Productivity Plus
Reduce Risk and Improve Productivity
Continuing Education Credits

NECA has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET) and is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

This session is eligible for 0.1 IACET CEUs

To earn these credits you must:

• Have your badge scanned **in and out** at the door
• Attend 90% of this presentation
• Fill out the online evaluation for this session
Learning Objectives – Add Value to What You Do

1. Explain the relationship between safety and productivity and why it is so important right now in our business.
2. Define what types of injuries are most common and/or most costly, in our business.
3. Summarize conditions that, if changed, will reduce risk and improve productivity.
4. Calculate the return on investment for a change that reduces risk and improves productivity and quality.
## True Cost of Injuries and Waste?

<table>
<thead>
<tr>
<th></th>
<th>GR8 Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>15,000,000</td>
</tr>
<tr>
<td><strong>WC Hard Cost</strong> (medical + Indemnity)</td>
<td>$60,000</td>
</tr>
<tr>
<td><strong>Soft Cost</strong> (5x Hard Cost)</td>
<td>$300,000</td>
</tr>
<tr>
<td><strong>Impact of Injuries</strong></td>
<td>$360,000</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td>208,000</td>
</tr>
<tr>
<td><strong>Burden of Injuries per Hour</strong></td>
<td>$1.73</td>
</tr>
</tbody>
</table>
Typical Soft Costs Of Injuries

- Project delays
- Injury cleanup
- Wages of other workers
- Investigation costs
- Administrative costs
- Legal costs
- Productivity losses
- Loss of employee & customer goodwill

- First Aid Costs
- Management time
- Supervisor time
- Replacement Costs
- Retraining costs
- Property damage
- Premium increases
- Lost job opportunities
- Dealing with OSHA & media
# True Cost of Injuries and Waste?

<table>
<thead>
<tr>
<th></th>
<th>GR8 Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue</strong></td>
<td>15,000,000</td>
</tr>
<tr>
<td><strong>WC Hard Cost</strong> (medical + Indemnity)</td>
<td>$60,000</td>
</tr>
<tr>
<td><strong>Soft Cost</strong> (5x Hard Cost)</td>
<td>$300,000</td>
</tr>
<tr>
<td><strong>Impact of Injuries</strong></td>
<td>$360,000</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td>208,000</td>
</tr>
<tr>
<td><strong>Burden of Injuries per Hour</strong></td>
<td>$1.73</td>
</tr>
</tbody>
</table>
# True Cost of Injuries and Waste - Waste Model

<table>
<thead>
<tr>
<th></th>
<th>GR8 Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Claims</td>
<td>$6,000</td>
</tr>
<tr>
<td>General Liability Claims</td>
<td>$1,000</td>
</tr>
<tr>
<td>OSHA / EPA Fines (Est.)</td>
<td>$0</td>
</tr>
<tr>
<td>Soft Costs (5x)</td>
<td>$35,000</td>
</tr>
<tr>
<td>Productivity Losses</td>
<td>$433,000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>20 Min. per day of treasure hunting, wasted motion, material handling, rework, etc. @ $50 rate</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$475,000</td>
</tr>
<tr>
<td>Cost per Hour</td>
<td>$2.29</td>
</tr>
</tbody>
</table>
## True Cost of Injuries and Waste - Waste Model

<table>
<thead>
<tr>
<th></th>
<th>GR8 Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact of Safety Costs per Hour</td>
<td>$1.73</td>
</tr>
<tr>
<td>Impact of Other Losses per Hour</td>
<td>$2.29</td>
</tr>
<tr>
<td>Total Estimated Cost per Hour</td>
<td>$4.02</td>
</tr>
<tr>
<td>Total WC, WL, GL and Productivity Cost Impact</td>
<td>$835,000</td>
</tr>
<tr>
<td>New Business Required to Offset these Losses (at a 10% Margin)</td>
<td>$8,350,000</td>
</tr>
</tbody>
</table>
History of Safety Performance

US Workplace Deaths

Injury Rates by Industry

Why Has Safety Improved?

