



NOTES

**Unit - I - Material Accounting**

**Classification Of Materials**

‘Classification’ refers to the systematic division, grouping or categorization of materials or store items with reference to some common characteristic. Classification of materials can be made on different bases namely nature, manufacturing process, value, purpose etc.

For identification of materials being purchased and stored it is necessary that they should be properly classified. The store incharge should make a close study of the materials during the process of storage for the purpose of their (i) safe custody, (ii) meticulous handling and storing, and (iii) protection from damages, fire, pilferage, spoilage, etc. He is responsible for the classification of the materials.

The broad classification according to the materials (i) nature, (ii) use, and (iii) service can be done in the following, classes:

- (i) Raw Materials
- (ii) Consumable Stores
- (iii) Machinery and Plant
- (iv) Equipment: Factory and office
- (v) Inflammable Stores
- (vi) Chemical
- (vii) Furniture and Fixtures
- (viii) Scrap Materials
- (ix) Packaging Materials
- (x) General Stores.

**Basis Of Classification Of Materials**

The important basis of classification of materials may be given as follows:



**NOTES**

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On the Basis of Nature

On the basis of nature, materials may be divided into:

(i) Direct Materials: Direct materials are those items of material which can be identified with a product or a group of products in a manufacturing concern and can be easily measured and charged directly to the product. Such materials form the part of the finished product e.g., timber in furniture, cloth in garments, bricks, sand and cement in building, yarn in cloth etc.

(ii) Indirect Materials: These are the materials which cannot be traced to a specific product and cannot be charged directly to the various products. These materials do not form part of the product. Examples of indirect materials are—repair and maintenance stores, lubricating oils, cleaning materials, cotton rags etc.

**On the Basis of Manufacturing Process**

(i) Pre-process Stock: These are the items of stores which are yet to be taken into the manufacturing process and are obtained prior to the commencement of the manufacturing process or production. These include raw materials, bought-out parts and assemblies, and stock in pipeline of materials in transit.

(ii) Intermediate Stock: Intermediate stock comprises the parts or assemblies which are manufactured within the factory for use in the final product.

(iii) Finished Goods or Finished Products: As the name indicates, finished goods are the items which have been duly manufactured in the factory and are ready for shipment or sale to the customers.

**On the Basis of Value**

On the basis of the value, the stores items may be divided into:

(i) Category 'A': Category 'A' consists of materials which constitute 5% to 10% of the total items in the stores and represent 70% to 85% of the total stores value.

(ii) Category 'B': This category consists of materials which constitute 10% to 20% of the total items in the stores and also represent 10% to 20% of the total stores value.



### NOTES

(iii) Category 'C': This category consists of cheap materials which constitute 70% to 85% of the total items in the stores and represent 5% to 10% of the total stores value.

Category 'A' items constitute costly items calling for greater degree of control for preserving them. A reasonable degree of care may be taken to control category 'B' items while a routine type of care may be applied to control 'C' category or residuary items.

#### **On the Basis of Movement of Stores**

On the basis of the movement or rate of consumption, stores items may be divided into:

(i) Fast Moving Stock: Fast moving stock indicates the items of materials which exhaust at a very fast speed on account of high demand from production departments of a manufacturing concern.

(ii) Slow Moving Stock: This category indicates the items of stores or materials which are consumed or exhausted at a very slow speed on account of low demand from the production departments of the manufacturing concern.

(iii) Dormant Stock: This category covers stores items which do not have any demand at present and may regain demand in future. This category includes seasonal materials which are required during specified seasons.

#### **Advantages Of Classification Of Materials**

The main advantages of classifying stores items may be given as follows:

1. Helpful in Grouping of Stores Items: Classification process helps in the grouping of the different items of materials in the store. Items falling under a particular category can be stored at one place which ensures optimum utilization of storage space.
2. Easy Location: Proper classification of stores items helps in the easy identification of the various items. The store-keeping staff can easily find out the materials whenever these are required in the production departments.
3. Proper Accounting: Record-keeping process of properly classified items of stores is simplified. Simplified record-keeping ensures accuracy in posting the receipts and issues in the stores records.



**NOTES**

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4. Proper Care: By classifying the various store items on the basis of value, their relative importance can be ascertained and suitable degree of supervision and control may be exercised over them with reference to such value.

5. Avoidance of Duplication: Proper classification of the store items helps in avoiding the possibility of duplication in stocking the same item of material.

6. Standardization: Classification helps in the standardization of various items in the stores. Standardization of store items involves the variety reduction through the use of fixed sizes and types. Standardization aims at having uniform standards for similar items.

**Codification Of Materials**

After having classified or grouped the various items of stores, it is necessary and useful to codify them. Codification is the process of assigning a number or symbol to each store item in addition to its name for making its identification easy and convenient. Codification of store items leads to saving in time and labour on account of substitution of a symbol or number for a longer name.

There are different kinds of store codes in use and most of them are specially designed to suit the requirements of a particular organization. These codes may be based upon the nature of stock items, the purpose for which these items are used or on any other basis which is considered as suitable according to the local circumstances.

Also, accurate identification of the materials may require a lengthy description which may be complicated and hence may add to the confusion. Codification is necessary as it refers to as allotment of logical and systematic numbers or alphabets or both (as a mixture) so as to help in simple but accurate identification of the materials.

**Advantages of Codification**

The following are the main advantages of codification :

1. It avoids the long and unwieldy descriptions.
2. It tries to have accurate and logical identification.
3. It prevents duplication.



**NOTES**

4. It standardizes the purchasing as well as storage.
5. It reduces the varieties.
6. It makes purchasing, recording, accounting, computerizing pricing, costing, location, indexing and inspection efficient and result-producing.
7. It assures planned and quality production.

