Lean Six Sigma Green Belt Project Storyboard

Project Name:	**Increase mailroom productivity**
Industry:	**Service**
Project Type:	**Process Efficiency LEAN**

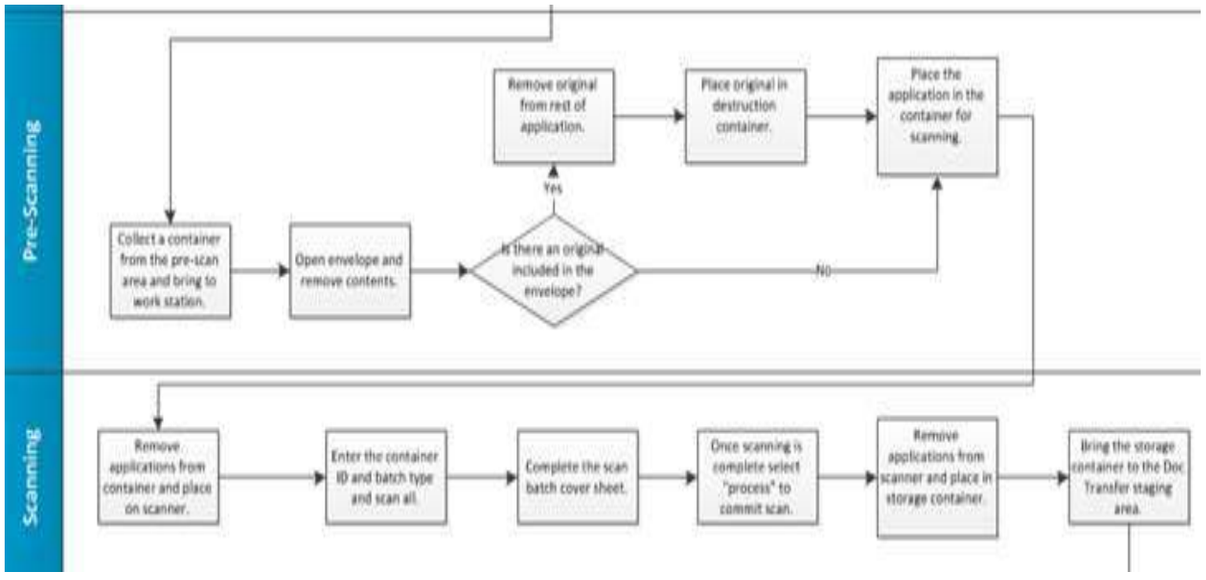
DEFINE: PROBLEM / BASELINE / GOAL

Problem Statement: Average handling time (AHT) for application processing is 1 minute 50 seconds which is resulting in additional staffing and overtime hours being required in the mailroom on a daily basis to ensure applications are processed the day they are received (per Customer Requirements)

Baseline Metrics: Primary - 110 secs AHT per appl/ **Secondary -** 15 FTE

Goal: To reduce application AHT by 50% to 55 seconds and free up 4 FTE to redeploy on new line

MEASURE: PROCESS / EXPERT KNOWLEDGE / DATA



Pre-scanning preparation and Scanning were the 2 areas where the wastes of motion and waiting were most observed.

- **Motion present in**
  - **-retrieval of containers**
  - **-delivery of container when completing copies**
- **-- Waiting at scanning while operator is idle while machine is running**

