

EXPOSURE DRAFT
Guidance Note on Internal Audit of
Power Industry

The following is the Exposure Draft of Guidance Note on Internal Audit of Power Industry issued by the “Professional Development Committee” of the Institute of Cost Accountants of India, for comments and suggestions. The comments/ suggestions on any aspect of this Exposure Draft would be most helpful if they indicate the specific paragraph or group of paragraphs including page number to which they relate, also contain a clear rationale and, where applicable, provide a suggestion for alternative wording.

The proposed Guidance Note may be modified in light of comments/ suggestions received before the same being issued as Guidance Note on Internal Audit of Power Industry.

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Note:

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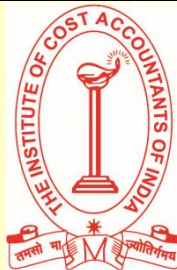
GUIDANCE NOTE

ON

INTERNAL AUDIT OF

POWER INDUSTRY

LAST DATE FOR COMMENTS: APRIL 03, 2014



PROFESSIONAL DEVELOPMENT COMMITTEE



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Contents

Chapter No.	Chapter Name	Page No.
1	Introduction to Internal Audit	1-7
2	Documentation and Working Papers	8-11
3	Planning an Internal Audit and Audit Programme	12-16
4	Audit Sampling	17-19
5	Audit Evidence	20-21
6	Analytical Procedures	22-24
7	Accounting System and Internal Control	25-27
8	Control and Risk Assessment	28-31
9	Internal Audit in ERP Environment and Systems Audit	32-39
10	Relying on External Opinion and Reference of Auditor Expert	40-41
11	Audit Conclusion and Corrective Measures	42-44
12	Report Writing and Audit Report	45-46
13	Introduction to Power Sector	47-58
14	Generation of Power	59-62
15	Transmission of Electricity	63
16	Distribution of Electricity	64-65
17	Special transactions peculiar to the Industry	66-67
18	<i>Activities/ Services of the industry</i>	68-71
19	Audit of Operational Activities	72-81
20	Audit of Special Areas w.r.t. peculiar transactions	82-89
21	Audit of Functional Areas	90-96
22	Cost Audit specific to the Industry	97-102
23	Audit follow up	103-104
24	Checklist	105-115

Chapter 1

Introduction to Internal Audit

Defining Internal Audit

1.1 Introduction:

Internal audit is an independent and separate appraisal function established within an organisation to examine and evaluate its activities as a service to the organisation. In the early years, internal audit was limited to ensuring that accounting records are properly maintained. But in the recent years internal audit is not restricted to financial records. It covers issues such as cost benefit analysis, resource utilisation, matters of propriety, effectiveness of management, etc. Thus the scope of coverage of internal audit has widened. Internal auditing provides added value to governing bodies and top level management as an objective source of independent advice.

Concept of Internal Audit is a dynamic one. It is experience gaining and applying the same in subsequent Audits and it should never be a routine exercise.

Internal audit also involves identifying potential frauds, participating under fraud investigation, conducting post fraud investigation, control breakdowns and mitigate financial loss. Organizations employ professional called Internal Auditors to perform internal audit function.

1.2 Definition:

The examination, monitoring and analysis of activities related to a company's operation, including its business structure, employee behavior and information systems is called internal audit.

The Institute of Internal Auditors (IIA), defines internal audit as, 'Internal audit is an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization to accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve effectiveness of risk management, control and governance processes.'

1.3 Necessity of Internal Audit:

- a. During the growth of business, many organizations still rely on old controls system that are no longer sufficient to protect the business.
- b. In many organizations appropriate control system has not been established resulting in customer dissatisfaction and fraudulent transactions.
- c. Organisations that do not have internal audit function are at risk of relying on management who is not in a position to provide independent and objective opinion.
- d. Internal audit ensure good governance, risk management and internal control.
- e. Internal audit provides valuable support and assurance to the organisation.

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- f. Organisations which do not carry out an internal audit function miss the benefits of professional internal auditor.
 - g. Internal auditors help the organisation in safeguarding assets and utilisation of available resources.
 - h. Having an internal audit activity is a good corporate governance practice.
 - i. A sound internal audit provides recommendation for the improvement of business operations.
 - j. Internal audit is necessary for organizations to comply with laws and regulations.
- Therefore an effective Internal Audit function helps in reducing the likelihood of undesirable events through evaluation and enhancement of organizations internal controls.

1.4 Objectives & Principles of Internal Audit

1.4(a) Objectives:

The objective of internal audit may vary as per the size, nature and structure of the organization and the requirement of management. But the following are the basic objectives of internal audit:

- 1) Determine the accuracy and authenticity of financial and statistical records.
- 2) Verify whether the accounting principles, policies and practices have been followed while preparing financial statements.
- 3) Verify whether the assets are existed and properly maintained. Also ensure that the assets are acquired and disposed under proper authorization.
- 4) Examine that the access to assets of the organization is restricted to authorized persons only.
- 5) Make sure that the liabilities are incurred for lawful activities of the organization.
- 6) Detection and prevention of errors and frauds.
- 7) The internal check system existing in the organisation is effective and efficient.
- 8) Ensure that proper compliance is maintained with policies of company, government and other statutory institutions.
- 9) Substantiate the effectiveness of the prevailing electronic information and processing system.
- 10) Review the overall operational efficiency and internal control system of the organization to ensure it accomplishes the desired goals.

1.4(b) Principles:

The principles govern the auditor whenever an audit is carries out by him. The Institute of Cost Accountants of India has issued Cost Audit and Assurance Standards CAAS – 101 to CAAS – 104, which govern the audit process. CAAS – 103 (Cost Audit and Assurance Standard on Overall Objectives of the Independent Cost Auditor and the Conduct of an Audit in Accordance with Standards on Auditing) states that *“The fundamental principles with which the auditor is required to comply are Integrity, Objectivity, Professional competence and due care, Confidentiality, and Professional behavior. In case an audit engagement is in public interest, then the auditor should be independent of the entity subject to the audit.”*

- 1) **Integrity, Objectivity and Independence:** The internal auditor should be straightforward, honest and sincere towards his work. He should be impartial and independent. The internal auditor should bring

The Institute of Cost Accountants of India

out any conflict of interest to the attention of appropriate management personnel so that they can take corrective action on it.

- 2) **Confidentiality:** The internal auditor should not disclose any confidential information to third party without the permission of concerned authority or unless there is a statutory or a regulatory requirement to do so.
- 3) **Professional Skills and Competence:** The internal audit should be performed by the trained and competent person. It is expected that Internal Audit should be carried out by the internal auditor with due diligence and professional care.
- 4) **Work performed by others:** While carrying out internal audit, there may arise the need to delegate the work to his assistants or experts. He should carefully delegate and supervise the work performed by others because he is responsible to the work delegated by him to others.
- 5) **Documentation:** The internal auditor should maintain the important documents and working papers as evidence of work performed by him was in accordance with Cost Audit and Assurance Standard CAAS – 102 on Cost Audit Documentation.
- 6) **Planning:** Determining the nature, timing and extent of audit procedure, the audit plan should be designed. The internal auditor should plan his work in order to complete the work in a timely manner. He should ensure that appropriate attention is devoted to significant areas of audit.
- 7) **Evidence:** The internal auditor should obtain sufficient and appropriate audit evidence based on his professional judgments to enable him to draw reasonable conclusions.
- 8) **Internal Control and Risk Management Systems:** The role of internal auditor is to suggest improvements in internal control and risk management systems. For this purpose, the internal auditor should:
 - a. Understand the risk management and internal control framework established.
 - b. Perform the steps in assessing the framework.
 - c. Review the adequacy of framework.
 - d. Perform risk-based audits on the basis of risk assessment process.
- 9) **Reporting:** On the basis of conclusions drawn and audit evidence obtained, the internal auditor should give his report and suggest remedial action. In case he comes across any frauds or misappropriation, he should immediately bring the same to the notice of management.

1.5 Internal Audit Strategy and Approaches:

1.5(a) Internal Audit Strategy:

The following are the steps of developing a proper audit strategy:

- 1) Defining an Internal Audit Vision.
- 2) Deciding the priorities.
- 3) Design proper key performance indicators.
- 4) Design an operating strategy.

- 1) **Defining an Internal Audit Vision:** Identify the requirements of the stake holders and define a vision for the strategy.
- 2) **Deciding the priorities:** After deciding the vision, identify the operational priorities and key business risks. Ensure that the processes and methods are flexible enough to face the emerging risks.
- 3) **Design proper key performance indicators:** It indicates the internal audit measures and its relation to expectation of stakeholders.
- 4) **Design an operating strategy:** List out the activities that will enable to develop the operating strategies for the internal audit.

1.5(b) Approach:

The internal auditor has to follow the approach to maintain the equilibrium between the management and staff. The auditor should interact with the auditee frequently instead of only giving importance to the documentary evidence. The recommendations should be given keeping in mind, the auditee and his business. The internal auditor should also consider the point that the client has more knowledge of the business environment.

