



Developing Operator Base Skills to improve performance

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Today's Presentation

- New Zealand Sugar overview
- The TPM³ journey to date
- Why did we select 'Micro Education & Training Base Skills Team'?
- What did the team achieve?
- What were our learnings?
- How are we sustaining the gains?
- Next steps to develop operator skills



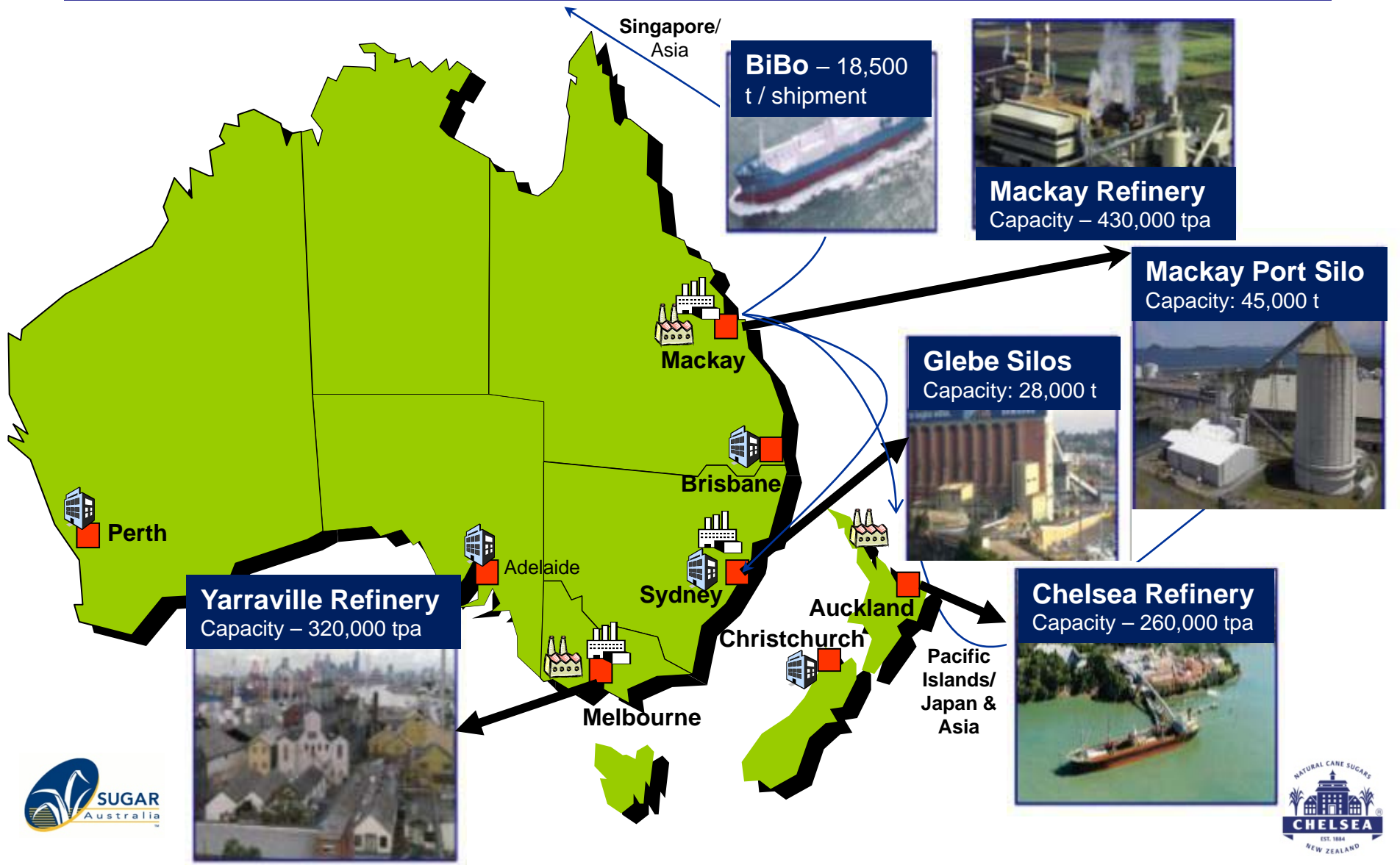


NZ Sugar – sites

- **Chelsea Refinery**
 - Established 1884
 - Head Office – Sales, Finance, HR
 - Refinery, Packing and Warehousing operations
- **Porana Rd Blending Facility**
 - Established 2001
 - Critical hygiene facility producing blends for Japanese food industry
- **Christchurch**
 - South Island Warehouse
 - Liquid Sugar Plant



