CH0401 Process Engineering Economics

Chapter 2 – Balance Sheet and Cost Accounting

Lecture 2f

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Process Engineering Economics

1. Capital requirements for process plants
2. Balance Sheets
3. **Earnings, process and returns (Income statements)**
4. **Economic production, break even analysis charts**
5. Cost accounting - pre construction cost estimation - allocation of cost.

In 1930's **Walter Rautenstrauch**, an industrial engineer and professor of Columbia University invented a planning analysis called ***Break- Even analysis*** or cost-volume-profit analysis.

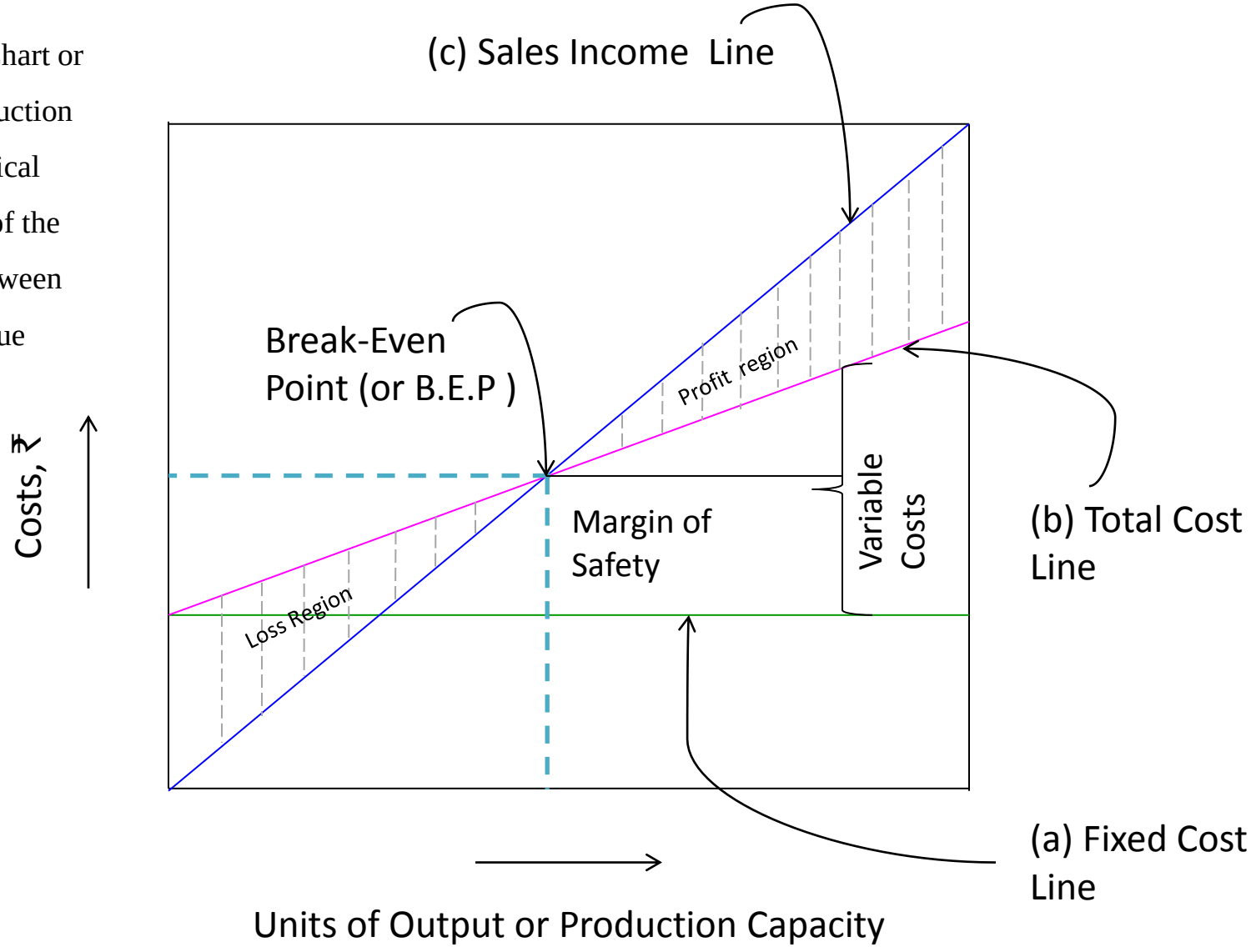
Significance of Break-Even analysis

It helps solving the following types of problem

1. What *volume of sales* will be necessary to cover a reasonable return on capital employed ?
2. Determines the *variable and fixed costs per unit* of production.
3. The volume of output at which neither a *profit* is made nor a *loss* is incurred.

Process Engineering Economics – ***Break – Even Chart***

Break – Even Chart or Economic production chart is a graphical representation of the relationship between costs and revenue (income)



Process Engineering Economics – ***Break – Even Chart***

The break-even chart consists of an ordinate (y-axis) and an abscissa (x-axis). The oridnate presents a scale of money against which fixed costs, variable costs and revenue (sales income) can be measured. The abscissa can be dimensioned in terms of production volume that is number of units produced or production capacity.

The lines marked in colors a, b, and c can be noticed in the break even chart

- Line 'a' is *fixed cost* function line.

  Fixed charges do not change as function of increased volume of production
- Line 'b' is an increasing linear, monotonic function that increases with increasing volume of production. It represents total costs which results from summation of fixed and variable costs.
- The variable cost assigned to the product produced are shown by triangular area between the fixed costs line and total costs line i.e. line 'a' and line 'b'

Process Engineering Economics – ***Break – Even Chart***

- Line ‘c’ is the sales revenue (or income) line. A linear relationship utilized to describe revenue; which indicates the price at which any quantity of output can be sold is fixed and does not change with the volume of production.

- Profit as percentage, % = $1 - \frac{\text{Vairable Cost}}{\text{Costs of Sales or Sales}}$

- Cost of Sales = Fixed Costs + Variable Costs

- B.E.P (Break Even Point) is the point where no loss and no gain is identified

Process Engineering Economics – ***References***

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