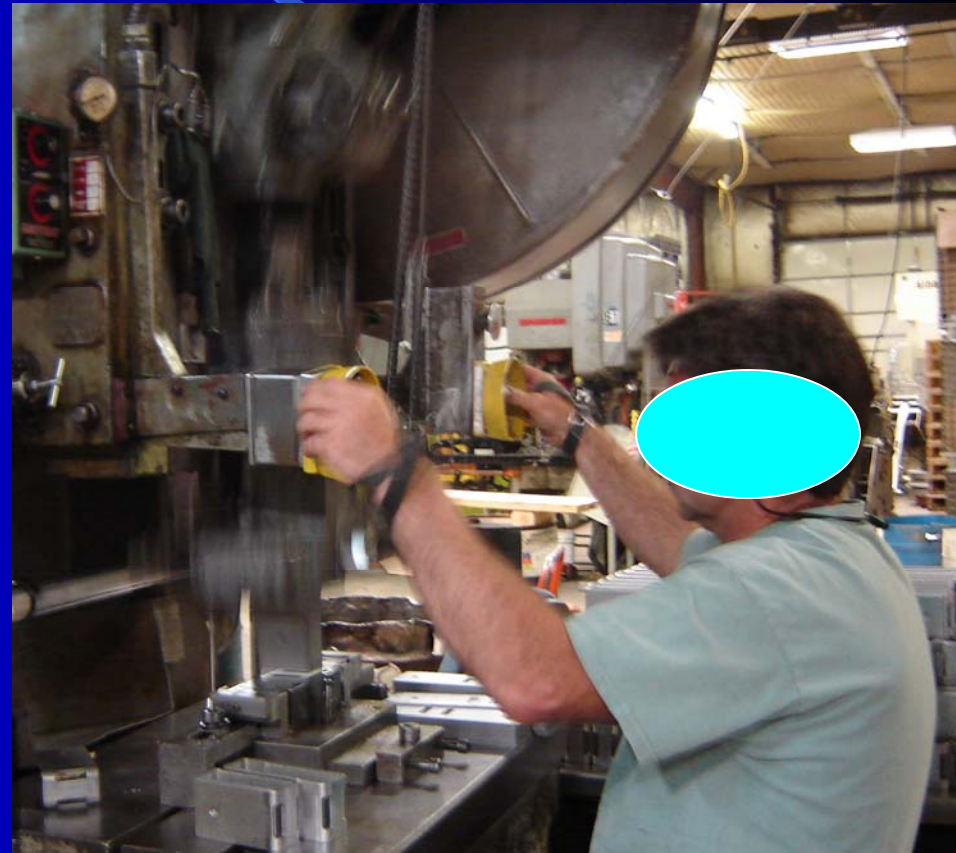
- Range of Motion:
 - Perform No Work:
 - Above Shoulder Height
 - Below Knuckle Height
 - Actuation Buttons
 - Prevent Forward Bending
 - Tilt Tables
 - Fold Down Bins
 - Extended Reach
 - Lifting & Lowering



Engineering Controls Work: Position / Location



Controls at Knuckles, Below Forearm



Controls over Shoulder Height



Education and Training



- Who receives it?
- How do they use it?
- Are they expected to use it?

Ergonomics Training

- Awareness: Classroom & OJT
 - Job Shadowing, Ergo Teachers, Work Hardening
 - Signs & Symptoms
 - Risk Factors
- Job Analysis: Ergo Controls In Place
 - Able to make Adjustments to Workstation
 - Check list: trends, risk factors
- Problem Solving
 - Ees, Mgr, Engineers, Maint., Purchasing, Leads

Medical Management

- Recognize Symptoms
- Early Reporting
- Physician Familiar with Jobs/Tasks
- Provide Job Accommodation

Medical Treatment



- Employee Capabilities
- Employee Restrictions
- Follow-Up
- Information to Provider
- Information to Employee

Web Site



U.S. Department of Labor
Occupational Safety & Health Administration

www.osha.gov

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December 30, 2005

Site Index: **A B C D E F G H I J K L M N O P Q R S T U V W X Y Z**



OSHA's mission is to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. [more...](#)

Audiences:

- En Español
- Hispanic Employers & Workers
- Small Business
- Workers
- Teen Workers

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Keeping Workers Safe During Clean Up and Recovery Operations Following Hurricanes [more...](#)

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Department of Labor

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- eTools
- Grants
- Hispanic Employer/Worker
- Posters
- Quick Start
- Recordkeeping
- Small Business
- Training

Laws & Regulations

- Standards
- Interpretations
- Federal Registers
- Directives
- Dockets & E-Comments

Enforcement

- Federal Agency Programs



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Safety and Health Topics

Ergonomics: Outreach and Assistance

OSHA provides assistance to businesses, particularly small businesses, and helps them proactively address ergonomic issues in the workplace.

