



"The Shift"

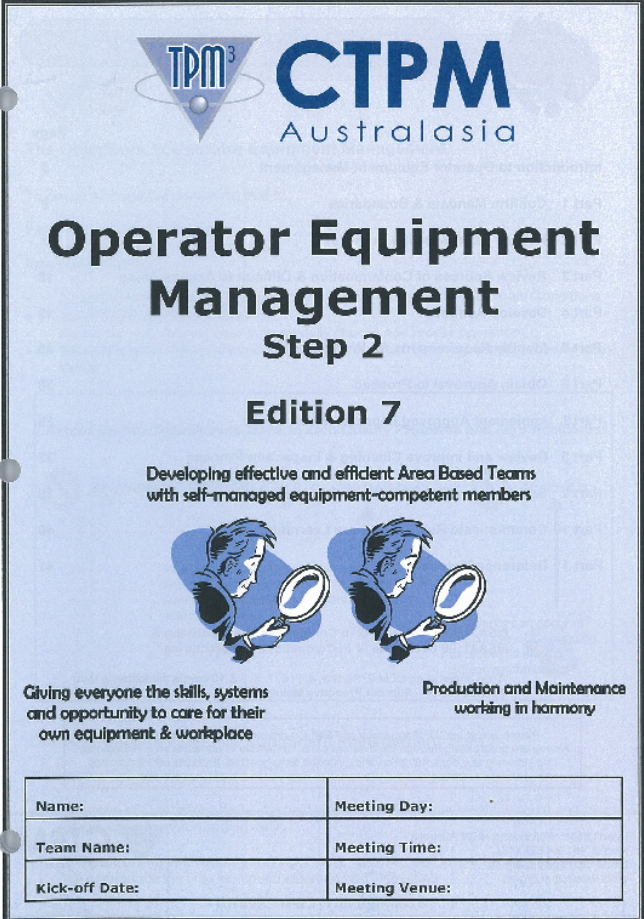
Refinery Area Based Team



Approach Taken

Schedule of 10 steps for OEM2


1. Confirm Mandate for area
 - Determined by Refinery Area Leadership team
 - Agreed upon by team
2. Review Team and Scope activities
3. Review Difficult to access areas and Sources of contamination
4. Develop Actions
 - Defect Lists
 - Difficult to access
 - Sources of contamination
5. Identify Requirements For Workplace
6. Obtain Approval to proceed
 - Midway Presentation
7. Implement Approved Solutions
8. Review and Improve Cleaning & Inspection Process
9. Self Assess Achievements and Team Skills
10. Communicate results and Share Learnings



TPM³ CTPM Australasia

Operator Equipment Management Step 2 Edition 7

Developing effective and efficient Area Based Teams
with self-managed equipment-competent members



Giving everyone the skills, systems and opportunity to care for their own equipment & workplace

Production and Maintenance working in harmony

Name:	Meeting Day:
Team Name:	Meeting Time:
Kick-off Date:	Meeting Venue:





Approach taken

Involvement

- Roles
 - Sharing of tasks
 - Paperwork and Improvement sheets
- Focus areas
 - Liquid Sugar Plant
 - Pan Station
- Tasks undertaken
 - Cleaning
 - Defect Identification
 - Responsibility for Fixing Defects Decided
 - Preparation and Painting
 - Problem Solving



TPM³ Improvement Sheet

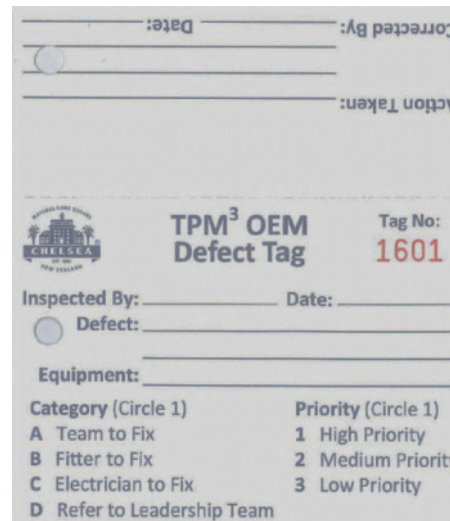
Team Name:	THE SHIFT	Location:		Initiated Date:	1/3/12
Team Type:	OEM 2	Item:	Soft brown syrup pump and bund	Completed Date:	5/5/12
Initiator:					
1. Problem (Plan)					
Syrup and seal water leaks, corroded floor					
2. Current Situation (Plan)			3. Proposed Change / Approved Improvement (Do)		
Photo:			Photo:		
					
