

A systems approach to mathematical modelling for steam accumulator in palm oil mill

ABSTRACT

The present general trend of palm oil mills in Malaysia has turned towards large scale mill processing. This increase in milling capacity requires either more steam or electrical energy. The key word today in the energy management in the palm oil mill industry is to cut wastage through better energy system and equipment design, maintenance and operation control, for efficient utilisation of available thermal energy. It is therefore, the objective of this research work to study steam generation and distribution system in palm oil mill in order to provide better understanding for solving steam demand fluctuating problems. In this research work, the steam accumulator option has been proposed to improve the steam management system in palm oil mill. A mathematical model based on conservation of mass and energy principle was developed to study the dynamics of the back pressure vessel (BPV) and the steam accumulator when subjected to different operating conditions. The results from simulation work showed that the steam accumulator is capable of reducing the pressure fluctuation in the BPV.

Keyword: Back Pressure vessel; High pressure steam; Mathematical model; Steam accumulator