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An application of Pareto analysis and cause-and-effect diagram (CED) to examine stoppage losses: a textile case from Bangladesh

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Abstract

Spinning industries are facing challenges of improving productivity in the competitive market nowadays. Ring spinning, the most widely used yarn manufacturing process for short staple spinning, uses several types of machinery from blow room to ring frame for producing yarns from cotton fibers. An enterprise can improve utilization of resources by identifying unwanted machine stoppage and taking corrective actions at different points in the production cycle. This study focuses on the major six stoppage losses that are used to calculate Overall Equipment Efficiency (OEE) of ring frame section. The Pareto analysis reveals that idling and minor stoppage and breakdown losses are responsible 89.3% of total stoppage losses. According to cause-and-effect analysis, root causes for the stoppage losses are: high doffing time, high traveler changing time,

broken end of yarn due to piles generation through the front roller, power failure and change in Draft Change Pinion (DCP) due to breakage of teeth of the gear during starting of machine by operators before lowering of ring rail and change of Twist Change Pinion (TCP) due to the displacement of TCP gear shaft. Finally, few recommendations are made to reduce stoppage losses and to increase the productivity of the ring frame section.

Keywords:

Yarn manufacturing process | ring frame | OEE stoppage losses | Pareto analysis | cause-and-effect diagram | loss prevention

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