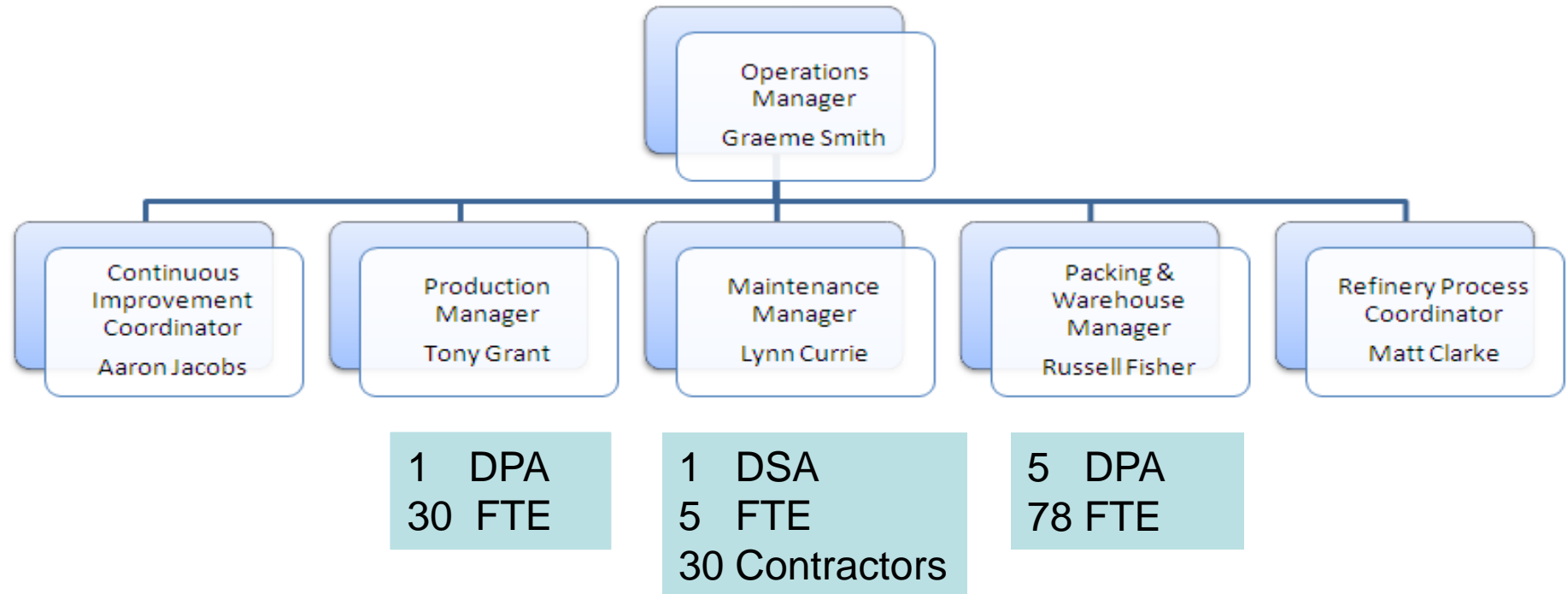
Refined Sugar Sites - Group



NZ Sugar – Operations Team



Chelsea Refinery and Porana Rd Blending Facility



DPA = Defined Production Areas
FTE = Full Time Employees

DSA = Defined Support Areas





Sales Channels

New Zealand

Food & Beverage



Retail



Foodservice



Containerised Exports



Blends Exports to Japan





TPM³ - journey to date

- Cycle 1 Feb 2008
3 Pilot Teams
- Cycle 10 May 2011
29 teams /4 Leadership teams
95% Ops employees involved
- 10 Cycles = 207 Improvement Teams





TPM³ - journey to date

Full range of cross functional and area based teams used so far:

- Focused Equipment & Process Improvement
- Focused Process Improvement
- Work Area Management (Prod, Maint, Lab)
- Operator Equipment Management Steps 1-4
- Maintenance Improvement Teams
- New Equipment Management
- New Area Management
- Education & Training





TPM³ - journey to date

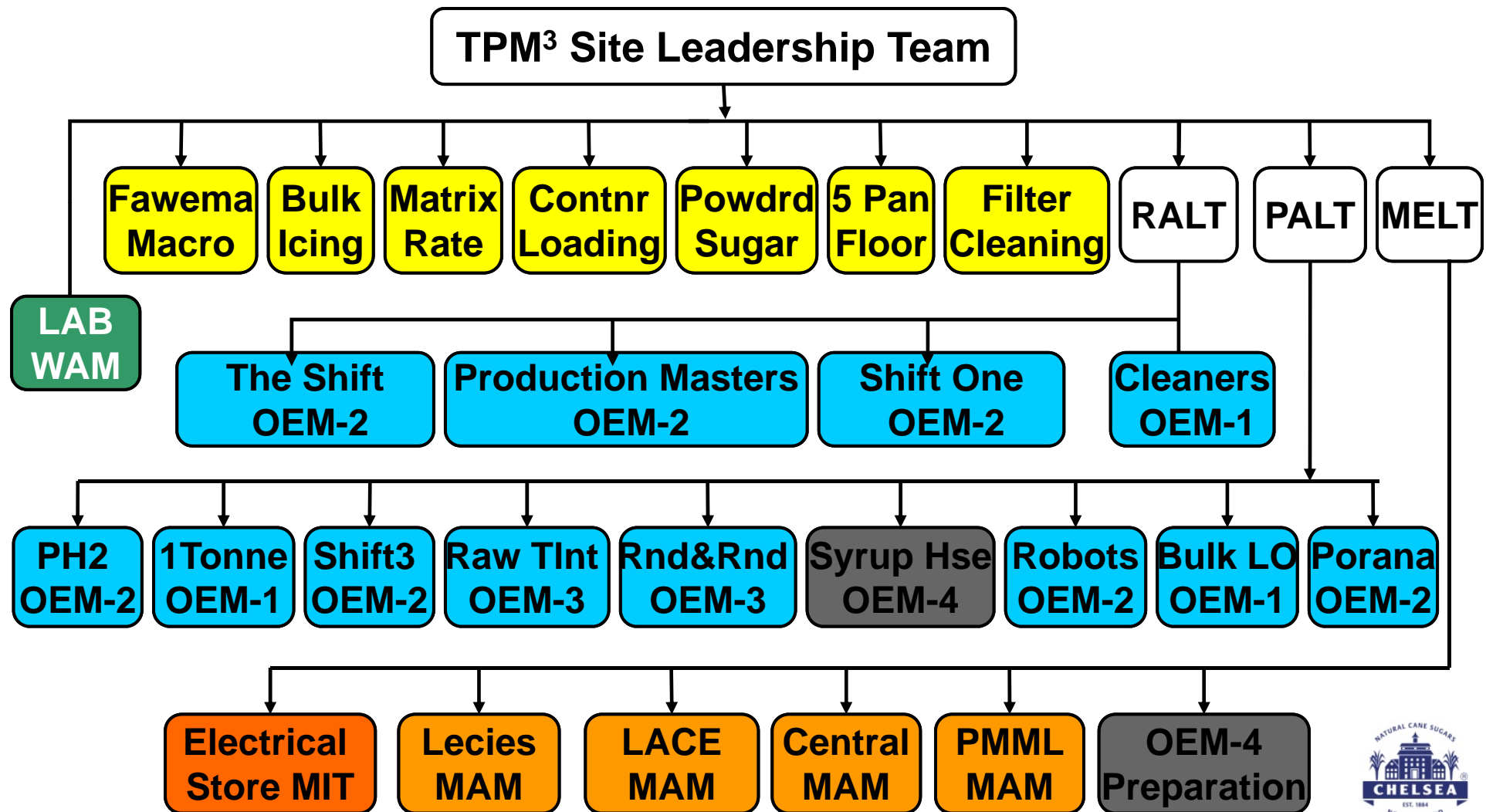
- July 2009 - Level 2 achieved





TPM³ Structure – Cycle 11

4 Leadership Teams and 27 Improvement Teams





TPM³ - journey to date

- 2008/2009 – Cross-functional Teams completed on most key Packing Lines
- 2010 - key focus moved to Area Based Teams
- 2010 - OEE levelling out. Rate loss a key contributor
- 2011 - refocus Cross-functional Teams