ANALYZE: DRIVERS / ROOT CAUSES / VITAL FEW

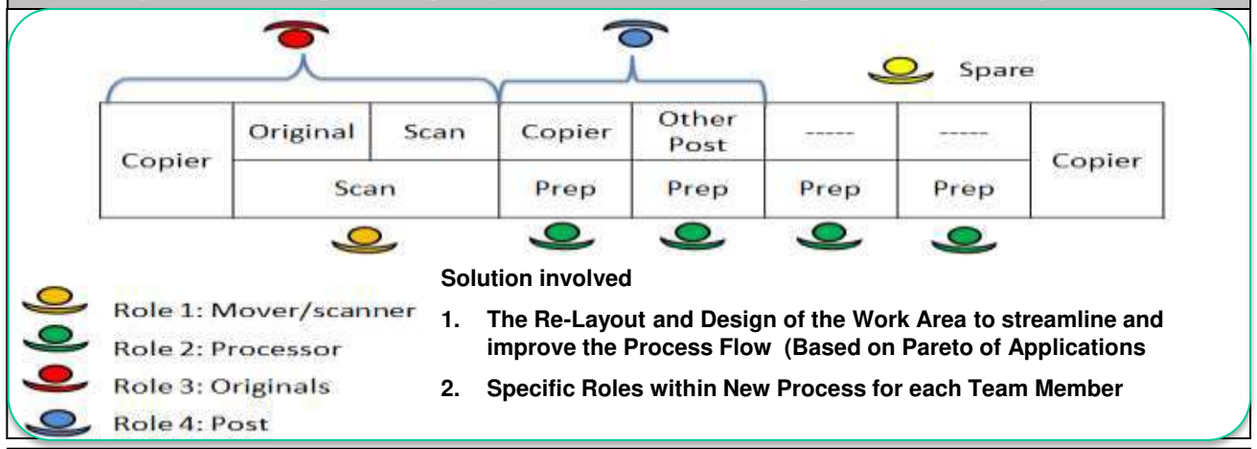
1. Why is the AHT in application processing so high?
   Because we are receiving problem applications in with normal applications
2. Why are problem applications causing delays?
   Because the pre-scan agent has to photocopy each one
3. Why does the pre-scan agent need to be the one who copies them?
   Because it's documented in their job description to do so
4. Why are photocopies a problem?
   Because the photocopiers are located across the mailroom and the pre-scan agent has to walk there
5. Why are the photocopiers located on the across the mailroom?
   There is no real reason why the mailroom floor was just laid out that way

Recommended Actions:

The process can be updated to remove these issues:

1. Change the role of the pre-scan agent so they do not need to complete these copies
2. Move the photocopier to a new location closer to the agents

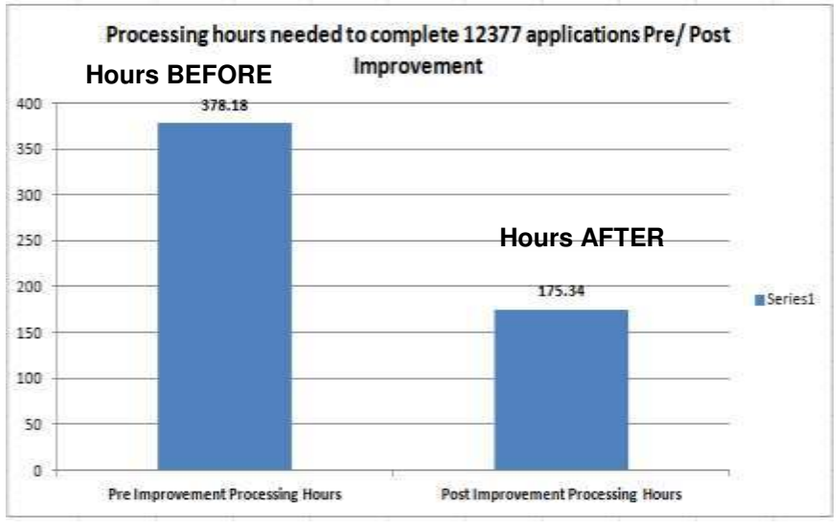
IMPROVE: INNOVATION / IMPLEMENTATION PLANNING



Solution involved

1. **The Re-Layout and Design of the Work Area to streamline and improve the Process Flow (Based on Pareto of Applications**
2. **Specific Roles within New Process for each Team Member**

CONTROL: RESULTS / SUSTAINING



Project Goal Achieved

- Hrs to process 12377 apps pre Improvement – 378.18
- Hrs to process 12377 apps post Improvement- 175.34
- Percentage Difference- 46% (Providing 54% improvement)
- AHT reduced to 51 seconds
- Freed up 4 FTE to redeploy on new line
- **Total Saving: €96,000**

Lean Six Sigma Green Belt Project Storyboard

Project Name:	**Reduce Waste on Slicer 1**
Industry:	**Manufacturing - Food**
Project Type:	**Six Sigma**

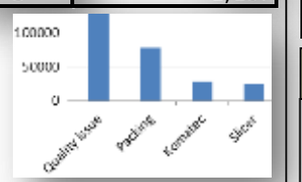
DEFINE: PROBLEM / BASELINE / GOAL

Problem; Line 2 accounts for 50% (1KT of 2KT) of the entire factory waste

Baseline; 1,026 Ton/year on L2, 692T is for Customer A Products, 42T associated with GHD Slicer alone.

