Corporate Overview

• Over 50 years experience designing, developing and manufacturing guidewires for the world’s largest medical device companies.

• Manufacture approximately 70% of worldwide guidewire volume.

• Over 1500 global employees (Chaska, MN – New Ross & Galway, Ireland, Shanghai, China)

• Staff of 27 in the maintenance department, consisting of 17 skilled crafts people dedicated to supporting production equipment. As a result of ongoing improvements in the department, the team are now also involved in new process development, manufacturing and equipment design & build.
9 Years on Our Lean Journey

- 2003 Consultants / Kaizen Blitz
- 2005 C.I. Team Formed / Total Productive Maintenance (TPM)
- 2006 Speciality ‘Value Stream’
- 2007 Lean in non-production areas
- 2008 Standard Work & Training within Industry (TWI)
- 2009 World Class Maintenance
- 2010 A3 Problem Solving
- 2011 Develop Value Stream / Inventory Reduction Program
- 2012 VSM Expansions / Rapid A3 / Shingo Accreditation
LAKE REGION MAINTENANCE DEPARTMENT (2007)

- Constant fire fighting.
- 80% unplanned work for craftsmen.
- High dependency on contractors for project work.
- Little knowledge in spare parts management.
- Only data recorded in our CMMS was PM’s and spare parts usage.
- All Preventative Maintenance was calendar based.
- Some bottlenecks in the process were due to inconsistent machine performance.
- No maintenance visual management tools on the floor.
- Low percentage of Continuous Improvement work completed.
- No equipment manuals.
Asset Management Improvement System

Traditionally the primary mission of the Maintenance Department is to fix breakdowns!

- The goal is to achieve optimum life cycle cost of assets with maximum availability, performance efficiency and the highest quality.
- Provides a method for establishing our current asset management status, benchmarked across 4000 other organisations.
- Provide a structured and systematic programme for the journey to asset management excellence.
- Sets priorities and determines the required actions to progress.
AMIS ASSESSMENT SCORES 2008 - 2011

2009 - In Control
- CMMS
- Systems Engineer
- Visual Management tools

2010 - Innovative
- Maintenance strategy
- Operator Asset Care
- Automation team
- Standard work

2011 - Innovative
- Planner
- PPS - A3’s
- Stocking Policy
- Medical device average score is 41%
Maintenance Strategy

Goal: 100% Operational Availability

- **MTBF**
  - No of repairs

- **MTTR**
  - Time per repair

System to prevent breakdowns

- Design & build good machines
- Improve new machine
- Preventative maintenance
- Fix machines before they break
- Recurrence prevention

System to quickly & correctly repair

- Maintenance skill
- Training plan
- Training methods

Maintenance control

- Spares
- Tools

B.O.C Break Down Occurrence Sheet

- 8 Step Problem Solving - Rapid A3

**Introduce good machine**
- Design review
- Factory acceptance testing
- Installation qualification

**Improve new machine**
- Introduction snag list
- Birthday book

**Preventative maintenance**
- Master Ledger

**Running maint.**
- S.O.P

**Asset Care**
- Master Ledger

**Recurrence prevention**

- Versatility
- J.B.S
- TWI / JI

- P.M.C
- Criticality

- Crash Carts
- Off Line testing
## STANDARD WORK

**THE SYSTEM SUPPORTING STANDARD WORK**

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### MAINTENANCE MACHINE LEDGER

<table>
<thead>
<tr>
<th>CHECK TYPE</th>
<th>INSPECTION ITEM</th>
<th>JUDGEMENT STANDARD</th>
<th>REASON FOR INSPECTION</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Forum</th>
</tr>
</thead>
<tbody>
<tr>
<td>MECHANICAL</td>
<td>Ends</td>
<td>No wear and tear; Replace if required.</td>
<td>Ensure good functionality of equipment</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>MECHANICAL</td>
<td>Shafts</td>
<td>Functioning correctly; Changing vice effectively</td>
<td>Ensure good functionality of equipment; Safe working conditions</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>MECHANICAL</td>
<td>Pulleys</td>
<td>All pulley wheels are tight and secure; Poliyl not rotating freely on shaft</td>
<td>Ensure good functionality of equipment and correct number of lubri to access</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>MECHANICAL</td>
<td>Bearings</td>
<td>Free from excessive preload (this should be an indicator of wear)</td>
<td>Ensure good functionality of equipment</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ELECTRICAL</td>
<td>Electrical connections and cables</td>
<td>No wear and tear, Poor from Egy</td>
<td>Safe working conditions</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>PNEUMATIC</td>
<td>Mechanical connections</td>
<td>No leaks, Worn or damaged</td>
<td>Ensure good functionality of equipment</td>
<td>6</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>GENERAL</td>
<td>Internal surfaces of Machine</td>
<td>Clean and free from dust</td>
<td>Maintain a clean working environment</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GENERAL</td>
<td>Machine interior</td>
<td>Clean and free from dust</td>
<td>Maintain a clean working environment</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GENERAL</td>
<td>Tools and surrounding table surfaces</td>
<td>Clean and free from dust following PM.</td>
<td>Maintain a clean working environment</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

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Adapted from Mervin Window and Doors, TWI Summit 2008
Lake Regions Maintenance journey

Benefits to date to the company:

- Stable equipment performance enabling predictable manufacturing output - volume, rework & scrap.
- Sustained capacity increases, particularly where asset care projects completed.
- Technicians now at 50% planned work daily.
- PM Compliance 100%.
- All work history now recorded in CMMS and is accessible for CI and Root Cause Analysis.
- Production trained on CMMS and now used to log maintenance calls.
Lake Regions Maintenance journey

- Benefits to date to the company:
  - 12% reduction in maintenance spares achieved in 2012 even though 8% increase in overall output from plant.
  - 2 maintenance fitters redeployed into Engineering roles.
- Technicians now involved in:
  - New line installations – reduced contractor assistance.
  - Involved in writing SOP’s
  - Factory Acceptance Tests for new equipment
  - Assisting other departments A3’s, project work
Any Questions?