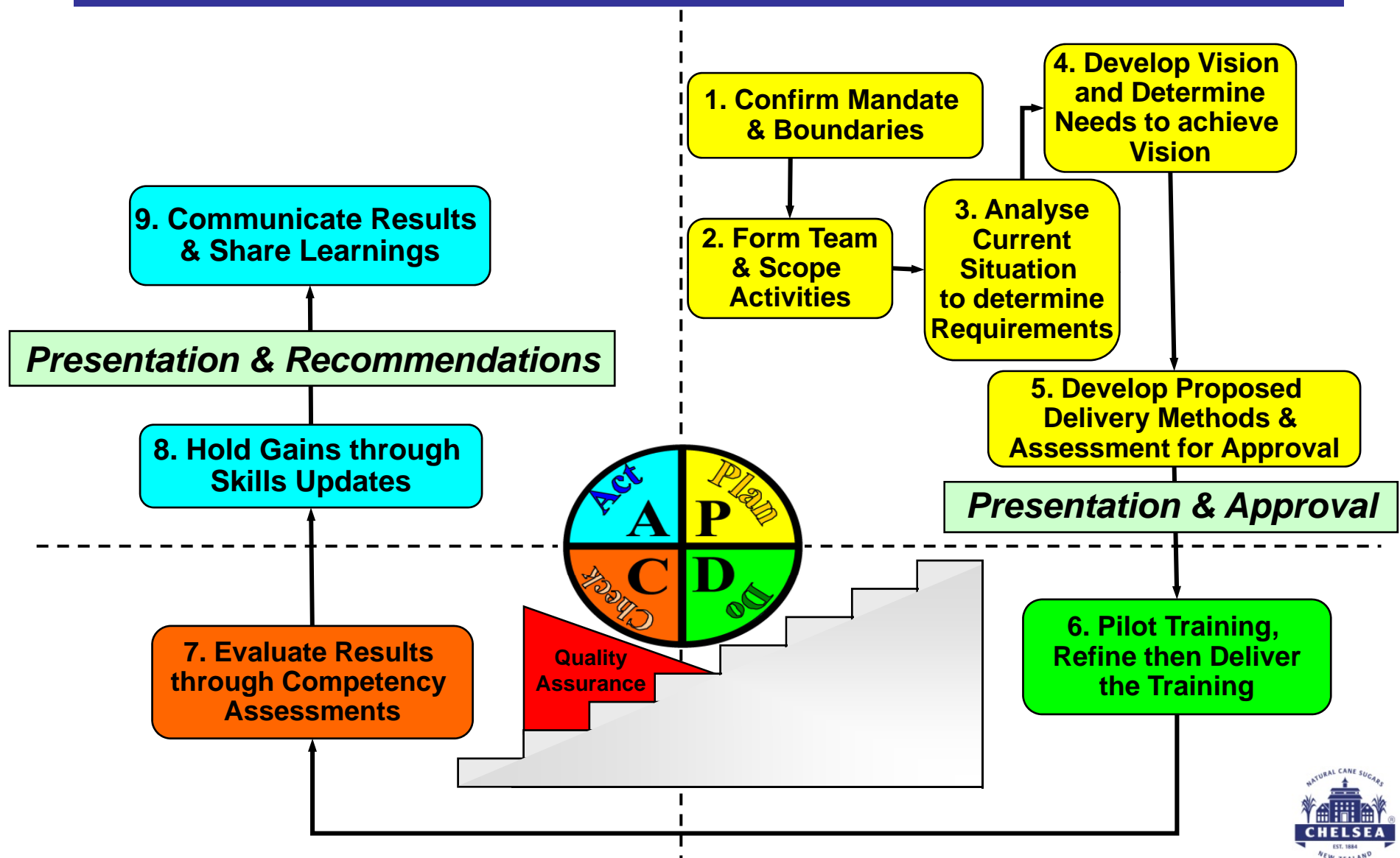
Rate Loss

- Cycle 10 (Feb 2011) – Established a Micro Education & Training Base Skills Team to focus on Rate Loss
- Why Rate Loss?
 - Availability (65-80%) - typically 'easy wins' addressed in first round of Cross-functional Teams
 - Rate (90-95%) - identified Rate as an opportunity by standardised settings and increasing operator skills
 - Quality (>99%) – little OEE potential



Micro Education & Training Base Skills Improvement

typically a 12 meeting cycle based on the P-D-C-A wheel



Checklist for Developing Base Skills

- Focus on developing the Team Leader
- Focus on Self Learning
- Ensure Competency of Required skill
- Focus on Practical Training
- Use a Systematic Approach
- Promote Team Discussion & Reflection
- Use Real examples
- Focus on Standardised Work
- Use Training within Industry (TWI) methods
- Use the Toyota Training Model for Delivery





How did we scope the team

- One Packing Line selected – Matrix Form Fill Seal machine

Selected based on:

- Machine fully utilised across 3 shifts
- Machine is one of 4 'like' machines



- 2 pack sizes selected

Selected based on:

- These 2 products represent over 50% of our total form fill seal volumes
- Ability to be focused on 2 pack sizes only

- Team selection

Selected based on:

- One packing shift formed the basis of the team
- Support staff from maintenance, quality and management



