

# Cost Audit Handbook



Vegetable Ghee & Cooking Oil Industry



Cement Industry



Sugar Industry



Fertilizer Industry



Thermal Energy Industry



Petroleum Refining Industry



Natural Gas Industry



Polyester Fibre Industry



Estd. 1951

**Institute of Cost and Management  
Accountants of Pakistan**

[www.icmap.com.pk](http://www.icmap.com.pk)

# **COST AUDIT HANDBOOK**



**Institute of Cost and Management Accountants of Pakistan**

ST-18/C, Block-6, Gulshan-e-Iqbal, Karachi-75300, Pakistan.

Ph.: (92-021) 9243900-01-02 & 04, Fax: (92-021) 9243342,

E-mail: <research@icmap.com.pk>, Website: <http://www.icmap.com.pk>

1<sup>st</sup> Edition : 2001  
2<sup>nd</sup> Revised Edition : 2005  
3<sup>rd</sup> Revised Edition : 2008  
Published by : Research Department  
Institute of Cost and Management  
Accountants of Pakistan

© ALL RIGHTS RESERVED

No part of this work covered by the copyright hereon may be reproduced or used in any form or by any means-graphic, electronic or mechanical, including photocopying, recording, taping, web distribution or information storage and retrieval systems – without the written permission of the publisher.

For permission to use material from this text or product, contact us on:  
Tel.: (92-21) 9243900, Fax: (92-21) 9243342

e-mail: [research@icmap.com.pk](mailto:research@icmap.com.pk)

## PREFACE TO THIRD REVISED EDITION

It gives me great pleasure to present this third revised edition of the Cost Audit Handbook. It is a comprehensively reviewed and updated version of the previous two editions, published in 2001 and 2005. The handbook is intended to provide detailed guidance to anyone who is interested, particularly members of the Institute, on maintaining proper cost accounting records and conducting Cost Audit in accordance with the relevant Cost Accounting Record Orders and Companies (Audit of Cost Accounts) Rules, 1998.



For the first time in the Institute's history, an exposure draft was issued to seek comments on the 'third revised edition of Cost Audit Handbook' from the members and other stakeholders. The comments so received have been considered and incorporated appropriately.

One very useful suggestion was to place the following Government's gazette notifications on ICMAP's web site ([www.icmap.com.pk](http://www.icmap.com.pk)) instead of including them in this booklet:

1. Vegetable Ghee and Cooking Oil Companies (Cost Accounting Records) Order, 1990
2. Cement Industry (Cost Accounting Records) Order, 1994
3. Sugar Industry (Cost Accounting Records) Order, 2001

What makes this third revised edition more useful compared to the previous ones, is the inclusion of a separate Chapter on "Manufacturing Process of Vegetable Ghee / Cooking Oil, Cement and Sugar industries' and glossary of technical terms. Additional material has also been included on Cost Audit Program, checklists and manufacturing flow charts of these three industries.

I am highly grateful to the National Council for its support and members of the Research, Quality Assurance & Ethics Committee, for their valuable input. I especially acknowledge with gratitude, considerably detailed professional contribution by Mr. Nazir Ahmed Shaheen, FCMA. I will be failing in my duty if I do not acknowledge the contribution of Mr. Qaisar Mufti, former Chairman of the ICMAP's Research Committee, who played a pivotal role in compilation and publication of the first edition of this handbook in 2001.

**M. H. Asif, FCMA**  
Chairman, Research, Quality  
Assurance & Ethics Committee

July 2008

## FOREWORD



I am immensely pleased to know that the third revised edition of the Cost Audit Handbook is being published by the Institute for the guidance of its members in particular and the business community in general. I hope that this reference guide would continue to help them in ensuring proper maintenance of cost accounting records and in assisting the practicing members in performing their foremost task of cost audit, in a more efficient and systematic manner.

The cost audit scenario in our country has changed recently, with the addition of five new sectors viz. fertilizer, thermal energy, petroleum refining, natural gas and polyester fibre. Previously, only three industries i.e. cement, sugar and vegetable ghee / cooking oil were under cost audit regime. The Securities and Exchange Commission of Pakistan has, by issuing the 'Companies Cost Accounting Records (General Order), 2008', specified the aforesaid industries, which are now required to maintain cost accounting records and comply with the provisions of Companies (Audit of cost Accounts) Rules, 1998. To keep our members on board, this edition also includes a separate chapter on new Cost Audit Sectors.

It is also a matter of great satisfaction for the Institute to have released, for the first time in its history, a draft Cost Accounting Guideline (CAG) on the Chemical Fertilizer Industry. This guideline would not be mandatory for the industry, but it would facilitate the entities in maintaining cost records and in complying with the requirements of the regulatory authorities. The guidelines for other cost audit sectors would also be issued by the Institute, in due course of time. It may be mentioned that sub-committees consisting of experts in these sectors have been constituted for preparation of CAGs.

It would be unjustified if I do not acknowledge here the strenuous efforts of my predecessors, who contributed a lot in updating this handbook, in consultation with the members and professionals. The members of the Research Committee also deserve my appreciation for their valuable input.

**Nazir Ahmed Shaheen, FCMA**

Chairman, Research, Quality  
Assurance & Ethics Committee

December 2008

# Cost Audit Handbook

## CHAPTER I: THE COST AUDIT

1. Definition.....1
2. Legal Provisions .....1
3. Companies (Audit of Cost Accounts) Rules, 1998 .....2
4. Cost Accounting Records Special Orders .....2
5. Cost Accounting General Order .....2

## CHAPTER II: THE COST AUDITOR

1. Development of Cost Audit Profession.....4
2. Professional Qualifications .....4
3. Appointment .....5
4. Ineligibilities .....5
5. Powers and Duties .....6
6. Liabilities.....7
7. Penalty for Non-Compliance.....7

## CHAPTER III: PRINCIPLES OF COST AUDIT

1. Planning and Performing Cost Audit .....8
2. Code of Ethics .....8
3. Independence of Cost Auditor.....8
4. Integrity and Objectivity .....9
5. Professional Competence and Due Care.....9
6. Confidentiality .....9
7. Professional Behaviour.....9
8. Technical Standards.....10
9. Professional Code of Ethics .....10
10. Engagement in other occupation.....10

**CHAPTER IV: PLANNING COST AUDIT**

1. General.....	11
2. Personal.....	11
3. Documentation .....	13
4. Quality Control.....	14
5. Cost Audit Programme .....	14
Annexure – “A” – Overall Cost Audit Programme .....	16
Annexure – “B” – Specific Cost Audit Programmes .....	20
Annexure – “C” – Checklists of Vegetable Ghee, Cement & Sugar Industries .....	41
Annexure – “D” – Manufacturing Flow Charts of Vegetable Ghee, Cement & Sugar Industries .....	48

**CHAPTER V: MANUFACTURING PROCESSES OF VEGETABLE GHEE, CEMENT AND SUGAR INDUSTRIES**

1. Manufacturing Process of Cement .....	53
2. Manufacturing Process of Sugar .....	57
3. Manufacturing Process of Vegetable Ghee/ Edible Oil .....	60

**CHAPTER VI: PERFORMING COST AUDIT, BACKGROUND KNOWLEDGE AND AUDIT PROCEDURES**

1. Knowledge of the industry and the ‘entity’ .....	63
2. Organisational set-up .....	64
3. Company Representations.....	64
4. Production .....	65
5. Gathering Cost Audit Evidence .....	65

**CHAPTER VII: PERFORMING COST AUDIT, IMPORTANT ELEMENTS OF COST**

1. Raw Materials.....	69
2. Wages and Salaries .....	70
3. Stores and Spare Parts .....	71
4. Power and Energy.....	72
5. Repairs & Maintenance.....	73
6. Depreciation .....	73
7. Overheads.....	74

**CHAPTER VIII: COST ACCOUNTING SYSTEM AND RECONCILIATION**

1. Determining Unit Cost .....	75
2. Cost Accounting System .....	76
3. Integrated Cost Accounting System.....	77
4. Reconciliation with Financial Accounts .....	78

**CHAPTER IX: COST AUDITORS REPORT**

1. Submission of Cost Audit Report .....	79
2. Appendix III of Companies (Audit of Cost Accounts) Rules, 1998 .....	80
3. Royalty/Technical Aids Payment.....	80
4. Abnormal non-recurring Features .....	80
5. Cost of Production.....	81
6. Sales and Profitability.....	81
7. Cost Auditors' Observations and Conclusions.....	82



---

<b>CHAPTER X: New COST AUDIT SECTORS – Fertilizer, Thermal Energy, Petroleum Refining, Natural Gas and Polyester Fibre</b>	
1. Companies Cost Accounting Records (Gen. Order), 2008.....	84
2. Cost Accounting Guideline (CAG-1) on ..... Chemical Fertilizer Industry	85
3. Manufacturing Process of Fertilizers.....	86
4. Process Flow Chart of Ammonia Fertilizer Manufacturing.....	89
5. Process Flow Chart of Phosphoric Fertilizer Manufacturing....	90
6. Gazette Notification.....	91
 <b>GLOSSARY OF TECHNICAL TERMS</b> .....	 93

---

## **Cost Audit**

### **1. Definition:**

Cost audit is an examination of cost accounting records and verification of the facts to ascertain that the cost of the product under reference has been arrived at in accordance with principles of Cost Accounting and evaluation of adequacy of proper Cost Accounting Records and their maintenance. The cost audit is performed by an independent, professionally qualified Cost and Management Accountant or Chartered Accountant. Cost audit is carried out to evaluate cost performance of the entity for which Cost Accounting Records have been prescribed by the Securities and Exchange Commission of Pakistan (SECP). The Cost Auditor, therefore, carries out such tests and makes such inquiries which enable him to give a professional, independent, unprejudiced opinion on the cost performance of the entity, as reflected in the cost information provided in the schedules and annexures which are prepared by the entity in accordance with the cost accounting records maintained.

### **2. Legal Provisions:**

The Companies Ordinance, 1984 while providing for the books of accounts to be kept by a company under Section 230, makes an additional provision in clause (e) of sub-section (1) of that section which reads:

“in the case of company engaged in production, processing, manufacturing or mining activities, such particulars relating to utilization of material or labour or to other inputs or items of cost as may be prescribed, if such class of companies is required by the Commission by a general or special order to include such particulars in the books of accounts”.

The Companies Ordinance, 1984 provides for Audit of Cost Accounts vide Section 258 which reads:-

“258. Audit of Cost Accounts.- (1) Where any company or class of companies is required under Clause (e) of subsection (1) of Section 230 to include in its books of accounts the particulars referred to therein, the Federal Government may direct that an audit of cost accounts of the company shall be conducted in such manner and with such stipulations as may be specified in the order by an auditor who is a chartered accountant within the meaning of the Chartered Accountants Ordinance, 1961 (X of 1961), or a cost and management accountant within the meaning of the Cost and Management Accountants Act, 1966 (XIV of 1966); and such auditor shall have the same powers, duties and liabilities as an auditor of a company and such other powers, duties and liabilities as may be prescribed.”

### **3. Companies (Audit of Cost Accounts) Rules, 1998:**

The basic structure of the Cost Audit has been laid down in the Companies (Audit of Cost Accounts) Rules, 1998. Cost Audit has to be carried out every year from 1997-98 in all industries to which Cost Account Records Orders issued by SECP apply. Cost audit ascertains compliance with “Cost Accounting” Record Orders.

### **4. Cost Accounting Records Special Orders:**

Under Clause (e) of Sub-section (1) of Section 230 of the Companies Ordinance 1984, the SECP (former Corporate Law Authority) framed the Vegetable Ghee and Cooking Oil Companies (Cost Accounting Records) Order, 1990 which came into force from 1st January 1991. Subsequently the “Cement Industry (Cost Accounting Records) Order 1994 and Sugar Industry (Cost Accounting Records) Order, 2001 were framed by SECP which came into force from 1st July 1994 and 13th February 2001, respectively. Under these three Special Orders, Vegetable Ghee and Cooking Oil Companies, units of Cement Industry and Sugar Industry are required to maintain cost accounting records to provide cost accounting information in a verifiable form, required to fill in the schedules and annexures prescribed in these orders.

### **5. Cost Accounting Records General Order:**

A Companies Cost Accounting Records (General Order) 2008 has been issued by the SECP vide gazette notification dated 26th September 2008. Through this General Order, it has been made mandatory for all the companies engaged in the following industries to maintain cost accounting records from the financial year commencing on or after 1<sup>st</sup> October 2008:

- (1) Fertilizer
- (2) Thermal Energy
- (3) Petroleum Refining
- (4) Natural Gas
- (5) Polyester Fiber

At present total eight industries are under cost audit regime. More industries are likely to be considered by the SECP in future.

A separate Chapter on Companies Cost Accounting Records (General Order) 2008 will follow later in this handbook.

## CHAPTER - II

---

# Cost Auditor

### 1. Development of Cost Audit Profession:

During World War I, a large number of contracts were awarded on cost plus basis, which made it necessary for the contractors to maintain cost accounting records. Cost Accounting techniques are needed not only to help the management exercise cost control, but the cost accounting records are also needed for such clients who place orders on cost plus basis. In such cases, the client has the right to examine cost accounting records or have performed cost audit. In USA, Defence suppliers and contractors have to maintain cost accounting records in accordance with Cost Accounting Standards laid down by the Cost Accounting Standards Board (CASB). This is subject to cost audit to ensure its authenticity. The Cost Accounting in its developed form helps the management of manufacturing concerns in improving the efficiency, in making the business decisions and in evaluating the performance of entities in the same industrial sector through standardizing the systems and procedures. However, it is only in India, Pakistan and Bangladesh that cost audit has been formalized under Companies Ordinance/Acts. India is the pioneer in introducing Cost Audit since late 60s and now over 40 industries are covered under Cost Audit Scheme. In India and Bangladesh, only Cost and Management Accountants are eligible to conduct cost audit. In Pakistan, Chartered Accountants are also eligible to conduct cost audit.

### 2. Professional Qualifications:

Statutory cost audit was introduced in Pakistan under the Companies (Audit of Cost Accounts) Rules, 1998. Under sub-rule (1) of rule 3 thereof, it has been laid down that every company shall be required to get its cost accounts audited by a cost auditor who is a Chartered Accountant within the meaning of the Chartered Accountants Ordinance 1961 [X of 1961] or a Cost and Management Accountant within the meaning of the Cost and Management Accountants Act, 1966 [XIV of 1966].

### 3. Appointment:

Under sub-rules (2) and (3) of rule 3 of the Companies (Audit of Cost Accounts) Rules, 1998, the cost auditor shall be appointed by the directors with the prior approval of the SECP within 60 days of the close of the financial year of the company. The company shall apply to the SECP in the form, set out in Appendix-I to the Companies (Audit of Cost Accounts) Rules 1998, for appointment of cost auditor, not later than 30 days before date on which cost auditor is to be appointed. The cost auditor is appointed by the directors subject to the prior approval of the SECP. The Audit Acceptance Letter may be used after the directors of the client company have agreed to appoint the cost auditor and have applied to the SECP in the prescribed form, for its prior approval.

### 4. Ineligibilities:

The persons ineligible for appointment as Cost Auditor have been specified in sub-rule 4 of Rule 3 of the Companies (Audit of Cost Accounts) Rules, 1998. Cost and Management accountants in practice, who are not eligible for appointment as cost auditor should not offer themselves for appointment.

The ineligibilities are briefly explained as under: -

- (i) The same accountant or accounting firm, who has been appointed as an auditor of the Company, under Section 252 of the Companies Ordinance 1984 shall not be appointed as a cost auditor. A financial or corporate auditor of a company, therefore, shall not be appointed as a cost auditor of the same company at the same time. Accountants who are already acting as auditors of financial statements of a company shall not be appointed as cost auditors of the same company.
- (ii) A person who is, or has been at any time during the preceding three years, a director, officer or employee of the company shall not be appointed as cost auditor.
- (iii) A person who is a partner of a director, officer or employee of the company; or an employee of a director, officer or employee of the company shall not be appointed as a cost auditor. The cost auditor cannot be a partner or an employee of any director, officer or employee of the company.
- (iv) A spouse of a director of the company shall not be appointed as a cost auditor of that company.
- (v) A person who is indebted to the company for any amount at the relevant time.
- (vi) A corporate body shall not be appointed as a cost auditor. A cost auditor, therefore, has to be an individual or a firm, and not a corporate body.

## 5. Powers and Duties:

Statutory provisions regarding audit of cost accounts are contained in Section 258 of the Companies Ordinance 1984. These are reproduced below:

*Section 258. "Audit of Cost Accounts: (1) Where any company or class of companies is required under Clause(e) of sub-section(1) of Section 230 to include in its books of accounts the particulars referred to therein, the Federal Government may direct that an audit of cost accounts of the company shall be conducted in such manner and with such stipulations as may be specified in the order, by an auditor who is a chartered accountant within the meaning of the Chartered Accountants Ordinance, 1961 (X of 1961), or a cost and management accountant within the meaning of the Cost and Management Accountants Act, 1966 (XIV of 1966); and such auditor shall have the same powers, duties and liabilities as an auditor of a company and such other powers, duties and liabilities as may be prescribed."*

The cost auditor has the same powers and duties as the financial auditor may have in terms of Section 255, including the following:-

- (1) Every auditor of a company shall have a right of access at all times to the books, papers, accounts and vouchers of the company, whether kept at the registered office of the company or elsewhere, and shall be entitled to require from the company and the directors and other officers of the company such information and explanation as he thinks necessary for the performance of the duties of the auditors.
- (2) In the case of a company having a branch office outside Pakistan, it shall be sufficient if the auditor is allowed access to such copies of, and extracts from, the books and papers of the branch as have been transmitted to the principal office of the company in Pakistan.
- (3) If any officer of a company refuses or fails, without lawful justification, the onus whereof shall lie on him, to allow any auditor access to any books and papers in his custody or power, or to give any such information possessed by him as and when required, or otherwise hinders, obstructs or delays an auditor in the performance of his duties or the exercise of his powers or fails to give notice of any general meeting to the auditor, he shall be liable to a fine which may extend to five thousand rupees and in the case of a continuing offence to a further fine which may extend to one hundred rupees for every day after the first during which the default, refusal or contravention continues.

### 5(a) Records for Cost Audit and Financial Audit:-

Section 255 and its sub-sections quoted in the foregoing paragraph defines the powers and duties of auditors appointed under Section 252(1) of the Ordinance and auditors appointed under Cost Audit Rules. References made in the sections to books of accounts and to balance sheet, profit and loss account or income and expenditure account would mean accounting records for the financial auditor and capacity utilization statement, statement of closing stock and cost accounting statements (schedules and annexures) would mean cost records for the cost auditor.

Although the role of the cost auditor has been defined while discussing the objectives of cost audit, the position of the financial auditor and that of the cost auditor, are slightly different. The position of an auditor of the Company is construed as a servant of the shareholders and it is his duty to examine the affairs of the company on their behalf and report to them his findings. The position of a cost auditor, however, is different because he is appointed by the management (Board of Directors), subject to prior approval of Securities & Exchange Commission of Pakistan, and his position is to be interpreted in view of the provisions of the Companies (Audit of Cost Accounts) Rules, 1998.

### 6. Liabilities:

A cost auditor, while examining the cost accounting records, is required to exercise reasonable care and skill. What is reasonable care and skill, depends on the circumstances of each case. If an auditor does not take reasonable care and does not exercise skill, his failing even in one instance could be construed as negligence, if not worse.

An auditor is not bound to be a detective. His role becomes amply clear with the discussion of professional competence and professional ethics in Chapter III of this Handbook. However, failure on the part of an auditor makes him jointly and severally liable with those who are responsible for the management of the company.

### 7. Penalty for non-compliance:

A cost auditor has to comply with the provisions contained in **Rule 5** of the Companies (Audit of Cost Accounts) Rules, 1998, which is reproduced as under:

*“Penalty: - Whoever fails or refuses to comply with, or contravenes any provision of these rules, or knowingly and willfully authorises or permits such failure, refusal or contravention shall, in addition to any other liability under the Companies Ordinance, 1984, be also punishable with fine not exceeding two thousand rupees and, in case of continuing failure, refusal or contravention, with a further fine not exceeding one hundred rupees for every day after the first during which such contravention continues.”*



## CHAPTER – III

---

# Principles of Cost Audit

### 1. Planning and Performing Cost Audit:

There are certain principles that the cost auditor has to observe in planning and performing the cost audit. There are also principles that the cost auditor has to see are being observed by the company he is auditing. On the one hand, the cost auditor has to safeguard his independence and professional status in planning and performing the cost audit, ensuring quality and standard of cost audit, as required by his professional body, the ICMAP, as well as by the Companies Ordinance 1984, and the Companies (Audit of Cost Accounts) Rules, 1998, and other rules regulating his audit engagement and reporting. On the other hand, he has also to see that the client unit operates within the legal framework provided for the industry, maintaining cost accounting records, in accordance with the cost accounting records order rules applicable to the industry.