Goal; Reduce GHD Slicer waste from current level of 5% to 2 % and bring heel heights back into Customer A tolerances (baseline of 70% yield within tolerance i.e. 30% outside of tolerance)

Line	WASTE Ton
2	1,026,180
1B	515,111
1A	377,376
4	134,931
3	1,157



MEASURE: PROCESS / EXPERT KNOWLEDGE / DATA

Using a data collection sheet below to determine the current status of the 3 sku's by sampling an entire tray of 72 units.

Primary Metric; Reduce GHD Waste. Secondary Metric; Produce within tolerance

LINE 2 PRODUCT ANALYSIS

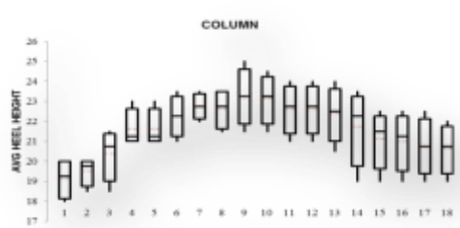
PRODUCT						ACTUAL	SETTINGS	TOLERANCE	
TIME					BLADES			UPPER	
DATE					UPPER BELT			LOWER	
SAMPLE #	PRODUCT HEIGHT	HEEL HEIGHT FRONT	HEEL HEIGHT REAR	DEPTH OF CUT	SAMPLE #	PRODUCT HEIGHT	HEEL HEIGHT FRONT	HEEL HEIGHT REAR	DEPTH OF CUT
1					37				
2					38				

450696; 50/ 72 in spec.

Range 9 (15-24)

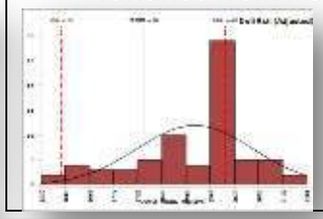
450697; 49 / 72 in spec.

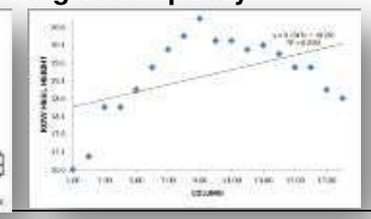
Range 5 (16.5-21.5)



ANALYZE: DRIVERS / ROOT CAUSES / VITAL FEW

1. **Studies completed to establish optimised settings to reduce waste whilst remaining within customer specificaiton**
2. **Emphasis on waste reduction must be conscious of direct effect on heel height tolerance from customer**
3. **Transfer conveyors are out in height by 4mm on in-feed causing heel height variance from front to rear of product plus cutting blade quality**





IMPROVE: INNOVATION / IMPLEMENTATION PLANNING

a. **Engineering Trials to optimise machine settings/programs to ensure standardised process and optimum Yield**

b. **Set-up Process to include verification of Transfer Conveyor alignment**

c. **Cutting blades replaced . Now on Preventative Maintenance routine for proactive replacement**

d. **Training on settings and importance of both metrics being met managed via a PDCA loop**

	AS-IS IN TOLERANCE	ADJUSTED IN TOLERANCE	IMPROVEMENT
DELI ROLL	14 / 72 19%	60 / 72 83%	+ 64%
PREMIUM BROWN	27 / 72 37.50%	58 / 72 80.55%	+ 43%
BACON ROLL	58 / 72 80.55%	66 / 72 91.67%	+ 11%

CONTROL: RESULTS / SUSTAINING

Waste down to less than 1% (versus baseline of 5%)	**€14k / yr**
90% Heel heights within tolerance (versus baseline of 70%)	**€21k / yr**
Total	**€35k / yr**

1. **a-d above now part of routine process controls**
2. **Value Stream Leader assigned management of Line Metrics to ensure ownership and accountability**
3. **Any future changes to settings/programs to be reviewed and approved via Change Control Process**

Slicer Settings

SKU	Blade Height	Upper belt
Premium Brown	16.0 mm	43.0 mm
TDS	16.0 mm	39.0 mm
Bacon	16.0 mm	36.5 mm

ADJUST THE UPPER BELT SETTINGS +/- AS REQUIRED TO ACCOMMODATE PRODUCT DIAMETER AND WASTE HOURS

Lean Six Sigma Green Belt Project Storyboard

Project Name:	**Incoming Inspection Platinum Wire Receipt Error Reduction**
Industry:	**Medical Device**
Project Type:	**Error Reduction**

DEFINE: PROBLEM / BASELINE / GOAL

Problem Statement: In the last 4 months, there has been a 49% error rate on Platinum Wire receipts in the Incoming Inspection area. 12 Platinum wire components are used in 71% of the SKU's manufactured onsite, and these SKU's represent 55% of the Worldwide revenue for the division. The average elapsed time to resolve the defects on Platinum Wire receipts in the same 4 month period above was 42 days. The high error rate and the subsequent delay in fixing the associated defects, creates a high risk of material not being available to production and potentially a line stoppage.