Micro E&T Base Skills Team Information Sheet

Cycle:10	Defined Production Area: Packing Hall 2 – Matrix Packing Line		
Strategic Reason for Selection:			
Mandate:	<ul style="list-style-type: none"> For 1kg and 500g 1a sugar packs, Improve OEE by at least 5% by increasing the Rate measure while also improving or maintaining the Goal Aligned Performance Measures in a sustainable manner; Identify and implement standardised settings and SOP's. Develop and implement training for all operators in correct setup. Recommend improvement initiatives to the Leadership Team and complete within 12 weeks after kick-off. 		
Boundaries:	Physical:	Within the Defined Production Area	
	Technology:	No change to existing technology unless approved	
	Team Resources:	Use existing resources in area, any extra resources to be approved by the Leadership Team Time for meetings per week: 1.0 hours; Time for support activities per week: 1.0 hour	
	Financial:	All improvement activities must be cost-benefit justified and funded within the company's delegation of authority and the site's current business plan	
Starting:	OEE (A x R x Q):		Target:
	Quality:		Quality:
Team Members:	Team Leader	Roneel Mudliar	
	Leading Hand	Floyd Apoderado	
	Operator	Danielo Tobias	
	Operator	Julian Magpantay	
	Maintenance - Mechanical	Ray Allen	
	Maintenance - Electrical	Mike Van Dorsten	
	Technical Support Person	Sophar Rach	
	Leadership Team Member (Mgr)	Russell Fisher	
Facilitation Support:	TPM³ Co-ordinator	Aaron Jacobs	
	CTPM Navigator	Dave Brokenshire	
Kick-off Date & Time:28/1/11		8.00am	Meeting Day & Time:
Recommendations from Mid-way Presentation			
Results from Final Presentation:			
Recommendations from Final Presentation:			
Key Learnings from Final Presentation:			

To be handed to each Team Member in Step 1 of kick-off workshop; To be completed at end of cycle by Team Leader for archives



Mandate

- For 1kg and 500g 1a Sugar Packs, improve OEE by at least 5% by increasing rate (while also improving or maintaining the Goal Aligned Performance Measures)
- Identify and implement standardised settings and SOP's
- Develop and implement training for all operators in correct setup
- Recommend further improvement initiatives to the Leadership Team and complete within 12 weeks after kick-off



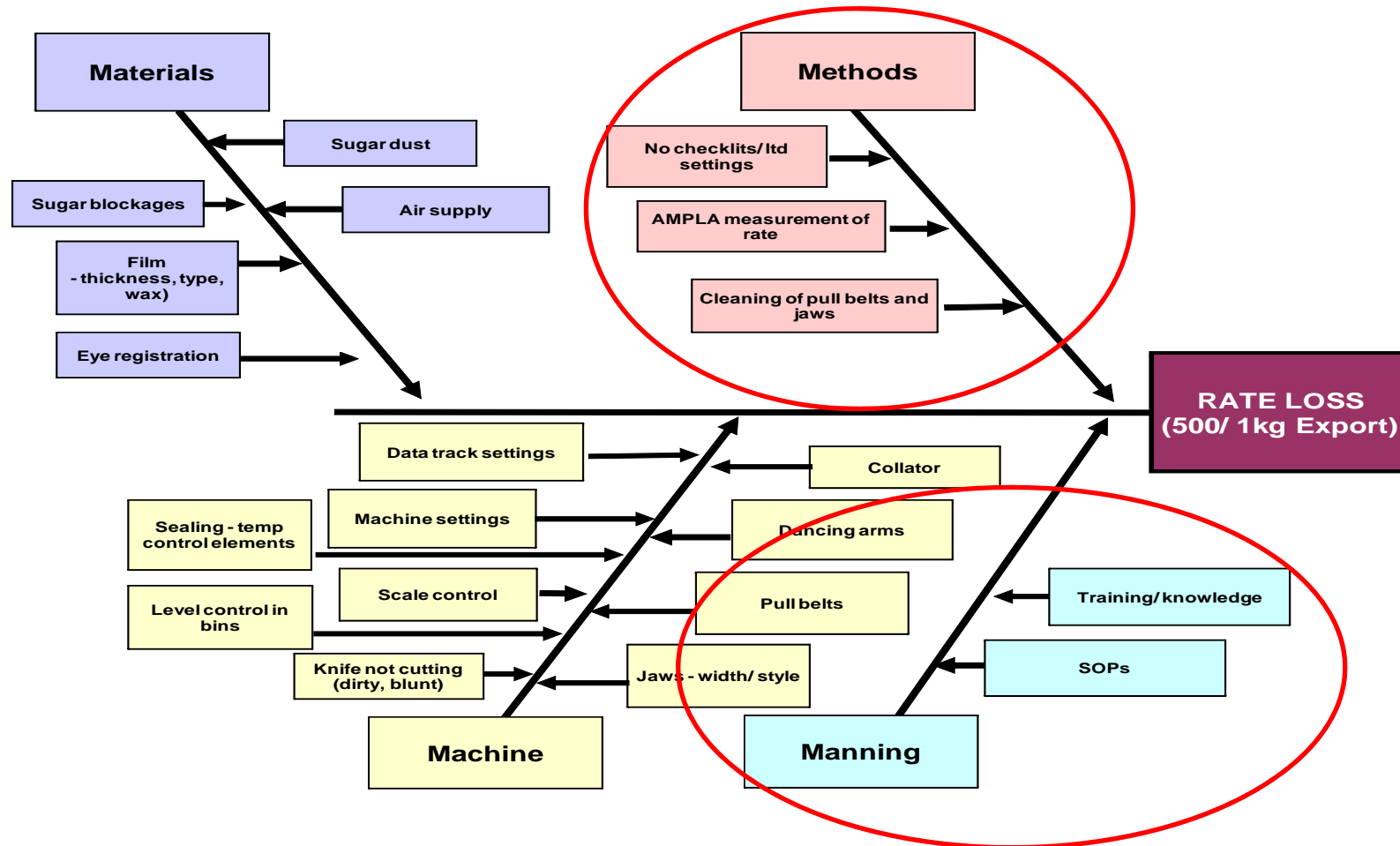
Video



Video



Analysis of Current Situation



Team mandate required a focus on methods and manning, however machine / material opportunities were progressed where possible



How did we address issues affecting rate?