**Systems of Codification**

The following four systems of codification are commonly used in a materials department:

1. Alphabetical system is one in which codes to materials are allotted in alphabets which have no relation to numbers. Each item of the storehouse is grouped according to nature, use etc. of the item and materials are then analyzed from the point of view of codification. Say, for example, Iron ore is given a code of IN-O and Iron Bars the IN-BA and so on.
2. Numerical system is one in which codes to materials are based on numbers. Numbers are allotted as codes to materials making provision for future expansion as well. Say, for example, Iron ore is given a code of 05—10 and Iron Bars the 11—67 and so on.
3. Decimal system is one in which codes to materials are again based on numbers but instead of dash in between two number decimals are put. This makes the codes more flexible and future expansion is very much possible. Say, for example, Iron ore is given a code of or Iron Bars the 11. 67.03 and so on.
4. Combined Alphabetical and numerical system. This combines all the three above. Say, for example, Iron ore is given the code of IN-05.10 and Iron Bars the IN-11.6 and so on.

**Bins and Racks**

Bin is a compartment or a separated portion of a particular almirah, pigeon-hole, cabinet, etc. utilized to store only one type of materials. A bin card is used for depicting the quality and quantity of the materials stored therein. It functions as a materials movement record and as replenishment index. It is a brief version of the stock ledger pertaining to an item. It serves the purpose of a ready-reckoner for the item binned therein. It, thus, serves as a mirror of the bin. The following is the specimen proforma of a bin card:



NOTES

Bin Card

Bin No. ....  
Article. ....  
Code No. Identification. ....  
Unit of Issue .....

Max. Stock .....  
Min. Stock .....  
Order Stock .....  
Danger Stock .....

Date	Delivery or Issue Note No.	Qty./ Weight		Balance	Date	Delivery or Issue Note No.	Qty. / Weight		Balance
		Receipt	Issue				Receipt	issue	

Racks are used for keeping materials inside the store. This is just like an almirah either open or close. They are mostly used for keeping general store items. They are in common use. Racks are fixed or movable frames of either wood or metal bars. Racks for storing tubes, bars, sheets, plates, types, cables, drums, etc. The racks may also be specially designed.

Methods of Pricing Material Issues: Methods:-

The important methods followed in pricing of issue of materials are:- 1. Actual Cost Method 2. First-In First-Out (FIFO) Method 3. Last-In First-Out (LIFO) Method 4. Highest-in First-Out (HIFO) Method 5. Simple Average Cost Method 6. Weighted Average Cost Method 7. Periodic Average Cost Method 8. Standard Cost Method 9. Replacement Cost Method 10. Next in First Out (NIFO) Method 11. Base Stock Method.

1. Actual Cost Method:

Where materials are purchased specially for a specific job, actual cost of materials is charged to that job. Such materials will normally be stored separately and issued only to that particular job.

2. First-In First-Out (FIFO) Method:

CIMA defines FIFO as “a method of pricing the issue of material using, the purchase price of the oldest unit in the stock”. Under this method materials are issued out of stock in the



**NOTES**

order in which they were first received into stock. It is assumed that the first material to come into stores will be the first material to be used.

Advantages:

- (a) It is easy to understand and simple to price the issues.
- (b) It is a good store keeping practice which ensures that raw material leave the stores in a chronological order based on their age.
- (c) It is a straight forward method which involves less clerical cost than other methods of pricing.

**Disadvantages:**

- a) There is no certainty that materials which have been in stock longest will be used, if they are mixed up with other materials purchased at a later date at different price.
- (b) If the price of the materials purchased fluctuates considerably, it involves more clerical work and there is possibility of errors.
- (c) In a situation of rising prices, production cost is understated.
- (d) In inflationary market, there is a tendency to under-price material issues. In deflationary market, there is a tendency to overprice such issues.

**3. Last-In First-Out (LIFO) Method:**

Under this method most recent purchase will be the first to be issued. The issues are priced out at the most recent batch received and continue to be charged until a new batch received is arrived into stock. It is a method of pricing the issue of material using the purchase price of the latest unit in the stock.

Advantages:

- (a) Stocks issued at more recent price represent the current market value based on the replacement cost.
- (b) It is simple to understand and easy to apply.



NOTES

(c) Product cost will tend to be more realistic since material cost is charged at more recent price.

**Disadvantages:**

(a) Valuation of inventory under this method is not acceptable in preparation of financial accounts.

(b) It is an assumption of a cash flow pattern and is not intended to represent the true physical flow of materials from the stores.

(c) More than one price may have to be adopted for an issue.

(d) It renders cost comparison between jobs difficult.

**5. Simple Average Cost Method:**

Under this method all the materials received are merged into existing stock of materials, their identity being lost. The simple average price is calculated without any regard to the quantities involved. The simple average cost is arrived at by adding the different prices paid during the period for the batches purchased by dividing the number of batches. For example, three batches of materials received at Rs. 10, Rs. 12 and Rs. 14 per unit respectively.

The simple average price is calculated as follows:

$$\text{Rs. } 10 + \text{Rs. } 12 + \text{Rs. } 14 / 3 \text{ batches} = \text{Rs. } 36 / 3 \text{ batches} = \text{Rs } 12 \text{ per unit}$$

This method is not popular because it takes into consideration the prices of different batches but not the quantities purchased in different batches. This method is used when prices do not fluctuate very much and the stock values are small in value.

**6. Weighted Average Cost Method:**

It is a perpetual weighted average system where the issue price is recalculated every time after each receipt taking into consideration both the total quantities and total cost while calculating weighted average price. For example, three batches of material received in quantities of 1,000 units @ Rs. 15, 1,300 units @ Rs. 16 and 800 units @ Rs. 14.



**NOTES**

The weighted average price is calculated as follows:

$(1,000 \text{ units} \times \text{Rs. } 15) + (1,300 \text{ units} \times \text{Rs. } 16) + (800 \text{ units} \times \text{Rs. } 14) / 1,000 \text{ units} + 1,300 \text{ units} + 800 \text{ units}$

$= \text{Rs. } 15,000 + \text{Rs. } 20,800 + \text{Rs. } 11,200 / 3,100 \text{ units} = \text{Rs. } 47,000 / 3,100 \text{ units} = \text{Rs. } 15.16 \text{ per unit}$

This method tends to smooth out the fluctuations in price and reduces the number of calculations to be made, as each issue is charged at the same price until a fresh batch of material is received.

This method is easier as compared to FIFO and LIFO, as there is no necessity to identify each batch separately. But this method increases the clerical work in calculation of new average price every time a new batch is received. The issue price calculated rarely represents the actual purchase price.

