

Meda Rottapharm



Company Ownership History

- Established 1998 by Rottapharm Group 1,200 employees
- 2007 Rottapharm acquire Madaus 2,000 employees
- 2014 Rottapharm Madaus acquired by Meda 5,000 employees
- 2016 Meda acquired by Mylan 35,000 employees

Site Summary

- Located in Mulhuddart, Dublin
- Footprint 10,000 square metres
- 172 Employees on site
- Ship to 67 markets worldwide
- API, bulk manufacturing, primary & secondary packaging
- Sachet, capsules, tablets, liquids
- 4 manufacturing suites
- 10 packaging lines

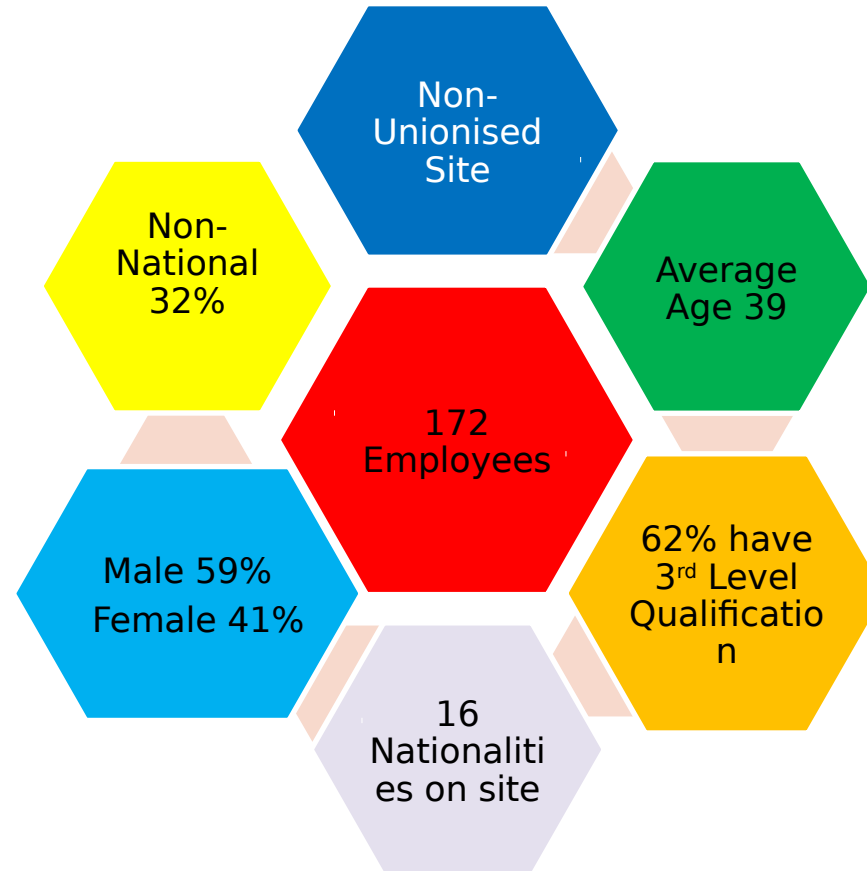
Products

Product	Form
Glucosamine Sulphate (VIARTRIL/DONA)	API, Sachets, Capsules
Bromelain (ANANASE/EXTRANASE)	Tablets
Plantago (PLANTABEN/SPAGULAX)	Sachets
Silymarin Extract (LEGALON)	Sachets
Sodium Fluoride / Vitamin D (ZYMA)	Tablets, Liquids
Aspirin (TROMALYT)	Capsules

Products

	<p>Dona/Viartril- S Sachets (Rheumatology Products)</p> <ul style="list-style-type: none"> •Line 1, 2, Cam •9 packs format •over 80 PN's active
	<p>Dona/Viartril-S Capsules (Rheumatology Products)</p> <ul style="list-style-type: none"> •Line 3,5 Tubs and Glass Bottle •9 Packs format •over 40 PN's active
	<p>Dona/Viartril-S Capsules(Rheumatology Products)</p> <ul style="list-style-type: none"> •Serialised Product Line 4 and Line 8 Blisters •2 Packs Format •3 PN's active
	<p>Extranase/Ananase (Tablets Bromelain)</p> <ul style="list-style-type: none"> •Line 4 Blister •5 Packs Format •5 PN's active
	<p>Zyma Drops (Vitamin D Sodium Fluoride)</p> <ul style="list-style-type: none"> •Line 7 Liquid Drops •4 Packs Format •4 PN's active
	<p>Zyma Tablets (Vitamin D Sodium Fluoride)</p> <ul style="list-style-type: none"> •Line 4 Blister, Line 3 Tubs •10 Packs Format •34 PN's active
	<p>Colofiber (Gastroenterology Products)</p> <ul style="list-style-type: none"> •Line 6 Sachets •1 Packs Format •2 PN's active

HR Information

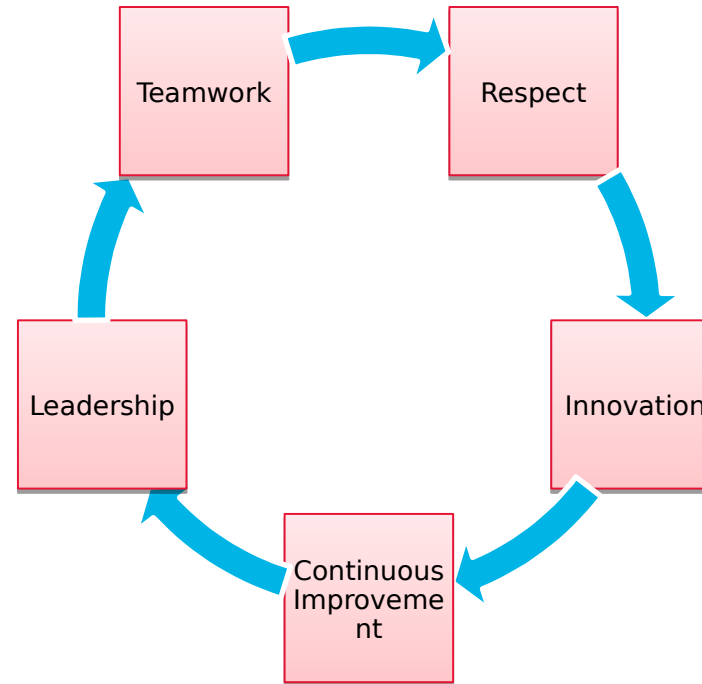


Our Core Purpose

***To be the best
for our
customers,
our people
and the
environment***

Our Core Values

- **Teamwork**
- **Respect**
- **Innovation**
- **Continuous Improvement**
- **Leadership**



2014 - 2024 Vision

***To become
recognised as
one of the
top 10
manufacturing
sites
in the world and
triple our
production
output by 2024***

OPERATIONAL EXCELLENCE

2006-2009

Improvement Initiatives 2006 - 2009

- Superblender batch size increase 2006 ✓
- Sachet line 1 OEE project 2007 ✗
- Incremental batch file review 2009 ✓
- Black belt six sigma sachet line 2006 ✓
- Lean Labs Quality Control 2007 ✓

Lead by managers, extensive use of consultants, top down, some success

Superblender

- Manufacturing blend batch sizes increased from 800Kg to 2,400Kg
- 3-fold reduction in Area Clearances required in manufacturing and packaging leading
- Only 1 batch file needed for 3 times the quantity
- Number of batches for testing reduced by 67%



OPERATIONAL EXCELLENCE

2010-2016

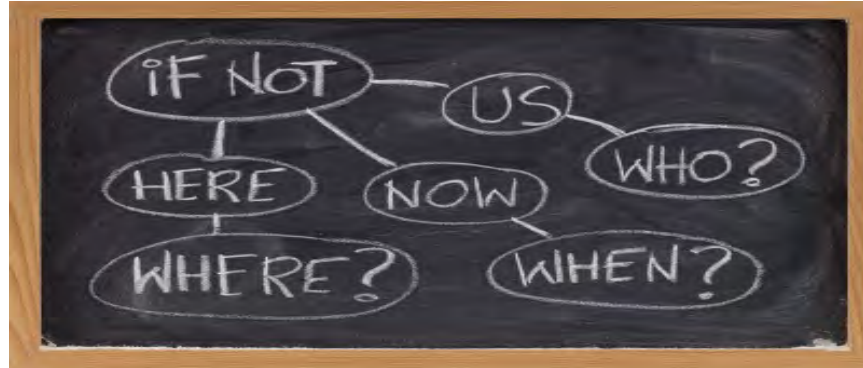
External Environment 2010



- Generic copies of branded products increasing in market share
- Delisting of our products from reimbursement
- Reduction in reimbursement price by governments
- Parallel imports
- Threatening our future!
- We needed to increase cost competitiveness and attract new products

Town Hall Meeting 2010

Urgent and Important



Hard goal – major challenges in implementation

Urgent – no time to lose!!!

Required – must do

Ensure the best future for our customers, our company and ourselves

Word Class Manufacturing



What is meant by World Class Manufacturing?

- The relentless pursuit of excellence in all areas
- The utilisation of industry best practice
- The ability to compete effectively in a global market
- Development and utilisation of talents of all employees
- Continuous improvement and innovation of processes
- Relentless Quality and EHS compliance

Objectives 2010 - 2013

World Class Manufacturing Vision



Increase capacity by 20%

Reduce costs by 15%

Achieve 60% OEE across all lines

Achieve 100% employees involved in CI activities

To become a paperless pharmaceutical plant

To become a reference site for WCM within the Rottapharm|Madaus Group

Achieving the Vision will require striving for :



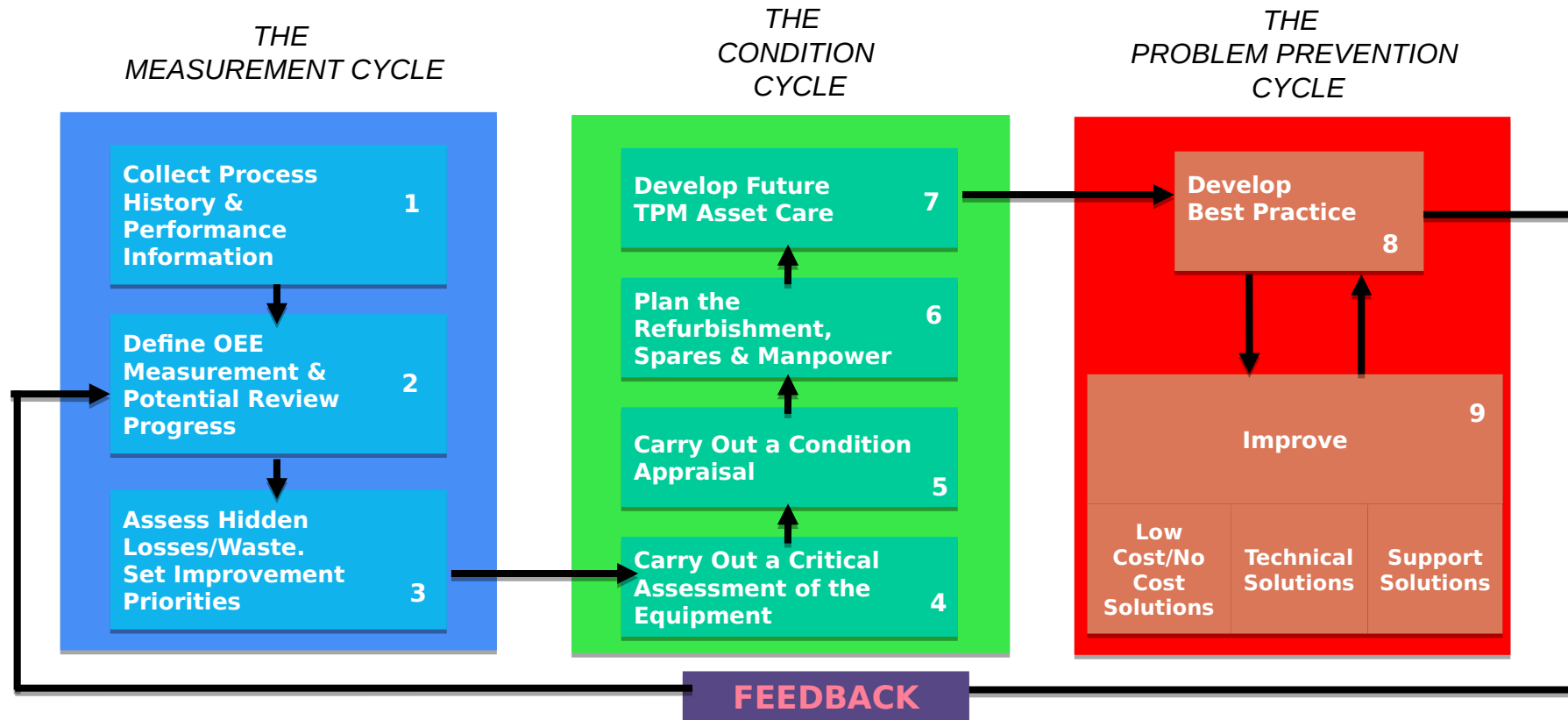
ZEro

Accidents
Defects
Breakdowns
Minor
Stoppages

TPM

- Total Productive Maintenance (TPM)
- The responsibilities for improving the equipment performance lie not just with the maintenance department but with all the plant personnel
- TPM is a tool for helping to bring about change
- The culture of a plant evolves through the use of TPM
- Other tools such as Six Sigma, Lean, Kaizen, Root Cause Analysis, Reliability Centred Maintenance aid the overall change

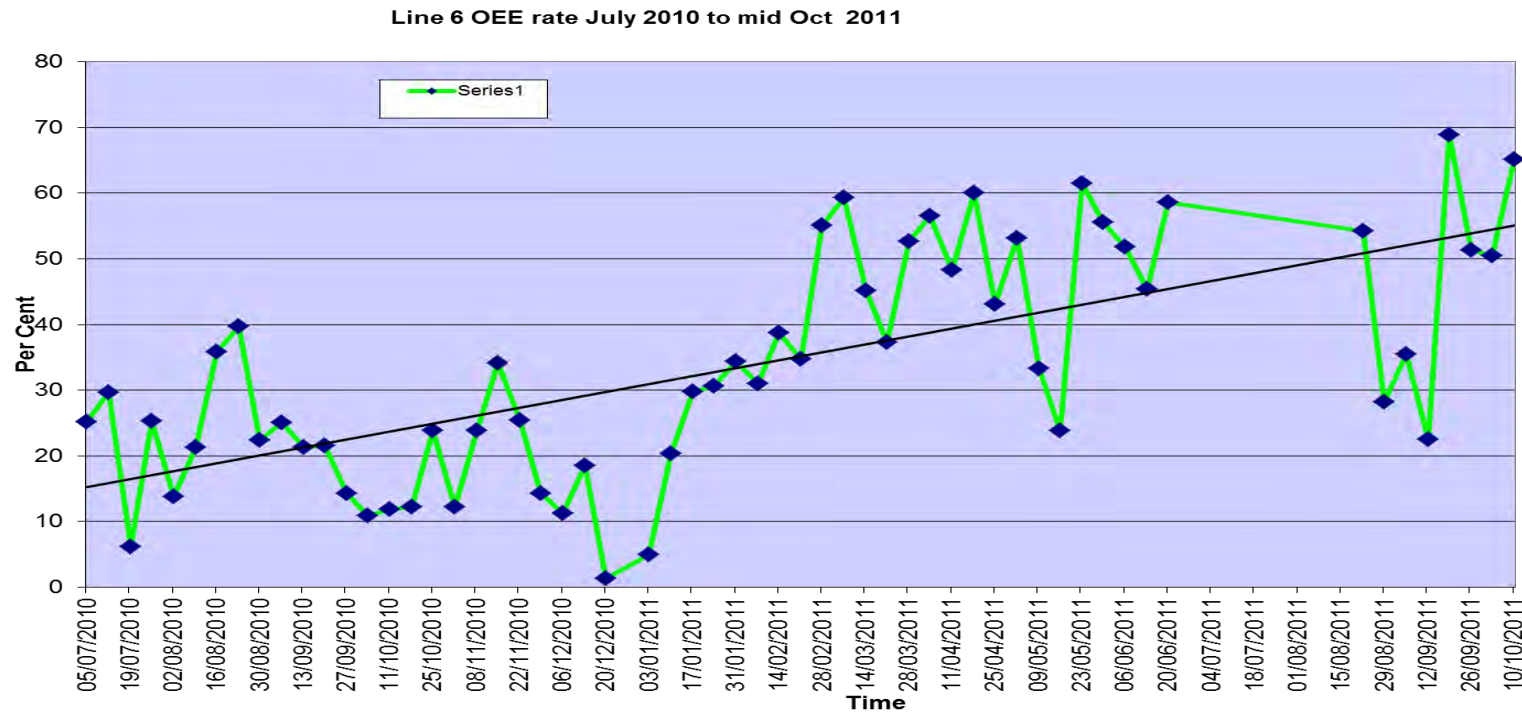
The TPM Process



The Trial Period

- April 2010 four day training with TPM consultant on the TPM process – 19 people
- July 2010 two pilot projects launched – 6 people per team
- Production stopped for 8 hours per week
- November 2010 pilot teams completed the 9 step process
- Improvements made, team structure developed
- Success - operations/maintenance working together
- Roll out programme developed for the plant

