ABSTRACT

PT XYZ is a home industry engaged in convection. One of the products produced is jeans. The company implements a make to stock system, where jeans are produced based on customer demand estimates. In the jeans production process, there are eight stages of production, namely pattern, cutting, sorting, sewing, washing, ironing, inspection, and finishing. Based on the company's historical data for the period January 2020 – December 2021, the sewing process is a process that needs to be improved because it has the highest number of defective products of 1354 products from the total number of defective products. The types of defects that occur in the sewing process are wavy stitches, jump stitches, and uneven stitches. The solution given is the design of a needle storage area to minimize product defects in jeans in the sewing process at PT XYZ.

Problem solving using Define, Measure, Analyze, and Improve (DMAI) methods. In the define stage, identification of product CTQ, identification of process CTQ, and identification of problems is carried out at each stage of the process. At the measure stage, the stability and process capability calculations are carried out. At the analyze stage, the root cause analysis of the problem is carried out where the problem is the CTQ process that is not fulfilled in the sewing process. The fulfilled process CTQ is the movement of components is not smooth, stiff, and tense. Root cause analysis was carried out using fishbone diagrams and 5 whys. From the root cause analysis, improvement priority analysis was carried out using the FMEA tool. Then, it is known that the influencing factor is that the needles are in one container. So that to improve the problematic sewing process in order to minimize the frequency of defects, the improvement stage is carried out, namely the design of a proposed tool for storing needles so that operators can put needles in their respective places using Quality Function Deployment (QFD).

The design results obtained are a needle storage area that has a product length specification of 17 cm, a product width of 10 cm, and a product height of 3 cm. The needle holder has 3 bulkheads with the material used, namely Medium Density

Fiberboard (MDF). The product also has a usb holder for attaching a usb lamp. The results of the design are then verified, validated, evaluated, and the implementation plan is analyzed.

The implementation of the design of the needle storage area in the sewing process at PT XYZ is expected to minimize product defects by assuming a decrease in the number of defective products up to 41.24%. The decrease in defects that occur will have an impact on changing the sigma value from 3.77 sigma to 3.84 sigma, and reducing the Defect per Million Opportunity (DPMO) value from 12891 DPMO to 10722 DPMO. The DPMO value means that one million jeans products products produced have 10722 opportunities for product defects to occur.

Keywords: DMAI, Defect, Sewing Process, Quality Function Deployment