Performance Solutions by Milliken

Jordan Workman
Director of NA & EMEA Client Development
Milliken & Company’s Background

- Founded in 1865
- Privately held

- ~$2.5 Billion in revenue
- ~7,500 associates
- 45 sites in 6 countries
- Operations throughout the Americas, Europe and Asia
Key Markets

Specialty Chemicals
Intermediates • Textile Chemicals • Plastic Additives • Specialty Colorants • Carpet Cleaning

Floor Coverings & Interiors
Commercial • Contract • Residential • Hospitality • Napery & Drapery • Office Fabrics

Protective & Performance Products
Performance Apparel Fabrics • Workwear Fabrics • Military Fabrics • Airbags • Nonwovens

Industrial Products
Composites • Belt & Hose Textiles • Inner duct • Tire Cord • Core Materials

Performance Solutions
Safety • Performance Excellence • Training
Milliken & Company’s Reality
Performance vs Domestic Textile Players

Textile companies with > $1B sales:

1995
- Milliken
- Springs
- Burlington
- Collins & Aikman
- Westpoint Stevens
- Fieldcrest Cannon

Today
- Milliken

Percent of U.S. consumption that is Imported

U.S. Textile Mill Production
Who we were...

➢ Privately held, no debt
➢ Best equipment & data rich
➢ Value-based
➢ Hyper-competitive industries
➢ Command and Control
➢ Initiative Driven
Who we were...

➢ Privately held, no debt
➢ Best equipment & data rich
➢ Value-based
➢ Hyper-competitive industries
➢ Command and Control
➢ Initiative Driven
➢ Award Winning
Life after Awards and Initiatives

We were not sustaining the gains...
Evolution of Operational Excellence

1980
People Excellence Era
1980 to 1985

1985
Process Excellence Era
1985 to 1990

1990
Business Excellence Era
1990 to 1996

2017
Implementation of the Milliken Performance System
1996 to 2017

Over 125 Corporate Initiatives
The Performance System
Study Missions to Japan

Benchmarking World-Class Manufacturing Practices
## Japan Study Mission Results 1994-1996

<table>
<thead>
<tr>
<th>Measurement</th>
<th># of Companies Reporting</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>9</td>
<td>61%</td>
</tr>
<tr>
<td>Process Reliability / OEE</td>
<td>8</td>
<td>32%</td>
</tr>
<tr>
<td>Breakdowns</td>
<td>9</td>
<td>92%</td>
</tr>
<tr>
<td>Defects</td>
<td>7</td>
<td>74%</td>
</tr>
<tr>
<td>Claims</td>
<td>6</td>
<td>85%</td>
</tr>
</tbody>
</table>

Milliken sent 120 managers on 4 Study Mission Trips
The Leadership Challenge

Western Management

40% Daily Operations
60% Firefighting

The Best in Japan

20% Daily Operations
20% Firefighting
60% Continuous Improvement/Innovation

Routine
Working Through Cross-Functional Teams
Milliken Hires Japanese Consultants
MILLIKEN PERFORMANCE SYSTEM

Lean Enterprise

Daily Team Maintenance
Continuous Skill Development
Focused Improvement - DMAIC
Production Control
Planned Maintenance
Quality Management
Early Equipment Management
Concurrent New Product Development - DFSS

Strategic Clarity

Safety

# Performance System results

<table>
<thead>
<tr>
<th>Measurement</th>
<th># of Japanese Companies Reporting</th>
<th>Japanese Improvement (Historical)</th>
<th>Milliken Improvement (OE Journey)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>9</td>
<td>61%</td>
<td>78%</td>
</tr>
<tr>
<td>Process Reliability / OEE</td>
<td>8</td>
<td>32%</td>
<td>30%</td>
</tr>
<tr>
<td>Breakdowns</td>
<td>9</td>
<td>92%</td>
<td>88%</td>
</tr>
<tr>
<td>Defects</td>
<td>7</td>
<td>74%</td>
<td>80%</td>
</tr>
<tr>
<td>Safety</td>
<td>–</td>
<td>–</td>
<td>36%</td>
</tr>
</tbody>
</table>
# Milliken Performance System Transitions

## Before

<table>
<thead>
<tr>
<th>Management System</th>
<th>Reliance on experience Individual Management Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach</td>
<td>Tools/ initiative driven (unsustainable)</td>
</tr>
<tr>
<td>Training</td>
<td>Variation in operators</td>
</tr>
<tr>
<td>Attitude</td>
<td>Acceptance of waste</td>
</tr>
<tr>
<td>Improvement</td>
<td>Incremental, unsustainable</td>
</tr>
<tr>
<td>Communication</td>
<td>Little, infrequent</td>
</tr>
</tbody>
</table>