### 2. Code of Ethics:

Cost Auditor should comply with the “code of ethics for professional accountants.” The fundamental principles governing the professional responsibility of the Cost Auditors are enumerated as follows:

- a. independence;
- b. integrity;
- c. objectivity;
- d. professional competence and due care;
- e. confidentiality;
- f. professional behaviour; and
- g. technical standards.

### 3. Independence of Cost Auditor:

The independence of the cost auditor is largely covered by the Companies (Audit of Cost Accounts) Rules 1998, under which a person who has or had specified relationships, which go to mar his independence, cannot be appointed as a cost auditor.

**4. Integrity and Objectivity:**

Integrity implies not only honesty but fair dealings and truthfulness. The principle of objectivity imposes the obligation on all professional accountants to be fair, intellectually honest and free of conflict of interest. Financial involvement with the client effects independence and may lead a reasonable observer to conclude that it has been impaired.

A professional cost and management accountant should be straightforward and honest in rendering professional services as a cost auditor. He has neither any ulterior motives nor any personal ends to serve. He should be fair and should not allow any prejudice or bias, conflict of interest or any other influence to override objectivity. Cost audit is to meet the management's and the Government's need for credibility in cost information and cost accounting systems.

**5. Professional Competence and Due Care:**

A professional accountant should not project himself as having expertise or experience which he does not possess. Attainment of professional competence requires a high standard of general education followed by specific education, training and examination in professionally relevant subjects and a period of work experience, with which all ICMAP members are equipped. Professional competence requires to be maintained by a continuing awareness of developments in the accountancy profession, including relevant national and international pronouncements on accounting, auditing and other relevant regulations and statutory requirements. The cost and management accountant has to maintain professional knowledge and skill at a level required to ensure that a client or employer receives the advantage of competent professional service, based on up-to-date developments in practice, legislation and techniques.

**6. Confidentiality:**

A cost and management accountant should respect the confidentiality of information acquired during the course of performing professional services and should not use or disclose any such information without proper and specific Commission or unless there is a legal or professional right or duty to disclose. The duty of confidentiality continues even after the end of the relationship between the cost auditor and the client or the cost and management accountant and the employer.

**7. Professional Behaviour:**

A professional Cost and Management Accountant, being a member of the Institute of Cost and Management Accountants of Pakistan, should act in a manner consistent with the good reputation of the profession. He should meticulously avoid any such conduct or

behaviour as may cast an unfavourable aspersion on the profession. He has to ensure professional behaviour while meeting his responsibilities to clients, third parties, other members of the cost and management accounting profession, staff, employers and the general public.

### **8. Technical Standards:**

A professional Cost and Management Accountant should carry out professional services in accordance with the relevant technical and professional standards. A Cost and Management Accountant has a duty to render professional services with care and skill, in accordance with the instructions of the clients or employers, insofar as they are compatible with the requirements of integrity, objectivity, and in the case of Cost and Management Accountants in public practice, independence. Moreover, they have to conform to the technical and professional standards laid down by the Institute of Cost and Management Accountants of Pakistan, International Federation of Accountants (IFAC), International Accounting Standard Board (IASB) and the relevant laws, orders, rules and regulations.

### **9. Professional Code of Ethics:**

A distinguishing mark of a profession is its acceptance of responsibilities to the society. The Cost Auditor's independence is to be judged by his clients, Government, employers, employees, investors in the business, the financial community and the consumers at large, who all rely on the objectivity and integrity of the Cost and Management Accountant. This reliance imposes a public interest responsibility on the professional cost and management accountant.

### **10. Engagement in other occupation:**

A professional accountant in public practice should not concurrently be engaged in any business occupation and activity which might impair his integrity, objectivity or independence or the good reputation of the profession. The code of professional ethics of the Institute of Cost and Management Accountants of Pakistan must be carefully observed.

**CHAPTER – IV****Planning Cost Audit****1. General:**

- (i) Cost Audit should be planned with professional care, recognising that circumstances may exist to cause the cost statements to be materially misstated. For example, management will be providing cost accounting information in the Schedules and Annexures prescribed in the cost accounting record orders/rules, and also statements regarding capacity and inventories. The cost auditor will be finding evidence to support the information provided; but he is not to assume it is necessarily correct.
- (ii) The cost audit should be so programmed and conducted as to provide reasonable assurance that the cost information provided in the Schedules and Annexures, taken as a whole, are free of material misstatement. Reasonable assurance is a concept relating to the accumulation of audit evidence, necessary for the cost auditor to conclude that there are no material misstatements in the cost accounting information and statements, taken as a whole. The concept relates to the whole audit process.
- (iii) Acquiring an undertaking of the industry, studying the client's organisational set-up and the cost accounting control exercised over the various elements of cost are all a part of conducting the cost audit procedures. In planning cost audit, the personnel requirements of an assignment; documentation of the cost audit procedures and of audit evidence and quality control exercised over performing cost audit being important factors, are briefly discussed here.

This chapter relates to the planning done in the cost auditor's office and the documentation, which has to be looked after by the cost audit staff.

**2. Personnel:**

Cost audit work is to be assigned to personnel who have the degree of technical training and proficiency required in the circumstances. The personnel needs should be planned, keeping in view the staffing and timing requirements of specific cost audit. Qualifications

of personnel as to experience, position, background and special expertise should be evaluated. Care should be exercised not to assign any staff who may have any disqualifying relationship. The following aspects of personnel are also to be considered:

**(i) Experience:**

Experience and training of cost audit personnel should be considered, particularly keeping the relevant industry in view, as the cost and management accounting procedures and techniques considerably differ on the basis of the nature and type of industry. Earlier cost audit or other practical experience of the industry helps in carrying out cost audit of a unit of that industry.

**(ii) Directions:**

Assistants to whom work is to be delegated need appropriate direction and supervision. Direction involves informing assistants of their responsibilities and the objective of the procedures they are to perform. It includes informing them about the nature of the industry, possible cost accounting and auditing problems that may affect the cost audit routine and the procedures that they are to perform. The cost audit programme, in providing the time budget and the overall audit plan, should also prove helpful in providing necessary audit directions.

**(iii) Supervision:**

Supervision involves both direction and review of audit work. Personnel carrying out supervisory responsibilities generally perform the following functions during cost audit:

- a) monitor the progress of the cost audit and also assess that:
  - i the assistants have the necessary skills and competence to carry out their assigned tasks;
  - ii assistants understand the cost audit directions; and
  - iii the cost audit is being carried out according to the overall cost audit plan and the cost audit programme.
- b) stay aware of the cost accounting and cost auditing questions, raised during the cost audit, assess their significance and modify the cost audit plan and the cost audit programme, as considered necessary; and
- c) remove any differences of professional judgement between the personnel and decide the level to which making reference is appropriate.

### **3.1 Documentation:**

The cost auditor should document all matters which are important in providing evidence to support the opinion given in the cost audit report. Documentation here means the working papers prepared by and for, or obtained and retained by the cost auditor in connection with the performance of cost audit. Working papers may be in the form of data stored on paper, film, electronic media or other media. Working papers record the audit evidence, resulting from the cost audit work performed, to support the cost auditors opinion. The extent of working papers is a matter of professional judgement. They may cover the detailed aspects of the cost audit or may include the daily work sheets or daily diary maintained by each member of the cost audit staff engaged on the assignment.

The daily work sheets should include all queries raised; with whom each was discussed and how; and if they were satisfied. The form and content of the working papers will be determined by the nature and complexity of the business, nature and condition of the entity's cost accounting and internal control systems.

Use of standardised working papers (such as checklists, confirmation forms, standard letters etc.) may improve the efficiency with which such working papers are prepared and reviewed. Standardised working papers facilitate delegation of work and provide a means to control quality of work. Schedules, statements, analyses and other documents prepared by the entity may be utilised and made a part of the cost audit working papers, only after being satisfied that the materials have been properly prepared with due care.

### **3.2 Confidentiality of Working Paper:**

The cost auditor should adopt appropriate procedures for maintaining the confidentiality and safe custody of the working papers and for retaining them for a period sufficient to meet the needs of the practice and in accordance with legal and professional requirements of record retention.

Working papers are the property of the cost auditor. Although portions or extracts from the working papers may be made available to the entity at the discretion of the cost auditor, they are no substitute for the cost accounting records that the entity has to maintain under the cost accounting records orders rules, applicable to the industry.

### **3.3 Working Paper Management**

Working paper management improves the cost audit productivity. The essential aspect of such management is quick retrieval of information from the files of working papers. The filing system should be sound. Normally working papers are organised into: Permanent file, Working file and Correspondence and Administrative file. Papers which normally do not change from year to year are kept in the Permanent file. Permanent file

will have write- up on the organisation, manufacturing process etc. The Permanent file is updated at the beginning of every audit, making changes, if any, since the previous audit. Working paper file contains details relating to the year of audit. There will be a separate working paper file for every year. This file should be properly indexed and divided into convenient sections. File management is a matter of personal preference of the cost auditor.

#### **4. Quality Control:**

Quality Control policies and procedures should be implemented both at the level of the cost audit firm and individual cost audits. The cost auditor should implement quality control policies and procedures designed to ensure that all cost audits are conducted in accordance with international audit standards or relevant national standards or practices. Quality control procedures, to a large extent, depend on strict adherence to the laws, orders and rules applicable to cost audits. The objectives of the quality control policies and procedures include professional requirements, skills and competence, assigning work to personal having technical training and proficiency, providing sufficient direction, adequate supervision and review of work. Every cost auditor has to continuously, monitor that the quality control policies and procedures are being followed and the quality of work is being effectively achieved. Quality control policies and procedures should not only be communicated to personnel but also explained and some training provided to them to ensure that the policies and procedures are understood and implemented. The cost auditor and his staff members with supervisory responsibilities will consider the professional competence of assistants performing work delegated to them, when deciding the extent of direction, supervision and review appropriate for each assistant. Any delegation of work to assistants should be on the basis of reasonable assurance that such work will be done with due care by persons having the degree of professional competence required in the circumstances.

#### **5. Cost Audit Programme:**

The Cost Auditor should develop a cost audit programme setting forth the procedures that are required to implement the cost audit plan. The programme is basically based on the objectives for each area and must have an appropriate detail to serve as a instrument of instruction to the audit staff. It also serves as a means to control the adequate execution of cost audit work. It helps the audit staff to perform their jobs in a systematic way and also enables them not to overlook any important point while conducting audit. Furthermore, it facilitates the Cost Auditor to make a final review of the work already done, before signing cost audit report. There are four **Annexures i.e. A, B, C & D**, given at the end of this Chapter. The brief descriptions of these annexures are as under:

**Annexure “A”** – indicates an overall cost audit programme that includes an initial cost audit plan covering all aspects of cost audit of a unit. It should be prepared with due care after making a thorough study of the entire set up of an organization. This may help the cost auditor to identify and collect the desired information from the respective departments and cost centers.

**Annexure “B”** – exhibits specific audit programmes of various costs of production items. These would facilitate the cost auditor to check all items indicated therein.

**Annexure “C”** – comprises of all essential production items that must be acquainted with by the cost auditor. A thorough study of these lists would help him to develop an appropriate plan for cost audit.

**Annexure “D”** – contains the production flow charts of Cement, Sugar and Vegetable Ghee & Cooking Oil companies. These charts would help the cost auditor to comprehend and fully grasp the production process of each industry.



## Annexure – “A”

**COST AUDIT PROGRAMME**

An overall cost audit programme is drawn up as under for guidance of the Audit Staff:

Planning Phases	Action to be taken
<p><b>1. Familiarisation with the company:</b></p> <p>(a) Nature of business and industry</p> <p>(b) Objectives of the company. e.g.            Maximisation of Profits            Market expansion            Market diversification            Product diversification, etc.</p> <p><b>Comment:</b> The specific business objectives shall also be checked and notes kept in respect thereof, as contained in the Memorandum of Association</p> <p>(c) Ownership, e.g. public or private            Major Shareholders Management            Position of Shareholders</p> <p>(d) Corporate structure, e.g.            Subsidiaries and Affiliates            Ownership percentage            Dates of acquisition</p>	<p>Acquire the previous years' Annual Reports and Accounts.</p> <p>Keep notes.</p> <p>Identify</p> <p>Identify            Keep Notes</p>
<p><b>2. Company records:</b></p> <p>Memorandum and Articles of Association Foreign technical collaboration &amp; agreement Other agreement deeds or contracts Including that of inter - company transactions Secretarial records and registers.</p> <p><b>Comment:</b> Only material information need to be obtained/notes kept in respect of that contained in the secretariat records and registers, since these contain much detailed information relating to different statutory matters.</p>	<p>Obtain copies. Keep Notes.</p>

<p>3. <b>Familiarisation with the Organogram of the Company:</b></p> <p>(a) Director of Finance and Accounting.  (b) Other Directors &amp; Key personnel.  (c) Delegation of Financial and Administrative Authorities.</p>	Keep Notes
<p>4. <b>Familiarity with organisation profile:</b>  Main or Central or Head Office  Administration Offices Other functional managements, e. g. Purchase, Sales, Production, Finance. etc. Background of Key personnel</p>	Obtain detailed organisation chart showing functional relationships.
<p>5. <b>Familiarity with the company policies:</b></p> <p>(a) <b>Capitalisation:</b>  Debt/Credit lines-short-term  Seasonal capital requirements  Short-term obligations  Long-term obligations</p> <p>(b) <b>Products or Services:</b>  Main Product lines  By-product lines  Production sites</p> <p>(c) <b>Inter - company transactions' policies</b></p> <p>(d) <b>Other important policies</b></p>	<p>Keep Notes</p> <p>Identify</p> <p>Obtain a Chart. Keep notes.</p> <p>Identify</p>
<p>6. <b>Sales policy and sales management:</b>  Pricing Policies  Home and export sales  Export Policy  Exporting countries  Export/Import Control Order-effect,  Product image - place in national national economy  Own country sales policy  Distribution policy  Credit and collection policy</p>	<p>Keep Notes</p> <p>Identify</p> <p>Keep Notes</p>

<p><b>7. Production planning and control:</b> Types of manufacturing process Process layout, Product layout. Production plans, scheduling etc. Plant capacities and other facilities. Detailed manufacturing process</p>	<p>Obtain the process flowcharts, planning schedules, and charts for licensed and installed capacities.</p>
<p><b>8. Accounting systems:</b> Financial accounting Cost accounting, Integrated accounts Internal control set-up Store accounting Trial balance</p>	<p>Obtain the procedures manual, if any.</p>
<p><b>9. Management information systems:</b> Budget Controls Standard costing</p>	<p>Obtain an outline of the schemes adopted, if any.</p>
<p><b>10. Internal audit system and Internal control</b> Systems / Internal Audit Programmes. Internal Audit Manual</p>	<p>Obtain Internal Auditor's reports on areas covered.</p>
<p><b>11. Cost records, statements and reports:</b> (a) Cost accounting records and other related records. (b) Cost Statements and related subsidiary Statements (c) Cost Accounts Manual (d) Previous cost auditor's reports (if any)</p>	<p>Obtain them from the cost department.</p>
<p><b>12. Cost audit programmes on each significant Audit area:</b> (a) General, e.g. production and service departments, Cost centres, costing methods internal checks and controls, system of classification, codification of cost items. etc.  (b) Specific, e.g. systems of purchase, storage, issues of materials, stock-taking and accounting practices, systems of labour attendance, wages and transfer records, systems of overheads classification, allocation and apportionment records, systems of inventory, Adjustment of cost variances from standard costing, Trial Balance, Profit and Loss Account, control account</p>	<p>(a) Prepare audit programmes and allot a time-schedule for completion of audit.  (b) Allot and assign the audit personnel.  (c) Collect audit evidences as to accuracy, relevance, objectivity and fairness during execution of programmes.</p>

<p>(c) System of reconciliation between cost and financial records. Matters or conditions requiring special attention e.g., material error, accounting problems, changes in technology, labour incentive schemes. etc.</p>	<p>(d) Identify them for clarification and obtain documentary evidences.</p> <p>(e) Identify and document for audit considerations.</p>
<p><b>13. Coordination &amp; Review of sectional audit programme:</b></p> <p>Rotation of emphasis on specific audit areas. Further audit scrutiny. Scanning of audit evidences, Scrutiny and finalisation of audit evidences.</p>	<p>(a) Identify specific audit areas.</p> <p>(b) Document the audit evidences duly referenced to the basic records, etc.</p>
<p><b>14. Audit evidence:</b></p> <p>For reporting information on company's (or product's) financial position, production statistics, raw materials, power and fuel, wages and salaries, stores and spare parts, overheads, royalty and technical payments, sales statistics, abnormal non-recurring costs, manpower utilization.</p>	<p>(a) Collect the information based on verification during the course of audit.</p> <p>(b) Keep working papers duly referenced.</p>
<p><b>15. Finalisation of Cost Audit Report:</b></p> <p>(a) Draft matters to be qualified in the report</p> <p>(b) Draft Cost Audit Report (Annexure &amp; Proforma).</p>	<p>(a) Obtain comments from the company management.</p> <p>b) Final check.</p>

Prepared by:

**Name & Date**

-----

**Cost Auditor**

## Annexure – “B”

**COST AUDIT PROGRAMME****General**

<b>AUDIT STEPS</b>	<b>WORKING PAPER (W/P) REFERENCE</b>	<b>INITIALS DATES</b>
<ol style="list-style-type: none"> <li>1) Study and examine the chart of accounts with special reference to the system of cost methods adopted by the company.</li> <li>2) Study the basic raw and packing materials, chemicals and stores required for the manufacture of the product and their sources.</li> <li>3) Study the organizational structure and know the details of manufacturing process.</li> <li>4) Examine whether cost centres are split-up into production &amp; services functions</li> <li>5) The licensed capacity and installed capacity should be ascertained. Any addition to production capacity during the preceding two years shall also be ascertained.</li> <li>6) Examine the adequacy of internal checks and control.</li> <li>7) Before starting audit, meet the various important executives of the company and note down the functions, responsibilities and power delegated to each.</li> <li>8) Obtain an understanding of the clients business and the production processes involved, the flow of the process, till the finished goods are packed and transferred to the finished stores for despatch.</li> <li>9) Obtain the Balance Sheets of the company for the past two years and make a note of the important points contained n the Directors' Report to the shareholders on the various financial, operation and technical matters.</li> </ol>		

<p>10) Have a look into the books/ record containing production etc, statistics maintained by the factory in compliance with the excise and other Government requirements and note down the licensed/ installed capacities. Ascertain the reasons for shortfall in production, if any.</p> <p>11) Study the Cost Accounting System followed by the company in respect of the products under Cost audit and examine its adequacy with reference to the Cost Accounting Records Rules.</p> <p>12) Examine whether the company has properly and adequately identified the various production and service cost centres and whether the expenditure has been initially booked to these cost centres correctly.</p> <p>13) Examine the service cost statements, viz. steam, power, air conditioning, etc. and whether these are allocated properly to the various cost centres. In respect of supplies made to or received from other units of the company, ensure that the rates charged are reasonable and that the method followed are consistent.</p> <p>14) Compare actual production with the installed capacity.</p> <p>15) Reconcile quantity of production with that of sales, captive consumption and stocks in respect of each quality of product.</p> <p>16) Ascertain any abnormal reasons for low productions and/ or high usage of services and high down time in the plant. Find out whether these have been properly recorded and reported separately.</p> <p>17) Verify whether consistency is maintained with regard to cost accumulation, cost allocation, cost analysis, cost treatment and costing procedures adopted for inventory valuation from period to period.</p> <p>18) Examine the records maintained for inter-company transfers.</p>		
---	--	--