**Store Location and Layout**

The location of the stores is also an important consideration which has a direct bearing on the product cost. The basic principles of stores location are – straight line movement with minimum of backtracking, minimization of handling, re-handling and internal transportation costs, minimization of waste motion for personnel and reduced human hazards, efficient utilization of storage space and provision for the flexibility and expansion of the store area.

The materials are stored at one central godown or in the godown located at distant places. Where the materials are stored is distantly located godowns, receiving materials from various suppliers and issuing materials to remotely located production centers. The optimum stores location is decided on the basis of clearly defined objective function with the help of quantitative techniques or through the computer programming.

The stores location will differ according to the divisibility of the total storage space, type of business activity say multi-product operations, manufacturing operations carried on at multi-plants located at distant places, type of production processes such as continuous processing, job order production, assembling etc. Fundamentally the raw materials should be stored in the vicinity of the starting point of the production operation, work in progress



**NOTES**

between first and following operation, finished inventories near the shipping area, spares, tools and stores somewhere in the central storage area.

**Stores Organizations:**

The stores manager assisted by storekeeper manages the stores. He either reports to the materials manager or to production controller / manager.

The problem of centralized storing versus decentralized one should be decided on the basis of their under mentioned relative merits and demerits which are mutually exclusive in nature.

**Merits of Centralized Storing:**

- 1) Bulk buying in few orders with the advantage of quantity discount and transportation cost.
- 2) Possibility of standardization of materials reducing the variety of items stored.
- 3) Reduced investments in inventories
- 4) Reduction in administrative cost.
- 5) Reduction in the requirements of the personnel
- 6) Reduced storage space and other incidental expenses
- 7) Greater safeguard against pilferage and theft.

**Role of Computers in Accounting:**

The manual system of recording accounting transactions requires maintaining books of ac-counts such as journal, cash book, special purpose books, and ledger and so on. From these books summary of transactions and financial statements are prepared manually.

The advanced technology involves various machines, which can perform different accounting functions, for example a billing machine. This machine is capable of computing discount, adding net total and posting the requisite data to the relevant accounts.



**NOTES**

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With substantial increase in the number of transactions, a new machine was developed to store and process accounting data with greater speed and accuracy. A computer, to which it was connected, operated this machine.

As a result, the maintenance of accounting data on a real-time basis became almost essential. Now maintaining accounting records become more convenient with the computerized accounting.

**Objects of Introduction of Computers in Accounting:**

**Labor Saving:**

Labor saving is the main aim of introduction of computers in accounting. It refers to annual savings in labor cost or increase in the volume of work handled by the existing staff.

**Time Saving:**

Savings in time is another object of computerization. Computers should be used whenever it is important to save time. It is important that jobs should be completed in a specified time such as the preparation of pay rolls and statement of accounts. Time so saved by using computers may be used for other jobs.

**Accuracy:**

Accuracy in accounting statements and books of accounts is the most important in business. This can be done without any errors or mistakes with the help of computers. It also helps to locate the errors and frauds very easily.

**Minimization of Frauds:**

Computer is mainly installed to minimize the chances of frauds committed by the employees, especially in maintaining the books of accounts and handling cash.

**Effect on Personnel:**

Computer relieves the manual drudgery, reduces the hardness of work and fatigue, and to that extent improves the morale of the employees.



**NOTES**

**Meaning of Computer Accounting:**

Accounting is the language of the business. Different parties such as shareholders, stakeholders, tax authorities, stock exchanges, etc. are interested in the accounting information for their varied needs. A full disclosure is insisted by Securities Exchange Board of India [SEBI] and therefore, full information and its neat, simple, and quick presentation has become very essential. Manually main-tained accounting system may not be able to provide all these facilities.

In recent times, computers are being used to maintain the accounting records and for the preparation, analysis, and interpretation of accounting statements. Hence, the system operated through computers is called as computerized accounting or simply, accounting in computerized environment.

A large, semi-transparent watermark of the DACC logo is centered on the page. It consists of a shield-like shape with a red and blue design, and the text 'DNYANSAGAR ARTS AND COMMERCE COLLEGE' in a bold, blue font above it.

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NOTES

**Unit-II - Labour cost and Payroll**

The term salary and wages is often confused by people and is used interchangeably. But the truth is that both these terms differ from each other and hold different meanings. Salary is a fixed amount paid or transferred to the employees at regular intervals for their performance and productivity, at the end of the month whereas wages are hourly or daily-based payment given to the labour for the amount of work finished in a day.

BASIS FOR COMPARISON	SALARY	WAGE
Meaning	A fixed pay that an individual draws for the work done by him on an annual basis.	A variable pay that an individual draws on the basis of hours spent in completing the certain amount of work.
Skills	Skilled personnel	Semi-skilled or unskilled
Type of cost	Fixed	Variable
Rate of payment	Fixed rate	Wage rate
Payment cycle	Monthly	Daily
Basis of payment	Performance basis	Hourly basis
Paid to whom	Employees	Labor
Nature of work	Administrative-office work	Manufacturing-process work
KRA (Key resultant area)	Yes	No
Extra pay for extra hours	No	Yes



**NOTES**

**Conclusion**

It can be easily concluded from the above comparison that salary is a fixed amount of money paid at a regular intervals to an individual for the work done by him in given period of time whereas wage is a variable pay given to an individual for the number of hours spent by him in completing a certain amount of work.

**The Methods of Payment of Wages**

The following points highlight the top three methods of wage payments. The methods are:  
1. Time Rate System 2. Piece Rate System 3. Incentive Wage System.

**Method # 1. Time Rate System:**

Under this method of wage payment, the workers are paid the wages on the basis of time. In this system of wage payment, the workers are paid the wages on the basis of time as, per hour, per day, per week, per fortnight or per month etc. This system does not consider the production of the employees during this time.

The amount of wages under this system is calculated as under:

Wages = Time spent by the worker × Rate of wages according to time.

**Suitability of Time Rate System:**

This system of Wage Payment is particularly suitable in the following circumstances:

1. When it is not possible to measure the production in terms of units or in any other terms.
2. When the work is of high standard.
3. When it is not possible to divide the production into units.
4. When the production is of the nature that it requires efficiency more than the speed.
5. When the worker is undertraining.

