What Gets Measured Gets Done
Performance Measures for Ergonomics

Josh Kerst, B.Sc. CPE, CIE
Vice President
Agenda

- What is performance excellence in ergonomics?
- How are companies achieving ergonomics excellence?
  - Key activities
  - Communities
  - Tools and training
- Putting it all together with an ergonomics management system
  - Metrics and indicators
Why do we have injury reports in sports???

Detroit Tigers
Fernando Rodney RP Shoulder Out Out until at least mid-April
Vance Wilson C Elbow Out Out until at least early May
Joel Zumaya RP Shoulder Out Out until at least early July
Curtis Granderson CF Finger DL 15-day DL. Out until at least mid-April
Jordan Tata RP Hand Out Out until at least late April

Versus

Kansas City
Kazuo Matsui 2B Hemorrhoids DL 15-day DL. Eligible to return April 5
L. Hudson RP Tendonitis. Felipe Paulino SP Arm DL 15-day DL. Out until at least mid-May
David DeJesus CF ankle sprain . Wandy Rodriguez SP Oblique Questionable Day to day
2007 and 2008 Benchmarking Studies

- Involved large companies in:
  - Aerospace
  - Automotive
  - Health care products
  - Diversified products
  - Computer systems
  - Semiconductors
  - Construction equipment
  - Industrial products
  - Pharmaceutical
  - Aluminum products
  - Steel products

- Looked at:
  - Methods
  - Roles
  - Training
  - Metrics
Benchmarking Study

- Compare and contrast approaches for aggressive enterprise-wide health and safety improvement initiatives
- Role that ergonomics has played in improving health and safety performance
- Data was collected via telephone interviews with corporate Health and Safety Managers or Directors through 2007 with a more detailed follow up review during 2008
- Average annual decrease was 12% (TRIR – Total Recordable Incident Rate) and 13% (DART Rate)
- Program results since initiation averaged 72% improvement according to traditional lagging metrics (TRIR & DART)
- Overall trend is to “operationalize” ergonomics
Ergonomics Excellence

Searching for substantial and sustained improvement in:

- WMSD rates and costs
- Productivity
- Quality
- Engagement

Workplace Design and Improvement
Where is the root of the problem?

- What are the root causes and contributing factors to ergonomic injuries in your workplace?
- Who has the most influence on the conditions of your workplace?
  - Who sets up workstations?
  - Who specifies equipment?
  - Who designs tooling?
  - Who influences work schedules?
  - Who makes purchasing decisions?
  - Who drives CHANGE?

Employees?
Health & Safety?
Human Resources?
Engineering?
Ergonomics Excellence - What to Expect

Enterprise-wide results (average reductions)

- WMSD lost workdays (6): 80%
- WMSD rate (5): 79%
- Workers’ comp. costs (8): 70%
- Incidence rate (4): 58%
Building Blocks of Manufacturing

“Knowledge GAP”
Building Blocks of Manufacturing
Filling the GAP…

● Leading companies are changing their perspective to see every interaction between your people and their work and ask:
  • Are there barriers to human performance?
  • Are there wasted efforts and motions?
  • Can people work at their best?
Optimize Stability and Performance

Human-Centered Design

Methods
Machines
Materials
Man
Agenda

● What is excellence in ergonomics?

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● Putting it all together with an ergonomics management system
Key Activities & Process Characteristics

- “C” level support and sponsorship
  - Talk – Injury / Engagement / Quality / Productivity
- Management system in place
  - Policy & Guidance Document
  - Clear roles and responsibilities
  - Accountability (w/ metrics) at all levels in organization
- Data driven with the focus on risk management
  - Heavy on engineering and workplace improvement
  - Engage the workforce in the process
- Integrated with other company initiatives
  - Link with whomever drives change in your organization
-VISIBLE demonstration of value to the business
  - Monthly, Quarterly and Annual updates to top level of organization
Steps to “Operationalize” Ergonomics