- Understood machine functions
- Developed standard settings
- Documented SOPs for rate limiting tasks
- Conducted training
- Resolved technical issues



Initial Base Skills Matrix - example



PACKING SHIFT ONE SKILLS MATRIX

	F. Apoderado	Johnel Suralta	R Tecson	D Tobias
Forkhoist			1	
Packing LH	2			
Robot Operator				
Daylor	2	2		2
Remelt				
Collator	3	2	2	3
Matrix	2	3	2	3
Rovema A	2	3	1	3
Raw Grader		2		
Budpak	1	2	1	2
Extra Fine Handpack	2	2		
Coffee IBC		2		
Soft Brown Packing	3	2		
Soft Brown blending	2			
Carousel	1			



Development of Standard Machine Settings

DAYLOR FLOOR MATRIX SETTINGS

These are reference settings for all products packed on the Daylor Matrix.

PROGRAM NUMBER	PRODUCT
1	1kg 1A Export
2	500g Castor
3	500g 1A Export/Local
4	4kg Castor
5	
6	4kg Raw
7	4kg 1A Export
8	1kg Castor Local/Pams
9	3Kg 1A Budget

RUN SETUP SCREENS

PROGRAM NUMBER	1	2	3	4	5	6	7	8	9
Bags/min	52	50	50	15		11	15		17
SEAL CLS S	29	29	29	29	29	29	29	29	29
CLOSE TOL	18	18	18	18	18	18	18	18	18
CTR RST TIME	0	0	0	0	0	0	0	0	0
DUMP DELAY	0	0	0	20	0	20	50	3	12
AUTO	Off	Off	Off	Off	Off	Off	Off	On	Off
E GUIDE	Off	Off	Off	Off	Off	Off	Off	Off	Off
A CTR RST	Off	Off	Off	Off	Off	Off	Off	Off	Off
SEAL TEST	Off	Off	Off	Off	Off	Off	Off	Off	Off
SEAL SET	Off	Off	Off	Off	Off	Off	Off	Off	Off
GUSSET TST	Off	Off	Off	Off	Off	Off	Off	Off	Off
PRINT TIME	4	4	4	4	2	2	6	4	4
LABEL POINT	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
STAGER OD	6	0	0	15	5	10	8	0	8
H COOL TIME	25	25	20	100	35	25	30	25	30
H COOL DEL	0	0	0	0	0	0	0	0	0
V COOL TIME	20	25	20	120	30	25	30	20	30
VS OPEN TIME	12	14	16	22	10	10	16	18	16
CLOSE WITH	Film Stop	Film Stop	H. Seal	H. Seal	Film Stop	Film Stop	Film Stop	H. Seal	Film Stop
AUTO	Off	Off	Off	Off	Off	Off	Off	Off	Off
IMPRINT	On	On	On	On	Off	On	On	On	On
STAGER	Off	Off	Off	On	Off	Off	Off	Off	Off
AUX	Off	Off	Off	Off	Off	Off	Off	Off	Off

The following settings are used to control the performance of the Matrix line.

1. FORM FILL SEAL (MATRIX)

PROGRAM NUMBER	1	RATE (BPM)	52-53
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HEAT SETTINGS		MATRIX SETTINGS	
VERTICAL - TOP	180	H SEAL	40
VERTICAL - BOTTOM	180	V SEAL	42
FRONT TEMP	140	FILM DELAY	14
REAR TEMP	140	KNIFE C TIME	10
		PRODUCT TIME	0
		OVERLAP	140
		DUMP DELAY	0

Adjustment of machine settings:

- All settings that are highlighted (by shadow) can be adjusted to manage the performance of the machine.
- All other settings must not be adjusted without the authorisation of the Leading Hand (record of adjustment to be made in Leading Hand Logbook)

All settings are documented on the Matrix Generic Settings sheet



Development of SOPs



Matrix Jaws Cleaning Procedure

PH1-MAT-SOP-208

Overview	Instructions & Explanations	Photos
<p> GMP applies</p> <p> Picture/info on right</p>	<p> General Attention Activator</p> <p> Related SOPs</p>	<p> Short Note</p> <p> Safety Warning</p>
<p>1. Secure the film roll</p>	<p>1.1 Apply the film roll brake by turning ON the brake isolator valve. </p>	<p> Brake isolator valve</p>
<p>2. Remove and clean the knife</p>	<p>2.1 Open the front safety door. </p> <p> This door is interlocked to the machine to disable the air supply system but not the main electrical power.</p> <p>2.2 Remove the knife</p> <p> The knife and its locks could be very hot , be extra cautious when performing this job.</p>	<p> Front door</p>
<p>3. Clear the jaws of sugar build-up</p>	<p>3.1 Remove the Teflon seal tape for the front and rear jaw. </p> <p> Be aware that the jaw assembly is extremely hot and could cause serious injury.</p> <p>3.2 Scrape off all the sugar build ups in the front and rear jaw.</p> <p> Use the green scrubbing pad to smoothen the surface of the jaw.</p>	<p> Jaw seal tape</p>





Integration of SOPs into training assessment

MATRIX KNOWLEDGE ASSESSMENT CHECKLIST

TRAINEE _____

ASSESSOR _____

DATE _____

When doing assessments operator is to be asked to explain each of the following points and a rating of 1, 2 or 3 applied to each point according to the assessed level of understanding. (1 = under training or more training needed, 2 = good level of understanding, 3 = excellent level of understanding and could train others on this point) The operator should be put at ease that this is not a test but an assessment of training needs.