Improvement Target:	Fix all leaks, clean and paint drive and bund.		Cost:	\$300	Expected Saving: N/A
4. Results: (Check)			5. Future Actions: (Act)		
Leaks fixed, drive and bund painted to standard.			Included in checklist for regular maintenance.		
CTPM Australasia	Approved by:	Shift A	Shift B	Shift C	Shift D
	Team Leaders to sign off acceptance of Proposed Change				



Planning and Execution

Preparation and Planning

- Clean For Inspection Planning
 - Improvement Areas Decided
 - Activities planned By team
 - Safety Plan for each activity
- Defect management
 - Defect tags attached
 - Responsible Person Decided
 - Operator
 - Shift Fitter
 - Shift Electrician
 - Review progress and Completion of tasks



TPM³ OEM Defect Tag

Tag No: 1601

Inspected By: _____ Date: _____

Defect: _____

Equipment: _____

Category (Circle 1)	Priority (Circle 1)
A Team to Fix	1 High Priority
B Fitter to Fix	2 Medium Priority
C Electrician to Fix	3 Low Priority
D Refer to Leadership Team	



TPM³ OEM Defect Tag

Tag No: 1601

Inspected By: _____ Date: _____

Defect: _____

Equipment: _____



Planning and Execution

Execution of activities – 4 Lists

Cleaning for inspection activities to thoroughly identify

1. Sources' of Contamination
2. Difficult to access areas
3. Defects
4. Key questions

Removal and Eliminate Contamination.
Painting

TPM³ Improvement Progress Report Sheet

Final % completed / 5 97% 20 items improvements on specific area

Team Name: THE SHIFT Number of actions completed this week: 1 Number of new actions this week:

Start Date: 15/2/12

No.	Description of Improvement Task Required	Team Member Responsible	Original Target Date	Revised Target Date	% Complete
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OEM Sources of Contamination List

Date: 15/2/12

Equipment: PLS plant + Pan Floor

Team: The Shift

No.	Type of Contaminant	Description of Source of Contamination	Comments	Date Actioned
✓ 1	water + sugar	water tank lid	minimise water levels	
✓ 2	water - To PLS	water balance tanks	float valve faulty, adjusting by hand	
✓ 3	water	downcomer (water), venturi, water control		
✓ 4	Syrup - Floor	GS line syring tanks		

OEM Difficult to Access Area List

Date: 15/2/12

Equipment: PLS plant + Pan Floor

Team: The Shift

No.	Description	Comments	Date Actioned
✓ 1	Hand scaffolding	DONE	8/3

OEM Defect List

Date: 15-02-12

Equipment: PAN FLOOR



Team: THE SHIFT

No.	Defect Tag No.	Description	Comments	A	B	C	D	E	Date actioned
✓ 1		B PAN GIN FILTER LID	STOPPER TO AVOID TOUCHING CLOTHING						
✓ 2		A & B PAN	PROPER LABELS						
✓ 3		PIPE TO STAIR ABOVE	LEAKING						
✓ 4		VAPOUR PIPE S PAN LEAKING	LEAKING						
✓ 5		STEEL @ A PAN	REDUNDANT - FOR REMOVAL						
✓ 6		STEEL @ D/E PAN	TO INSTALL VENTURI UNDERNEATH						
✓ 7		LIGHTING NOT WORKING @ RECYCLING	TO BE FIXED						
✓ 8		GS Pan leak in bottom right and left hand side							
✓ 9		A & B Pan lighter line broken							
✓ 10		B Pan lighter line longer							
✓ 11		Redundant 50mm front of A Pan	to remove						
✓ 12		Hose box back of B Pan to secure							
✓ 13		Replace lighting inside of UV equipment							

