OPTIMIZATION OF RESOURCE UTILIZATION OF PRINTING PROCESS THROUGH CLEANER PRODUCTION

BY

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EXECUTIVE SUMMARY

In the past, the human being could use more limited resources than they do now. With the population growth, development of technology in diverse areas and modernization of society, the utilization demand for such unlimited resources have gone up and the world has to reduce use of resources per capita tremendously, before some of such resources depletes completely. Not only the availability of the resources, but by products and wastages from the processing and usage of these resources adding into the environment is another dimension the technologists and industrialists have to thought of. Although pollution of the environment is one dimension of the threat to the human being, damaging the environment which cause full threat to fauna and flora is a third dimension that everybody should be concerned, before the life on the earth comes to an end on a future date.

The concept of Cleaner Production has evolved in an attempt to address the above issues. This is a continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency, and reduce risks to humans and the environment. Cleaner Production can be applied to the processes used in any industry, to products themselves and to various services provided in society.

In this research project, a 'Cleaner Production Audit' was conducted to find out the possibilities of applying cleaner production solutions to achieve resource efficiency, process effectiveness and environment friendliness of printing process at the press of the Open University of Sri Lanka (OUSL). The OUSL press is considered to be the money spinner and use of resources sparingly and reduce wastages would bring more income to the University and save cost tremendously.

At the initial stage the background of economical and environmental impacts of the general industry and subsequently the background of OUSL press were studied. The OUSL press is catering the total annual requirement of over 36 millions A4 size equivalent pages of course material and other documents for more than 20,000 registered students. In this event the press has incurred a material cost of Rs. 14,267,814 and total cost of Rs. 28,311,348 in the year 2002.

Then a literature survey was carried out to get a thorough knowledge of the concept of cleaner production and its activities as well as the printing industry.

Above studies were very useful to formulate a suitable methodology to perform a Cleaner Production Audit for this study.

In the process analysis, all the process steps and their inputs and outputs were analyzed and then identified all waste streams. It was observed that the major stream of waste is paper and the percentage is nearly 20%. The waste reduction by half will give a saving of over Rs. One Million per annum. The printing operation uses hazardous chemicals. Though the cost component associates with the chemicals is nearly 0.8% of the total material cost, the environmental effects are very large. Since all used and waste chemicals are discharged to normal drainage systems, which lead to 'Diyawanna Oya', it is very essential to avoid or minimize those discharges and it can be achieved through Cleaner Production solutions.

In this exercise the root causes for waste products were identified and studied in depth. CP solutions for each problem were generated.

Generated CP Options have been prioritized considering technical, environmental and financial feasibility. Also, it has been categorized according to the implementation cost and an economical evaluation has been carried out to compute the expected savings. It was expected more than a million of rupees through low cost options and more than two million of rupees with all the options.

It was interestingly noted that the press workers are unaware of the wastes and the extent of the wastes, but they simply consider them as inevitably generated in the process, which should discharge to the environment as waste materials. Therefore educating and training of the workers about Cleaner Production concept will help to sustain the CP activities and reach the expected achievements.

Although the CP options seems to be simple on the face of it, the implementation of the solutions would make substantial savings to the extent of two million of rupees. CP solutions are continuous and they should be integrated into the production system. It requires high-level commitment of the managers and all others concerned in the production process if a production and operation system integrated CP solutions is to sustain.