- Formally declare an enterprise-wide ergo improvement initiative, with executive sponsorship outside of the EHS management line.
- Establish key health and ergo metrics and routinely report progress on these metrics at the site, business, and enterprise levels.
- Set aggressive multi-year improvement goals for the enterprise and cascade improvement goals down to the business and site levels.
- Hold line management (facility managers and above) accountable for improvement, tying progress to compensation.
- Reinforce the improvement initiative through a combination of routine reporting of key metrics and audits of site health and safety activities.
- Provide targeted assistance to sites struggling to meet goals.
- Include specific activities for ergonomics in the health and safety improvement initiative and establish goals specifically for ergonomics.
- **Introduce leading indicators (activities, audit scores) as primary metrics after initial progress is made toward lowering injury rates.**
Ergonomics Maturity Curve

- Incident investigation
- Issue/complaint resolution
- Incident investigation
- Continuous improvement
- Ergonomics risk management
# Lean/Continuous Improvement

<table>
<thead>
<tr>
<th>Improvements</th>
<th>Metric</th>
<th>Before</th>
<th>Improvement Objective</th>
<th>Actual</th>
<th>Improvement</th>
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<tbody>
<tr>
<td>Total operator cycle time</td>
<td>Seconds</td>
<td>460</td>
<td>30%</td>
<td>315</td>
<td>31.5%</td>
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<tr>
<td>Productivity</td>
<td>Units/day/operater</td>
<td>31</td>
<td>15%</td>
<td>39</td>
<td>20.5%</td>
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<tr>
<td>WIP inventory</td>
<td>Units</td>
<td>6</td>
<td>10%</td>
<td>5</td>
<td>16.6%</td>
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<tr>
<td>Occupied area</td>
<td>ft²</td>
<td>1536</td>
<td>20%</td>
<td>1325</td>
<td>13.7%</td>
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<tr>
<td>Quality</td>
<td>Scrapped units/day</td>
<td>3</td>
<td>30%</td>
<td>2</td>
<td>33.3%</td>
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<tr>
<td>Ergonomic risk</td>
<td>Stations BEST&gt;29</td>
<td>4</td>
<td>100%</td>
<td>1</td>
<td>75%</td>
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</table>
Workplace Improvement by Risk Management

Before

After

<table>
<thead>
<tr>
<th>H/W</th>
<th>Elb</th>
<th>Sho</th>
<th>N</th>
<th>B</th>
<th>L</th>
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<tbody>
<tr>
<td>Red</td>
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<td>Green</td>
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<td>Green</td>
<td>Yellow</td>
</tr>
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</table>
Ergonomics Maturity Curve

- Incident investigation
- Issue/complaint resolution
- Continuous improvement
- Ergonomics risk management
- Manufacturing design
- Product design
Ergonomics Guidelines

- Workstations
- Manual material handling
- Hand and arm strength
- Hand tools
- Clearances
- Environment
- Controls and displays
- Laboratories
Agenda

- What is excellence in ergonomics?
- How are companies achieving ergonomics excellence?
  - Key activities
  - Communities
  - Tools and training
- Putting it all together with an ergonomics management system
# Key Communities

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activity</th>
<th>Community</th>
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</thead>
<tbody>
<tr>
<td>Reactive</td>
<td>Incident investigation</td>
<td>EHS &amp; Occupational Health</td>
</tr>
<tr>
<td></td>
<td>Issue/complaint resolution</td>
<td>Managers, Supervisors and Employees</td>
</tr>
<tr>
<td>Proactive</td>
<td>Lean/continuous improvement</td>
<td>Lean improvement team with EHS</td>
</tr>
<tr>
<td></td>
<td>Ergonomics risk management</td>
<td>Production engineers with EHS</td>
</tr>
<tr>
<td>Advanced</td>
<td>Manufacturing process design</td>
<td>Advance manufacturing engineers</td>
</tr>
<tr>
<td></td>
<td>Product design for assembly</td>
<td>Product designers</td>
</tr>
</tbody>
</table>
Ergonomics Maturity Curve

PROACTIVE

- Engineering
- Manufacturing design
- Ergonomics risk management
- Lean/Continuous Improvement
- Issue/complaint resolution
- Incident investigation

