

The Axle Assembly Cats claw their way to success!

One of our favourite parts of the TPM & Lean Annual Forum is inviting some of the best improvement teams from our clients to present their achievements and participate in the Aussie Cup Team Competition. This year, there were three teams in the running, the B&D Doors & Openers Revesby “Men at Work”, the New Zealand Sugar “Carbon Credits” and the B&D Doors & Openers Kilsyth “Axle Assembly Cats”.

The Axle Assembly Cats are a Cross-functional Team made up of Nathan Allan, Process worker (Warehouse); Stewart Moon, OH&S Co-ordinator; Lou Ney, Process worker (Series 1 Line); and Hoang-Van Nguyen, a 36 year B&D Veteran and Leading Hand (Series 1 Line). The team aimed to improve the safety conditions and efficiency of their Axle Assembly line. Nathan kicked off the presentation by introducing the team’s mandate.

Figure 1 – The Axle Assembly Cats Team Photo



L to R: Hoang-Van Nguyen, Lou Ney, Stewart Moon and Nathan Allan

Some of the objectives the Axle Assembly Cats strived towards included:

- Identify (measure) and reduce Manual Handling risks related to Axle Assembly Process by 80%;
- Identify (measure) and reduce Non Value Add activities by 50%;
- Recommend Improvements to Work Area to eliminate mobile plant and human interaction; and

- Recommend further improvement opportunities to the Leadership Team.

In order to decide what they hoped to achieve, Lou explained that the Cats surveyed all the operators involved in the Series 1 Line and asked them to list the issues they identified on the line and how things could be improved. Although a number of problems were identified, it was the injuries sustained during the Axle Assembly that stood out as the most significant issue faced by the operators.

The improvements identified included setting up equipment on Roll-up in a way that was similar to their Series 2 Line, improve housekeeping to fix the Axle Assembly process, reduce injuries, and to pre-drill to make the task less difficult.

Before implementing any changes, the team had to complete a Risk Assessment using the Australian Standard Risk Assessment Model. By doing so, they were able to identify that the Axle Assembly Process involved excessive Manual Handling operations.

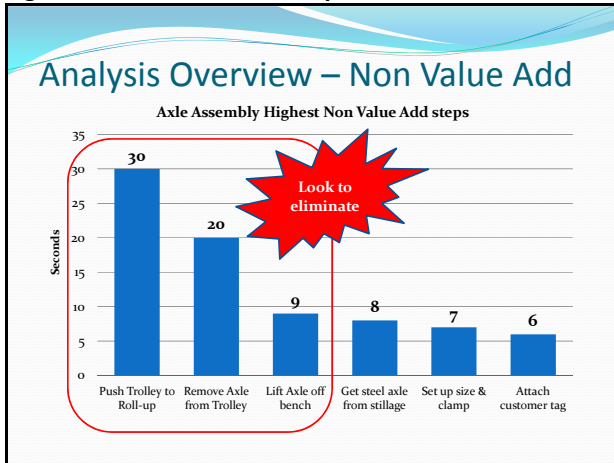
The Kilsyth team also completed a Value Add and Non Value Add assessment to understand whether customer value was being created. If any steps of the process had a physical impact on the axle, they were assessed as Value-Add steps. On the other hand, the steps that involved transferring parts, carrying or lifting and did not physically change the axle, were identified as Non Value Add.

Through the Analysis Overview, 24 key process steps were identified. The Cats also concluded that the total cycle time was approximately 216 seconds, 98 seconds of Value Add time and 138 seconds of Non Value time.

To demonstrate the risks involved in the existing processes, Lou showed a video of the Axle Assembly process before they implemented their improvements. The axles were stacked on a trolley, which the operators had to lift and put

onto a vertical trolley and manually push it across the floor. As these axles weigh approximately 23kg and are around 3 metres high, this was not a simple task. As a result, operators often suffered injuries as they were manually manoeuvring the axles around the line.

Figure 2 – Non Value Add steps identified



In order to improve safety conditions and efficiency, Stewart outlined the brainstorming process that went into deciding how the team would confront these issues. The Axle Assembly Cats had to ask themselves what will decrease or eliminate the most risk and the most unnecessary steps or Non Value Add. To ensure they thought creatively, they did not constrain their thinking based on cost alone. The team considered all ideas and ensured there was a robust discussion involving everyone concerned before making a final decision.

