

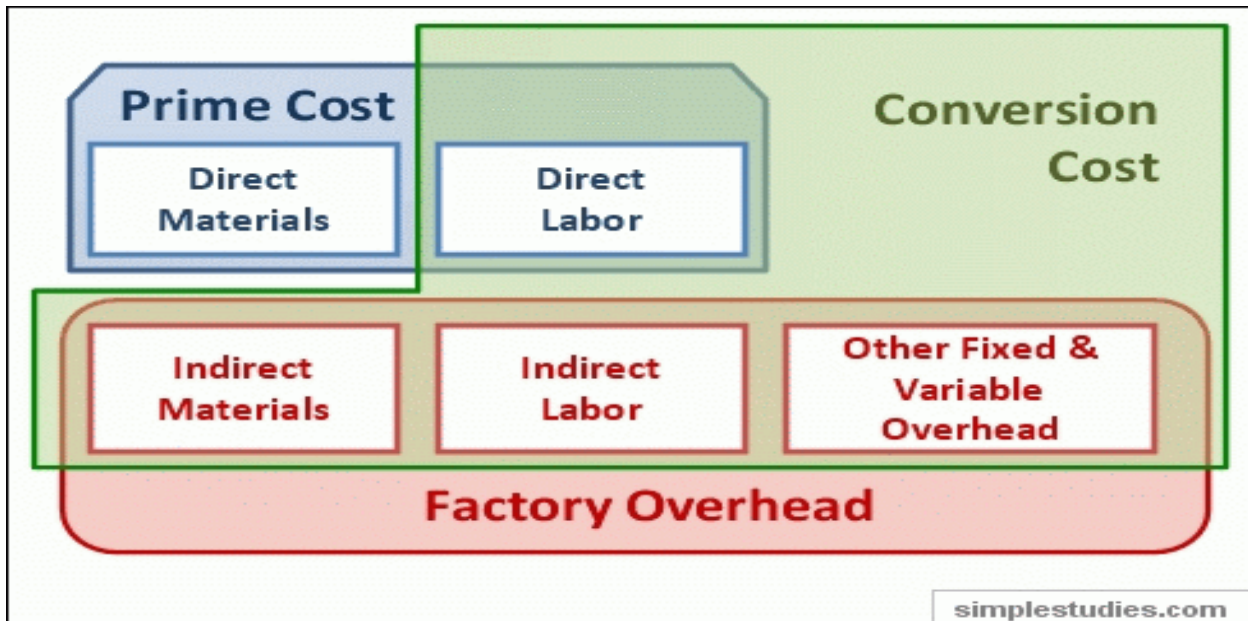
## Automation and other measures to reduce cost of production including human resource”.

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Globalization of the sector is increasing pressure on the sugar producers to make sugar industry more efficient to compete in the international market. These requirements imply that everything must work in sync effectively: it may be process controls systems, automation, electrical drives, communication and information technology. Integrity of the system is the key solution to curb the production cost via reducing the use of resources involved in production. Reduction of the overheads is equally important to achieve the objective of manufacturing cost reduction.

### Introduction to over heads:

Factory overhead is the costs incurred during the manufacturing process, not including the costs of direct labor and material. Factory overhead is normally aggregated into cost allocated to amount of sugar produced during the period. Much of the attention, while considering the manufacturing cost goes to the purchased material and manufacturing labor. In fact, less visible costs in the overhead, general and administrative (G&A) categories are larger than direct labor costs at the prime level.



### Overhead cost reduction methodology:

Followings should bear in mind to shrink overheads leading to reduced production cost.

#### 1. Manpower Planning:

Manpower Planning is a two-phased process:

- Analyzing the current human resources.
- Forecasts of employment programmes.

### Importance of man power planning:

- All the recruitment and selection programmes are based on manpower planning.
- Shortages and surpluses can be identified to keep staff as per requirements.
- It also helps to identify the available talents in a concern and accordingly training programs can be chalked out to develop those talents.
- The four managerial functions, i.e. planning, organizing, directing and controlling are based upon manpower. Human resource management helps in the implementation of all these managerial activities.
- Staffing function under the HRM not only includes putting right men on right job, but also comprises to assure higher productivity against minimum wastage of time, money, efforts and energies.
- Strength of human relations is managed for the success of a concern and the human relations are fastened through effective control, supervision, clear communication and leadership.

## 2. Automation:

Automation federation defines automation, as “The creation and application of technology to monitor and control the production and delivery of products and services.” Automation can serve as the catalyst for improvement in the economy of sugar industry.

Automation mainly covers:

### ➤ Decreased Overhead Costs:

By addition of automation competitive advantages can be obtain in operation and production through low staff strength and increase productivity.

### ➤ Consistency, Reliability and accuracy:

Manufacturing processes can be adequately regulated and manipulated in order to maintain overall quality as the human error element is greatly reduced.

### ➤ The use of automated equipment is an effective way to prevent worker’s injuries. Through automated production, devices keep workers at a safe distance from the more hazardous areas of work. Instrumentation is able to work in extreme environments such as very hot or cold areas of the plant.

### ➤ Making tasks easier that are beyond human capabilities, handling of heavy or large loads, manipulating tiny objects or the requirement to make products very quickly or slowly, are performed conveniently.

### ➤ Automatic startup and shut down procedures are also more efficient.

- Early warning systems can forewarn of disorder in the process or operation. Accurate monitoring of process and machine operating parameters allows safety of machines and losses of process.