- [OSHA Ergonomic eTools](#)
- [Success Stories](#) OSHA Ergonomic eTools
- [Case Studies](#)
- [Cooperative Programs](#)
- [Training and Education](#)
- [Speeches](#)
- [Industry-Developed Guidelines](#)
- [Additional Ergonomics Information](#)

OSHA Ergonomic eTools

OSHA recognizes the benefit of distributing, via the

Hot Topics

- [OSHA Launches Ergonomics in the Printing Industry eTool. \[\\[More...\\]\]\(#\)](#)
- [OSHA Adds Link to Industry-Developed Ergo Manual for Apparel and Footwear Industries \[3.9 MB PDF\]](#)
- [OSHA Adds Link to Industry-Developed Ergo Guidelines for Common Telecommunications Jobs \[4.14 MB PDF\]](#)

Safety and Health Topics

Ergonomics

Additional Resources

- [News Room](#)
- [FAQs](#)
- [State Plan States](#)
- [eTools](#)

Four-Pronged Approach

1. [Guidelines](#)
2. [Enforcement](#)
3. [Outreach and Assistance](#)
4. [National Advisory Committee](#)

Success Story

MANUFACTURING COMPANY REDUCES WEIGHT AND REDUCES INJURIES

Full article: http://www.osha.gov/SLTC/ergonomics/spring_window2.html

Situation

Workers positioned single ram cut-off dies weighed approximately 25 pounds by hand into a machine press.

Machine press operators experienced sprains, strains, and cuts when changing dies in machine presses.

Solution

The company replaced heavy steel die parts with light-weight aluminum, reducing overall weight and making the die much easier to handle.

Results

In the past year, there have not been any compensable injuries from performing this task.

QuickTakes

Sign-up at www.osha.gov



2 pages every 2 weeks
There are now more than 57,000
subscribers to our bi-weekly
electronic newsletter

See what is new and may
affect your workplace

OSHA Consultation

- <http://www.osha.gov/dcsp/smallbusiness/consult.html>



OSHA's Cooperative Programs

Alliance Program



- Voluntary Protection Programs
- Strategic Partnership Program
- Consultation Program & Safety and Health Achievement Recognition Program (SHARP)



References

- www.osha.gov
- www.cdc.gov/NIOSH
- Washington State Dept of Industry & Labor
 - <http://www.lni.wa.gov/Safety/Topics/Ergonomics/default.asp>
- Dana Root – Regional Ergonomics Coordinator
310 W. Wisconsin Ave. Room 1180
Milwaukee, WI 53203
414-297-3315
root.dana@dol.gov

Summary

- OSHA is Looking at ERGO
- Ergo Program is Expected If Warranted
- Numerous Avenues for Assistance
- Ergonomic Controls are Feasible

QUESTIONS



THANKS!



Safety and Health Add Value

To Your Business
To Your Workplace
To Your Life

www.osha.gov

THANKS!!!

- Photos Courtesy of:
 - Whirlpool Corporation
 - Polaris Industries, Inc.
 - AGV
 - Prab
 - AFC

Disclaimer

- This information has been developed by an OSHA Compliance Assistance Specialist and is intended to assist employers, workers, and others as they strive to improve workplace health and safety. While we attempt to thoroughly address specific topics *or hazards*, it is not possible to include discussion of everything necessary to ensure a healthy and safe working environment in a presentation of this nature. Thus, this information must be understood as a tool for addressing workplace hazards, rather than an exhaustive statement of an employer's legal obligations, which are defined by statute, regulations, and standards. Likewise, to the extent that this information references practices or procedures that may enhance health or safety, but which are not required by a statute, regulation, or standard, it cannot, and does not, create additional legal obligations. Finally, over time, OSHA may modify rules and interpretations in light of new technology, information, or circumstances; to keep apprised of such developments, or to review information on a wide range of occupational safety and health topics, you can visit OSHA's website at www.osha.gov.