Productivity Improvement in Side Member Press Shop by Using Quality Tools

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Abstract:

This project is related to productivity improvement in the side member press shop for the three resources viz 5000T hydraulic press, 80T CNC press and decambering line. These are the resources on which the FSM manufacturing stability and the capacity of vehicle manufacturing are dependent. The southern plants of AL mainly depend on this single source of operations. Thus the productivity of these machines plays an important role in on time delivery, lead time and manufacturing cost management. The effective resource utilisation is the key to productivity management.

In the current project work the various losses of productivity are analysed. For the productivity loss of 5000T hydraulic press, the DMAIC process of six sigma is used to identify and analyse the root causes that are resulting in 84% of the speed losses. For the 80T CNC punching press, relating to the higher machine load and the necessity of the third shift production requirement are analysed. The lean methodology and the VSM is mapped for the current state and the future state and cycle time for processing a high volume model has been reduced from 360 s per part to 180 s by using alternate tools and modification of the existing tools to suit the need. For decoiling and decambering line, the losses are analysed using the VA/NVA methodology and the ideas are developed based on the data to increase the value added time to improve the productivity.

The productivity loss of 500T hydraulic press is caused by production of the new variant of the cargo FSM and is analysed using DMAIC approach and utilising the internal resources and with low lead time the productivity losses of 84% has been eliminated. For the CNC press the value stream mapping of the current state for the runner model is analysed under normal condition and the current model requirement, by modifying the tool setting using the existing alternate tools and by modification of similar tools with a low investment. The tools are upgraded and the product cycle time is reduced from 360s to 180s and the quality of the product has been improved. In the decambering line the VA/NVA analysis has been done and in order to reduce the NVA the improvement in end bit processing is done by reengineering the sheet sensor to get the digital readout from the machine till the end. Multiple length production in a single coil has been implemented and this has resulted in productivity improvement by 25% and increase in material yield from 94% to 97%.

Productivity improvement using quality tools