

IT SOLUTIONS TO ENERGY CONSERVATION

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INTRODUCTION

The Indian IT industry is poised for a quantum jump in terms of its contribution to the National Economy. For achieving such a growth, sufficient increase in the I.T infrastructure has to be made. To keep operations of the IT industry energy efficient, Electrical Energy Management Networks play a vital role. This article introduces computerised electrical management networks as a solution to achieve energy efficiency in IT industry.

Electrical Energy Management Network:

The essential functions of a typical electrical energy management network are

- a)Energy Accounting
- b)Energy analysis
- c)Evaluation and decision making

Energy Accounting:

Energy accounting starts with monitoring. Effective management requires that each operation be optimized from the energy efficiency point of view. This is measured in terms of the energy input into an operation in relation to the product of that operation.

Some operational parameters to be monitored include the product output, Idle-running period, stoppages and optimum loading parameters. Some Electrical parameters to be monitored should include those that contribute to the cost of electrical energy like power, power factor, Energy demand, voltage, current and frequency.

Energy Analysis

Energy analysis calls for a centralized energy management network. The use of stand-alone instruments has several drawbacks.

- a)Reading from stand-alone instruments will generally be in the form of raw data.
- b)Because of the geographical spread and resulting time lag between readings recorded manually from different instruments, the data is not correlated in real time. This can introduce large errors while subjecting to data analysis.
- c)It is difficult to relate energy consumption of a particular operation to the product output, leading to large errors in assessing energy efficiency of operations.

d) Optimisation and Energy Conservation arises from control or corrective measures and not by monitoring alone. Most of these measures have to be implemented on the basis of online data. This is not possible with off-line instruments.

e) In stand-alone instruments there is prone to be some amount of human error in assimilating the data and getting it to a centralized point of analysis which would bring in lot of inaccuracies in the overall control strategy.

Therefore, for effective management and optimization, it is essential to have a centralised system of monitoring, which overcomes all the drawbacks mentioned above.

Evaluation and Decision making

Evaluation involves extensive calculations, assumptions and plant system and process knowledge. This is an intermediate step, which is made, based on the raw input data to finally arrive at a decision for building a control strategy. Once the control strategy is implemented, it would result in the efficient use of energy, and energy cost savings.

Control-Key to Optimisation and savings

Most of the control measures for optimisation have to be implemented on-line. A centralised energy management network acquires on-line data and decision making is based on this data. Hence it provides excellent support for implementing control measures which include:

a) Control measures for optimisation of operation, leading to improved productivity or savings in electrical energy costs or both.

b) For direct optimisation and control of electrical parameters, demand control, power factor, voltage control by transformer, tap changers, etc., are typical examples.

Components of An Energy Management Network

The main components include

a) A computer system with the desired energy management software.

b) Remote units, which constitute the main electrical data generators like voltage, current, frequency, demand, etc.

c) Network components like data cables, data converters, data repeaters and data concentrators.

The remote units will be located at the load centers, power control centers, main receiving stations and motor control centers. They generate the desired electrical data pertaining to that point and send the data to the centralized computer via the Network cables. The computer receives the data and delivers it to the Energy management software which analyses the data and gives the desired decision making outputs.

The system outputs useful for making control strategy decision could be of the following types:

- a)Historic Trend chart
- b)On-line Trend charts
- c)Performance Reports
- d)Energy reports
- e)Budget Reports
- f)Alarm Reports
- g)Specific Energy consumption reports

The system output is dependent on the type of industry and the kinds of controls desired by the Industry to achieve Energy Conservation. Depending on the needs of the plant, the output report is customized to meet their needs.

These outputs can be used to analyse the plant performance by the plant managers and arrive at the control strategy and Energy conservation implementation strategy to realize cost savings.