

ENERGY MANAGEMENT

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Abstract - Energy has become one of the main expenditures in our society. Energy management includes arrangement and operation of energy consumption unit and energy generation. The main objectives of energy management are to achieve and maintain optimum energy procurement and utilization throughout the organization to minimize energy costs without affecting its production and quality. Energy management system is a technique used to achieve a proper ratio to be maintained on power supply side as well as end user side. The paper suggests as direct load control, dispatch load management is a technique for managing the load at power supply side. Energy consumption can be reduced by monitoring and controlling the system by reducing the cost. To achieve efficiency by managing energy at power generation side as well as consumer side.

Key Words: Energy Management, Energy Audit, Demand Side Management.

1. INTRODUCTION

Nowadays electrical energy is very important for every work because the entire equipment machine and other things (light, fan, mixture etc.) work on the electrical energy. Due to that we cannot imagine the world without electrical energy. But this electrical energy is generated by using various sources such as thermal energy (coal, plant) hydro energy (water) etc. But this all energy source is very limited because this type of energy source generated under the earth. This is a very long process due to that this is limited. But nowadays population is increasing day by day due to that electrical energy use also increases according to the population. So nowadays need to move on other techniques to generate electrical energy but this is not only one way to use electrical energy because a huge amount of electrical energy is waste and misuse. Due to that it is necessary to do proper management of electrical energy. This is one of the ways to save electrical energy. If management of electrical energy is proper then there is no need of generation of electrical energy more due to that large amount of cost or investment for generation of electrical energy is reduced and also reduced the pollution due to electrical energy. Momentum is given by reestablishment and enterprise of power system to energy management principle. It's

necessary to reduce expenditure of energy in the existing system has been a traditional and significant strategy for the achievement of any organization. So the energy audit has to play an important role in energy expenses. Its analysis would be helpful in finding out energy conservation measures in any organization [3]. Energy audit is one of the techniques which consist of an analysis of energy use of organization. The information required for energy audit can be obtained from building management system without disturbing day to day working of the organization.

2. ENERGY AUDIT

“Energy audit is the key to a systematic approach for decision-making in the area of energy management. It attempts to balance the total energy input with its use, and serves to identify all the energy streams in a facility. Industrial energy audit is an effective tool in defining and pursuing comprehensive energy management programmes. An energy audit is an inspection, survey and analysis of energy flow. Audit means that it is necessary to find a way of describing what constitutes good, average and bad energy. The need for energy audit gives a positive orientation to reduce energy expenditure. It is used to identify energy being consumed. And organized the correct energy efficiency programmes.”

3. ENERGY MANAGEMENT

The energy management is defined as the effective utilization of energy to increase profit or to reduce cost of energy per unit for an organization. This idea made possible the method for minimization of energy requirements. The main objective of energy management is to reduce cost, minimize environmental effect and also optimize energy utilization throughout organization.

4. ENERGY MANAGEMENT TECHNIQUES

Energy management embodies engineering, architecture, application and to some extent.

i) Direct Load Control

During peak demand periods DLC is to allow utilities to turn specific appliances on and off. Load management sources expenditure for both utilities and consumers by

minimizing the need for generation capacity. The benefit of the DLC includes power system production cost saving, power system generating capacity cost saving and power system loss reduction.

ii) Dispatch Load Management

The load dispatch department is the nerve centre for the operation, planning, monitoring and control of the power system. Electricity cannot be stored and has to be produced when it is needed. It is therefore essential that power system is planned and operated optimally and also economically. This is the main objective of load dispatch centre. The objective of load dispatch department is regulating the system frequency optimum utilization of resources matching the power demand with system reliability and security of generation and transmission facilities.