**Merits of Time Rate System:**



**NOTES**

**1. Simplicity:**

It is very easy to calculate the amount of wage under this system.

**2. Certainty of the Amount of the Remuneration:**

This system of wage payment provides certainty of the amount of wage payment to the employee. It develops the feeling of confidence and certainty among them.

**3. High Quality of Production:**

As this system of wage payment has no concern with quantity of production, quality of production produced by the workers under this system is very high.

**4. Proper Utilisation of the Factors of Production:**

As this system is not related with speed, the workers perform their work in very confident manner. They make the best Utilisation of the factors of production.

**5. Co-Operation between Labour and Capital:**

This system of wage payment brings the industrial peace because it satisfies the workers and the industrialists. Thus, it develops harmony and co-operation between labour and capital.

**6. Best System for Artistic Work:**

This system of wage payment is most suitable for artistic work.

**Demerits of Time Rate System:**

**1. Need of Intensive Supervision:**

This system requires intensive supervision over workers. It increases the cost of supervision.

**2. Lack of Incentive:**

This system of wage payment makes equal payment to both the efficient and inefficient workers. Therefore, efficient workers do not get any incentive for more production.



**NOTES**

**3. Encouragement of Labour Unions:**

This system encourages labour unions. Sometimes, these labour unions misuse their powers.

**4. Misuse of Time by Workers:**

Under this system of wage payment, the workers do not make proper Utilisation by their time.

**5. Fall in the Quantity of Production:**

Under this system of wage payment, the quantity of production decreases because the workers do not get any incentive for increasing the production.

**Method # 2. Piece Rate System:**

Under this system of wage payment, the workers are paid the wages on the basis of quantity and quality of work performed by them. Under this system, the rates of wages are determined according to quantity and quality of work and the workers are paid according to these rates.

The amount of wages to be paid to a worker under this system is calculated as under:

Wages = Units of production × Rate per unit.

**Suitability of Piece Rate System:**

This system of wage payment is very suitable in the following conditions:

1. When the work is of standard nature.
2. When the work can be measured easily.
3. When there is a great need of increase in the production.

**Merits of Piece Rate System:**

**1. Incentive to More Work:**



**NOTES**

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This system encourages the workers to do more and more work because they get their wages according to their work.

**2. Proper Utilisation of Machines:**

Under this system, the workers use their machines and equipment with proper care because they feel that if their machine is out of order, their work will be held up and their wages will be low.

**3. Increase in the Quantity of Production:**

The system of wage payment gets more production because all the workers make their best efforts to increase the production.

**4. Best Utilisation of Time:**

As the workers are paid according to their work, they make the best possible utilisation of their time. They do not want to waste their time.

**5. Decrease in the Cost of Production:**

This system decreases the cost of production because the maximum production is done by the workers in the minimum time. It decreases the cost per unit of production also.

**Demerits of Piece Rate System:**

**1. Lack of Unity among Workers:**

This system lacks the unity and mutual co-operation among workers. They feel themselves competitor to each other.

**2. Loss of Workers on the Failure of Machines etc.:**

It because of any reason, the machines fail or the power fails, the work of workers is held up and they lose their wages.

**3. Misuse of the Factors of Production:**

The workers do not pay proper attention towards the factors of production. They only want to increase the speed of production.



**NOTES**

**4. Adverse Effect on the Health of Workers:**

This system motivates the workers to do more and more work. It affects the health of workers adversely.

**5. Low Quality of Production:**

This system of wage payment does not pay any attention on the quality of production. As a result of it the quality of production falls down.

**6. Unsuitable for Artistic Work:**

This system is not suitable for artistic work because artistic work cannot be paid only on the basis of quantity of production.

**7. Uncertainty of Wages:**

As the amount of wages depends upon the quantity of production, the actual amount of wages to be paid is always uncertain. The workers also cannot estimate their remuneration in advance.

**Method # 3. Incentive Wage System:**

There are two basic systems of wage payment—time rate system and piece rate system. Both the systems have their merits and demerits. No system can be considered suitable for all times and under all circumstances. To maintain the merits of both the systems and to overcome the demerits of these systems, some experts have developed the systems of incentives wage.

These systems are also known as incentive wage systems, progressive wage system and bonus schemes etc. Under these systems, both the time and speed are considered as the basis of wage payment.

These systems provide incentives to the workers to produce more and more maintaining the quality as well. The workers are paid bonus or premium for the additional work. It is important to note that almost all the systems incentive wages provide for minimum guaranteed wages to the workers.



**NOTES**

**Characteristics of an Ideal Incentive Wage System:**

Important characteristics of an Ideal Incentive Wage System are as under:

1. It must be easy to calculate and to understand.
2. The standards of work must be determined on scientific basis.
3. It must establish direct relationship between efforts and remuneration.
4. It must give a guarantee of minimum wage to all the workers.
5. It must be in the interests of both the employers and the employees.
6. It must be flexible but stable.
7. It must be framed in the manner so that it may be used widely for all the activities of the enterprise.
8. It must be helpful in increasing the production as well as productivity.

**Advantages of Incentive Wage System:**

- i. There is increase in the prospect of workers to earn more. As shown by F. Herzberg good salary is one of the hygiene factors in the absence of which people are unhappy and dissatisfied. Wage incentive offers them the prospect of earning more.
- ii. The scientific work study which is done before introducing a wage incentive plan brings about improvements in methods, work-flow, and man-machine relationship and so on.
- iii. There is effective reduction in the supervision costs Closer supervision of employees becomes unnecessary because workers become more responsible. Rather than the supervisor chasing the workers the workers themselves sometimes chase the supervisor for materials, tools, etc.
- iv. Employees promptly expose all such problems before management which retard their earnings. Management becomes more alert in areas such as flow of process materials, adequate spares, etc.



**NOTES**

v. Employees are encouraged to become “inventive”. They invent and adopt ways and means to achieve their production targets with lesser exertion and lesser expense of energy. They come forward with new ideas and suggestions.

vi. There is improvement in discipline and industrial relations. Go-slow and similar other techniques are not resorted to by the workers to express their dissatisfaction with management policies and practices. There is increase in workers’ punctuality and decrease in absenteeism.

vii. There develops a feeling of mutual co-operation among the workers as their operations are interdependent and any hold-up at one point may affect the production and earning at other points.

