

Frontline Equipment Care begins at Sugar Australia – Croydon



The end of 2013 saw Sugar Australia's Croydon site in Victoria, complete their 10th cycle of TPM & Lean (TPM³) improvement activity.

This latest cycle of improvement activity focused on Operator Equipment Management (OEM), which comprises 4 Stages and 7 Steps as detailed in Figure 1 below. The 7 Step process typically spans 2-3 years involving some 9 improvement cycles of up to 12 weeks duration.

The production area chosen to begin Operator Equipment Management – Step 1 (OEM-1) was the Retail Line which includes a Rovema Packaging machine, RML Case packer and MAR Robot Palletiser.

Figure 1 – The 4 Stages and 7 Steps of OEM

Stage	Objective	Step	Description
1	Cleaning for Inspection* Activities Learn how to recognise, rectify and prevent equipment defects so as to achieve and maintain Basic Equipment Conditions and thus reduce variation in Equipment Component Life (to allow Maintenance to enhance their PMs / PdMs) while improving Safety and Quality. Note: PM = Preventive Maintenance PdM = Predictive Maintenance	1	Identify & Rectify Equipment Defects
		2	Address Sources of Contamination and Difficult to Access Areas
		3	Establish Perfect Lubrication and Clean for Inspection Standards & Procedures
2	Training for Inspection* Activities Learn how equipment functions so as to diagnose equipment, quality and safety problems at the earliest possible time, be able to identify and contribute to improving Design Weaknesses and contribute to achieving a workplace that has Zero Breakdowns while improving Safety and Quality.	4	Understand Equipment Functioning (by each inspection category or module)
		5	Finalise Inspection Standards & Procedures for Equipment Care
3	Consolidate Quality Assurance Activities Develop a deeper understanding of the relationships between Quality and Equipment Conditions so as to create a workplace that has Zero Quality Problems while improving Safety.	6	Understand Quality and Equipment Relationships
4	Consolidate On-going Improvement Activities Manage own Workplace as a successful Mini Business (eg mature synergistic Area Based Team) so as to always achieve the Production Plan with Zero Breakdowns, Zero Quality Problems and Zero Accidents or Incidents.	7	Manage own Workplace

*To find Equipment Defects

OEM-1 Improvement Teams

Two OEM-1 teams were formed;

- **"The Sugar Cubes"** (Day Shift) – Andrew Fisher (Team Leader), Ron Elliot, Steve Lloyd, Richard Callow and Rick Gualano; and
- **"Transformers"** (Afternoon Shift) – Mandip Singh (Team Leader), Michael Strickland, Brijesh Patel, Brian Smith and Terry Thorpe.

The Retail Line equipment was divided up between the two teams with the **"The Sugar Cubes"** focusing on the Rovema and RML machines and the **"Transformers"** on the Robot Palletiser.

Both teams conducted separate Initial *Clean for Inspections* on their focus equipment, which involved operators, maintainers and the management team.

The meaning of Clean for Inspection is to not only make equipment look clean, but also to touch and look at every part of the equipment to find equipment defects such as loose or missing bolts.

In other words, *cleaning is inspecting to find equipment defects (anything that could lead to early deterioration)*, and therefore Clean for Inspection is the most effective method of detecting equipment defects and preventing trouble.

Figure 2 – Cleaning the RML Case Pack

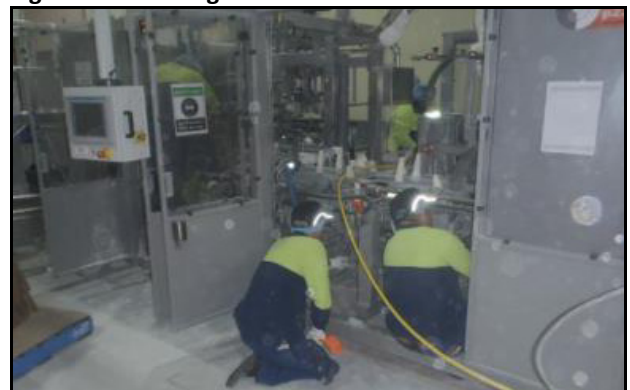


Figure 3 – Pre-briefing before starting the clean



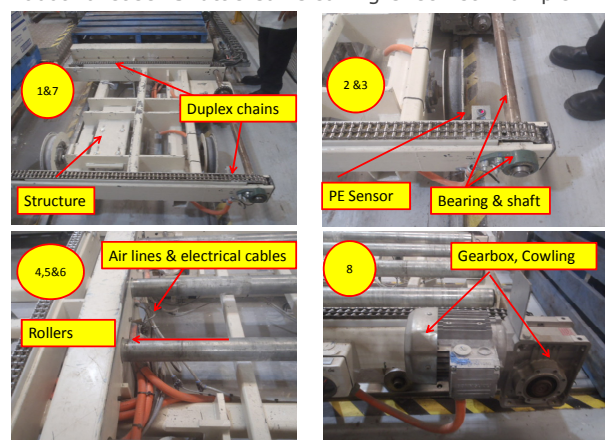
“The Sugar Cubes” identified 42 equipment defects of which 17 were fixed during the Initial Clean for Inspection and the “Transformers” also found a further 43 equipment defects of which 16 were fixed during the Initial Clean for Inspection.