<p>19) Ascertain if any Royalty/Technical Services Fee has been paid to Collaborator/Technology Supplier. If it is one time payment /lump sum check the charge to cost of product is equitable and reasonable.</p> <p>20) Examine the Royalty agreement and check the details furnished.</p> <p>21) Check Quality Control Expenses and see whether the company has ISO certificate or not. If yes, verify the certification number, category in which the company is certified. Moreover, also check the amount incurred on the quality control, quality audit etc and their treatment in the cost of product.</p> <p>22) Examine whether the company is complying with the various legislation provision with respect to pollution control and the expenses incurred therein.</p> <p>23) Examine whether detail with respect to WTO requirements are maintained to assess its competitiveness in global market for import / export.</p> <p>24) Verify the cost of production details for domestic sale and export, which is required under WTO/Anti-dumping exercise against dumping of goods.</p> <p>25) Examine the methodology adopted for value addition. All materials such as raw materials, components, packing materials, process materials, stores and spares, consumables etc and purchased services such as power, water etc are to be excluded.</p> <p>26) Verify the financial ratios and examine the capital employed for the product with reference to Cost centre-wise fixed asset register and working capital required.</p>		
--	--	--

<p>27) Verify the details of sales tax paid.</p> <p>28) Verify the reconciliation statement between the profit/ loss as per the cost accounts and profit/ loss as per the financial accounts. Also examine the variations and reasons thereof.</p> <p>29) Examine whether the data maintained in the cost record are reconciled with the relevant returns submitted by the company to government authorities.</p> <p>30) Where a system of standard costing is used, it should be ensured that such costs are converted into actual for the purpose of determining the figures required to comply with the requirements of Cost Accounting Record Rules. The Cost Auditor should study and examine the method of adjustment of variances to arrive at the actual cost from the standard cost.</p> <p>31) Examine that cost statements have been prepared as per requirements of Cost Accounting Records Rules and Cost Audit Report Rules.</p> <p>32) The annexure to Cost Audit Report Rules and Proforma prescribed under the Rules has been authenticated and signed by concerned authorities of company.</p> <p>33) Examine whether there are any abnormal features affecting production during the year, e.g., strikes, lock-outs, major breakdowns in the plant, substantial power cuts, serious accidents, etc., and what is their impact on the cost of production.</p> <p>34) Examine if there are any special expenses, which have been directly allocated to products under reference, and what is the total amount as also the incidence per unit of product.</p>		
---	--	--

**Prepared by:**

**Name & Date**

-----

**Cost Auditor**



## COST AUDIT PROGRAMME

### Materials

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Examine the stores ledger for raw materials and specific stores etc. in respect of receipts, issues and balances both in quantities and values.		
2) Examine the procedure for purchase of raw materials and the standards fixed for its quality control.		
3) Check the rebate to be deducted from supplier's bills in case of supply of sub-standard materials		
4) The receipt entries should be verified with reference to supplier's invoices and delivery challans. Goods received notes and the contracts entered into with the suppliers should be examined. Any excess or short supplies made by the parties, the basis on which such excess / short supplies were settled to be looked into carefully.		
5) Check the correctness of accounting of transit losses (if any) of raw materials.		
6) Study the basis of classification of material cost into direct and indirect categories.		
7) The system and frequency of stock verification should be looked into carefully. Authorization for adjustment of physical inventory differences should also be noted.		
8) Verify that all the goods received within the financial year are included in purchases.		
9) Check purchase returns with original invoices and verify credit obtained from the suppliers.		
10) Reconcile the value of material issued by the Stores and received by the Plant. Check and reconcile the movement of material to plant and process.		

<ol style="list-style-type: none"> <li>11) Verification of material consumption ratios from the actual figures should be examined.</li> <li>12) Check the production yield and ratios of process loss.</li> <li>13) A list of non-moving and slow-moving store items should be prepared and the value of such items of stores in relation to total closing inventory should be determined.</li> <li>14) Examine the chemical consumption with reference to raw material mix.</li> <li>15) Study the store accounting systems and procedures followed by the unit for indenting, purchasing, receiving and inspection and delegation of powers to the various authorities in this regard. Check the adequacy of the systems as appropriate for inventory control.</li> <li>16) Collect a set of documents/ proformae used for recording arrival of materials at the factory, their acceptance into stock, issues for consumption, return and transfer of materials between the departments and stores, physical verification of stocks, written off unserviceable materials etc.</li> <li>17) Examine the system of passing and payment of purchase bills to ensure that there is no scope of fraudulent or duplicate payment.</li> <li>18) Examine and note any delays in accounting of materials after their receipt in the factory.</li> <li>19) Check whether the bin cards and individual material wise priced stock ledger are maintained. Also check whether bin cards are posted chronologically and how often balances as per bin card are compared with priced stock ledger.</li> <li>20) Check the serial number control of the documents for receipts, issues and returns and transfers.</li> <li>21) Examine the procedure for issues of materials to the user departments.</li> <li>22) Verify entries into the priced stock ledger in respect of receipts, issues, returns with reference to goods received notes, requisitions, return notes, suppliers' bills etc.</li> </ol>		
---	--	--

<p>23) Check whether freight and all other incidental expenses have been considered as part of the individual items of material cost.</p> <p>24) Check the material issue analysis with special reference to non-production stock materials issued for non-production activities including capital jobs.</p> <p>25) Compare actual quantities consumed in respect of key raw materials, with their estimated / standard quantity contents in actual finished products and ascertain reasons for significant over or under usages.</p> <p>26) Examine how losses of materials in storage and in process are accounted for and whether these are satisfactory according to cost accounting principles accepted as authoritative.</p> <p>27) Scrutinize the transit losses register and verify the amounts reimbursed by the Insurance Company.</p> <p>28) Examine if any stores/ materials have been written off. If so, review the total amount written off under each category – damaged, obsolete and surplus stock for reasonableness and compare with previous years. Also examine the system and Commission for adjustment of physical shortages and surplus found on physical stock taking.</p> <p>29) Compare stores and stock levels with standards fixed and with preceding year levels. Obtain explanations of significant variations.</p> <p>30) Check the valuation of year-end stock of materials, work-in-progress and finished stocks.</p> <p>31) Where computerized accounting is in vogue, find out what control checks have been built up in the computer system.</p> <p>32) Check measuring devices available in stores, which are utilized for measuring incoming and out-going stores.</p>		
--	--	--

<p>33) Obtain the list of closing stocks of important raw materials by quantity and value at the end of the accounting year and calculate how many months' requirements are held in stock and ascertain reasons for abnormal stock holdings.</p> <p>34) Obtain and check the list of materials, especially stores and spare parts that have not moved over two years with the stores ledger.</p> <p>35) Check the system of classification of materials into direct and in-direct categories.</p> <p>36) Reconcile consumption by adding purchases with opening balance and deducting closing stocks from the total thereof.</p> <p>37) Checks the records showing generation / purchase of electricity, steam, chilled water, treated water, etc and their distribution to various cost centres.</p> <p>38) Check the correctness of various elements of costs of these utilities and compare the unit cost of generation with budget or previous periods.</p> <p>39) Verify the basis of distribution of the cost to various cost centres and assess whether the bases are reasonable.</p> <p>40) Check if the transport costs are significant, in which case the same shall be shown separately.</p>		
---	--	--

## COST AUDIT PROGRAMME

### Labour, Salaries & Wages

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) The total wages charged in the cost records should be reconciled with the total wages paid during the financial year.		
2) Study the basis of classification of labour cost into direct and indirect costs.		
3) Scrutinize the break-up of salaries and wages charged to production, administration and selling and distribution.		
4) Examine the system of authorization of overtime work and its treatment in costs. Also check the effect of absenteeism and its relationship with overtime in multiple shift working.		
5) Check whether the method of allocation of wages and salaries to production jobs, service jobs and capital jobs, has been consistently applied.		
6) Check the calculation of incentives or bonus for direct and indirect workers.		
7) Study the variation in standard labour efficiency from actual figures and analyse the cause of variations.		
8) Examine the treatment of idle time and lay-off payments in cost.		
9) Review the system of recording of attendance at the Time Office and booking of time in the department for all employees, i.e. direct, indirect and supervisory personnel.		
10) Study the classification of labour engaged in production and service departments as also the reclassification within the production department into direct (treated as variable) and indirect (treated as fixed)		

<ol style="list-style-type: none"><li>11) Check the procedure for identification and booking of direct labour.</li><li>12) Verify the correctness as to the preparation of pay roll and procedure followed for disbursement of wages to the workers.</li><li>13) Check the incentive scheme, if any, in operation.</li><li>14) Examine the system followed for recruitment and payment of casual labour.</li><li>15) Check whether the pay roll shows separately the wages for time-rated and piece-rated workers categorizing under permanent, temporary and casual worker.</li><li>16) Check the amount of previous year's and deferred payment, if any, and their treatment in cost accounting records.</li><li>17) Check the procedure followed for booking of labour to capital jobs and ensure that labour used for capital work, if any, is excluded from revenue expenditure.</li><li>18) Examine the procedure followed for authorization of overtime work and accuracy of the rates applied for preparing overtime bill.</li><li>19) Check the reasons for abnormal idle time and overtime work.</li><li>20) Check the treatment of variances where standard costing system is followed.</li><li>21) Check the correctness of the analysis of wages and salaries into direct labour costs, indirect labour costs, wages and salaries allocated to service cost centres / production / process centres/ administration overheads, selling and distribution overheads etc.</li></ol>		
--	--	--

<p>22) Ensure that payment of annual bonus and gratuity are not included in wages and salaries in cost account records.</p> <p>23) Reconcile salaries and wages of different departments with the total salaries and wages booked in the financial books of accounts.</p> <p>24) Check the amount of salaries and perquisite of Directors and Chief Executive.</p> <p>25) Check the number of total man-days of direct labour available and actually worked for the year.</p> <p>26) Check the average number of workers employed for the year.</p> <p>27) In case of seasonal industries like sugar, it shall be checked that wages are shown separately for the season and off-season periods.</p>		
--	--	--

## COST AUDIT PROGRAMME

### Overheads

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Examine whether the allocation and apportionment of overheads to cost centres are equitable, and it has been consistently applied. 2) Total overheads relating to production, administration, selling and distribution should be reconciled with the financial accounts. 3) Check the apportionment of head office or common unit expenses to different activities/ production of company, examine if the basis adopted is equitable. 4) Check whether the predetermined factory overhead rates has / have been computed correctly and the methods adopted for adjustment of under/ over-applied overheads are correct. 5) Examine the sanctioned load (Fixed Electrical loads and utilization of energy) and compare the energy consumption with standards and ascertain the reasons for variances. 6) Obtain the trial balance of the organization under audit and prepare a list of items of overhead covering factory, administration, selling and distribution, eliminating those items of expenditure, which are not to be considered in cost as per the record. 7) Examine the correctness of classification of overheads according to cost accounting principles. 8) Examine the basis adopted for primary distribution of overhead to cost centres and secondary distribution from service cost centres to ensure that the basis is reasonable and consistent.		



<p>9) Examine that the cost of utilities are not taken doubly i.e. once directly taken as an element of cost and again as overhead.</p> <p>10) Examine the reasonableness and consistency of the basis of re-recovery of overhead adopted by the unit, the rate of recovery and overhead charged to production cost centres where predetermined or estimated rates are used.</p> <p>11) Check the extent of the amount of over or under recovery of overhead and its adjustment for variance to cost.</p> <p>12) Examine the procedure adopted for segregating overhead into variable and fixed and verify whether variable overhead bear reasonable relationship with the activity or production.</p>		
--	--	--

## COST AUDIT PROGRAMME

### Repairs and Maintenance

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Check and verify the expenses incurred on the repairs and maintenance of land and building, plant and machinery, equipments, motor vehicles, staff quarters and colony etc maintained by the company.  2) Check whether any expenditure on repairs and maintenance needs to be capitalized, and if so, whether it has been shown separately.  3) Check the deferred amount of repairs and maintenance incurred in earlier years and written off during the current year.  4) Check the basis of allocation of repairs and maintenance expenditure to different cost centres.  5) Check whether separate records for in-house repairs and maintenance and that through external agencies are being maintained.		

## COST AUDIT PROGRAMME

### Fixed Assets and Depreciation

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Check whether assets registers or records are maintained for each type of assets and whether they show the locations, installation/acquisition dates, economic life, original costs, depreciation expense, accumulated depreciation, written down value and rate of depreciation charged.		
2) Verify the method of charging depreciation adopted by the unit.		
3) Verify whether depreciation charged to cost accounts are as per the prescribed rules.		
4) Check the basis for apportioning depreciation of common assets to various cost centres and see that the basis used is reasonable and consistent.		
5) Compare the amount of depreciation considered in financial accounts and depreciation charged in cost accounts. This difference should appear in Reconciliation Statement.		
6) Check if the company has revalued the assets its impact is not included in the cost of production.		
7) Examine the lease agreement in case the company has taken on lease fixed asset and verify the amount of lease rent paid thereof.		

## COST AUDIT PROGRAMME

### Utilization of Equipment

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Examine the system of recording the utilization of different segments of the plan.		
2) Compare the total hours utilized with the available time as per working shifts from the logbook.		
3) Compare actual production with rated capacity of the plant.		

### Inventory

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Ensure the finished stocks and work-in-progress are physically verified in their respective stages.		
2) Examine the system of physical verification in vogue and ascertain whether all important items of raw materials, process materials, packing materials, stores and spares and finished goods, etc are verified at least once during the accounting year and that shortages/ surpluses are properly investigated and adjusted, and treatment shown in the cost records.		
3) Examine value of non-moving items of stock, their percentage, in respect of direct material, indirect material, work-in-progress, finished goods etc.		

<p>4) Obtain the list of closing stocks of important materials by quantity and value at the end of the financial year and calculate how many months' requirements are held in stock and ascertain the reasons for abnormal stock holdings.</p> <p>5) Examine the procedure and amount of written off stock in respect of direct materials, indirect materials, work-in-progress and finished goods during the year and ascertain the causes for write-off and action taken for recovery of realisable value / residual value of the items written off.</p> <p>6) Check the correctness of the valuation of closing stock of work-in-progress with reference to different stages of manufacture, other materials (imported and indigenous), self manufactured.</p> <p>7) Verify that there is no change in the method of Valuation from period to period.</p> <p>8) Examine and verify the valuation of scrap/ wastages and the treatment of income generated from sale of scrap / wastages etc during the year.</p> <p>9) Examine and verify the difference between the valuation of inventory as per the financial accounts and cost accounts.</p>		
---	--	--

## COST AUDIT PROGRAMME

### Research and Development

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Check whether the unit under audit is a recognized R&D unit. 2) Verify the records maintained on R&D showing details of R&D work undertaken and their costs. 3) Verify the procedure of classifying the R&D expenses into process development and improvement, existing product development charging expenses to the cost of products. 4) Examine the amount paid to related parties, if any, under this head.		

## COST AUDIT PROGRAMME

### Sales of the Products

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Examine the system of preparation of sales invoices and recording of sales figures in accounts.		
2) Examine whether sales figures both in quantity and value for each type of product is available by direct tabulation of invoices.		
3) Verify the domestic and export sales of the product.		
4) Verify whether separate cost statements are maintained for export products.		
5) Verify the quantities exported, the countries to which exported, the FOB value of export, and net sales realization per unit.		
6) Examine that the basis of allocation and apportionment of expenses are in uniformity with the home products.		
7) Ensure that the value of export incentives, are shown separately in the cost statement.		

## COST AUDIT PROGRAMME

### Margin Per Unit of Output

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Verify the margin per unit of output on domestic sale and export with reference to cost statements.		
2) If sale is made under group of product, check and verify the margin per unit of output of all the major group of products.		
3) In case of significant variation in the margin compared to previous year, the reasons for the same be ascertained and recorded.		

### Capitalization of Revenue Expenditure

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Scrutinize the figures given under this para with reference to details given in financial accounts.		
2) Verify whether share of overhead as applicable has been allocated.		
3) Verify the amount of capitalization under various heads in the fixed asset register such as building, plant and machinery/ equipment manufactures etc.		
4) Verify the amount of excise duty paid and capitalized.		



## COST AUDIT PROGRAMME

### Packing

AUDIT STEPS	WORKING PAPER (W/P) REFERENCE	INITIALS DATES
1) Verify the cost of own manufactured packing material and the cost of those purchased from the outside parties.		
2) Investigate if cost of packing material manufactured by the company is higher than the cost of packing material obtained from the market.		
3) Examine the yield and ratios of its scraps.		
4) Study the method of allocating packing expenditure to different products.		
5) Study the method of treatment of the cost of damaged packing material. Compare the current damaged packing material cost with standard or with past year's actual.		
6) Study the procedure followed for disposed of scrap materials.		

## Annexure – “C”

**CHECK LIST -VEGETABLE GHEE  
AND COOKING OIL INDUSTRY****Basic Data****Information Required:**

- Plant Capacity (Installed and Utilized)
  - Process Layout
  - Organization Chart.
  - Balance Sheet & Accounts with Trial Balance for Current Year & Last Year.
  - Stock Statements as of year-end.
  - Consumption Statement (Qty. & Value)  
(Opening Stock + Receipts = Total Less Closing Stock = Net Consumption)
  - Raw Material & Chemicals, Packing Material and Consumable Stores
  
  - **Utility Consumption** (Qty. & Value – Month wise with units consumed)  
(Electricity, Steam, Water, Fuel)
  - Consumption Norms
  - Production Statements
  - Oil Blend
    - Cotton Seed Oil (%)
    - Soyabean Oil (%)
    - RBD Palm Oil (%)
    - Sunflower Oil (%)
    - Canolla Oil (%)
    - Any other Oil (%)
- TOTAL INPUT (100%)  
NET OUTPUT (%)

- **Process Loss:**
  - Visible Loss (actual quantity) (at realizable value credited to cost of oil)
  - Invisible Loss (quantity only)
  
- Production Statement (Packed wise)
  - **Vegetable Ghee** (Packed Tins)
    - 16 Kg Packed
    - 5 Kg Packed
    - 2.5 Kg Packed
  
  - **Cooking Oil** (Packed Tins)
    - 17 Litre Packed
    - 5 Litre Packed
    - 2.5 Litre Packed
  
  - **Margarine** (Packed wise)
    - Bakery Margarine
    - Table Margarine
  
  - **By Product**
    - Laundry Soap
    - Oxygen or Carbon dioxide Gas
    - Glycerene
    - Filter Cake
  
- Employee strength / Salaries & Wages (Department-wise)
- Cost of Steam generated and consumed
- Cost of Electric Power generated and consumed
- Cost of chilling
- Cost of tin manufactured and consumed
- Cost of chemicals consumed
- Basic raw material prices
- Selling Prices (Packed wise)
- Process-wise Cost Statements

- **Statement of Sales (Packed wise) (Qty. & Value)**
  - Vegetable Ghee (Packed Tins)
    - 16 Kg Packed
    - 5 Kg Packed
    - 2.5 Kg Packed
  
  - Cooking Oil (Packed Tins)
    - 17 Litre Packed
    - 5 Litre Packed
    - 2.5 Litre Packed
  
  - Margarine (Packed wise)
    - Bakery Margarine
    - Table Margarine
  
  - By Product
    - Laundry Soap
    - Oxygen or Carbon dioxide Gas
    - Glycerine
    - Filter Cake

**TOTAL SALES** (Tonnes)

Gross Sales- Rupees'000

Less Sales Tax – Rupees '000

Trade Discount / Commission – Rupees '000

- Proportion of closing inventory of stores representing items, which have not moved for over twenty-four months.
- Summary of Sales as per Sales Tax record.

## CHECK LIST – CEMENT INDUSTRY

### Basic Data

#### *Information Required:*

- Plant Capacity (Installed and Utilized)
- Process Layout
- Organization Chart
- Balance Sheet & Accounts with Trial Balance for Current Year & Last Year
- Stock Statements as of year end
- Consumption Statement (Qty & Value)  
(Opening Stock + Receipts = Total Less Closing Stock = Net Consumption)  
Raw Material & Chemical Packing Material and Consumable Spares
- Utility Consumption (Qty & Value – Month-wise with units consumed)
  - Electricity, Steam, Water, Fuel
- Consumption Norms
- **Production Statements**
  - Cement**
    - Ordinary Portland Cement
    - Sulphate Resistance Cement
    - Portland Blast Furnace Cement
  - White Cement
  - Clinker**
    - Clinker – Ordinary Portland Cement
    - Clinker – Sulphate Resistance Cement
    - Clinker – Portland Blast Furnace Cement
    - Clinker - White

- Employee Strength / Salaries & wages (Department-wise)
- Cost of Steam/compressed air generated and consumed
- Cost of Electric Power generated and consumed
- Cost of transportation of raw materials from quarry
- Cost of crushing
- Cost of packing and storage
- Basic raw material prices
- Selling Prices
- Process-wise Cost Statements
- Statement of Sales (Qty & Value)
  - Ordinary Portland Cement
  - Sulphate Resistance Cement
  - Portland Blast Furnace Cement
  - White CementTOTAL SALES (Tonnes)  
Gross Sales- Rupees'000  
Less: Sales Tax – Rupees '000  
Trade Discount / Commission – Rupees '000
- Proportion of closing inventory of stores representing items, which have not moved for over twenty four months.

