

The BULLDOGS



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LQB
Clean In Place (CIP) Changeover
Downtime Reduction

Special Micro Focused Equipment &
Process Improvement Team

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Team Photo



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Team Roles Sheet

Roles	Team Member Responsible	Back -up Team Member
Prepare Agenda and Update Task List (Team Leader)	Darren O'Toole	Anna Sutjiadi
Record Team Minutes (Assistant Team Leader)	Anna Sutjiadi	Phil Elsley
Update Attendance and Schedule Sheet	Mo Hassan	Tome Najdovski
Update History Sheet	Mo Hassan	Tome Najdovski
Update Parking Lot Sheet	Phil Elsley	George Skiadopoulos
Ensure Agreed Measures are up to date	Chi Chung Hang	Tome Najdovski
Ensure Team Noticeboard is up to date	Tome Najdovski	Mo Hassan
Ensure Team Scoreboard is up to date	Tome Najdovski	Mo Hassan
Ensure TPM ³ Improvement Sheets are up to date	George Skiadopoulos	Chi Chung Hang
Facilitate the Team (TPM ³ Co-ordinator)		



Team Mandate

- Achieve an initial reduction of at least 50% in CIP changeover time.
- Recommend further actions to the Leadership Team so as to reduce the CIP changeover time by at least 90% from baseline
- Ensure means to sustain improvements are effective and understood and implemented on all shifts.
- Complete within 12 weeks after kick-off.



Team Rules - Bulldogs

- Punctual: all team members to be on time for meetings
- During the meeting there is only to be one person speaking at any one time
- Meeting is to follow the agenda which has been laid out
- All team members are to be given opportunity to voice their opinions
- The allocation of all activities/ tasks arising from the meetings are to be shared equally between all team members
- All mobile phones are either to be switched off or put on silent for the duration of the meeting
- Behaviour: There is to be no “finger pointing” toward or criticism of any individuals or shifts

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Attendance & Schedule

Team: Bulldogs Kick-off Date: 16.2.10

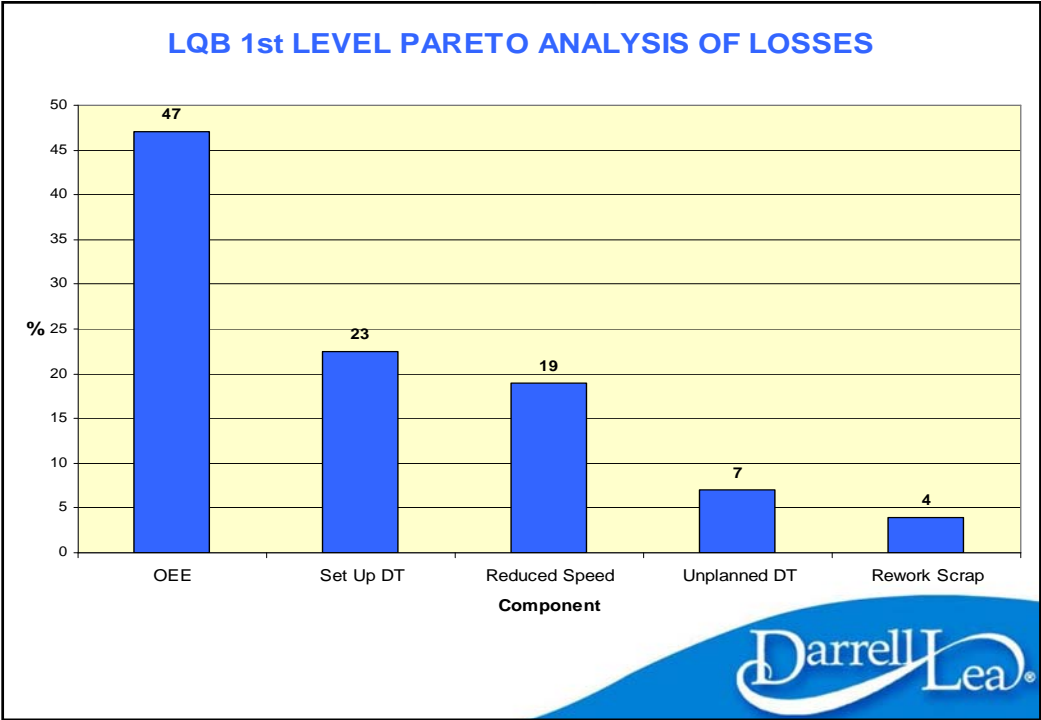
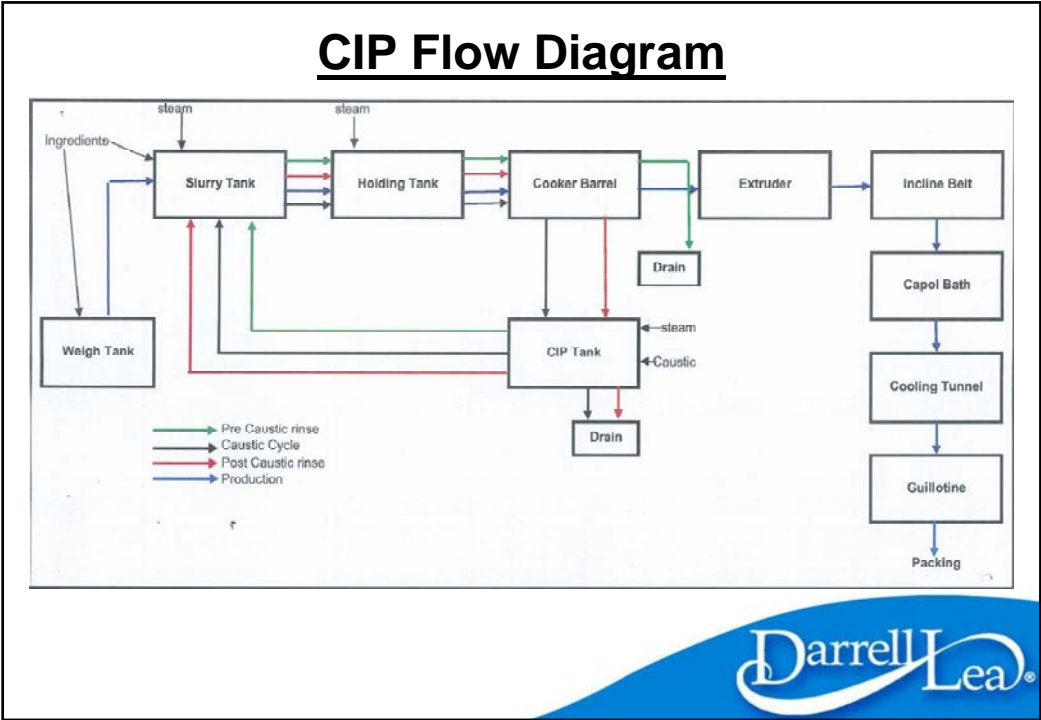
Attendance	1	2	3	4	5	6	7	8	9	10	11	12
Team Members (4-8)												
Darren O Toole	✓	✓	✓	✓	✓	✓						
Anna Sutjiadi	✓	✓	✓	✓	✓	✓						
Ma Hassan	✓	✓	✓	✓	✓	✓						
Phil Easter	✓	✓	✓	✓	✓	✓						
Chia Ching Sana	✓	✓	✓	✓	✓	✓						
James Maynard	✓	✓	✓	✓	✓	✓						
George Skodopoulou	✓	✓	✓	✓	✓	✓						
Time of meeting:	11 am	11 am	11 am	11 am	11 am	11 am						
Date of meeting:	16/2	23/2	3/3	10/3	17/3	24/3						

