

**EFFICIENT UTILISATION OF ELECTRIC  
MACHINE DRIVES IN THE INDUSTRY  
OF CYPRUS**

**A THESIS SUBMITTED TO THE UNIVERSITY  
OF SALFORD IN PARTIAL FULFILMENT OF  
THE REQUIREMENTS FOR THE**

**DEGREE OF MASTER OF SCIENCE**

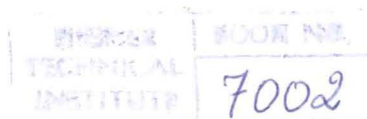
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**October 1986**



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**ABSTRACT**

In consideration of the characteristics of the Industrial sector of a small and developing economy a study is presented which reveals the state of utilisation of electric machine drives in the industry of Cyprus and examines the possible technological and financial effects from the penetration of specific electricity conservation measures.

Through an analysis of the electricity consumption records and the kVA capacity of the electricity consuming apparatus the state of utilisation of electricity is described in sectoral and subsectoral levels as well as by the form of end use. Thus it was found that 88% of the electrical equipment in use in the Industrial sector are AC machine drives. The subsequent field investigations have described the loading conditions of these motors which indicate an average loading of 51.7%, an overall efficiency of 85% and 11.9 average daily hours of operation.

Four specific energy conservation measures which are likely to be adopted locally are thoroughly discussed through a technological and financial appraisal. The provision of a benefit/cost ratio enables the comparison of the four measures and makes possible the identification of the most economical measure for adoption.

The impact from the penetration of these measures in the Industrial sector and the dominant industrial subsectors are examined taking into account where necessary the risks involved from the electricity price variations and the annual hours of operation. It was generally found that the Power Factor Controller method is rarely financially viable whereas the Energy Efficient motor can be considered as the standard type of drive for certain applications such as compressors and the Reduced Voltage approach and proper sizing of motors produce high rates of return in situations where serious underloading exists.