ABSTRACT

Sanding is a sanding method used on locomotives which is used to increase the adhesion between the wheels and the rails. Sanding is used when the rail conditions are slippery which can be caused by many things, such as liquid spills, grass and damp rails. Therefore, the sanding system is one method that has been used so far to prevent slippage on locomotive wheels. Currently filling sand into the sand box is still done manually by carrying the sand then pouring it into the hole in the sand box. Currently PT. KAI Depo Locomotive A Bandung has made an arduino-based semi-automatic sand filler, but the tool still often has problems with the air suction machine which is often damaged.

In this Capstone Design, a PLC-based sand filling system is designed that can fill sand into the sand box automatically. The working principle applied is to use a pneumatic conveying system. This design was carried out with the aim of facilitating the process of filling sand by paying attention to aspects of worker health and aspects of equipment efficiency. To facilitate control and monitoring, a user interface in the form of a Human-Machine Interface is used. The user interface displays indicators of all instruments and output sand weight displayed on the screen.

The results of the design that has been done, obtained an average output amount of sand as much as 6,9 kg/minute. The results of dust measurements around the tool obtained an average of 0,65 μg/m³. In addition, the operation of the tool can be carried out automatically properly through a user interface that has been designed while monitoring the system properly. A push button is used which is used as an emergency stop if the system experiences a misoperation which can function properly. From the results that have been obtained, this tool is able to facilitate the sand filling process and has fulfilled the health aspects of workers and also the efficiency of the tool with compact tool dimensions.

Keywords : Sanding, Resanding, PLC, HMI, Automation