## CHECK LIST – SUGAR INDUSTRY

### BASIC DATA

**Information Required:**

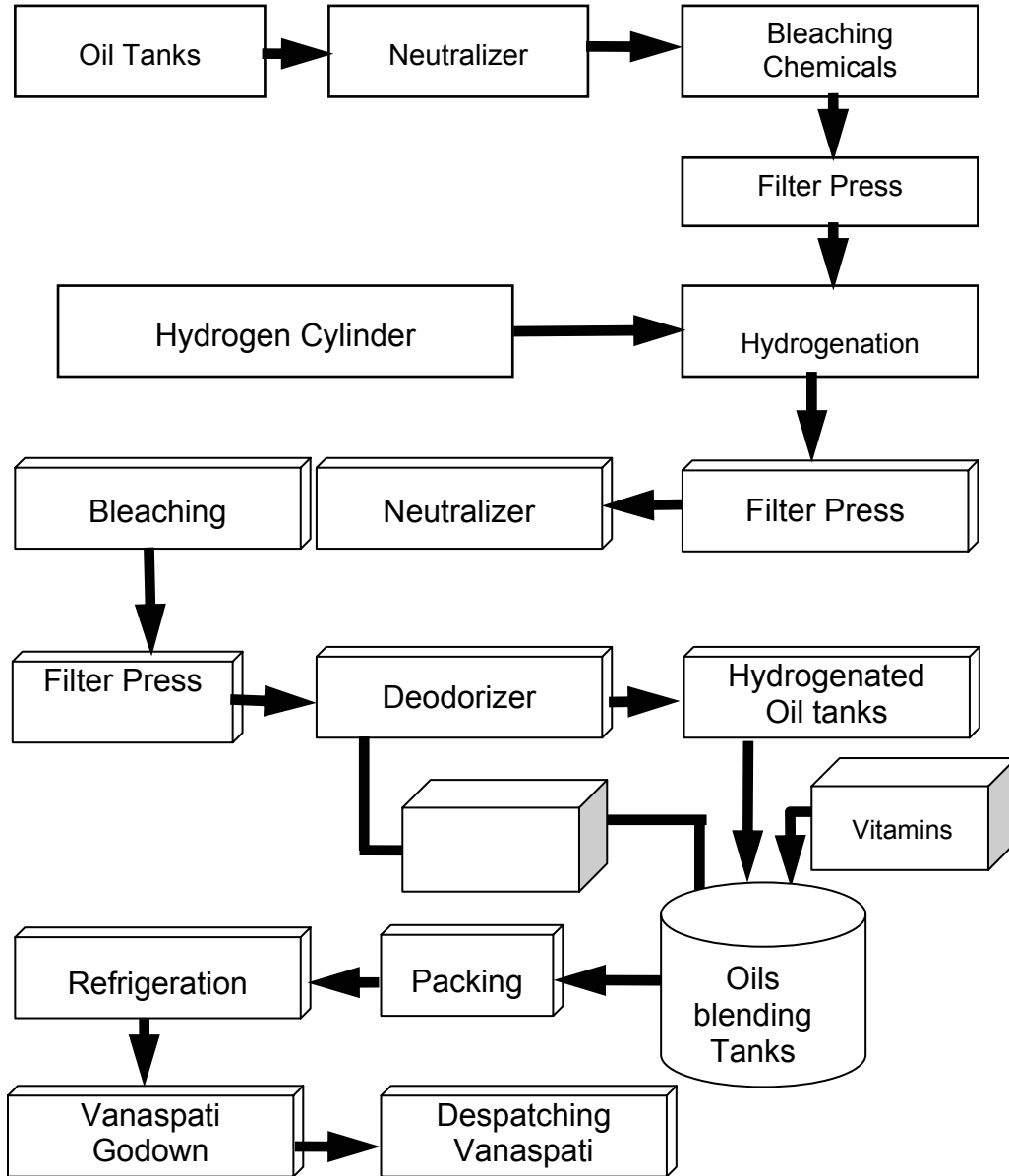
- Plant Capacity (Installed and Utilized)
- Process Layout
- Organisation Chart
- Balance Sheet & Accounts with Trial Balance for Current Year & Last Year
- Stock Statements as of year end.
- Consumption Statement (Qty & Value)  
(Opening Stock + Receipts = Total Less Closing Stock = Net Consumption)  
Raw Material & Chemical Packing Material and Consumable Spares
- Utility Consumption (Qty & Value – Month-wise with units consumed)  
(Electricity, Steam, Water, Fuel)
- Consumption Norms
- Production Statements
  - Sugar Cane crushed & Juice Produced
  - Gurr melted
  - Raw Sugar processed
  - Sugar importedBy -Product
  - Molasses
  - Baggase
  - Filter Cake
- Employee Strength / Salaries & wages (Department-wise)
- Cost of Sugarcane Purchased/Produced
- Cost of Beet consumed (if any)
- Cost of Process Materials/Chemicals consumed
- Cost of Steam generated and consumed
- Cost of Electric Power generated and consumed

- Basic Raw Material Prices
  - Selling Prices
  - Process-wise Cost Statements
  - Statement of Sales (Qty & Value)
    - (i) Sugar
    - (ii) Molasses
    - (iii) Baggase
- Sales** (Tonnes)
- Gross Sales** - Rupees '000
- Less:
- Sales Tax
  - Trade Discount / Commission – Rupees '000
- Proportion of closing inventory of stores representing items, which have not moved for over twenty four months.
  - Statements under Rule 4(1)(a) and (b) of Companies (Audit of Cost Accounts), Rules, 1998 (Capacity Utilization and Closing Stocks)
  - RT – 4 (excise) Report

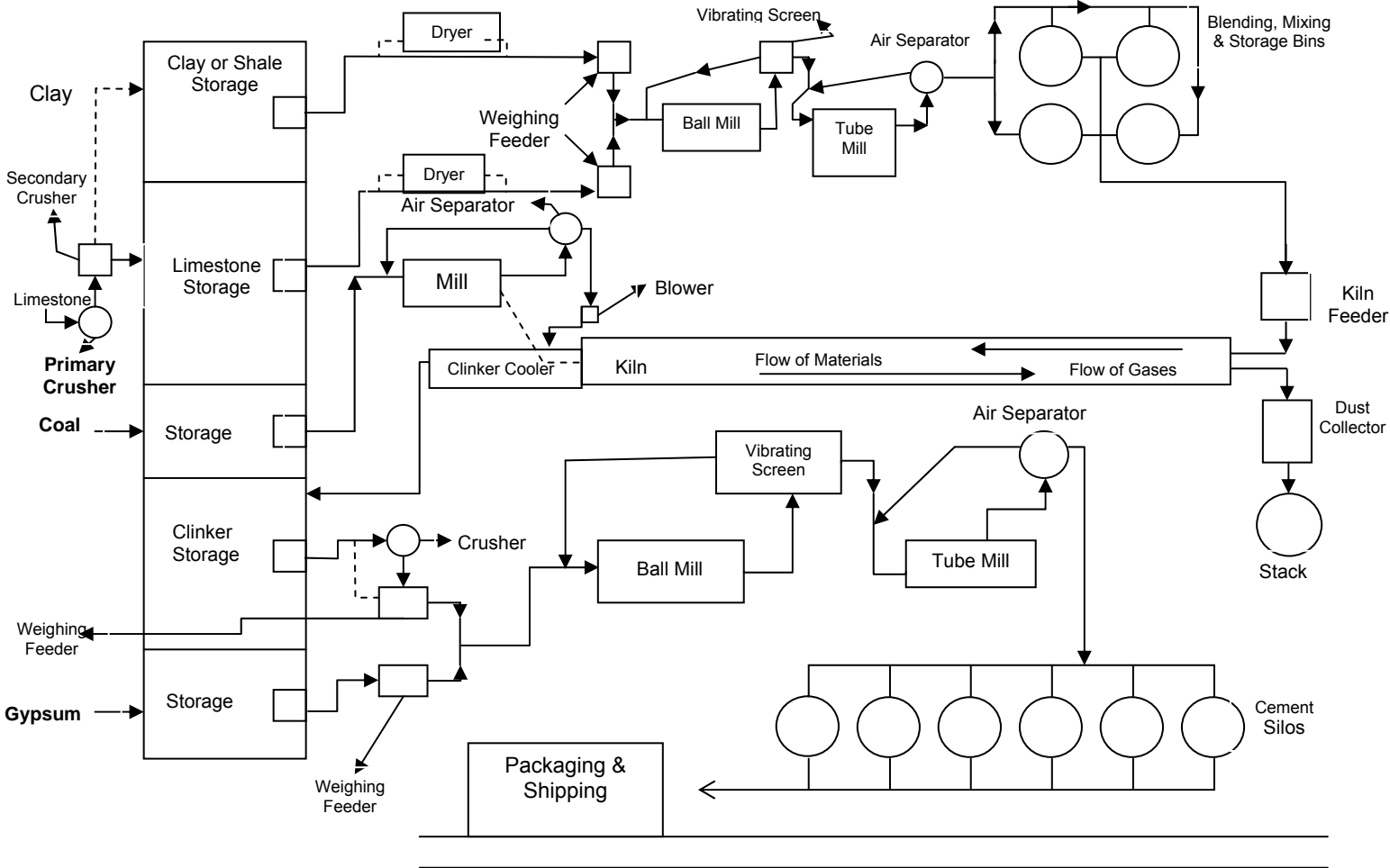


Annexure – “D”

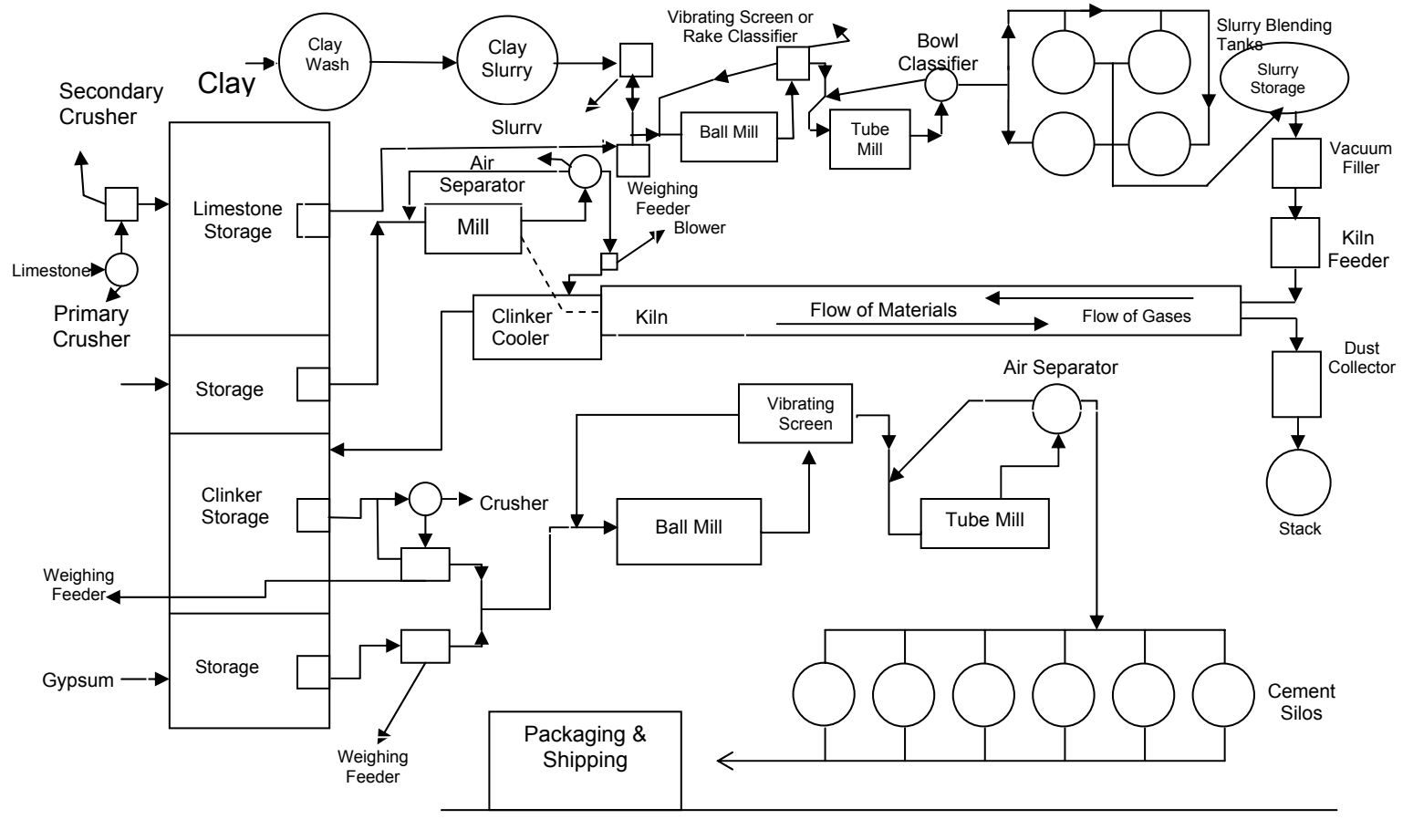
PROCESS FLOW CHART – VANASPATI



PROCESS FLOW CHART FOR DRY PROCESS OF CEMENT MANUFACTURING

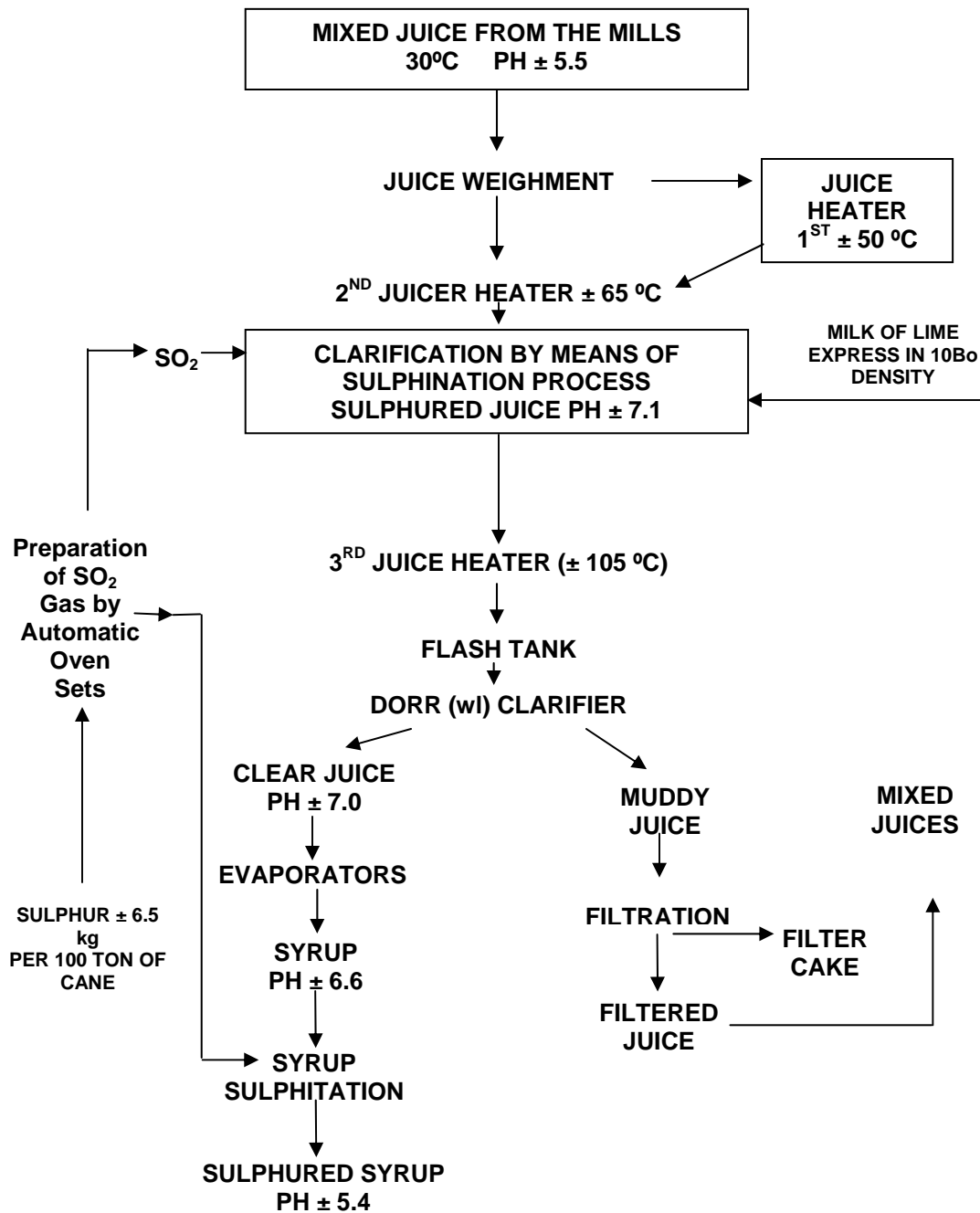


**PROCESS FLOW CHART FOR WET PROCESS OF CEMENT MANUFACTURING**



## PROCESS FLOW CHART OF SUGAR MANUFACTURING

(Contd. on next page)





**CHAPTER – V**

---

## **Manufacturing Processes of Vegetable Ghee, Cement and Sugar Industries**

### **Production Processes**

This chapter basically deals with the manufacturing process of cement, sugar, vegetable ghee and cooking oil. Its main aim is to provide awareness to the Cost auditor with the technical knowledge of the manufacturing processes of the above three products. This will enable the Cost auditor to conduct cost audit more effectively.

#### **(1) Manufacturing Process of Cement**

Portland cement has great demand in Pakistan due to its major usage in construction work. The demand of other varieties of cement is insignificant and as such they are produced in lesser quantities.

In order to produce Portland cement, calcareous and argillaceous materials are used. Calcareous is combinations of four types of materials such as lime stone, chalk, marl, marine shells and alkali wastes whereas clay and shale form the argillaceous materials. Certain other materials like bauxite, laterite and iron ore are also used as correcting materials in small proportions. The process consists of grinding limestone along with other argillaceous material to form a suitable raw mix. This raw mix is blended by means of compressed air in R.C.C. Silos. A uniform raw-mix is passed through a four-stage suspension preheater and through a rotary kiln where calcining and sintering takes place to form cement clinker. The clinker discharged from the kiln is cooled in a clinker grate cooler. The cooled clinker is ground along with a fixed proportion of gypsum in the cement mill to give cement. The cement is stored in storage silos from where it is packed and dispatched by rail or trucks. The above processes are described in detail in the following paragraphs.

### **Sources of Raw Materials**

The procurement of raw materials are either from own sources or other sources. When the raw materials are from own sources, quarrying, digging or dredging operations will have to be carried out according to their nature and then the raw materials are transported to the cement factory. The nature of manufacturing operations after the receipt of raw materials into the factory may be briefly described as follows:

- i. Crushing, pulverising, proportioning and grinding the raw materials i.e., preparation of raw materials.
- ii. Calcining and heating to a state of incipient fusion the raw materials mix in a rotary kiln, i.e., manufacturing clinker.
- iii. Cooling and grinding the clinker with the addition of a small percentage of gypsum i.e., processing into cement.
- iv. Packing and dispatching the cement.

### **Preparation of Raw Materials:**

Two processes are generally employed in the preparation of raw materials of Portland cement, viz., the dry process and the wet process. Fine grinding of raw materials is possible only if they are practically dry or contain substantial quantities of water. The choice of the process is determined on the following factors:-

- i. Availability and cost of fuel for burning clinker.
- ii. Cost of power for grinding.
- iii. Availability of water for processing.

