



ALMC – Spotswood

The TPM³ Improvement Journey Begins



Australasian Lubricants Manufacturing Company Pty Ltd (ALMC) is the largest manufacturer of Lubricants in Australia. They currently manufacture more than half of the lubricant demand in the Australian market which is distributed nationally and also exported internationally.

The Spotswood site manufactures a range of products including:

- Engine oils;
- Transmission fluids;
- Gear oils;
- Hydraulic oils;
- Oil based process and cutting fluids; and
- Agricultural spray oils.

Improvement Cycle 1

The Spotswood site commenced their TPM³ (TPM & Lean) improvement journey back in January 2013 with a Macro Focused Equipment & Process Improvement (FE&PI) Team on the Small Pack Rotary Packing Line. This line predominately fills and packs 4 and 5 Litre bottles of engine oil and other oils for the retail market.

The Cross-functional Team as pictured in Figure 1 was mandated to establish Overall Equipment Effectiveness (OEE) for the Rotary Line, and then:

- Improve OEE by at least 25% to free up one day of capacity per week while also improving or maintaining the Goal Aligned Performance Measures; and
- Identify all equipment and process losses and wastes (including all unplanned interventions) for the Rotary Line.

Using existing production data and conducting 4 OEE Line Observations to capture different product related problems and losses, the teams Pareto Analysis identified that set-ups and changeovers brought about the biggest OEE Loss. However, it was decided that a Special Micro FE&PI Team

would best address these losses in the second cycle.

Figure 1: Rotary Line Macro FE&PI Team



L to R: Charlie Gixti, Troy Dumbleton (Team Leader), Greg Woolnough, Dean Menhennet, Nik Mastilovich, Jeff Ind, and Darren Gauci

Hence the team focused on improvements to reduce operator intervention (minor stops) and rework / waste. This included 8 improvement projects and 10 fixes or minor improvements.

One of the key improvements the team made was to greatly reduce the number of cross threaded caps for a particular product from 7% to 0.2%.

Another key improvement was recommending that the existing line fault detection system be upgraded to a fully integrated system to ensure all packaging related quality problems were captured on the line to eliminate any rework. This project required capital expenditure which has since been approved and ordered.

Improvement Cycle 2

The second cycle of activity commenced in May 2013, this time with teams in two different Defined Production Areas. This saw a continuation of improvement activity on the Rotary Line with a Special Micro FE&PI Set-up Time Reduction Team ("The Persuaders") and also the introduction of a Micro New Equipment Management (NEM) Team ("Deal or No Deal") on the 205 Litre Lines.

“The Persuaders”

As per the recommendation from the Cycle 1 Rotary Line Macro FE&PI Team, a Special Micro FE&PI Set-up Time Reduction Team was formed to reduce changeover and set-up time for the Rotary Line (refer to Figure 2).

Figure 2: “The Persuaders” – Set-up Time Reduction Team



L to R: Charlie Grixti, Dennis Paul, Troy Dumbleton (Team Leader), Dean Menhennet, and Adrian Farrugia

“The Persuaders” were mandated to reduce the set-up by at least 25% and make recommendations to reduce set-up time by a further 50%.

Firstly the team identified that there were 3 types of set-ups or changeovers. They are:

- Standard** = product change only (no tools);
- Semi** = Minor Adjustments; and
- Full** = Complete Line change.

The team then conducted set-up observations of the 3 set-up types above, sometimes using a video to capture all the set-up elements on a Set-up Time Reduction Chart (STRC) as seen in Figure 3. Once all the set-up elements were identified, the team first separated all the **external elements** (activities that can be conducted pre or post changeover) from the **internal elements** (activities that can only be conducted when the line is stopped).

Figure 3: Set-up Time Reduction Chart

SET-UP TIME REDUCTION CHART (STRC)
Type Of Change: Standard / Semi / Full (circle)
Current Product: VLDL5-3XSL
Date: 3-Jun-13

Task	Start	Finish	Time	E/I	Operator	Remarks	mins.	5	10	15	20	25	30	35	40	45
Last carton out of cartoniser	7:25	7:30	0:05	E	Jeff	VLDL5-3XSL Vecton Long Drain 10W-40 LS SL										
Fill out paperwork of last job	7:35	7:50	0:15	I	Jeff											
Drum test	7:55	8:00	0:05	E	Charlie	While machine still running previous product										
Get bottle pallets	8:00	8:15	0:15	E	Charlie	Product onsite										
Get caps	N/A	N/A	0:00	E	N/A	Product onsite										
Get Cartons	N/A	N/A	0:00	E	N/A	Product onsite										
Flush new product into Filler	7:50	8:10	0:20	I	Jeff											
Record bottle info & load up	8:00	8:15	0:15	E	Charlie	Record P00 Number & load into De-pall										
Take sample to lab	8:20	8:30	0:10	I	Jeff	Sample failed										
Flush & re-sample to lab	8:30	8:50	0:20	I	Jeff	Passer										
Cleaning cartoniser	8:25	8:50	0:25	E	Charlie	Cleaning glue webs										
IMOKO	8:55	9:15	0:20	E	Jeff & Charlie	Short break										
Key weight into console	9:15	9:20	0:05	I	Jeff											
Key weight into scales x2	9:15	9:20	0:05	I	Charlie	Carton scales not altered										
Get bottle batch number	9:25	9:30	0:05	I	Charlie											
Set bar code scanner	9:30	9:35	0:05	I	Charlie											
Set up corner label	9:35	9:40	0:05	I	Charlie											
First carton out of cartoniser	9:35		1:00			RXP-3XSL RX Plus 15W-40 SL										

Total Set-Up Time 110 mins

Once the external elements were removed from the changeover, the team then focused on converting internal elements into external elements, and / or reducing the time taken to conduct the internal elements. The team implemented 10 improvements which have allowed them to exceed their mandate and achieve 35% reduction in set-up time. Figure 4 is an example improvement of reducing the time taken to conduct an internal element.