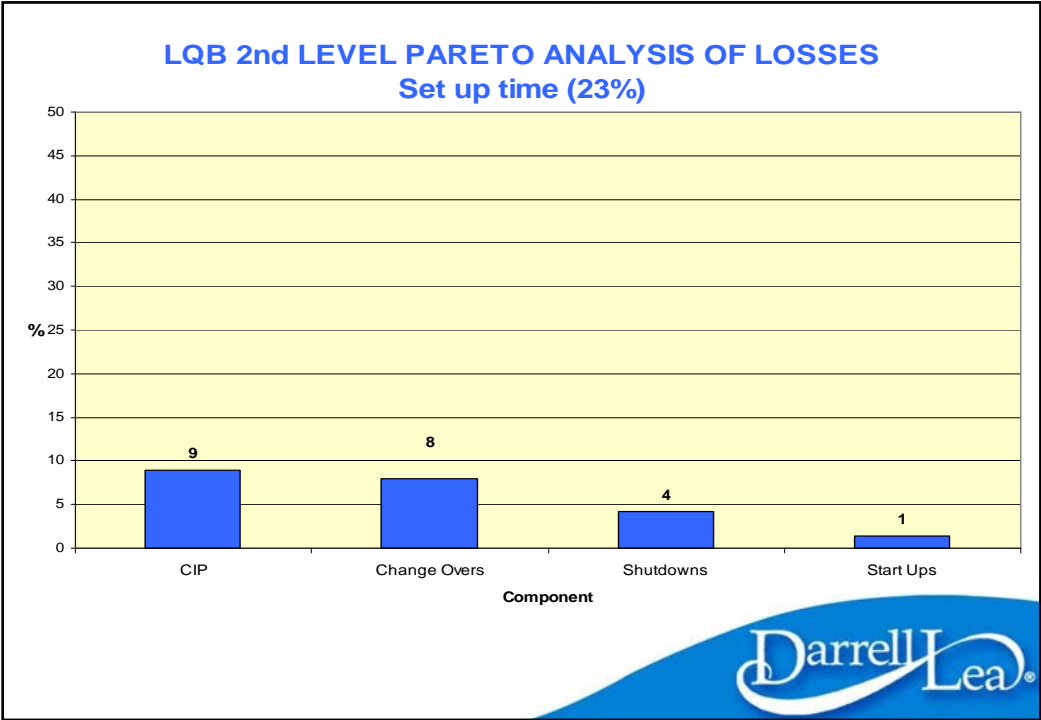
✓ = Attended x = Unjustified Absence A = Justified Absence

Week 1: 16-2-10 Mid Way Presentation: _____ Final Presentation: _____

Schedule	1	2	3	4	5	6	7	8	9	10	11	12
Task												
0. Half-day kick-off workshop	✓											
1. Confirm Mandate & Boundaries	✓											
2. Form Team & Scope Activities	✓											
3. Analyse Current Situation	✓	✓	✓	✓	✓							
4. Develop Vision of Improved Performance	✓	✓	✓	✓	✓							
5. Identify Possible Root Causes & Solutions	✓	✓	✓	✓	✓							
5a. Prepare presentation and Present to the L.T.						✓						
6. Pilot Proposed Solutions, Refine & Implement Successful Solutions							✓	✓	✓	✓	✓	✓
7. Evaluate Results & Measure Progress								✓	✓	✓	✓	✓
8. Hold the Gates & Define Future Actions									✓	✓	✓	✓
8a. Prepare presentation and Present to the L.T.										✓	✓	✓
9. Communicate Results & Share Learnings											✓	✓

