

RICE MILL INDUSTRIES BASED ENERGY CONSERVATION, MONITORING AND CORRECTIVE TECHNIQUES

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Abstract

Energy consumption is increasing at a very fast rate. With growing demand for energy it has become essential to minimize energy leakages. This paper shows the present status of energy crisis in A Rice Mill by installing load capacitors in various induction motors having different ratings. Energy conserved is Energy Generated. Optimum use of electrical energy, not only results in cash savings, but also improves the economy of the country substantially. Hence there is an urgent need for energy management and control, which ultimately concludes with the practice of energy conservation.

Key Words:Energy Audit, Energy Consumption, Energy Conservation, Payback Period.

1 INTRODUCTION

Energy crisis is one the crucial problems faced by all the countries in the world due to depletion of natural resources. The fundamental

goal of energy management is to provide services with the least cost and least environmental effect. India is among the top growing countries in casting and forging units. These units consume a large portion of electricity. The work presented in paper explores the possibility to minimize the wastage of energy in these units. A careful study of various hp induction motors have been carried out in this paper in which load capacitors are installed to various motors to improve the power factor. Before installing capacitors various parameters like size, ratings are finalized so that minimum cost of installation should occur and losses and payback period should also be minimum. After installing the capacitor banks the new values of various parameters are compared with the actual values of rewind induction motors. Calculation of optimum capacitor size and rating to have minimum expenses and running cost.

2 LITERATURE REVIEW

Audit is a systematic independent inspection of an industry or organization. Energy audit is defined as the verification, monitoring and analysis of use of energy including submission of technical report containing recommendation for improving energy efficiency with cost benefit analysis and an action plan to reduce energy consumption[1]. Energy audit is an analysis of energy consumption in building and reduces energy consumption without negatively affected outputs. Energy audit can be classified into i)Preliminary Audit ii) Detailed Audit. Preliminary energy audits relatively quick exercise; it estimates the scope for saving using the existing or easily obtained data and helps identify the areas for more detailed study [2][3].Energy audit can be one of the fastest and cheapest solutions, to mitigate gap between energy demand and supply. Every day the demand for electrical energy is increasing due to fast progress in industrialization, population growth and urbanization. The study also shows that energy audit can prove to be a cost effective and holistic approach for energy conservation and for sustainable environment [4][5].

Energy audit is first step towards understanding how energy is consumed in selected premises as it indicates where the potential lies for energy conservation and shows areas where energy manage-

ment is required [6]. The starting point any lighting energy audit would be existing lighting scheme. With this input the audit provides detailed information on retro-fitting or replacing of existing luminaries, with complete cost of project, annual energy savings and payback calculation. After the calculations and necessary modification, it is important to verify the luminance levels on the task planes before and after changeover to make sure that ample level are maintained after the lighting system is modified [7-9]. Efforts for optimizing energy consumption in lighting should concentrate toward using new energy efficient lighting equipment, promoting localized task lighting, and implementing automated lighting control schemes to avoid energy wastage during day light hours. It is important to think ways to manage energy intelligently and reduce energy cost, at the same time maintain required quality understanding the opportunities and risks involved [10-15].

3 METHODOLOGY

Energy Audit: Energy audit is an inspection of various electrical appliances in which our motive is to reduce the amount of input energy without affecting our output.

The main purpose of an energy audit is to find out the energy usage patterns, the amount of energy used, and most important - the amount of energy needed. Next, based on these findings the auditor must develop possible scenarios of energy efficiency with precise recommendations and return on the investment analysis.

To study the energy savings by using energy efficient utilities, we would like to compare the energy consumption of conventional utilities with energy efficient utilities. To carry on our comparative study, we proposed energy auditing before and after with various appliances. To minimize external effects on the system, we planned to compare the energy consumption.

The following table shows the before and after energy audit values.

S.NO	MACHINES	BEFORE ENERGY AUDIT				NO'S	AFTER ENERGY AUDIT			
		HP	WATT	UNIT	COST		HP	WATT	UNIT	COST
1	PADDY CLEANER	7	5222	26684.42	244162.443	2	4	2984	15248.24	139521.396
2	PADDY HUSKER	13	9698	24778.39	226722.2685	1	10	7460	19060.3	174401.745
3	DE-STONER	21	15666	40026.63	366243.6645	1	17	12682	32402.51	296482.9665
4	INCANDESECNT/CFL		15	153.3	1402.695	4		9	91.98	841.617
TOTAL				91642.74	838531.071			66803.03	611247.7245	

Table.1.Before and after energy audit value

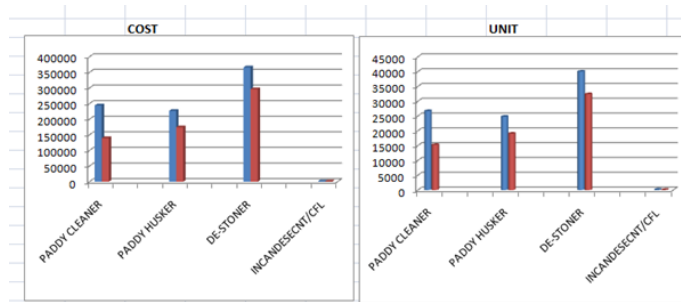


Fig.1.Graphical representation of Energy audit, here X-axis machines and Y-axis Cost & Unit. *Blue Color-Before energy audit/ Brown color-After energy audit

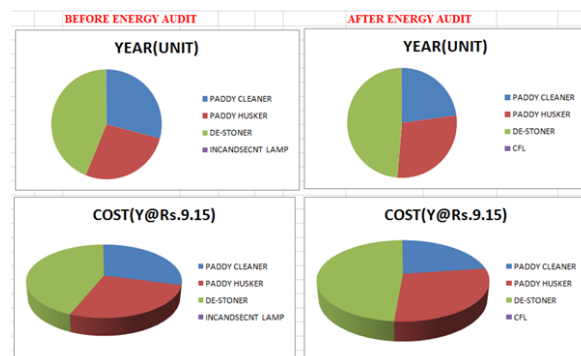


Fig.1.Graphical representation of Energy audit in pie diagram

4 CONCLUSION

Energy efficiency is one of the most important and most cost effective tools that can be applied for any facility. The goal of energy efficiency is to reduce the amount of energy required to provide products and services, or a healthy indoor climate.

From above analysis, energy conservation through energy audit has shown tremendous improved results.

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