1.6 Core Competence & Excellence:

A Successful Internal Audit Team will need to demonstrate the Core Competencies such as:

- Contributing to the Team
- Communication
- Customer Focus
- Decision Making
- Work Standards
- Continuous Improvement & Innovation

1.7 Terms of Engagement:

The Management of the Company may decide to outsource the activity of the Internal Audit by engaging a professional expert with a view to bring professional approach in Internal Audit.

The purpose of Terms of Engagement is:

- Agreeing the terms of engagement with the client and
- The auditor's response to a request by a client to change the terms of an engagement.

The auditor and auditee should agree on terms of engagement before commencement. Normally the internal auditor prepares the engagement letter. The engagement letter is to be signed by the internal auditor as well as by the auditee. The terms of engagement should be approved by the Board of Directors or Audit Committee.

Elements of Terms of Engagement:

The key elements of terms of engagement of internal auditor are as follows:

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- 1) **Scope:** The terms of engagement should contain the scope of internal audit engagement. The terms of engagement should clearly mention the broad areas of function of internal audit. It should indicate areas where internal auditors are expected to make their recommendations and value added comments. It should clarify that any additional services which are not mentioned shall be performed by mutual agreement and with separate engagement letter.
- 2) **Responsibility:** The terms of the engagement should clearly mention the responsibility of the auditee in relation to the internal auditor. The management of the auditee is responsible for providing timely and accurate data, information, records, personnel etc., and for extending cooperation to the audit team. The internal auditor has the responsibility to inform the management before commencement of the assignment about the engagement team and the audit plan.
- 3) **Authority:** The terms of engagement should provide the internal auditor the authority to access all departments. The internal auditor should have full authority over the audit tools which he may use in the course of internal audit.
- 4) **Confidentiality:** The terms of engagement should be clear that the ownership of working papers rests with the internal auditor and not the auditee. The engagement letter should contain a condition that the report of the internal auditor should not be distributed or circulated by the auditee or the internal auditor to any party other than that mutually agreed between the internal auditor and the auditee unless there is a statutory or a regulatory requirement to do so.
- 5) **Limitations:** The terms of engagement should specify clearly the limitations on scope, coverage and reporting requirement, if any.
- 6) **Reporting:** The terms of engagement should lay down the requirement regarding the frequency of reporting and intended recipients of the audit report.
- 7) **Compensation:** The compensation regarding out of pocket expenses, taxes, etc. for the services provided by the internal auditor shall be decided by the internal auditor and the client.
- 8) **Compliance with Standards:** The internal audit engagement would be carried out in accordance with the Professional Standards applicable. This should be stated in the terms of internal audit engagement.
- 9) **Withdrawal from engagement:** If the internal auditor does not agree to any change in terms of engagement, or is not permitted to continue as per the original terms, he should withdraw from terms of engagement.

1.8 Independence of Internal Auditor:

The independence of the auditor refers as the attitude of the auditor is free from any undue influence. It also refers as the auditor as freedom, lack of restriction on audit work and lack of restriction on access the books of accounts of the entity.

Independence of internal auditor means the independence from the parties who are dependent on the result of the internal audit. It means the internal auditor's opinion should not be influenced by any other party.

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Parties who have financial interest in business may try to interfere in the audit work being performed by the internal auditor. Thus he should work in an impartial manner. The internal auditor is required to carry out his work freely for being independent. Auditor independence is the basis of public's trust and confidence.

1.8(a) Types of Independence:

- 1) **Programming Independence:** It is the independence regarding selecting the audit strategy for performing the audit. The strategy decided by the auditor to be implemented cannot be opposed.
- 2) **Investigative Independence:** Investigative independence suggests that the auditor is free to implement the audit strategy in the suitable manner. If the auditor during the audit comes across a query, the company is answerable to him. The auditor must not be abstained from collecting the required audit evidence. This means that he has access to all the information of the company.
- 3) **Reporting Independence:** The auditor is independent to reveal the information to the concern authority if he feels it should be disclosed. The auditor should immediately inform the management about any defects in the accounting books or internal control system.

1.8(b) Advantages of Independence of Internal Audit:

- 1) The independence of the auditor is to be informed, Objective and fair opinion on the financial statement of the organization.
- 2) The society i.e. investors, creditors, bankers, etc. will take any economical decision on the basis of independence of the auditor.

1.9 Pronouncement on Internal audit:

The internal audit activities are performed in varied environments. The purpose, size, complexity and structure differ from organization to organization. These differences may affect the way internal audit is performed. Thus, the internal auditors should comply with Standards for Professional Practice of Internal Auditing. These standards consist of **Attribute, Performance and Implementation** Standards.

Attribute Standards consist of the purpose, authority and responsibility of audit and independence and objectivity of the auditor. The internal audit should be performed with proficiency and due professional care. The internal auditor should use computer assisted tools and other analysis techniques while exercising due professional care. The internal auditor should undergo continuous professional development. The internal audit process should adapt quality assurance and improvement program. The internal auditor should report their activities in accordance with International Standards for Professional Practice of Internal Auditing. Disclosure should be made on non-compliance of standards.

The performance standards describe the nature of internal audit against which the actual performance can be measured. These standards describe managing and planning of the internal audit. They provide guideline for resource management and risk management. Performance standards also state that the internal auditor should periodically report to the management. The internal auditor should assist in maintaining effective control. Appropriate recommendations should be made on improving governance process. The internal



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auditors should communicate the engagement result. The communication should be accurate, clear and concise. The auditor should follow and ensure that management has taken effective actions.

The Implementation Standards expand upon Attribute and Performance Standards. These Standards provides guidance applicable in specific types of engagements. They also deal with specific industry, region or type of audit.

Chapter 2

Documentation and Working Papers

2.1 Introduction:

Audit Documentation is a written record from which auditor draws conclusions that support him to make representations in his audit report. Written documents include audit planning, audit procedures, evidence of audit and final audit conclusions. It represents that audit work is performed as per requirement. Audit documentation is also known as working papers or work papers.

As per Cost Audit and Assurance Standard CAAS – 102 issued by the Institute of Cost Accountants of India, “Audit Documentation means the material including working papers prepared by and for, or obtained and retained by the cost auditor in connection with the performance of the audit.”

2.2 Review of Audit Documentation:

Reviewer is a person who has a reasonable knowledge of internal audit, legitimate information about the professional standards and the operating environment of the entity. Reviewers of audit documentation may include –

- 1) Newly engaged auditor may review previous year’s documentation to plan the current year’s audit.
- 2) Inspection team may review the documentation to evaluate whether the audit performed was with compliance to professional standards and various legal requirements.
- 3) Audit documentation done by assistants may be reviewed by their seniors.
- 4) Management personnel may review the audit documentation to understand how the auditor reached his conclusions and whether there was proper evidence to reach the conclusions.

2.3 Identification of the preparer and Reviewer:

The Preparers and Reviewer should sign the internal audit documentation. The internal audit documentation should state –

- 1) The person who completed the work and when it was completed.
- 2) The person who reviewed the work done and when it was reviewed.
- 3) Why the specific internal audit documentation was created?
- 4) From where the information relating to internal audit documentation was gathered?

2.4 Form and Contents of Internal Audit Documentation:

- 1) Proper working papers show professionalism while conducting an internal audit. It also shows how the work was done from the primary stage till the preparation of audit report. Internal audit documentation may be done on paper or in electronic form. E.g.: Correspondence, memoranda, e-mails and other important matters.
- 2) The internal audit documentation should be in detail so that the internal auditor is in a better position to finalize the audit report.

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- 3) It is impractical to document each and every observation. Therefore the extent of documentation should be based on professional experience of the internal auditor.
- 4) The internal audit documentation is not an alternate to the organization's accounting records.
- 5) The documentation should include a copy of engagement letter which contains the terms and conditions of appointment, if the internal audit is outsourced.
- 6) The documentation should be prepared in such a manner that it helps to understand the nature, time and extent of the audit to the reviewer who does not have any previous connection with the internal audit.
- 7) Audit documentation should mention the audit evidences obtained and the conclusions derived from it.
- 8) The audit documentation will also be affected by any statutory requirements, if any.

2.5 Nature & Purpose of Audit Documentation:

- 1) Provide evidence to auditor for preparing auditor's report.
- 2) Provide evidence to auditor for performing his audit work in accordance with Audit standards and any other legal requirement.
- 3) Assisting to auditor for the engagement team to plan & perform the audit work.
- 4) Retaining records which are useful for future audit.
- 5) Assist audit work to engagement team.
- 6) Conducting any external inspection as per legal requirement, if applicable.