Line 6: Pilot OEE rate



Front Line Operator Asset Care (FLOAC) - Operator as the Technician



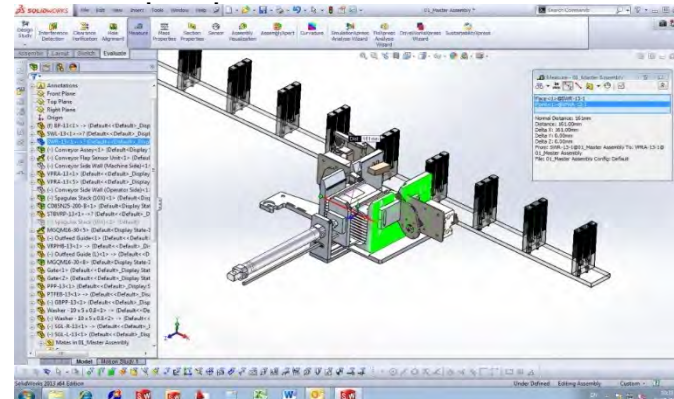
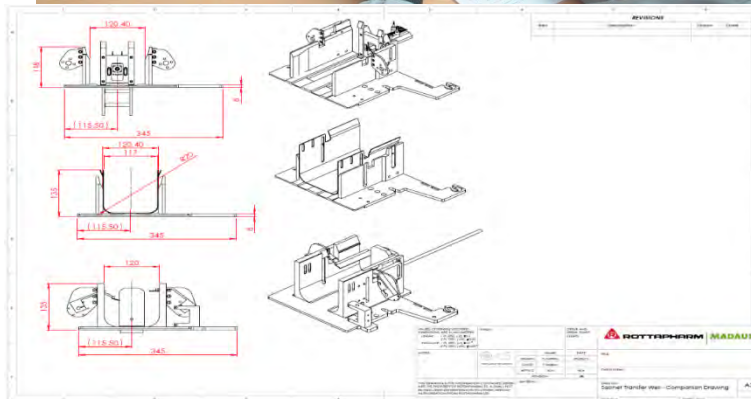
- The operator takes on the role of first line maintenance
- Checking the condition of the equipment during operation
- Carrying out maintenance during the weekly maintenance window
- Progressing to monthly maintenance and carrying out change overs on equipment



Technician as the Engineer



- Technicians spend more time on design and engineering out problems
- Less work is outsourced
- More knowledge and ability is developed in-house
- Technicians feel more motivated and more



Improvement Tools - PCO



- Introduction of Precision Change Over (PCO) using lean six sigma techniques
- Dramatic improvements – Bulk API process increased output by 33%
- BIT Type 1 reduced by approximately 60% across most of the packaging lines

The People and the Teams



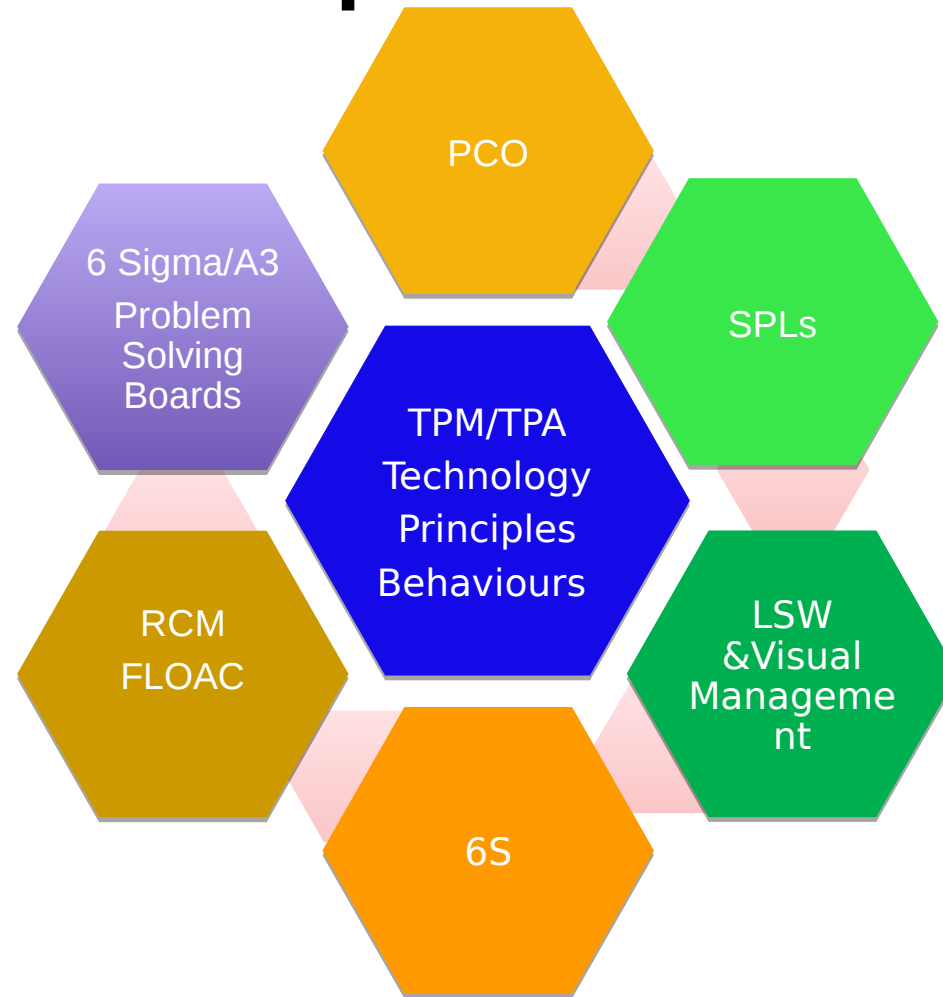
- TPM teams established across the plant
- Teams self managing, progress tracked via TPM audits level 1a - 4b
- Culture of responsibility developed - “how can I make a difference?”
- Cross Functional teams established for Six Sigma projects, A3 problem solving, Process Mapping
- Communications - CI newsletter, net presenter and improvement boards
- Celebration of success, reward & recognition

Total Productive Administration (TPA)





- Recognised the need to involve everyone in CI activities
- September 2012 , teams from QC, QA, Finance and Logistics trained
- Process mapping to remove non-value adding activities in processes
- Continuous Improvement Structure developed for the administrative and support areas

Helping to Generate a Culture of Improvement




Single Point Lesson

		<h2>Single Point Lesson (SPL)</h2>			
SPL TITLE: Assembly of the capsule filling machine MG2 G37		Asset code: CF103	Location: M4	SPL No: OP-0092	Rev: 00
Prepared by: Damian Busko <i>DBusko</i>		Date: <i>20/06/12</i>	Approved by: Michal Majzel <i>Majzel</i>		Date: <i>21/06/12</i>




1

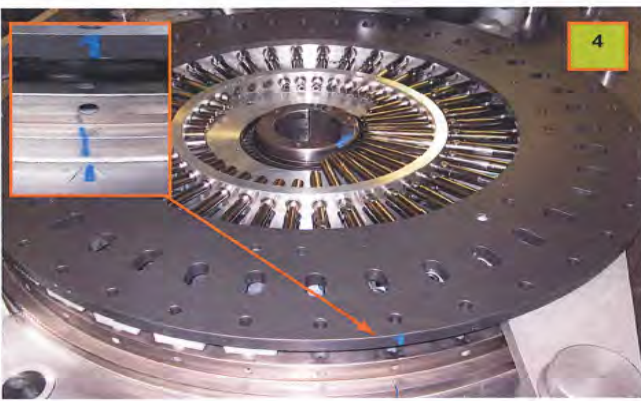
Suction mouth



2



3



4

WHAT? : The purpose of this SPL is to detail the procedure to be followed when assembling the capsules filling machine MG2 G37

WHY? : To ensure no damage occurs to MG2 G37 during this procedure

HOW? : By introducing best practice routine for all involved with carrying out this task

BEST PRACTICE


1. Always wear the gloves when reassembling. Do not over tight the screws, nuts when reassembling.
2. Place the suction mouth and secure it by using big screw. (Fig 1)
3. Install 40 bushes and secure them by white plastic bush holders (Fig 2). Installing of bushes is possible only in place shows by arrow.
4. Reassembly 40 aluminium blocks in capsule rotary dosing unit. All blocks are numbered from 1 to 40, start reassembling from number 1 and continue in increasing order up to 40. Place the bush with spring to the half block then secure it with second half block and tight it with nut (use washer between block and nut). (Fig 3)
5. Place the black aluminium capsule ring plate. Make sure number one is in line with blue marks on machine MG2 G37. (Fig 4)

Valid only on the day of printing 19/09/16

Page 1 of 5

OP-0092

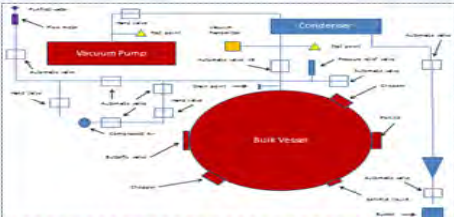
A3#:	13-006	TEAM:	Bulk		
AUTHOR:	Richard Hayes	MANAGER START APPROVAL:	Mark Duffy/Paul Ludof/Padmig McCrum	START DATE:	04/11/13
TITLE:	Bulk Vacuum Extract High Temperature Alarms	FINAL APPROVAL:		COMP DATE:	17/04/14



STEP 1: CLARIFY THE PROBLEM

There are intermittent vacuum high extract temperature alarms at the start of the vacuum drying phase of the Bulk blending process, this problem causes process deviations which affect the bulk operations and support departments. The problem started in February 2013 and has occurred randomly, there does not appear to be any trend although the alarm goes off on the second batch (the first alarm occurred on the first batch of the day). This problem is costing €5000 per incident

STEP 2: BREAKDOWN THE PROBLEM



STEP 3: SET A TARGET

Identify the root cause or causes of the vacuum extract high temperature alarms on the Bulk Blending process during the vacuum drying phase

We want to put in preventative measures to remove the root cause/s and eliminate the problem

We want to complete this project by the end of the end of February 2014

STEP 4: ANALYSE THE ROOT CAUSE

November 2013 - Chilled water set point raised by 2 degrees to save energy (this resulted in saving per degree - 40% savings on electricity bill)

End of May/Start of June 2014 - Chilled water pump speed reduced to 87%

Sept 2014 - new type of wet filter fitted - more condensate collected in the tank

Nov 2014 - All problem started to look at high vacuum temp alarms

December 2014 - chilled water set point dropped by 2 degrees to generate more cooling energy

Feb 15th - Chilled water pump speed increased to 90%

Feb 15th - High vacuum temp alarm increased from 70 to 80

STEP 5: DEVELOP COUNTERMEASURES

Before moving to Step 6 please answer the following question:

Are changes controlled through CCR process?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	If yes refer to number, no changes
Are changes controlled through TCR process?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	If yes refer to number, no changes
Is validation required?	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	If yes refer to number, no changes to alarm time required - TCR No
Are all key stakeholders and senior management aware of changes	YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	

Countermeasures

- Lower the cooling temperature of the chilled water
- Lower the product start temperature
- Raise the vacuum extract alarm set point and monitor
- Only measure the temperature after initial temp spike
- Raise the chilled water circuit flow rate and measure impact

Comments

Measure effect, this is not efficient in terms of energy usage. This could have a potential negative impact in slowing the cycle time. In fact have told us that other companies run at 60-70 degrees - an increase to 40 may not be extreme as the duration would only be for a short period. This would involve changing the software to ignore the temperature for a short period at the initial stage of the drying process. This could be achieved by increasing the chilled water circulation pump speed, this would not be efficient in terms of energy usage.


Impact of countermeasures

- The chilled water was lowered but there are still temperatures above 30 and variation in the process temperatures is still being observed
- The alarm set point was increased to 40—trends to be monitored and condition of pump—As a result of sufficient flow in the condenser temperature has dropped below 25 degrees
- The increase in flow rate has corresponded to a reduction in the maximum temps observed on the vac line

STEP 6: IMPLEMENT COUNTERMEASURES

- Cooling temperature lowered, there does not appear to be a benefit, to be returned to normal under controlled action.
- TCR to be implemented to raise alarm set point from 30 to 40 and monitor result, does the alarm go over 40? - once flow is sufficient this does not happen.
- Chilled water flow rates measured at normal speed and full speed, run at full speed and monitor process conditions, determine impact. If there is no benefit return to normal speed—There has been an impact on this action, by raising the flow rate the vacuum extract temperature has dropped significantly—step change can be observed on the graph below.
- As a follow up to action 3 it has been decided that raising the vacuum extract set point and lowering the pump speed (flow rate) on the chilled water system is the best and most economic option. There is no additional moisture being drawn off at the vacuum pump.

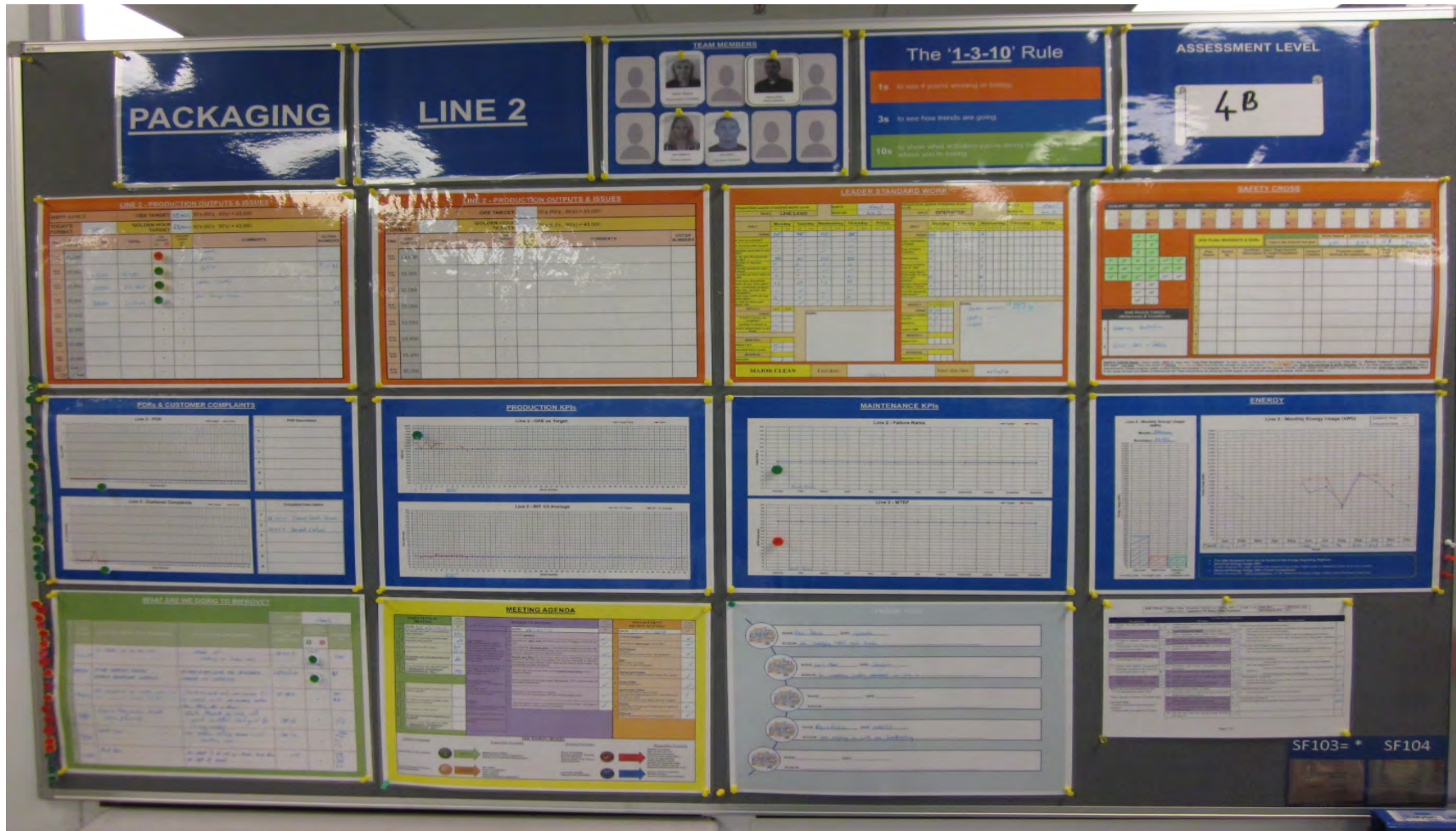
STEP 7: MONITOR RESULTS & PROCESSES



STEP 8: STANDARDIZE SUCCESSFUL PROCESSES

The system is currently in control, no alarms have occurred and the temperature on the extract has not exceeded. A permanent change control is being raised to allow the process operate with a reduced level of cooling capacity on the condenser (only an issue at initial draw off of vapour). The moisture content collected at the vacuum pump has not changed from when the cooling capacity was higher and there has not been a deterioration in the pump performance. The project is now considered to be closed

