Automotive Industry Development Centre

Case Study

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# CRH Africa Port Elizabeth
# TPM EC Cluster Programme

*"CRH Africa has embarked on this TPM (Total Productive Maintenance) Project with the aim of improving on it currents inefficiencies within the plant. This would therefore lift the business to improve its current position by making us more globally competitive"*

*Gareth Fismer*
*Plant Manager*

## Overview

**Company:** CRH AFRICA

**Location:** Cnr Newbolt & Dudley Street
Korsten
Port Elizabeth 6001

**Number of employees:** 155

**Core products & processes:** Pressed components

**Programme period:** December 2012 to November 2013

## Company Background

CRH Africa was initially Allmay tooling, founded in1974 by two German nationals, initially supplying brackets, and pressings to the local Original Equipment Manufacturers (OEMs) as well as components for the automotive component sectors.
They also took opportunity in the Catalytic Converter industry with the start of stainless steel pressings. Stainless steel pressings make up approximately 97% of current revenue for CRH. Allmay Tooling was purchased by CRH Group in 2007 with the name thus changing to CRH-Allmay Tooling. In 2011 CRH-Allmay was bought by Johnson Control, and the name changed to CRH-Africa. Current customers include Tenneco, Eberspacher, Faurecia, DAS and VWSA.

## Key Challenges Faced

- Oil contamination
- OEE(Overall Equipment Effectiveness) of less than 50%
- Lack of understanding of Total Productive Maintenance
- High number of tool breakdowns and insufficient utilisation of Problem Solving techniques
- No proper programme to improve skills of Shop-floor personnel
- In-effective application of the Planned Maintenance Methodology

## Goals

- Conduct Production study for model area to collect data on the inhibiting factors of production efficiency
- Conduct a value stream map to gain in-depth understanding the production bottle necks.
- Train operators and management on 5s, Total Productive Maintenance, Jishu Hozen, 7 Quality Control Tools, Kubetsu Kaizen and WHY WHY problem solving analysis. This will improve Production Associate involvement on TPM initiatives
- Implementing Jishu Hozen(Autonomous Maintenance) and Kubetsu Kaizen(Focused Improvement) to restore equipment basic conditions
- Implement TPM Master Timing Plan Board with Declaration Statement, TPM Policy and Annual KPI's

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Figure 1 Scrap Shakers: The above figure shows the breakthrough development of a Scrap Shaker, this will eliminate the time stop to remove the off-cut pieces

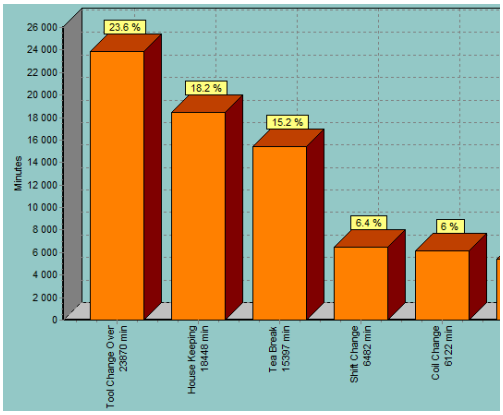


Figure 2 Tool Changeover: This chart shows all downtime reasons and rates their impact against the other. The chart shows that tool changeovers amount to (23.9%) and this is where the biggest loss is.

## Programme Journey

CRH AFRICA formally known as CRH ALLMAY has been part of the Tirisano cluster programme during the period 2009-2011. The Company expressed interest in the TPM Cluster Programme, due to the success of the Tirisano Lean Programme, it felt that it needed a system that will take it to the next level in its pursuit to World Class manufacturing Excellence. The TPM Programme will assist in the improvement of CRH AFRICA's OEE, to achieve a state of Zero Defects, Zero Accidents and Zero Breakdowns. Training on TPM and application of the 8 Pillars of TPM is also imperial in aligning the shop floor worker's knowledge with the rest of the management structure on the basis of running a Breakdown and Defect Free enterprise. The TPM programme is focused on the following deliverables:

- OEE improvement from 50% to 85% in year three of the journey
- 100% Implementation Autonomous Maintenance Step 0-3 by end of 2013 on the Manager with 85% audit result from AIDCEC
- Zero Minor Stoppages on Manager Model Machine by end of 2013
- Zero Breakdowns on Manager Model Machine by end 2013
- Achieving Zero Oil Contamination on Manager Model Machine
- Changeover analysis using the SMED concept Quick Changeover System implementation by end 2013 on Model machine
- Training of 18 Production Personnel on Autonomous Maintenance Step0-3 in the Model Area
- Training all 3 Senior Managers and 6 production Supervisors' on the 6 Big Losses that impact OEE

