COST ESTIMATION, ANNUAL REPORTS AND ANALYSIS OF THE PERFORMANCE

CAPITAL REQUIREMENT FOR PROCESS PLANT :

The capital required for the buildings and equipments in the process industries varies with the type of operations size of the plant and the time at which the investment is made. The equipment for a process plant may be classified into two types:

The equipment required actually to the process material
The equipment and the facilities necessary for providing the service to the process and to operate the plant efficiently

For eg :

1.Process equipment, eg pumps
2.Service or non process facilities water supply , treatment , air supply etc .

These methods usually involve two procedures
The use of cost indices, whether by cost known at some given date are corrected to the current time
The establishment of a summary fof cost data on individual item where the cost is related to some or capacity factor

Cost indices

A cost index may be defined as , which it permits comparison of cost at various dates a period of time from the present back to any date in the past for which data are available

For example :

Cost of construction, material cost , labour cost , chemical cost etc

Capital requirement for complete process plant items :

Equipment cost delivered
Installed equipment cost
Process pipping
Instrumentation
Buildings

Service
Total installed physical cost
Engineering
Construction
Total constructed cost including
Site development
Pre operation charges
Contingency

A plot of this sort for shell and tube heat exchanger. The application of the rule of thumb for most purchased equipment is , however an over simplification . since the actual value of the cost , capacity exponent vary from less than 0.3 to greater than 1.0.

For example :

Equipment	Size range	Exponent
Blower , centrifugal	0.5-4.7m^3/5	0.59
Heat exchanger	10-40m^2	0.60
Tray , dubble cap	1-3m (dia)	1.20

Because of this , the 0.6 power should be used only in the absence of other information. In ,general , the cost capacity concept should not be used beyond a ten fold range of capacity , and care must be taken to certain, the two pieces of equipment areas similar with regards of type of construction , materials of construction, temp and pre operating range, and other variables . six-tenth rule is widely used in approximation of equipment and event total process cost .

Total plant investment range based on equipment :

Equipment cost :

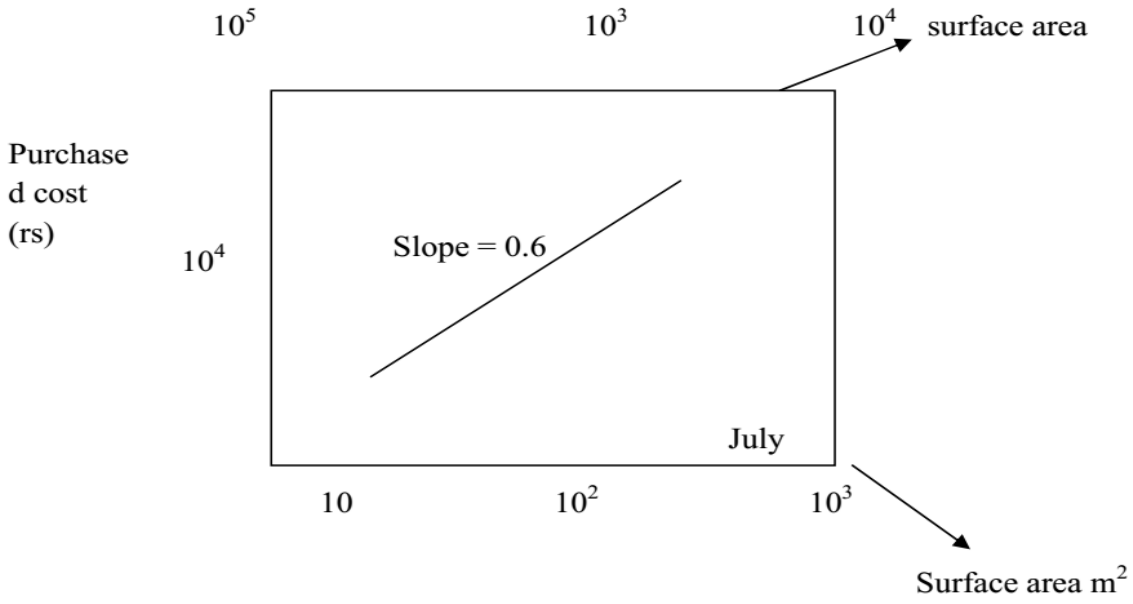
Six tenth factor rule :

It is often necessary to estimate the cost a piece of equipment, when cost data are not available for the particular size or capacity involve .

Prediction can be made by using the power relation ship known as six tenths factor rule, if new pieces of equipment is similar , to one of another capacity for which cost data are available.

According to this rule , if cost of a given unit "B" at one capacity is known the cost of a similar unit 'a' with 'x' times the capacity the first is $X^{0.6}$ times , cost if initial unit. Application of 'six – tenth factor ' rule to cost.

For V tube heat exchanger



Service facilities :

Utilies for supplying steam , water , compressed air and water ,fuel are part of the service facilities of a chemical process plant, waste disposal, fire protection and miscellaneous service items require capital investments that are included under the heading of service facilities cost .

BALANCE SHEET

Balance sheet is not a account but a statement summarising the financial positions of a business enterprises at a particular data . all the accounts that have not been closed by transfer to either the trading account or the profit and loss account are to be recorded in the balance sheet . it summarises on the one side. The right hand side assets of the business enterprises. The left hand side liabilities of the business .

The capital – the business owes to the owners is recorded on the liabilities side. Net profit is added to it while net losses deducted from the capital. At same time , drawings (owners debt to the business) is not recorded as a separate item on the asset side , but it is deducted from capital accounted consequently, a total two slides must show equal amounts. This equality is a group of arithmetical accuracy . hence a balance sheet can be called as statement of assets and liabilities of a business entity at aparticular data.