### **Crushing and Drying:**

The quarry products are first crushed in jaw or gyratory crushers and passed through secondary pulverisers like hammer mill or crushing rolls. After secondary crushing they are stored to be taken when needed. The raw materials may be dried first and then mixed or may be mixed and then dried, drying taking place during the preliminary grinding utilizing the heat generated in the grinding process augmented if necessary by waste heat from kiln or from separate heating units.

### **Grinding:**

The raw materials are ground into fine powder usually in two stages. In the first preliminary grinding, the particle sizes are reduced to about 20 mesh finesses and the

finishing mills completing the reduction to 200 mesh fineness. Ball mills are used for preliminary grinding and tube mills for finishing. The grinding media in these mills are forged steel balls of diameters suited to the size of ground materials being produced. These balls wear out and their replacement is an item of expense. Raw materials could also be ground in a single stage utilizing compartmental tube mills. After final grinding, the raw materials are sorted in bins or silos from where they are moved as required, to the kiln feeder. Blending silos are also used to facilitate the exact proportioning of the raw materials. Dust collected from kiln gases can again be used along with the raw materials.

### **Wet Process:**

This process is advantageous when one or more of the raw materials contain substantial quantities of water or where low-grade raw materials can be used in a floatation process.

### **Preparation for Grinding:**

In using dry materials such as limestones and shales the materials are crushed as in the dry process. But before grinding, water is added to the extent 35 to 40% of the combined weight. If one of the raw materials (e.g. clay) contains considerable moisture, its water content is increased so that the clay slip (i.e., clay in water suspension) is added in the correct proportion to the crushed rock as it enters the preliminary mills for being ground. Where both raw materials contain considerable water, required quantity of water is added to bring the water content up to 35 to 40% before grinding.

### **Grinding:**

The wet materials mix is ground in mill similar to that used in dry process. Wet grinding is more efficient than dry grinding but the maintenance of the equipment is more expensive. Sometimes it may happen that the mix contains more water than is required for good grinding. The high water content is reduced by a thickening process in large shallow tanks. Centrifugal equipment is used to classify and separate solids from the water.

### **Blending:**

Slurry is pumped into the blending tanks where it is blended to produce the final kiln feed of correct composition. Slurry blending is comparatively simple and this is one of the advantages of wet process. Before feeding the slurry to the kiln possibly entire water is removed by means of rotary vacuum filter in order to reduce the amount of heat required in the kiln.



## PRODUCTION OF CLINKER

### The Kiln:

In the kiln chemical changes are made in the raw materials so that the compound composition of the clinker may become quite different from that of the raw materials. The kiln size is the determinant of the plant capacity. The rotary type kiln is commonly used even though vertical kilns are used for smaller capacities. The modern rotary kiln is a long cylindrical steel shell 2 to 3 meters in diameter and from 25 to 200 meters long. The diameter is not necessarily uniform throughout the length. The steel shell is lined with refractory materials. The kiln is set at an angle with the horizontal and rotates on its axis at a slow speed. The speed and the inclination govern the rate at which materials pass along the kiln.

### Kiln Fuel:

Fuel burned is an important item in a cement plant. Pulverized bituminous coal is generally used, but oil and natural gas are also used. Coal must be dried and finely ground. It is customary to have individual coal grinding mill for each kiln. In the wet process about 10% to 25% more fuel than the dry process may normally be required.

### Kiln Feed:

Dry raw material mix is fed into the kiln by means of a short screw conveyor through an inclined pipe or by a table type-feeding device. Wet raw materials are fed by means of bucket wheels that dip into the slurry and feed it into the kiln.

### Clinkering:

The raw materials pass through three stages in the kiln. In the first zone, moisture is removed and naturally more heat is required here in the case of wet mix than with the dry mix. In the second zone, calcinations takes place. In the third zone, which is the hottest place, the calcined mix is raised to sintering temperature where clinker is formed. In the dry process kiln temperature ranges from about 760° to 980° C at the feed end to about 1400° to 1600°C at the hottest point. In the wet process more use is made of the hot kiln gases and the temperature at feed end is usually around 200° to 350°C.

### Clinker Cooling:

As soon as the clinker leaves the kiln, it will have to be cooled. It is usually passed over vibrating screens of perforated plates through which air is drawn. The rate of cooling of clinker is important because it affects the grindability of the clinker. Cooled clinker is stored in bins from where it is taken for grinding as and when needed.

**Clinker Processing:**

Clinker particles, especially in the case of dry process, may require crushing in order to make them of suitable size for being ground as cement. After crushing and before the clinker particles are fed into the grinding mills gypsum is added to the clinker. Gypsum is mixed to control the setting quality of cement produced and hence is called the retarder. The quantity of gypsum to be added is determined by laboratory tests of setting time for each sample of cement drawn. The normal quantity of gypsum added is about 2% to 5% of the weight of clinker. The gypsum particles should be more or less of the same size as that of the clinker in order to facilitate proper grinding.

**Grinding:**

Preliminary grinding of clinker is done in ball mills or ring mills as in the case of raw materials in the dry process and for finishing grinding tube mills are used. It is necessary that the particles should be finely ground and the particle sizes suitably graded.

**Storage:**

After finish grinding, cement is sent to storage bins from where it is packed either in paper bags by means of automatic bag filling machines. The cement in bags is then dispatched by railway wagons which come into the packing bay by means of special siding or by trucks.

**(2) Manufacturing Process of Sugar**

There are two types of processes, which are generally employed in the running of the sugar factory:

- a) Double sulphitation process;
- b) Double carbonation and double sulphitation process

These two sulphitation and carbonation processes are clarification process. Different equipment is needed in clarification section while all other stations will have the same equipment. Sugar factory consists of the following five main stations:

- i. Mill House
- ii. Boiler House
- iii. Power House
- iv. Clarification and Evaporation House
- v. Boiling and Curing House

**Mill House:**

It is the cane-crushing unit, which consists of cane carrier, cane cutter and cutting knives, milling tandem (4 to 6 mills of 3 rollers each) bagasses carrier and conveyor. The sugar factory of 1250 tonnes crushing capacity per day has only four mills of 30" X 60" size rollers. There are 3 rollers in each mill. Cane feeding to the cane carrier is being done either manually or by mechanical unloading cranes. As the cane carrier moves, the cane kicker even out the load in the cane carrier and then two sets of cane knives cut them into small pieces. This process of cane cutting is called 'cane preparation'. These cane pieces, then, pass through different mills and the juice is extracted. The mills are run by steam turbines, which are driven by the high pressure steam generated by the boilers.

**Boiler House:**

There are about two or three boilers in a sugar factory, which generate steam by burning of bagasse. The steam is used in mill house for running mill turbine, powerhouse, boiling house, curing house etc. In a sugar factory of 1250 tonnes crushing capacity, two boilers of 20 tonnes per hour steam generation each are used. The steam required by the Sulphitation process varies from the 55 per cent to 70 per cent of the cane crushed per hour. The steam that is generated in the Boiler is used directly by the Mills where the heat energy is converted to mechanical energy and the exhaust steam is taken to the process. It is only in the Turbo Alternators installed in the Power House that the heat energy of steam is converted to electrical energy and the exhaust from this as well as the exhaust from the Mill Turbines are combined and used in the Boiling House for heating and boiling the juice.

**Power House:**

The major portion of the steam generated by the boilers is utilized for producing power by the Turbo-alternators. This power is sufficient for the running of different electrical units of a sugar factory. Steam after converting its energy to electrical energy comes out from Turbo-alternators as exhaust steam. This exhaust steam is utilized in heating and boiling the juice.

**Clarification and Boiling House:**

*Juice heaters and evaporators:* The juice extracted by the mills is weighed by juice weighing scale and thereafter is heated by juice heaters to final juice temperature of 100°C in different temperature stages depending upon the clarification process. Juice is heated in juice heaters by the exhaust steam coming out of the Turbo-alternators and Mills turbines, and by the steam vapours blend from the first body of the evaporators, clarification is carried out in the following two ways:

- 1) **Sulphitation:** Juice is first heated to a temperature of 65°C and then required lime and sulphur di-oxide gas are added to it. The juice, thereafter, is heated to a temperature of 100°C and is then, passed through clarifier. The mud juice from the clarifier is passed through vacuum filter wherein mud is taken outside the factory as waste and clarified juice from vacuum filter and clarifier is taken to evaporator for evaporating its water content.
- 2) **Carbonation:** Juice is heated in three stages, i.e., from 30° to 55°C, 50 to 75°C 70°C to 100°C by exhaust steam and steam vapours. After heating to a temperature of 55°C, juice is first carbonated in first carbonation tanks, where carbon dioxide and required lime is added. The juice is clarified by first filter presses and is then passed to second carbonation tanks. After that, juice is heated to a temperature of 75°C and is passed through second filter presses. Second carbonated filtered juice is sulphited by adding required sulphur di-oxide and is heated from 70° to 100°C and is then taken to evaporators.

The evaporators set consists of four bodies. Fourth body is kept under 25" vacuums. First body is heated by exhaust steam, however, other bodies by the vapours of the previous body. The evaporation being done by both the exhaust steam and vapours. The percentage of evaporation being (60-15)/60 per cent i.e. 75 per cent. The juice after evaporation is termed as syrup. This syrup is normally of 60° brix, i.e. total solids in the syrup are 60% of its total weight. The syrup is then sulphited in syrup sulphitation tank.

### **Boiling House and Curing House:**

Sulphited syrup is kept at the pan floor in the storage tanks. There are four pans of 45 tonnes capacity each in the sugar factory of 1250 tonnes crushing capacity. The syrup in these pans is boiled under vacuum. Three massecuite boiling systems are normally adopted, in which, A, B and C massecuites are formed. A massecuite is formed by boiling syrup on footing of B-single cured sugar seed. This A-massecuite is poured into crystallizers and then from crystallizers, it is taken to A-fore worker centrifugal machines for curing where A-heavy massecuite and A-single cured sugar is separately obtained. A-magma is made from A-single cured sugar and then it is again cured in A-after worker machines. A double cured sugar is bagged. A-light molasses are pumped to pan floor and are used for making A-massecuite.

A-heavy molasses are pumped to pan floor wherein these are used in making B-massecuite in B-pans. B-massecuite is poured into B-crystallizers and is then cured in B-centrifugal machines. B-heavy molasses and B-singles cured sugar are separately obtained. B-single cured is used for seed. B-heavy molasses are pumped to pan floor and are used in making C-massecuite in C-pans. C-massecuite is poured into C-crystallizers where it is cooled for about 20-24 hours. From C-crystallizers C-massecuite

is taken to C-core worker centrifugal machines for curing. Final molasses and C-single cured sugar are obtained. C-double cured sugar is melted and is used in making A-massecuite. C-light molasses are taken to pan floor and are used in making C-massecuite.

### **Bagging House:**

A-After-worker or A & B After-worker discharge the sugar on to a grass hopper conveyor and by letting in hot air, the sugar is dried and then taken to a grader where the different grades are separated and bagged as per grain size.

### **By-Products of a Sugar Factory:**

The three principal by-products of a sugar industry are bagasses, molasses and press cake. These three by-products alone constitute about 40% of the weight of the total cane crushed, Bagasses itself accounts for about one-third of the weight of the cane crushed. Proper and economic utilisation of these by-products can reduce the cost of production of sugar to some extent.

## **(3) Manufacturing Process of Vegetable Ghee/Edible Oil**

There are different types of raw oils, which are further processed for manufacturing vegetable ghee/edible oils. Some of these oils are imported from abroad and some are locally made available for consumption. These oils are indicated below:

- a) Imported – Palm oil, Soya bean oil.
- b) Local – Cotton seed oil, Rapeseed oil, Sunflower oil

The following main processes are used in the manufacture of vegetable ghee/edible oil:

- i) Pre-refining
- ii) Hydorgenation
- iii) Post-refining
- iv) Deodorisation
- v) Packing

### **i) Pre-refining**

The raw oils used in manufacturing of vegetable ghee/edible oil are first subjected to pre-refining. The objective underlying this treatment is to remove the objectionable slime, dirt, free fatty acids and colour which are present in the raw oils. Pre-refining consists of “alkali neutralisation” followed by bleaching. For neutralisation, caustic soda is the alkali, which is most widely used. The commonly used batch neutralization process is carried

out in vessels specially designed for the purpose, in which raw oil is treated with a solution of caustic soda. The amount and strength of caustic soda used depends on the quality of oil and its contents of free fatty acids. The caustic soda combines with the free fatty acids present in the oil and settles at the bottom of the vessels as soap stock. The soap stock while settling down carries with it some of the other impurities present in the oil. The soap stock is then drained off from the vessels and in most cases treated in separate wooden vats with sulphuric acid, producing acid oil. This acid oil which is a by-product in the neutralization process is commonly used in soap-making. After removal of the soap stock from the neutralising vessels, the oil, is washed free for soap by hot water.

In some plants, the neutralisation step is carried out as a continuous process involving continuous mixing of the oil with metered amount of caustic in a mixer followed by the separation of oil and soap in a battery of centrifuges. The separated oil is subsequently washed continuously with hot water. The mixture of oil and water is then separated in another set of centrifuges. In the neutralisation process while the free fatty acids and other impurities are removed, some loss of neutral oil in the soap stock is unavoidable due to saponification by excess caustic which has necessarily to be used and by entrainment in soap-stock. This loss of neutral oil varies with the quality of the oil.

The neutralised oil is dried under vacuum and bleached to remove most of the colouring matter present in the oil. This is done in bleaching vessels by treatment of the oil with activated bleaching earth. In some plants, a common vessel is used for neutralising and bleaching. After bleaching, the oil is filtered over filter presses for removal of bleaching earth.

## **ii) Hydrogenation**

The neutralised bleached oil is then subjected to hydrogenation. During this process, hydrogen is added at the double bonds in the oil molecule, thereby reducing the degree of unsaturation and increasing the melting point of the oil. The presence of a catalyst is required to carry out this reaction, the catalyst normally used being nickel. The oil mixed with the necessary amount of nickel catalyst is heated in 'Autoclaves' or hydrogenation vessels and treated with hydrogen. When hydrogenation has proceeded to the necessary extent, the process is stopped. The hydrogenated oil is filtered over filter presses for removal of nickel catalyst.

## **iii) Post-Refining**

There is a slight increase in the free fatty acid content of the oil during the process of hydrogenation. In order to remove these and the traces of nickel, which may be present in the hydrogenated oil, the hydrogenated oil is again neutralised and bleached. The process is called post-refining and is analogous to the neutralisation and bleaching

process described under pre-refining. However, the caustic employed is less and more dilute and the bleaching earth usage is lower. After neutralising and bleaching, the oil is filtered again for removing the bleaching earth.

#### **iv) Deodorization**

The purpose of deodorization is to remove odorous substances from the oil. The post-refined oil is deodorized in vessels specially designed for the purpose by treatment with a current of steam under vacuum before being emptied from the deodorizer. The various oil components used in Vanaspati are either blended in the required proportion after this final stage of deodorization or the hardened oils along with the soft (unhardened) oils are blended before the post-refining stage.

#### **v) Packing**

The Vanaspati oil blend is enriched with Vitamins A and D before being packed into containers. Vanaspati is produced either with a granulated texture resembling 'ghee' or as a smooth grainless product. For the granulated product, the vitaminised oil blend is filled hot (at a temperature of around 50°C) into containers and the filled containers are cooled gradually in cooling rooms. The grainless product is made by rapid cooling of the blend (either over chilling rolls or by continuous chilling in closed tubes) before being filled into containers.

**CHAPTER – VI**

---

## **Performing Cost Audit Background Knowledge and Audit Procedures**

### **1.1. Knowledge of the industry and the entity:**

Before performing cost audit, the cost auditor must have or obtain knowledge of the industry and its business environments, sufficient to enable him to identify and understand the events, transactions and practices that in the Cost Auditor's judgement may have a significant effect on the cost accounting statements of the entity to be audited, or on the cost audit report. The cost auditor should also have a general knowledge of the country's economy and the industry within which the entity operates. He should also have a clear understanding of the conditions that affect or may be affecting the cost and profit performance of the entity.

### **1.2 Updating of knowledge of industry**

The knowledge that the cost auditor obtains about the industry and the entity at the planning stage of the cost audit keeps increasing and updating, while taking up the assignment and at every stage throughout the performance of cost audit. The cost auditor keeps re-evaluating the knowledge and information gathered earlier.

Knowledge of the industry, which the cost auditor may already have, may be updated through discussions with the entity's senior --operating personnel, publications relating to the industry, government surveys, statistics, trade journals, visit to the entity's premises and plant facilities. Knowledge of the industry and the entity is extremely important in cost performance evaluation.

The cost auditor should ensure that the assistants assigned to a cost audit engagement also obtain sufficient knowledge of the business to enable them to carry out the cost audit work delegated to them. It should be ensured that they understand the need to be alert for additional information and the need to share that information with the principal and other assistants.



### **1.3 Legal and Regulatory Framework:**

When planning and performing cost audit procedures, the cost auditor should keep in view the legal and regulatory framework within which the entity has to operate. Although it is the responsibility of the management to ensure that the entity's operations are conducted in accordance with the laws and regulations and the cost auditor cannot be held responsible for non-compliance by the entity; he should see that the provisions of the Companies Ordinance, 1984, the relevant cost accounting record order and of the Companies (Audit of Cost Accounts) Rules, 1998 as far as they relate to the maintenance of cost accounting records and providing of cost accounting information, are duly observed and followed by the entity. Non-compliance of such provisions by the entity would have a material effect on the cost accounting statements, in which case the cost auditor is specifically required to report whether or not the entity complies with the provisions of laws or regulations which are directly related to cost audit.

### **2. Organisational Set-up:**

While taking up any new cost audit assignment, the cost auditor should, first of all, study the organisational set-up of the entity. He should get familiar with the administrative, financial, buying and selling, production and planning functions at the entity. He should be introduced to the functional heads, as he will be dealing with them during the course of cost audit. Each function and sub-function should be organised in a logical manner, according to its nature and size. The size of, and the manner in which the various functions are organised, have a direct bearing on the cost of each function performed at the entity. The cost auditor will do well in discussing the functional set-up with the top management, pass on the concept of activity-based costing and also offer comments on the set-up, if considered necessary, under the circumstances. Knowledge of the organisational set-ups of each function helps in obtaining knowledge of the industry and the entity, referred to in the foregoing paragraphs.

The cost auditor has also to verify and express opinion on the company representations made under the Companies (Audit of Cost Accounts) Rules, 1998, and on the cost accounting information provided by the company. He has also to evaluate and offer comments on the entity's cost accounting system. He thus has to work, maintaining close liaison with the functional heads and with various levels of management.

### **3. Company Representations:**

Under Clauses (a) and (b) of sub-rule (1) of Rule 4 of the Companies (Audit of Cost Accounts) Rules, 1998 every company shall, in addition to the records and statements specified in the order of the Securities and Exchange Commission of Pakistan, issued under Clause (e) of sub-section (1) of Section 230 of the Companies Ordinance 1984, prepare:

- “(a) a statement of production capacity of the plant, in terms of machine hours and production units, the actual utilisation of the capacity and the reasons of difference between the two; and
- (b) a stock-in-trade of the company as at the end of financial year in terms of quantity and cost thereof, distinguishing between:
- i stock of raw material and components;
  - ii stock of work-in-process;
  - iii stock of finished goods; and
  - iv other stocks.”

Under sub-rule 2 of Rule 4 of the Cost Audit Rules, “(2) the statements specified in Clauses (a) and (b) of sub-rule (1) shall be signed by the chief executive and chief accountant of the company.” Both the statements specified in Clauses (a) and (b) shall be submitted along with the Cost Auditor’s report. Capacity as explained in para (1) of Appendix III of the Rules: “1. Capacity: (a) Licensed, installed and utilised capacities of the factory or factories for the product under reference.

- (c) If the company is engaged in other activities besides the manufacture of the product under reference, give a brief note on the nature of such other activities.”

#### **4. Production:**

After checking the stock-in-process at the end of the financial year with the production records and after adjusting the opening stock-in-process or last year’s closing stock-in-process, “production in quantities of each type of product under reference” should be worked out, (sub-rule (3) of Rule 4) of the Companies (Audit of Cost Accounts) Rules 1998”.