2.6 Documentation of Audit Procedure and Evidences Obtained:-

- 1) The auditor should understand the nature, timing and extent of the audit procedure.
- 2) Important matter observed during audit and conclusion on it.
- 3) The auditor should record the work performed and date of work completed by him.
- 4) The auditor should review the audit work and date on which such review takes place.
- 5) The auditor should assemble the audit files on a timely basis. He should not delete the assembled audit files before the end of his retention period.
- 6) In exceptional cases, if the auditor, after the date of audit report, draws new or additional audit procedure and draws a new result, he should submit revised audit report, stating therein the reasons for doing so and details of new procedure adopted and conclusions drawn.

2.7 Objects of Working Papers:

- 1) Working papers show in detail the work of the audit clerk which helps to support the auditor's report.
- 2) The working papers help the internal auditor to save time in preparing the audit report.
- 3) Duplication of work can be avoided with the help of working papers if there are frequent transfers of staff performing the audit.
- 4) Future audit work can be done on the basis of working papers of prior years.

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- 5) The internal auditors with the help of working papers can advise the client on the weaknesses of internal control system and accounting system to avoid future risk.

2.7(a) Importance/Significance of Working Paper:-

- 1) The Working papers forms an important basis for the auditor for his final conclusion or opinion.
- 2) The working paper helps in reviewing audit work.
- 3) The responsibility of audit work is fixed as documentations are signed and checked by authorized person.
- 4) The working paper provides direction to audit staff.
- 5) The working paper is important for future planning of the audit work.

2.7(b) Files of Working Paper:

- 1) **Permanent file.**
 - 2) **Current file.**
-
- 1) **Permanent file:** The permanent file contains the details which are not subject to change very frequently. It includes Memorandum of Association (MOA), Articles of Association (AOA) and necessary legal documents for audit. It also contains financial statements of the company, accounting policies and observations of previous year's auditor. It consist notes regarding accounting policies adopted by the company. It is an examination of internal control system. Record of communication between the retiring auditor and present auditor is also contained in this file.
 - 2) **Current file:** As the name suggests, the current file contains information relating to the current period. It contains minutes of Board Meetings, audit programme, copies of financial information and details of audit procedure. It involves the record of communication made between third party, experts and other auditors. It contains examinations of transactions and balances. It contains notes regarding audit programme.

2.8 Audit Note Book: Audit notebook is the permanent record book of the auditor. It should be maintained systematically, cleanly and completely. Audit notebook is the evidence to the auditor in the event of any charge against him. It contains various matters arise during the course of audit.

2.9 General Guidelines for the Preparation of Working papers:

- a) **Completeness & Accuracy:** The working papers should be complete, accurate and conclusive.
- b) **Clarity and Understanding:** Working papers should be simple to understand and should reveal the nature and scope of the work performed by the auditor.
- c) **Relevance:** The audit working papers should contain information which is important and necessary for the purpose of internal audit.
- d) **Logical:** The working papers should be arranged in a logical manner.
- e) **Neat and clean:** Working papers should be neat and legible. Working papers should not be sloppy.

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- f) **Safety:** The audit working papers should be kept in a safe place and also the date should be put on every working paper.

2.10 Auditors Right on Working Papers:

The working papers are the property of the auditor. Thus the custody of working paper lies with the auditor. It is the duty of the auditor not to disclose any confidential information of client to any third party. But the auditor cannot disclose the data in working papers to any third party except with the permission of the client or if he is legally bound to disclose such data. The client cannot access the audit working papers. If the auditor himself shows the working papers to the client, it does not affect the terms of confidentiality.

Chapter 3

Planning an Internal Audit and Audit Programme

3.1 Introduction:

The internal auditor should, well in advance, plan out the audit to be performed. A strategic plan should be prepared by the internal auditor in relation to the long term goals of the organisation. The audit plan must be flexible enough to cope with some future uncertain events. The plan should also include objectives and scope of audit, time and staff required for the audit. A proper audit plan enables to identify probable problems in future, track whether the work is going on as per the scheduled time. An audit plan helps the auditor to consider various areas of complexities of work, devote proper attention to the specific areas and manage the assistants properly. Audit plan should be formulated in a cost efficient manner.

3.2 Stages of Planning an Internal Audit:

- 1) Deciding the objective of internal audit.
- 2) Consider the recent developments in statute.
- 3) Understand the structure and operations of the entity.
- 4) Identify the strengths and weaknesses of internal control.
- 5) Consider the plans of external audit.
- 6) Find out the materiality of items.
- 7) Decide the most effective and efficient approach for audit.

3.3 Scope of Planning:

- 1) Obtain knowledge about client's business so as to determine nature, time and extent of audit procedure.
- 2) Obtain knowledge of accounting system and policies of the organization.
- 3) Obtain legal knowledge about the area
- 4) Evaluate the time required for various activities.
- 5) Determine the reporting responsibilities.

3.4 Internal Audit Charter

1. Purpose

"Internal auditing is an independent, objective assurance and consulting activity designed to add value and improve an organisation's operations. It helps an organisation accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes" as defined by the Institute of Internal Auditors.

2. Objectives

The objectives of internal audit are to provide independent advice and assurance to management that the policies, operations, systems and procedures for which they are responsible:

- Comply with relevant legislation and standards (under Compliance Audit);

- Optimum use of resources (economies and efficiency) (under Transaction Audit & Propriety Audit); and
- Achieve the objectives specified in Corporate and Operational Plans (under Systems Audit).

3. Review Scope and Coverage

The scope of Audit would normally depend on the importance attached to each of the core activities. Once all the core activities are fully covered then the scope could be extended to other non-core activities as well. The coverage and frequency of audits depends upon varying circumstances such as results of previous audit, relative risk associated with activities, materiality and the adequacy of systems of internal control.

The following will be considered before deciding to include an activity (other than an internal audit function) in the scope of the function:

- (i) Limitations on the internal audit function's ability to give independent advice on the Company's operations.
- (ii) The impact on the core internal audit function.
- (iii) The availability of skills and knowledge required to effectively perform activities.

4. Operating principles

The following operating principles are to be observed to ensure the effectiveness of internal audit:

a) Confidentiality & Professionalism:

All the work of internal audit will be confidential to the Company and will not be disclosed to third parties, except for external auditors, without both parties' consent. Audits are to be conducted with impartiality and integrity. The Professional Standards on Auditing (AAS / IAAS) shall be followed.

b) Risks Vs Benefits of Control:

The need for internal controls/quality controls is based on an assessment of the risk, potential benefits, and costs of such controls. Control must be adequate but also cost effective. Internal audit must ensure assignments are completed by suitably skilled, experienced and competent persons, with a regular review of audit plans, working papers and reports.

5. Internal Audit Process

a) Planning

- While planning the Internal Audit it shall be planned in such a way that the operations of the auditee are not disturbed and the staff concerned are least affected.
- Internal auditor to consult with the Unit Heads in developing the forward program of audits based on a preliminary risk evaluation.
- Should any problem arise regarding the scope of audit, the matter will be referred to the Director (Finance)/CFO.

b) Execution

- During the Course of Audit, periodic review shall be made to assess the progress.
- If there is any situation, which requires more verification, then the same shall be communicated to the Corporate Office for information and extension of the time.
- After completion of the audit, an analysis of the budgeted time and the actual time taken for each task shall be made, which will be useful while planning the future audits. In case of over run of time, the reasons for such delay shall also be explained.

c) Reporting

- Important issues should be discussed with Staff concerned and the Unit Head during the conduct of the audit after which audit reports of detailed findings and recommendations should be presented to the management for compliance.
 - Based on the observations made during the course of audit, a Preliminary Audit Report will be furnished seeking the Auditee / User Department to furnish their replies / clarifications.
 - Upon receipt of replies / clarifications from the Auditee Unit / User Department a Final Audit Report will be made which shall consist of the following namely –
 - i) Issues which require clarification from the top management.
 - ii) Issues indicating weaknesses in the Internal Control System, which requires a corrective action.
 - iii) Issues which warrant action by the management in case of gross negligence / fraudulent transactions.
 - iv) A statement showing the leakage of revenue Identified and realization of the same with a brief description for each issue (to enable the management to formulate instructions for arresting revenue leakage of similar nature in other units).
 - v) A list of observations, which are repetitive in nature.
- At every meeting of the Audit Committee a report on the Internal Audit Progress will be tabled for review.

d) Follow Up

- Field unit management of the auditee and internal audit should jointly follow up the progress on implementation of approved audit recommendations.
- Progress reports should be included in periodical Audit Committee Meeting agenda.

8. Training and Capacity Building

- As a part of programme, the Internal Audit staff will also be provided with necessary training by nominating them to important conference / seminars (either in-house or outside).
- The benefit of the training / guidance to internal audit staff shall also accrue to the organisation in form of improved skills and performance.

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3.5 Audit programme:-

The programme prepared by the auditor for completion of audit denoting the work and responsibility of audit staff is known as audit programme. It includes the plan of audit, method to be followed, etc. Hence, the audit programme means nothing but deciding in advance that what is to be done for completion of audit in specific time. The audit programme is a 'Guideline' to the internal auditor.