Legend
A - Reported by Operators
B - Reported by Mechanical Maint
C - Reported by Electrical Maint
D - Referred to Mechanical Maint
E - Referred to Electrical Maint



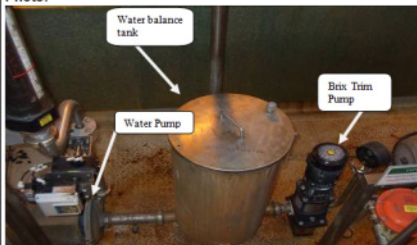
TPM³ Improvement Sheet

Team Name:	THE SHIFT	Location:		Initiated Date:	29/2/12
Team Type:	OEM 2	Item:	Liquid Sugar Plant	Completed Date:	5/5/12
Initiator:					
1. Problem					(Plan)
Contamination, leaks and corroded floor and wall.					
2. Current Situation			3. Proposed Change / Approved Improvement		
(Plan)			(Do)		
Photo:			Photo:		
					
Improvement Target:	Identify and fix leaks and contamination issue's, Thorough clean up and re paint.		Cost:	\$3000	Expected Saving: N/A
4. Results:			5. Future Actions:		
(Check)			(Act)		
Leaks and contamination issue's sorted, dry floor and Plant repainted.			Plant included in checklist for regular maintenance.		
CTPM Australasia	Approved by:	Shift A	Shift B	Shift C	Shift D
	Team Leaders to sign off acceptance of Proposed Change				

Planning and Execution

Execution of activities

- A3 problem Solving Liquid Sugar Plant
 - Water Balance tank Float overflowing
 - Improved operations and reduced energy usage



TPM ³ Improvement Sheet														
Team Name:	The Shift	Location:	PLS Plant water supply pumps	Initiated Date: 23/4/12										
Team Type:	OEM 2	Item:	PLS Plant water supply pumps	Completed Date: 23/5/12										
Initiator:	TGRB													
1. Problem (Plan)														
PLS mixing losing water supply, Water tank overflowing, multiple leaks, high cost of running and maintaining the plant.														
2. Current Situation (Plan)														
Photo:														
														
3. Proposed Change / Approved Improvement (Do)														
Improvement Target: Simplify plant by removing water supply and brix trim pumps including tank. Water supply directly feed from existing main line via pressure regulator.														
Cost:														
Expected Saving:														
4. Results: (Check)														
Reduced operating and maintenance cost, Plant running more stable, Leaks eliminated, Easy to maintain.														
5. Future Actions: (Act)														
<table border="1"> <tr> <td>Approved by:</td> <td>Shift A</td> <td>Shift B</td> <td>Shift C</td> <td>Shift D</td> </tr> <tr> <td>Team Leaders to sign off acceptance of Proposed Change</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					Approved by:	Shift A	Shift B	Shift C	Shift D	Team Leaders to sign off acceptance of Proposed Change				
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CTPM Australasia				Page 15										

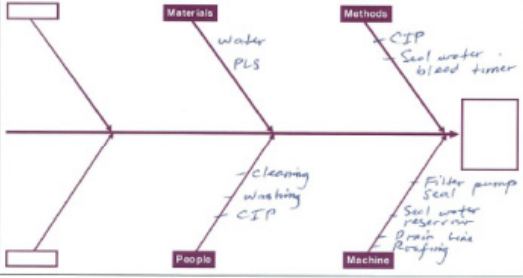
Improvement Theme:		Title: Eliminate water overflow of lost of water		Site: PLS plant																													
Department:	Equipment / Process:	Prepared By:	Date Initiated:	Date Completed:	Latest Update Date:																												
Production			7/3/12	19/5/12																													
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<table border="1"> <tr> <th colspan="2">Problem Statement</th> <th>Point of Occurrence</th> </tr> <tr> <td>What is the problem?</td> <td>Water, over flowing, lost of water</td> <td>Water balance tank</td> </tr> <tr> <td>Where did we find the problem?</td> <td>PLS water balance tank</td> <td>Supply of water</td> </tr> <tr> <td>When did it happen?</td> <td>From tube to float</td> <td>Float contaminated with water and sudden lost of supply water</td> </tr> <tr> <td>Size</td> <td></td> <td></td> </tr> </table>						Problem Statement		Point of Occurrence	What is the problem?	Water, over flowing, lost of water	Water balance tank	Where did we find the problem?	PLS water balance tank	Supply of water	When did it happen?	From tube to float	Float contaminated with water and sudden lost of supply water	Size															
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<p>Test conducted with water supply direct from Regulator and isolating both water pump and Brix trim pump. Results very encouraging, brix + flow stable. Flow rate can be varied to minimum to max 1/min.</p>																																	
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Planning and Execution