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CIP Changeover – how we measure it

Extruder Shutdown

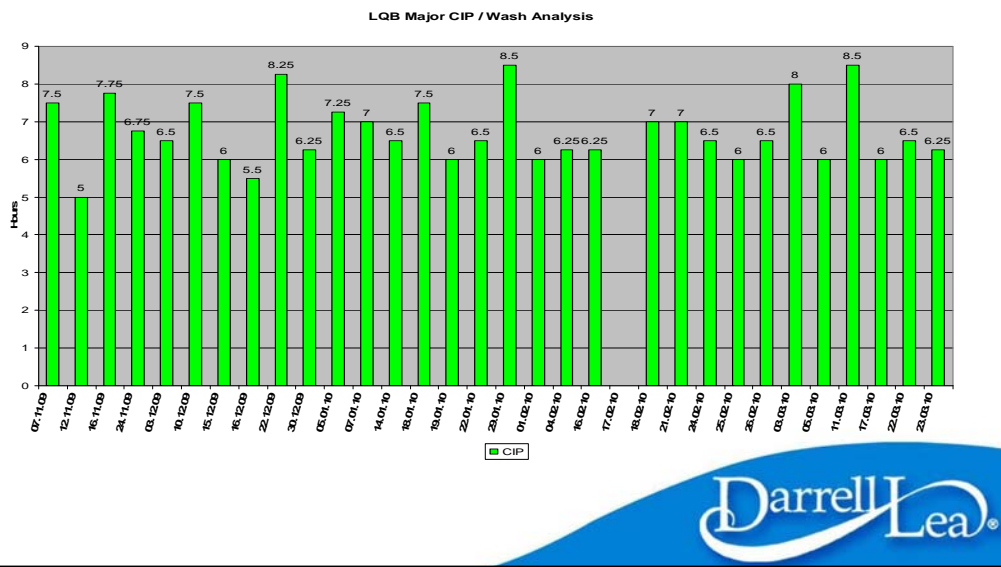


Extruder Start-up

(good product on belt going into cooling tunnel)



CIP Changeover Times – Nov’09 to Mar’10



CIP Changeover Times – Nov’09 to Mar’10

Average Time = 6.75 hrs



Results of Operator Set-Up Survey Sheet

1 = Innocence, 10 = Excellence

- Ease of CIP Wash – score **7/10**
- Length of CIP Wash – score **2/10**
- Adjustment during CIP Wash – score **6/10**
- Adjustment after CIP Wash – score **7/10**
- Scrap performance after CIP Wash – score **7/10**
- Organising Availability (Equipment & Tools) – score **5/10**
- Safety during CIP Wash – score **5/10**

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Operator Survey – Comments Summary

Likes:

- No contact with chemicals.
- CIP cycle is automatic.

Dislikes:

- We do not have the right equipment.
- Time consuming.
- When we clean head, not enough room between head and wall.
- Getting wet and dirty

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Operator Survey – Comments Summary **(cont.)**

How We Can Improve Changeovers:

- Takes time to fill CIP with water and heat – make this faster.
- Extra help.
- Make it easier to scrape hard licorice.
- Preparation before CIP wash – clean slurry tank and minors prepared for next product to be run.

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Operator Knowledge Base Summary

- Procedures not up to date – 2007 & 2009 versions exist
- Detailed but very “wordy”
- No copies of procedures were found on the production floor
- Procedures are in computer system therefore not easily accessible
- QA is responsible for controlling documentation
- SOPs are not used by cooks
- **Every cook has their own variation on how they do the CIP Changeover**

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Activity No	Int/ Ext	Set-Up Element Description	Time	Duration
	Ext	Pump slurry out		13 min
	Ext	Fill Slurry Tank with hot water		5 min
	Ext	Stir Hot water in slurry tank		225 min
	Ext	Fill CIP tank with Caustic solution		10 min
	Ext	Cover switchboard with plastic		5 min
	Int	Shutdown extruder and open water flush valve	10:20pm	15 min
	Int	transfer hot water from slurry tank to holding tank		5 min
	Int	Germie slurry tank		5 min
	Int	transfer caustic to slurry		5 min
	Int	empty out holding through cooker		5 min
	Int	re-circulate slurry (caustic)		10 min
	Int	Dismantle head and move to bath		15 min
	Int	Remove worm screw		10 min
	Int	remove and clean main extruder		40 min
	Int	remove gooseneck & install blank & connect up elbow		5 min
	Int	start cip wash	10:55 - 11:55	60 min
	Int	clean gooseneck (flush) + twisthead (remove stars) + worm		120 min
	Int	fill cip tank water (for rinse)	11:55 - 12:10am	15 min
	Int	germie extruder		60 min
	Int	wash floor around extruder		50 min
	Int	clean alcohol bath and floor		8 min
	Int	transfer rinse water to slurry tank		5 min
	Int	transfer rinse water to holding tank		5 min
	Int	start cip rinse	12:30 - 1:18	48 min
	Int	clean floor		10 min
	Int	reassemble head		27 min
	Int	fill cip tank with water	1:30 - 1:47	17 min
	Int	cip rinse no.2	2:00 - 2:40	40 min
	Int	assemble extruder head		40 min
	Int	ph testing	2:55 - 3:00	5 min
	Int	cooker flush		12 min
	Int	minors preparation		20 min
	Int	flush wet weigh tank with glucose		5 min
	Int	minors added to slurry tank		3 min
	Int	batching up (one batch only)		60 min
	Int	water activity check		7 min
	Int	pump/ cook/ extrude		23 min
				min