The “percentage of production of the product under reference” should be seen “in relation to the installed capacity. If there is any shortfall in production as compared to the installed capacity, brief comments as to the reasons for the shortfall,” shall be offered in the cost auditor’s report. While laying down particulars to be included in cost auditor’s report to the Directors of the Company, para 3(c) of Appendix III to the Companies (Audit of Cost Accounts), Rules 1998, further provides that “if there is any addition to the production capacity during the year under review or in the immediately preceding two years, this may also be mentioned.”

#### **5.1. Gathering Cost Audit Evidence:**

The cost auditor has to follow the International Audit Standards (IASs) and related technical pronouncements issued by International Federation of Accountants. Cost audit,

like any other audit, involves: (a) planning (b) carrying out audit procedures or gathering cost audit evidence and (c) drawing reasonable conclusions on which to base the audit opinion. The principles and planning have generally been explained in Chapter III and IV of this Handbook, respectively. During the course of audit, the cost auditor should obtain sufficient appropriate audit evidence for arriving at reasonable conclusions. Audit evidence is the documented information obtained by the cost auditor in arriving at the conclusions, on which the audit opinion is based. Audit evidence will consist of source documents, cost accounting records, cost accounting statements, company representations and corroborating information from other sources. Cost audit procedures mean tests to obtain cost audit evidence to detect material misstatements in the statements and in the information provided by the entity. The tests may be performed on the details of transactions and balances, following analytical procedures. When obtaining cost audit evidence from substantive procedures, the cost auditor should consider the sufficiency and appropriateness of audit evidence from such procedures, together with any evidence from tests of control to support the cost and other information asserted by the management of the entity. If unable to obtain sufficient appropriate cost audit evidence, however, the cost auditor should express a qualified opinion or a disclaimer of opinion.

## **5.2 How Cost Audit Evidence is obtained?**

Cost audit evidence is obtained by procedures such as inspection, observation, inquiry and confirmation, computation and analytical procedures noted below:

- (i) Inspection consists of examining records, documents, or tangible assets. Inspection of records and documents provide cost audit evidence of varying degrees of reliability, depending on their nature and source and the effectiveness of internal control over their processing. Documentary cost audit evidences may be created by third parties and held by third parties or held by the entity or created by the entity and held by the entity.
- (ii) The cost auditor may observe the procedures being performed, say the counting of inventories by the entity's personnel. Inquiry consists of seeking information from knowledgeable persons inside or outside the entity. Inquiries may be written or oral, providing new or corroborative information. Confirmation is the response to an inquiry.
- (iii) Computations consist of checking the arithmetical accuracy of source documents and cost accounting records or of performing independent calculations. Analytical procedures consist of significant ratios and trends, including the resulting investigation of fluctuations and relationships that are inconsistent with other relevant information or deviate from predicted amounts. Analytical procedures

include the consideration of comparison of the entity's cost information for prior periods, anticipated results of the entity, such as budgets or forecasts or expectations of the cost auditor, such as an estimation of depreciation. The entity's cost performance may also be compared with similar industry cost information.

- (iv) Analytical procedures also include consideration of relationships among elements of cost information that would be expected to conform to a predictable pattern based on the entity's experience, such as contribution analysis. Relationships also exist between such direct and indirect costs as payroll and employee related costs. Various methods may be used in performing analytical procedures, ranging from simple comparisons to advanced statistical techniques. Choice of procedures, methods and level of application is a matter of professional judgement. The cost auditor should apply analytical procedures, when forming an overall conclusion as to whether the cost statements as a whole are consistent with the auditor's knowledge of the business. The conclusions drawn from the results of such procedures are intended to corroborate conclusions formed during the audit of individual components or elements of the cost accounting statements and assist in arriving at the overall conclusion as to the reasonableness of the cost statements. They may also identify areas requiring further procedures. The extent to which analytical procedures may be relied upon would depend on the materiality of the items involved.
- (v) Cost audit evidence is obtained from an appropriate mix of tests of control and substantive procedures. The type of tests to be performed is important to an understanding of the application of audit procedures in gathering cost evidence. The cost accounting system is tested to identify the characteristics or attributes that indicate performance of a control, as well as possible deviations and conditions which indicate departures from adequate performance. The cost auditor should perform audit procedures appropriate to the particular test objective on each item selected.
- (vi) The cost auditor should obtain sufficient appropriate audit evidence as to whether the standard cost, planned cost, budget cost or cost estimate, being used for cost accounting and control purposes, is reasonable in the circumstances. An understanding of the procedures and methods, including the cost accounting and cost control, used by the management in making the control yardstick is important for the cost auditor to plan the nature, timing and extent of the cost audit procedures. The cost auditor should either review and test the process used by the management to develop the standard; use an independent standard for comparison with that prepared by the management or review subsequent events which confirm the standard made.

- (vii) The cost auditor should make a final assessment of the reasonableness of the standard estimate, based on the auditor's knowledge of the business and whether the yardstick is consistent with other audit evidence obtained during the audit. After an evaluation of results of cost audit procedures, the auditor should feel convinced of their being reasonable. Vouching, testing, examining, analysing, comparing, confirming, inspecting, reconciling, tracing, verifying the details, the cost auditor collects audit evidence to form his opinion not only about the production and capacity utilisation, but also on the cost accounting system (Section VII), inventories and the cost accounting statements prepared by the management in accordance with cost accounting records order/rules, applicable to the industry. Cost statements differ from industry to industry and reflect how production and auxiliary services are generally organised.
- (viii) The cost audit procedures outlined in the foregoing paragraphs are not only performed on the statements submitted by the company under the Companies (Audit of Cost Accounts) Rules 1998, but are also performed on the cost accounting records which the industry has to maintain under the cost accounting records order/rules. The cost accounting records order rules specifically mention the principal elements of cost involved in the production of the relevant product and specify adequate and proper accounting records for the same. The principal elements of cost, generally relevant to various industries, are discussed in the next Chapter.

<b>CHAPTER – VII</b>
----------------------

---

## **Performing Cost Audit Part Two: Important Elements of Cost**

### **1.1 Raw Materials:**

Raw materials and other materials which can be directly identified with production would normally constitute major part of the cost. The cost of raw materials, both in quantities and value, as given in the statements, should be verified. In case the transport cost of raw materials is a significant element of cost, as in the case of cement and sugar industry, the transport cost is determined separately. In case of imported raw materials, the various elements are: FOB value, ocean freight, insurance, custom duty, clearing/forwarding and inland freight. Withholding income tax and sales tax would be separately accounted for. Raw materials are the materials which directly go into the process of manufacture and physically constitute a part of the product; whereas there may be some direct materials, which are directly identifiable with the production process but only help production. Materials which are relatively of insignificant value viz. material although may be directly conducive to production also classified as indirect material. Data for raw materials consumption have to be provided for the year under audit, as well as for the previous two years, for comparison.

### **1.2 Material Consumption:**

Components and parts in the case of engineering industries are referred to as direct materials. Material consumption would normally refer to material consumed in production. Every cost auditor knows how the figure of material consumption is worked out by deducting closing inventories, from the receipts and adding opening balance. Consumption of materials should be carefully checked with the issues to production processes. The use of the term “major raw materials”, in para 4 of Appendix III to the Companies (Audit of Cost Accounts) Rules, 1998, indicates all direct materials; some of which may be small in quantity and value but large in number, which may not be reported as required in this same para. Provisions of the cost accounting record rules should be kept in mind, as the rules also specify accounting requirements for raw materials and other direct and indirect materials.

### **1.3 Comparison with Standards or Estimates:**

Various Clauses of para 4 of Appendix III provide for comparison of the consumption of major raw material with the standard requirement, if any. If standards have not been worked out, there should be estimates on the basis of which management of the entity exercises control. In the absence of an estimate, the cost auditor should arrive at a standard or estimate, on the basis of his knowledge of the industry. Variances from the standard or estimate and from the figures of the “preceding two years”, should be looked into and commented upon by the cost auditor in his report.

### **1.4 Maintenance of raw material quantity and cost:**

The relevant cost accounting record rules generally provide the manner in which the record of cost and quantity of raw materials shall be maintained and how the cost is arrived at. The cost of raw materials includes all direct charges upto works, such as freight, inward transport handling, insurance etc. The basis of “costing of raw material should be consistently followed”, and should be commented upon by the cost auditor.

### **1.5 Components of Cost of materials:**

Cost accounting record orders/rules may provide the manner in which cost of purchases, cost of inspection and receipt should be included in the cost of the raw materials. The cost auditor should examine the procedures being followed in procuring, planning, purchasing, transporting, receiving, inspecting, that is all procedures and costs involved in making the materials available at the point of the production process. Moreover, realisable value of any waste material or by-product, which may have adjusted the cost of raw materials, be carefully considered and treated in accordance with the normal or standard cost control practice followed by the industry, according to the knowledge the cost auditor may have.

### **2.1 Wages and Salaries:**

Para 5 of Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998, provides that the following particulars relating to wages and salaries be included in Cost Auditor's Report to the Director of the company:

- ”(a) total wages and salaries paid for all categories of employees, separately in respect of each of the following namely:-
- i- direct labour cost on production;
  - ii- indirect employees cost on production;
  - iii- employees cost on administration;
  - iv- employees cost on selling and distribution;
  - v- bonus to workers and employees;

- vi other employees cost, if any (including taxes and levies); and
- vii- total employees cost (total of items (i) to (iv) above)
- (b) Salaries and perquisites of directors and chief executive.
- (c) Total man-days of direct labour available and actually worked for the year.
- (d) Average number of workers employed for the year.
- (e) Direct labour cost per unit of output of the product (give information in respect of each).
- (f) Brief explanation for variances in item. (e) above, if any, as compared to the previous two years.
- (g) Comments on the incentive schemes, if any, with particular reference to its contribution towards increasing productivity and its effect on cost of production.”

## **2.2 Incentive Schemes:**

Provisions of the cost audit rules in regard to the Cost Auditor’s report quoted in the foregoing para, requires the cost auditor not only to carry out a fairly comprehensive analysis of all wages and salaries paid to all categories of employees, from the Directors and Chief Executive to workers employed for production, administration, selling and distribution, but also to examine any incentive schemes and the contribution such schemes make to achieving more production, higher productivity and their effect on the cost of production. Added marginal cost may be justified to achieve higher production to meet the public demand.

## **2.3 Comparison with previous years:**

Total man-days of direct labour available and actually worked, during the year, direct labour cost per unit of production; and average number of workers employed for the year, with explanation for the variances in the direct labour cost per unit of production, should be compared with the previous two years, and necessary comments on the comparison included in the Cost Auditor’s report. Detailed study of employees and employee related costs considerably enlarges the scope of the Cost Auditor’s report.

## **3.1 Stores and Spare Parts:**

Although para 6 of Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998, refers to stores and spare parts kept in stock by the entity, “the expenditure per unit of output on stores etc.”, referred to in para 6(a), is related to repairs and maintenance. Provisions of the applicable cost accounting recorder orders/rules also refer to consumable stores, the consumption of some or all of which may be identifiable with or chargeable direct to production. The cost auditor should examine and comment upon the system of stores accounting, i.e recording of receipts, issues and balances, both in quantities and values.



### **3.2 Ageing of Inventory:**

Partly to safeguard against any unfavourable change in the import policy, industrial units in Pakistan generally overstock imported stores and spares. The cost auditor, while examining the list of stores and spares, should pay particular attention to the ageing of inventories. He should point out such slow moving items in which there has been no movement over the last twenty four months.

### **3.3 Inventory valuation formulas:**

The various inventory cost formulas (LIFO, FIFO, NIFO), weighted average cost, base stock, specific identification, latest purchase price have different effect on costing and asset valuation. If an entity follows a formula which is different from the one generally followed by the industry, it should be specially commented upon by the cost auditor in his report. The record keeping should also be examined, which should be on a perpetual inventory system, indicating quantities and values. Inventories are generally an important item of assets and the corporate auditors of financial statements attend to the physical count of inventories. The cost auditor, who takes up the assignment after the financial audit, should take into account the audited inventory records and balances.

### **4.1 Power and Energy:**

Complete record of costs and quantities of all types of power, fuel and energy such as electricity, compressed air, gas, steam, fuel oil, compressed air and electricity which may be generated/produced by the company itself, by its wholly owned subsidiary or sister concern, or purchased from outside, consumed by the industry, should be available. The cost and quantity consumed for production shall be shown in the relevant annexures, as required under the applicable cost accounting record order/rules. The records shall be so maintained as to enable assessment of consumption of power by different departments or manufacturing units or cost centres on a consistent basis. Allocation of cost shall be on the basis of actual consumption, if separate meters, measurement devices are installed; or on the basis of technical estimates, if separate measurement devices are not installed.

### **4.2 Cost of Fuel purchased:**

Adequate record should be available to ascertain the cost of furnace oil/gas and/or other energy material purchased and charged to various departments/cost centres. If the cost of furnace oil or gas etc is allocated to different departments on basis other than actual cost, reconciliation with the actual cost and the treatment of variances should be indicated in the records.

Records of receipts and issues should be so maintained as to clearly show any excess or shortage at the time of stock taking.

### **4.3 Power and Fuel cost as a percentage of cost:**

The cost auditor should examine the power and fuel cost as a percentage of the total cost. Energy costs have become important, not only because of the rising trend in prices, but because of scarcity of the material. Energy has to be conserved.

In case any residuary inputs, such as bagasse in the sugar industry, are used as a source of energy, quantification and evaluation of such inputs should be examined. Both energy consumption and possible conservation should be discussed with the technical staff of the company. Moreover, progress made in implementing any energy conservation plan, indicated by the management in the Directors' reports presented in AGMs, should be examined and commented upon in the Cost Auditor's report.

### **5.1. Repairs and Maintenance:**

Record of costs incurred on in-house repair and maintenance facility shall be examined and the basis on which the cost is allocated to various departments shall be examined. Some repairs and maintenance may have been carried out by outside contractors. Maintenance policy should be examined from cost benefit point of view. As regards the in-house maintenance facilities, classification of activities for activity based costing (ABC) may be a part of the maintenance policy. Indirect Material consisting of operating supplies/ consumable stores, as already observed, may be charged direct to production, but such indirect materials as are required for break-down maintenance (stores and spares) and for regular periodical/planned maintenance, shall be allocated on the basis of usage or maintenance service actually provided to various departments.

### **5.2 Heavy repairs or overhaul cost:**

Cost incurred in carrying out major repairs and maintenance may be partly or wholly of capital nature, such as heavy repairs or overhaul costs, the benefit of which is likely to be spread over a period longer than one financial year. This should be separately shown and pointed out. Such expenditure should be treated as deferred revenue or capital expenditure. Repair and maintenance relevant to the current year, and capital or deferred revenue expenditure, the incidence of which is to be spread over a period longer than one financial year, should be properly differentiated.

### **6.1 Depreciation:**

Cost accounting record order/rules require that record of all fixed assets, in respect of which depreciation is to be provided, shall be maintained. Depreciation is charged according to the depreciation policy of management, which may be on a straight line or reducing balance method, based on the useful life of the asset. Any basis adopted should be consistently followed. If any basis, other than the useful life of the asset, is followed, the impact of providing excess or less depreciation should be pointed out.

## 6.2 Provisions of Companies Ordinance:

Provisions of the Companies Ordinance, 1984 in regard to depreciation should be kept in view. Clause F of part III of the Fourth Schedule of the Ordinance: "F(i) The amount provided for depreciation, renewals or diminution in the value of fixed assets:

- (ii) if such provision is not made by means of a charge for depreciation, the method adopted for making such provision shall be disclosed;
- (iii) where such provision is made by means of a charge for depreciation, the value of the assets and the additions or depletions thereto, the depreciation methods and the depreciation rates used for fixed assets under each sub-head of paragraph 1(A) of Part-II of this Schedule shall be disclosed.
- (iv) Where no such provision has been made, the reasons for not making it and the amount of depreciation which should have been provided and the quantum of arrears of depreciation, if any, shall be disclosed."

## 7.1 Overheads:

Overheads is a well defined and well understood term. According to para 8 of Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998, the total amount of overheads should be identified and divided into four categories: factory overheads, administration overheads, selling and distribution overheads and financial charges.

Reasons for significant variations in the overheads, compared with the previous two years, have to be given in the cost auditors report. Providing item-wise break-up into factory overheads, administration overheads, selling and distribution overheads and of financial charges would go to make the audit report more meaningful. If not all, significant items may be so analysed.

## 7.2 Allocation of Overheads:

The basis of allocation/apportionment of overhead cost to cost centres should be in accordance with the accepted principles of cost accounting, quantification of services rendered by service departments to cost centres; or on the basis of activities which are cost drivers.

**CHAPTER – VIII**

---

**Cost Accounting System and Reconciliation****1.1 Determining Unit Cost:**

Cost Accounting system differ from industry to industry. The system under which the data may be processed manually or on a computer would also differ to some extent from company to company, according to the interpretation of the management and cost control requirements of the management of the company. Basically, different cost accounting systems are followed for job processing, batch processing and continuous processing industries. Job costing is generally adopted where specific jobs have to be individually costed and completed, like aircraft manufacturing. Batches are processed in industries like pharmaceutical. Textile and cement are examples of continuous process industries.

Both in batch costing and continuous process industries, cost per unit in the batch or in the production process run is determined by averaging the total cost of the batch or the production process run over the units produced.

**1.2 Cost Control:**

Cost accounting is needed both for ascertaining cost of a product or operation, as well as for exercising cost control. However, there should be some benchmark or yardstick against which actual cost can be measured. Such a yardstick may be estimated cost, standard cost, budget cost or activity based cost. Cost auditors are familiar with all such cost measurement and cost control techniques. Standard costing and activity based costing are complete systems. Under the standard costing, standard costs are used instead of actual costs and then variances are analysed and adjusted. Under activity-based costing, costs are ascertained on the basis of activities, which are cost drivers.

Financial accounting has been a mandatory requirement ever since corporate laws were framed to regulate corporate business. Cost accounting records, in earlier times and in some cases even now, are maintained in an informal manner in memorandum form, which in small industries meet the basic managerial control requirements. Even when cost data is compiled in memorandum form for providing managerial control information,

the cost data is reconciled with financial accounting data. Financial accounting data being subject to mandatory audit, is usually considered more reliable and comprehensive. Units of such industry as are covered by the cost accounting record order/rules, have to maintain proper and adequate cost accounting records, in order to provide cost accounting information in the prescribed schedules and annexures.

The cost auditor has to judge and give his opinion on whether or not the cost accounting records maintained are adequate for the cost accounting of important elements of cost, specifically mentioned and explained in the cost accounting record order/rules.

### **2.1 Cost Accounting System:**

Under para 2 of Appendix III to the Companies (Audit of Cost Accounts) Rules, 1998, the cost auditor has to offer brief comments “on the cost accounting system and its adequacy or otherwise to determine correctly the cost of the product under reference”. It is always appropriate to give a brief description of the cost accounting system being followed by the unit under audit, before offering any comments on it. The cost auditor, in his comments, should highlight changes, which may have been made in the cost accounting system, since last year.

### **2.2 Adequacy of Cost Accounting System:**

Although the rules refer only to the adequacy of the cost accounting system in arriving at the cost of production, it is necessary to examine the adequacy of the system from the angle of arriving at the marketing costs as well. This is necessary in view of the provisions that are generally included in the cost accounting record orders that (1) the cost accounting shall be kept in such a way as to make it possible to calculate from the particulars entered therein, the cost of production and cost of sales of each of the products under reference, during the financial year (see sub-Clause 3 of Clause 3 of Vegetable Ghee and Cooking Oil Companies (Cost Accounting Records) Order, 1990.

The term cost of production must be taken to include cost of processing activities. For example, when cost accounting record rules are issued to cover an industry like Textile, the textile processing company which processes textile produced by another manufacturer, will also be covered by those record rules. Similarly, some cement manufacturing units may buy Clinker produced by a different cement plant. Both making clinker as well as processing clinker to produce cement are covered by the cost accounting record rules, applicable to the cement industry. In such cases, all processing companies have to get their cost accounts audited by Cost Auditors for the processes involved.

### 2.3 Requirement of Cost Accounting Record Rules:

It is advisable for the cost auditor to keep the requirements of Schedule 1 of the relevant cost accounting record rules in his files and review the existing cost accounting system being followed by the unit under audit, in the light of that analysis. Important elements of cost, like raw materials, labour, employee related cost, power, fuel, stores and spares, repairs and maintenance, other overheads and depreciation, which are specifically mentioned and explained in the cost accounting record order/rules and for which adequate cost accounting records have to be maintained, have been discussed in the preceding two chapters of this Handbook.