- Innovation
- Accountability
- Investment
- Measurement
- Management Commitment
- Increased Training

- Competition
- Customers
- Cost
- Incentives
- Planning
- Employee Involvement
- Regulation
History of Productivity Improvement

What Drives Productivity Improvement?

- Innovation
- Accountability
- Investment
- Measurement
- Management Commitment
- Increased Training

- Competition
- Customers
- Cost
- Incentives
- Planning
- Employee Involvement
What is Value?

What is your definition of Productivity?
Productive Work vs. Waste

**Productive Work**
- Direct Installation / Servicing
- Prefabrication (on or off site)
- Pre-Assembly
- Testing & Commissioning

**Wastes**
- Defects and Rework
- Delivery and Material Handling
- Unnecessary Motion
- Inefficient Production
- Ineffective Activities
- Treasure Hunting
A Relatively Young World in 2000

Percent of Population Age 60+ in 2000

Source: U.S. Census Bureau
Rapidly Aging World by 2025

Percent of Population Age 60+ in 2025

Source: U.S. Census Bureau
Rapidly Aging World by 2025

Population Breakdown, By Age: United States of America

Share Of Total Population (%)


Age Group

1950
Today the majority of the US workforce is over 40
As We Age

Maximal Strength
Muscle Mass
Bone density
Visual and Auditory Acuity
Fitness
Aerobic Capacity
Cognitive Speed/Function

Obesity
Arthritis
High BP
Diabetes
Depression
Heart Disease
Wisdom & Experience
The longer your employee is out of work the more unlikely they will ever return to work.

- 12 weeks, only **50%** will return
- 26 weeks, only **25%** will return

*Nationwide Data – All Industries, 2007*
Current Worker Population

• Five people leave the construction industry for every one person entering
• Only 33% of employers report that their organization have made projections about retirement rates of their workers
• The National Electrical Benefit Fund (NEBF) Shows:
  – In 1947 there were 47 workers for every retiree
  – In 2001 there were 2 workers for every retiree
  – In 2003 there was 1 worker for every retiree
Objective 1: Why Safety = Productivity

- Injuries and waste both increase labor cost, reducing our competitiveness
- The principles that we have successfully used to reduce injuries also improve productivity and quality
- Workforce demographics demand improved safety performance as the workforce grows older and younger workers grow more scarce.
Claims and Costs

Average Cost per Claim
2009-2012: $20,000

Source: EMCOR Group, Inc. Claim cost summary 2009-2012, CNA verified 02/21/14 (Adjusted to exclude extreme outliers from 2012)
Root Cause of Injury? – Management and Safety Culture

Contributory Causes of Injury & Their Contributory Cause Factors

- **Tools & Equipment**
  - Not Trained in Use
  - Unsuitable
  - Unavailable
  - Defective
  - JSA Not Undertaken
  - Not Specific Enough
  - Working Outside Capabilities

- **PPE**
  - Not Trained in Use
  - Not Adequate
  - Not Issued
  - Not Used
  - Hazards Not Identified
  - Hazards Not Mitigated
  - Not Trained to Deal with Hazards

- **Work Methods**
  - Bad Practice
  - Accepted Practice
  - Lack of Standards

- **Instruction**
  - Not Provided

- **Environment**
  - Physical Limitations
  - Distracted Worker
  - Age / Experience

- **Human Factors**
  - Lack of Standards
  - Human Factors

What you put in is what you get out

Injury or Improved Productivity
Causes of EMCOR Recordable Injuries ’09-’12

- Work Methods: 39%
- Human Factors: 15%
- Work Environment - Not Identifying or Mitigating Hazards: 28%
- PPE: 9%
- Poor Work Practice: 2%

Total: 85%

<table>
<thead>
<tr>
<th>Poor Work Practice</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Methods</td>
<td>39%</td>
</tr>
<tr>
<td>Not Dealing with Hazards</td>
<td>28%</td>
</tr>
<tr>
<td>PPE</td>
<td>9%</td>
</tr>
<tr>
<td>Tools &amp; Equip.</td>
<td>7%</td>
</tr>
<tr>
<td>Instruction</td>
<td>2%</td>
</tr>
<tr>
<td>Total</td>
<td>85%</td>
</tr>
</tbody>
</table>
Relationship Between Injuries & Other Claims