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graph LR
    Prep[Preparation] --> Split(( ))
    Split --> HEC[Head & Extruder Cleaning]
    Split --> CIP[CIP Cycle]
    HEC --> Merge(( ))
    CIP --> Merge
    Merge --> Batching[Batching]
    
```

6.75 hrs

Total time = 6.75 hrs

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CIP Changeover Observation Summary

Preparation – Key activities

- Clean slurry tank & platform after last batch pumped out
- Heat CIP water
- Dose CIP water with caustic to 5%
- Prepare minor ingredients for next product

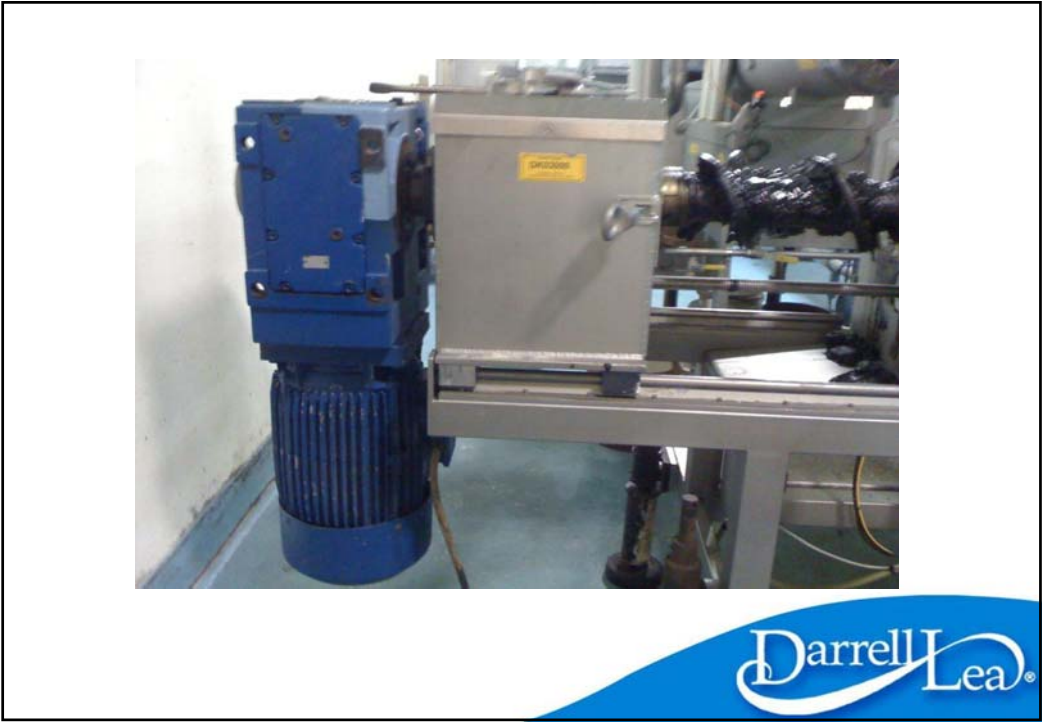
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CIP Changeover Observation Summary

Head & Extruder Cleaning – Key activities

- Disassemble Extruder Head
- Clean tubes, plates, worm
- Gerni extruder head, chamber, extruder

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CIP Changeover Observation Summary

CIP Cycle – Key activities

1. CIP Caustic wash
2. Drain system & fill CIP tank with water & heat to 80 C
3. Circulate water
4. Drain system & fill with CIP water
5. Flush system with 700 L of water
6. Flush system to pH7

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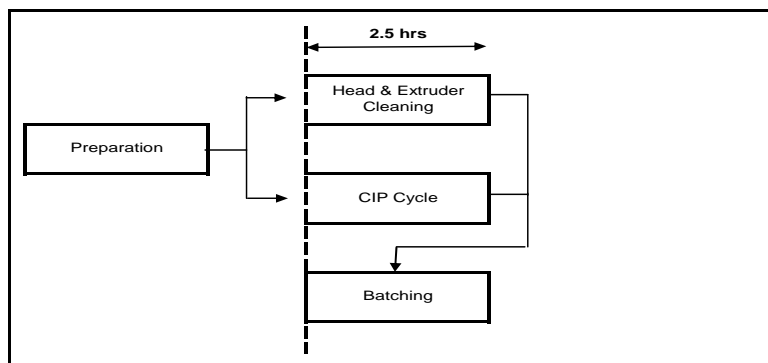
CIP Changeover Observation Summary

Batching – Key activities

1. Load 2 batches in Holding tank and 1 batch in Slurry tank

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CIP Changeover Vision



Total time = 2.5 hrs (compared to average of 6.75 hrs)

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CIP Changeover Vision

- CIP Cycle to be reduced to as minimum time as possible
- All head & extruder disassembly, cleaning and assembly activities to be completed by the end of the CIP cycle
- Batching in Slurry tank to be made possible while CIP cycle is running

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CIP Changeover Vision **Target**

**Extrusion to commence as soon as CIP
cycle is complete**

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CIP Changeover Vision **Strategy**

1. No Spend Strategy
2. Minor Spend Strategy
3. Major Spend Strategy

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Steps to Achieve this Vision

1. No Spend

- Standardised SOPs
- Increase from 2 to 3 cooks to assist cleaning equipment
- Change batching to 2 batches ready (1 in slurry, 1 in holding) from 3 batches (1 in slurry, 2 in holding)

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No Spend Target

CIP Changeover Time = 6 hours

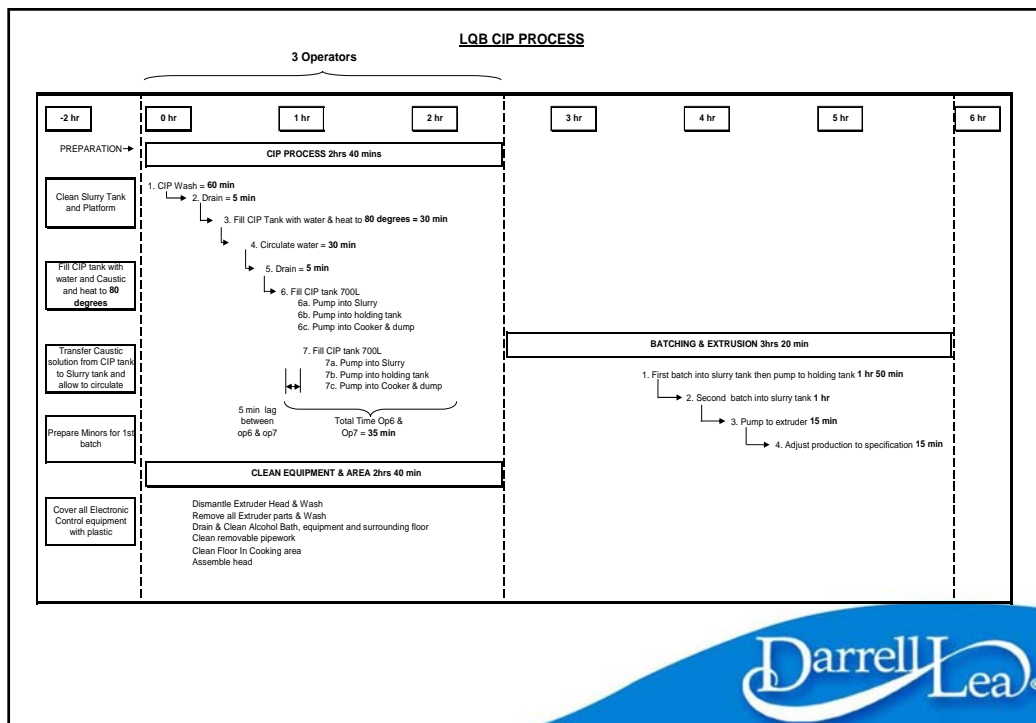
Estimated savings p.a = \$20k - \$30k

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Implementation – No Spend Outcomes

- Agreed Standardised Operating Procedures in place
- Third operator now in place during CIPs
- CIP batching process changed

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Steps to Achieve this Vision

2. Minor Spend

- Plumbing modifications to deliver water into CIP tank faster (>100L /min).
- Heating modifications to deliver hot water as close to 80 C.
- Minor improvements to speed extruder head cleaning such as rattle gun, second gerni.



