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Use of Methodology DMAIC to Eliminate Gum's Process Variation

P. Juarez and L. Cuautle

Universidad Popular Autónoma del Estado de Puebla (UPAEP)
Puebla, México

Corresponding author's Email: paola17_19487@hotmail.com

Author Note: Paola Belén Juarez Tello is a graduate student of the mastership in the integrated manufacturing systems and Quality strategies at UPAEP University and has a CONACYT scholarship. Paola Juarez contributes directly applying the methodology in the gum´s process in the confectionery plant in Puebla, Mexico. Luis Cuautle Gutiérrez, Ph.D is a full time graduate professor at UPAEP. Luis Cuautle contributes in the theory of the methodology DMAIC for applying in the industry.

Abstract: Mexico's biggest confectionery factory has a big challenge.- To elaborate a new product with new technology in Puebla´s Plant for china's marketplace. A FMEA has been used to identify the main potential issues and their possible effects on the manufacture of a new product, with the purpose of prioritizing those issues and effects, and focusing on the sources. After the FMEA was applied, a main problem in the variation of weight of the slab was found. In fact, this is a new format that Puebla's factory had never produced before. The authors began working on this project with the DMAIC methodology with the purpose of reducing the variation of the slab weight and reaching a 1 CPM. The authors use a SIPOC tool to visualize the fluency of the slab process; 72 variables of the process were found.
Researchers performed a Gage R&R to make sure that the data of the project are reliable. An x-ray of the current status from the variation has to be taken, the results of it shows that the CPM is 0.60. All of the variables were analyzed by the Multiple Regressions tool to know the most significant variables of the slab's weight, and the result of the analysis showed 15 potential variables. A test has to be done and the Xs have to be adjusted according to the results of the analysis. All the data have to be checked and adjusted; big results reaching a 1.07 CPM were achieved. These adjustments were recorded in the control plan of the process. The results of this project were reached satisfactorily for Puebla's factory. Because it was the first project with a vertical start up, this means that all the high performance indicators were achieved.

Keywords: FMEA, DMAIC, SIPOC, Gage R&R, Regression Multiple, Control Plan