Figure 4: Example Set-up Time Improvement
TPM³ Improvement Sheet

Team Name:	"The Persuaders"	Location:	Rotary Line	Initiated Date:	26/06/2013
Team Type:	Set-up Reduction	Item:	Palletiser In-feed Guide Rails	Completed Date:	18/7/2013
Initiator:	Dennis Paul				
1. Problem	(Plan)				
Reduce the time taken to adjust Palletiser in-feed Guide rails					
2. Current Situation	(Plan)	3. Proposed Change / Approved Improvement (Do)			
It currently requires 15 minutes to adjust in-feed guide rails					
Improvement Target:	Reduce the time of this activity during the set-up from 15 minutes to 1 minute	Cost:	\$1,100	Expected Saving:	14 minutes during set-up time
4. Results:	(Check)	5. Future Actions: (Act)			
Reduction in set-up time by 14 minutes					
Approved by:		Production Coordinator	Production Manager		
Sign off acceptance of Proposed Change		Troy Dumbleton	Dean Menhennet		
CTPM Authorisation					

“Deal or No Deal”

The 205 Litre production area consists of 3 Lines that can dispense oil products into 1000 litres IBC, 205 and 60 litre drums. A Micro New Equipment Management (NEM) Team was formed (refer to Figure 5) to **investigate how best to install a “fill by weight system” into the existing Filling Lanes (1, 2 & 3)** and recommend further actions to the Leadership Team so as to further improve performance.

Figure 5: “Deal or No Deal” – Micro NEM Team



L to R: Nik Mastilovich, Richard Tite, Michael Barthelot, Kevin Yuan (Team Leader), Paul Green, Dennis Paul, and Jim Michals

To help analyse the existing production area the team decided to divide the project into 3 main parts:

- Product Holding and Transfer;

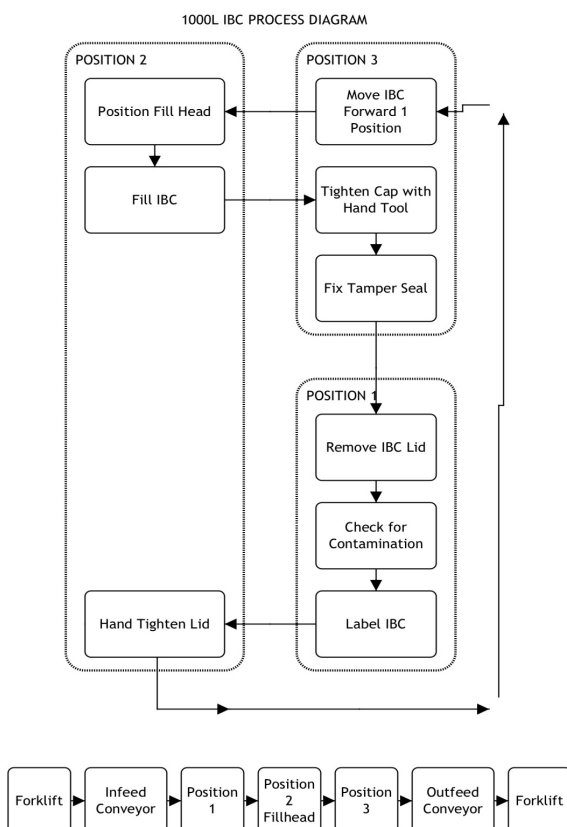
- ii. Conveying Systems (including Check Weigher); and
- iii. Dispensing (Filling) System.

To ensure all operators of the area were able to have a say, the team conducted an “End User Survey” and surveyed 8 operators who work on the 205 Litre Lines. A number of problems and issues were identified and were categorised into 3 headings:

- a) Safety & Environment
- b) Losses / Non Value Adding
- c) Quality / Waste

The team also used the Process Flow Mapping Tool to help the team visualise all the equipment and processes, and calculate cycle times for each of the different processes. Refer to Figure 6 for an example.

Figure 6: IBC Process Map



In the team’s Final Presentation it was recommended and agreed by the Leadership Team to expand the initial mandate and conduct a Macro NEM in Cycle 3 to replace the existing 3 Filling Lines and other plant equipment, rather than installing a “fill by weight system” into the existing 3 Filling Lines.

While these two teams were busy working on their projects a third team “**Just Fix It!**” formed (refer to Figure 7) to investigate how to improve “nesting” when palletizing 20 litre plastic pales on the 20 Litre Line.

Figure 7: “Just Fix It!” Team



L to R: Nik Mastilovich, Adrian Farrugia (Team Leader), Paul Green, Dennis Paul, and Katherine Marshall

This team also conducted a Final Presentation to the Leadership Team which has resulted in a new Macro NEM Team forming in Cycle 3.

CTPM would like to congratulate all of the teams on an excellent effort and great results. We look forward to supporting all the new teams in Cycle 3 starting in August 2013.

For further information please contact:



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