Baseline: *Average of 23 defects per Month & Average of 42 days to fix defects.*

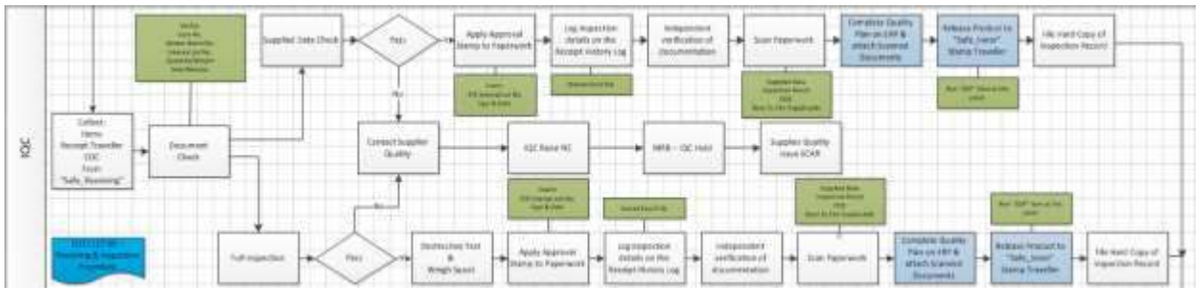
Goal: Zero Defects & Time to fix a defect of less than 1 day.

MEASURE: PROCESS / EXPERT KNOWLEDGE / DATA

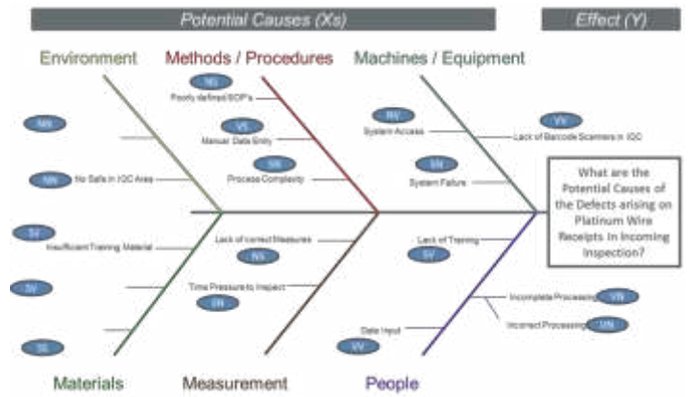
Data collected during the measure indicated the defects were occurring in the Incoming Inspection area.

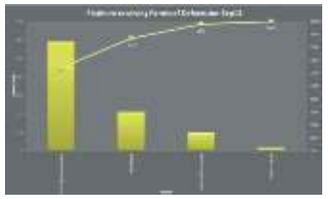
A detailed process flow of the incoming inspection process was generated with the project team.

Data indicated an increasing error rate month on Month



ANALYZE: DRIVERS / ROOT CAUSES / VITAL FEW





Fishbone screening & data revealed following top causes:

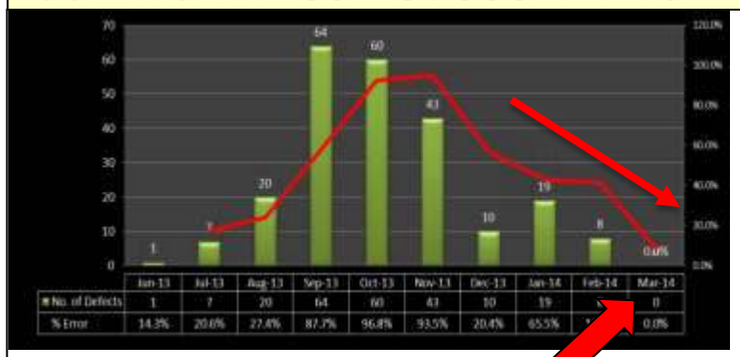
1. **Incomplete Processing**
2. **Data Input errors**
3. **Incorrect Processing**
4. **System Failure**