The audit programme should be in writing, which includes the procedures required for the audit plans. The proper knowledge of accounting system and internal control is necessary for preparing the audit programme. The previous year audit programme should be taken into consideration while preparing an audit programme.

3.5(a) Advantages of Audit Programme:-

- 1) Audit programme is set of instruction which directs the staff as to work to be done in specified time.
- 2) Helps in selection process of assistants as per their knowledge.
- 3) It helps in allocating the responsibility to the staff.
- 4) Supervision of work can be possible with the help of audit programme.
- 5) It is the time saving programme.
- 6) The audit programme helps the auditor for giving proper audit report.

3.5(b) Disadvantages of Audit Programme:-

- 1) The whole concept may not be understood due to mechanical approach of work.
- 2) The initiative of the assistants may reduce due to rigid audit programme.
- 3) Monotonous work may lead to frustration among audit staff.
- 4) Any unusual matter is not considered by the audit staff if it is not mentioned in the audit programme.

3.6 Specimen of Audit Programme:-

Type of Audit	Statutory Audit/ Tax Audit/ Internal Audit, etc.		
Staff Involved	Mr. P (Head) Mr. Q (Audit Assistant)		
Particulars	Remarks	Time Taken	Sign of Audit Head
1) Journal			
2) Purchase Book			
3) Sales Book			
4) Bills Register			
5) Debtors Confirmation			
6) Creditors Confirmation			
7) Cash Book			
8) Bank Statement			
9) Bank Reconciliation Statement			
10) Fixed Assets Register, Details of cost centre-wise analysis of assets, etc.			

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11) Bill of Material for all products			
12) Quantity and cost of actual material consumed, i.e. Coal, coke, furnace oil, gas, etc.			
13) Idle labour time			
14) Direct Labour Cost Analysis, i.e. analysis of labour cost of each cost centre such as Operations section of each unit, turbine / boiler maintenance, coal handling plant, etc.			
15) Details of Direct Expenses and its analysis			
16) Details of overheads			
17) Installed capacity and capacity utilization			
18) Plant outage analysis			
19) Details of Repairs and Maintenance costs			
20) Other cost records			

Chapter 4

Audit Sampling

4.1 Introduction:

Details review of audit evidence is essential to achieve the objective of audit. But, it is not possible to review and examine all the evidences. Therefore the internal auditor has to apply the selective approach or verification. This verification, based on selective approach, is called as audit sampling.

E.g.: Debtors – The Company having a large number of debtors in particular financial year. If internal auditor has to verify all the evidences, it will take many years to complete the audit. Hence audit sampling is required in this case.

4.2 Meaning:

Audit sampling means examining less than 100% of the items in population or verifying total evidence. Here, population means the entire set of data from which sample is selected and of which the auditor draws conclusions. Audit sampling means that auditors will not be able to examine all the information available to them as it would be impractical and uneconomical. Audit sampling is known to reduce the risk of ‘over-auditing’. While sampling, auditor should select a sample which is a representative of population.

While in following circumstances, sampling may not be suitable:

- 1) Checking Bank Reconciliation Statements.
- 2) Compliance with Statutory Provisions.
- 3) Transactions with related parties which are very high in amount.
- 4) Transactions of foreign exchange.
- 5) When internal controls are very weak.

4.3 Precautions while conducting Audit Sampling:

- 1) Proper study of accounting system should be necessary before audit sampling.
- 2) The study of internal control system also helps the internal auditor for further test check plans.
- 3) Proper plans of audit sampling should be thoroughly elaborated and explained to audit staff.
- 4) Transactions and balances should be classified, if required.
- 5) The sample size should be properly determined.

4.3(a) Types of Audit Sampling:

- 1) **Judgmental sampling:** This is a traditional method of sampling in which size of the samples and composition is decided on the basis of auditor’s experience.

E.g.: An internal auditor may decide to check the entries of alternative months while doing the audit of certain year and out of remaining months in next year.

Advantages:

- Simple to operate.
- It is easier for the audit staff to understand traditional approach of judgmental sampling, though they have less expert knowledge.

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- Year end transactions are examined in detail to ensure whether cut off procedures are adequate.

Limitations:

- Unscientific method.
- The samples examined may not be true representative of population.

2) Statistical Sampling: This method is based on probability theory and more scientific method than judgmental sampling. It involves the application of different mathematical techniques like theory of probability, use of random number table, etc. In this method, auditor should note that it is not necessary for him to have an in-depth understanding of the statistical techniques.

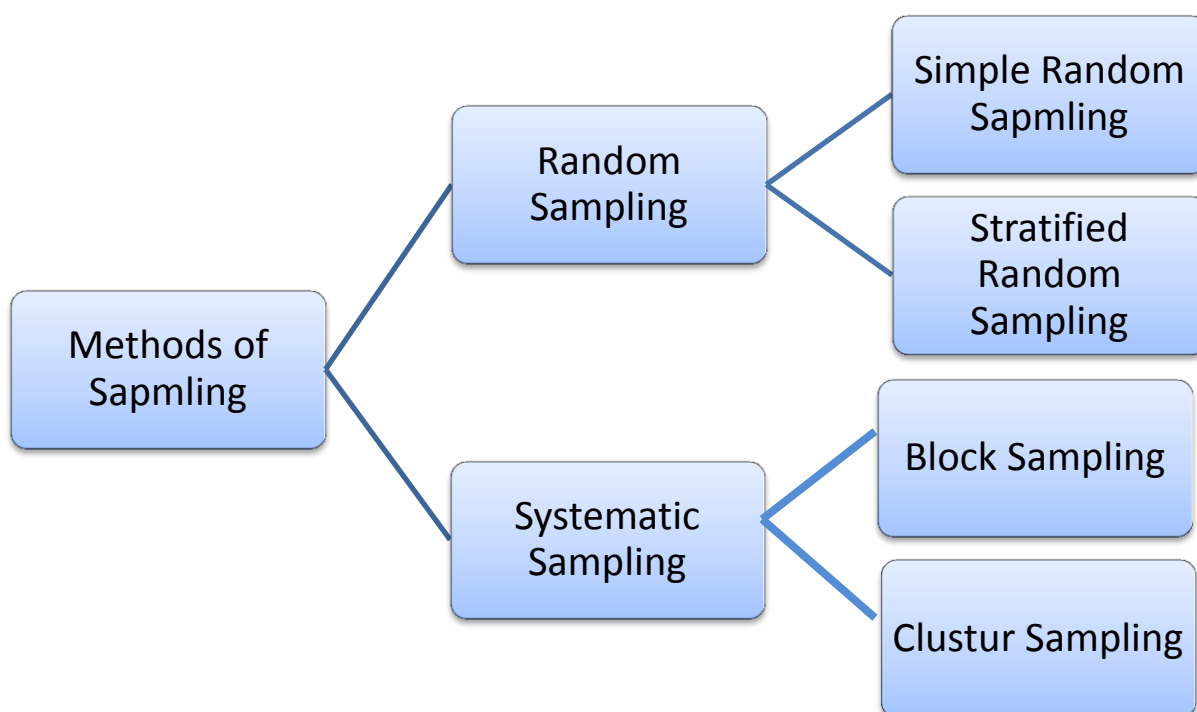
Advantages:

- Scientific technique.
- More reliable.
- Widely accepted way of sampling.

Limitations:

- Complex to operate.
- Time consuming.

4.4 Methods of Audit Sampling: (Please see next page)



- 1) **Random Selection:** This method ensures the equal chance of selection of items among the population.
E.g.: Use of random numbers of tables.

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- a) **Simple Random Sampling:** This method is suitable for population having similar items. Each item of population has equal chance of selection.

E.g.: Sales items ranging from Rs.50000 to Rs.100000.

- b) **Stratified Random Sampling:** Stratification means dividing different groups of population into population having similar types of items. It is an extension of simple random sampling.

E.g.: Sales items ranging from Rs.50000 to Rs.100000 can be further divided into samples ranging Rs.50000 to Rs.60000, Rs.60001 to Rs.80000 and Rs.80001 to Rs. 10000.

- 2) **Systematic Sampling:** In this method items are selected by keeping constant interval between two samples.

E.g.: Every 5th Purchase invoice.

- a) **Block Sampling:** A block of consecutive items is selected. It is a simple method.

E.g.: First 10 sales invoices

- b) **Cluster Sampling:** Cluster means a group of population. In this method, clusters are selected randomly.

E.g.: 100 sales invoices are divided into 10 equal clusters. Out of those clusters, 1st, 4th & 8th clusters are selected randomly.