As a result, the Series 1 Operators would put forward proposals to be considered by the Axle Assembly Cats. During the presentation, the team went through a number of proposals and showed the ways in which they decided whether or not they would be effective. Whilst considering each solution, the Cats would make a list of the advantages and disadvantages by considering how effective the solution would be, how much it would reduce Manual Handling risk and Non-Value Add activity as well as if it could pose any new risks.

Although cost wasn't a major priority, the team also estimated the cost and profits the business would experience through each solution. After considering a number of solutions, the Cats decided to take the advice of Senior Management and introduce an automatic version of the manual transfer system.

Figure 3 – Proposal matrix to improve Axle Assembly

How did we rank these?							
	Effectiveness		Will it introduce new risks?	Will it improve traffic management?	Will it slow down the roll-up?	Cost approx	Overall rating
	Manual Handling risk reduction	Non-Value Add reduction					
Manual transfer solution	46%	62%	No	Yes	No	\$25K manual \$75K mech.	1.
Mezzanine	48%	64%	Work at heights & mobile plant risk	No	No	75K	
Dual Jib Arm	48%	64%	No	Yes	Yes	70K	
Mobile Jib Arm	41%	43%	No	Yes	Yes	125K	
Single Jib Arm	48%	64%	No	Yes	Yes	85K	
Rolling table	26%	50%	No	No	Yes	5K	
Automated gantry	48%	64%	Will need isolation	Yes	No	400K	
Conveyor	29%	36%	Nil	Yes	No	100K	
Axle release hook	3%	0%	No	No	No	<1K	

The next steps involved creating a concept for an Automatic Axle Transfer System to be submitted to three different automation specialists to provide a quote. Automation Innovation in Clayton Victoria was eventually appointed as the successful contractor and the new system was soon underway. Once the unit was assembled, tested and installed, the maintenance and operators were trained to use the equipment.

As a contrast to the before video, Lou then showed a video of their new system.

"After all of these long processes we had an answer to our prayers," Lou said laughing.

The video showed that the operators no longer have to lift the axles and drag the heavy trolleys around the floor manually. Instead of this, the axles are rolled onto a machine that lifts the axle upwards and into place. Not only has this improved the efficiency of the process, but it has also created a safer work environment for the Axle Assembly Operators.

After showing the new system in action, Hoang outlined the benefits of their improvement. In terms of tangible results, the Axle Assembly Cats **exceeded their Overall Manual Handling Risk Reduction target of 80% by achieving an 84% reduction.** The mobile plant and people interaction has been eliminated and safety performance since the installation has improved and is continually reviewed.

The Axle Assembly Cats also achieved a number of intangible results. They were finally able to achieve a success on something that had been tossed into the "too hard basket"; they learned the **value of a structured improvement process**; and were able to

reduce frustration levels and received a boost in morale. There is now a general consensus on the shop floor that things are finally getting done and even the Series 2 Operators want to implement similar improvements.

In addition to the tangible and intangible results, Nathan also identified that the Series 1 Operators discovered a number of key learnings throughout the process. The team found that the structured process and group brainstorming helped to achieve an outcome and give the operators a voice which was vital to their success. They also noted that operators needed to be kept in the loop and provided with frequent updates in Toolbox Meetings to maintain high morale. Monitoring and coaching by key personnel and learning to be flexible to take on new ideas were also necessary for the success of the process.

The Axle Assembly Cats understood that an engaged workforce and structured plan are crucial to the success of the business. Nathan wrapped up these concepts nicely at the conclusion of their presentation by saying:

“A journey unfinished is nothing but a waste of fuel.”

Although it was the “Men at Work” team from the B&D Doors & Openers in Revesby that came out on top of the Aussie Cup Team Competition, CTPM would like to thank the Axle Assembly Cats for their fantastic presentation and congratulate them on all of their great achievements.

For further information please contact:



Sally McMullen

CTPM Journalist and Sales Executive

Head Office: +61 2 4226 6184

Website: www.ctpm.org.au