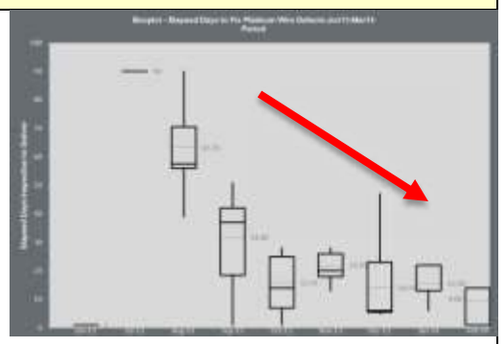
IMPROVE: INNOVATION / IMPLEMENTATION PLANNING

Solutions Implemented:

1. **Barcode Scanners to prevent and/or detect errors (mistake proofing)**
2. **Automation & Email notification**
3. **Modify Process SOP's to focus on system failures and Root Causes**
4. **SME Training with Scanners to reduce error rate and incomplete processing**

CONTROL: RESULTS / SUSTAINING





Goal of **Zero** defects achieved March 2014

Goal of less than 1 day to fix defects not achieved by project close although significant improvement achieved per trend in graph ; Risk here was mitigated by mistake proofing measures implemented during the control phase to ensure zero defects.

Lean Six Sigma Green Belt Project Storyboard

Project Name:	**Optimization of Cleaning In Place Programme**
Industry:	**Manufacturing - Food**
Project Type:	**Cost and waste reduction**

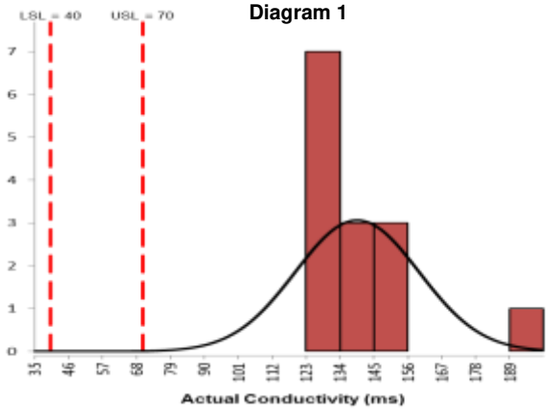
DEFINE: PROBLEM / BASELINE / GOAL

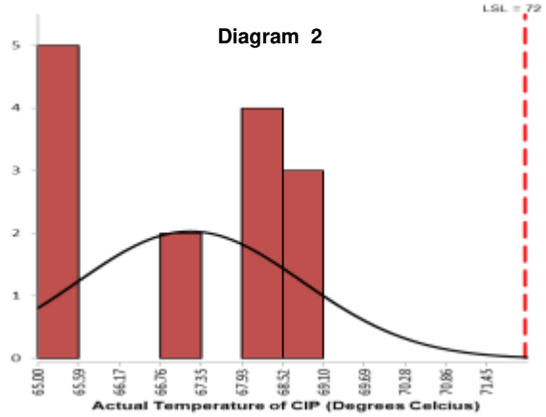
The existing CIP (Cleaning in Place) Programme in Tanks 1 and 2 fails to wash correctly and leaves considerable amounts of residual soiling in the tanks resulting in non-conforming units.

The goal of this project is as follows :

1. Reduce the number of non-conforming minibulk units produced by the inefficient CIP programme in Tanks 1/2. Baseline is 5475 cfu's/g which is a measure of non-conformity. This needs to be reduced below 500 cfu's/g.
2. Tanks 1 and 2 to receive a validated and repeatable CIP programme
3. Reduce the overall process cost focusing on
   a. Cost of reprocessing non conforming minibulk units
   b. Optimisation of the CIP parameters to reduce water, steam and chemical usage