Chapter 5

Audit Evidence

5.1 Introduction:

Audit evidence refers any information obtained by the auditor, on which he can draw conclusions and express his opinion on financial statement and cost statement. Auditor should obtain sufficient and appropriate audit evidence for audit procedure before he draws his conclusions. The sufficient and appropriate audit evidence should be evaluated by internal control, experience of previous year's audit, degree of misstatements, materiality, trends and ratios and so on. Audit evidence assures auditor from substantive procedures reasonably in respect of existence, valuation of assets & liabilities, measurement of transaction and appropriate presentation and disclosures of items.

5.2 Types of Audit Evidence:

The audit evidence can be classified as physical evidence, documentary, testimonial and analytical evidence. The details of different audit evidence are given below:

- 1) **Physical evidence:** Physical evidence is obtained by direct inspection or observation of people or assets. The physical evidence may be documented in memoranda, photographs, charts, etc.
- 2) **Documentary evidence:** It consist the information that may be internally generated.
E.g. - Letters, contracts, invoices, reports, etc.
- 3) **Testimonial evidence:** Evidence obtained by way of inquiries, interviews or questionnaires is called testimonial evidence. This type of evidence may be written or spoken.
- 4) **Analytical evidence:** Analytical evidence includes computation, comparisons and rational arguments.
E.g. – Computation of amount of depreciation.

5.3 Presumptions for judging reliability & competency of evidence:

- 1) Evidence obtained from third party is more reliable than the evidence obtained from the auditee.
- 2) Evidence developed from effective management control is more reliable than that is obtained from where management controls are weak or do not exist.
- 3) Evidence obtained by the auditor through direct physical observation, computation and inspection is more reliable than evidence obtained indirectly.
- 4) Original documents are more suitable than Xerox copies.
- 5) Information obtained from an expert person having knowledge of the area would be more reliable.
- 6) Objective evidence would be more reliable than the evidence which requires judgment.
- 7) Written evidence is more reliable than oral evidence.

5.4 Methods to obtain audit evidence:

The auditor obtains evidence in performing compliance of substantial procedure by following one or more of the following methods.

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- 1) **Inspection:** It consists of examining records, documents or assets. Inspection provides degree of reliability depending upon its nature and source. Inspection of physical assets may prove their existence, but not about the organization's right over the assets or its valuation.
- 2) **Observation:** Observation consists of perceiving a process or procedure which is being performed by others in the entity.

E.g. - The auditor may observe counting of inventories by the client's employees.
- 3) **Enquiry & Confirmation:** Enquiry consists of obtaining information from knowledgeable person within the organization or outside the organization. Confirmation means response to an enquiry.

E.g. – The auditor requests confirmation of amount of loans by direct communication with bank.
- 4) **Computation:** Computation consists checking with mathematical accuracy of records or performing independent calculations.
- 5) **Analytical Review:** It is studying of various ratios and trends and investigating unusual fluctuations.
- 6) **Re performance:** The auditor performs the work which is already performed previously by the entity's employees. E.g. – Preparing the Bank Reconciliation Statement.

5.5 Need of Audit Evidence:

Audit evidence provides the auditor a reasonable assurance in respect of assertions made by the management.

- 1) **Existence:** the audit evidence helps to check the existence of an asset or a liability at a given date.
- 2) **Valuation:** The audit evidence shows the value of assets & liabilities recorded at an appropriate carrying value.
- 3) **Measurement:** Measurement of a transaction is recorded in proper amount and revenue or expenses are allocated to the proper period.
- 4) **Rights & Obligations:** The assets are the right of the entity whereas the liabilities are the obligations of the entity at a given date.
- 5) **Occurrence:** The transactions which are recorded in the books of account should be prepared during the relevant period.
- 6) **Presentation & Disclosure:** The items which are disclosed classified and described in accordance with recognized accounting policies and practices and statutory requirements, if any.

5.6 Procedure to Obtain Audit Evidence:

- 1) **Compliance Procedure:** The internal auditor should test whether the internal control exists; internal control is operating effectively and has been so operated throughout the period. In short, compliance procedure is performed to check designing, operative effectiveness and continuity of internal control system.
- 2) **Substantive Procedure:** Substantive procedures are performed to check completeness, accuracy and validity of transactions and balance. Internal auditor performs substantive procedure in respect of measurement, presentation and disclosure, completeness. Occurrence, valuation, existence and rights & obligations.

Chapter 6

Analytical Procedure

6.1 Introduction:

At each and every stage of audit, internal auditor should use the analytical procedure. Analytical audit procedure is nothing but the method which helps in comparing relationship among data. This method is introduced at planning stage of audit, during the course of audit and near the end of audit while reviewing the financial statement.

Analytical audit procedure includes:

1. Comparison of current year data with previous year data.
2. Comparison of actual results with budgeted data.
3. Study of relationship between financial and non-financial information.
4. Inter business comparison of information.

6.2 Definition:

“Analytical procedures” means the analysis of significant ratios and trends, including the resulting investigation of fluctuations and relationships that are inconsistent with other relevant information or which deviate from predicted amounts”. Analytical procedure helps the Internal Auditor to make an assessment of the information collected during audit.

6.3 Factors to be considered while performing analytical procedure as substantive procedure:

1. Objectives of analytical procedure.
2. Availability of business information and its sources.
3. To check whether the available information is reliable or not.
4. Comparison between information available.
5. Understanding the effectiveness and efficiency of the internal control system.
6. The auditor should determine the suitability of substantive analytical procedure for a particular item.
7. The substantive analytical procedure is adopted for those transactions which tend to be predictable over time.
8. The expectation of the auditor should be sufficiently precise; any misstatement can be easily identified.
9. As substantive procedures when their use can be more effective or efficient than tests of details in reducing detection risk for specific assertions in the Audit Report.
10. If, difference is more than acceptable difference, then the auditor shall further investigate to rule out the possibility of misstatement.

6.4 Nature of Analytical Procedure:

1. As per the above standard on Auditing, Analytical procedures include the consideration of comparisons of the entity's financial information with, for example:
 - Comparable information for prior periods.

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- Anticipated results of the entity, such as budgets or forecasts.
 - Predictive estimates prepared by the auditor, such as an estimation of depreciation charge for the year
 - Similar industry information, such as a comparison of the entity's ratio of sales to trade debtors with industry averages or with other entities of comparable size in the same industry.
2. Analytical procedure assists the internal auditor in understanding of business environment. After understanding the business environment, internal auditor plans the nature, timing and extent of internal audit procedure.
 3. Analytical procedure helps the internal auditor decide on risk assessment procedure.
 4. Identify the non-expected factors such as errors, frauds and unusual transactions.
 5. Analytical procedure comparison of prior period information, budgets, forecasts and ratios of the entity with the similar industry information.
 6. It also compares relationship between financial and non-financial information.

Following matters are to be considered while determining the extent of analytical procedure:

- The reliance on internal control system.
- The availability of information of the industry.
- The importance of the matter, which is being examined.

6.5 Analytical Procedures at the end of Internal Audit:

The internal auditor should apply analytical procedure at the end of the internal audit for deriving the conclusion on the systems, controls and operating efficiency of the business. The areas, where further work needs to be done, should be identified by internal auditor before arriving at any conclusion.

6.6 Extent of Reliability on Analytical Procedures:

The extent of reliability of analytical procedure depends on following factors:

- Materiality of items involved.
- Internal audit procedure.
- Assessment of risk and control risk.
- The accuracy of result of analytical procedure.

6.7 Investigating the Result of Analytical Procedure:

If the auditor identifies fluctuations or a significant difference between recovered and expected values, then the auditor shall investigate by

- a) Enquiring management and thereafter obtaining evidences to confirm the same.
- b) Performing other procedure as necessary in the circumstances. E.g.: if management's responses are not available or reliable.

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6.8 Objective of Auditor regarding Analytical procedures:

1. Obtaining evidences while using substantive analytical procedure.
2. Design and perform analytical procedure for reliability on financial statement and cost statement at near end of audit.
3. To help the auditor in forming an opinion on financial statement and cost statement.

Chapter 7

Accounting System & Internal Control

7.1 Introduction of Accounting System:

It is the method and procedure used to collect, classify, summarize and report financial data. Accounting system is a task and records by which the transactions are maintained in the books of accounts.

The principles of accounting it should be consider while designing the accounting system. When the management designs the accounting system, the following points should be considered:

- 1) Balancing of cost with revenue.
- 2) Produces useful reports.
- 3) It is able to adopt the future need.
- 4) There should be adequate internal control system.

The auditor should obtain an understanding of the accounting system to identify and understand the following points:

- a) The internal auditor should understand the major classes of the transactions of the organization.
- b) How such transaction are passed in the books of account.
- c) Accounting records and supporting documents to the transactions.
- d) The accounting and financial reporting process.

7.2 Introduction of Internal Control:

Internal control means the plan of an entity adopted by management to ensure effectiveness & efficiency of the business and includes management policies, safeguard of assets, prevention & detection of frauds and errors and accuracy of accounting records for the reliability on financial information. Internal control system includes internal audit and internal check as it is established by the management. The scope of internal control system is beyond the accounting control and operational control. Proper understanding of internal control will help the internal auditor to examine the nature, time and extent and other audit procedure.