Visual Management Board



Meeting Agenda

MEETING AGENDA

DAILY CI PULSE MEETING			Please Tick upon completion	WEEKLY CI MEETING			Please Tick upon completion	MANAGEMENT REVIEW MEETING			Please Tick upon completion
DATE: / /			✓	DATE: / /			✓	DATE: / /			✓
E A R L Y S H I F T	1	Do you have any safety concerns that you wish to highlight?		<u>Time / Location:</u> At the appropriate time to allow shift cross over and CI activities take place after the meeting. The meetings can take place in the local area or in a meeting room if a team based event follows after the meeting such as an A3 problem solving activity. The meeting should only last for 15 -20 minutes, the focus should be on using the assigned time for improvement activity. <u>Facilitation of meeting:</u> Time keeping – 15-20 minutes per meeting. Follow the agenda. Ensure all members have appropriate tasks/actions assigned. <u>Attendees:</u> Weekly – Local team members and technician SME & designated facilitator Rotating through the various teams Local Production and Maintenance Manager	1	Check for <u>attendance</u> .		1	Check for <u>attendance</u> .		
	2	Are there any immediate machine issues that needs to be resolved?			2	Check for any <u>safety items</u> (all safety issues are to be logged on the SOR system).		2	Check that the <u>Safety Cross</u> is up to date.		
	3	Do you have any BITs today?			3	Go through the <u>discussion items</u> on the SharePoint tracker site for the team. (New improvement or problem solving ideas can be discussed at this time but should be logged on the ideas register system)		3	<u>OOE/Outputs</u> . On target? Hourly targets, Golden Hours – any achieved?		
	4	Do you have any issues that needs to be escalated?			4	<u>Review new ideas</u> that have been raised on the SharePoint tracker and assigned to the team for consideration (by relevant managers) or that have been raised by team members. If the ideas are not already on the register, ensure that the new ideas are logged.		4	<u>BITs</u> . BITs 1 and 2 vs. target BITs 3, 4, 5 status and trends?		
	5	Can you meet the daily plan with regard to: <u>RESOURCES</u> ; <u>MATERIALS</u> ; <u>INTERMEDIATES</u> ; <u>PO's</u> ?			5	Review areas where we are losing and put <u>Improvement Actions</u> in place. Update the board.		5	<u>Machine performance</u> . Is the MTBF on target & Failure Rates below target?		
L A T E S H I F T	1	Do you have any safety concerns that you wish to highlight?			6	Review progress on the <u>Goal Action Performance</u> (GAP) improvements for the month on SharePoint.		6	<u>Energy Saving</u> . Shift-end practices.		
	2	Are there any immediate machine issues that needs to be resolved?			7	Update the local team board as required. (Completed by the board owner and relevant <u>KPI update owner</u>)		7	<u>Improvement Actions</u> . What are the improvement actions? Who have they been assigned to & is there follow-up? Are they on Target? Do any items need extra support from Sur, Mgmt?		
	3	Do you have any BITs today?			8	After the meeting - take on assigned individual or team based GAP improvements or problem solving activities as required.		8	<u>Projects</u> . Is there any A3 in progress? What is the 6S status? Is everyone involved?		
	4	Do you have any issues that needs to be escalated?					9	<u>Follow-up</u> . Items to be pursued by Senior Management team?			
	5	Can you meet the daily plan with regard to: <u>RESOURCES</u> ; <u>MATERIALS</u> ; <u>INTERMEDIATES</u> ; <u>PO's</u> ?									

THE SHINGO MODEL



- SLT Gembera walks weekly

Problem Solving Board

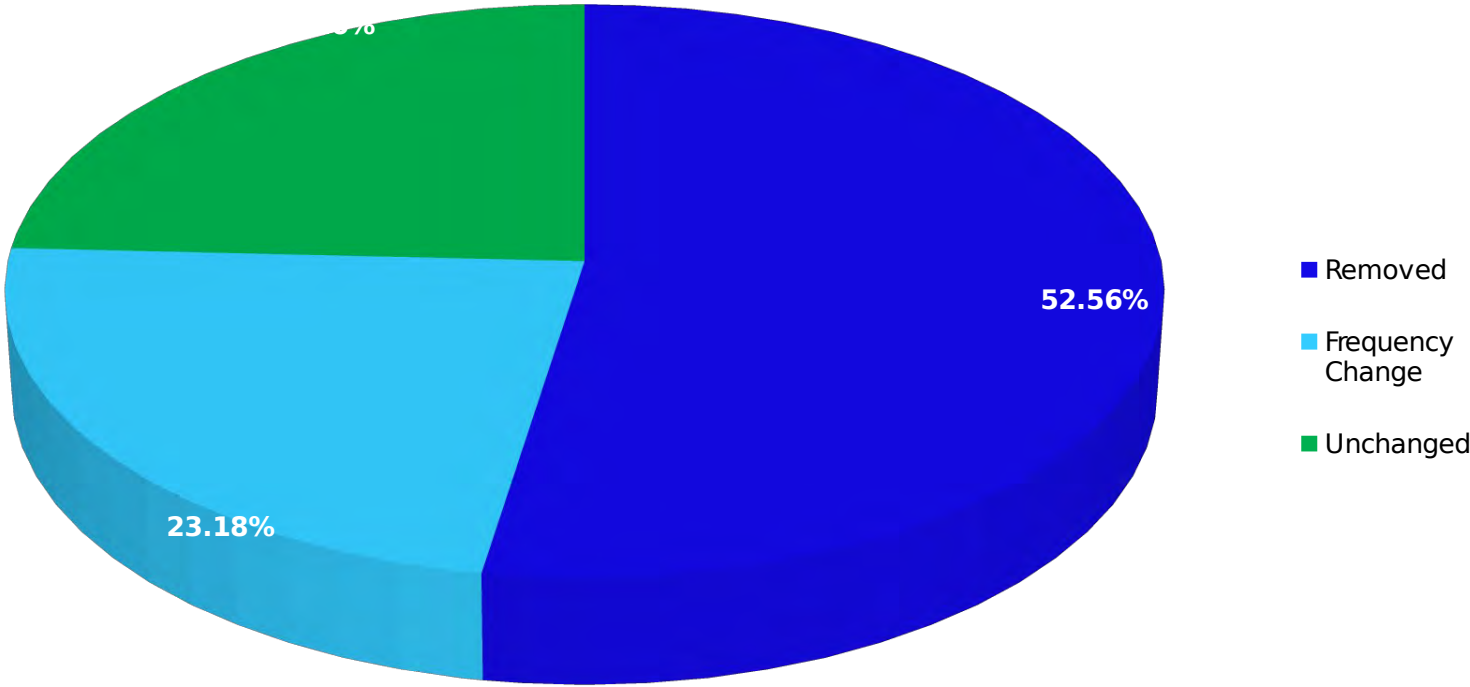
ISSUE START DATE: 19/09/2016		EQUIPMENT TAG NUMBER: 8C202		RESOURCES: A. Kallay	
1. Describe in detail what the problem is (e.g. error messages, noise, smell etc.):			6. What are the potential problems causing the issue?		7. What work has been carried out to resolve the issue?
<p>Damaged Blisters</p> <p>The corner of the blisters are getting damaged while being transferred into the cartons.</p>			<p>Damaged Blisters</p> <p>Failed Seal Tests</p> <p>Broken Tablets</p>		<p>Check Product Pusher</p> <p>Leaflet Position</p> <p>Machine Speed</p> <p>Hopper Set-up</p>
2. Did anything change before the problem started?			8. How was the issue resolved?		
NO: <input checked="" type="checkbox"/> YES: <input type="checkbox"/> NO			Moved the position of the leaflet, adjusted hopper spring pressure and height of the product pusher		
3. Has the problem happened before? - (check Pemac history)			9. Follow on work:		
NO: <input type="checkbox"/> YES: <input checked="" type="checkbox"/> Checked Pemac			Are we certain the root cause has been established? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
4. Can we compare the settings to a 2 nd machine?			Can we create an SPL for the problem? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		
NO: <input checked="" type="checkbox"/> YES: <input type="checkbox"/> NO			Can we add this problem to a PM? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		
5. Is the problem:			Could we design out the problem area? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
Reproducible: NO Intermittent: YES Constant: NO			10. Requirements for a completed job (tick if complete)		
			Detailed Pemac reports. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
			Work order created for any follow on work required. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
			Do we need to re-order spares? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
			Has the area been returned to running status? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
			Image of this board & Pemac report documented on trouble shooting folder. YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>MATERIALS</p> <p>MANPOWER</p> <p>MEASUREMENTS</p> </div> <div style="text-align: center;"> <p>METHOD</p> <p>MACHINE</p> <p>MOTHER NATURE</p> </div> </div>			11. Result of work?		
			QIP happy to run the line with slight damage on the blisters & new product pusher to be designed.		
Root Cause Analysis Template					
Most Probable RC 1:			Most Probable RC 2:		
WHY?			WHY?		
WHY?			WHY?		
WHY?			WHY?		
WHY?			WHY?		
WHY?			WHY?		

Reliability Centred Maintenance

- Eliminate non-value adding PM tasks
- Replace time based with condition based PM tasks wherever possible
- Avoid intrusive PM tasks wherever practical
- Ensure task frequencies are correct
- Identify where there are omissions
- to reduce PM workload and improve plant performance

RCM PM Review Results

Results	Total	Removed	Frequency Change	Unchanged
Total	2127	1118	493	516
%	100	52.6	23.2	24.3



CI Team Focus

Dedicated CI Time in all departments



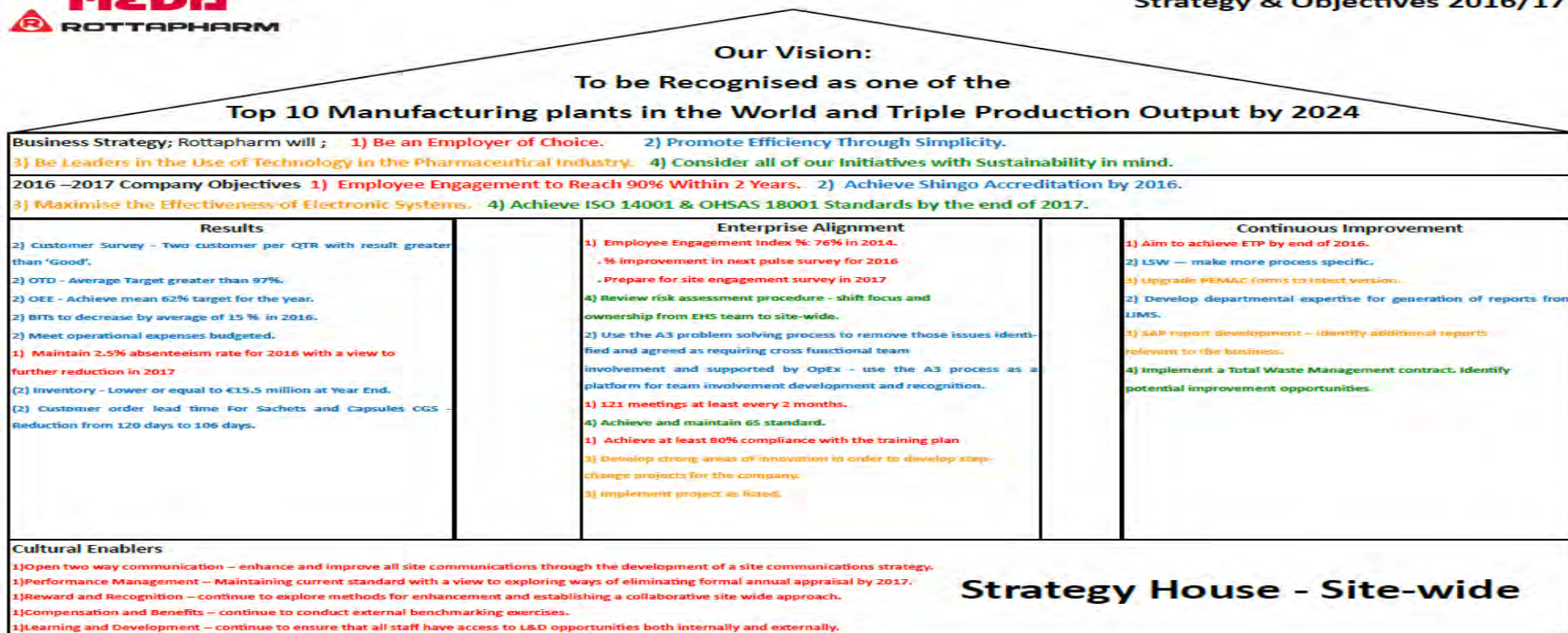
Objectives 2014 - 2015

- Safety: 10% reduction in accidents each year
- Environment: 5% reduction in energy used to produce each pack of product
- Quality: 10% increase in right first time for finished product
- People: 100% of employees to achieve CPD standard by December 2015
- Customer: 10% reduction in order cycle time
- Shingo: Challenge for Shingo prize by December 2015

Rottapharm - Strategy House - Site Wide



Strategy & Objectives 2016/17



- Four key objectives established for the site
- Site wide consultations on the departmental objectives to support site objectives
- Individual objectives aligned to departmental objectives
- Site strategy and departmental strategy houses aligned

Technology & Innovation

The Paperless Plant



- Introduction of a Electronic Batch Records - Manufacturing Execution System (MES)
- Introduction of a Laboratory Information Management System (LIMS)
- Introduction of Paperless Maintenance (CMMS)
- Introduction of an OEE system
- Introduction of Sharepoint
- Introduction of SAP
- Introduction of a Learning Management System
- Introduction of 3D Scanning and virtual spare parts library
- Over 1,000,000 wet signatures removed
- Operation and maintenance efficiency improved and errors eliminated
- Value of technology: elimination of waste & generation of information for CI