- Millions of Instances of POOR WORK PRACTICE
  - Tens of Thousands of Near Hits
  - Hundreds Of Recordable Injuries
  - Thousands of First Aid Cases

- General Liability
  - Tens of Thousands of Near Hits
  - Hundreds Of Damage Claims
  - Thousands of Minor Events
  - 1 Serious Event

- Auto Liability Claims
  - Tens of Thousands of Near Hits
  - Hundreds Of Auto Claims
  - Thousands of Minor Events
  - 1 Serious Event

- Workers Compensation
  - 1 Fatality
  - Hundreds Of Recordable Injuries
  - Thousands of First Aid Cases
  - Tens of Thousands of Near Hits
Objective 2: The Most Common and Costly Injuries

- Overexertion Injuries – those related to wear and tear on the body
- Slip, Trip, Falls – Correlated to some of the physiological effects of aging
- Falls from Elevation – Also correlated to age
- Cuts – Unique to electricians
Changing the Way We Work

Making a change begins with

**OBSERVATION**

of the *worker* and the process

The CHALLENGE to you –

Observe, Measure, Change, Improve
Changing the Way We Work

What 2 Questions Do **YOU** Need to Ask?

-- Why Are We Doing It That Way?

-- Is There A Better Way To Do It?
Working at Floor Level
Best Practices – Staging
Best Practices - Staging
Vehicle Inventory - Housekeeping

• “I cut my hand while reaching for PPE in the back of my truck” — Actual Incident Report
Products for Working Smarter

- TOPCON GPT 8200 Series
- Maxis Pull-It 1000
- Greenlee® 6810 Ultra Cable Feeder
Change Human Factors to Reduce Fatigue and Waste

- The **art** of observing human beings as they are:
  - Walking  –  Climbing
  - Bending  –  Descending
  - Carrying  –  Twisting
  - Pushing  –  Reaching
  - Pulling  –  Improvising
  - Lifting  –  Etc., etc., etc.

... and questioning why work is being done that way
Change Human Factors to Reduce Fatigue and Waste

• The *art* of observing human beings as they are:

  - Walking  –  Climbing
  - Bending  –  Descending
  - Carrying  –  Twisting
  - Pushing  –  Reaching
  - Pulling  –  Improvising
  - Lifting  –  Etc., etc., etc.

  … and questioning why work is being done that way
Change Human Factors to Reduce Fatigue and Waste

• The *art* of observing human beings as they are:
  - Walking
  - Bending
  - Carrying
  - Pushing
  - Pulling
  - Lifting
  - Climbing
  - Descending
  - Twisting
  - Reaching
  - Improvising
  - Etc., etc., etc.

... and questioning why work is being done that way
Change Human Factors to Reduce Fatigue and Waste

- The **art** of observing human beings as they are:
  - Walking – Climbing
  - Bending – Descending
  - Carrying – Twisting
  - Pushing – Reaching
  - Pulling – Improvising
  - Lifting – Etc., etc., etc.

... and questioning why work is being done that way
Change Human Factors to Reduce Fatigue and Waste

- The art of observing human beings as they are:
  - Walking
  - Bending
  - Carrying
  - Pushing
  - Pulling
  - Lifting
  - Climbing
  - Descending
  - Twisting
  - Reaching
  - Improvising
  - Etc., etc., etc.

... and questioning why work is being done that way
Change Human Factors to Reduce Fatigue and Waste

• The *art* of observing human beings as they are:
  – Walking    – Climbing
  – Bending    – Descending
  – Carrying   – Twisting
  – Pushing    – Reaching
  – Pulling    – Improvising
  – Lifting    – Etc., etc., etc.

... and questioning why work is being done that way
The art of observing human beings as they are:

- Walking
- Bending
- Carrying
- Pushing
- Pulling
- Lifting

- Climbing
- Descending
- Twisting
- Reaching
- Improvising
- Etc., etc., etc.

