

The Optimisation of Power Systems Loads for a Least Cost Performance Criterion: Part I – Theoretical Basis

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Abstract: *A number of references can be made to the literature involving power factor definition and correction as applied to alternating current system. There has always been an increasing interest in improving the methods used in the power factor correction of induction motors. Recently, there has been keen interest in the determination of the maximum capacitance that can be connected across a given induction machine for the purposes of power factor correction without causing self-excitation. This paper provides a critical review of the conventional definition and interpretation of 'power factor' and identifies the limitations of such a definition when applied to abnormal loads. A new definition is suggested which encompasses the conventional interpretations for the usual steady state, linear and time invariant as well as for abnormal loads and loading conditions. This paper considers the basic approaches for power factor correction and draws some fundamental conclusions. Particular schemes for load compensation (Correction) are developed.*

Keywords: *Optimisation, systems loads, power factor, least cost, Trinidad and Tobago*