1. SAFETY

Knowledge Assessment	Y / N
GENERAL LOCKOUT PROCEDURE Training completed and signed off on separate sheet	
PLANT ISOLATION SPECIFIC TO MATRIX:	
<ul style="list-style-type: none"> FULL TRAINING GIVEN AND SIGNED OFF ON "LOCKOUT PROCEDURE" CHECKSHEET. FULL UNDERSTANDING OF ISOLATION AND LOCKOUT PROCEDURES REQUIRED ON THIS PLANT: INCLUDING MATRIX, SCREWS, CONVEYORS, E-STOPS AND LANYARDS PAWA CONVEYORS. MAY START AT ANY TIME. 	

Reference
to SOPs

2. SUGAR SUPPLY / SCALES

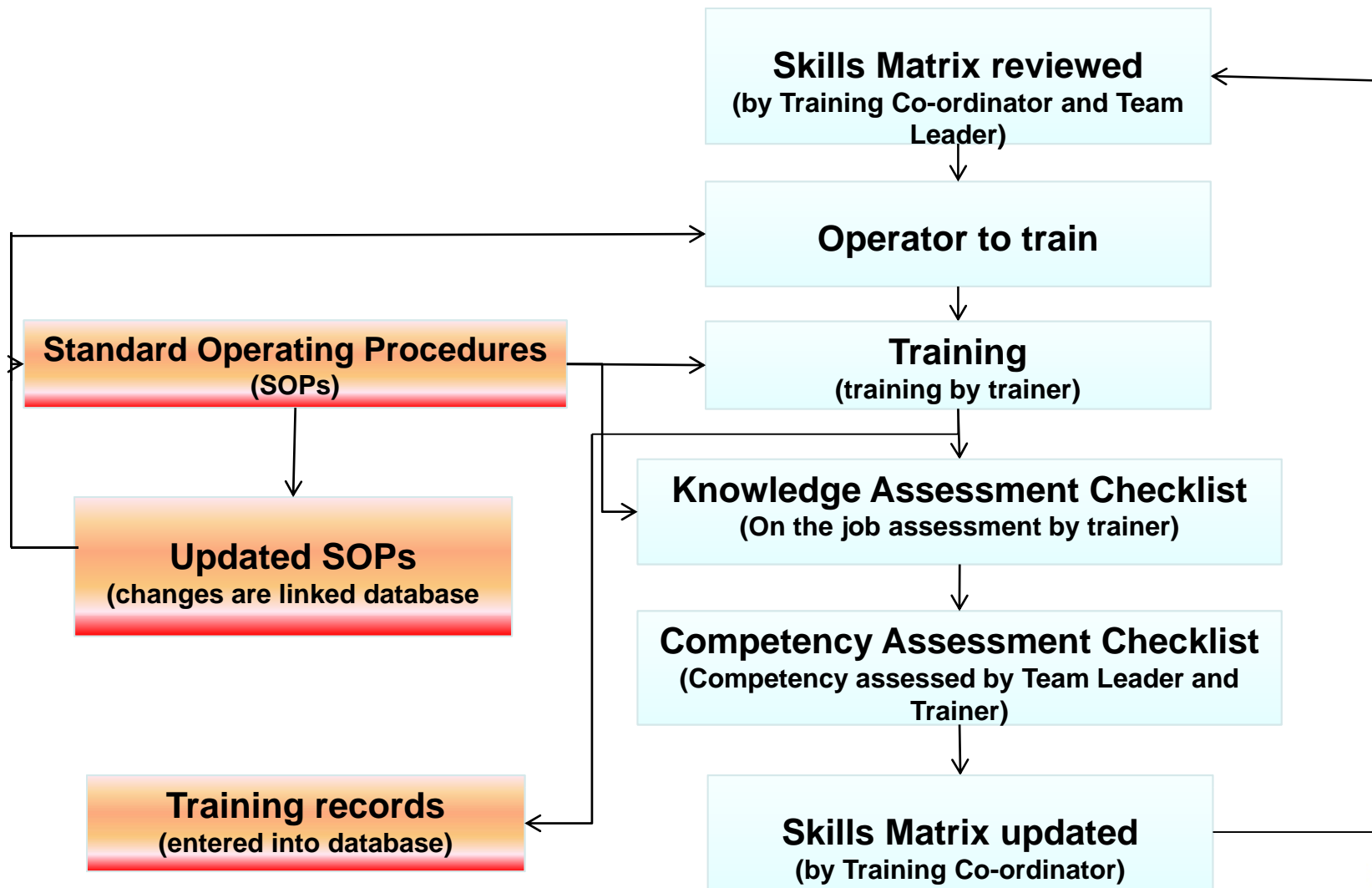
Knowledge Assessment	Rating
CITECT SYSTEM - SUGAR SUPPLY FROM THE MATRIX BIN OR THE D.C RAW CONVEYOR	
DUMPING FACILITY ON THE MATRIX BIN	
DATATREK - CHANGING COUNTER WEIGHTS (PH1-MAT-SOP-101)	
DATATREK - DUMP ADJUSTMENT (PH1-MAT-SOP-102)	
DATATREK - CHANGING THE DEFAULT VALUE (PH1-MAT-SOP-103)	
DATATREK - WEIGHT ADJUSTMENT (PH1-MAT-SOP-104)	

3. FORM FILL SEAL (MATRIX)

Knowledge Assessment	Rating
MACHINE PARAMETERS AND TOUCH SCREENS (PH1-MAT-SOP-201)	
THREADING THE POLYFILM	
ADJUSTMENT OF DI ASTIC TO GIVE CORRECT OVERLAP AT VERTICAL SEAM	