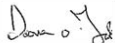

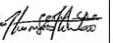
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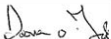

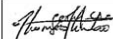
Minor Spend Target

CIP Changeover Time = 5.5 hours


Estimated savings p.a = \$40k - \$50k

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<h1 style="text-align: center; margin: 0;">TPM³ Improvement Sheet</h1>					
Team Name: BULLDOGS		Location: KOGARAH		Initiated Date:	
Team Type: MICRO FE & PI Setup Time Reduction		Item: Sourcing a Rattle Gun		Completed Date:	
Initiator: George Skiadopoulos					
1. Problem (Plan) Stripping down the extruder for cleaning is being manually done with hand tools and this is taking a long time					
2. Current Situation (Plan) Photo: <div style="text-align: center;">  </div>			3. Proposed Change / Approved Improvement (Do) Purchase a pneumatic rattle gun to quickly undo stars and bolts on the extruder head, and to aid quick re-assembly <div style="text-align: center;">  </div>		
Improvement Target:			Cost: \$600		Expected Saving:
4. Results: (Check)			5. Future Actions: (Act)		
Approved by:			Day Shift	Afternoon Shift	Night Shift
Team Leaders to sign off acceptance of Proposed Change					
CTPM Australasia			Page 15		

<h1 style="text-align: center; margin: 0;">TPM³ Improvement Sheet</h1>					
Team Name: BULLDOGS		Location: KOGARAH		Initiated Date:	
Team Type: MICRO FE & PI Setup Time Reduction		Item: Modification to Water Delivery System at LQB		Completed Date:	
Initiator: Phillip Elsley					
1. Problem					(Plan)
Time is being lost waiting for the CIP tank to fill with water. Current observations have this happening at around the 30 minute mark					
2. Current Situation			3. Proposed Change / Approved Improvement		
(Plan) Photo: <div style="text-align: center;">  </div>			(Do) To obtain a confirmation that a modification to the water delivery system (speed) at LQB can be made to help reducing CIP time.		
Improvement Target:			Cost: \$4610	Expected Saving: 15 minutes per CIP	
4. Results:			5. Future Actions:		
(Check) Current flow rate is 45.6 litres per minute. New rate would be 102.6 lpm. This is an means the tank could be filled 2.25 times faster or in 13.65 minutes			(Act)		
Approved by:		Day Shift	Afternoon Shift	Night Shift	
Team Leaders to sign off acceptance of Proposed Change					
CTPM Australia					
Page 15					

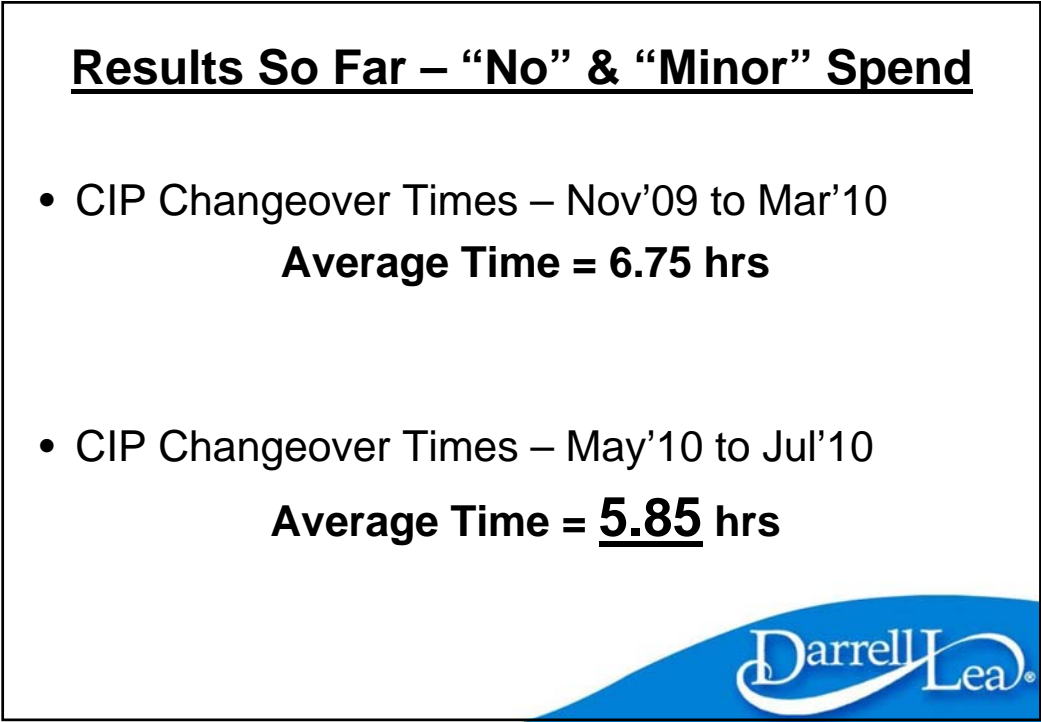
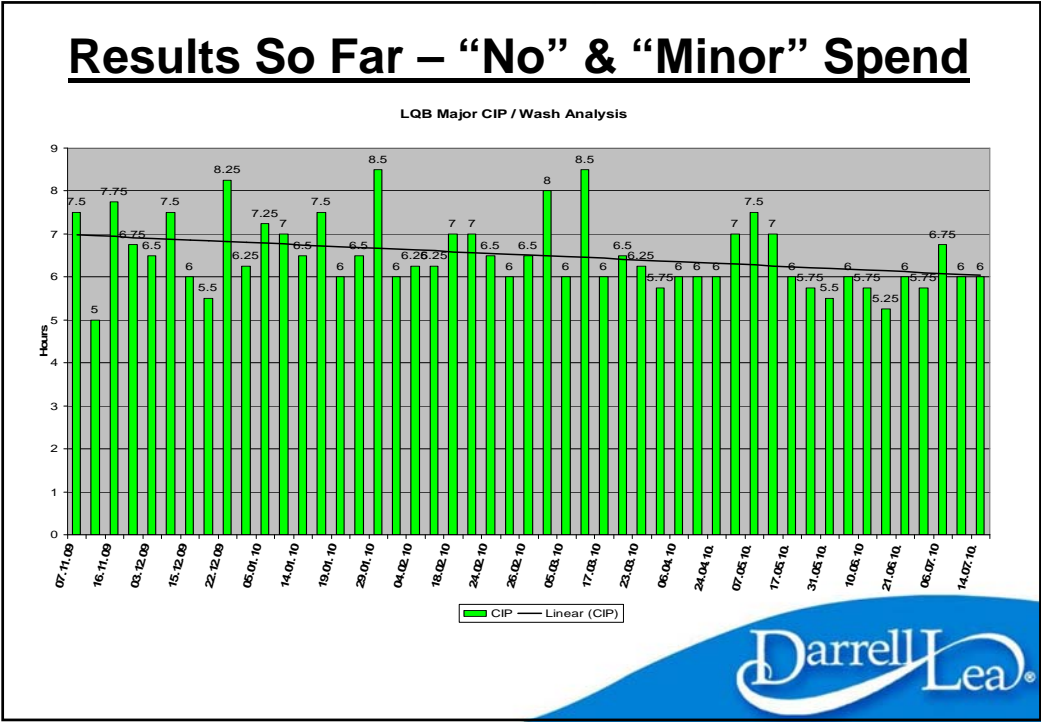
TPM³ Improvement Sheet

Team Name: BULLDOGS		Location: KOGARAH		Initiated Date: 06.02.2010	
Team Type: MICRO FE & PI Setup Time Reduction		Item: Gerni		Completed Date:	
Initiator: Peter Roubekas					
1. Problem (Plan)					
In order to align the Cleaning of equipment activity in the CIP Process with the proposed reduced CIP process a second Hi-Pressure water cleaner will be required. Currently one of the operators has to wait until the other operator finishes. Both cleaning functions need to be done concurrently. There is a second Hi-Pressure water cleaner (Blue unit) in LQB but the unit does not expel water with enough pressure to clean adequately.					
