



THE DESIGN OF AN AUTOMATIC FEEDING SYSTEM FOR THE FRUIT DISTRIBUTING CONVEYOR BASED ON AN ELECTROPNEUMATIC SYSTEM IN LIBO PALM OIL MILL, RIAU

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ABSTRACT

The digester is a crucial component in a palm oil processing mill, responsible for breaking down fresh fruit bunches (FFB) to facilitate the pressing process. To maintain efficient operation, the FFB feed entering the fruit distributing conveyor must remain continuous, ensuring the digester level stays at 75%. However, an ongoing issue is the imbalance in feeding across the fruit distributing conveyors, which affects each conveyor line. This imbalance causes the tippler to stop frequently and shortens the lifespan of conveyor feeder components. The primary cause of this issue is the manual adjustment of the feeder on the top cross conveyor, leading to an uneven distribution of feed—60% to line B and 40% to line A. To address this problem, this research designs and implements an automatic sliding mechanism based on an interlock system for the Level Digester of line B. The automatic sliding mechanism closes partially, maintaining an opening of approximately 40% when the digester level reaches 75% of its total volume. The design results demonstrate that the automatic sliding mechanism effectively balances feed distribution and reduces overload. Data analysis indicates a reduction in tippler stoppages by an average of 2.8 minutes and a decrease in overload duration in line B by approximately 1.3 minutes. System testing also shows a significant impact in reducing breakdown time in the fruit distributing conveyor, preventing feed imbalance across the distribution lines.

Keywords: *Digester, Level Digester, Interlock System*