

Abstract

This thesis is aimed at developing a level control system for an existing steam boiler. This project builds on the thesis "Power regulation on a demo model of a steam boiler" by Wouter Spruyt, which built on the thesis of Flor Morlion "Demo model of a steam boiler for educational purposes".

The main goal was to maintain a fixed water level independent of the steam demand. The importance of a level control on such a steam boiler is crucial for the safety of the operator, the environment and the boiler.

The fixed water level is mainly achieved by means of four weighing cells that transmit the water level (weight) of the boiler to an Arduino Uno. Based on these data, the Arduino Uno will calculate how much water needs to be added to reach the desired level, using a self-programmed controller which is programmed in the Arduino Uno. It will then control a stepper motor that adjusts the needle valve. This needle valve controls the flow of feed water to the boiler. This feed water comes from a vessel that is under compressed air, the pressure of which is higher than the pressure inside the boiler. If the water level does not reach the minimum level, water will flow into the boiler.