## After

<table>
<thead>
<tr>
<th>Improved knowledge Standard work for leaders &amp; operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common language, common process (Sustainable)</td>
</tr>
<tr>
<td>Jobs, training, and operators use standard methods</td>
</tr>
<tr>
<td>Waste elimination</td>
</tr>
<tr>
<td>Break-through; sustainable</td>
</tr>
<tr>
<td>ROI is clear at all levels</td>
</tr>
</tbody>
</table>

What are the keys to building a sustainable performance system?
Key to Implementation - #1

Embrace Zero Loss Thinking

- Strong benevolent discontent
- Stop measuring success internally
- Celebrate the RED as opportunity
What is a Loss?

- Actual Cost: Total real dollars spent to manufacture a product.
- Ideal Cost: Absolute minimum cost required to manufacture a product (theoretical cost).
- Loss: The difference between actual cost & ideal cost.

Cost Reduction Opportunity
What is Zero Loss Thinking?
Loss Categories

JIPM Losses
1. Equipment Failure
2. Set-up & Adjustment
3. Cutting Blade Change
4. Start-up
5. Minor Stoppage & Idling
6. Speed
7. Defect & Rework
8. Shutdown
9. Management
10. Operating Motion
11. Line Organization
12. Logistics
13. Measurement & Adjustment
14. Energy
15. Die, Tool & Jig
16. Yield

Milliken Losses
1. Breakdowns
2. Change Over
3. Start-Up & Shutdown
4. Minor Stops
5. PM & Cleaning Downtime
6. Planning
7. Material Handling
8. Speed Loss
9. Off-Quality
10. Rework
11. Waste
12. Obsolescence
13. Allowances
14. Inventory Variances
15. Training
16. Inspection & Testing
17. Indirect Materials
18. Purchase Price Variance/Claims
19. Over/Under Spending
20. Spending not Captured
Associate engagement is structural

- **Structure**: Provide the opportunity via teams, projects & deployment
- **Education**: Prepare people to be successful
- **Measurement**: Measure, track and provide feedback
- **Recognition**: Reinforce and recognize behavior

Key to Implementation - #2
Key to Implementation - #3

Become process thinkers

• Facts and data must trump emotions/political power

• Process health monitored more than results

• Results, without showing process, not celebrated

• Trust the process - success begets confidence
Key to Implementation - #4

Align and cascade the strategy

Forecast and Planning of KPIs & TARGETS is a cascading process. Each level supports the OBJECTIVES of the level above.
Key to Implementation - #5

Translate system success to financial results quickly and consistently
Loss Analysis

Milliken & Company
Average loss landscape per plant $MM/year

$11.7MM

Note: All losses are full variable

175 asso./site
$50MM in rev/site

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Loss Analysis

Milliken & Company
Average loss landscape per plant $MM/year

Note: All losses are full variable

$11.7MM  23% of revenue
Milliken & Company
Average loss landscape per plant $MM/year

$11.7MM

175 asso./site
$50MM in rev/site

$3.5 million reduction per plant

Milliken & Company reduced losses 30% on average per plant within the first 24 months of implementation of the Milliken Performance System.

Note: All losses are full variable.
Loss Analysis

In 1995, 57% of COGS (excluding raw material but including yield losses) was identified as a LOSS. By 2016, we had reduced LOSSES by 45% (from 57% of COGS to 30% of COGS). LOSSES became 30% of COGS (excluding raw material but including yield losses) was identified as a LOSS.
Milliken Performance System: Hard Benefits

Production Labor Productivity

Revenue Per Production Associate (Indexed to 2004 = 100)

From 2004 to 2016: 5% Annual Productivity Improvement
Milliken Performance System: Hard Benefits

Manufacturing Management Productivity

Revenue Per Manufacturing Management Associate (Indexed to 2004 = 100)

From 2004 to 2016: 9% Annual Productivity Improvement
Milliken Revenue and Earnings Since 2004

**Revenue**

- 2% CAGR

**Earnings**

- 16% CAGR
Performance Solutions by Milliken

400 + Operations
27 Countries

Industries
- Food & Beverage
- Glass
- Steel Manufacturing
- Agribusiness
- Packaging
- Paper Manufacturing and Converting
- Construction
- Chemicals
- Non-wovens
- Consumer Packaged Goods