REACTIVE

- EHS
- Product design

TIME

EFFECTIVENESS

Designers

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Summary of Tools

● Reactive
  - Injury Investigation
  - Observational Tools

● Proactive
  - Risk Assessment & Priority
  - Root Cause Identification
  - Countermeasures

● Advanced
  - Ergonomic Design Guidelines for Engineers
  - Design for Ergonomics in Assembly Standards
  - Digital Assembly
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Management System Documentation

**ERGONOMICS Policy**
- Position & Goal of Top Management
- Requirements & Responsibilities

**ERGONOMICS PROCESS GUIDANCE DOCUMENT**
- Steps and Methods for Process Management

**TECHNICAL GUIDANCE**
- Tools and Methods to Identify and Control Risk Factors
  - Applied Ergonomics Manuals
  - Ergonomic Design Guide for Engineers

**AUDIT CRITERIA**

Increasing Detail

Site Ergonomics Process
# Roles & Responsibilities (simplified)

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibilities</th>
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</thead>
<tbody>
<tr>
<td>Management Sponsor</td>
<td>Sponsorship by top management.</td>
</tr>
<tr>
<td>Ergonomics Process Lead</td>
<td>Coordinate rollout and management of site program.</td>
</tr>
<tr>
<td>Ergonomic Team Member</td>
<td>Assess ergonomic risks. Identify solutions. Monitor for changes in workplace.</td>
</tr>
<tr>
<td>Engineering</td>
<td>Specify, install, and maintain equipment correctly. Implement solutions</td>
</tr>
<tr>
<td>Training</td>
<td>Conduct awareness training for managers and employees.</td>
</tr>
<tr>
<td>Associates</td>
<td>Operate equipment correctly. Work safely.</td>
</tr>
<tr>
<td>Managers and Supervisors</td>
<td>Ensure proper equipment and solutions are implemented and work is done correctly.</td>
</tr>
<tr>
<td>Medical Services</td>
<td>Treat injuries effectively. Facilitate timely return to work.</td>
</tr>
</tbody>
</table>
Goals and Metrics

Goals

● 50% reduction in TRIR and DART in the 4 to 7 year range
● All jobs reduced to low or no risk level

Leading Metrics

● Training plans completed and ergonomics incorporated into job metrics
● Percent of job conditions with medium or high ergonomic risk
● Number of countermeasures implemented
● Percent ergonomic risk reduction
● Conformance of new equipment with ergonomic design criteria
Additional Leading Indicators

- Percent employee engagement and participation in ergonomic improvement activities
- Early reporting ratio (ERR) with a goal of 10:1
- Percent of managers who demonstrate safety leadership commitment
- Number of toolbox talks provided by team leaders on ergonomics
Key Learnings Related to Ergonomics

- Standardized risk assessment tools are important so you can move to risk-driven metrics
- Have a process for ergonomics identified before you get started
- Really understand ergonomics; health and safety professionals typically lack in-depth knowledge of workplace design principles
- You need solid data analysis, locally and at the enterprise level
- Recognize that there are cultural differences (geographic), as well as different levels of maturity in safety that will affect ergonomics deployment
Key Learnings Related to Ergo (cont.)

- Spent a lot of time in the field with the engineers to understand ergonomic issues they face and the best way to address them
- Make sure management understands the objectives and their individual criteria for success (and accountability) prior to roll-out
- You need good metrics to monitor ongoing performance (activities and injury rates)
- Step change will be made when improvements are implemented to their fullest
- Drive ergonomics concepts into workplace and product design early in the initiative
Assess Your Ergonomics Process

- Where are you on the curve?
- Who is the sponsor?
  - Who is responsible for Ergo?
  - Is EHS a competitive advantage?
- What is an acceptable level of risk?
  - Do you have a qualitative tool?
  - Are its outcomes widely understood?
- Do you have standards or guidelines for engineers?
  - Is ergonomics incorporated into stage gate reviews for new equipment and workstations?
- Is ergonomics seen as an engineering issue?
  - Do you prioritize risks during project reviews
  - Do you have a historic concerns list?
Your people matter...

A lot.

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