Improving Overall Equipment Efficiency in Robotic Welding Cell

Student's Name	**Mahesh Malagavi**	**EMM (PT-2008)**
Academic Supervisor(s)	N. Sandeep	
Industrial Supervisor(s)	Mallikarjun G. Nugganatti, Ace Designers Ltd, Bangalore	

Mahesh Malagavi

mahesh.m504@gmail.com
Ph. No: 0 99723 87054

**Keywords:** Overall Equipment Effectiveness, SMED, Visual Control

Abstract:

In today's world the key success driver for manufacturing unit is Overall Equipment Efficiency (OEE). OEE approach helps to identify areas of improvement. World class companies follow a strategy to achieve OEE of more than 75%. A higher OEE has a greater impact in making manufacturing unit a best in class. A thorough study to increase OEE by reducing the losses in availability, performance and quality becomes need of the day. In this project work an existing Robotic welding cell used for mass production is taken for study. Data collection showed an OEE of 20%. Process study (Gemba study) revealed that, quick change and setup were the major areas demanding improvement.

Lean approach is adopted to study, analyze and derive a solution. The approach includes tools like, SMED, KAIZEN, and JIDOKA. In total there are four counter measures developed, two (Visual management and standardisation) are implemented and other two (SMED and VA and NVA analysis) are virtually simulated and validated with simulation software for safety and OEE improvement.

By implementing visual control, fixture setup time reduced to 15 min from 20 min which improved the availability of the cell. A shadow board and a mobile tool kit minimised the non value adding operator movements around the cell. Removing non-value adding steps ensured the performance improvement of the robot by 15%. By implementing twin pallet system it is found that the availability of the cell will improve by 25%, which makes the OEE of the cell to 40.72%. Simulation tool was used to validate the improvements.
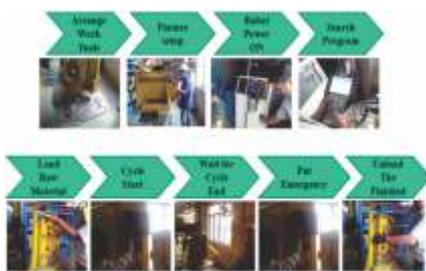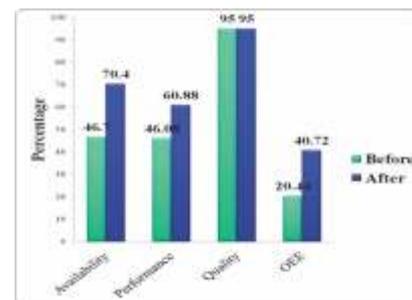
Process flow in Robo-2 welding cell
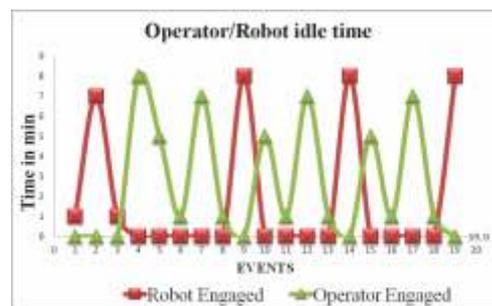
Idle times of robot and operator

3D-Virtual validation of counter measure

OEE Before and after