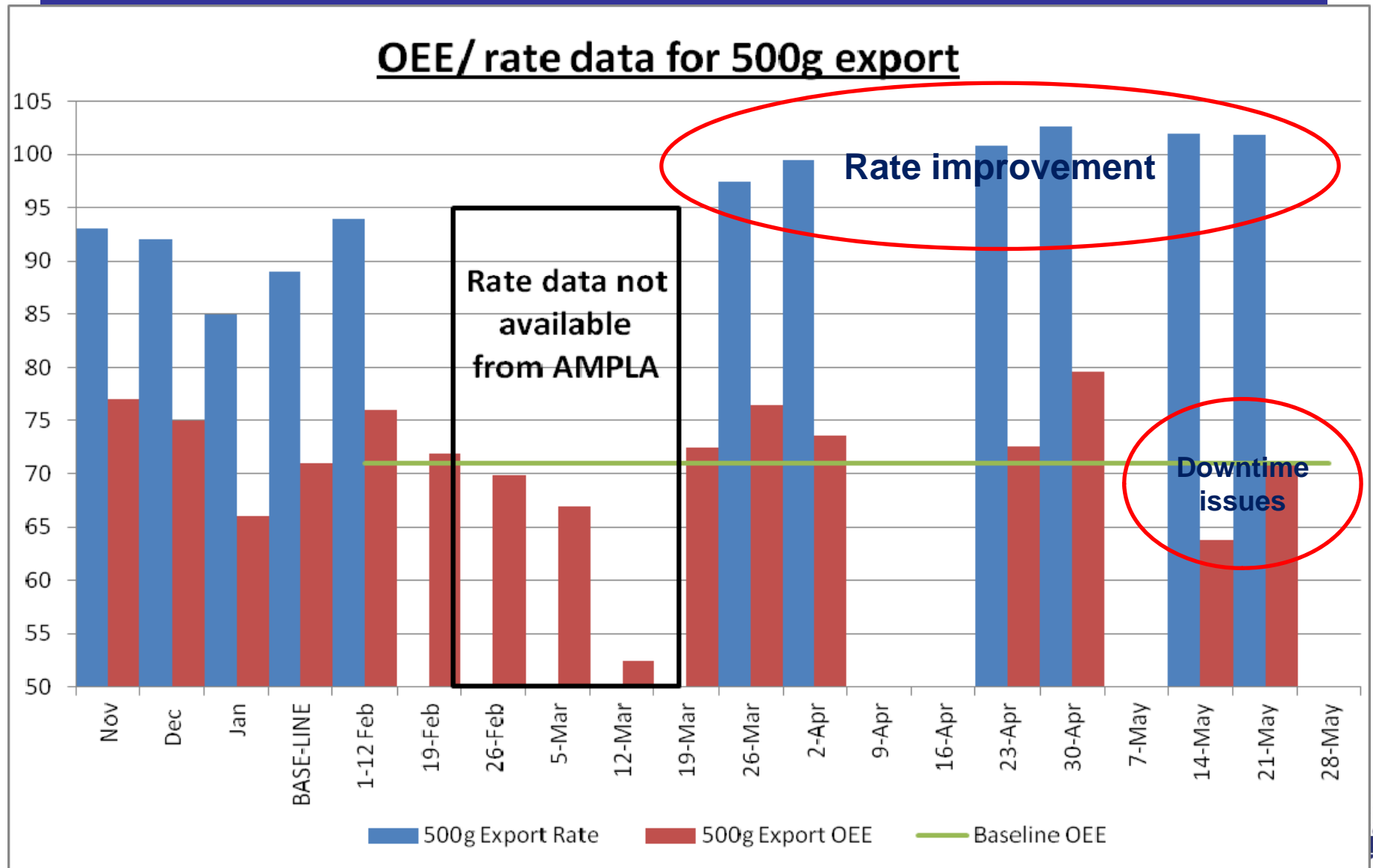


Integration of SOPs into training data base



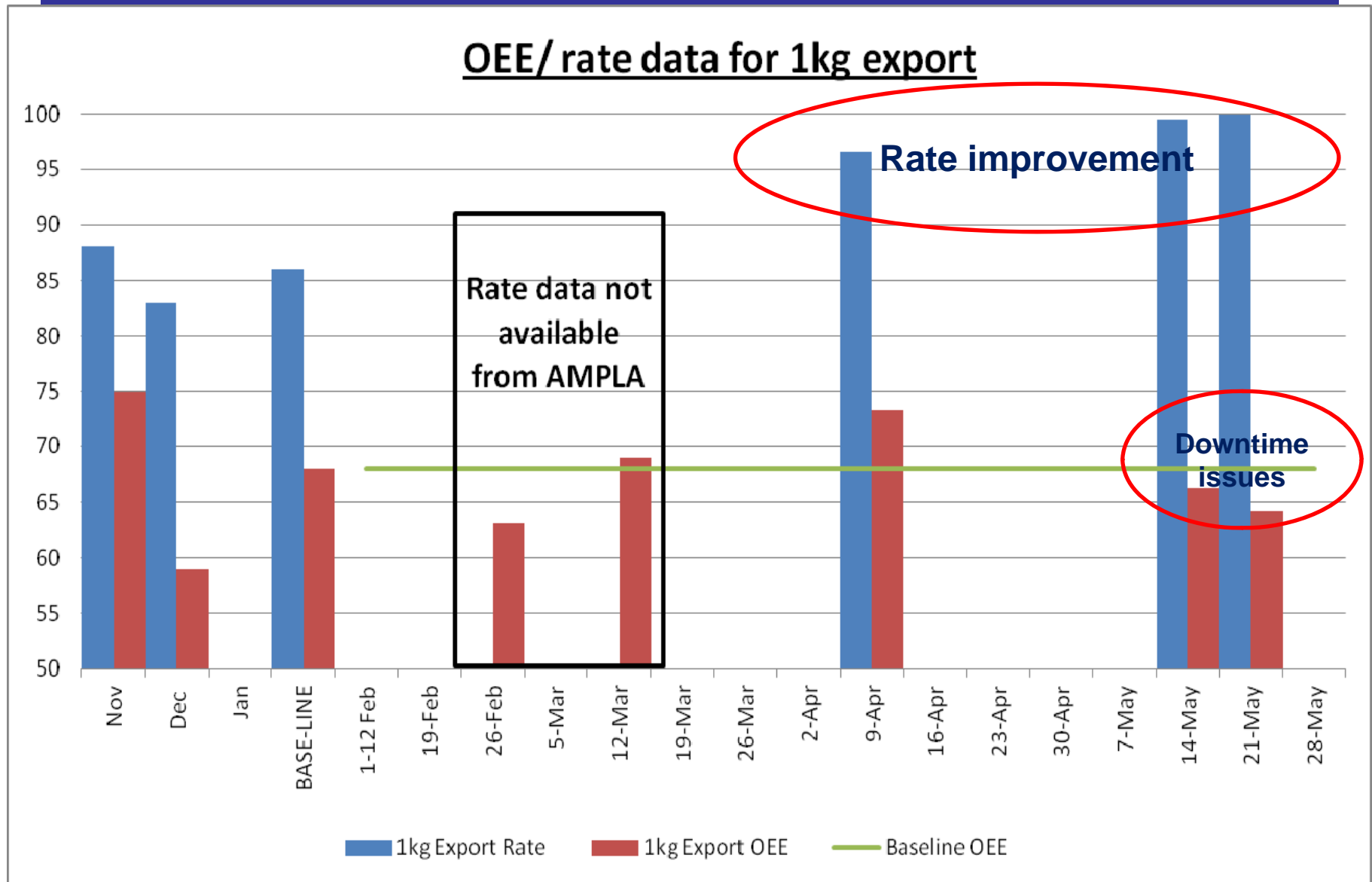


Results





Results





Results

- Tangible
 - Packing OEE: improvement of 5%
 - Labour efficiency: direct labour savings \$25K pa
 - Benefit for other products: not measured
- Intangible
 - Staff engaged and recognised
 - Learning experience



Key learnings from this team



- Appreciation of rate by all operators in DPA (quickly transferred to other machines)
- Rate is influenced by many factors
- Excellent exchange of ideas between operators – trials and training
- All packing/ maintenance staff were able to learn something new
- Importance of standard settings and SOPs
