A QFD and FMEA Integrated Model

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Abstract

In today's highly competitive marketplace, the enterprise must satisfy all customers' need in various products. To satisfy various customers' need, producing high quality products by lower cost is the challenge that current enterprise needs to face. Therefore, Concurrent Engineering (CE) are getting more concern to achieve the goal. In CE, the Quality Function Deployment (QFD) is often used and discussed. QFD is based on the customer's need, and transfer the need to the product functions through a serious of matrix operation. However, it is found that QFD can't efficiently find out the inner problem caused by the production process or feedback from the marketing.

For overcoming the problem of QFD, this research is to develop a integrate system, thus, the failure information of products can be feed backed to the developing structure of QFD directly and efficiently, so that corrections can be made in the beginning of the product design. In this research, we establish a CE product developing system that integrates QFD and failure mode and effects analysis (FMEA). FMEA is used to generate the Risk Priority Number (RPN) from product's failure and effect chart. The RPN can be affected by some managerial parameters such as P value and k value. After getting the RPN, we would get FMEA weight value (F_i) and it would be feedback to QFD directly. In the study of Bike disc brake case, the integrated model of our research can feedback the failure information of products corrected efficiently during design stage.

Keyword: Concurrent engineering (CE); Quality function deployment (QFD);
Failure mode and effect analysis (FMEA).