

Energy Management in Manufacturing Industry

Energy management systems are being deployed around the world to improve energy and facilities management and to help reduce electricity and fuel. The Indian Manufacturing Industry has also shown the urgency in energy savings. The Energy management systems can assist the Plant Managers and corporate management in first understanding and then actively managing energy use and cost. In particular, this can be used for the following in manufacturing Industries.

Benchmarking Energy Consumption

Understanding the patterns of all forms of energy use and other utilities is the first step in assessing the potential for efficiency savings. With the data available through system, Energy Management system can guide the plant manager to organize and display (visualize) key energy and other parameters in real time thus providing a tremendous diagnostic tool for identifying and solving energy problems and appreciating opportunities for cost savings.

Reduction in Specific Energy consumption

The majority energy consumption in the plant is for production activity. Each product manufactured will be measured by energy consumed to make one unit of product. With Energy Management system, the plant manager can measure as well as reduce energy by close monitoring of machinery run hours and prevent idle running of machine and there by reducing the specific energy consumption of manufactured product.

Reduction in Distribution Loss

The power received from Electricity board and captive power is being fed through various transformers to various load centers like MCC, PCC Pumps, Blowers, Compressors, Fan, Chillers, Lighting loads and so on. With the Energy Management system it is easy for plant manager to identify energy consumed by each machinery. It is very important to know whether power received from source is being utilized effectively by all machines and level of the losses incurred due to distribution. By understanding the measured value, various steps can be taken to reduce losses. Ideally this loss should be less than 3% in any manufacturing plant.

Reducing Peak Demand

This can assist in reducing peak demand and associated demand charges. Regular verification of daily load profile will help plant manager to identify and eliminate demand spikes, such as those associated with simultaneous motor, pump, compressor start ups or schedule operation in such a way as to reduce overall demand. This will help plant to bring down Demand charges which need pay to Electricity Boards.

Energy Resources Planning

Our system computes the energy balance at various nodes and system losses to formulate and implement loss elimination schemes as any electrical distribution network has inherent losses. Conducts overall energy accounting. Since energy use pattern of every feeder is monitored, any variation in power consumption pattern at any process or sub section is exposed immediately for immediate control.

Eliminating Inefficient Equipment Operation

This is highly useful in quickly spotting wasteful energy use. By reviewing daily load profiles and comparing to bench mark levels, plant manager can identify the instance when equipment is not performing properly or unused equipment is left running. Our services have helped customer in saving of upto 5% or more just from eliminating gross wastage.

Predictive Maintenance

Energy management system helps in planned shut down based on run hours and efficiency of the equipment. This reduces down time and helps plan predictive maintenance. In a palm oil company, the screw press loses its efficiency because of timing, poor lubrication etc leading to breakdown and increased power consumption. The pattern of power consumption could be used as a diagnostic tool to asses the performance of the press and take decision on the maintenance schedule.

Root Cause Analysis

The system can analyze incidents like Excess energy consumption, overloading, excess T&D loss, Machine breakdown, breaker tripping, damages to capacitors etc. for which Root Cause Analysis is necessary. Energy management system helps to correct problems in production rate and product quality by analyzing the trends of energy consumption in relation to production

Measurement and Verification

Energy Management system covers the measurement and records energy consumption trends. Verifies results of energy savings measures taken. Enables achievement of the objectives with the precision, which assist in decision making.

Improving Energy Equipment Performance

Malfunctioning or degraded equipment often has an associated “energy fingerprint”. For example a broken economizer damper may be signaled by an increase in the frequency of compressor cycling. Similarly increase in ventilation or fan usage might be a result of filters than need to be changed or cleaned. Such finger prints can be detected by regularly viewing data generated by the system over the time. Energy Managers will work your plant manager in this regular review process and will help in the “fingerprinting process”

Remote Energy Efficiency Consultancy Services

This is a remote monitoring of EMS system through Internet which does complete data analysis and also under standing process of the plant and single line diagram. Based on consultancy, the saving opportunity in the plant is being found and recommendation of Energy Efficiency measures report is being submitted.

The consultancy service is being done by Energy Auditors and Energy Managers for few months along with concerned plant in charge who operates the system.

The benefits under Remote Energy Efficiency Consultancy Services are

- Optimum energy utilization
- Analysis of load profile and energy pattern
- Detection of Idle running heavy equipment to reduce specific energy consumption
- Demand monitoring and management and reduction in demand charges.
- Power factor improvement and solutions,
- Power quality and harmonic monitoring and management,
- Quantifying T&D loss,
- Increase Productivity and better resource utilization and higher profitability

Conclusion

To manage energy efficiently in your Plant, building or utility you need to start by asking the right questions, which often leads you half the way to the final answers.

Reference Book

Electrical India
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