Lean Competitive Manufacturing (LeanCM)

Improving Quality Throughput and Safety

Reducing Waste And Costs

Do you need Lean Competitive Manufacturing (LeanCM)?

<table>
<thead>
<tr>
<th>Question</th>
<th>Tick if 'Yes'</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Are there times when materials or information is not available?</td>
<td></td>
</tr>
<tr>
<td>2  Do some operators do the same job differently?</td>
<td></td>
</tr>
<tr>
<td>3  Do you have to handle work repeatedly?</td>
<td></td>
</tr>
<tr>
<td>4  Are there a lot of finished goods in your warehouse?</td>
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<tr>
<td>5  Is there a lot of work in progress inventory in your process?</td>
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<tr>
<td>6  Is the priority of jobs sometimes unclear?</td>
<td></td>
</tr>
<tr>
<td>7  Has there been any recent quality complaints about your product or service?</td>
<td></td>
</tr>
<tr>
<td>8  Is it difficult to record your performance and quality issues?</td>
<td></td>
</tr>
<tr>
<td>9  Do you have a panic clean-up when someone important visits?</td>
<td></td>
</tr>
<tr>
<td>10 Is the process location and flow not obvious?</td>
<td></td>
</tr>
</tbody>
</table>

Total (add up the ticks):
Define Value

Define value from the customers' perspective

The highest **Quality** product or service at the lowest possible **Cost**, **Delivered** on time.

Need to find out:
- How much they want
- When they want it

Map the Value Stream
Reduce Waste & Cycle Time

Establish Flow

The continuous movement of products, services and information from end to end through the process.
Respond only when the customer Pulls the work (JIT)

Allocating resources based on actual consumption not on forecasted demand

Sequential Pull

Replenishment Pull

Waste Elimination Process

Identify Wastes

Estimate: Effort / Value

Identify Improvements

Implement Improvements

Document: “01B” 30 Minute Waste Reduction

Candidate Name:

Work Area:

Date:

Difficulty

Hard

Easy

Value

Low

High

5S Project Action Plan

<table>
<thead>
<tr>
<th>Project: Resources Flow</th>
<th>Process: Pull Work, Reduce Waste</th>
<th>Method</th>
<th>Effort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify Wastes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implement Improvements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify Improvements</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Implement Improvements</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wood Manufacturing 2010
Clelands Timber Case Study

Mandate for Improvements;
• Improve Productivity by 20%
• Improve Equipment and Process Reliability
• Improve Teamwork and Performance

Company Values Mission Statement
• Clelands Timber Ltd is striving for excellence as a cost efficient processor of quality timber products for both domestic and export markets.

Company Aims & Objectives
• Be committed to supply customers with quality timber products and services.
• Through team management ensure the company is profitable to enable staff to be compensated for effective performance.
• To provide an acceptable return on invested capital.

KPI's - from production budgets 09 2010

<table>
<thead>
<tr>
<th></th>
<th>Budget Before</th>
<th>Current Budgets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M3</td>
<td>M3</td>
</tr>
<tr>
<td>Optimiser</td>
<td>200</td>
<td>235</td>
</tr>
<tr>
<td>Finger Jointer</td>
<td>175</td>
<td>200</td>
</tr>
<tr>
<td>Machine Shop</td>
<td>268</td>
<td>316</td>
</tr>
<tr>
<td>Pre-Priming</td>
<td>188</td>
<td>220</td>
</tr>
<tr>
<td>Laminating</td>
<td>42.8</td>
<td>75</td>
</tr>
</tbody>
</table>

Audit & Implement the Plan

Benchmarking Results May 09

Value Matrix - Example Only

High Level Plan – Example Only

Clelands Timber Benchmarking Results May- 09

Av.12 SMEs
Av.9 Corporate

™ Strategy, Business Planning and Results are significantly above the SME average.
™ Work Practices and Quality categories are slightly below the SME average.

Results

Key: Green = In progress; Orange = Started but Incomplete; Red = Not Started
Identify Value Stream Wastes

Performance Focus - Daily Operations
Focus on Value Stream Performance

Product Value Stream Mapping

- Machine Shop
  - Planning & Scheduling
  - Pre-Prime
  -ennaatch

Legend:
- Available work time per shift
- Telephonic Visual Aid
- Employee Information
- Techniques
- Transport Company
- Optimation
- Pack Size 400 Lm
- from Kiwi
- 4 Weeks Inventory
- Purchase Price / SOPLAN: Cost Optimisation
- - Purchasing at lower price
- - sort out clears?
- From Wood Manufacturing 2010

Detailed Maps required for: Information Flow (Profiles, Volume etc); Knife Grinding Process

Customer Demand Qty. Per Shift

Product Type

Q/T: (H) 0
C/T: (H) 0.00
C/O: (H) 0.50
C/OF: (#) 5.00
Quality (%): 95.0%
Rate: (%) 100.0%
Uptime: (%) 98.0%
Shift: 1

I LEGEND: Available work time per shift

E customer demand qty. per shift

Employee Information Techniques

D T/T Travel time
C/O Change over time
Store ( W.I.P or FIFO sequence flow ) (to next process)
P C/T Cycle time
C/Tt Cycle time (Touch) (finished goods)
T L/T Lead time (finished goods) (e.g. from Store)

L/T = P/T + T/T
P/T = Q/T + C/T + C/O

PFD = Personal Fatigue & Delay Time

Information Flow

Takt Time =

Detailed Maps required for: Information Flow (Profiles, Volume etc); Knife Grinding Process

Deliver a full Load:

Transport Company

Optimisation?

Pack Size 400 Lm

from Kiwi

4 Weeks Inventory

Purchase Price / SOPLAN: Cost Optimisation

- Purchasing at lower price

- sort out clears?

