State of Material Handling and Safety in Paper Industry

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ABSTRACT

The subject of handling materials related to safety in Paper Industry, is an exceedingly important. Various products including raw materials, processed and finished goods, scrap and wastes used or produced in industry must be handled properly and scientifically.

The names used, therefore, must vary to meet such factors as state of materials, size, weight, rate of handling, distance moved, the purpose of moving or handling to mention a few.

The methods and procedures used vary, not only among plants, but also between departments within a plant. Therefore, the handling of materials is an important function of overall - planning. The need and problems of each department also must be studied in detail and suitable methods decided upon. Since the subject is so vast, the discussion in this article is limited to certain phases of it that are of major importance to safety.

Inspite of several difficulties faced by the paper in its early years of development, it has, today, established an important place in the industrial structure of the country. From a total production of about one lakh tonnes in 1950, the production exceeded a million tonnes by 1980, thus accounting for a ten-fold increase. With this massive increase in production, it is essential that the paper industry should pay due attention in material handling and safety. Here we have taken the opportunity to indicate some of the relevant aspects in Material handling and Safety.

Requirement of skilled manpower

Inspite of all modern technologies and automotion, Man power remains the prime factor in paper industry. Without the help of competent and well trained persons, no sophisticated modern machines or systems can be effective and fruitful. This should be kept in mind that with the rapid growth of paper mills, the trained manpower should be created. Otherwise, paper mills can not be run with high efficiency and profitably. These skilled and trained persons will operate the machinery very efficiently and smoothly. In this matter specially small paper units are facing serious problems due to shortage of skilled and well trained man power.

Proper operations of Raw materials and Chemicals

Different types of raw materials are consumed by the paper industry. Small units are often based on non-conventional raw materials. So due to improper operations, it has been often found that water reuse, material handling and processing remain overlooked at the cost of ultimate productivity and product quality. Random storage of raw materials in scattered and in unprotected conditions will increase the storage cost. Moreover inadequate sorting of non-conventional materials like rags, waste hessain and waste paper will also contribute in reduced productivity.

Paper industry consumed large quantity of cooking chemicals, like caustic, chlorine etc. These chemicals need some special techniques in handling and storage. Otherwise, these hazards on material will cause a danger in the paper industry. Particular attention should be paid to the loading and unloading section of all types of conveyers since it is usually at these points that trouble develops. The most important from the stand point of tonnage handled are the various types of conveyers, cranes and bucket elevators. Most of hazards connected with the use of these devices arise from the

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possibility of injury from contact of moving machinery. Bucket elevators, in particular, have difficuly with joining of materials between buckets and side of the bats. Due to accumulation of materials on the sides, and it may frequently prove to be very difficult indeed to accomplish regular discharge of materials from them. This should be well checked and handled by the skilled personnels.

Paper making technology has undergone rapid change during recent years. However, there has been little improvement in the Crane technology used in mills. Crane requirements are unique to each mill. To be cost effective, each crane must need the performance requirements of its particular applications in the most economic way. The analysis design and selection of paper mill cranes depend not only on available crane technology but, more important, on the paper mills technology.

Proper chemical recovery and waste water recycling

It is an irony that the Paper industry which meets the daily requirements of various grades of papers and employments to the thousands of people also creates some enviromental and pollution hazards in the course of processing of raw materials to finished paper products. The consumption of chemicals in the Indian paper industry also leaves room for substantial improvement. The average consumption of caustic soda varied between 39kg. to 141 Kg. per tonne of white printing paper, among the various mills while the consumption of chlorine varied between 33Kg. and 150 Kg. without considering the small units of paper mills nor the grades of paper. A substantial part of these costly chemicals is not recovered properly and is washed into the effluent emanating from the paper plant. Apart from the inefficient system of production this implies, the enviromental pollution that would inevitably results from such large quantities of chemicals in the effluent, can easily be imagined. This will cause a great threat to the safety of the people, living down stream of the discharge points of such effluent as a result of neglect. It is a moral obligation and social responsibility for the paper manufacturer which can not be denied. Therefore, there is urgent need to have a good and modern chemical recovery system in each paper mill.

Chemical recovery is an aspect which is appreciated by both paper technologists and manufacturers. This will affect not only on the economy in cost but also increase efficiency of production. Again, this aspect can not be neglected at the cost of social safety. Proper modernisation will not only help adequate chemical recovery but also neutralisation of chemicals in the effluent in such a way that about cent percent recycling of water is possible. This waste water can be used for irrigation purpose in the plant cultivation with success.

A large quantity of water is used in the processing of pulp and paper. But availability of fresh water for irrigation and human consumption is not exactly abundant in the country, so proper water management is necessary by the expert personnels. This problem is closely interlinked with the problem of effluent disposal. So proper technological know how is required for the management of effluents which will automatically result in a greater recovery of chemicals and at the same time re-cycling of water as an input.

In fact more efficiency in chemical recovery and recycling of water will result a good economy and on the other hand will serve the purpose of control of pollution, which has got tremendous effect on human health and safety. Considerable R and D work is reportedly underway in the west to design closed cycle systems without wastes or pollution. Such systems serve a twin purpose with a well designed water re-use system and a good effluent treatment, so that fresh water demand and heat consumption are considerably reduced. But the technology which is available expensive and Indian paper industry cannot afford it due to financial constraint in both capital expenditure and operational costs. Inview of this, further research is needed to innovate an economically viable system of greater efficiency and at the same time, some kind of relief should be given from other ends.

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