Execution of activities

- Water on Liquid Sugar plant Floor
 - Fixed leaks
 - Repaired Roof
 - Repaired Drains

TPM ³ Improvement Sheet			
Team Name: The Shift		Location: PLS Plant	
Team Type: RB		Initiated Date:	
Initiator: RB		Completed Date:	
1. Problem (Plan)			
2. Current Situation (Plan)		3. Proposed Change / Approved Improvement (Do)	
			
Improvement Target: Identify and fix all leaks		Cost: Expected Saving:	
4. Results: (Check)		5. Future Actions: (Act)	
Floor dry, safer workplace			

Improvement Theme:				Title: Problem Solving A3																											
Department: Production / Process: PLS Plant				Prepared by:																											
Date Initiated: 2.5.12				Date Completed: 12.6																											
Site:				Latest Update Date:																											
1. Define Problem (Plan)																															
Problem Statement: Wet floor, inspo of tank and reservoir pump																															
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Tangible Achievements

Impact on Area and Actions to Sustain

- 37 Defects Identified
 - 22 Liquid Sugar Plant
 - 18 Pan Floor
- 36 Defects Resolved – 97% Complete
- 16 Improvements sheets completed
- 2 Frontline problem solving
- Check Sheets modified
 - Inspection Check sheet done Weekly
- Huge Visual Impact

MIDWAY - 68% COMPLETE
FINAL - 95% COMPLETE

19/26

19/20 > 95%

OEM Defect List

Date: 15-02-12
Equipment: PLC PLANT
Team: THE SHIFT

Legend
A - Repaired by Operators
B - Repaired by Mechanical Maint
C - Repaired by Electrical Maint
D - Referred to Mechanical Maint
E - Referred to Electrical Maint

No.	Defect Tag No.	Description	Comments	A	B	C	D	E	Date actioned
1	0897	PIPE LEAK	NEEDS WELDING						
2	0896	PIPE LEAK (CIP LINE)	RJT "O" RING REPLACEMENT						
3	0894	FLOW SWITCH	RJT LEAKING						
4	0898	PIPE	RJT LEAKING						
5	0852	BALANCE TANK	LIP RUBBER STOP TO REPLACE						
6	0850	PLS GAP FILTER	GASKET LEAKING						
7	0881	PLS GAP FILTER	LESS WELD TO FLOOR						
8	0855	SEAL WATER TANK DRAIN PIPE	DIVERT TO DRAIN						
9	0854	BALANCE TANK DRAIN	LOCK GATE - TO FIX						
10	0856	RJT	LEAK						
11	0743	PLS DIVERT VALVE	LEAKING						
12	0741	LP STEAM LINE	LEAKING						
13	0735	FILTER PUMP	MECHANICAL SEAL LEAKING						

MIDWAY - 73% COMPLETE
FINAL - 100% COMPLETE

15 items of defects completed

OEM Defect List

Date: 15-02-12
Equipment: PAN FLOOR
Team: THE SHIFT

Legend
A - Repaired by Operators
B - Repaired by Mechanical Maint
C - Repaired by Electrical Maint
D - Referred to Mechanical Maint
E - Referred to Electrical Maint

