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Good Housekeeping in Latex Industries

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Abstract-The production of rubber and rubber products is a large and diverse industry. Health hazards in synthetic rubber production are primary related to exposure to monomers. An excess incidence of leukemia has been observed in styrene/butadiene rubber production, attributed to exposure to 1,3-butadiene. Excesses of cancer and respiratory disease have been reported, although specific causative agents are rarely identified. Exposures have varied greatly over the years, based on changes in materials used, work practices, and ventilation. Good Housekeeping practices could provide a real economic asset and advantage for companies. For instance, minimizing the use of raw materials, energy, and water, as well as waste and waste water, leads to cost reduction. Furthermore, by adopting Good Housekeeping practices, enterprises could reduce the level of environmental impact created by the company. A Companycould improve its image – and that of its products – vis-à-vis customers, suppliers, neighbors, and regulatory authorities. In this research, much could be accomplished at a low cost, or even through cost savings, and in ways that are easy for SMEs to implement. The implementation of Good Housekeeping measures requires internal communication, motivating employees, and setting clear responsibilities. These aspects must be addressed as part of the implementation process, which could lead to organizational benefits that help a company to improve its performance in the longer run.

Keywords-Cleaner production, wastewater, pollution, cost saving, productivity

I.

INTRODUCTION

Good Housekeeping refers to a number of practical measures based on common sense that enterprises can undertake immediately and on their own to improve their productivity, obtain cost savings, reduce the environmental impact of their operations, and improve organizational procedures and workplace safety. Thus it is a management tool for cost management, environmental management, and organizational change. When these areas are adequately taken into consideration, a "triple win" (economic, environment, organization) can be achieved and a successful process of continuous improvement in the company can be established.

Efficient production and a good working environment are complementary. The elimination of inefficiencies and accident hazards caused by unfavorable conditions in and about the workplace is essential in getting the job done properly and safely. The Good housekeeping is focused on three main benefits in the form of triangle as shown under



Fig. 1.1 Benefits of Good Housekeeping

OBJECTIVES AND SCOPE OF RESEARCH

The aim of this research is to identify strengths and optimization potentials, its actual effects and causes, as well as inexpensive, easy-to-identify, common sense measures. This research has also the specific objectives as mentioned below:

II.

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- 1. To reduce cost of production in latex industries.
- 2. To minimize air pollution from latex industries processing.
- 3. Treatment of wastewater from generated by latex industries and its management.
- 4. To suggest improvement of safety in latex industries
- 5. To suggest the measures for improving the productivity in latex industries.

The scope of this research is to study the management of latex industries in terms of productivity, cost saving, pollution, organizational improvement and safety. Case study of this work is done at Eagle Foam Industries, Ahmedabad.

III. DES CRIPTION OF GOOD HOUS EKEEPING

According to Dr. Edith Kürzinger, Petra Kontny-Eimer, Joyce Miller, (GTZ),2006, the authors have described the Good housekeeping as:

- Rationalizing the use of raw materials, water, and energy inputs, reducing the loss of valuable material inputs and therefore reducing operational costs
- Reducing the volume and/or toxicity of waste, waste water, and emissions related to production
- Reusing and/or recycling the maximum of primary inputs and packaging materials
- Improving working conditions and occupational safety in the company
- Making organizational improvements.

According to Dong Nai province, Vietnam, 2004, waste hierarchy refers to the 3Rs of reduce, reuse and recycle, which classify waste management strategies according to their desirability. The 3Rs are meant to be a hierarchy, in order of importance.



Fig. 3.1 Waste hierarchy

The following diagram shows how to check the activities related to good housekeeping in latex industries: Energy, safety, waste water and storages



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Fig 3.2 check list diagram

The above diagram describes the overall activities regarding the cleaner production and good housekeeping in latex industries. In order to improve the productivity of latex industries it has seemed that the management of wastewater, air, energy consumption and overall factors affecting the cost could be taken into account and provides ustainable measures for potential production.

IV. DATA COLLECTION

Eagle Foam Industries, located in Odhav (Ahmedabad, India), is one of the leading Manufacturing of 100% Natural Rubber latex products like mattresses, pillows, cushions, sofa cushions, scooter seats, bus seats, footwear cushion seats since 1989. The latex used in Eagle Foam Industries comes mostly from Karala, south of India, in 200 Kg barrels. Ammonia is added in latex from Karala (60% rubber, 40% ammonia) to prevent coagulation as it takes some days to reach Ahmedabad. The first step is the removal of ammonia from latex; it takes around one (1) hour. This is done with a kind of rotation of discs. The data collected was summarized in the form of tables according to the additives as mentioned below: the table 4.1 shows the second step of latex mixed with additives and shows the proportions of additives; but before the mixture, each additive has to be prepared separately.