MEASURE: PROCESS / EXPERT KNOWLEDGE / DATA





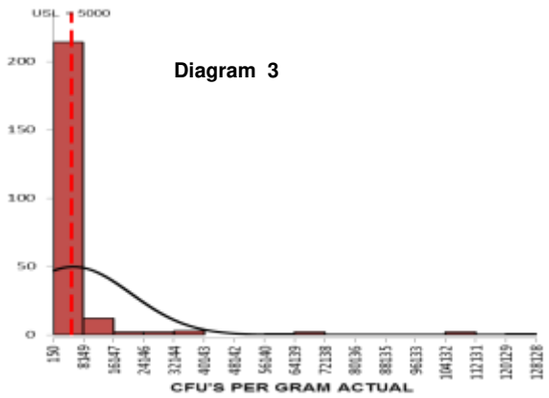
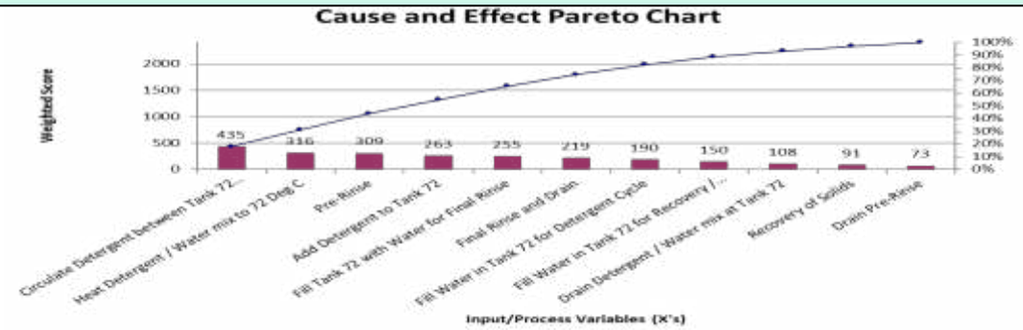


Diagram 1 : Conductivity readings consistently exceeded the specified conductivity limits

Diagram 2 : The CIP detergent temperature consistently failed to reach or exceed the target temperature of 72 Deg C

Diagram 3 : Following the measurement of 239 MBU's the average cfu's/gram averaged at 5489 (MBU's defective when cfu's/gram >5000)

ANALYZE: DRIVERS / ROOT CAUSES / VITAL FEW

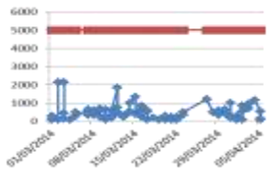


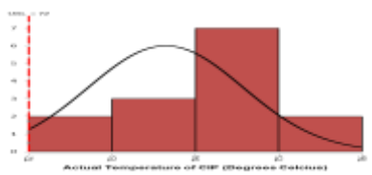
Bases on Pareto Analysis, the most common causal factors relating to the failures in the CIP Programme for Tanks 1/2 are associated with the detergent preparation and circulation. The rinse and water addition steps also appeared to contribute to the failures in the CIP process .

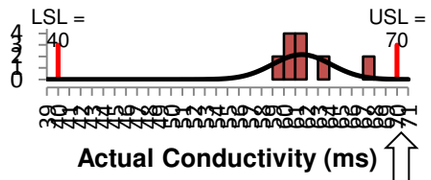
IMPROVE: INNOVATION / IMPLEMENTATION PLANNING

- Improvements made to the pre and post -rinse steps including the reduction of water volumes deployed and the addition of caustic to the pre-rinse aid in softening the residual soiling.
- Improvements made to reduce the quantity of charred particles circulating during the pre-rinse step and detergent cycle inhibiting spray ball functionality. This was achieved by increasing the specification on the filtration system and introducing intermittent burst rinses in tank 2 at the end of each programme step
- Significant changes made to the detergent cycle – introduced more conductivity control in the programme through the installation of a new caustic metering system.
- Detergent cycle temperature remains consistently above 72 deg C through modifications to the SCADA software.
- Detergent is re-circulated around tank 2 prior to the commencement of the detergent cycle to ensure uniform conductivity
- Modify the CIP programme to ensure the post-rinse does not re-circulate and flushes straight to drain
- Equalised the balance of rinse and detergent contact time between tanks 1 and 21 , initially imbalanced in the old CIP programme.

CONTROL: RESULTS / SUSTAINING







1 Zero non-conforming units for all MBU's produced on line 2 following the modifications to tanks 1/2 CIP programme. Post Changes CFU / g have mean cfu/g count of 475 for all MBU's which is below the limit of 500 set as a goal in Define Phase

2 Following the implementation of the improve action plan , temperature of the detergent cycle now consistently achieves the upper temperature limit of 72 deg C following 14 CIP runs (see graph)…….

Following implementation of the improvement actions , the conductivity measurements provided us with a mean conductivity reading of 61.55 millisiemens over 14 trial washes

The improvements are sustainable through standardisation of the CIP programme and validation of the CIP programme every 2 years. Implementation of a Internal Training Assessment Programme.

3 Total cost savings of €45,000 p.a. per Goal 4 in Define Phase