Paperless Maintenance



Direct history reports of unplanned maintenance

Complete corrective work orders

Complete routine preventative and predictive maintenance

Generate work requests

Raise purchase orders

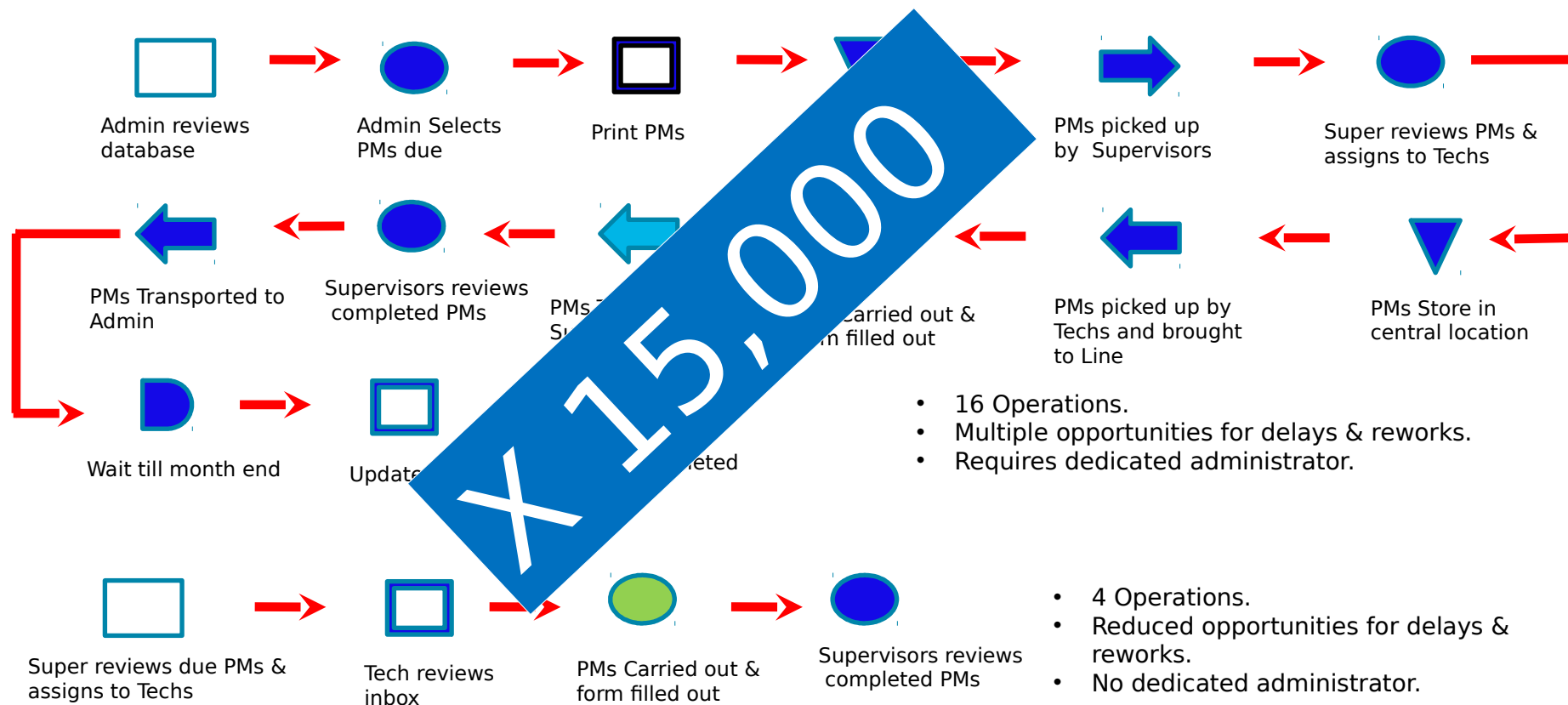
View up to date maintenance history

View assigned work via individual inbox

Carry out spares search

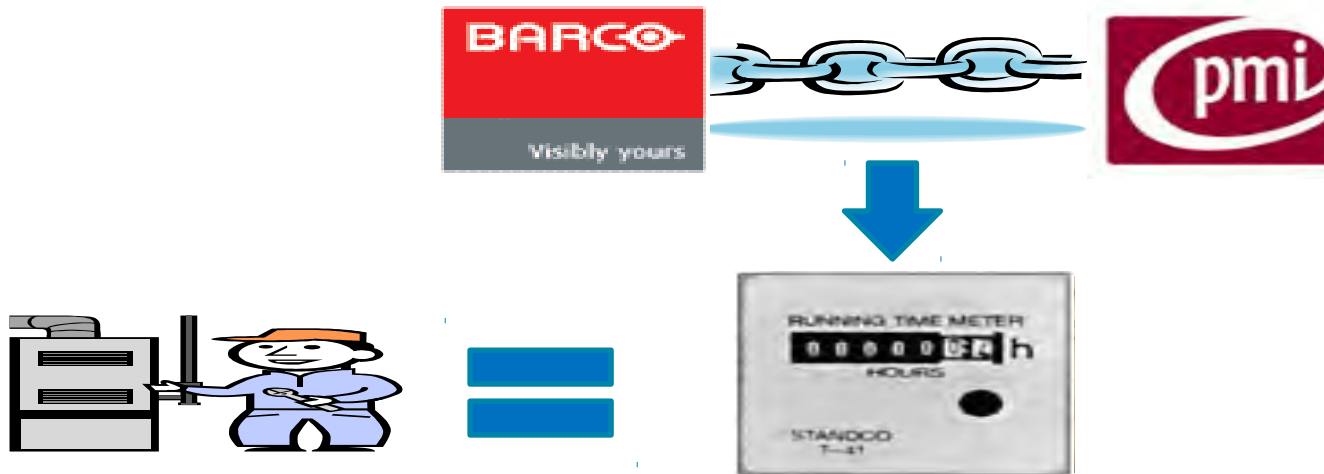
View maintenance documentation-
Manuals, set up sheets, SPL's

Minimising Waste



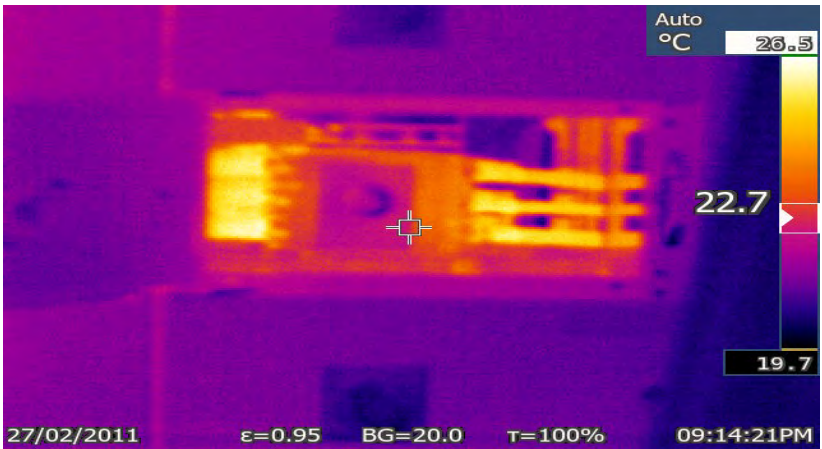
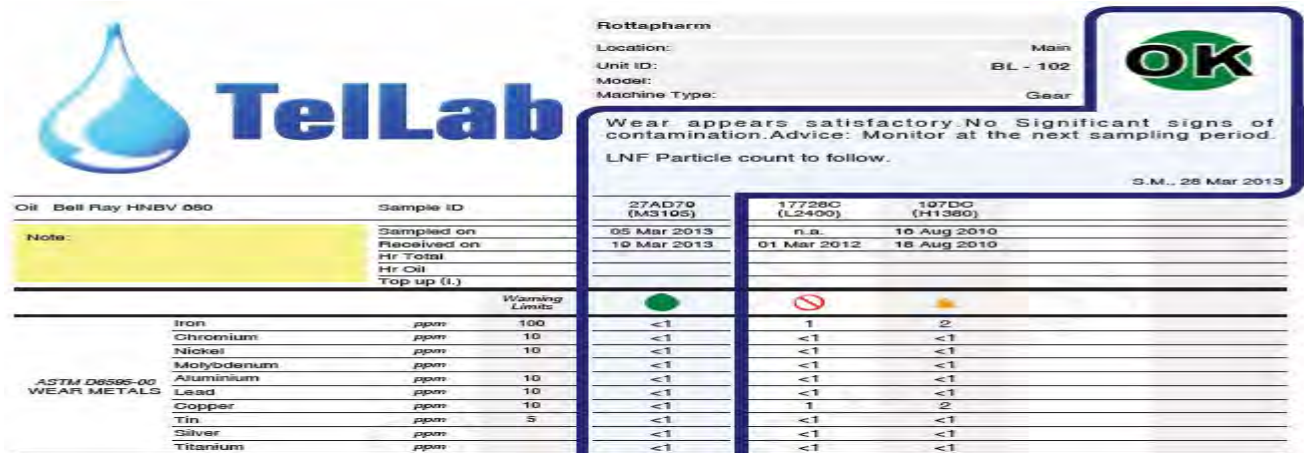
Meter Based Maintenance

- Barco OEE system and CMMS (PMI) interface
- Allows actual running times determine routine maintenance schedule

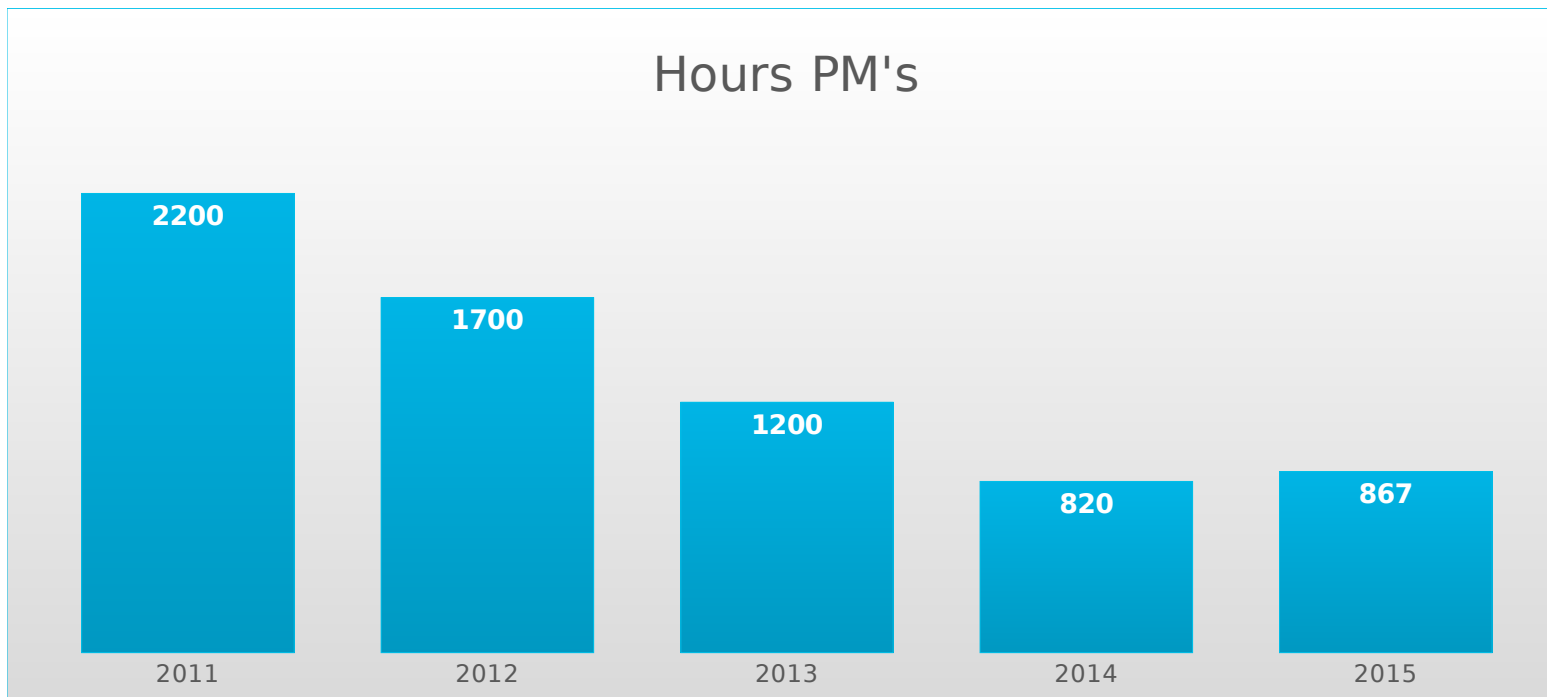


Condition Based Maintenance

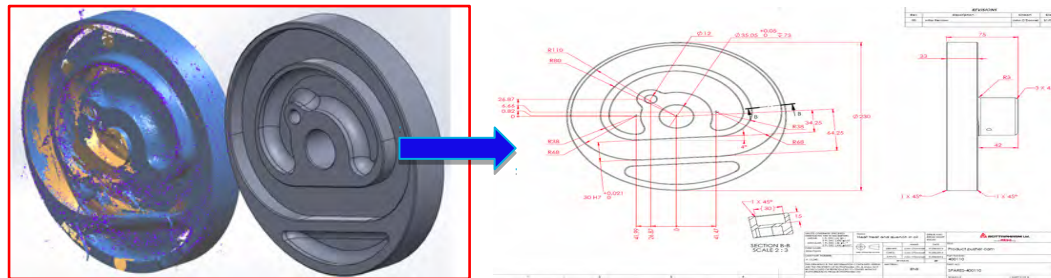
Thermal Analysis, Oil Analysis, Vibration Testing



Results - Technician PM Time



3D Printing / 3D Scanning / Virtual Stores



1. Scan/Model

2. Drawing

Spare Part Details

Register | Details | Store Specific Userfields | Gen. Details | **Related Documents**

Spares Code	Generic Name
400110	Default
Spares Description	
DWG Marchesini Product Pusher Cam P/N A 13.240	

☒ Tag

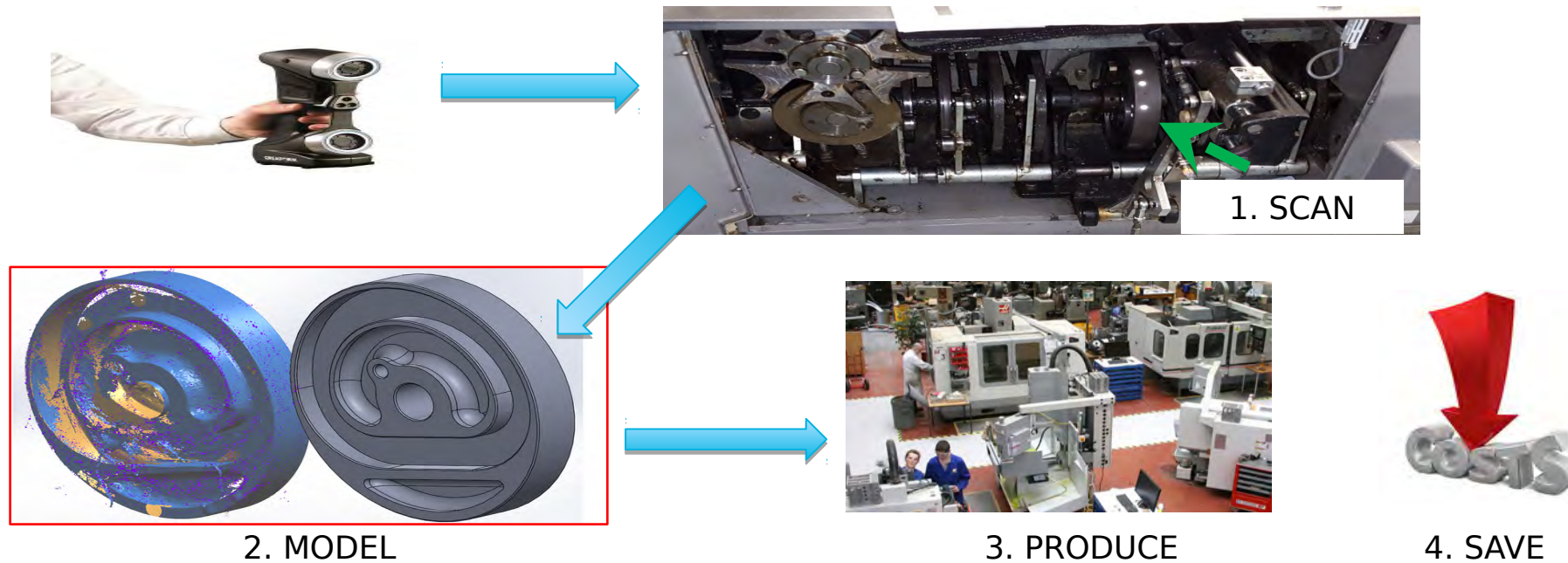
No. Documents
1

Load	Document Description	Filename
<input type="checkbox"/>	DWG Marchesini Product Pusher Cam P/N A 1	I:\Private\Facilities-Maintenance Support\Drawings\0011

