

Process Improvements in the Automotive Industry - Plant Layout

Executive Summary:

The automobile is a fundamental need. Even though it was previously forecasted that the market growth for the automobile companies will drastically reduce, it did not come true. It is a fact that many car manufacturers like Ford, Hyundai, and Nissan mass produce their cars. They have to deliver the product on time in order to match the competition. In order to achieve this their operations and production processes should be very fast and prompt, in which plant layout plays a very important role.

In this project, we identify the important factors to consider while designing a plant for an automotive Industry and we make recommendations based on the findings and the literature survey. It benefits management to spend the majority of time on finding the root cause of the problems. The solution can then be identified once we define the cause of the problem. We performed a literature survey to find practical examples on automotive plant layout.

We initially explain the regular product flow in the automotive industries and we took a real time current plant layout example of Renault Nissan India and we explain the effects in their plant layout based on planning, location, space, volume and transportation. In order to make sure that the current layout is understood properly, the production process of each and every unit in the automotive industry has been explained. While considering a plant layout design it is very important that the sub stations and work cells are to be designed effectively for a smooth flow of the product and it has been explained according to product selection, cell design engineering and defining the infrastructure in our paper. Some other important factors such as warehouse layout, TAKT time in lean manufacturing, several optimizing tools like flexible manufacturing system, value stream mapping, systematic layout planning are clearly explained and suggestions are made for each and every tool in their sections.

The process of optimizing production is a continuous process and it has no end. It also applies for the plant layout design, but plant layout should be optimized during the initial stages of plant construction. We make several suggestions and recommendations. Initially three plant layout proposals are made, in which the first proposal is the easiest and most feasible which has

the advantage of less transportation as the work cells are placed parallel. The second proposal has two L shaped lines which has the advantage of extremely available area for pre assembly and material facades. The third proposal is a mixture of both first and second having parallel cells and L shaped cells which has the advantage of both one and two.

By following the recommendations made such as prioritizing the processes, considering automatic operative equipment's for faster and defect less production, flexible fixtures, implementation of AGV's for transportation will improve the efficiency of the plant layout in terms of production capacity and capability. In addition we suggest that these methods are to be performed on an iterative basis to achieve the best possible production efficiency. Finally a staff with the necessary competencies and capabilities is required for the design of efficient plant layout. These were the basic findings from the study that we conducted on optimizing the plant layout. The results of the study have been explained in the final report.