No.	Defect Tag No.	Description	Comments	A	B	C	D	E	Date actioned
1		D PAN GAP FILTER LIP	STOPPER TO AVOID TOGETHER CLIPPING						
2		A & B PANS	PROPER LABELS						
3		PIPE TO STOP ROUSE	LEAKING						
4		VAPOUR PIPE & PAN LEAKING	LEAKING						
5		STOP @ A PAN	REDUNDANT - FOR REMOVAL						
6		STOPS @ D & E PAN	TO INSTALL WINDOW UNDERBATH						
7		LIGHTING NOT WORKING @ REDUNDANT	TO BE FIXED						
8		G Pan Leak in between floor and support bracket							
9		A & B Pan support line bracket							
10		E Pan support line bracket							
11		Redundant stops front of A Pan to column							
12		Hose by back of B Pan to remove							
13		Replace leaking seals of VV pumps							



Tangible Achievements

Impact on Measures

- Impact on overall refinery performance hard to gauge due to being a part of a large continuous process, however...
- G Pan Vacuum improved from 25.5 "hg to 27.5 "hg >\$30,000
- Liquid Sugar plant improvement due to Frontline Problem solving
 - Max continuous flow rate 150 L/min to 200 L/min
 - Energy Saving >\$2000
 - Reduced Maintenance Cost
 - Less Complex Fault diagnostic
- Housekeeping improvement
 - Stop Deterioration
 - Eliminate unnecessary overtime due to cleaning
 - Less slip hazards, overall safety improvement



Impact on Employees

Work Practices

- Change to Checklist
 - Updated each cycle
- Operator care
 - Awareness of issues
 - Report Leaks
- Liquid Sugar Plant
 - Problems & Safety Issues Resolved
 - More Efficient
- Improvement opportunities
 - Operators part of improving area

THE SHIFT TEAM OEM IMPROVEMENT AREA

REFINED and BOILOUT FUGAL, PAN FLOOR, PLS and SCRUBBER AREA

HOUSEKEEPING CHECKLIST

COMMENTS / ACTION TAKEN

1 REFINED CELLAR

- 1.1 Floors cleaned
- 1.2 Broom and shovel in place
- 1.3 Pile of sugar cleaned
- 1.4 Hotwater hose rolled up
- 1.5 Waste trolley emptied
- 1.6 No new leaks

V	X	COMMENTS / ACTION TAKEN

2 REFINED FUGAL

- 2.1 Broom and shovel in place
- 2.2 Floors cleaned
- 2.3 Doors properly close
- 2.4 Fugal hatches closed

V	X	COMMENTS / ACTION TAKEN

3 BOILOUT FUGALS AND MELTERS

- 3.1 Broom and shovel in place
- 3.2 Floors cleaned
- 3.3 Fugal hatches closed
- 3.4 No new leaks

V	X	COMMENTS / ACTION TAKEN

4 PLS PLANT

- 4.1 Floor cleaned
- 4.2 No new leak
- 4.3 Looseness and vibration

V	X	COMMENTS / ACTION TAKEN

5 VACUUM PUMPS AREA

- 5.1 Floors cleaned
- 5.2 No new leaks
- 5.3 Hose rolled up
- 5.4 Looseness and Vibration

V	X	COMMENTS / ACTION TAKEN

6 SCRUBBER AREA

- 6.1 Floors cleaned
- 6.2 Hoses rolled up
- 6.3 No water and syrup leaks
- 6.4 PPE board clean and gears ready to use
- 6.5 Looseness and Vibration
- 6.6 Sugar dust level acceptable

V	X	COMMENTS / ACTION TAKEN

7 PAN FLOOR

- 7.1 Floor cleaned
- 7.2 No new leak
- 7.3 Looseness and vibration

V	X	COMMENTS / ACTION TAKEN

CHECKED BY: _____

DATE: _____

Revised: 6/06/12









Impact on Employees

Morale / Frustrations

- “We have Set the Standard!”
- “The Shift” team have lifted the standard of workmanship
- Created positive atmosphere among other teams using TPM as a tool
- Enthusiasm as improvements realised
- Encourage other teams to step up
 - “We changed behaviour”