3. Link to CMMS

- Currently using 3D Printer to design and manufacture prototypes in plastic
- 3D Scanner and solid works software to develop a “ Virtual Stores”
- 3D Scanner enables fast accurate development of models
- From the 3D model schematic drawings are developed and are attached to spares via the CMMS system
- Drawings can be provided to local vendors and the parts can be produced within hours.
- Results include reduced costs on spares, no long OEM Lead times, reduced inventory
- 121 Parts now created in the “Virtual Stores”

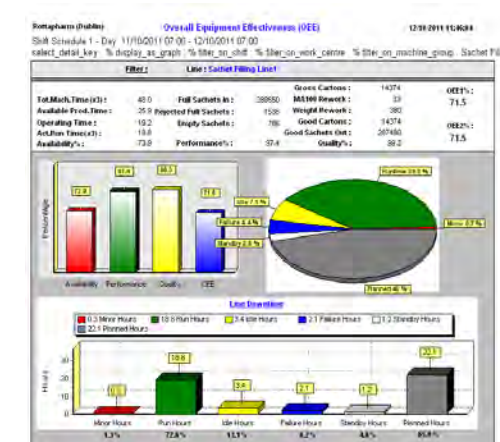
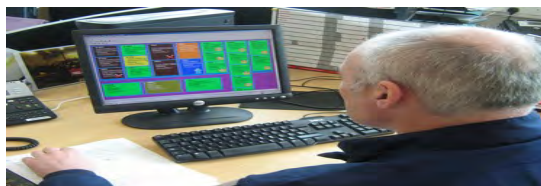
Process - Reverse Engineering



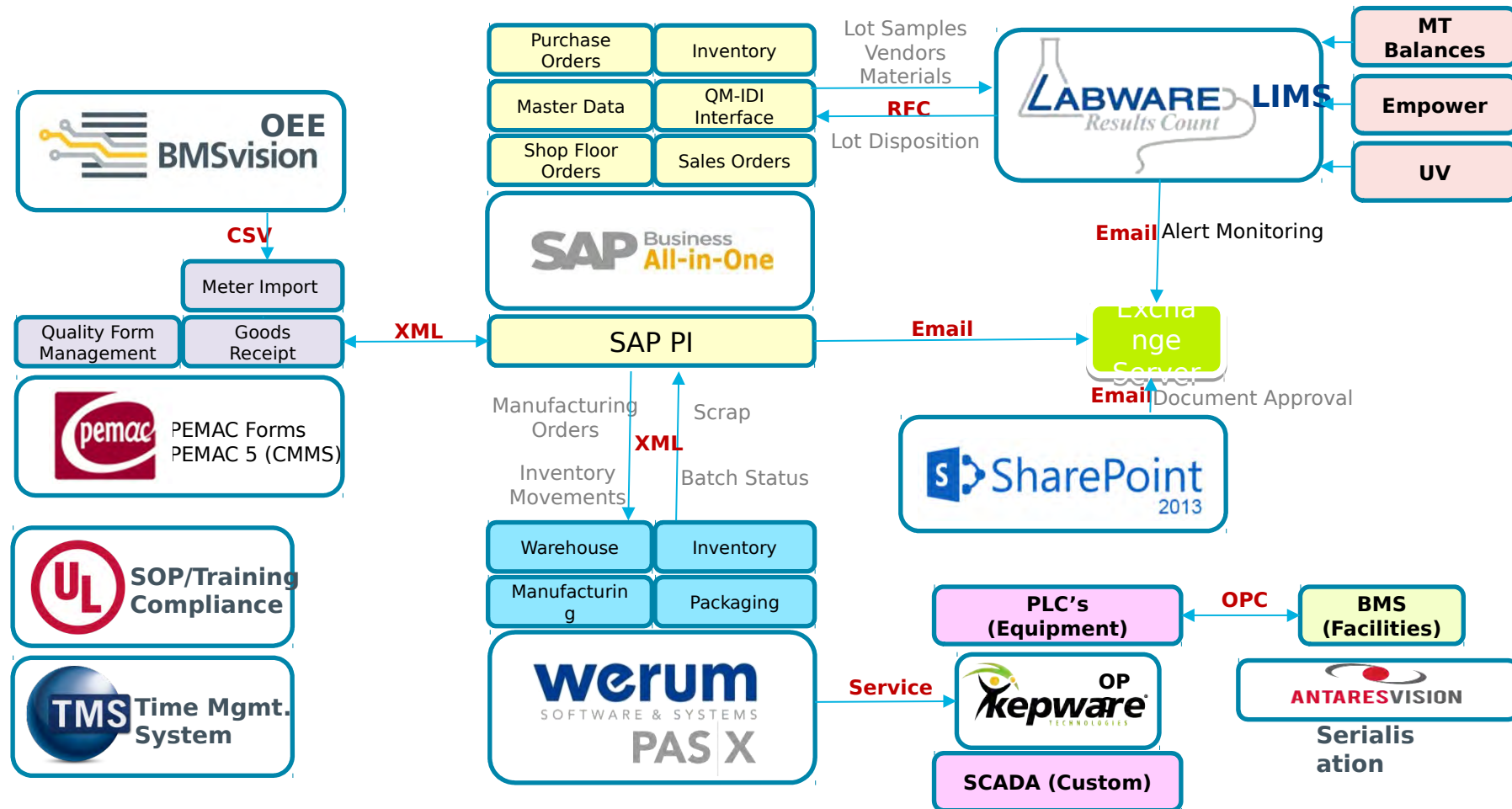
Example of Savings

<u>Part Description</u>	<u>Local Cost</u>	<u>Vendor Cost</u>	<u>Saving</u>
DWG Dosator Sieve Bearing	€10.50	€153.36	93.15%
DWG Dosator Bearing 30mm x 20mm P/N 271.01.512	€11.00	€97.07	88.67%
DWG Sealing Jaw Drive Shaft P/N 235.21.228	€70.00	€390.00	82.05%
DWG Funnel Mounting Support Block P/N 07910103	€24.00	€125.76	80.92%
DWG Sealing Plate Isolator P/N 235.21.256	€22.20	€201.23	88.97%
DWG Code Block Drive Ring P/N 235.45.231	€30.00	€153.40	80.44%
DWG Pusher Pull Back Guide Track P/N RM092.048	€360.00	€1,350.00	73.33%
DWG Sealing Jaw White Plastic Wire Cover Left P/N 235.21.257	€66.00	€614.87	89.27%
DWG Sealing Jaw White Plastic Wire Cover Right P/N 235.21.357	€66.00	€614.87	89.27%
DWG Vertical Cutting Blade P/N 235.20.351	€40.00	€572.14	93.01%
DWG Chain Tensioner Assembly	€235.00	€885.50	73.46%
DWG Product Pusher Cam P/N A 13.240	€830.00	€3,512.16	76.37%

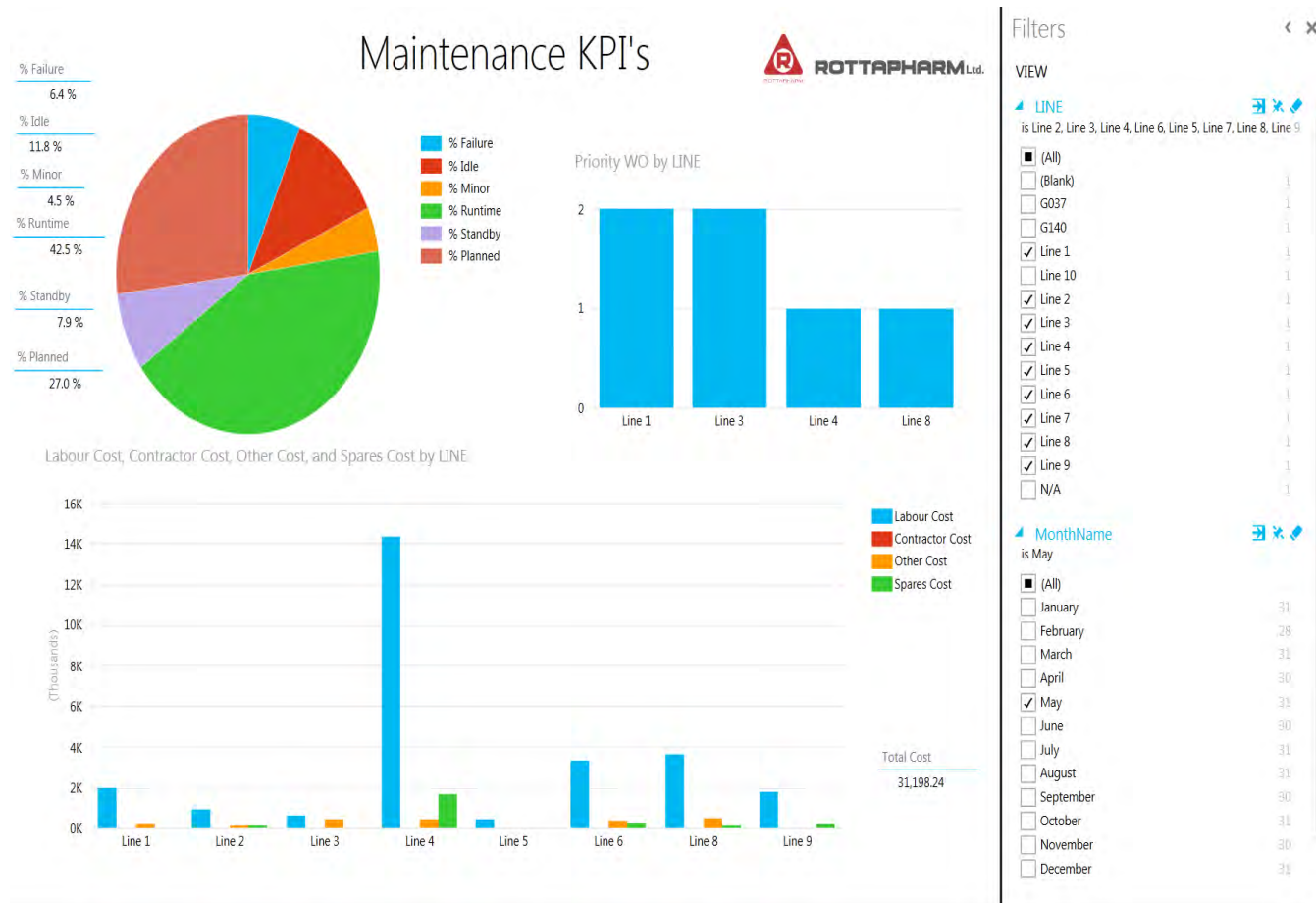
OEE - Real Time Equipment Monitoring



IT Systems Network



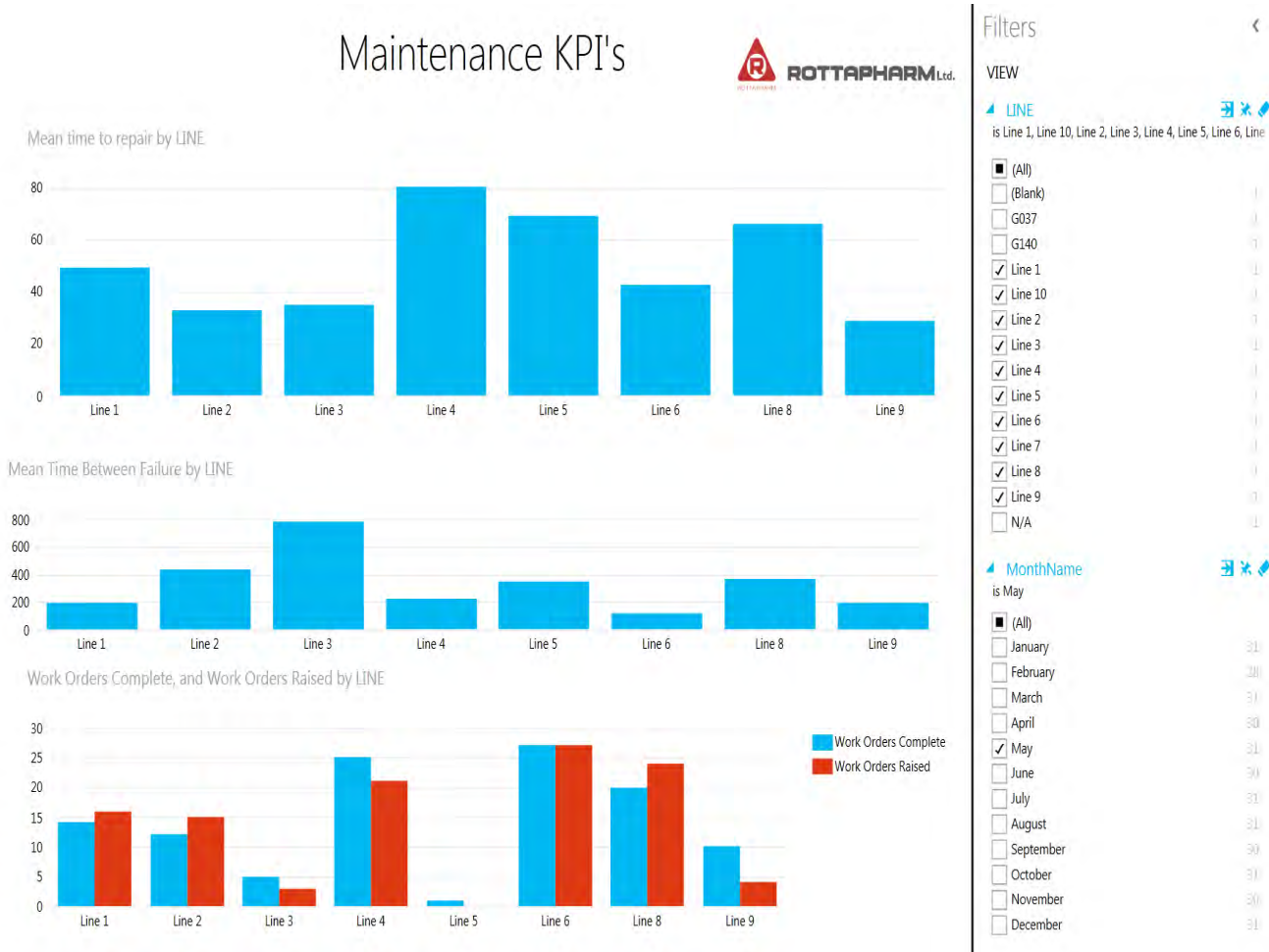
Business Intelligence in Maintenance



- Data from multiple systems stored in Data warehouse

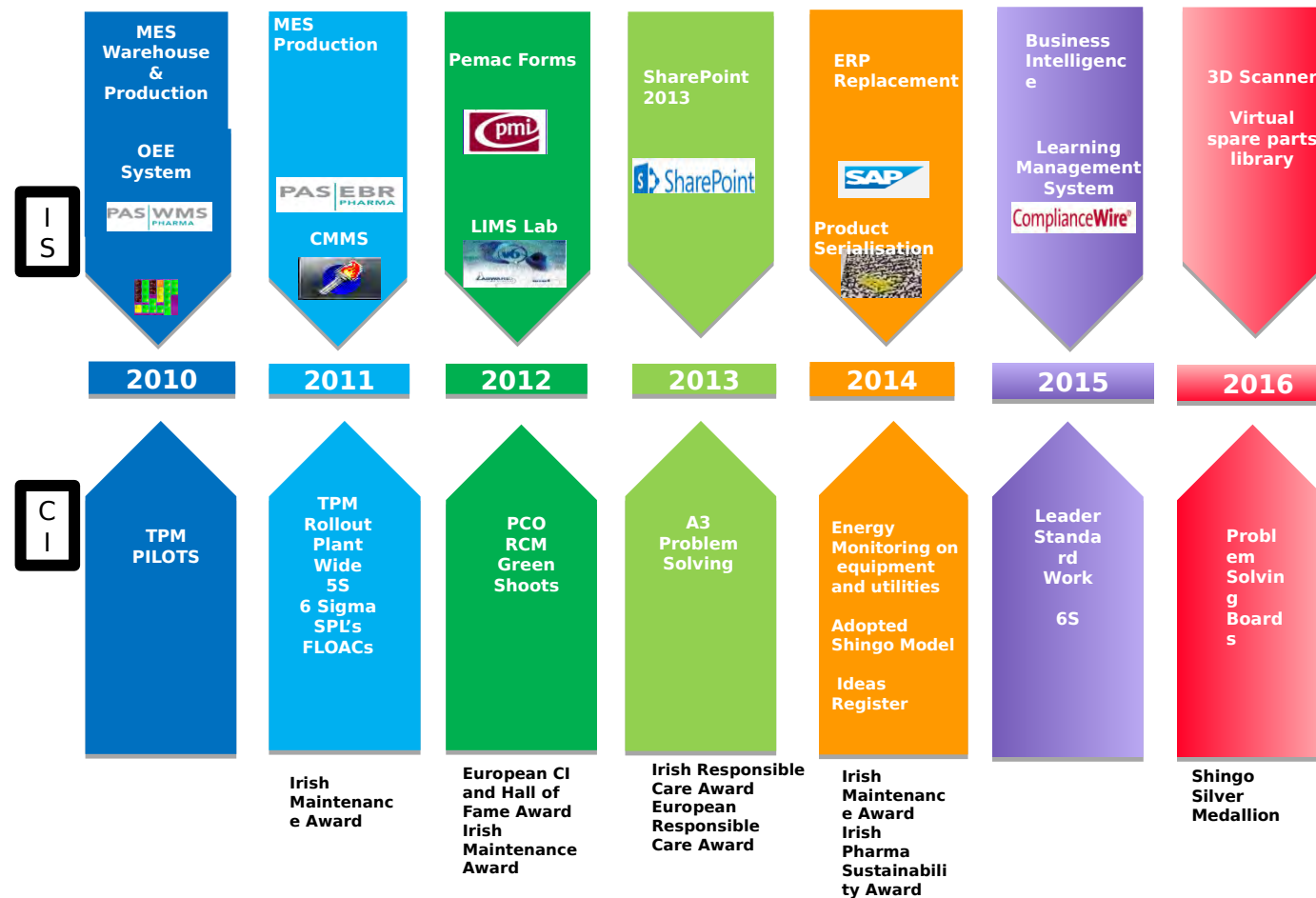
- Customised reporting based on user requirements