7.3 Objectives of Internal Control System:

- 1) The proper execution of transaction in accordance with management authorization.
- 2) The transactions are entered in the books of account appropriately, in the accounting period and in the correct amount in which these transactions are executed.
- 3) The financial transactions are recorded as per Accounting Standard, Generally Accepted Accounting Principles or any other statutory requirement as applicable. Similarly, cost transactions are maintained as per Cost Accounting Standards (CAS), Generally Accepted Cost Accounting Principles (GACAP) and other statutory requirements.
- 4) Evaluate the accuracy and adequacy of control measures.
- 5) Prevention and detection of frauds and errors.
- 6) Ensure the reliability of Management Information System and Control System.

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- 7) The safeguard of assets from any unauthorized access, use or disposition.
- 8) Periodical comparison between existing assets and recorded assets.
- 9) Ensure the effectiveness of operational control.
- 10) Take corrective measures in safeguarding assets.
- 11) Ensure the various reports are timely prepared and presented for management decision making.

7.4 Internal control system comprises of:

- 1) Control Environment
- 2) Control Procedure

- 1) **Control Environment:** - It is an attitude and action of management regarding internal control system and its importance to the entity. It effects on Control procedure & provides backgrounds to other control procedure.

Factors which affect Internal Control Environment are:

- a) Organizational Structure
- b) Management's Philosophy Operating Cycle
- c) Personnel Policies & Procedure

- 2) **Control Procedure:** - The policies & procedure which are additional to the control environment are known as control procedure. The control procedures are established by management. The objective of control procedure is to achieve entity's specific objective. Control procedure includes following:

- 1) Reporting.
- 2) Checking the mathematical accuracy of the records.
- 3) Controlling computer information system.
- 4) Comparison of actual result with budget.
- 5) Controlling documents, records and assets of the entity.
- 6) Maintaining and reviewing internal control.

7.5 Types of control:

The internal control covers the:

- 1) Internal audit function
- 2) Division of duties
- 3) Supervision of work
- 4) Attitude and operating style of the management.

7.6 Limitations of Internal Control:-

- 1) **Abuse of Authority:** The person who is responsible for maintaining internal control himself may break the regulation.

E.g.: The person authorized to issue raw material to various production departments only for authorized use, can himself misappropriate raw material for personal use.

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- 2) **Manipulation by management:** Manipulation by high level management requires judgment or estimates in the preparation of financial statements.
- 3) **Human errors:** Due to misunderstanding, a human error occurs in internal control system on part of personnel.
- 4) **Unusual transactions:** The unusual transactions may be missed by most control procedure because control procedure is made for usual transactions.
- 5) **Change in condition:** The control procedure is inadequate due to change in condition or change in environment.
- 6) **Collusion among employees:** Collusion among the employees may lead some employees to commit fraud. The collusion may be within the organisation or with outsiders.

7.7 Accounting & Financial Controls:

The aim of internal control system in accounting and financial control is as follows:

- 1) The asset should be safeguarded and restricted to authorized person only.
- 2) Every stage of work should require documentation.
- 3) There should be proper division of responsibility of work.
- 4) Maximization of profits by minimizing wastages & losses.
- 5) Providing work flow at every stage.
- 6) Right information should be available at right time at right place.
- 7) The transactions should be recorded in appropriate manner as per the accounting policies and practices as applicable.
- 8) Separately maintaining transactions of different periods in their respective accounting periods.
- 9) In addition to financial accounting records, cost accounting records are also maintained, which contains apart from analysis of financial data, some technical and quantitative data and their inter-relationship with financial data. E.g. in case of power sector, many technical details are maintained such as Plant Load Factor (PLF), auxiliary consumption, plant outage, plant availability, quantity of coal consumed, furnace oil details, etc.

Chapter 8

Control and Risk Assessment

Internal controls are practices that protect or make more efficient use of the company's assets. They are the kinds of things you already do because they are generally just good business practices. Internal controls can involve anything from protecting computer files with passwords to making sure that the door is locked when everyone has gone home for the night.

Typically, management is responsible for developing an appropriate system of internal controls, but every employee is responsible for following and applying those practices. They may seem unimportant by themselves, but taken as a whole, they can have a major impact on the business operations. Internal controls can be preventive, detective, or corrective in nature:

8.1 Introduction:

Risk assessment means *"the identification and analysis of relevant risks to achievement of the [entity's] objectives, forming a basis for the determination of how the risks should be managed."* Hence the identification of risk is the first step in risk assessment process.

There are many reasons for performance of risk assessments in any organization. They provide assurance that key business processes have appropriate control activities in place and provide a roadmap to guide management in developing standard policies and procedures.

Risk assessment is the identification and analysis of relevant risks to the achievement of an organization's objectives, for the purpose of determining how those risks should be managed. Risk assessment implies an initial determination of operating objectives, then a systematic identification of those things that could prevent each objective from being attained. In other words, it's an analysis of what could go wrong.

Not all risks are equal. Some are more likely than others to occur, and some will have a greater impact than others if they occur. So, once risks are identified, their probability and significance must be assessed.

A risk assessment involves evaluating existing physical and environmental security and controls and assessing their adequacy relative to the potential threats of the organisation.

Finally, having identified and assessed risk, management must decide how to deal with it. In some cases, the decision may be to control it; in others, it may be to accept it. The risk assessment process is an ongoing one. Internal and external threats constantly develop, presenting new hazards to the organization. Change itself is a risk, and management must continually adapt its policies and procedures to manage its changing risks to a comfortable level.

Each operating unit at the Company faces its own challenges and must assess how it will manage them to meet its objectives. A good internal control system can mitigate those risks, and the Internal Audit office can advise you on developing good internal controls.

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8.2 Need for Control and Control Mechanisms:

While need for control and control mechanisms has been there since times immemorial, it was mainly with reference to governance of a Kingdom. Business today is impacted, among other variables, by:

- Global changes in economy, politics, technology, trade, environment, etc.
- Changes in value systems of people
- Continuous changes in Information Technology
- Higher volume of financing required and various options for its sources

Internal control is of vital importance today, with the COSO internal control integrated framework document, which provides a comprehensive structure of internal control. This framework is a mechanical structure with components such that each component makes a contribution to the overall process of internal control so as to achieve overall objectives of a business.

8.3 Internal Control – Meaning:

Internal control is defined by COSO as:

“A process, affected by an entity’s board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives:

- Effectiveness and efficiency of operations
- Reliability of financial reporting
- Compliance with applicable laws and regulations”

It means the achievement of the above three elements, viz. effectiveness and efficiency of operations, reliability of financial reporting and compliance with applicable laws and regulations, is desirable from the business processes. There is need to integrate internal control in business process and also constantly review the processes over a period of time, as the external environment is very dynamic.

8.4 Regulatory Drivers:

When the businesses listed on the stock exchanges in USA were mandated to adhere to **Sarbanes Oxley Act, 2002**, they adopted COSO as the base framework for use in Process Mapping and documentation of controls and obtaining an assurance on the adequacy of internal controls in the organisation. COSO is comparatively easy to apply and also has inbuilt list of generic risks and controls under ten mega processes like inbound activities, outbound activities, use of technology, human resources, etc.

Further, Clause 49 of the Listing Agreement for listing on Indian Stock Exchanges under requirements for Corporate Governance is also applicable and is similar to above requirements under Sarbanes Oxley Act in U.S.A. The requirements under Clause 49 also clearly brings out that the role of audit committee includes reviewing with management, external and internal auditors, adequacy of internal control systems.

8.5 Internal Control Reviews:

Internal control system in existence in any organisation is reviewed in the light of COSO’s Integrated Framework on Internal Control. The various dimensions of internal control framework to be considered are as follows:

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- Control is a process and not an end in itself.
- Control is affected by the entity's Board of Directors and the Executive Management.
- Control operates within a complex social environment

Thus, through a mechanism of controls, business tries to achieve various objectives in the areas of operations, compliance and financial reporting. In fact, it can be compared with ABC (Accelerator, Brake and Clutch) control mechanism in a car, which enables to achieve the objective of reaching your destination, comfortably, safely and that too, within reasonable time.

COSO's Internal Control Integrated Framework has 5 main components, as follows:

1. Control Environment
2. Risk Assessment
3. Control Activities
4. Information and Communication
5. Monitoring.

The above components are discussed below in detail:

8.6 Control Environment:

The individual attributes of integrity, ethical values and competence of the people form a foundation for strong control environment. The quality of internal control activity is dependent on the nature of this environment. The environment of a business is affected by the quality of top management, i.e. constitution of the board, the quality of the agenda for the board meeting and Board's Committee Meetings and quality of discussions at such meetings. The quality of information received at the meetings affects the decisions and of course, the controls. So, communication systems must be such that there is openness and transparency in reporting.