**Effects of Incentive Wage System:**

Experience has shown that incentive compensation is not an unmixed blessing. It may produce certain ill-effects unless precautionary steps are taken to check them in advance.

These ill-effects are as under:

i. There is tendency among the workers to sacrifice quality for the sake of quantity. This calls for a very strict system of checking and inspection.

ii. In the absence of adequate provisions incentive payment brings about certain rigidity in the operations. This makes it difficult for the management to revise norms and rates following changes in technology, methods, machines, materials etc.

iii. Employees very often ask for compensation whenever production flow is disrupted due to the fault of management.

iv. Unless greater vigilance is exercised there is a danger of workers disregarding safety regulations.

v. Unless a maximum ceiling on incentive earning is fixed some workers tend to overwork and undermine their health.

vi. Jealousies may arise among workers because some are able to earn more than others. In the case of group systems, the fast workers may be dissatisfied with the efforts of the slower members of the group; where heavy work is involved older workers in particular



NOTES

are likely to be criticised for being too slow. One likely effect of this is the splitting up of trade unions.

vii. The introduction of a system by results increases the amount and cost of clerical work since it involves considerably more bookkeeping. This is particularly true when the production is subdivided into many processes.

**Type # 1. Halsey Premium Plan:**

This plan known after F.A. Halsey is also called the Weir Premium Plan because it was first introduced in the Weir Engineering Works in England. Under this plan, a standard time is fixed (on the basis of past performance records and not on the basis of elaborate time study) for the completion of a job. A worker who completes his job in less than the standard time is paid at this hourly rate for the time actual spent on the job plus a bonus for the time saved.

This bonus is calculated at his hourly rate on a percentage (usually 50) of the time saved by him. A worker who fails to finish the job within the standard time is not penalised but is paid a guaranteed time wage. Thus, with a standard of 25 units per hour and a base rate of pay of Re. 1 per hour, an employee producing at the rate of 15 units per hour for an 8-hour day would receive Rs. 8.

$$T \times R + \% (S - T) R.$$

Under Halsey — Weir plan, the premium is set at 30% of the time saved.

<b>ILLUSTRATION 4.</b> Rate per hour	= ₹ 1.50 per hour
Time allowed for job	= 20 hours
Time taken	= 15 hours

Calculate the total earnings of the worker under the Halsey Plan. Also find out effective rate of earning.

**SOLUTION**

S (Standard Time)	= 20 hours
T (Time taken)	= 15 hours
R (Rate)	= ₹ 1.50 per hour
Total Earnings	$= T \times R + 50\% (S - T) \times R = 15 \times ₹ 1.50 + \frac{50}{100} (20 - 15) \times ₹ 1.50$
	$= ₹ 22.50 + ₹ 3.75 = ₹ 26.25$
Total wages for 15 hours	= ₹ 26.25

$$\text{Therefore, effective rate of earning per hour} = \frac{\text{Total Wages}}{\text{Actual Time Taken}} = \frac{₹ 26.25}{15} = ₹ 1.75$$

**Note.** Percentage of bonus is to be taken 50% when it is not given.



**NOTES**

The formula for calculating bonus and total earnings is as follows:

(a) Bonus = 50% of [Time saved x Time rate]

(b) Total Earnings = Time rate x Time taken + 50% of [Time Saved x Time rate]

**Type # 2. Rowan Premium Plan:**

This plan was introduced by James Rowan. Under this method, the standard time and the standard rate of wage Payment are determined in the same manner as Halsey Plan. The workers, who complete their work within standard time, are paid the wages at standard rate. The workers, who complete their work in less time than the standard, are paid wages at the standard rate plus some bonus. This bonus is calculated in proportion of time saved.

**under this system the bonus is calculated as under:**

**Bonus = Saved time/Standard time × Actual time taken × Rate per hour.**

Its formula is:

(a) Bonus = (Time Saved/Time allowed) x Time taken x Time rate

(b) Earnings = (Time taken x Rate) + Bonus

**Group incentive schemes**

These are bonuses awarded to a team of employees rather than individual employees. The incentives are enjoyed by every member of the team based on an agreed formula of sharing.

**Advantages of Group Incentive Schemes**

- ☑ It enhances team spirit among employees and organizational cohesiveness
- ☑ Quality of output is not unduly compromised
- ☑ Compared to individual incentive schemes, it is relatively easy and less expensive to administer



**NOTES**

☒ It avoids unhealthy competitive rivalry among employees

**Disadvantages of Group Incentive Schemes**

☒ Lazy team members are rewarded the as hard working group members.

☒ This does not provide motivation for individual hard work.

Individual incentive Scheme

These are bonus schemes that reward individual employees for their efficiencies.

**Advantages of Individual Incentive Schemes**

☒ Individual employees are motivated to be more and more efficient and productive

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☒ It may generate competitive spirit among employees

☒ Employee morale is raised since individual effort is rewarded

☒ Ultimately, both the employee and the business organisation obtain enhanced benefits.

**Disadvantages of Individual incentive schemes**

o Employees may compromise on quality in an effort to increase their bonus earnings

o Excessive competition can bring about unhealthy rivalry

o The determination of standard performance levels for the purpose of determining efficiency levels can conflict in the organisation

o It is relatively more difficult and expensive to operate an individual incentive scheme compared to a group incentive schemes.



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**UNIT -III – OTHER ASPECTS OF LABOUR**

**Labour Turnover:**

Labor turnover, also known as staffing turnover, refers to the ratio of a number of employees who leave a company through attrition, dismissal or resignation to the total number of employees on the payroll in that period.

Labour turnover refers to the rate at which employees leave employment. Labour turnover can be evaluated by relating the number of employees leaving their employment during a period of time to the total or average numbers employed in that period.

It may also be defined as engagements and losses in the working force as related to the total number of employees who were on the pay roll at the beginning of the period in question.