5. ENERGY MANAGEMENT SYSTEM POWER GENERATION SIDE

The power generation plant produces and supplies the electrical energy to the consumer. It is also able to deliver sufficient electric power at a high rate of reliability and good power quality. The power utility is divided into four section like generation, transmission, distribution and retailing of electric energy. We know that electricity is a construable product. The goal of supply side energy management is to organize this complexity. While demand side energy management focus on saving energy. At supply side management involve focus on CHOOSING energy resources and then orchestrating them in the most cost-effective configuration for your operation. For example on a hot afternoon when power demand on a electric grid is high and prices are edging upward, it may be cost effective to use energy from your on site solar panels than form the grid. or per phase your facing the opposite circumstances. Grid price are low, so it's best to buy electricity and store the energy generated by your solar panel in your on site battery you then can use the stored energy at height or when electricity prices rise.

6. ENERGY MANAGEMENT SYSTEM THROUGH CONSUMER

This section focuses on EMS techniques used to manage electrical energy on the consumer's side. We applied different method undertaken on the consumer side, to reduce energy cost.

i) Power Factor Correction

Power factor is ratio of Kw and KVA and drawn by electrical load. Inductive load such as induction motor can cause a low power factor in industries and low power is penalty by the power company. Low power factor is

undesirable from economic point of view. Following are the causes of low power factor. Arc lamp, electric discharge lamp and industrial heating furnaces operate at low lagging power factor. The load on the power system is varying being high during morning and evening and low at other times. During low load period, supply voltage is increased which increases the magnetization current. This result in the decreased power factor. The improvement of power factors is very important both consumer and generation station. Important of power factor improvement regulation of the line is improved. Following way given below to improving power factor such as when the use of a synchronous condenser and also used of capacitors.

ii) Lighting

In order to lower the energy bills improving the lighting efficiency is one of the easiest ways. While deciding and replacement of lighting consideration of type of light, the location, lamp technology, the lighting condition, the correct control system and remaining component of commercial lighting system. In order to reduces electric expenditure following are the way for optimization of lighting of your business. As CFL are four times efficient and its life is 12 times longer than incandescent bulb. Due to this reason incandescent light are to be replacing CFL lighting indoor and outdoor. For outdoor lighting system usage of photocell or timer is proved advantages, so that they can automatically switch off. For indoor lighting system, the lighting level can be adjust according to our needs with three way lamp, dimmer switch for overhead light and task lighting. By replacing the work area near the window use of natural lighting is very advantages. By doing installation of occupancy sensor, light will rich automated in unoccupied room.

iii) Motor

To reduce the amount of energy which is need to run a motor, motor efficiency is improved and servile measures are taken for it. In order to reduce the cost, the inefficient motor can be replaced. With premium efficient motor. This can increase productivity and reliability of motor. Following are some point that can be helping improving the motor efficiency. If you want to buy a new motor select the motor energy efficient as well as cheaper motor. The cost of premium efficiency motor is 20% more but they can have relatively short payback period. The lower power factor motor may be operated at low load factor and having with less efficiency. At a higher load V -belt can slip and it can be deteriorated also there is a reduction in efficiency by using synchronous belt rather than V- belt optimization in transmission efficiency is achieved. When the load is vary significantly the variable speed drive motor in place of traditional motor are proved more advantages. The voltage of the motor will not exist its design limit which is on the name plate. If it happens this will decrease the power factor

your power company may be penalty you for the low power factor.

iv) Air Compression

Air compression is the overpriced component of the plant which needs more energy consumption than any other. The following are some remedies in order to reduce energy consumption in air compressor. For optimization of performance, compressor are stage with control and regular maintenance is required .The implementation of company the wide compress air management policy in order to reduce unnecessary used and also fixing of leaks and synchronizing use supply and demand.

v) HVAC

The 30% of energy can be consuming by HVAC component. The determination of energy usage by HVAC system is essential while purchasing new equipment. The business utility can be control by well designing the system and using effective energy saving technique. When purchasing new equipment, select unit that are energy star qualified. And combined a dehumidification component to your HVAC system to increase customer comfort and reduce the for large equipment.

7. CONCLUSION

In this paper, direct load control, interrupted load control and time of use (TOU) are method used for load management. These are the method were implement an demand side and developed on the supply side and by using these method system peak demand is reduced and reliability of power supply can be improved. Load management can also be achieved by power factor improvement.

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