Many a times, presence of top management seems lacking. The active involvement of top management, directors in critical business issues will definitely have a positive impact on the quality of decisions relating to controls.

Another key aspect is that since actions of people affect the control environment, organization's HR practices do have an impact on the control environment. Better HR practices that match the value system and beliefs of the organisation lead to stronger work culture and better quality of decision making.

Similarly, a code of conduct for employees and its strong implementation sends a clear message on the acceptable behaviour patterns. But, here no aberration should be permitted; otherwise it may send a wrong signal amongst the employees.

8.7 Risk Assessment, Control Activity, Information and Communication:

In fact, Risk Assessment and Control Activity are Siamese twins. There is always a debate as to whether risk assessment is a part of internal control or control is a part of risk assessment. COSO includes risk assessment as a part of internal control framework.

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The identification of the exposures by the organisation and its detailed understanding is risk assessment. In control activity, by properly managing the exposures identified in the risk assessment, various methods are established so as to maximize on the opportunities and minimizing the losses. All those responsible for managing exposures should know as to how one should perform risk assessment (Information) and how should one communicate, to whom and what should be communicated and when? (Communication).

Risk assessment is a process where a systematic approach towards exposures is laid down. Control activities are for mitigation / exploitation and Information is communicated appropriately to ensure that the exposures are control by those who are responsible for controlling. Areas for improvement are also identified.

8.8 Monitoring:

This is necessary to ensure relevance of the control systems in a dynamic business environment. The control system is continuously under testing periodically and reporting.

8.9 Control Self-Assessment:

Control Self-Assessment (CSA) is a process by which controls are reviewed by the process owners for performance regularly on monthly / quarterly basis and feedback provided to the team leads. In this process, employees are involved in assessing the adequacy of the controls and identifying weaknesses in the controls so as to increase effectiveness of the controls and achieve its objectives – operational, financial, reporting, statutory compliance, etc.

8.10 Enterprise Risk Management (ERM) – Meaning

When the entire aspects of policy, procedures, risk identification, analysis, evaluation, treatment processes, communication and information schedules and its ongoing review indicate of a vibrant enterprise-wise risk management organisation, it is “Enterprise Risk Management”.

Enterprise Risk Management is defined in ISO 31000, COSO ERM: 2004 as follows:

“Enterprise Risk Management is a process, affected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding achievement of entity objectives”.

ERM process is all about strengthening risk taking capability of the organisation and increasing success of the decision-making process. ERM usually has two elements, technical and human. Technical elements are simple but must be strong in its framework. However, much of the success of ERM process and attaining its maturity depends upon the human dimension.

Chapter 9

Internal Audit in ERP Environment and Systems Audit

9.1 Introduction

Information Technology (IT) is now a pervasive factor in almost all business verticals as well as in personal life. In fact, IT has become a business enabler for various entities. The businesses are trying to keep pace with technology enhancement. With these changes in business environment, the function of “Audit” is bound to change to adapt to these changed face of business environment.

In 1960, the mainframes started getting established in business organisations. The computer department was christened as “Electronic Data Processing (EDP)” Department and with this, EDP Audit gained momentum. With the advent and growth of computer network systems, Computer Systems are now “Information Systems”. EDP Audit got replaced with terms such as “Information Technology Audit” and “Information Systems Audit”.

The use of Information Technology (IT) has brought in multiple risks and there are various areas of concern, which the auditors will now need to look at. The auditor has to identify these risk areas and ascertain that appropriate controls are in place. Thus, IT audit / IS Audit has to cover audit of systems including hardware, software, processes, networks, people, etc. In fact, there is a seamless integration of business process, internal controls, accounting, systems and IT.

It is very important for the auditor to know about the current IT trends, which are as follows:

1. Increase in end user computing and decentralized processing
2. Increase of mini / micro users as compared to mainframes
3. Increased use of Relational Database Management Systems (RDBMS)
4. Methodology for system development is becoming crucial and CASE tools are mostly used by organisations

9.2 What is IS Audit?

The Information Systems Audit and Control Association (ISACA) define IS Audit as:

“The process, which collects and evaluates evidence to determine whether information systems and related resources, adequately safeguards assets, maintain data and system integrity, provide relevant and reliable information, achieve organisational goals effectively, consume resources efficiently and have in effect internal controls that provide reasonable assurance that business, operational and control objectives are met”.

9.3 Objective and Scope of Internal Audit in IT Environment:

The objective of IS Audit is assessment and evaluation of processes and systems. There are also objectives to ensure effectiveness, efficiency, confidentiality and availability of information. The objective of audit of

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financial statements is to ensure that financial statements reflect true and fair view. The overall objective and scope of audit does not change in EDP environment. There may be increase in frauds and errors due to computerization of accounts. The internal auditor must have proper knowledge of computer systems while performing audit in EDP environment. Therefore, the objectives and scope of audit does not change if the accounts are maintained in EDP.

9.4 Why IS Audit?

Following are the reasons, which state 'Why IS Audit' is important for any organization:

- a) Compliance:
- b) Assurance
- c) Customer Specifications
- d) Risk Management
- e) Improvement

a) Compliance:

There are various laws and regulations regulating any organization which differ from industry to industry. An organization needs to comply with these regulations which are issued by the government or by the regulating body. The IS Audit will ensure the compliance of the entity to these regulations through auditing the technology and processes.

b) Assurance:

The IS Audit assures about the information processing in the organization. This helps to build up confidence in internal and external stakeholders. Management and employees are the internal stakeholders while external stakeholders include customers, suppliers, regulators, business partners, etc.

c) Customer Specifications:

Customers are a very important part of any organization. Hence, it is essential to maintain a bond of trust with the customers. Many times, customers have certain specifications which require the information systems to be in proper manner. IS Audit helps to gain the confidence of customers regarding the information processing.

d) Risk Management:

It is essential to manage the internal and external risk in the organization. Internal risk includes weaknesses in technology, people, environment and process. External risk includes requirements of compliance, customers and service providers. The IS Audit helps to identify the strategy implemented by the entity in risk management process.

e) Improvement:

The IS Audit suggests improvement in the people, process and technology. The IS Audit helps in improving the procedures and controls to ensure the information systems meet the business requirements.

9.5 Audit Approach in IT Environment:

Auditing Around the computer - In this type of audit approach the auditor checks the transaction by examining the printouts. This is also known as 'black box approach'. The auditor carries out the audit like manual system. The auditors who have little computer knowledge perform this audit.

Auditing through the computer - Now-a-days, the auditors no longer audit around the computer. Auditors perform audit through the computers. The auditors input the data and the results are analyzed with the help of computer. There are three methods for Auditing through computers:

1. Test Data: Special set of input data is prepared to test a programme.
2. Controlled Processing: Under the control of auditor a tested programme is used for a processing run.
3. Computer audit programme: Auditor uses this programme for testing the internal control system and validity of transactions.

9.6 How to conduct the IS Audit?

The IS Audit should be done with the structured approach towards planning and audit programme. The IS Audit should be conducted effectively to reduce the time. The following are the steps for conducting the IS Audit:

- ❖ Audit Plan
- ❖ Audit Charter
- ❖ Audit Schedule
- ❖ Resources
- ❖ Audit Criteria

Audit Plan:

For effective IS Audit programme, preparing the audit plan is necessary. The audit plan includes the plans relating to the goal, schedule, budgeting and reporting. A well designed and detailed audit plan is the base of a successful audit plan.

Audit Charter:

The audit charter is a part of audit planning which indicates all the areas needed for performing audit. As per ISACA (Information Systems Audit and Control Association), following elements are to be covered in an audit charter:

- a) Purpose
- b) Role
- c) Scope
- d) Objectives
- e) Responsibilities

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- f) Goals
- g) Authority

Audit Schedule:

Audit schedule identifies specific areas while conducting audit. Audit schedule makes the list of the dates and time for audit. It also mentions the duration of audit activity.

Resources:

The audit plan also contains the resources which are essential for audit programme. The resources will need to address the people, technology and processes and their requirement.

Audit Criteria:

Deciding the audit criteria is essential because it indicates the requirements and specification. Following are the factors which decide the audit criteria:

- a) Customers requirement
- b) International Standards
- c) Policy and procedure adopted by the organization
- d) Technical Standards
- e) Statutory requirement

9.7 Internal Control in Computer based system:

There are three types of controls in a computer based system.

1. Administrative Control: Administrative controls are designed to ensure that efficiency is maintained over the daily operation of computer department. These are important in computer based system. Administrative control includes the following :
 - a) Division of responsibilities: There should be proper division of responsibilities between computer department and user department.
 - b) Control over computer processing: There should be control over computer processing by scheduling of work and use of manuals which state standards of operating discipline.
 - c) File Control: File control is necessary for avoiding use of files for unauthorized purpose.
2. Systems Development Controls: This is designed for testing the system and programmes and implementing them in computer based system. These controls are necessary to ensure that whether the required documents are properly prepared.
3. Procedural Control: Procedural controls are required to ensure whether the original data is completely processed or not. These can be categorized under IT Application Controls.