**Causes of labour Turnover:**

- (i) Lower wages;
- (ii) Bad working conditions;
- (iii) Unsympathetic attitude of the management;
- (iv) Lack of opportunities for promotion;
- (v) Lack of proper training;
- (vi) Improper manpower planning;
- (vii) Lack of proper incentives;
- (viii) Bitter relationship between management and workers;
- (ix) Lack of conveyance, accommodation, medical and educational facilities and recreational amenities etc.

Sometimes workers have to leave the organisation because of management requirements and administrative actions. They also leave their employment at their own will, that is, on



**NOTES**

personal reasons. In the latter case the management can do nothing but remains a helpless onlooker. So, unavoidable causes may be administrative or personal.

(1) Administrative causes:

- (i) Termination of service due to indiscipline, insubordination, bad conduct etc.
- (ii) Retrenchment or lay-off due to shortage of resources, low demand for recession.

**(2) Personal causes:**

- (i) Change for better job;
- (ii) Death;
- (iii) Retirement due to old age;
- (iv) Change for better working conditions, better environment;
- (v) Change for secured job;
- (vi) Marriage, especially of women workers;
- (vii) Illness and accident rendering the worker permanently incapable of doing any work;
- (viii) Domestic need and responsibility etc.

**3. Effects of Labour Turnover:**

Labour turnover is harmful and costly. It results in increased cost of production due to the following reasons:

- (i) With frequent changes in labour force, production planning cannot be properly executed resulting in substantial loss in production.
- (ii) Since the new workers have no previous experience in production there is loss arising out of defective work, increased spoilage and wastage resulting in high cost of production.
- (iii) Newly recruited workers are likely to mishandle tools and equipment which results in breakages.



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(iv) The organisation has to incur extra cost for workers' training.

(v) Labour turnover causes increased replacement cost.

(vi) Labour cost increases because of lower productivity of newly recruited workers as they do not possess the same expertise as the old workers who have left the organisation.

**4. Measurement of Labour Turnover:**

Labour turnover rate can be measured by the application of any one of the following three methods:

(i) Separation method:

(ii) Replacement method:

(iii) Flux method:

**Merit rating**

Whilst job evaluation assesses the worth of the job, merit rating measures the jobholder's performance so as to determine whether the employee should be promoted, demoted or given a special award. It also uses its own yardsticks on the performance and attributes of the employee like accuracy, initiative, level of responsiveness, willingness etc. Most industries employ rating techniques at the end of each year in order to determine the progress of each employee within the salary structure.

**Work study** This is a system of increasing or maximizing the productivity of an operating unit by reorganizing the work of that unit. Work study is sub-divided into two major methods namely methods study and work measurement.

**Method study**

This is the recording and critical examination of existing methods of doing work and comparing same with proposed methods with a view to coming up with easier methods which would be more effective and cheaper on the long run.

**Work measurement**



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As the name suggests, work measurement seeks to measure the time required for a qualified worker to complete a specific assignment at a specified level of performance

**Job evaluation**

This is a technique which seeks to show the relative worth of each job so as to rank it against other jobs and ultimately establish the appropriate weight of remuneration to attach to the job. Job evaluation analyses the content of each job using yardsticks such as degree of responsibility,

decisions involved, training and experience required, working conditions etc, awarding points for each yardstick.

**Objectives of job evaluation**

The main objective of job evaluation is to ensure equitable remuneration for relative worth of a job. As per the ILO Report, the aim of the majority of systems of job evaluation is to establish, on agreed logical basis, the relative values of different jobs in a given plant or machinery, i.e., it aims at determining the relative worth of a job. The principle upon which all job evaluation schemes are based is that of describing and assessing the value of all jobs in the firms in 6 terms of a number of factors, the relative importance of which varies from job to job”.

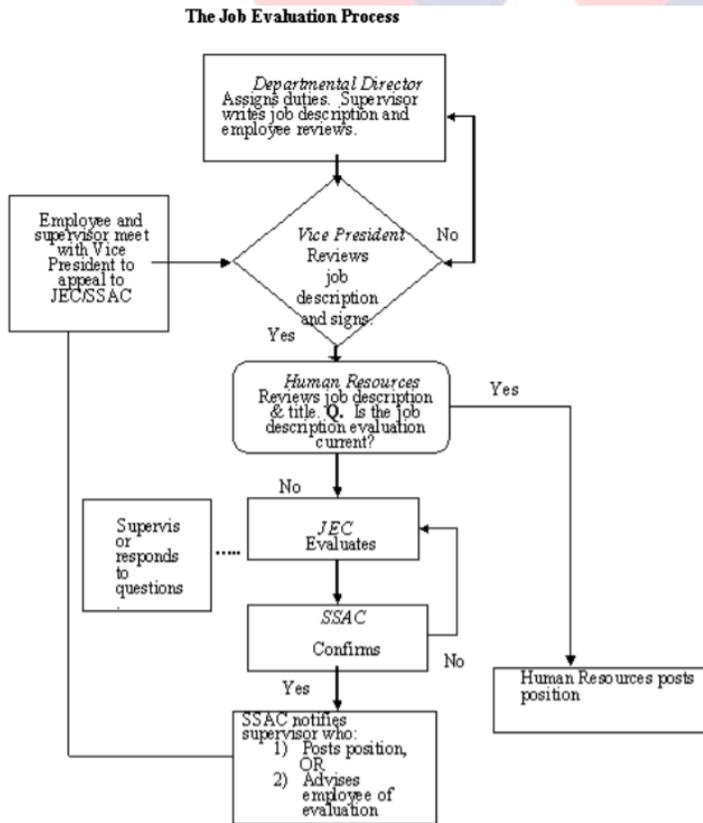
The objectives of job evaluation, to put in a more systematic manner are to:

1. Establish a standard procedure for determining the relative worth of each job in an organization;
2. Ensure equitable wage for a job and reasonable wage differentials between different jobs in a hierarchical organization;
3. Determine the rate of pay for each job which is fair and equitable with relation to other jobs in the plant, community or industry;
4. Eliminate wage inequalities;
5. Use as a basis for fixing incentives and different bonus plans;



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- 6. Promote a fair and accurate consideration of all employees for advancement and transfer;
- 7. Provide information for work organization, employees" selection, placement, training and other similar purposes;
- 8. Provide a benchmark for making career planning for the employees in the organization and;
- 9. Ensure that like wages are paid to all qualified employees for like work.





