

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

In automotive product industry, there are the growing market share and production volumes increasing not only in number but diversity as well. Therefore, this study is developed and shows how correct warehouse design support this increase as well as showing how and improving the existing resources can support the company goals to successfully compete in the market.

In this case, the study company is an automotive assembly plant. The automotive manufacturer's name is "ABC Company". The problems are current material storage space for run-out model is occupied by other product materials, new product model coming, and then existing warehouse is ineffective process for new materials offloading, receiving, checking and smooth put away. In order to have a utilization improvement, warehouse area or sector called material handling section is selected to be studied due to the highest number of SKUs.

The goal to improve the warehouse in designing a warehouse which improves plant material/information flow efficiency and effectiveness in the physical configuration and operation process. This can improve the material handling process and minimize wastes in the process of warehousing.

The warehouse design is considered from methodologies and existing warehouse conditions including layout - physical design, warehouse operation and material handling resources.

6.1.1 Lay out and physical design

The warehouse is categorized into 3 zones depending on part operation, zone 1, zone 2 and zone 3 represent the pull card zone, internal

sequencing zone and call for material tool part zone, respectively.

By considering the number of SKUs to be stored in the warehouse and container condition in each area, selection tables and applicable storage module table are applied to determine the storage module. In small part, zone 1, the additional gravity flow is selected due to its alignment with the existing flow rack and layout, support picking operation and suitable for material container. For bulk material, lack of utilization of the air space in the existing design leads to installation of the racking system to utilize the air space in pallet load material zone 2 and zone 3, and also the addition of gravity free rollers in order to support ergonomic and FIFO process. Totally warehouse space is increased 56.32%.

6.1.2 Warehouse operation

The warehouse operation could be considered to have improved because of more efficient analyzing process steps and element time. Main processes, unloading/receiving and inspecting, inspecting and put-away are focused on. The process element time is developed by checking the highest time consumption and eliminating documentation transfer time. From this, the information technology, bar coding, is introduced in order to save time in checking and recording the material arrival which also improves accuracy. By utilize the existing resource warehouse operation/information flow is better by 54.22%. The assist device could be installed for supporting the separating and sorting process to reduce the work load.

6.1.3 Material handling resource

In terms of material handling resources are planed by relating to the production line rate which is constant at 12 jobs per hour and by balancing input and output from warehouse, the number could be the same for both workforce and mobile equipment. Here, workforce position is changed and grouped for working in the zones and according to smooth information flow.

6.2 Recommendation

The recommendations are below.

- 1) This study is related to the automotive manufacturing material warehouse so, this design can be use as reference for the automotive material store or the vehicle spare part distribution center or similar product. And also, it can be applied for the warehouse which requires similar operation and material characteristic.
- 2) In case the floor space of the warehouse is full, the racking system can be applied to increase the warehouse capacity. The free space on the overhead area can be used to support this. Following the information related in this study, racking can serve the part proliferation with significant results.
- 3) In the warehouse which faces an increase of SKUs, to improve warehouse activity, information systems can support in order to reduce the operation time and real time tracking. And also, they are useful for supporting the warehouse operations such as annual physical inventory count, part status monitoring, min-max tracking, etc..