TPM³ Improvement Sheet

Team Name:	The Shift	Location:		Initiated Date:	7/3/12
Team Type:	OEM 2	Item:	G Pan	Completed Date:	4/4/12
Initiator:					
1. Problem (Plan)					
G Pan low vacuum , Leak contaminating insulation, floor and Silo sugar sampling.					
2. Current Situation (Plan)			3. Proposed Change / Approved Improvement (Do)		
Photo:					
					
Improvement Target:	Identify, Repair and clean syrup leaked onto insulation and cladding. Improve Pan Vacuum.		Cost:	\$200	Expected Saving: Over \$30,000
4. Results: (Check)			5. Future Actions: (Act)		
Vacuum improved to 27.5" from 25.5". Pan boiling fast and efficient. Leak contaminating insulation and floor repaired.					
Approved by:		Shift A	Shift B	Shift C	Shift D
Team Leaders to sign off acceptance of Proposed Change					
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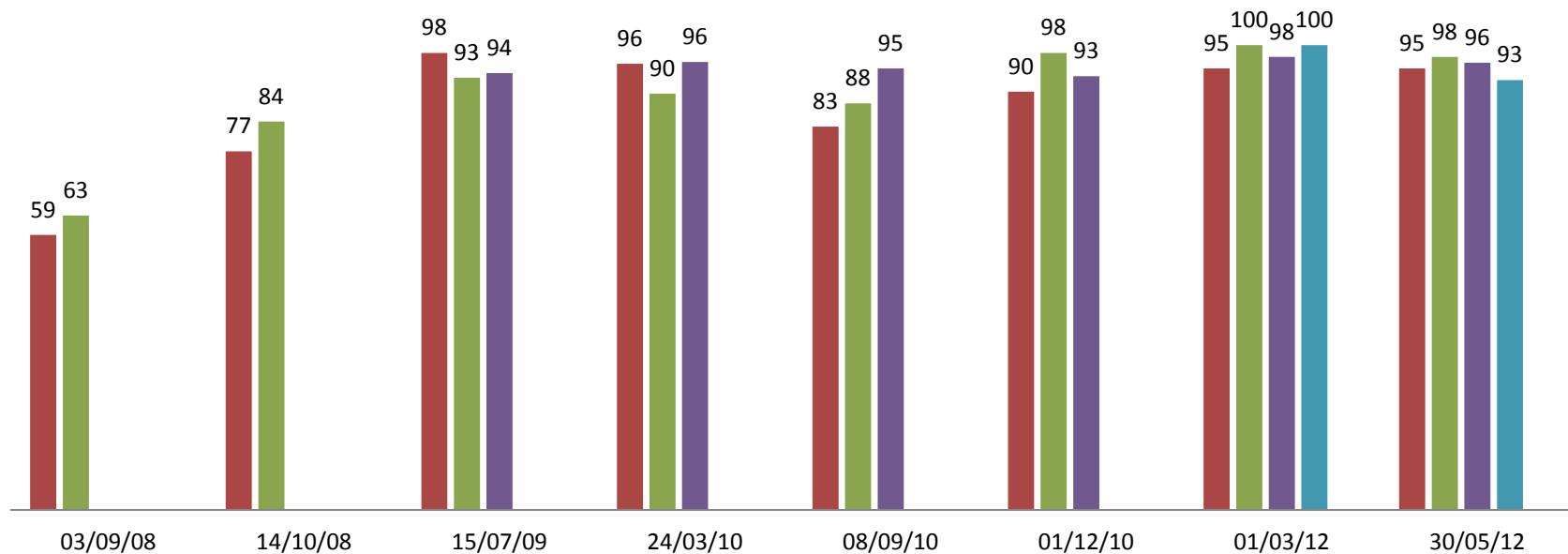


Impact on Employees

Team Self Assessment

The Shift - Team Self Assessment

■ A. Team Effectiveness ■ B. Work Area Management ■ C. Cleaning for Inspection ■ D. Sources of Contamination ■ E. Lubrication