2. Current Situation (Plan)			3. Proposed Change / Approved Improvement (Do)		
Photo: 			Purchase second K'Archer Hi-Pressure unit from the same supplier		
Improvement Target:			Cost: \$3950	Expected Saving: As per saving model Option 2	
4. Results: (Check)			5. Future Actions: (Act)		
Approved by:		Day Shift	Afternoon Shift	Night Shift	
Team Leaders to sign off acceptance of Proposed Change					
CTPM Australasia		Page 15			

Implementation - Minor Spend Outcomes

- Plumbing modifications to be complete – end July
- Rattle guns now in use
- Second gerni now in use





Results vs Mandate - “No” & “Minor” Spend

Initial Mandate

- Achieve an initial reduction of at least 50% in CIP changeover time.

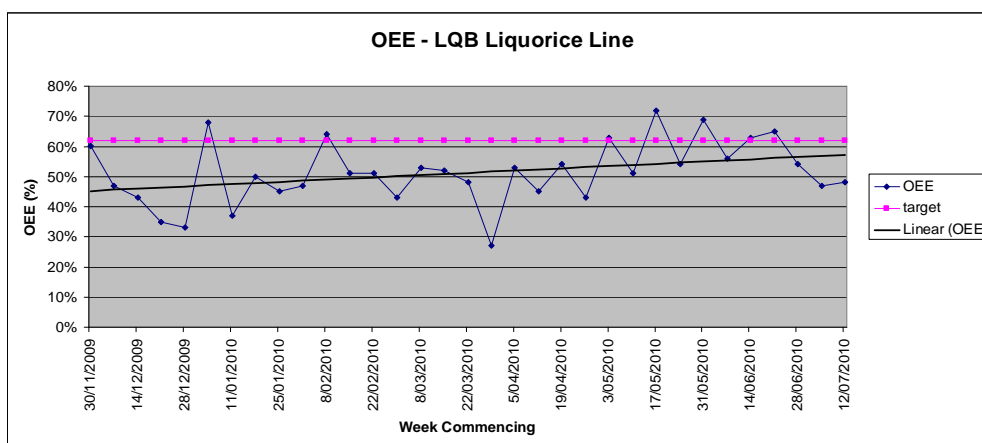
Revised Mandate (reviewed at mid point)

- Achieve an initial reduction of at least 20% in CIP changeover time.

Achieved to Date – 13.3% reduction

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LQB - OEE Performance







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Other Immediate Action Items


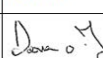
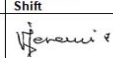
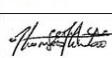
- 5 other immediate action items identified
- These pertain to the following:
 1. Safety
 2. Work area management
 3. Ergonomics
 4. Process control





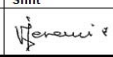
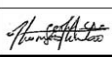
TPM³ Improvement Sheet

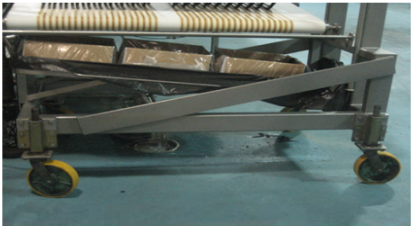
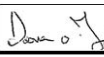
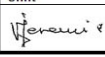
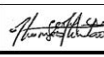
Team Name: BULLDOGS	Location: KOGARAH	Initiated Date: 08.03.10	
Team Type: Micro FE & PI Setup Time Reduction	Item: GLISSEN (Caustic Pallecon for CIP)	Completed Date:	
Initiator: Tome Najdovski			
1. Problem (Plan)			
2. Current Situation (Plan)		3. Proposed Change / Approved Improvement (Do)	
Photo: 		Current Situation We do not have the correct fitting to connect outlet of the caustic solution pallecon to the CIP system. We are currently extracting from the top of the pallecon. This is hazardous and can lead to spills and possibly affect dosage into the CIP system Proposed Solution Contact Supplier of Caustic solution (Ecolab) to provide correct fitting to ensure caustic is dosed correctly	
Improvement Target:	Closed loop dosing system complying with all OH & S requirements.	Cost:	NIL
		Expected Saving:	T.B.A
4. Results: (Check)		5. Future Actions: (Act)	
Approved by: Team Leaders to sign off acceptance of Proposed Change		Day Shift	Afternoon Shift
			
CTPM Australasia		Page 15	


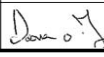

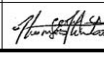
TPM³ Improvement Sheet

Team Name: BULLDOGS		Location: KOGARAH		Initiated Date: 02.03.2010	
Team Type: MICRO FE & PI Setup Time Reduction		Item: Wall Pockets		Completed Date:	
Initiator: Anna Sutjiadi					
1. Problem (Plan)					
Unorganised/Scattered documents, causing confusion and incomplete data records					
2. Current Situation (Plan)			3. Proposed Change / Approved Improvement (Do)		