Uses of the balance sheet :

To ascertain the nature and value of assets business entities at a particular data.
To ascertain the nature and value of the liabilities and the value of the business a particular date.
To assess the solvency of the business.

To examine how much capital is distributes among the various assets to strengthen the efficiency of the firms
To assess the exact financial position of the business.
To facilitate comparison with in the enterprises and with the enterprises of similar nature in the market .

A brief summary of the terms in the balance sheet .

Current assets: capital represented by items that are essentially the same as cash , rawmaterial , bills that customers owe the company , finished products and material in the process.
Fixed assets and depreciation account: the fixed assets are capital represented by plant equipment , trucks, nachinery , land and building
Other assets : for example : goodwill,petterns , franchise, trade marks
Current liabilities ; these are obligation that the company has currently outstanding. Such as , bills for materials
Accured liabilities : interest owed and the taxes for that portion of times that has been not yet paid are also included, but since these items are not yet due they are called accured liabilities .
Working capital : working capital is the investment in current assets of firm eg inventory , accounts receivable, cash etc current assets are financed by current liabilities eg bills payable , bank borrowings , etc investment requirement and this is reflected in the cash flow estimates .
Depreciation : depreciation is the wear and tear infixed assets caused due to their continuous use .the continuous use of a fixed assets results in reduction of productivity of the assets with time . depreciation may also arise if the assets losses its technological advantage. There are two methods of determining the depreciation on assets , namely straight line method and written down method.

Depreciation = original cost of acquisition – residual value / expected useful life of asset

Depreciation (%)= amount of depreciation / acquired cost X 100

Formulas :

Liquidity ratios : liquidity ratios measure the ability of a firm to pay its short term obligations . these are used very commonly as a measure of short term liquidity and solvency of a firm .

The most popular and commonly used liquidity ratios are :

Current ratio = current assets /current liabilities
Quick ratio = current assets –inventory /current liabilities
Debt ratio = total debt/total debt +net worth
Acid test = quick assets/current liabilities
Fixed assets = fixed assets / net worth
Inventory ratio = inventory / total investment

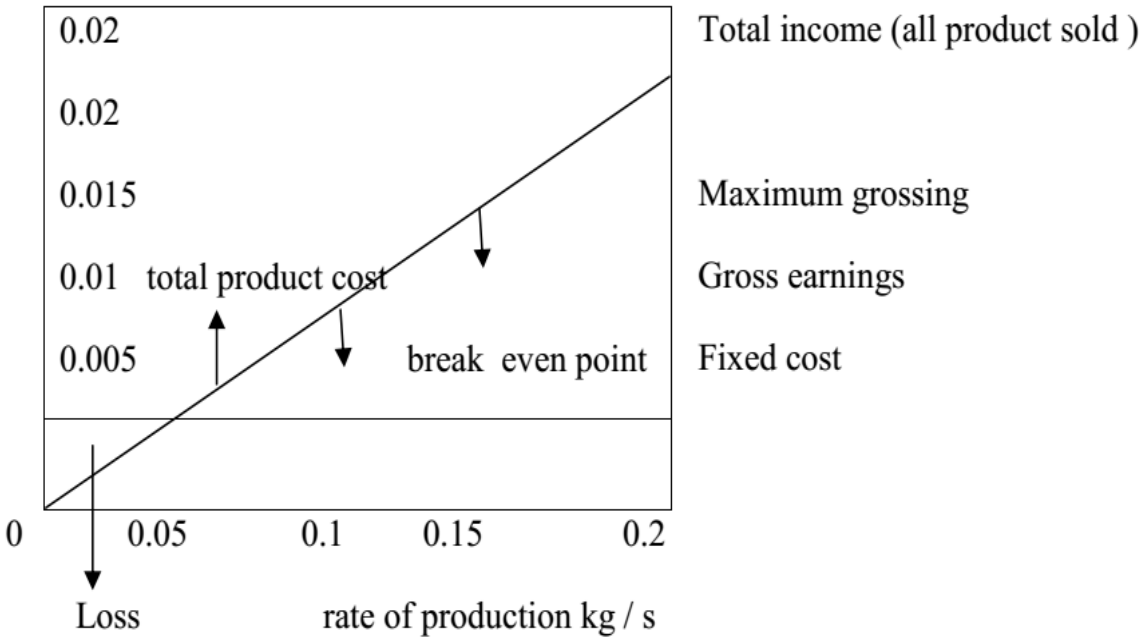
Working capital ratio = working capital / total investment
Process investment ratio = process investment / total investment

Pro – forma for the balance sheet

Balance sheet of ----

Liabilities	Rs	Rs	Assets	Rs	Rs
Capital	xxx		Cash in hand		Xxx
(+)net profit	xxx		Cash at bank		Xxx
(+)interest on capital	xxx		Sundry debtors	Xxx	
(-)net loss	xxx		(-)bad debts	Xxx	
(-)drawings	xxx		(-)provision for bad and doubtful debts	Xxx	Xxx
(+)int on drawing	xxx	Xxx		Xxx	
(-) income tax	xxx		Fixed assets	xxx	Xxx
Sundry creditors	xxx	Xxx	(-)depreciation	xxx	
Wages		Xxx	Intangible assets	xxx	Xxx
Salaries		Xxx	(-)depreciation		Xxx
Income received in advance		Xxx	Prepared expenses		Xxx
Rent		xxx	Insurance premium		Xxx
			Accured incomes		Xxx
			Commission		xxx
			Closing stock		
Total		xxx	Total		xxx

Product chart [break even chart]


0.02
0.02
0.015
0.01
0.005
total product cost
break even point
Total income (all product sold)
Maximum grossing
Gross earnings
Fixed cost
0
0.05
0.1
0.15
0.2
Loss
rate of production kg / s