Business Intelligence in Maintenance



- Reports used for more accurate analysis
- Automatic KPI's
- Hosted on Engineering SharePoint site

Towards World Class Manufacturing Information Systems and Continuous Improvement

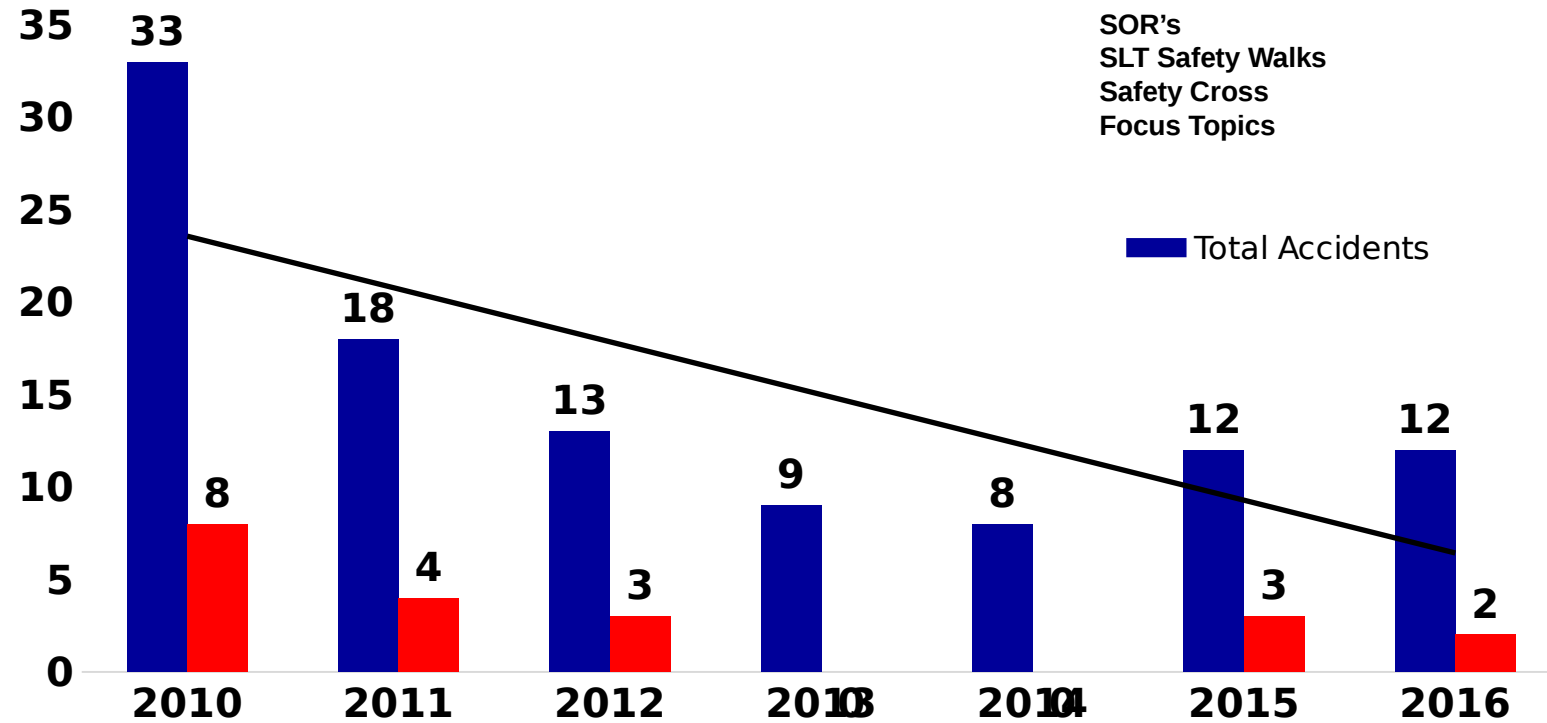


Operations Performance in the Pharma Industry

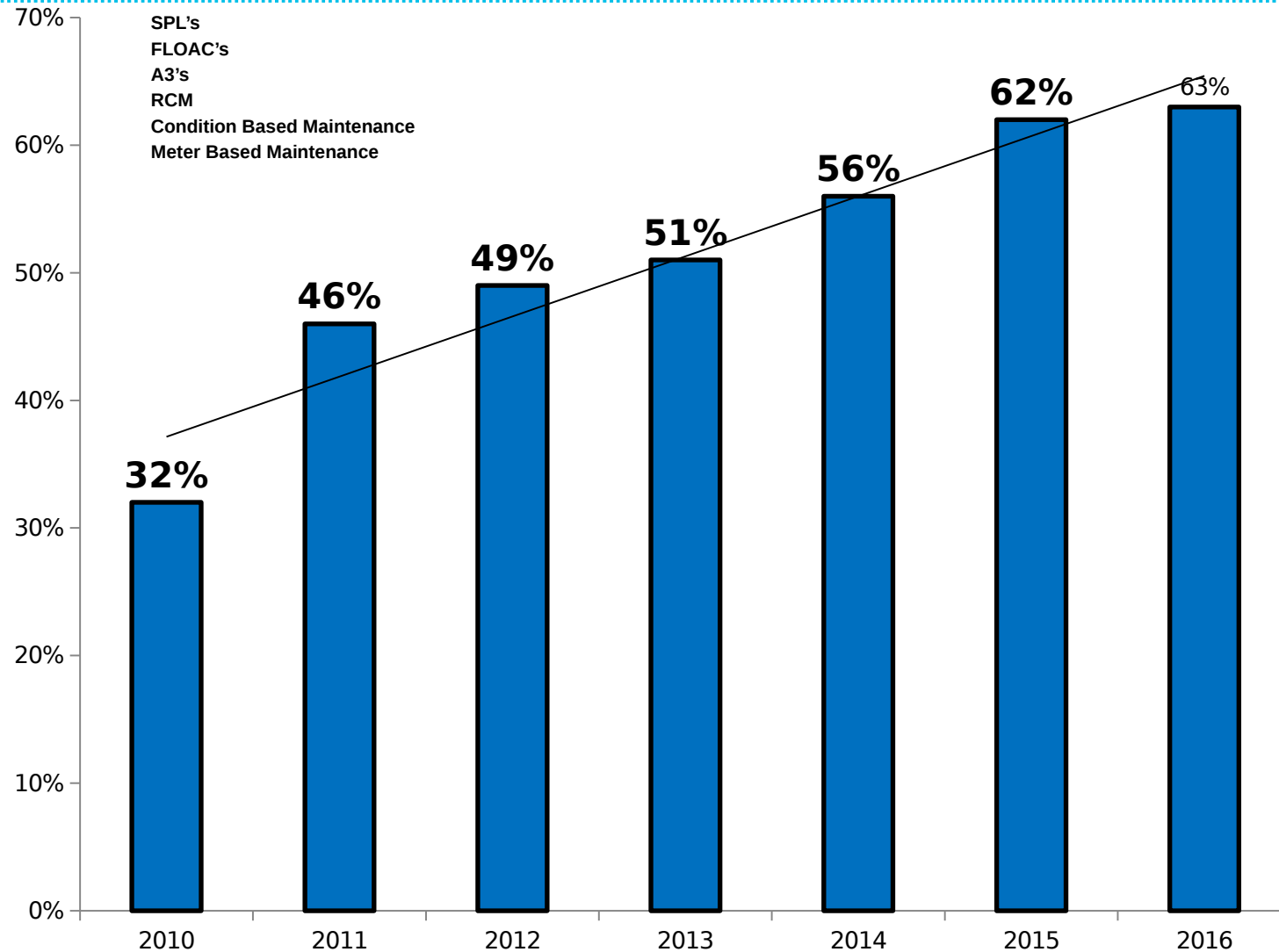
Measure	Pharma	Meda Rottapharm
Percent OEE	10-60	63
Percent Right First Time	60-80	94
Lead time in days	120-180	108
Inventory of finished goods in days	60-90	30