Photo: 			To place wall pockets to ease document searching, reduce confusion and improving communication between shifts.		
Improvement Target:		This proposed change is to take place as soon as possible		Cost: \$120	Expected Saving: -
4. Results: (Check)			5. Future Actions: (Act)		
Pockets have been mounted and will be labeled accordingly					
Approved by:		Day Shift	Afternoon Shift	Night Shift	
Team Leaders to sign off acceptance of Proposed Change					Page 15

TPM³ Improvement Sheet

Team Name: BULLDOGS		Location: KOGARAH		Initiated Date: 17.03.2010	
Team Type: MICRO FE & PI Setup Time Reduction		Item: PPE while using the Gerni in LQB during CIP / Wash process		Completed Date:	
Initiator: Darren O'Toole					
1. Problem (Plan)					
During a recent Risk Assessment, it became apparent that currently while using the Gerni in LQB during the CIP / Wash at the Cooking End of the process, the operators do not wear the correct PPE (across all 3 shifts). The correct PPE is not worn all of the times. Additionally, there are certain items of PPE (namely Safety Glasses / Safety Face Guards) are not worn as recommended by and required by the manufacturer of the piece of the equipment and conveyed to staff during the training on using this piece of equipment.					
2. Current Situation (Plan)			3. Proposed Change / Approved Improvement (Do)		
Photo: 			Safety Glasses / Face Shields and other items needed for use during the CIP / Wash while using the Gerni are to be sourced. This PPE is to be then made available to all operators across all 3 shifts that use and are trained to use the Gerni. The need to wear this PPE is to be communicated as soon as possible and to be monitored on an ongoing basis.		
Improvement Target:		To establish what PPE must be worn during the CIP / Wash while using the Gerni and to ensure all operators across all shifts use the same PPE at all times		Cost:	Expected Saving:
4. Results: (Check)			5. Future Actions: (Act)		
Approved by:		Day Shift	Afternoon Shift	Night Shift	
Team Leaders to sign off acceptance of Proposed Change					Page 15

TPM ³ Improvement Sheet						
Team Name: BULLDOGS		Location: KOGARAH		Initiated Date: 16.03.2010		
Team Type: MICRO FE & PI Setup Time Reduction		Item: Rusty Wheels		Completed Date:		
Initiator: Chi Chung Hang						
1. Problem (Plan)						
Rusty wheels – difficult to move the extruder head around. Under the current conditions whereby the wheels on the trolley are faulty and do not move easily, there is a potential safety hazard for an operator to injure themselves. The wheels need to be replaced.						
2. Current Situation (Plan)		3. Proposed Change / Approved Improvement (Do)				
Photo:		 <p>Belling assembly is required. Work order to be raised to get the wheels repaired. Team leader has raised the work order on 16.03.2010</p>				
Improvement Target:		No OH & S risks in moving Extruder head to sink for cleaning		Cost:	\$600	Expected Saving:
4. Results: (Check)		5. Future Actions: (Act)				
Approved by:		Day Shift	Afternoon Shift	Night Shift		
Team Leaders to sign off acceptance of Proposed Change						