- SOPs very time consuming to develop



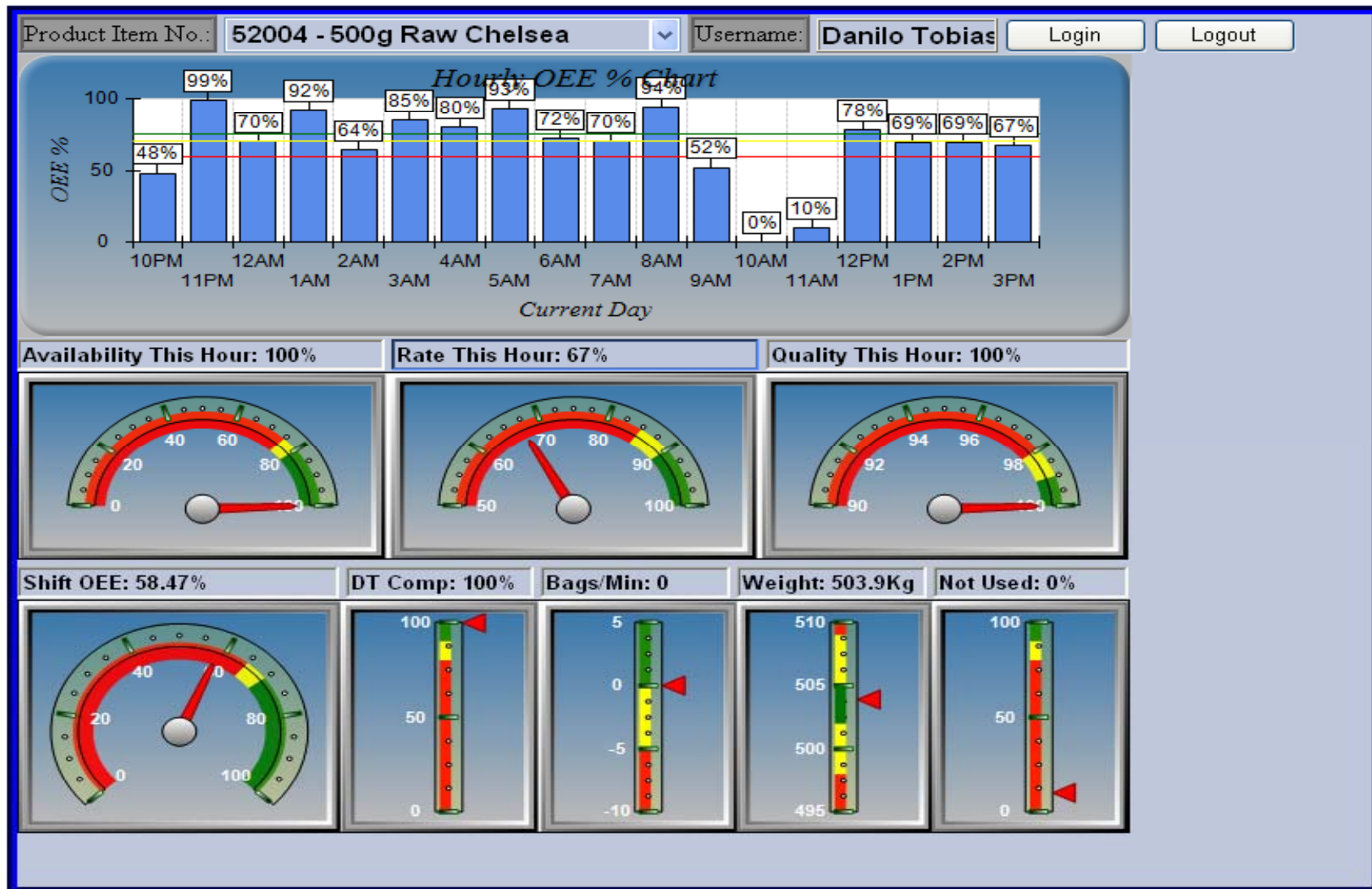
How are we sustaining the rate gains?



- Modification of PLC to secure settings
- Develop process of sign off for changing standard settings
- Use problem solving to address rate limiting issues
- Use of Ampla for real time reporting for operators / management to monitor plant / rate performance



Real Time reporting using Ampla





Next step to develop Operator Skills

- Continued use of 'Education & Training Base Skills' for future teams (cycle 11)
- Continued use of OEM-4 to develop understanding of plant equipment
- Continue operator training plans and regular review





Questions