KPI Trends

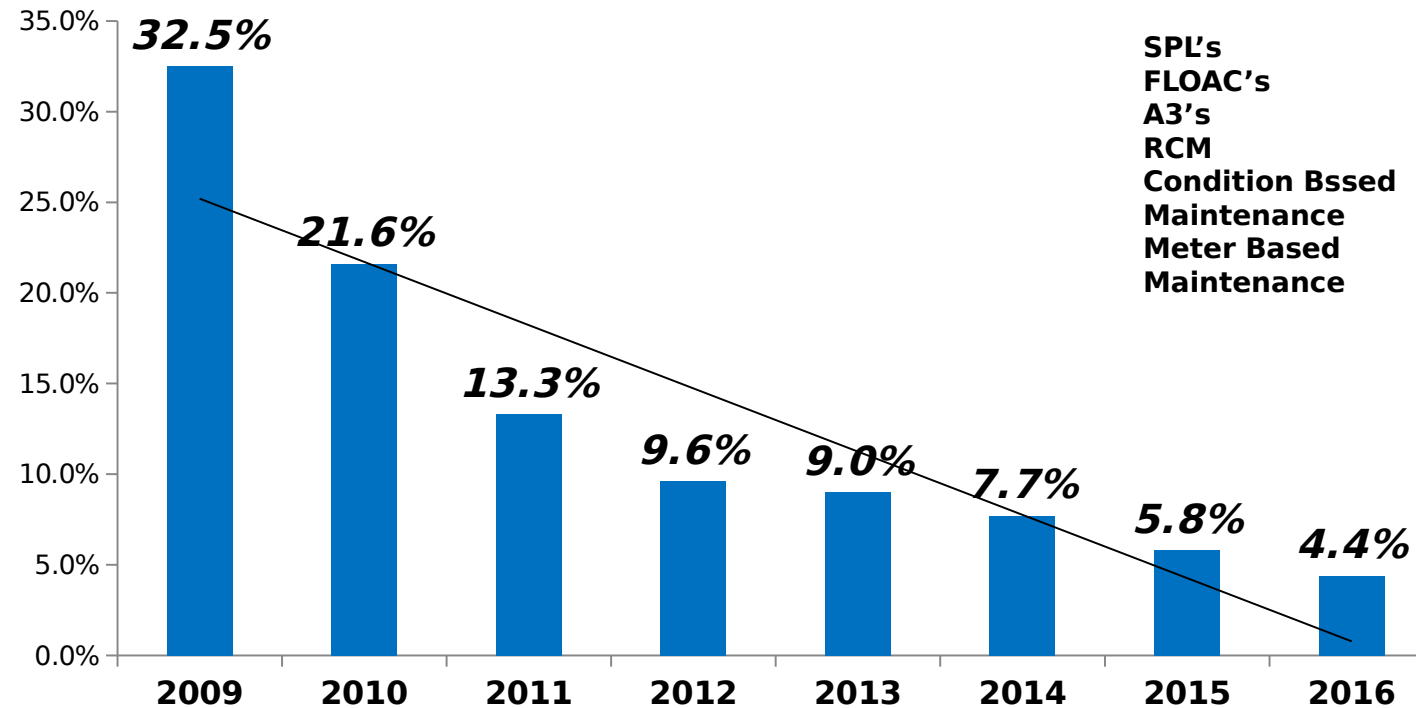
Accidents



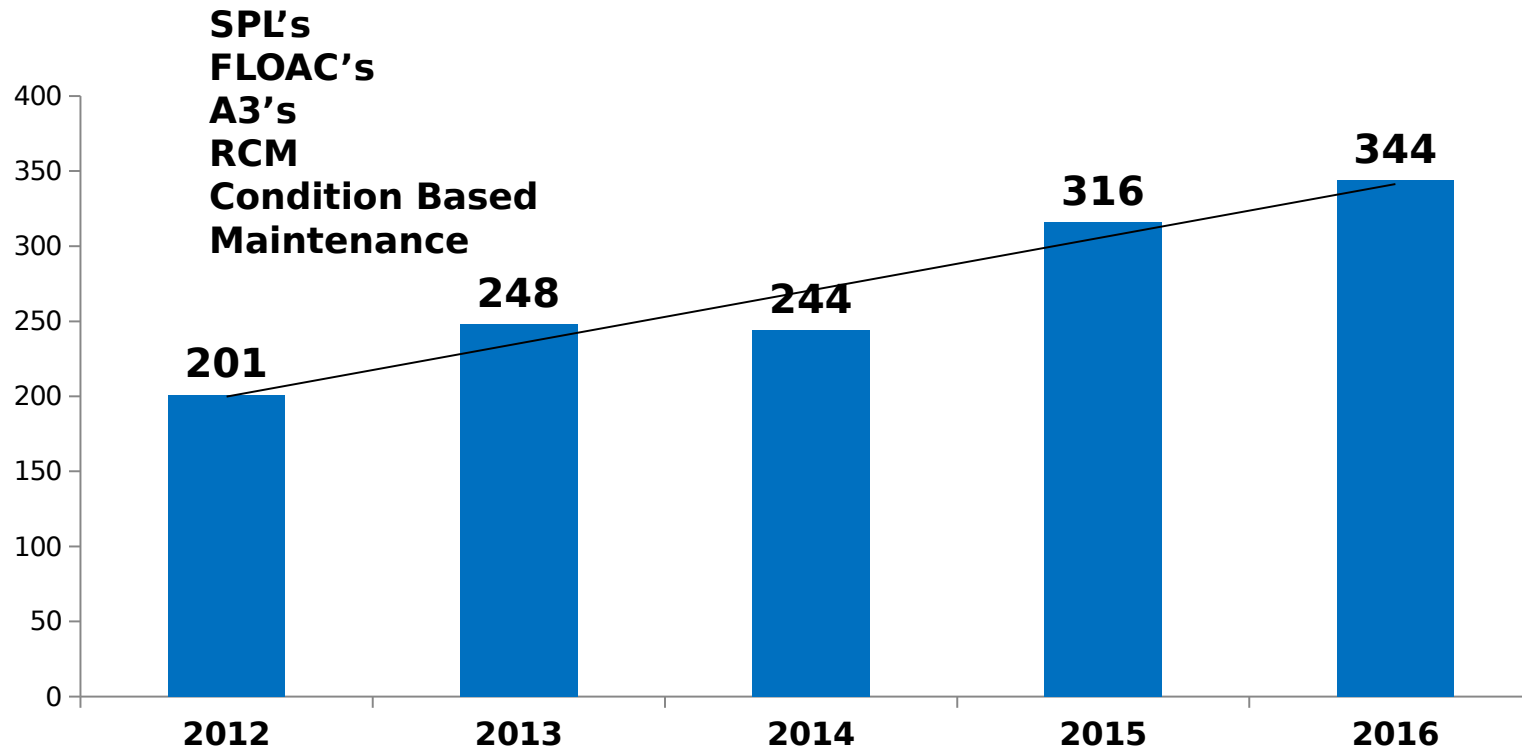
Plant OEE Average



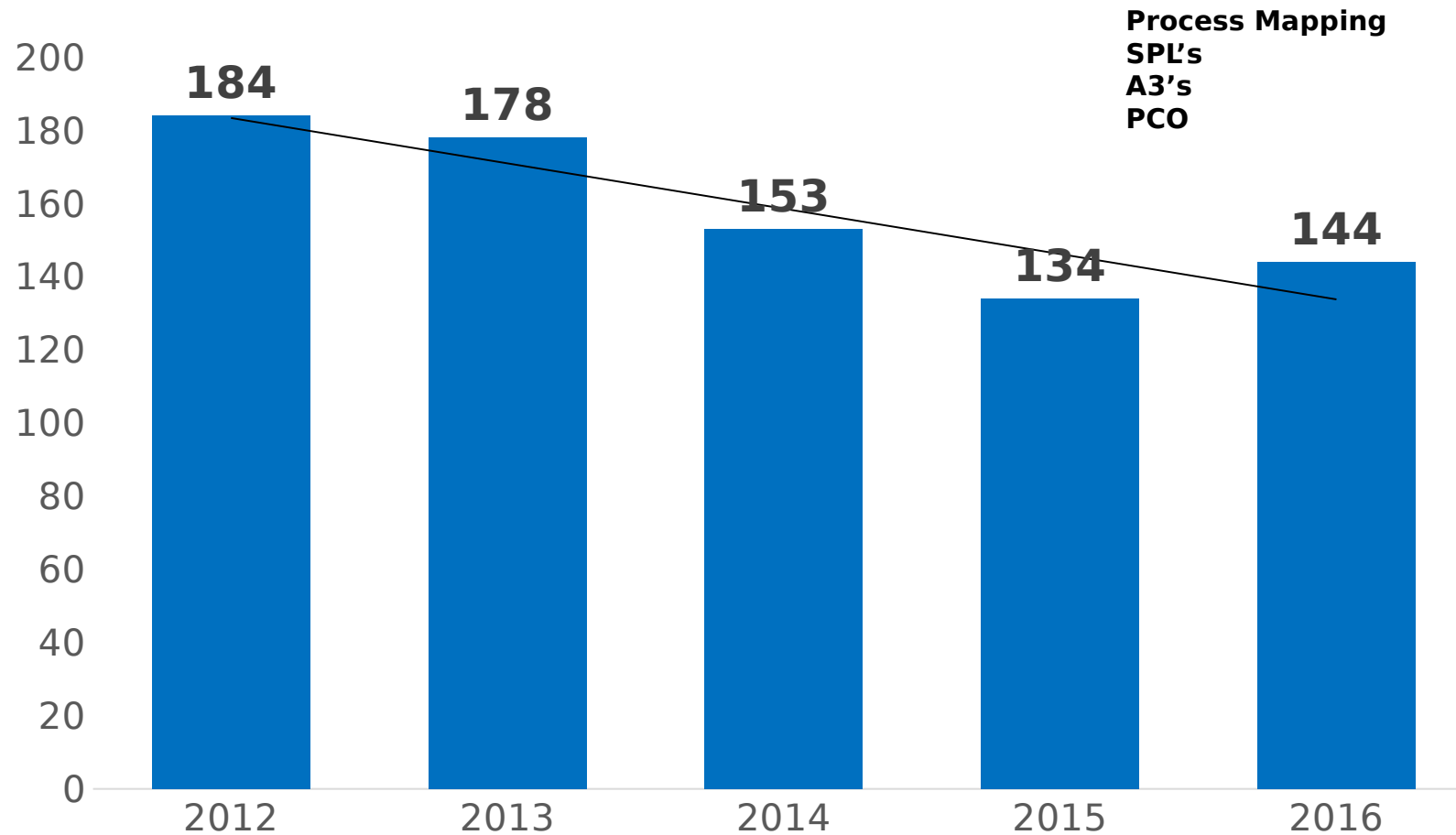
Equipment Average Failure Rate



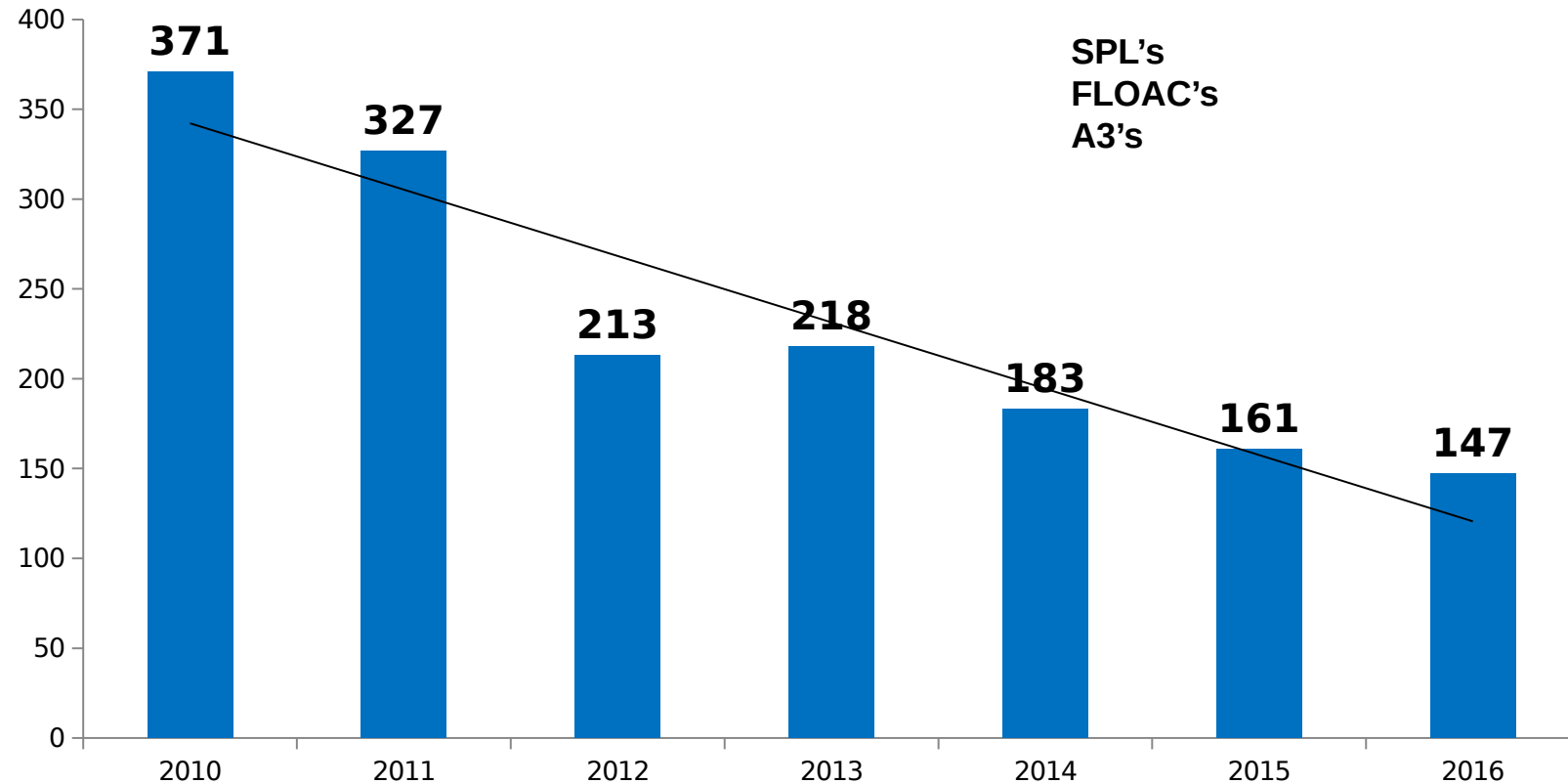
Mean Time Between Failure (minutes)



Batch Interval Times (BITs in minutes)