The production study conducted during Q1 of the TPM journey, on the Manager Model Machine Press 50, revealed that the biggest contributor to the production losses were Minor Stoppages, most particularly the removal of Scrap Off-cuts (manually stopping the machine, and using an iron rod to remove the steel pieces form the tool). These inefficiencies were brought to management's attention through weekly management review meetings. Countermeasures to eliminate and reduce the Minor stoppages were achieved by Small Project Teams consisting of Production, Quality, Maintenance and AIDC, utilising the Kubetsu Kaizen Pillar with focused improvements to eradicate this loss. One major breakthrough was the development and the prototyping of a Scrap Shaker, which will remove the Scrap Off-cuts automatically, increasing availability by 8hrs per week *(See figure1: Scrap Shakers)*. Autonomous Maintenance Pillar has been implemented and the company has achieved a 90% pass for the Step 1 Audit. The Activity boards have been institutionalised and the production team members are displaying the activities for Autonomous Maintenance and Focused improvement.

Tool Changeover (See figure 2: Tool Changeover) was the 2nd major loss to be eliminated, this was done by Focused Improvement small group activity, whereby the Ishikawa Diagram and the 5 Why Analysis where the key tools utilised to find the real root cause, which in this case was due to the poor prioritisation of work before changeover and during changeover, this was reduced by 35%, and increased OEE by 5%. **All these efforts resulted in a Total Saving for the year to date of R 685,000.00**

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Figure 4: The Model Area team of CRH Africa

Figure 5: The operator cleaning his machine

Figure 6: The operators applying the Tag Principle of the Autonomous Maintenance tool set

## Programme Master Plan

| Item | Objective Description | Timeline | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | N | D | J | F | M | A | M | J | J | A | S | O |
| 1 | TPM Cluster Kick-Off | ■ | | | | | | | | | | | |
| 2 | Initial Calibration – Setting up KPI's | | ■ | ■ | | | | | | | | | |
| 3 | Subproject 1: Production Study Press 50, improve OEE to 60% | ■ | ■ | ■ | ■ | | | | | | | | |
| 4 | Subproject 2: AM Step 1-2 implementation in the Model Area | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| 5 | Subproject 3: AM Step 3 implementation in Model Area | | | | | | | | | ■ | ■ | ■ | ■ |
| 6 | Subproject 4: Focused Improvement Workshops | | | | ■ | | | | | ■ | | | |
| 7 | Subproject 5: Training on AM Step 0-3, Activity Boards, 7 QC Tools, Why-Why Analysis Tool | | | ■ | | | ■ | | | ■ | | ■ | |
| 8 | Subproject 4: AM Step 3 Implementation and Horizontal deployment of AM Step 0-2 | | | | | | | | | | | ■ | ■ |

## Benefits (KPI's)

| KPI | Before | After | % Improvement | Value of Savings |
|---|---|---|---|---|
| **Chipping of scrap cutters at Trim Stage** | 103min | 0 | 100% on E16 Tool | R103,882.00 |
| **Scrap off-cuts removal manually** | 8hours per week | 0 | 15% increase in output per week | TBC |
| **Upgrading of feeder guide roller for coil** | 22.3% of downtime | 18.2% of downtime | 4.1% reduction in downtime | R530,823.12 |
| **Tool Changeover Reduction** | | | | |
| **Total Savings** | | | | **R 685,000.00** |

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**Before**


**After**


**Before**

**After**

## Key Learning Points

The journey at CRH started out with the Plant Manager doing a state of the nation address to all the employees in the plant with a brief background on TPM. This approach proved effective as it was evident by the number of employees who volunteered to take part in the TPM Model Area rollout. The full participation of all employees is key as it ensures that the gains made in the journey are preserved.

## Sustainability (From AIDC's viewpoint)

It is proposed that CRH should set up a TPM Promotion Office, by appointing on a full time basis a TPM facilitator that will spearhead the TPM projects. The TPM Facilitator will focus on deploying TPM horizontally across the whole organisation, with the support of Managers and Shift Leaders and conduct training and focused improvement workshops. This approach will ensure the company is consistent in applying TPM as its only means of survival in this globally competitive environment.

## Way Forward

CRH Africa has allowed two members of the TPM Steering Committee attend the well coveted TPM Facilitators course presented by TPM Club India Chairman and CII TPM Councillor Mr Rajesh Parim. These Facilitators will ensure that there is a successful horizontal deployment of TPM according to the JIPM standards in the model area and in the whole plant. The journey has started and TPM AM Step 1 has been completed with a 90% pass after the audit. AM Step 2 implementation is under is under way, and the goal is to implement AM Step 3 by end of the year.

**CONTACT DETAILS**

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