### 2.4 Comments on Cost Accounting System:

While offering comments on the cost accounting system, the cost auditor should keep the following points in mind:-

- a the manufacturing process of the unit;
- b control aspects distinct from cost ascertainment;
- c other activities of the organisation in addition to operation relating to product under review with particular reference to the reasonableness of allocation and apportionment of common expenses;
- d joint cost ascertainment and process of assessment;
- e evaluation of component/inputs made by the company using own facilities;
- f standard cost and adjustment of variances; and
- g management information system and how the same is linked to functions, and to financial and cost data collection.

### 2.5 Scheme of Cost Centres:

The logical scheme of cost centres should also be examined to see whether or not the scheme provides an appropriately effective cost control. There should be a balance between the cost of controlling procedures and the benefits derived therefrom. Evaluation of this and such other aspects of the cost accounting and control system shall largely depend on the judgement of the cost auditor.

## 3. Integrated Cost Accounting System:

With the introduction of electronic data processing, the days of maintaining cost accounting records separately, in memorandum form, are over. Cost accounting records are now also based on the same data from which financial accounts are prepared, even though the data may not be processed by the computer. Such integration is possible by

adding a secondary classification in the accounting code, with which all Cost and Management Accountants are familiar.

With integrated cost and financial accounting, the cost and financial statements can be more conveniently prepared and reconciled. Expenses which are recorded according to their nature in financial accounts, are sub-divided through a secondary classification according to various cost centres. Expenditure which has been recorded in financial accounts according to its nature and then classified according to purpose or cost centres, can be identified and reconciled. However, if for example salaries and wages appearing in the accounts of various cost centres do not add up to the total amount shown in the financial accounts, entries in the financial account which have not so been sub-divided will have to be separately marked and suitably commented upon.

#### **4. Reconciliation with Financial Accounts:**

After the financial or corporate auditor submits his report for the year, the cost auditor “shall submit a supplementary report on reconciliation with financial accounts to the directors, before the date fixed for holding the Annual General Meeting of the company” (para 15, Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998. The requirement of re-conciling with financial account considerably enlarges the scope of the cost auditor’s report. The cost auditor has to go beyond the cost of production and cost of sales and examine such items as appear in the financial accounts, but not in the cost accounting records, for the conciliation purpose. This aspect of the cost auditor’s report has been further explained hereinafter.

## CHAPTER – IX

# Cost Auditor's Report

### 1.1 Submission of Cost Audit Report:

According to sub rule 3 of Rule 4 of the Companies (Audit of Cost Accounts) Rules, 1998: "The cost auditor shall make out a report within 60 days of his appointment to the Directors in the form set out in Appendix II, alongwith statement of capacity utilisation and stock in trade as specified in Clauses (a) and (b) of sub rule (1), in the form set out in Appendix III and simultaneously shall submit two copies thereof to the Securities and Exchange Commission of Pakistan and the registrar concerned". The prescribed form of the cost auditor's report requires a cost auditor to confirm that the cost accounting records have been or have not been maintained in accordance with the cost accounting record order/rules, issued under Clause (e) of sub-section (1) of Section 230 of the Companies Ordinance, 1984.

In view of the varying practices followed in record keeping and maintaining cost accounting records by companies, to which the cost accounting record order/rules apply, the cost auditor should carefully express an opinion, after satisfying himself that all the information required in the prescribed Schedules and Annexures is readily available in a verifiable form in the cost accounting records maintained.

### 1.2 The Report Format:

The cost auditor in his report has to confirm the conclusions drawn from the cost audit evidence gathered during performance of cost audit. Any deviation or error of omission or commission in the records or in the maintenance of cost accounting records observed during cost audit may be rectified by the company during the course of the cost audit, in order to avoid an unfavourable opinion in the cost auditor's report. The cost auditor has also to confirm in his report that all information and explanations required by him were readily provided, which to the best of his knowledge and belief were necessary for the purpose of cost audit. The cost auditor has to confirm in his report that proper returns, statements, schedules for the purpose of audit of cost accounts were duly received from branches and offices not visited by him, and that the books and records give or do not give the information required by the rules in the manner required. He has also to give his



opinion on the statements of capacity utilisation and stock in trade, and confirm that the same are in agreement with the books of accounts of the company and exhibit true and fair view of the company's affairs. The cost auditor has also to confirm whether or not the cost accounting records maintained by the company give a true and fair view of the cost of production, processing, manufacturing and marketing of each product of the company under reference. In giving this opinion, the cost auditor uses his judgement, keeping in view all his findings during the course of cost audit and the audit evidence collected by him.

## **2. Appendix III of Companies (Audit of Cost Accounts) Rules 1998:**

In Appendix III referred to in sub rule 3 of Rule 4 of the Companies (Audit of Cost Accounts) Rules, 1998, particulars which have to be included in the cost auditor's report to the directors of the company have been enumerated. Most of the particulars which should be included in the cost auditor's report have been discussed in the foregoing chapters of this Handbook while describing performance of cost audit procedures. Evaluating the cost accounting system has been described in chapter VIII. Audit of capacity utilisation, production, raw materials, wages and salaries, stores and spare parts have been explained in chapter VII. Depreciation and overheads alongwith other important elements of cost have been elucidated in the same chapter i.e. chapter VII. The remaining items given in Appendix III, which have to be commented upon in the cost auditor's report, are given in the paragraphs which follow.

## **3. Royalty/Technical Aids Payments:**

Industrial units which have acquired technology under some agreement have to pay royalty or make some technical assistance payment, which amount should appear as part of the cost of the product. The cost auditor evaluates the total amount of such royalty/technical aid fee payable for the year and sees that the amount is in accordance with the agreement. Such amount forms a part of the cost of production and its incidence

on per unit cost should be computed. Cost auditor should also look into whether: (i) the agreement is legally in force and (ii) the agreement is in line with the laws and regulations.

## **4. Abnormal Non-recurring Features:**

If there have been any abnormal and/or non-recurring features affecting production during the year, such as strikes, lock-outs, major break-downs in the plant, substantial power cuts, serious accidents etc., they should all, as far as practicable, be mentioned in the cost auditor's report and their impact on the cost of production should be indicated. Similarly, if some abnormal and/or non-recurring costs were incurred during the year and

were directly allocated to the cost of the products under reference, the total amount so allocated and the incidence on the per unit cost, should be indicated in the cost auditor’s report.

Abnormal and non-recurring costs should be tested both for principle and materiality. As a result of any unusual event, like major break-down, sabotage etc., considerable wastage of material inputs may have occurred. The cost auditor should consider all aspects and not just take the impact of total fixed expenses on the cost of production.

## **5. Cost of Production:**

The cost per unit of each category, variety or quality of the product under reference, with comparative figures in the previous year, and comments on the reasons for differences should be included in the cost auditor’s report. Such an analysis and comparison will also help in reconciling the total cost of the product under reference with the total cost of production, which can also be worked out from the figures given in financial accounts. Figures of financial accounts include provisions, allocation and appropriation of expenditure, which may have been paid in the previous year or may be paid in the next year, but relates to the current years production. If there are any such adjustment made in the financial accounts, these should become obvious as a result of reconciling the cost accounting information with financial accounts. Moreover, it is necessary to determine cost of different varieties, categories, qualities of each product in order to make an analytical study of the contribution made by each type of product.

### **6.1 Sales and Profitability:**

Although cost of selling has been dealt with in an earlier chapter of this Handbook, according to para 12 of Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998, sales in quantity and net sales realisation of different categories, varieties or qualities of product under reference, showing the average sales realisation per unit, should be shown in the cost auditor’s report. If the “Product under reference is exported, net realisation per unit, countries to which exported, indicating the profit or loss in export”, should be specifically explained in the cost auditor’s report. Sales of different quantities and qualities of the product under reference can help to make an interesting and useful study of contribution analysis. If it is possible to increase the volume of sales of such qualities or quantities as are yielding a higher contribution, it should be possible for the company to increase its profits. In the case of export, it may be observed that export to every country, to which the product under reference was exported, may not be yielding the same amount of profit per unit. The reasons can be many such as a better price in one country or higher cost of packing and higher amount of freight incurred on exporting to another country.

## 6.2 Profit/(Loss) Per Unit:

According to para 13 of Appendix III, “the profit per unit on each category, variety or quantity of the products, comments on the comparative profits of different categories of the products per unit as well as in terms of per machine hour etc., and comments on the adequacy or otherwise of product for maximisation of profit” should also be identified in the cost auditor's report. This exercise would help in studying the contribution made by sales of different quantities and different varieties of the products, also profitability of different market segments. Larger quantities result in longer, continuous production runs and should normally yield a higher amount of profit compared to smaller quantity produced during intermittent production runs, bearing a higher incidence of setting up, test runs, wastages and other overhead costs.

## 6.3 Financial Ratio Analysis:

In order to evaluate the company's financial position and profit performance, the cost auditor performs checkups on various aspects of the company's financial health. A tool frequently used during these checkups is working out “financial ratios”. Ratios provide a basis of carrying out both internal and external comparisons. A financial ratio, which relates to two accounting numbers, is obtained by dividing one number by the other. Ratios can be used for comparing changes within the company from period to period, or may be used for comparing the position with another company.

Financial ratios may compare the financial position or profit performance of the company. For comparing the financial position, balance sheet figures are used and for comparing the profit performance, figures of the profit and loss account are used. From the balance sheet figures, financial leverage, or the gear ratio, which are from the debt ratios may be calculated. These ratios show the extent to which the company is financed by loans. Cost and Management Accountants are quite familiar with such gear ratios. Liquidity ratio measures the company's ability to meet short-term obligations. From the profit and loss account figures, leverage ratio may be calculated which relates the financial charges of the company to its ability to service or cover them. Activity ratio measures how effectively the company is using its assets. Various profitability ratios are also worked out, which relate profit to sales and to investment.

## 7. Cost Auditor's Observations and Conclusions:

Para 14 of Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998, is important, particularly insofar as it requires the cost auditor to make such observations and conclusions with which the management of the company may not agree. These observations and conclusions should be made on the basis of reliable cost audit evidence. The provisions of the para quoted here should be carefully noted:

- “(a) Matters which appear to him to be clearly wrong in principle or apparently unjustifiable.
- (b) Cases where the company’s funds have been used in a negligent or inefficient manner.
- (c) Factors which could have been controlled, but were not controlled resulting in increase in the cost of production.
- (d)
  - (i) The adequacy or otherwise of budgetary control system, if any, in vogue in the company; and
  - (ii) The scope and performance of internal audit, if any.
- (e) Suggestions for improvements in performance e.g., by-
  - (i) rectification of general imbalance in production facilities;
  - (ii) fuller utilisation of installed capacity;
  - (iii) comments on areas offering scope for-
    - (a) cost reduction;
    - (b) increased productivity;
    - (c) key limiting factors causing production bottle-necks;
    - (d) improved inventory policies; or
    - (e) energy conservancy;
  - (iv) state of technology, whether modern or obsolete; and
  - (v) plant, whether new or second-hand when installed.”

<b>CHAPTER – X</b>
--------------------

---

## **New Cost Audit Sectors – Fertilizer, Thermal Energy, Petroleum Refining, Natural Gas and Polyester Fiber**

### **1. Companies Cost Accounting Records (General Order) 2008**

The Securities and Exchange Commission of Pakistan (SECP) has issued the “Companies Cost Accounting Records (General Order), 2008’ vide gazette notification dated 26<sup>th</sup> September 2008, thereby making it mandatory for all companies engaged in (1) Fertilizer, (2) Thermal Energy, (3) Petroleum Refining, (4) Natural Gas and (5) Polyester Fiber industries to maintain cost accounting records from the financial year commencing on or after **1<sup>st</sup> of October 2008**. The cost accounting records shall be kept in such a manner and in such detail, as to make it possible for the auditor to audit the same and to produce his report as required under the law.

The main points of the Companies Cost Accounting Records (General Order) 2008 are summarized below:

- Conducting Cost Audit at the end of each year, through an independent firm of Cost or Chartered Accountant.
- Producing a Reconciliation of the cost accounts with the audited financial accounts.
- Circulating cost auditor’s report to Directors’ along with reconciliation, within six months of financial close, to members, directors and shareholders of the company, SECP and Registrar concerned.
- Posting on Website the Cost Audit Report, within six months of the close of the financial year.
- Circulating photocopies of the cost audit report to the shareholders, instead of printing the same.
- Cement, Vegetable Ghee and Sugar industries are also required to comply with this General Order.

## **Cost Accounting Guideline (CAG-1) on Chemical Fertilizer:**

In pursuance of Companies Cost Accounting Records (General Order), 2008, the Institute of Cost and Management Accountants of Pakistan (ICMAP) has issued a draft of Cost Accounting Guideline (CAG-1) on the Chemical Fertilizer Industry.

The objective of this Guideline is to facilitate the companies engaged in production and manufacture of chemical fertilizers to maintain their cost accounts in accordance with the requirements of the Companies Cost Accounting Records (General Order) 2008, and to ensure onward compliance with the provisions of the Companies (Audit of Cost Accounts) Rules, 1998.

This Guideline would not be mandatory for compliance by the chemical fertilizer industry, however, it would facilitate them in improving their overall performance, optimizing capacity, minimizing production cost, conserving energy and rectifying production imbalances. Members of the Fertilizer industry who wish to seek these benefits would be inclined to adopt this Guideline.

The adoption of Cost Accounting Guideline on Chemical Fertilizer Industry would standardize the maintenance of cost accounting records, including all particulars relating to utilization of material, labour or other inputs of items of cost. The cost statements are to be prepared and filled by the entities for each type of fertilizer product, intermediary product and by-product separately, as per formats specified in the Guideline.

The Cost Accounting Guideline (CAG-1) on Chemical Fertilizer industry is available on Institute's website: [www.icmap.com.pk](http://www.icmap.com.pk) for download.

## Manufacturing Process of Fertilizers

Agricultural growth is mainly dependent on advances in farming technologies and increased use of chemical fertilizers. The fertilizers contain three basic nutrients for agriculture i.e. Nitrogen (N), Phosphorous (P) and Potassium (K). It also contains Sulphur and some micro-nutrients, derived from mineral deposits.

**Nitrogen** in fertilizers comes from the air, which is 78% nitrogen. However, the nitrogen that we breathe is in a chemically inert form that plants cannot use. Large amounts of energy are required to convert this nitrogen to a form that is useful to plants. Nitrogen is primarily provided by nitrogenous fertilizers such as urea (46%N) or ammonia fertilizers, e.g. ammonium sulfate (20.6%N). Further shares of nitrogen are contained in complex fertilizers that combine all three plant nutrients (NPK).

**Phosphate** comes in the form of straight phosphatic fertilizers such as single super phosphate (16%P<sub>2</sub>O<sub>5</sub>) or as part of a complex fertilizer. Phosphate rock is the basic material used in all phosphorus fertilizer production. Phosphate rock is treated with concentrated (90 to 93 %) sulfuric acid to produce a mixture of phosphoric acid and gypsum. Filtration removes the gypsum to leave green, wet-process or merchant grade phosphoric acid containing about 22 % phosphorus. Sulfuric acid very often remains as a waste product of the chemical industry.

**Potassium** used to make fertilizers is in a salt form called potash. **Potash** deposits are derived from evaporated seawater. Potassium deposits occur as beds of solid salts beneath the earth's surface and brines in drying lakes and seas. These deposits are mined and then refined by crystallization or flotation. Potassic fertilizer is available as straight potassic fertilizer, such as muriate of potash (60%K<sub>2</sub>O) or sulfate of potash (50%K<sub>2</sub>O) or as a complex NPK fertilizer component.

Fertilizer production entails gathering these raw materials from nature, treating them to purify them or to increase their concentration, converting them into plant-available forms and often combining them into products that contain more than one nutrient.

### Common Fertilizer Products and Intermediaries

Some common fertilizer products and intermediates are mentioned below:

1. **Nitrogen fertilizers** – such as Ammonia, Ammonium Sulphate (AS), Ammonium nitrate (AN), Calcium Ammonium Nitrate (CAN) and Urea.
2. **Phosphate fertilizers** – such as Single Superphosphate (SSP), Triple superphosphate (TSP), Diammonium phosphate (DAP), Monoammonium phosphate (MAP) and Ground phosphate rock.

3. **Potash fertilizers** – such as Muriate of potash (MOP), also called potassium chloride, Sulphate of potash and Sulphate of potash magnesia.
4. **Magnesium fertilizers** – such as Kieserite and Epsom salts.
5. **Complex fertilizers** – such as NPK fertilizers, NP fertilizers, NK and PK fertilizers

### **Production of Nitrogenous Fertilizers**

The basic raw material for the production of nitrogenous fertilizers is ammonia. Ammonia contains 82% nitrogen. The production of ammonia is most energy and resources intensive. The hydrocarbon source provides a source of energy for the production of heat and compression in the manufacturing process as well as hydrogen. Water contributes hydrogen, and air is the source of nitrogen.

The most important step in producing ammonia (NH<sub>3</sub>) is the production of hydrogen, which is followed by the reaction between hydrogen and nitrogen. A number of processes are available to produce hydrogen, differing primarily in type of feedstock used such as steam reforming of natural gas and partial oxidation.

#### **(a) Steam Reforming of Natural Gas:**

The hydrogen production route predominantly used worldwide is steam reforming of natural gas. In this process natural gas (CH<sub>4</sub>) is mixed with water (steam) and air to produce hydrogen (H<sub>2</sub>), carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>). Waste heat is used for preheating and steam production, and part of the methane is burnt to generate the energy required to drive the reaction. CO is further converted to CO<sub>2</sub> and H<sub>2</sub> using the water gas shift reaction. After CO and CO<sub>2</sub> is removed from the gas mixture ammonia (NH<sub>3</sub>) is obtained by synthesis reaction.

#### **(b) Partial Oxidation:**

Another route to produce ammonia is through partial oxidation. This process requires more energy (up to 40-50% more) and is more expensive than steam reforming. The advantage of partial oxidation is high feedstock flexibility: it can be used for any gaseous, liquid or solid hydrocarbon. In practice partial oxidation can be economically viable if used for conversion of relatively cheap raw materials like oil residues or coal. In this process air is distilled to produce oxygen for the oxidation step. A mixture containing among others H<sub>2</sub>, CO, CO<sub>2</sub> and CH<sub>4</sub> is formed. After desulfurization CO is converted to CO<sub>2</sub> and H<sub>2</sub>O. CO<sub>2</sub> is removed, and the gas mixture is washed with liquid nitrogen (obtained from the distillation of air). The nitrogen removes CO from the gas mixture and simultaneously provides the nitrogen required for the ammonia synthesis reaction.



### **Production of Urea and Other Fertilizers from Ammonia**

Urea is manufactured by reacting ammonia with the carbon dioxide formed in the production of hydrogen in the first step of the ammonia manufacturing process. Urea contains 46% nitrogen.

Ammonia nitrate can be produced through the combination of ammonia and nitric acid adding further energy in form of steam and electricity.

Other fertilizer types produced on the base of ammonia include calcium ammonium nitrate (ammonium nitrate mixed with ground dolomite) and NP/NPK compound fertilizers. For the most part further energy is required to induce the necessary chemical processes.