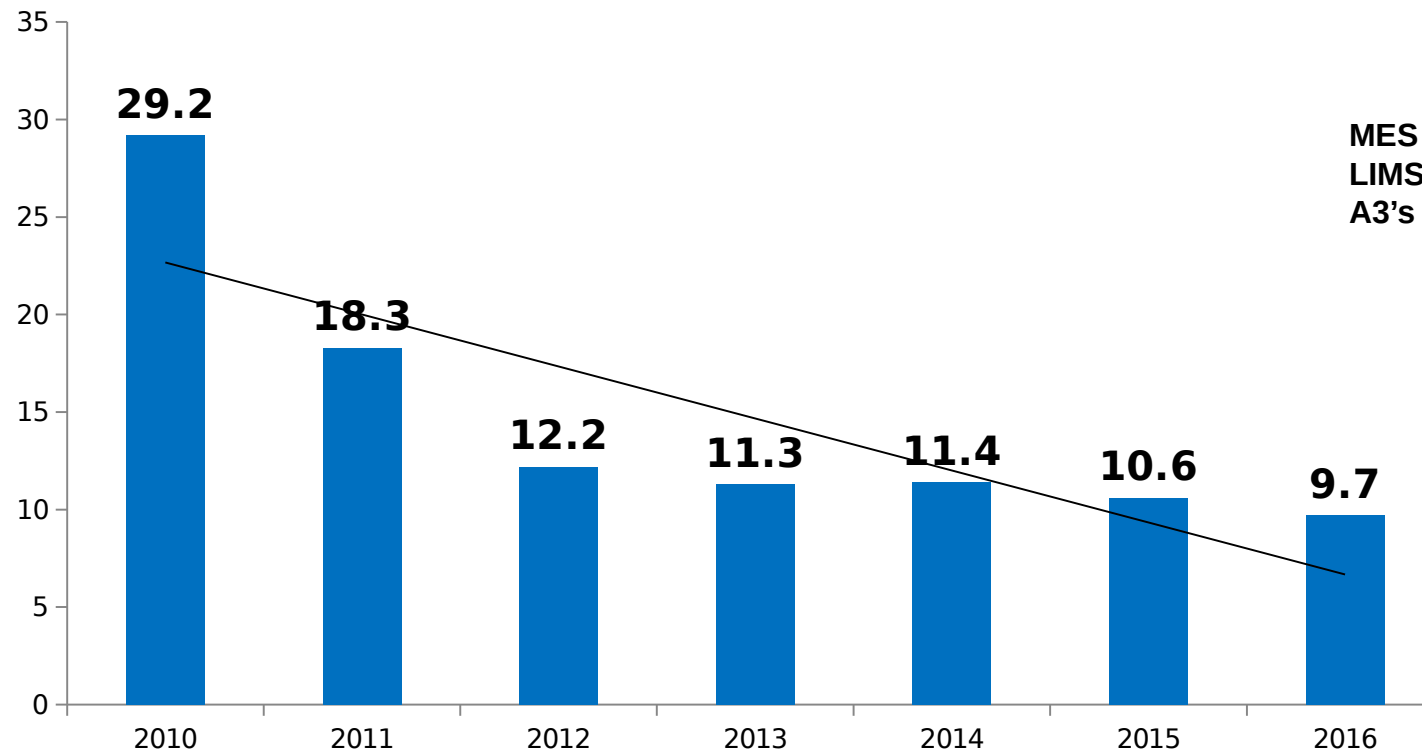


Number of Process Deviations

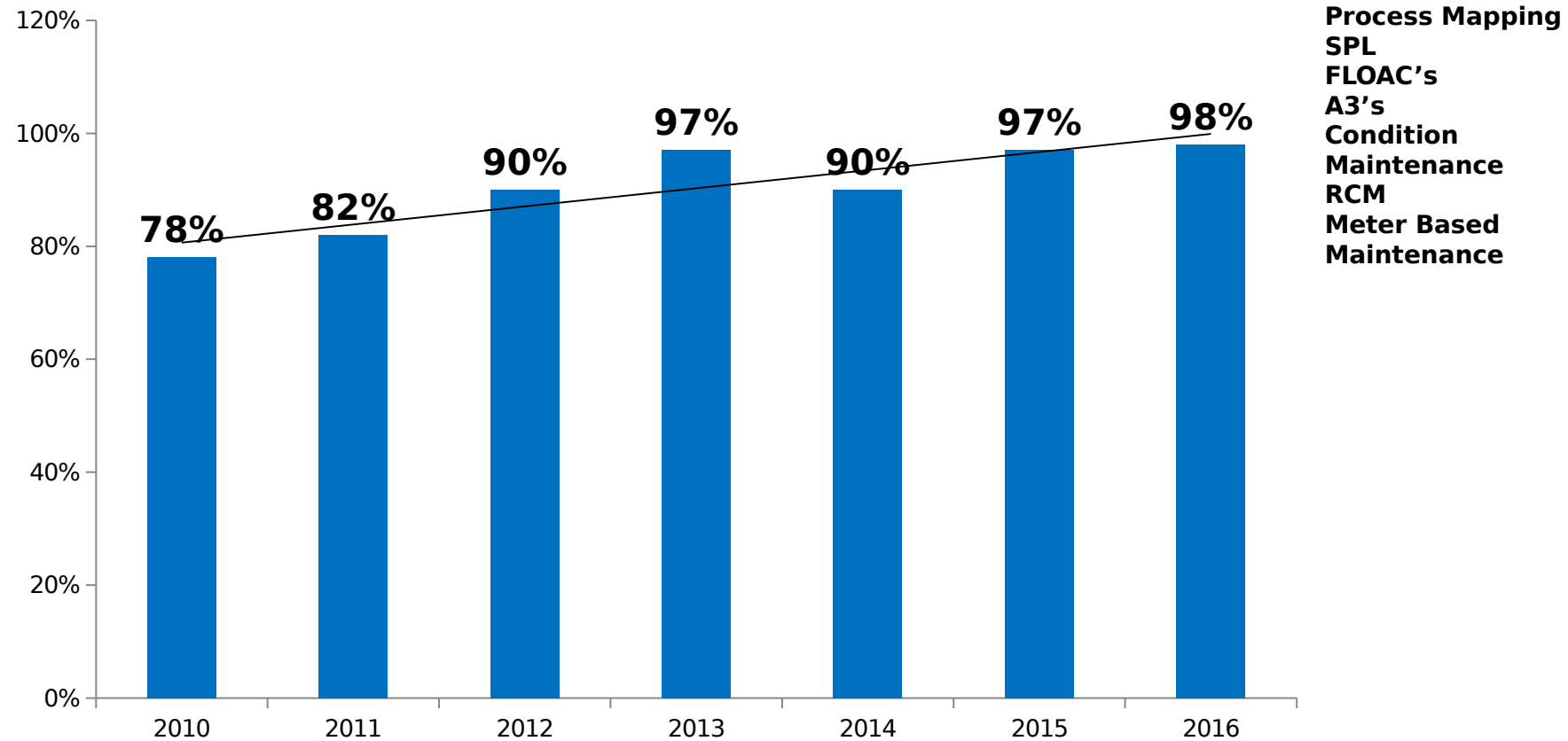


Batch Completion

Number of days for batch release



On Time Delivery

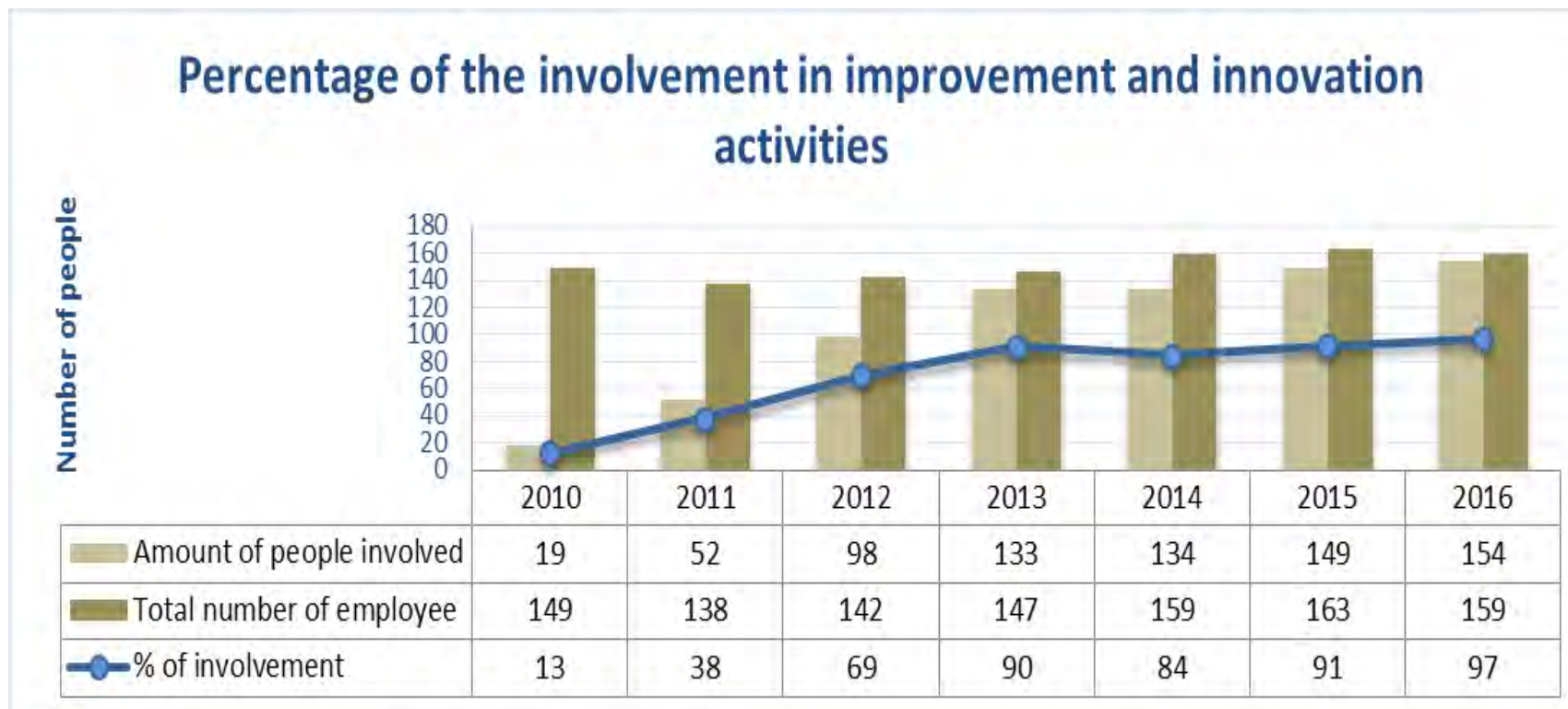


Energy Consumption per Pack

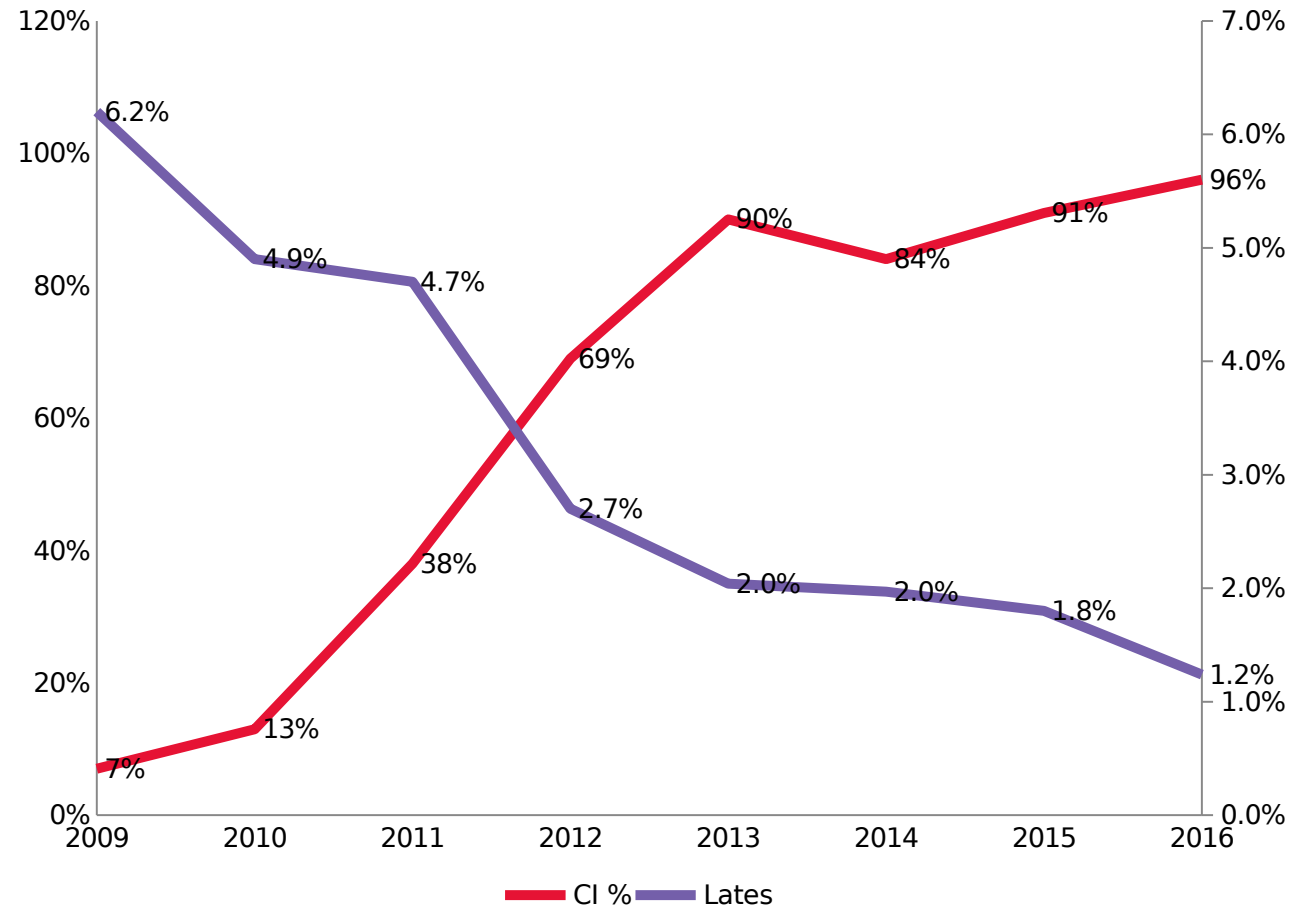
kWts — kWhrs of energy used per pack produced

Energy consumption reduced by projects on AHU's, boilers, compressors, lighting and behavioural change. Energy meters on all packaging lines.

CI Participation Results



Culture Change - Lates and Continuous Improvement



Employee Engagement 2014 -v- 2016

Engagement with	2014 Engagement %	2016 Engagement %
Manager	74.6%	80.0%
Team	79.6%	85.0%
Organisation	72.6%	72.6%
Work	79.7%	82.5%
Company Total	76.2%	80.1%

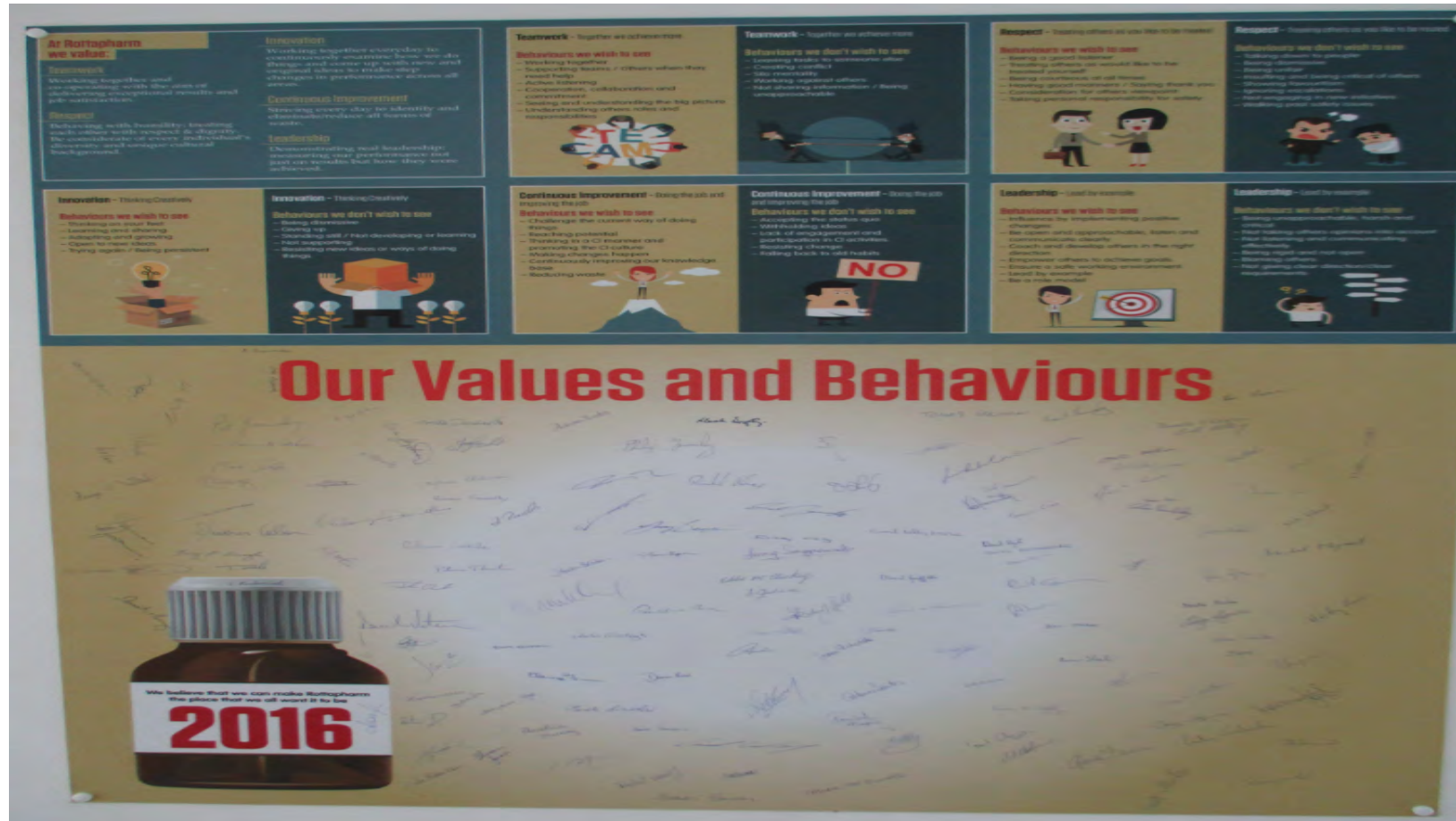
- On-line survey conducted by independent consultant
- Response rate 90%.

Company Values and Key Behaviours

- Focus on behaviour required to sustain changes and maintain our CI journey
- Company Values embedded through recognising and celebrating the correct behaviours
- Behaviours form part of 6 monthly appraisals and monthly 1: 2:1 's
- Rottapharm All Stars monthly award was borne allowing peers to nominate colleagues who have excelled in the display of behaviours



Values and Behaviours



Constancy of Purpose

- 2010 Volume Decrease
- 2011 Redundancies
- 2012 Rottapharm for sale
- 2014 Rottapharm acquired by Meda - adopted Shingo Model
- 2015 Meda consider divestment of manufacturing
- 2016 Meda acquired by Mylan

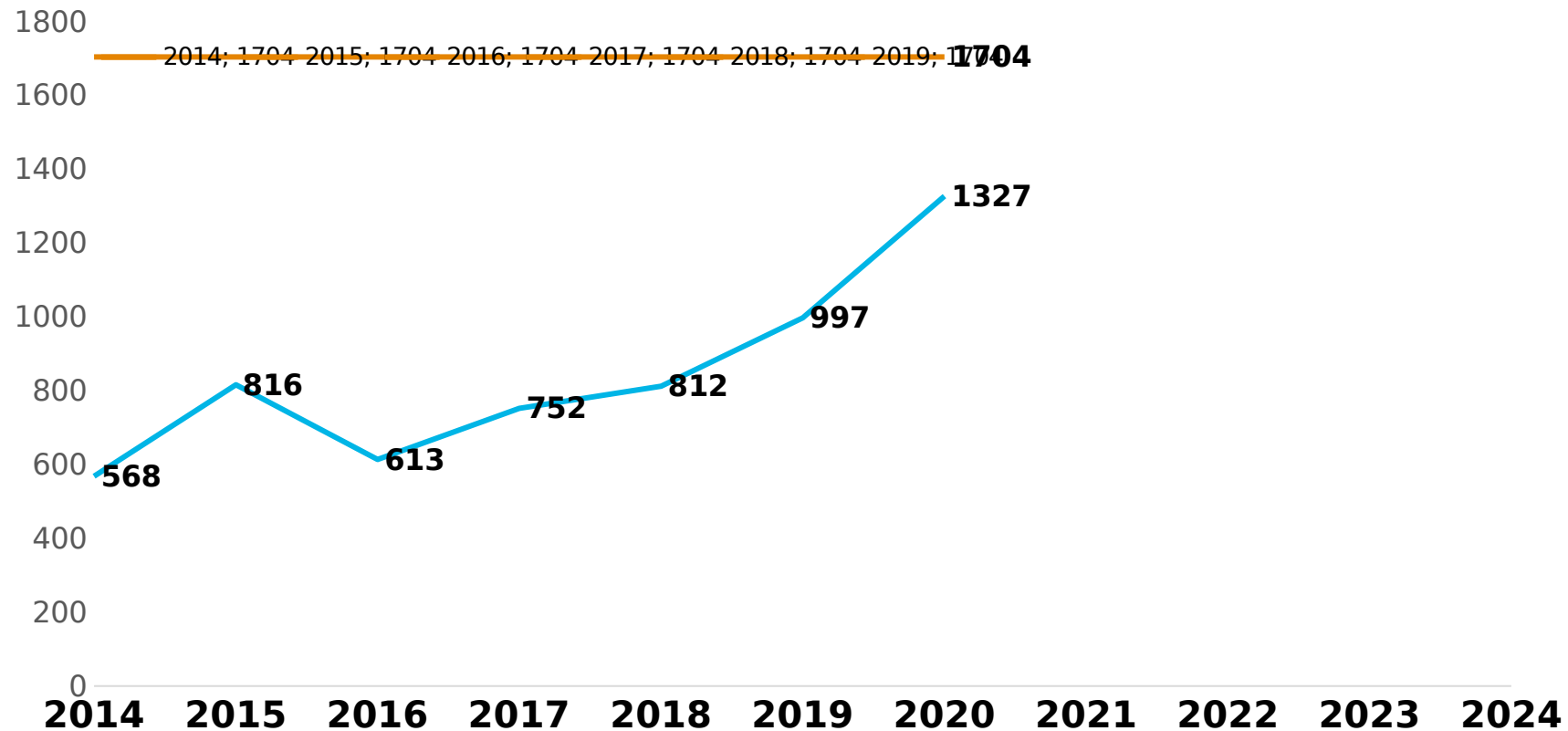
Period of Change

Constancy of Purpose



2014 - 2024 Vision

Number of Doses



Volume and Cost Trend 2006 - 2015

Volumes +196%

Factory Running Cost +34%

Employee Output Summary 2006-2015

	2006	2015
Number of packs	9.8m	29m
Headcount	120	152
Packs per employee	81,000	191,000
Increase in packs produced per employee	135%	

Learnings

- Reach out and involve everyone in improvement initiatives
- Allow people the freedom to create their own templates
- Front line manager is the conduit for engagement
- Make the job of the Production Operator as easy as you can
- Communicate early and often
- Have the right people in the right seats
- Developing people is central to a successful continuous improvement journey
- Step changes are easier to accomplish with a culture of continuous improvement

Management Responsibility

Employees commit a big part of their lives to employers
We should not waste their time