Rubber plus additives								
composition	sulfur	Zinc oxide	Sodium	Soap	rubber			
proportion	50g	50g	87g	60g	1kg			
Composition of sulfur(50g)								
sulfur	ZDEC	ZMTB	Dispersal	Water	Time			
9 kg	5kg	4kg	700g	301	36h			
Composition of zinc oxide $(50 g)$								
Zinc oxide	Water	Time						
50%	50%	undefined						
Composition of sodium (87 g)								
sodium	Dispersal	Water	Time					
15 kg	700 g	301	15h					
Composition of soap (60 g)								
Castor oil	Caustic	Water	Boiling					
	soda							
8 kg	2.5 kg	60 l	1 to ½ hour					

Table 4.1: all	additives	proportions
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After all this is done, it (latex + additives) has to be mixed with maize powder in order to create foam. The amount of maize and the time of mixing are not defined and it is done with the help of a mixer. After mixing, latex is poured in mold, depending on the product they want to obtain like mattress, scooter seat etc. The mold is then introduced in oven where the latex becomes a solid mattress. The mattress is then quizzed to remove water from it and then introduced in another oven from where it will get dried. The duration of this process is approximately two (2) days. **V. DATA ANALYS IS**

Cost saving estimation

Energy Potential gross saving/year

> 30 x actual cost = gross saving 100

The electricity bill/year is 200,000 Rupees. So the gross saving will be

70	x 200,000		
		=	140,000 Rupees
	100		

Net saving

As the company will pay some materials to provide solar energy, we have to subtract those fees from the gross saving to obtain the net saving.

Gross saving – additional costs = net saving

The solar panel they have to pay the solar panel at 50,000 then the net saving will be

140,000 - 50,000 = 90,000 This is the cost saving in energy for the first year. The following years they won't have to pay any solar panel, so cost saving for energy will remain 140,000 Rupees/year.

VL OBSERVATIONS AND SUGGESTION

A. OBSERVATIONS

After collecting data from Eagle Foam Industries, the following observations have been drawn as shown under:

Storage and Handling of Materials

- Raw materials are stored inside the working place.
- The floor of the chemical store is not flat to allow easy handling of chemical containers to prevent spills.
- No sufficient ventilation is provided to keep humidity, temperature, and the concentration of fumes and vapors at a low level.
- No warning signs describing precautionary and preventive measures have been posted in areas where hazardous chemicals are stored.
- The storage area is not kept clean to avoid any contamination of raw materials.
- Substances are not properly labeled to prevent any mistakes on the part of workers.
- The expiration dates for all raw materials to avoid having inputs that are no longer usable are not verified.

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- No instruction for workers to avoid using the same tools (e.g. scoops, cups, buckets) for measuring andremoving chemicals in order to avoid contaminatingstored materials.
- Smaller containers used to transfer chemicals are not clearly labeled.

Water and Waste Water

- 2000 liters of water are used per day.
- They don't know the quantity and composition of waste water generated each month.
- Still bath is used to avoid continuous rinsing with water and to reduce water consumption.
- Personnel are not informed about what could be achieved by reducing water consumption.
- No signs posted near taps reminding workers to conserve water.
- No instructions posted (in the local language or by using symbols) asking people not to throw waste into thetoilets.
- The enterprise is connected to an appropriate wastewater treatment center.

Energy

- 8 tons/month of wood are used to provide heat.
- Running equipment when the machines are not in actual use for production is avoided.
- Electric devices adequately installed.
- Adequate and energy-saving bulbs are used.
- Employees are instructed to reduce any preheating periods for machinery as much as possible.
- Personnel are instructed to switch off lights, fans and stand-by equipment when not in use and at night.
- No energy-efficient electricity generators are available to handle power cuts in the most important production steps.
- They don't checked possibilities to replace electrical equipment by machinery that is able to use other energy sources (e.g. gas, fuel) in order to increase independence from public power supplies.

B. SUGGESTIONS

Energy

- They can use solar energy to provide electricity in the whole company. This way they can have around 70% of cost saving in electricity bill as they work more in day time than night time.
- They can replace woods used to provide heat by mineral coal. It cost less and will avoid smoke generation.

Water

• They can collect rain water and conserve it in special tanks; they can use it for washing of final material. Cost reduction for water can go up to 50% depending on rainy seasons.

Solid waste

• Solid waste is due to the fact mold is overloaded from the process. Pouring latex in mold should be calculated and should be done carefully so that latex will not get out when mold is closed. If this is done properly then there will be cost reduction in waste disposal around 50%.

Safety

- Helmet, gloves, masques, goggles and boots must be provided to workers for their health and safety. If this is done then the company will have cost saving in insurance.
- Some of the machinery in motion should be isolated to prevent any accident

Storage

• The raw material should not be stored in the working place. As there's a lot of free place in the factory, an extra room can be built for that purpose. This will reduce floating particles, bad smell and workers will breathe properly.

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