From Wood Manufacturing 2010

Detailed Maps required for: Information Flow (Profiles, Volume etc); Knife Grinding Process

Customer Demand Qty. Per Shift

Product Type

Q/T: (H) 0
C/T: (H) 0.00
C/O: (H) 0.00
C/OF: (#) 0.00
Quality (%): 95.0%
Rate: (%) 0.0%
Uptime: (%) 0.0%
Shift: 1
Apply CM: Identify & Eliminate Wastes

Map the Process & Identify Wastes

Implement Improvements CM Tools

Monitor & Sustain Improvements

Root Cause Analysis
Wood Manufacturing 2010

Waste Elimination Tool # 1

5S for Success

1. Sort
2. Set in Order
3. Shine
4. Standardise
5. Sustain

5 S's
### 5S “No Cost” Improvements

<table>
<thead>
<tr>
<th>Operation</th>
<th>Problem</th>
<th>Actions Taken</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimiser</td>
<td>• Too much clutter&lt;br&gt;• Area hard to keep clean&lt;br&gt;• Materials stored in work area&lt;br&gt;• Tools Scattered&lt;br&gt;• Frequent stoppages</td>
<td>• Implementing 5S&lt;br&gt;• Reduced clutter&lt;br&gt;• Tools set in order&lt;br&gt;• RCA on stoppages&lt;br&gt;• Proactive maintenance</td>
<td>• Organised workplace&lt;br&gt;• Easier to clean and keep clean&lt;br&gt;• Safer with less clutter&lt;br&gt;• Improved uptime&lt;br&gt;• Improved team performance 35 M3</td>
</tr>
<tr>
<td>Laminating</td>
<td>• Too much clutter&lt;br&gt;• Tools scattered&lt;br&gt;• Area hard to keep clean&lt;br&gt;• Motion waste&lt;br&gt;• Glue Blockages</td>
<td>• Implementing 5S&lt;br&gt;• Cleaning and organising&lt;br&gt;• Proactive maintenance</td>
<td>• Organised workplace&lt;br&gt;• Improved organisation&lt;br&gt;• Improved safety&lt;br&gt;• Reduced searching and motion waste&lt;br&gt;• Improved team performance 32.5 M3</td>
</tr>
</tbody>
</table>

**Before 5S**

**Sorting**

**After 5S**

---

**5S “No Cost” Improvements**

<table>
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<td>• Too much clutter&lt;br&gt;• Tools scattered&lt;br&gt;• Area hard to keep clean&lt;br&gt;• Motion waste&lt;br&gt;• Glue Blockages</td>
<td>• Implementing 5S&lt;br&gt;• Cleaning and organising&lt;br&gt;• Proactive maintenance</td>
<td>• Organised workplace&lt;br&gt;• Improved organisation&lt;br&gt;• Improved safety&lt;br&gt;• Reduced searching and motion waste&lt;br&gt;• Improved team performance 32.5 M3</td>
</tr>
</tbody>
</table>
### 5S Investments

<table>
<thead>
<tr>
<th>Operation</th>
<th>Problem</th>
<th>Actions Taken</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grinding Room</td>
<td>• Too much clutter</td>
<td>• Implementing 5S</td>
<td>• Organised workplace</td>
</tr>
<tr>
<td></td>
<td>• Poor workflow</td>
<td>• Reduced clutter</td>
<td>• Safer with less clutter</td>
</tr>
<tr>
<td></td>
<td>• Heads difficult to handle in &amp; out of storage</td>
<td>• Improved workflow disassembly – grind – assembly</td>
<td>• Reduced changeover time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Improved storage and safety</td>
<td>• Improved layout and flow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Improved team performance (MS)</td>
</tr>
</tbody>
</table>

### 5S and Variation Reduction

<table>
<thead>
<tr>
<th>Operation</th>
<th>Problem</th>
<th>Actions Taken</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Prime</td>
<td>• Too much clutter</td>
<td>• Implementing 5S</td>
<td>• Organised workplace</td>
</tr>
<tr>
<td></td>
<td>• Hard to clean</td>
<td>• Reduced clutter</td>
<td>• Safer and easier to clean</td>
</tr>
<tr>
<td></td>
<td>• Coverage variation</td>
<td>• RCA on paint coverage</td>
<td>• Reduced paint waste and variation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Redesigned pumping system</td>
<td><strong>Improved team performance 32 M3</strong></td>
</tr>
</tbody>
</table>

Before 5S | After 5S

Before 5S | 5S WIP
## Quick Change Improvements

<table>
<thead>
<tr>
<th>Operation</th>
<th>Problem</th>
<th>Actions Taken</th>
<th>Results</th>
</tr>
</thead>
</table>
| Machine Shop    | • Disorganised work stations  
                   • Motion and transport waste  
                   • Tools scattered  
                   • Variable changeover times | • Implementing 5S  
                   • Reduced clutter  
                   • Reorganised out-feed process  
                   • Apply quick changeovers | • Organised workplace  
                   • Safer with less clutter  
                   • Sustained focus on quality & throughput  
                   • Improve team performance 43 M3 |

## Proactive Maintenance Improvements

<table>
<thead>
<tr>
<th>Operation</th>
<th>Problem</th>
<th>Actions Taken</th>
<th>Results</th>
</tr>
</thead>
</table>
| Finger Jointer  | • Too much clutter  
                   • Tools scattered  
                   • Stoppages  
                   • Glue blockages  
                   • Long changeovers | • Implementing 5S  
                   • RCA on stoppages  
                   • Proactive maintenance  
                   • Quick changeovers | • Organised workplace  
                   • Improved uptime and throughput  
                   • Reduced changeover time by 20 minutes  
                   • Improve team performance 25 M3                  |