INDUSTRIAL, MANUFACTURING, & SYSTEMS ENGINEERING
CAPSTONE PROJECT /INTERNSHIP SUMMARY

Your Name: Valeria Bejarano, Gabriel Garcia, Andres Mendez

Type of Capstone (research, teaching, practical application): Practical Application

Capstone Project Title: Inventory and Operations Improvement for Del Sol Medical Center Engineering Department

Year and semester: Fall, 2016

INTRODUCTION

Las Palmas Del Sol Healthcare, as part of the hospital chain Hospital Corporation of America (HCA), has been one of the principal healthcare sources in El Paso and close regions since 1974. Las Palmas Del Sol Healthcare takes incomparable healthcare resources to El Paso through a center of different fields. It is committed to the care and improvement of patient’s health, providing a high-quality service and a cost-effective healthcare to the community. Nonetheless, behind the daily accomplishments of the hospital, there are several departments working together to achieve their goals. Such is the case of the Engineering department who oversees the maintenance of the whole facility.

The scope of our project was to examine the daily operations and procedures of the engineering department at the hospital and improve them. After analyzing the data, the following problems were defined. The department currently had no control over the ordering of inventory for the HVAC system.
This was leading to unnecessary expenses and inventory within the facility that was not accounted for. The inventory throughout the hospital was also causing a conflict with NFPA safety codes that the hospital must comply with. There was also not a standard for the preventive maintenance procedures for the air handler units. We applied principles from Methods, Industrial Layout, and Production and Inventory Control to improve the different issues just mentioned.

**PROJECT OUTCOMES**

After collecting and analyzing the data we came up with several alternatives that could be implemented as solutions. Nonetheless, based on criteria and a prioritization matrix, we were able to choose among all the alternatives the one that better fits the department’s needs. Our first optimal solution was to implement a Just in Time Inventory System for the components needed to service the air handling units. This includes filters, pre-filters, and belts among others. In order to do so we develop an air handling unit database containing all the information related to each unit in terms of type of material needed and quantity. In addition to this, we came up to an agreement with Grainger which is the supplying company to develop a list on its website for each unit and its own requirements. With this list, the Engineering department will be working together with Grainger to supply the material needed in correspondence with the Just in Time system. Having this new inventory system will allow the department to have more control over what is being ordered and consequently the amount of money spent. Moreover, as part of this new inventory system and as a result of the lack of storage/handling space area, we proposed the implementation of 5S principles in the area next to shipping and receiving inside the boiler room. With this new storage/handling area we would be improving the maintenance processes and reduce its processing time by 43%. Additionally, another important aspect that concerns the air handling units is the schedule under which employees work to perform the preventative maintenance. As part of our solutions, we proposed a new air handling unit preventative maintenance schedule where the goal is not to reduce the processing time but to balance the time spent servicing a unit throughout the week. This proposed schedule takes into account the fact that the workers are not only responsible for the preventative maintenance of the critical equipment but are also in charge of any work order requested throughout the day. For this reason, this schedule does not specify a day or time of the week at which the PM has to be performed. It only specifies in which week which units have to be serviced. This way,
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workers have a more flexible schedule that allows them to work on their other responsibilities without disregarding the servicing of the units.

INDUSTRIAL ENGINEERING PROGRAM ASSESSMENT

As students, it is hard to imagine how real life problems actually work. In the classroom we are given several sets of problems, perhaps some real world problems, but with that we are given many useful information. Information that helps us significantly define the real problem and design a solution. Nonetheless, most of the times it does not work that way in the real world. With this project, we were not only able to apply the concepts learned in a classroom but we were able to expand our perspective. With this project, we were able to see that there are many unknowns that are not going to appear unless we search for them, that the problem may not always be that obvious and that the cause can certainly be the most unexpected one. Although challenging at times, this project exposed us to an untraditional Industrial Engineering industry in which we were still able to successfully apply the techniques from our education and obtain our desired outcome. This unique experience has enriched our knowledge as Industrial Engineers, has helped us see the importance of looking at a situation from various points of view, and certainly, this experience has provided us the opportunity to learn from other people and take that knowledge with us and apply it wherever we go.