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**UNIT – IV –Direct Cost, Introduction to JIT, CAM and ERP.**

Just-in-time (JIT) purchasing is a cost accounting strategy where you purchase the minimum amount of goods to meet customer demand. Say you decide to approach your supplier about moving to a JIT purchasing arrangement. The supplier needs to deliver smaller shipments more frequently. You request a price quote based on new, different levels of purchasing activity. Compare the financial impact of your current purchasing system with a JIT purchasing system.

**JIT purchasing costs in cost accounting**

Say you manage a large chain of sporting-goods stores. You're considering the impact of JIT purchasing for many products. At the moment, you're evaluating baseball bats.

Here's some information regarding baseball bat purchases:

**Purchasing costs:** The cost per baseball bat is \$100 for both your current purchasing method and JIT purchasing.

**Ordering costs:** The cost per order is \$150 for both purchasing methods.

**Opportunity costs:** Company management has decided on an 8 percent required rate of return on investment. That 8 percent rate applies to any use of capital, including inventory purchases. This is the minimum return that the company expects from the money it has invested. If this return is not achieved, there are likely better alternatives for the company's cash.

**Average inventory:** Average inventory is defined as the average value of inventory during a certain time period. Average inventory is  $(\text{beginning inventory} + \text{ending inventory}) \div 2$ . Currently, your average inventory is 10 percent of annual sales, or 2,000 bats. Under JIT, your average inventory will decline to 200 units.

**Carrying costs:** You also incur costs for insurance and storage. Carrying costs total \$15 per unit.

**Advantages and Disadvantages of Just-In-Time Systems**



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- Just-in-time approach keeps stock holding costs to a minimum level. The released capacity results in better utilization of space and bears a favourable impact on the insurance premiums and rent that would otherwise be needed to be made.
- The just-in-time approach helps to eliminate waste. Chances of expired or out of date products; do not arise at all.
- As under this management method, only essential stocks which are required for to manufacturing are obtained, thus less working capital is required.
- Under this approach, a minimum re-ordering level is set, and only when that level is reached, order for fresh stocks are made and thus this becomes a boon to inventory management too.
- Due to the abovementioned low level of stocks held, the ROI (Return On Investment) of the organizations be high in general.
- As this approach works on a demand-pull basis, all goods produced would be sold, and thus it includes changes in demand with unanticipated ease. This makes JIT appealing today, where the market demand is fickle and somewhat volatile.
- JIT emphasizes the 'right-first-time' concept, so that rework costs and the cost of inspection is minimized.
- By following JIT greater efficiency and High-quality products can be derived.
- Better relationships are fostered along the production chain under a JIT system.
- Higher customer satisfaction due to continuous communication with the customer.
- Just In Time adoption result in the elimination of overproduction.

**Disadvantages of Adopting JIT Systems**

- JIT approach states ZERO tolerance for mistakes, making re-work difficult in practice, as inventory is kept to a minimum level.
- A successful application of JIT requires a high reliance on suppliers, whose performance is outside the purview of the manufacturer.
- Due to no buffers in JIT, production line idling and downtime can occur which would have an unfavourable effect on the production process and also on the finances.
- Chances are quite high of not meeting an unexpected increase in orders as there will be no excess inventory of finished goods.



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- Transaction costs would be comparatively high depending upon the frequency of transactions.
- JIT may have certain negative effects on the environment due to the frequent deliveries as the same would result in higher use and cost of transportation, which in turn would consume more fossil fuels.

**What is CAM?**

Computer-aided manufacturing is the use of software and computer-controlled machinery (CNC) to automate the manufacturing process. CAM itself stands for computer-aided manufacturing and usually works in tandem with CAD (computer-aided design) to allow machines to create objects directly from computer designs and software rather than engineers having to set up machines and processes manually.

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Computer-aided manufacturing is the use of software and computer-controlled machinery (CNC) to automate the manufacturing process. CAM itself stands for computer-aided manufacturing and usually works in tandem with CAD (computer-aided design) to allow machines to create objects directly from computer designs and software rather than engineers having to set up machines and processes manually.

**Manual machine setup**

In the past, machines had to be set up and often operated manually, but CAM means these processes can happen automatically, as directed by the computers at the heart of the machines.

**How does CAM work?**

Traditional manufacturing methods rely on engineers to set up the various machines used in the manufacturing process – often creating ‘jigs’ or patterns for machines to follow. The CAM system works by substituting hand-made jigs with software that defines the actions and processes of a machine directly.



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Computer-aided manufacturing software translates drawings and data into detailed instructions that drive automated tools/machines. This allows designers to submit designs and specifications directly to machines without the need to develop jigs or program machines manually.

Typically, a designer will use CAD software on their computer to create a 3D design of a model or part. The software talks to CAM tools/machines to set up the processes to produce/tool the physical item automatically. CAM machines can then produce thousands of identical models automatically – reducing the time it takes to produce.

**What is CAM used for?**

In today's world, you'd be better off to ask what CAM can't be used for. CAM is used – and can be used – to produce almost any item created by a machine or tool. It can be used to create models from metal, plastic and even wood.

**Its main roles are:**

- Tool path designs create computer models of new designs
- Machining equipment in manufacturing that rely on numerical controls for precision cutting, shaping and packaging
- Management of overall production process to drive efficiency
- Fabrication and engineering design which relies on the integration and synchronisation of various pieces of machinery with CAM software
- Equipment safety. CAM is highly reliable – able to reproduce identical processes without deviation. This can also result in cost savings as manufacturing facilities can then maintain OSHA compliance.

**Advantages of CAM**

**Predictable and consistent**

Flexible and versatile, CAM systems can maximize utilization of a full range of production equipment (high-speed, 5-axis, multi-function and turning machines, electrical discharge machining (EDM) and CMM inspection equipment)

- Ability to create prototypes quickly and without waste
- Can aid in optimizing NC programs for optimum machining productivity



**NOTES**

- Can automate the creation of performance reports
- Provides integration of various systems and processes as part of the manufacturing process
- Higher productivity
- Designs can be altered without the need to manually re-program machines especially with parametric CAD software
- Ease of implementation as CAD and CAM systems become standardised
- CAD and CAM software continues to evolve offering visual representation and integration of modelling and testing applications
- Accuracy.

