




CASE STUDY- Productivity Improvement in Diff Case Line of components Manufacturing

Name of Team/Group: Atharva

| | |
|---|--|
|  | Madhusudhan K- Manufacturing Engineer |
|  | Krishna Kumar T V- Production Engineer |
|  | Muthu M- Production Engineer |



Project Start Date: 15.03.2023

Project End Date: 04.05.2023

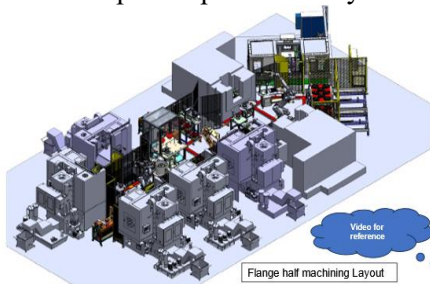
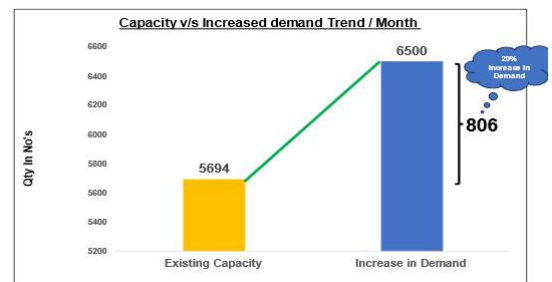
Team Profile -Team Atharva is part of the differential machining line with CFT members from Production, MFE, Quality & PLE. Team is driving continual Improvement projects since last 4 years. Team had identified 82 ideas and implemented 67 ideas successfully. The Objective is to drive for excellence in production line through automation, people involvement, TPM practices, & Quality Tools

Project Objectives:

- The aim of the project is to improve productivity in differential case line for 15i Flange half from 73 to 90 numbers/shift.

Execution methodology

- The project was conducted using Problem Identification, Observation, Analysis, Action, Check, Standardize & conclude to improve productivity and quality.



By following the above steps, we studied the process flow and identified some challenges in machining process. Observed **idle time** in each operation (OP). As the cell is fully automated, **In OP10** machining insert indexing time is **100mins** (Twice in shift)-04 machines, in **OP20** machining insert indexing time is **40mins** (04 times in shift)- 01machine & also online part runout inspection idle time loss is 40Mins (04Times in shift) and in **OP30** part indexing for aligning by robo idle time loss is 01min/component (**73 mins**).

- With Brainstorming, idea generation activity

KAIZEN -OP10 P Q C D S M E

| BEFORE | AFTER |
|--|---|
|  <p>Before Supplier Tagdate: Grade:TR125, WDA-WC0CT and Kennametal Grade:K15</p> |  <p>After Supplier Tagdate: Grade:TS15</p> |
| <p>Insert Indexing done twice in a shift</p> | <p>Insert indexing frequency reduced to once in a shift</p> |

OP20

- Same Grade Inserts Horizontal Deployed to OP20
- Insert indexing frequency reduced from 4times to 2times in a shift

& Process mapping CFT, implemented below Actions.

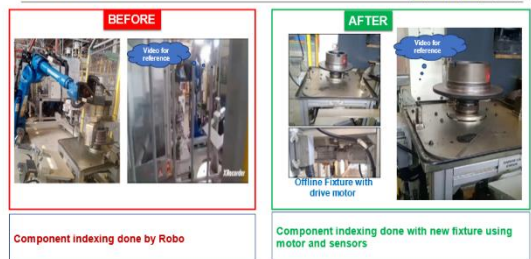
1) **New grade inserts** in OP10 & OP20 and reduced insert indexing frequency from **4 times/shift to 2 times /shift**.

2) In OP20 the **offline runout fixture** facilitated for runout checking of part, leading to improvement of **40 mins** inspection time to **0 Mins**

3) In OP30 **Offline fixture** with drive motor facilitated part indexing and thus reducing the time from **1 min to 10secs/ component**.

This project yielded the desired results and achievements with application of 7QC tools and techniques: Gantt chart, Pareto analysis Gemba observations, Check sheet, Cause & Effect diagram, Brainstorming.

KAIZEN –OP30

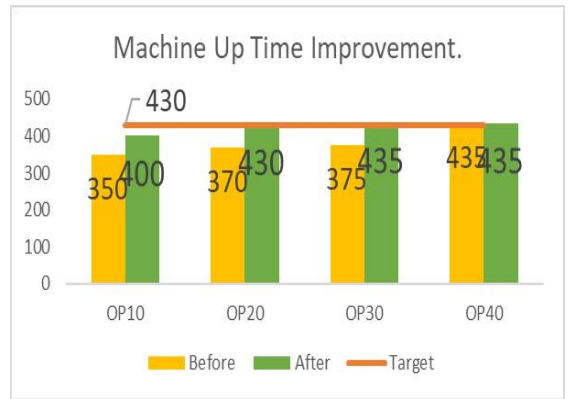


Preventive action to avoid reoccurrence:

- Standardization of MIG & SOS.
- Sustenance audit plan introduced and ensured.

Tangible Benefits:

- Production output increased from **73 to 87no.s** per shift.
- Eliminated expected business opportunity cost loss of **12.09Mn per month**.
- On the machine runout checking time reduced from **40mins to Zero mins**.
- Insert indexing frequency reduced from 04 times to 02 times per shift.



In-Tangible Benefits:

- Operator morale was boosted by reducing insert indexing time frequency and eliminating machine runout inspection.
- New Customer demand fulfilled.
- Ensured 100% delivery by increase in productivity.

GANTT CHART : PROJECT PLANNING – PLAN VS ACTUALS

| Timelines / Phase | Plan / Actuals | 2023 Mar W3 | Mar W4 | Apr W1 | Apr W2 | Apr W3 | Apr W4 | May W1 |
|-------------------|----------------|-------------|--------|--------|--------|--------|--------|--------|
| Problem | P | | | | | | | |
| | A | | | | | | | |
| Observation | P | | | | | | | |
| | A | | | | | | | |
| Analysis | P | | | | | | | |
| | A | | | | | | | |
| Action | P | | | | | | | |
| | A | | | | | | | |
| Check | P | | | | | | | |
| | A | | | | | | | |
| Standardize | P | | | | | | | |
| | A | | | | | | | |
| Conclude | P | | | | | | | |
| | A | | | | | | | |

Total time taken to complete the project – 48Days

Legend (for Actual's row):

| | |
|--------------------------------------|---------------------------|
| Task Completed | All cells in Green color |
| Task initiated but not yet completed | All cells in Yellow color |
| Task not yet initiated | All cells in Red color |
| Task planned | All cells in blue color |

Implementation From date: 15.03.2023 To date: 04.05.2023