Clean for Inspection Checklists

Both teams divided their assigned equipment into sections and then developed Clean for Inspection checklists. An example checklist can be seen in Figure 4 below.

Figure 4 – Shuttle Car Cleaning Checklist

Robot Palletiser Shuttle Car Cleaning Checklist Example



Visual	Correct isolating procedures must be followed	Item: Shuttle car
Remove		Date Developed: 05/12/2012
Listen		Developed by: Carmine Caruccio
Clean	Date of clean: Operators:	Date Reviewed:
Adjust		Reviewed By:
		Signed Off:
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Item	Standard	Target Time	Method	Action	Completed
1. Check & clean duplex chains	Clean, free to move	2 mins	🔍️ 🧽		Yes No
2. Check & clean photo and proximity sensors	Clean, No damage to sensors, Align properly	2 mins	🔍️ 🧽		Yes No
3. Inspect all Bearings and Shafts	Clean, Dust cap not missing	2 mins	🔍️ 🧽		Yes No
4. Check & clean air lines, inspect for air leaks	Clean, No air leaks in hoses	2 mins	🔍️ 🧽		Yes No
5. Clean & check the rollers	Clean, No visible damage to the chains	2 mins	🔍️ 🧽		Yes No
6. Check all electrical cables & wipe down	Clean, No frayed or loose wiring	5 mins	🔍️ 🧽		Yes No
7. Clean & check support frame for cracks	Clean, No cracks visible, broken welds nuts & bolts all tightened	5 mins	🔍️ 🧽		Yes No
8. Gearbox, Cowlings and electrical motors	Clean, No oil leaks, No hot parts, Cowlings free of sugar	10 mins	🔍️ 🧽		Yes No

Operator Print Name: Operator Sign Name: Team Leader Validation Signature:

Improvements and One Point Lessons

The teams identified a number of equipment improvements, for example stopping sugar from contaminating drive belts, as seen in Figure 5. The teams also developed some One Point Lessons

(OPL) to answer questions logged on the Key Question List by operators. Refer to Figure 6 for an example.

Figure 5 – RML Vertical Drive unit TPM³ Improvement Sheet

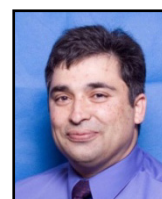
Team Name:	The Sugar Cubes	Location:	RML Retail line	Initiated Date:	06/11/12
Team Type:	TPM/OEM	Item:	Guards on vertical drive units	Completed Date:	
Initiator:	TPM team				
Change Management Required	Yes	No			
Problem	(Plan)				
Any sugar from damaged bags currently falls straight into the vertical chimney drives in the RML causing timing differences in chimney plate height and damage to product and machine					
2. Current Situation	(Plan)		3. Proposed Change / Approved Improvement (Do)		
Currently belts are open and allow sugar into drive belts causing timing issues		Guards over drive belt prevent spills and any airborne dust affecting timing			
Improvement Target:	Guards to cover belts from spills and stop changes in driving heights		Cost:	\$0 RML to fit	Expected Savings:
4. Results: (Check)	Guards fitted chimney heights recorded daily with no change in height setting/ no weekly cleaning required, no lost time recorded		5. Future Actions: (Act)	Monitor cleaning cycle length and insert into OEM clean schedule	
Approved by:	Reliability	Dayshift A	Afternoon shift	Safety Coordinator	Quality Coordinator
CTPM Approver: Team Leaders to sign off acceptance of Proposed Change					

Figure 6 – Palletiser Shuttle Car Gearbox OPL

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One Point Lesson	
Subject: Palletiser Shuttle Car Gear Box . Safety: Take your time to ensure there is no risk or injury to the racking & staff. Location: Croydon – Robot Palletiser Purpose: How disengage the Shuttle Car gearbox to move it manually for cleaning	
Move this lever forward and hold in position while pushing the car	
To move the Shuttle Car manually (push it along) for cleaning you require 2 people only . One person to push the lever forward and hold in position while the second to helps move the car	

CTPM congratulates both teams on an excellent effort and result. We look forward to the sites continual journey towards making Frontline Equipment Care part of the everyday work environment.

For further information please contact:



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