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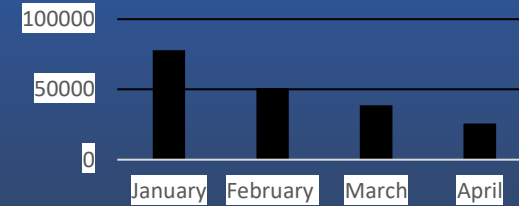Manufacturing Engineering Department
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## Abstract

On this project I will be introducing a new system to Verified and evaluated the bend process. The system allows to read the different contour of the bend parts on the XYZ axis and compare them to the actual drawing measurements.
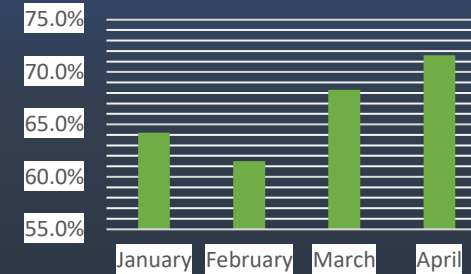
## Problem Definition

- **Operators Knowledge-** The human factor is a big issue on this process due to the solution coming always from the operator.
- **Improper fits on check fixture and MYLAR-** This normally happens when the operator decide to run the order without checking the first piece.
- **Part trim short for next process-** it could be leaving a highly scrap cost from $10,000.00 to $30,000.00.

## Scrap:



Increased on GU



**Define:**
The initial idea for this project was brought due to different concerns on the bending process such as bend corrections and high scrap due to parts bend incorrectly or out of tolerance specifications.

**Control:**
The option that was determined to be use is an AICON machine. This machine is designed as a chamber with 16 high resolution cameras located around it. The operating system allows to read the different contour of the parts on the XYZ axis and compare them to the actual drawing measurements. After the comparison of both XYZ axis the program gives you corrections on the different points that need or required adjustments.

**Measure:**
Once I evaluated the actual process, i determine that we were making some mistakes on the correction method after the parts were bend. This is the actual process that the company use to correct problems on the bend parts and the way that we are going to measure the progress of the project. Part trim short or out of tolerance and Set up time on the CNC machines

**Improved:**
Under the investigation for a solution it was reach to the conclusion that the best option will be using a method to compare the XYZ coordinates of the actual tube with the ones established by the drawing specification. The AICON machine will be taking pictures of the actual tubes to read the patterns of the bends and after that it will be making a comparison of the drawings coordinates and the actual read coordinates of the tube. This project will be under evaluation for the first year to assure that the principal goal is achieved to reduce the high cost in scrap.

**Analyze:**
We will evaluate the progress of this Project using pareto charts. The raw data will be included on the Project information section.

## Conclusion:

After running this project for the last two months and a half we could determine that the time of set up on the CNC machines was reduced by 8%. This improvement was due to the program on the AICON that allow us to transfer the corrections that were determine by the comparison of the XYZ coordinates between the drawing and the actual tubes. The other big improvement was due to the proper way of verification on the lengths, angle and rotation of the bend parts.

The expected goal of this project was 20,000 to 30,000 dollars in scrap reduction. After evaluating the project I could announce that we achieved a goal of 64,473 dollars only in scrap reduction and also we get to increased the 8% on the GU, this give us 14 more orders deliver on the month. If we translate the 14 extra orders to the time pay to the employees into getting this order ready with the old system it gets to 5 work days and finally we translated this to currency it will be 10,512.00 dollars. Leaving a final achieved goal of 74,985 dollars.

## Fishbone Diagram