Experience at AWSM:

- Hot water temperature supplied for massecuite reheating in vertical crystallizer is controlled through simple automation and the desired C-massecuite temperature is gained for controlling losses in final molasses purity.
- Furthermore automation of secondary heater keeps the juice temperature constant, advantageous in clarification process.

For better planning, the following drawbacks should also be kept in mind.

- Expensive equipments:

Automated systems and equipment are expensive, so these additional costs will have to be compared to the overall reduction of cost in the long run.

- Require regularity:

Automation is useful for regular and periodic operations and processes.

- High quality maintenance:

Specialized and skilled staff is required for safe operation and zero defect maintenance of the equipments to ensure the reliability of the system.

➤ Chain automation:

The increase in productivity through automation, although beneficial, may be slowed by other non-automated process so; automation areas should be intelligently selected.

Overall, the advantages would seem to outweigh the disadvantages regardless of the social implications, there is no doubt that productivity increases with the proper application of automation techniques.

3. Exploration of energy resources:

Diversification of the energy sources is undebatable, generally in slack season sugar mills are dependent on WAPDA supply, supported by 500KVA gensets with the average fuel consumption of app: 40 ltrs/h; at peak load. Fortunately, maintenance time is the peak Sun hours. Addition of "on grid solar panels", to compensate costly diesel power generation and WAPDA supply in maintenance time, will road to energy conservation. "Off grid solar panels are economic for the residential area.

Comparison of 3 Kw power unit for residential area is as under:

Energy Source	Inst:	Opr/Kw	Maint:/y	Remarks
Genset	50000	15	5000	Life time 10 years

Solar Pannel	75000	05	00	life time 20 years
WAPDA	30000	17	00	----

#### 4. Conservation of Mill oil

Recommended Oil consumption at mills per bearing is 0.07ltrs/h, fear of bearing loss lean on the surplus oil consumption and the careless bearing sealing boosts it up.

##### Oil control at AWSM:

At AWSM during crushing season 2014-15 only 13 drums (205 liters/drum) of sugar mill compound were used with the consumption rate of 0.042 liters/h/bearing on a tandem of 4000 TCD. Oil consumption is controlled through proper bedding, bearing sealing and quality maintenance of the lubrication system.

#### 5. Proper tools and tackles:

Selection and availability of proper tools is always ignored in sugar industry, leading towards the wastage of time, poor maintenance, damaging of machines and workers injuries. Unwise use of hammer, adjustable screw wrench and pipe wrench instead of fix and box spanners is a common practice. Instead of proper puller and electric heater for pulling out and mounting the bearings, the use of hammer mostly breaks the bearings or the bearings clearance is knocked over.

## 6. Out sourcing of jobs:

Very fair economic analysis of material, labor, time and power saving is essential before out sourcing the job to specialized vendors without compromising on quality of work. In this regards, use of factory resources like over head crane, fork lifter, vehicle for scrape disposal should be documented and charged from the contractor as per agreement.

## 7. Procurement of material:

Discrepancy in the system starts from inaccurate and unrealistic material demands; demands should be carefully examined and monitored by specially detailed team for accurate specification and reasonable quantity. Duplication in demands should also be monitored. Data inventory system is a useful tool in this regards. Healthy competition among trustworthy suppliers and careful monitoring of the material purchase activities can produce positive cost oriented effect. Proper vendors should be registered with company by paying a nominal registration fee against business assurance, company should collect price lists of general and consumable items on monthly basis, and watching whether which item is economical to purchase on yearly consumption basis. But an eye should also be kept on store inventory. Following steps leads towards the future-oriented energy management.

## 8. Power/Energy conservation:

- The electrically driven sugar cane mills equipped with VFDs, attaining significantly higher level of efficiency.
- Installations of sub stations at different sections facilitates in reducing line losses, heavy cabling net work, accidents, maintenance cost and improving power factor.



- Processing with minimum required machines in operation.
- High capacity centrifuges will reduce no of machines in operation, saving power and maintenance cost as well.

#### 9. Attaining low steam % cane:

- Milling results with low imbibitions % cane,
- Improving bleeding system to generate and use vapors instead of exhaust and live steam as make-up.
- Avoiding unnecessary addition of water to the process, especially in pans.
- Replacing canal water by 70 % water present in the cane juice.

#### 10. Merging process house staff:

Different hands for maintenance and operation in process house creates controversy. A twofold benefit of improving performance and reduction in staff can be achieved by deputing same staff for maintenance and operation in process house, initially supported by especial allowances.

#### 11. Controlling the use of consumables:

Most common consumable misuses are:

- Use of damaged electric and gas welding leads and leaky gas regulators.
- Unchecked gas cylinders receiving and returning to the main store.
- Not consuming the electrode stick completely.
- Use of gas cutter for lightening instead of hand lamp.

- Use of kerosene oil for washing hands and clothes.
- Misuse and improper disposal of cotton rages.

## 12. Maintenance pace reducing factors:

- Dirty work places, presence of scrape at work place.
- Unnecessary holidays and gate passes.
- Self scheduled tea and lunch breaks.
- Unnecessary mutual workers meetings.
- Improper dressing, not using available PPEs.
- Use of mobiles fone during working hours.

By educating supervisory staff to think from management point of view and eliminating the mentioned minute issues will produce big financial impact.

*The end*