Communication of Lessons Learnt

Capturing the learnings

- Blockages
 - Improvements in Roof Leaks
 - Contractors need to treat improved areas with respect. Not scratch paint
- Achievements
 - Ahead of schedule- Revisited areas
 - Attitude and behaviour of operators greatly improved in maintaining the workplace. i.e. initiative, ownership
 - Problem Solving completed with excellent results
- Learnings
 - Liquid sugar plant able to be run at variable flow rate without water pump, brix control pump etc
 - Treat all leaks as contamination
 - We can do it ourselves

OEM-2 Leaders Manual - Part 2

History Sheet

Team: THE SHIFTKick-off Date: 15/12/12

Major Delays / Blockages / Hassles for the week:

Date	
14/12	IMPROVEMENTS IN PROGRESS, IE. ROOFING LEAKS
	ALL CONTRACTORS NEED TO TREAT OUR ACHIEVEMENTS WITH A BIT MORE RESPECT IE. SCRATCHING EQUIPMENT OVER NEWLY PAINTED FLOORS, SCAFFOLDING

Key Achievements for week:

Date	
14/12	AHEAD OF SCHEDULE
	Attitude and behaviour of operators greatly improved in maintaining workplace i.e. initiative, ownership
	2x Problem solving completed with excellent results

Lessons Learnt during the week:

Date	
	- FLS plant able to run at variable flow rate without water pump and Brix trim pump. Eliminating Leaks, Contamination and saving cost of operation
	- Treat all leaks as contamination

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Communication of Lessons Learnt

Sharing the Learnings

- Presentations
 - Midway after 6 weeks
 - Final after 12 weeks including Sucrogen Safety Health Environment Executive team
 - Special Repeat Presentation to all team leaders
- Improvement Sheets – on Display
- Area used as an example of what can be done

Just a quick note to thank you for your hospitality and time at last week's SHE face to face. I have not been back to Chelsea for around 4 years and what has been achieved in that time with the people, site and performance is a credit to the entire team at NZ Sugar. The business was already impressive and now it is even more so.

Could you also please pass on thanks to The Shift team who took us through the TPM improvements around the pans and PLS stations. They were fantastic and their enthusiasm and commitment to the workplace and each other was exceptional. It is obvious that there is a lot of buy in and pride in the refinery and business. Also thank the BBQ cooks and people who organised the catering and the meetings – all went like clockwork. – Regards

Craig Doyle

Executive General Manager of Cane Products



TPM³ Improvement Sheet

Team Name:	The Shift	Location:		Initiated Date:	7/3/12
Team Type:	OEM 2	Item:	D Pan microscope step	Completed Date:	18/4/12
Initiator:	TM				
1. Problem (Plan)					
Step and floor badly corroded due to metal to metal contact.					
2. Current Situation (Plan)			3. Proposed Change / Approved Improvement (Do)		
Photo:					
 <p>Steel plate</p>			 <p>Wooden base</p>		
Improvement Target:	Fit a wooden base to eliminate metal contact and step easier to move		Cost:	\$100	Expected Saving: N/A
4. Results: (Check)			5. Future Actions: (Act)		
Corrosion eliminated, step easy to move and greasy floor cleaned and painted					
Approved by:		Shift A	Shift B	Shift C	Shift D
Team Leaders to sign off acceptance of Proposed Change					
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Thank you!

"The Shift" Improvement Sheets for Cycle 13

The image displays a collection of 15 TPM Improvement Sheets, each detailing a specific factory improvement project. The sheets are organized into a grid-like collage. Each sheet typically includes the following sections:

- Header:** Team Name, Location, Initiated Date, and Completed Date.
- Problem:** A description of the issue being addressed.
- Current Situation:** A photo and description of the current state.
- Proposed Change / Approved Improvement:** A description of the planned or implemented change.
- Results:** A description of the outcomes and benefits.
- Approval:** Signatures of team leaders and approval from CTPM.

Key improvements shown include:

- Fixing water supply issues and leaks.
- Improving floor safety and cleanliness.
- Enhancing equipment maintenance and safety.
- Optimizing material handling and storage.
- Improving lighting and workspace organization.

At the bottom right, there are logos for the following companies:

- NATURAL CANE SUGARS CHELSEA NEW ZEALAND
- Equal
- BlendSure
- SIMPLY