... and questioning why work is being done that way
Changing the Way We Work

Body Mechanics Study:

• Average Age: 38

• Tested:
  – Strength
  – Hand strength
  – Pinch grip
  – Range of motion
  – Aerobic capacity

Most Common Failure

Only 42% Passed!
Working Smarter

- Personal
- Productivity
- Equipment
Working Smarter

- Personal
- Productivity
- Equipment
Working Smarter

- Personal
- Productivity
- Equipment
Objective 3: How to Reduce Risk & Improve Productivity

• Reduce the need to walk, bend, climb, descend, reach, carry, push, pull, etc.
• Use innovative tools to reduce fatigue
• Human factors issues are just as important (sometimes more important) as any safety rule – treat them that way!
Quantifying the Value of a Change

**THE PAYBACK:**
The following comparison between the GX 120-ME System and a traditional fastening technique shows the value of this innovative tool after just 750 uses.

<table>
<thead>
<tr>
<th>Fastening Method</th>
<th>GX-120 + Conduit Strap</th>
<th>Anchor + Conduit Strap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumables (straps, bits, anchors, gas, etc.)</td>
<td>0.35</td>
<td>3.00</td>
</tr>
<tr>
<td>Time per fastener</td>
<td>3 Sec.</td>
<td>60 Sec.</td>
</tr>
<tr>
<td>Time - 750 uses</td>
<td>37.5 Min.</td>
<td>12.5 Hrs.</td>
</tr>
<tr>
<td>Loaded Labor ($50 / Hr.)</td>
<td>$31.25</td>
<td>$625</td>
</tr>
<tr>
<td>Total Materials</td>
<td>$262.50</td>
<td>$2,250</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$293.75</td>
<td>$2,875</td>
</tr>
</tbody>
</table>

In this example this system saves more than $2,500, or $3.44 in labor and materials per use. At this rate an $800 investment would be paid for after just 233 uses.
The Value of a Change

- What are the current costs?
  - Labor Cost
  - Tools Cost
  - Value of Risk

- What is the value of alternatives?
  - What is the cost of the necessary investment and is it offset by improved productivity or reduced risk of injury
### Annualize Calculations

<table>
<thead>
<tr>
<th>Cost Factor</th>
<th>Current State</th>
<th>Proposed State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor (Material Handling Time)</td>
<td>30 Min. Day x 10 workers at $60 hr. = $300 / day or $75,000 / year</td>
<td>10 Min. Day x 10 workers at $60 hr. = $100 / day or $25,000 / year</td>
</tr>
<tr>
<td>Risk: Slip Trip and Fall, Overexertion, Fatigue from working overhead</td>
<td>1/4(^{th}) of average injury cost per year: $20,000/4 = $5,000 (one average injury every four years)</td>
<td>1/10(^{th}) of average injury cost per year: $20,000/10 = $2,000 (one average injury every 10 years.)</td>
</tr>
<tr>
<td>Total Annual Cost</td>
<td>$80,000</td>
<td>$27,000</td>
</tr>
<tr>
<td>Savings</td>
<td>NA</td>
<td>$53,000</td>
</tr>
<tr>
<td>Tool Investment (Carts)</td>
<td>No Cost</td>
<td>5 x $800 = $4,000</td>
</tr>
<tr>
<td>Payback Time for investment</td>
<td>NA</td>
<td>Investment of $4,000/Daily Savings of 20 min. per day x 10 people: $200 = 20 days</td>
</tr>
</tbody>
</table>
Objective 4: Measuring the Value When Nothing Happens

- Know (calculate, estimate, measure, etc.) the value of the current process, including the value of the risk of injury
- Identify alternative processes (tools, work methods, etc.)
- Calculate the value of the change (the return on safety/productivity investment)
- When change in quantified, management is more likely to support change.
Applying the Learning Objectives

1. Explain to your company the relationship between safety and productivity and why it is so important right now in our business.
2. Now that you know what types of injuries are most common and/or most costly, act to prevent them.
3. Observe and change the work to reduce risk and improve productivity.
4. Calculate the return on investment for a specific change in your company that will reduce your risk and improve your productivity and quality.
BUILD POWER SERVICE PROTECT
That’s the EMCOR Advantage™