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Any meaningful impact of an energy manager in a firm depends heavily on his/her ability to organize energy data logging as well as data collection from various departments of the firm not to mention data analysis and aggregation. The energy manager is faced with not so trivial issues such as comprehensiveness of data as well as correctness of data. Validation is as well an issue. Even in so called ISO 900X certified companies, which are supposed to regularly calibrate and repair in line instrumentation, sometimes instrumentation is simply not working. A stunningly simple procedure to make departments accountable for energy consumption is to either internally charge departments for their energy consumption, or even assign consumption ceilings to individual equipment. There are advantages as well as disadvantages making a boiler, or the ceramic tile department, or a motor-fan arrangement into a profit or loss centre. Tell us about your experience with internally charging departments for energy consumption, or any other management schemes to improve on energy accounting in your firm. No technical solutions please!! They are all known to us."

ENERGY ACCOUNTING & CONSERVATION

Varieties of sources of energy are being used by large number of organization for various purposes having diversity of effectiveness and efficiency. However, one thing is common for all of them that consumption of energy always add to the cost of their product and services. Conservation of energy is important for making the organizations cost effective at the same time; it is their social responsibility too. Saving of energy is same as generation of energy. It helps in improving the economic welfare of the consumers by making the product price effective and support the society by providing clean environment and makes additional energy available for future consumption.

In my opinion, the first and the foremost step to make any organization energy effective is to prepare energy balance sheet. It is the typical experience of the industries that whenever energy balance sheet is prepared substantial amount of energy is found lost unaccounted. Neither any department nor in any product fetches the responsibility of this piece of the pie and it ultimately leads to loss for the organization. The first and foremost action should be to identify and minimize such losses.

Identification of unaccounted energy and quantifying the same is not very easy task because it depends on large number of factors having no common rational in inter or intra industry conditions. However, measuring energy consumption in different departments of the organization to find out total energy consumed and comparing it with the energy supplied over a specified period of time makes it possible to identify the energy left unaccounted.

The basic principle of energy accounting is always true, that if you can't measure you can't control. Task of measuring energy consumption is two fold, involving technical facilities and managerial monitoring aspects. Choosing right type of energy measuring device is premise for success of metering and energy accounting. At the same time, maintaining the same in proper working condition with appropriate accuracy is the managerial aspect, posing challenge to the energy managers to demonstrate their ability to make the organizations success. Even in the

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organization having certifications for the excellence of performance like ISO 900X, sometimes may have metering and equipments with cross compensating errors or device for alarming deviation not in working condition. Such devices can successfully mislead the energy managers and result in a national loss. Energy Auditor identifies the flow of energy consumed in each step and pinpoint where energy is wasted. Energy managers are, therefore, not only responsible for collection of data and their aggregation for analysis to produce the information but are also responsible to ensure the correctness of the data. They are supposed to validate the data at various points of process and apply cross checks ensuring the adequacy and comprehensiveness of the data. This data ultimately creates the foundation for the success of organization. The whole exercise calls the energy managers to involve themselves in the process of calibration and periodic/preventive maintenance of instrumentation segment too.

After ensuring the accuracy and adequacy of data, by aggregating the same for a specified period of time, energy balance can be prepared and the areas resulting in unaccounted energy can be identify, but this is not in the end of the task. This calls for an intelligent managerial aspect of the energy manager to convince the concerned department including HOD and the employees that such loss is occurring in their department.

Typically in the Indian scenario I have the experience that once the men are convinced they can do miracle. My major experience is in power sector. Specific oil consumption for thermal generation should have been in the range of 2.5 to 3 ml/unit for the machines we have. However, it was invariably above 15 ml/unit. In spite of repeated efforts the performance was not improving. When the task was assigned to me, I divided the problem into two discrete sections, one technical needs and other managerial aspect. Technical investigations reveled that only a small expenditure was needed to meet the technical requirements and was mainly on the measuring instrument. These were fetching lower attention during routine maintenance because working of these equipments was not mandatory for running of the units. At the same time on the managerial aspect I noticed two problems viz. Lack of awareness and Lower Incentive to act upon.

I took the matter to the appropriate level of management and ensured that the investment required in the instrumentation side is done. Secondly I started awareness programme. Small posters were published weekly and got pasted at appropriate places in the power houses containing eye opening messages like "Saving of 1 ml in specific oil consumption yield an overall saving of Rs.10 Cr in a year", "In firing of one oil gun for one hour, cost of oil required is equal to one month salary of a Jounier Engineer" etc. Sharing of saving was the next step and was found most effective too. Profit sharing scheme was offered to the employees in which a saving of 10 % of amount oil saved was to be distributed amongst the employees. Providing necessary measuring devices for oil, efforts to generate awareness to save oil and motivation conveyed a positive message amongst the officers and employees. Lot many suggestions came from the user group, acceptable one were implemented and recognition was conveyed to respective person. The summary effect of these efforts generated a motion amongst the men to reach the Himalayan target. The result was more than expectations and to my satisfaction present level of specific oil consumption now is about 2 to 3 ml per unit.

The idea of sharing the above experience is that if men in the organization are convinced they can do miracle. Setting up of norms, measuring the actual performance, comparing them and intimating to the responsible makes effect only he is convinced about the variance and prepared to take corrective action. Else he will find n number of justifications and will prefer to invest his time and energy to prove that existing performance is best possible in the given set of conditions.

Making the department / facility profit centre or putting up ceiling on consumption are beyond doubt tools in the hands of management. They can easily bring the link between supply and consumption. The loss of energy can be located and responsibility can be fixed. However,

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both of them are not adequate. Making the departments profit centre some times may result in playing with the instrumentation and mal practices in getting apportionment done. Putting ceiling on the consumption may some time result in lowering the output. Energy conservation should not be confused with lower consumption, which affects the quantity/quality of output, but it means lower specific consumption and effective use of energy. In my views there has to be a comprehensive mechanism, involving measuring, monitoring, communication, awareness and motivating sub-mechanisms backed up by adequate incentive schemes.

Incentive may be of two types; monetary and non-monetary. They need be carefully applied. Monetary schemes are capable of providing imaginary results in one sector of people whereas it may find other sector immune to. This sector gets motivation by non-monetary reward e.g. recognition. The satisfaction of achieving the target and recognition of being identified as best, most of the time does not cost anything to the management, but is the best incentive to the executive class. Thus appropriate scheme should be applied, depending upon the cadre and class of the work group.