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Engineering mathematical analysis method for productivity rate in linear arrangement serial structure automated flow assembly line

Abstract

Productivity rate (Q) or production rate is one of the important indicator criteria for industrial engineer to improve the system and finish good output in production or assembly line. Mathematical and statistical analysis method is required to be applied for productivity rate in industry visual overviews of the failure factors and further improvement within the production line especially for automated flow line since it is complicated. Mathematical model of productivity rate in linear arrangement serial structure automated flow line with different failure rate and bottleneck machining time parameters becomes the basic model for this productivity analysis. This paper presents the engineering mathematical analysis method which is applied in an automotive company which possesses automated flow assembly line in final assembly line to produce motorcycle in Malaysia. DCAS engineering and mathematical analysis method that consists of four stages known as data collection, calculation and comparison, analysis, and sustainable improvement is used to analyze productivity in automated flow assembly line based on particular mathematical model. Variety of failure rate that causes loss of productivity and bottleneck machining time is shown specifically in mathematic figure and presents the sustainable solution for productivity improvement for this final assembly automated flow line.

Keywords; Assembly machines; Automation; Failure analysis; Production; Productivity; Safety engineering