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TPM ³ Improvement Sheet						
Team Name: BULLDOGS		Location: KOGARAH		Initiated Date: 23.03.2010		
Team Type: MICRO FE & PI Setup Time Reduction		Item: PLC Control Panel – Next to Holding Tank in LQB		Completed Date:		
Initiator: Darren O'Toole						
1. Problem (Plan)						
Currently, when the Operators/Cooks are cleaning and carrying out a CIP/Wash at the Cooking End in LQB, they cover the PLC Control Panel next to the Holding Tank with plastic bin liners as a means of protecting this very sensitive piece of equipment from being damaged by the water, which is used during the cleaning process in this area.						
2. Current Situation (Plan)		3. Proposed Change / Approved Improvement (Do)				
Photo:		 <p>A work order (#16855) was raised on 23.03.2010 to request Engineering / Maintenance putting this in place (as soon as possible) as a matter of priority, a more permanent and effective protective covering which will be used to protect the PLC for the Holding Tank during the CIP/Washes in this area..</p> <p>If the PLC is damaged it would mean a major disruption to liquorice manufacture with a potential 2 – 3 days loss of production</p>				
Improvement Target:		This proposed change is to take place as soon as possible		Cost:	\$1200	Expected Saving:
4. Results: (Check)		5. Future Actions: (Act)				
Approved by:		Day Shift	Afternoon Shift	Night Shift		
Team Leaders to sign off acceptance of Proposed Change						
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Steps to Achieve this Vision - The Future

3. Major Spend

- Re-engineer to allow separation of Slurry tank from CIP system when required to allow batching & CIP to occur at the same time
- Second CIP tank to eliminate waiting time for water
- Re-engineer extruder head box to allow access to all parts of screw feed.
- Re-programme PLC to eliminate manual intervention

CIP Changeover Time = 2.5 hours theoretically

Estimated savings p.a = \$200k

The logo for Darrell Lea, featuring the brand name in a white, stylized script font on a blue background that resembles a wave.

Major Spend - Timeline

- Dependant on completion of Robotics initiative
- Envisaged to be implemented by end 2011

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Mandate Update for Major Spend

Current Mandate

- Recommend further actions to the Leadership Team so as to reduce the CIP changeover time by at least 90% from baseline

New Mandate

- Recommend further actions to the Leadership Team so as to reduce the CIP changeover time by at least **63%** from baseline

The logo for Darrell Lea, featuring the brand name in a white, stylized script font with a registered trademark symbol, set against a blue background that has a wavy, wave-like shape on the left side.

Key Learning's

- Very difficult and dirty job
- Standard Operating Procedures (SOP's) not being followed and not being kept up to date.
- No process standardisation across shifts.
- Not enough of the right equipment to do CIP
- More people to help clean the “wet” end (only 2 out of 7 crew were involved!)

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