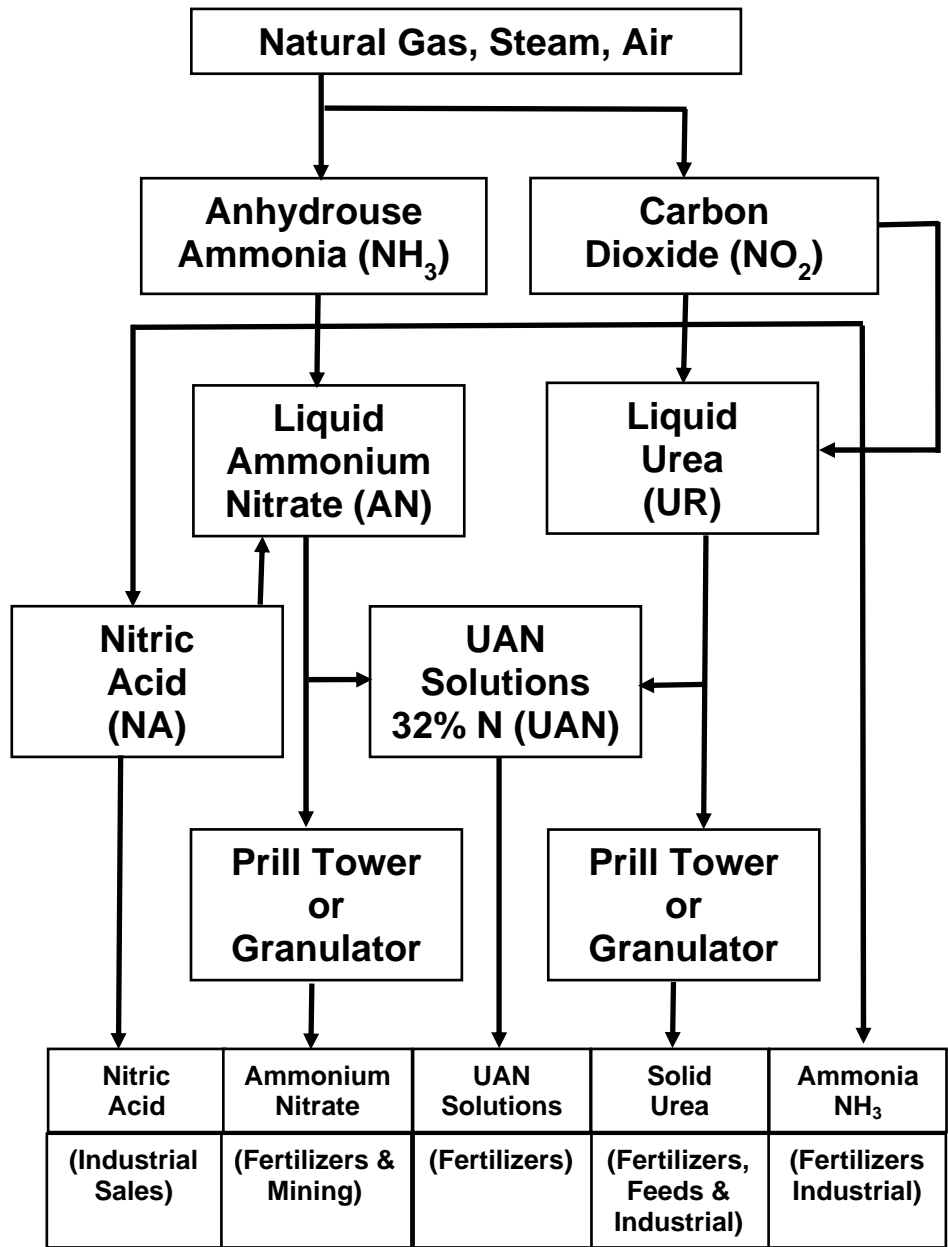
Ammonium sulfate (21% nitrogen, 24% sulfur) and ammonium nitrate (34% nitrogen) are produced by reacting ammonia with sulfuric and nitric acids, respectively.

### **Production of Phosphoric Fertilizers**

Almost all phosphate rock is strip-mined. It typically contains from 12-17% phosphorus and is usually upgraded for use in fertilizer manufacture. Upgrading removes clay and other impurities. This process is called beneficiation. Following beneficiation, the phosphate rock is finely ground and treated with acid. Sulfuric, phosphoric and nitric acids are used in the production of phosphorus fertilizers.

**Manufactured fertilizers are sometimes called "chemical" fertilizers**, but the nutrients forms in the final products are all found in nature, although in insufficient quantities to sustain global agricultural production.

**PROCESS FLOW CHART OF  
AMMONIA FERTILIZER MANUFACTURING**





The complete text of the gazette notification is reproduced below:

---

**THE GAZETTE OF PAKISTAN  
EXTRAORDINARY**

---

PART II  
Statutory Notifications (S.R.O.)  
Securities and Exchange Commission of Pakistan

**NOTIFICATION**

Islamabad, the 26th September 2008

**S.R.O. /1/2008.-** In exercise of powers conferred by clause (e) of sub-section (1) of section 230 read with section 246 of the Companies Ordinance, 1984 (XLVII of 1984), and section 43 of the Securities and Exchange Commission of Pakistan Act, 1997 (XLVII of 1997), the Securities and Exchange Commission of Pakistan is pleased to make the following Order; namely:-

**1. Short title, application and commencement.-** (1) This order may be called the Companies Cost Accounting Records (General Order), 2008.

(2) This Order shall apply to companies engaged in production, processing, manufacturing or mining activities as specified in sub-paragraph (3) below. However, those classes of companies for which special orders have been issued as at the date of this notification shall continue to be governed under their respective orders, except as provided otherwise in paragraph 4 below.

(3) This order shall be applicable to all companies engaged in the following industries from the financial year commencing on or after October 1, 2008,-

1. fertilizer,
2. thermal energy,
3. petroleum refining,
4. natural gas, and
5. polyester fiber.

**2. Maintenance of Records.** - Every company to which this Order applies shall keep such cost accounting records including all particulars relating to utilization of material, labour or other inputs or items of cost as would be necessary to comply with the requirements in Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998. The cost accounting records shall be kept in such a manner and in such detail as to make it possible for the auditor to audit the same and to produce his report as required under the law.

**3. Obligations under the law.-** Each company to which this order applies will be required to (a) have a cost audit conducted as at the end of each year, through an independent firm of cost or chartered accountants; and (b) produce a reconciliation of the cost accounts with the audited financial accounts, to comply with the requirements of paragraph 15 of Appendix III of the Companies (Audit of Cost Accounts) Rules, 1998.

**4. Circulation and distribution of reports.-** (1) Each company which falls within the industries specified in paragraph 1(3) above, shall be required to circulate the cost auditor's report to Directors prescribed in sub-rule (3) of rule 4 of the Companies (Audit of Cost Accounts) Rules, 1998 together with the Reconciliation stipulated in 3 (b) above within 6 months of the close of the financial year to members, directors and shareholders of the company, the Commission and the Registrar concerned. Such reports may be disseminated to its shareholders by posting the same on the company's website within six months of the close of the financial year. The cost audit report shall not be required to be printed and it shall be permissible to circulate photocopies thereof.

(2) Every company in respect of which a special order has been issued by the Commission prior to this notification that is to say companies engaged in production of cement, vegetable ghee and sugar industries shall be required to comply with the requirements of this paragraph and paragraph 2 and 3 above.

(3) It shall be the duty of every person referred to in sub-section (7) of Section 230 or sub-section (2) of section 246 of the Companies Ordinance, 1984 (XLVII of 1984), to comply with the provisions of this Order in the same manner as they are liable to maintain books of financial accounts required under section 230 of the said Ordinance.

F.No. DCS/24/SECP/2008

Abdul Rehman Qureshi

Advisor/Secretary

# Glossary of Technical Terms

## A

---

<b>Analyzing</b>	To determine or examine the composition of an item, account or amount, usually by reference to its historical origin; particularly (auditing) to review and set forth in a working paper the details or classified summary of items in an account, obtained or substantiated, where necessary, by reference to sources and accompanied by explanations of major items and by cross references to related accounts.
<b>Analytical Procedures</b>	A process which consists of the analysis of significant ratios and trends including the resulting investigation of fluctuations and relationships that are inconsistent with other relevant information or deviate from predicted amounts.
<b>Argillaceous Minerals</b>	Minerals containing substantial amounts of Clay-like components. These are fine-grained (less than 2 $\mu\text{m}$ ) aluminosilicates and more particularly Clay minerals such as kaolinite and chlorite. Clays and Shales are thus predominantly argillaceous.

## B

---

<b>Bagasse</b>	Cane residue leaving mills after extraction of juice.
<b>Bauxite</b>	Aluminum Ore containing minerals (such as gibbsite, boehmite and Diaspore) and iron-oxides (goethite and hematite), the Clay mineral (kaolinite) and small amounts of anatase. It was named after the village Les Baux-de-Provence in Southern France, where it was first discovered in 1821 by geologist Pierre Berthier.
<b>Bituminous Coal</b>	A hard coal containing a tar-like substance called Bitumen. It is of higher quality than lignite coal but of poorer quality than anthracite coal. It is an organic sedimentary rock formed by diagenetic and sub-metamorphic compression of peat bog material.
<b>Blending</b>	Such a combination or association in which separate constituents or the line of demarcation cannot be distinguished.
<b>Boiler</b>	A closed vessel in which water or other fluid is heated. The heated or vaporized fluid exits the boiler for use in various processes or heating applications.

**Boiling house** That part of the sugar mill in which the processes of production of sugar from raw juice are carried out. It is also referred to as the back-end or raw house.

**Byproduct** A secondary product obtained during the course of manufacture, having a relatively small value as compared with that of the main product or products. The cost of a byproduct is commonly regarded as indeterminable.

## C

---

**Calcareous** It refers to a sediment, sedimentary rock, or soil type which is formed from or contains a high proportion of calcium carbonate in the form of calcite or aragonite.

**Calcination** Calcination (also referred to as Calcining) is a thermal treatment process applied to ores and other solid materials in order to bring about a thermal decomposition, phase transition, or removal of a volatile fraction. The calcination process normally takes place at temperatures below the melting point of the product materials. Calcination is to be distinguished from roasting, in which more complex gas-solid reactions take place between the furnace atmosphere and the solids, whereas calcination takes place in absence of air.

**Carbonation** Process involving introduction of carbon dioxide gas into limed juice or syrup to remove color and non-sugar solids.

**Centrifugal** Centrifuge used to separate sugar from mother liquor.

**Clarifier** Apparatus for separation by sedimentation of suspended solids from turbid sugar solution.

**Clarification** Any process (typically an industrial process) that removes impurities.

**Classification process** The two sulphitation and carbonation processes are termed as classification process.

**Clinker** In manufacturing Portland cement, clinker is the solid material produced by cement kiln stage that has sintered into lumps or nodules, typically of diameter 3-25 mm.

**Comparing** To establish the correspondence or similarity of differently located items.

**Confidentiality** A professional accountant should respect the confidentiality of information acquired during the course of performing professional services and should not use or disclose any such information without proper and specific Commission or unless there is a legal or professional right or duty to disclose.

---

<b>Confirming</b>	Substantiation of the existence and sometimes the condition and value of a claim against another, or of an asset in the possession or control of another, or of the existence and amount of a liability. A confirmation usually takes the form of a written request and acknowledgment, but it may also be obtained orally, or through observation, as by the inspection of a passbook containing entries for deposits, or of records reflecting a certain transaction.
<b>Cost Accounting</b>	That branch of accounting dealing with classification, recording, allocation, summarization, and reporting of current and prospective costs. Included in the field of cost accounting are the design and operation of cost systems and procedures; the determination of costs by departments, functions, responsibilities, activities, products, territories, periods and other units, and of forecasted future costs and standard of desired costs, as well as historical costs; the comparison of costs of different periods, of actual with estimated, budgeted, or standard costs, and of alternative costs; the presentation and interpretation of cost data as an aid to management in controlling current and future operations.
<b>Cost Accounting System</b>	A system of accounts, often subsidiary to the general ledger, by means of which the cost of products, processes, or services are determined. Cost systems are usually regarded as falling into two broad classes: job-order and process-cost systems; estimated or standard costs may be a feature of either.
<b>Cost Center</b>	Any unit of activity into which a manufacturing plant or other operating organization is divided for purposes of cost assignment and allocation. For each such center, accounts are maintained containing direct costs for which the center's head is accountable.
<b>Cost Control</b>	The employment of management devices in the performance of any necessary operation so that pre-established objectives of quality, quantity, and time may be attained at the lowest possible outlay for goods and services. Such devices include a carefully prepared and reviewed bill of materials; instructions; standards of performance; competent supervision; cost limits on items and operations; and studies, interim reports, and decisions based on these reports.
<b>Cost Flow</b>	The concept of an item of cost or a group of costs passing through two or more stages within an economic unit; as, the movement of raw material costs from requisition to purchase, receipt, stores, production, sales, and collection.
<b>Cost of Production</b>	Expense incurred in and allocated to a manufacturing operation; the cost of materials, labor and often overhead charged to work in process.



<b>Cost Records</b>	Ledgers, supporting and supported by records, schedules, reports, invoices, vouchers, and other documents evidencing the cost of a project, job, production center, process, operation, product, or service.
<b>Crystal</b>	A crystal is a solid in which the constituent atoms, molecules or ions are packed in a regularly ordered, repeating pattern extending in all three spatial dimensions.
<b>Crystallize</b>	A state consisting of or containing or of the nature of crystals.
<b>Crystallization</b>	Nucleation and growth of crystals.

## **D**

---

<b>Deodorizer</b>	An equipment for deodorizing, the final stage in vegetable oil refining. Deodorizing removes odoriferous material, free fatty acids and other undesired minor components to produce bland oil with a good shelf life.
<b>Deodorization</b>	A process that uses high vacuum and superhead steam in the washing of fats and oils. Deodorization removes from fats and oils materials originally present or introduced during previous processing that would contribute undesirable flavors and odors to the finished products.
<b>Dry Process</b>	Modern Kiln technology that accepts the raw materials as a fine dry powder, ready for calcining and clinkerising.

## **E**

---

<b>Examining</b>	To probe records, or inspect securities or other documents, review procedures, and questions persons, all for the purpose of arriving at an opinion of accuracy, propriety, sufficiency and the like.
------------------	---

## **F**

---

<b>Fatty Acids</b>	A carboxylic acid, often with a long unbranched aliphatic tail (chain), which is either saturated or unsaturated. Carboxylic acids as short as butyric acid (4 carbon atoms) are considered to be fatty acids, whereas fatty acids derived from natural fats and oils may have at least 8 carbon atoms, e.g. caprylic acid (octanoic acid). Most of the natural fatty acids have an even number of carbon atoms, because their biosynthesis involves acetyl-CoA, a coenzyme carrying a two-carbon atom group.
<b>Forged Steel Balls</b>	Grinding balls that are available in different sizes and hardness.

---

**H**

---

**Hydrogenation** A class of chemical reactions which result in an addition of hydrogen usually to unsaturated organic compounds.

**I**

---

**Independence** Professional accountants in public practice when undertaking a 'reporting assignment' should be and appear to be free of any interest which might be regarded, whatever its actual effect, as being incompatible with integrity, objectivity and independence.

**Inspection** Inspection consists of examining records, documents or tangible assets.

**Integrity** A professional accountant should be straightforward and honest in performing professional services.

**Internal Control System** All the policies and procedures (internal controls) adopted by the management of an entity to assist in achieving management's objective of ensuring, as far as practicable, the orderly and efficient conduct of its business, including adherence to management policies, the safeguarding of assets, prevention and detection of fraud and error, accuracy and completeness of accounting records and timely preparation of reliable financial information.

**K**

---

**Kiln** Thermally insulated chambers or ovens in which controlled temperature regimes are produced. They are used to harden, burn or dry materials.

**L**

---

**Laterite** A surface formation in hot and wet tropical areas, which is enriched in iron and aluminum and developed by intensive and long lasting weathering of underlying parent rock. Nearly all rocks can be deeply decomposed by high rainfall and elevated temperatures. The percolating rainwater causes dissolution of primary rock minerals and decrease of easily soluble elements e.g. sodium, potassium, calcium, magnesium and silicon. This gives rise to a residual concentration of more insoluble elements, predominantly iron and aluminum.

**Limestone** A sedimentary rock composed largely of mineral calcite. Limestone often contains variable amounts of silica in the form of chert or flint, as well as varying amounts of clay, silt and sand as disseminations, nodules or layers within the rock.

**M**

---

<b>Magma</b>	A mixture of crystals and liquid (water, clarified juice, syrup or molasses) produced by mingling.
<b>Massecuite</b>	A mixture of crystals and mother liquor resulting from crystallization process of sugar refining. Massecuities are classified according to purity as A, B or C massecuities.
<b>Molasses</b>	The mother liquor separated from crystals by centrifuging. A, B or C molasses is derived from the corresponding massecuities. C molasses is also referred to as final molasses.
<b>Milling tandem</b>	An arrangement of rolling mills, in direct line, allowing the metal to pass from one set of rolls into the next set.

**N**

---

<b>Neutralization</b>	A chemical reaction in which a water solution of acid is mixed with a water solution of base to form a salt and water. This reaction is complete only if the resulting solution has neither acidic nor basic properties. Such a solution is called a neutral solution. Complete neutralization can take place when a strong acid, such as hydrochloric acid, is mixed with a strong base, such as sodium hydroxide. Strong acids and bases completely break up or dissociate into their constituent ions when dissolved in water.
-----------------------	---

**O**

---

<b>Objectivity</b>	A professional accountant should be fair and should not allow prejudice or bias, conflict of interest or influence of others to override objectivity.
--------------------	---

**P**

---

<b>Packing</b>	The processing and packaging of manufactured products, especially food products.
<b>Perforated Plate</b>	A flat plate with series of holes used to control fluid distribution, as in a perforated-plate (distillation) column.
<b>Portland Cement</b>	A binding agent of present-day concrete. It is a finely ground powder made by burning and grinding a limestone mixed with clay or shale. Its inventor, Joseph Aspdin (1799 – 1855), patented the process in 1824, naming the material for its resemblance to the limestone of the Isle of Portland, England. The cement combines chemically with the water it is mixed with, then hardens and strengthens.
<b>Professional</b>	A person who does a job that needs special training and a high level of education.

---

<b>Professional Behavior</b>	A professional accountant must act in a manner consistent with the good reputation of the profession and refrain from any conduct, which might bring discredit to the Profession.
<b>Professional Competence and Due Care</b>	A professional accountant must perform professional services with due care, diligence competence and has a continuity duty to maintain professional knowledge and skill at a level required to ensure that a client or employer receives the advantage of competent professional service based on current developments in practice, legislation and techniques.
<b>Proportioning</b>	The selection of ingredients for a mixture, to make the most economical use of available materials to produce the required properties.
<b>Pulverizing</b>	A process which reduces a material to powder or dust, usually by crushing, pounding or grinding.
<b>Q</b>	
<b>Quarry</b>	Quarry is Extraction pits, worked exposures, mines, and other kinds of working areas with natural raw materials such as stone, flint, or metal ores.
<b>R</b>	
<b>RCC Silo</b>	Reinforced Cement Concrete Silo is tall, enclosed structure used primarily to store. It is usually cylindrical in shape.
<b>Reconciling</b>	The determination of the items necessary to bring the balances of two or more related accounts or statements into agreement.
<b>S</b>	
<b>Shale</b>	A class of fine-grained clastic sedimentary rocks with a mean grain size of less than 0.0625 mm including siltstone, mudstone, and clay stone. One-half to two-thirds of all sedimentary rocks are shales.
<b>Silo</b>	Silo is tall, enclosed structure, usually cylindrical in shape, used primarily to store.
<b>Sintering</b>	A process of forming objects from a metal powder by heating the powder at a temperature below its melting point.
<b>Slurry</b>	A thin mixture of insoluble material floating in liquid.
<b>Sulphitation</b>	Adding of sulfur dioxide or derivatives to process streams in a sugar industry. This is done for one of three reasons i.e. pH Control, Biocide or Color blocking.

**T**

---

<b>Technical Standards</b>	A professional accountant should carry out professional services in accordance with the relevant technical and professional standards.
<b>Testing</b>	A specified procedure or set of procedures, including rules for assembling evidence, interpretation, and significance for accepting or rejecting hypotheses.
<b>Tracing</b>	To ascertain whether an item has been disposed of in accordance with source indications.

**V**

---

<b>Verifying</b>	To check that something is true or accurate.
<b>Vouching</b>	Preparation under a voucher system of invoices or other statements of liability for entry, distribution and payment.

**W**

---

<b>Wet process</b>	Kiln technology that requires the raw materials to be fed to the kiln process as a slurry for calcining and clinkerising.
--------------------	---

\*\*\*\*\*

# Cost Audit Handbook



Vegetable Ghee & Cooking Oil Industry



Cement Industry



Sugar Industry



Fertilizer Industry



Thermal Energy Industry



Petroleum Refining Industry



Natural Gas Industry



Polyester Fibre Industry



Institute of Cost and Management Accountants of Pakistan

[www.icmap.com.pk](http://www.icmap.com.pk)



Estd. 1951

**Institute of Cost and Management Accountants of Pakistan**

ST-18/C, Block-6, Gulshan-e-Iqbal, Karachi-75300, Pakistan.

Ph.: (92-021) 9243900-01-02 & 04, Fax: (92-021) 9243342,

E-mail: [research@icmap.com.pk](mailto:research@icmap.com.pk), Website: <http://www.icmap.com.pk>