

# **DEVELOPMENT OF A MODEL OF MOTOR CONTROL TECHNOLOGIES FOR ENHANCING EFFICIENCY OF MOTOR - DRIVEN EQUIPMENT: The Case of Tanzania Portland Cement Company Limited.**

**By Lomayan Mollel d(2015)**

## **ABSTRACT**

The improper motor control drives as well as low efficiency of motor driven - equipment possibly affects the plant operations. The scenario of low efficiency is happening in the big cement companies like TPCC due to lack of motor speed control technology. The old model of motor running in plant contributes too much frequency of machines failure. The poor quality of power supply feeding to motor driven equipment raises the energy consumption and increases the running cost of the plant operation.

In this research the problem of low efficiency of motor drives which causes energy loss at TPCC plant including low performance of motor control drives is like ASDs and VFDs fitted to driven- equipment systems was investigated. The research identified the factors affecting the efficiency of motor control system and energy loss and cost implications. The research focused to develop a mathematical model related to efficiency improvement and energy saving for motor control technology so as to enhance efficiency of motor driven equipment. Data were collected through questionnaire and physical and physical observation in the entire plant. The focus of the research was to develop a mathematical model of motor control technology for enhancing efficiency of motor drives and improving efficiency at TPCC.

The mathematical model of motor control control technology was developed related to three sections: 1) input data; 2) motor drives system data; and 3) output data. The input data are motor initial capital cost, supply system and constant voltage. The out data are efficient, energy and cost savings.

Modeling and simulation was done with the help of Motor Master software and results were validated using mathematical basic equations calculations and software computations.

The researcher recommends the best practice to be adhered to control the speed of motor driven equipment and introducing energy management policy. The policy will regulate the energy utilization in the industry so as to achieve optimal energy efficiency improvement to reduce unnecessary machines running cost implications.

**M.Eng.( Maintenance Management) Dissertation.**