**Disadvantages of CAM**

- Computer errors are possible
- CAD and CAM software can be expensive
- Training is expensive
- Computers and controllers to run the software and CNC machinery for manufacturing is expensive.

The manufacturing industry is highly dynamic and competitive in nature which makes it imperative for such businesses to have an integrated solution that can enhance efficiency, diminish costs, increase sales and profitability but most importantly, enable the organization to make accurate, informed and strategic decisions. An enterprise resource planning system such as ERP for manufacturing industry might be the answer to all these requirements.

**ERP-**

Enterprise Resource Planning is a business management software solution that enables organizations to use one system to manage business processes.

ERP is accounting and operations oriented and features one database as a master source of enterprise information. ERP for manufacturing is used to identify and plan the resource needs of the entire enterprise.

**6 Benefits of ERP for manufacturing industry are: -**



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- Automates and Streamlines Business Processes with greater Adaptability
- Respond to Market Conditions Quicker
- Strategic Decision Making
- Reduce Costs
- Enhance Customer Satisfaction

ERP for manufacturing industry integrates all aspects of business (resources, operations, monitoring, reporting, sales, accounting and finance, etc.) and empowers businesses to function smoothly by maintaining a single database.

In the last few years, an increasing number of businesses have opted for ERP solutions. According to an ERP Software Market Report published by Allied Market Research report, the global market is expected to garner \$ 41.69 billion by 2020.

In case, you are sitting on the fence about availing ERP system, listed below are 6 benefits of the solution that may help you understand why every manufacturing business must opt for it:

**Automates and Streamlines Business Processes with greater Adaptability**

A complete ERP solution streamlines business processes and drives automation for manufacturing organizations. By streamlining the processes, all data is available in a centralized location with complete visibility in all functionalities – development, designing, inventory, procurement, production, finance, sales, delivery and more.

Furthermore, any personnel can monitor the production status in real time, without any dependence on an individual or team. For instance, the designing team can monitor the progress of the production and update the purchasing and finance departments about requirements of additional raw materials.

This brings in efficiency in the system, improves productivity and helps companies maintain their customer commitments. By automating the processes with ERP for manufacturing industry, the company also reduces its dependence on manual processes. This not only accelerates the production process but minimizes errors and improves profitability significantly.

erp-solution



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**Respond to Market Conditions Quicker**

ERP for manufacturing industry provide real time data analysis helps businesses estimate, plan, adjust and respond to changing market requirements better. Decision makers refer to system generated reports on regular intervals to understand the varied market demands and capitalize on customers purchasing trends. Detailed insights give managers a 360 degree view helping them to reduce forecasting errors and capitalize on new opportunities if available.

**Strategic Decision Making**

A comprehensive ERP solution for manufacturing improves the decision-making ability of an organization. It provides thorough insights and visibility into every department and business process helping the company to make informed, spot-on, and faster business decisions. Access to key performance metrics such as overall sales, sales margin etc. helps manufacturing companies remain aligned to their goals and take necessary internal decisions if the need be. The complete visibility of internal processes and departments with ERP for manufacturing industry also helps the management to optimize the day to day operations.

**Reduce Costs**

A robust ERP software helps manufacturing organizations to reduce the overall operational cost as manual, time – consuming processes are replaced by automated, streamlined processes with real time business information. Additionally, by increasing worker productivity, the ERP for manufacturing industry minimizes labour expenses, and enhanced precision and lower error rates curtails the losses. Ability to track inventory accurately and integrate it efficiently with production planning eliminates excess inventory and warehousing costs. And lastly, improved organization visibility helps the management make savings wherever possible.

**Enhance Customer Satisfaction**

Accurate production planning, enhanced control over inventory, streamlined process scheduling, and coordination of distribution channels enable manufacturers to improve on-time delivery of products, a critical performance metric. Delivering products on time is critical to maintaining customer satisfaction. ERP solutions for manufacturing



**NOTES**

organizations offer data in real-time so decision makers can get a realistic view of inventory levels at any time.

While the benefits of an enterprise resource planning systems for manufacturing businesses are plenty, simply deploying any software will not help you achieve your organization goals. You must partner with an experienced ERP solution provider such as Embee to arrive at the right software for your business.

As one of the most significant partners of SAP, Embee is strategically positioned to provide you with the very best of ERP solution, the way you need it. Resolve all these & explore newer possibilities to grow your enterprise. Scale new heights of success with Embee's enterprise resource planning (ERP) solution, based on world's #1 ERP software – SAP Business One.

**Direct and indirect cost of labour**

As already discussed, labour cost is either direct or indirect. The direct labour cost is the labour cost incurred on employees who are engaged in directly transforming the raw materials into finished goods. It must be noted that, is only the basic wages paid to direct workers that constitute direct labour cost. Policy related cost incurred on direct workers is not direct labour but rather indirect labour. Examples of these policy related costs include:

**workmen compensation premium paid to insurance companies**

- employer's social security fund contribution
- bonuses paid to employees
- overtime premium paid to employees where the overtime is worked regularly as company policy etc.
- Wages cost incurred on indirect workers is indirect wages.
- Labour Cost Minimization Techniques
- Involved in minimizing labour cost. Some of the techniques include the following:
  - Effective labour monitoring and control
  - Reduce labour turnover



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**Labour Turnover**

This is a term which signifies the extent to which employees leave an organisation. It can be measured by using the following formulae: Number of employees leaving. To obtain the maximum benefit from the Calculation, the rate of labour turnover should be compared with rate for previous periods and if available, the rate for other businesses in the area and in the industry as a whole. If the number of leavers is high relative to the total number of employees, a high ratio will emerge. An increase in the number of employees leaving or a reduction in the total workforce will cause an increase in the rate compared with previous periods. The effect of a high rate is reflected in loss of output, lowering of morale and higher cost. Loss of output occurs because of:

- (a) The gap between the person leaving and his replacement;
- (b) The length of time taken to train a new employee to the level of efficiency of the previous employee;
- (c) The reduced effort given by an employee during the days or weeks immediately prior to the date of departure

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