

## **INTRODUCTION TO THE WORKSHOP:**

WWF, a largest independent environmental NGO is science and solution based and its mission is to stop the degradation of the planet's natural environment. This one year project funded by EU is all about Promoting Better Environmental Management Practices in the Textile Processing Sector of Pakistan (PBEPT), which are being practiced in European Union. The major aim of the workshop is to know the effectiveness and direct and indirect benefits of implementation of process specific Water and Energy Conservation Measures in Textile Processing Mills.

### **1. Findings of the Need Assessment Study and Intro of the BEMPs Manual**

Speaker: Aziz ur Rehman - Cleaner Technologies Programme Textile

This field survey of the textile industries were conducted in three regions of Pakistan to review current environmental practices of the textile industry to identify the major environmental concerns i.e. waste water, air emissions, noise, solid waste, objectionable chemicals etc. The estimated cost per year of extra water in a typical large, medium and small industry is Rs. 647,000; Rs. 460,000; Rs. 240,000 respectively. About 70 % of the industries are not aware of extra water consumption, and there is non- availability of water metering and monitoring systems. Over- consumption and Wastage of energy are because of Electricity over-use, Steam wastage and Lack of use of possible energy reuse and recovery measures. The major objective of the project is to identify the BEMPs already practiced in the advanced countries to comply with international buyers and requirements which will be helpful in Promoting Better Environmental Practices in the Textile processing sector of Pakistan (PBEPT). Better Environmental Management Practices (BEMPs) is basically the pollution reduction at source, which may include process improvement, better practices and proper maintenance, or Reuse, Recycling and Recovery, which is beneficial for better product quality, health and safety of workers, improved working environment and cost reduction by effective resource utilization.

### **2. Water and Energy Conservation Opportunities in TPMs**

Speaker: Anton Kassajager - TNO

To recognize the opportunities to save chemicals, water and energy; motivation and commitment of the management is required. In TPMs raw materials, water, energy and chemicals contributes in the manufacture of products, waste, water, solid and gas. Water and energy conservation prospects can be achieved by reducing chemical impact at source, water balance, controlling water consumption by improving working practices (Good Housekeeping). Energy can be conserved by making an energy balance, prevent losses, measuring energy streams, optimizing processes and then recovery. Process specific water and energy conservation includes electric motors, air compressors, washing machines, water efficient dyeing (jets) and lighting while cost benefit analysis

should also be concerned. BEMP options for Pretreatment and Dyeing Processes in Textile Processing Mills includes sizing, bleaching (H<sub>2</sub>O<sub>2</sub>), mercerizing, enzyme treatment, dyes and auxiliaries and dyeing, while Printing and Finishing Processes in TPMs comprises of printing, finishing, mechanical dewatering, drying and steaming. In the end exercise was given to identify the pros and cons of implementing BEMPs under specific conditions.

### **3. Case Studies for Water and Energy Conservation under Local Conditions (Cost Benefit Analysis)**

Speaker: Shafqat Ullah - Cleaner Technologies Programme

This case study was done locally, and some of the relevant terms taken for Energy Conservation Potential are Steam leakages, Steam distribution system, Insulation of the hot surfaces, Recovery of energy from the flue gas (economizer) and the Hot waste water (heat exchanger), Reuse of steam condensate, Clean hot water streams and Cooling water, Maintenance of combustion chamber etc. While terms used for Water Conservation Potential were Optimum utilization of water (water flow meters), Improved quality of water (softeners, RO Plant), Spring operated nozzles on water hoses, Counter current washings, Optimize liquor ratio, Use of steam condensate, Control of leakages, etc. The estimated capital cost of insulation bare hot surfaces is Rs. 200,000 whereas the pay back period is 2 months. Counter current washing at mercerization costs about Rs. 60,000 while the payback period is 1.5 months. The capital cost for recycling of mercerization wastewater in scouring/ designing/ bleaching is Rs. 70,000 and the payback period is 2 months. The estimated capital costs and the payback period of recovery of energy from hot wastewater, flue, gas, jets is Rs. 250,000 and 11 months, Rs. 650,000 and 2 years, Rs.50,000 and 4.5 months correspondingly.

### **4. Case Studies for Implementation of BEMPs under Local Conditions (Cost Benefit Analysis)**

Speaker: Shafqat Ullah - Cleaner Technologies Programme

The basic methodology for BEMPs is the continuous application of an integrated preventive environmental strategy applied to processes, products and services to increase eco-efficiency and to reduce risk for human and the environment. The classification of management practices options for textile industry is Good House Keeping, Resource Conservation, Process/ Chemical Usage and Cleaner Technologies.

Good Housekeeping practices include;

- Maintenance of Equipment
- Prescreening of Inventory
- Chemical Handling Practices

Resource Conservation comprises of;

- Installation of Water Flow Meters,

- Reuse of Bleach and Dye Bath,
- Reuse and Recycling of Cooling & Condensate Water,
- Reduction of Water Consumption in Printing Cleaning,
- Minimization of Energy Consumption in Stenter
- Reduction in Water Consumption in Washing Ranges
- Installation of Economizer Boiler
- Calculation of Boiler Efficiency

Process and Chemical Usage Include;

- Process Modification,
- Chemical Substitution
- Better Process Control Process Control Laboratory.

Process Modification and Chemical Substitution is mainly related with buyers requirements, quality control and costing. It is observed that this issue is hotly pursued by management to remain competitive and is a priority issue.

Cleaner Technologies comprises of;

- Caustic Recovery from Mercerization,
- Recovery of Printing Paste from Supply System and
- Using Counter Current Washing Methods