9.8 Online computer systems:

The following points indicate the importance to the auditor to an online computer system.

1. Authorization and accuracy of online transactions.
2. Changes in performance of audit procedure.
3. Integrity of records and processing.

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It becomes easier to the auditor to perform a pre implementation review of online accounting applications. It also provides sufficient time to the auditor to develop audit procedure in advance.

9.9 Information Security Management System:

Information Security Management System helps to design the policies and processes to control the risk related with Information Technology. It adapts the changes in the internal as well as external environment.

Factors of ISMS:

- 1) Confidentiality: It protects the vital information relating to company from any unauthorized parties
- 2) Integrity: Protecting the vital information from modifying by unauthorized users.
- 3) Availability: Making the information available to authorized users

9.10 Control objectives for Information and related Technology (CoBIT):

The recent version of CoBIT provides the comprehensive framework to the organization for achieving the objectives. It is based on 5 key principles:

1. Meeting stakeholder needs
2. Covering the enterprise End-to-end.
3. Applying a single integrated framework.
4. Enabling a holistic approach.
5. Separating governance from management.

9.11 COSO guidelines:

American Accounting Association, American Institute of CPAs, Financial executives International, The Association of Accountants and Financial Professionals and The Institute of Internal Auditors have jointly initiated The Committee of Sponsoring Organizations of Treadway Commission (COSO). It develops frameworks and provides guidance on enterprise risk management, internal control and fraud deterrence. The COSO framework was first published in 1992. Based on inputs of various stakeholders, it has undergone various changes.

Components used to framework of COSO:

- 1) Internal Environment
- 2) Risk Assessment
- 3) Control Activities
- 4) Information
- 5) Communication
- 6) Facts Identification

COSO was formed in 1985 to sponsor the National Commission on Fraudulent Financial Reporting.

9.12 OECD guidelines:

For the security of Information Systems the Organizations for Economic Co-Operation and Development (OECD) has designed a few guidelines. Following are areas in which the guidelines are issued:

1. Awareness: There must be awareness relating to security of information systems.

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2. Response: Members should respond in a timely manner to security incidents.
3. Risk Assessment: Risk assessments should be conducted by the participants.
4. Security Management: There should be extensive approach to security management.
5. Responsibility: Everyone is responsible for security of information systems.

9.13 Information Technology Act, 2000 (India IT Act):

The **Information Technology Act 2000** is an Act of the Indian Parliament notified on October 17, 2000. This Act is also known as ITA 2000 or IT Act 2000. This Act consist 124 Sections and 14 Chapters. In 2008 the Act has been amended through the Information Technology (Amendment) Act, 2008 which was passed by the two houses of the Indian Parliament.

The objective of this Act is to overcome the offences of Cybercrimes including cyber terrorism and data protection.

9.14 Sarbanes Oxley Act (US) – SOX:

The Sarbanes–Oxley Act of 2002 is enacted from July 30, 2002, also known as the 'Public Company Accounting Reform and Investor Protection Act' and 'Corporate and Auditing Accountability and Responsibility Act' and more commonly called Sarbanes–Oxley, Sarbox or SOX. SOX increased the independence of the auditor who reviews the financial statements of the organization and increases the role of BOD. The result of SOX is that, the top management should certify the accuracy of the financial statement.

Role of internal auditor in Sarbanes – Oxley activities:

Internal auditors have the skills that can help the company while complying to Sarbanes –Oxley. The knowledge and experience of process and operations make internal auditor a choice for participating in Sarbanes – Oxley compliance report. The IIA recommends that the internal audit's role in Sarbanes – Oxley projects, "should ideally be one of support through consulting and assurance."

The following points should be considered while defining internal audit's role related to Sarbanes – Oxley compliance:

- Skill of the internal auditor
- Issues relating to the independence and objectivity
- Involvement of the internal auditor

The further role of the internal auditor related to Sarbanes – Oxley should be discussed by audit committee and management.

Section 404 requires the company to publish information regarding adequacy and scope of internal control of financial reporting in their annual report. The company shall also report on effectiveness of internal control structure. This is costly aspect because it requires large effort for the company to document and test important financial control. The management shall:

- Assess operating effectiveness of internal controls in reference to material misstatement risk.
- Understand the flow of transactions to identify where misstatement can arise.

The Institute of Cost Accountants of India

- Perform a fraud risk assessment.

Regulatory Focus on Internal Audit – Indian Context

Keeping in line with the global scenario, the regulatory norms in India have also undergone major changes resulting in increased responsibilities for internal audit.

Clause (vii) of the Companies (Auditor's Report) Order, (2003) require Statutory Auditors to comment on companies have an internal audit system commensurate with the size and nature of its business.

Sections 177 of the Companies Act, 2013 and Clause 49 of Listing Agreement of SEBI mandate formation of an Audit Committee to:

- Recommend appointment, remuneration and terms of appointment of auditors of the company
- Review and monitor the auditor's independence and performance and effectiveness of audit process
- Review the structure/ staffing/ adequacy of internal audit function
- Review internal audit reports relating to internal control weaknesses
- Discuss and follow up significant findings of internal audit function

Consequently, Focus of Internal Audit needs to be updated on the significant changes in various regulatory norms like –Direct Tax Code, Convergence with IFRS (Indian AS), GST, Revised Schedule VI, Service Tax Amendments, Amendments to Cost Accounting Records Rules and Cost Audit Report Rules, etc.

Provisions of the Companies Act, 2013:

- Section 138 stating certain class of Companies to be prescribed by the Central Government shall be mandatorily required to appoint an Internal Auditor.
- Section 134, Sub-section 3, Clause (n) states that the Board Of Director's Report would include a statement indicating development and implementation of risk management policy for the Company including identification therein of elements of risk, if any, which in the opinion of the Board may threaten the existence of the Company
- Section 134, Sub-section 5, Clause (f) also states, Director's Responsibility Statement to include the directors had devised proper systems to ensure compliance with the provisions of all applicable laws and that such systems were adequate and operating effectively.
- Section 177 of the bill corresponding to Section 292A requires that the Audit Committee shall constitute of at least 3 directors with majority being independent directors

9.15 Tools and techniques in IS Audit:

The computerized audit tools and manual processes are used to conduct IS audit. The manual process includes checklist, observations and interviews. Various tools and techniques are used at different stages in

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organization. Following task can be done with the help of tools and techniques during the planning stage of the IS Audit:

- a) Assignment of auditors
- b) Generating details of audit programmes
- c) Reporting
- d) Developing audit schedule

9.16 Computer Assisted Audit Techniques (CAATs):

The tools which allows the auditors to collect, analyze and report data in an automated method are called CAAT (Computer Assisted Audit Techniques). Computer Assisted Auditing Techniques is the developing area in the audit profession. The auditor may use CAAT to improve audit coverage by reducing cost of testing and sampling procedure and other procedures which are performed manually. In CAAT, the audit process is done by using Computers. While using CAAT, the auditor review every transaction of the business performed during the year. The auditor should test all the data, if he has doubt about any fraud in the data. The CAAT auditor should look for any duplicate vendors or any duplicate transaction recorded in the books of accounts. CAAT provides reasonable evidence required to support audit conclusion in paperless environment. Internal Auditors should take advantage of CAATs to improve efficiency and effectiveness of the audit. The following factors are to be considered while using CAAT:

- 1) IT knowledge, expertise and experience of the audit team
- 2) Availability of computer facilities and data
- 3) effectiveness and efficiency;
- 4) time constraints
- 5) Difficulty in Manual test

Types of CAATs:

- a) Word processing
- b) Spreadsheet
- c) Database
- d) Statistical sampling
- e) Data mining
- f) Real time testing programs
- g) Integrated audit software
- h) Data analysis
- i) Artificial intelligence/expert systems

Chapter 10

Relying on External Opinion and Reference of Auditor Expert

10.1 Relying on External Opinion:

External opinion or external confirmation is the process of obtaining and evaluating audit evidence through a direct communication from a third party in response to a request for information about a particular item affecting assertion made by management in the financial statement.

External confirmation is the process of collecting and examining audit evidence through direct communication to third party in response to request information about some items. The external confirmation is made on the date of making financial statement or at a close date to it. The auditor confirms the client's transaction in determining the information to be confirmed by the third party.

The auditor can rely on the external confirmation, which may be positive or negative. Confirmation of reliability on external opinion is also similar to compliance audit. Compliance Audit is audit to certify the statement after carrying out audit, which be necessary under the particular cases

If the auditor's opinion about reliability on the external confirmation is negative or auditor is unreliable on external confirmation then:

- 1) Auditor shall obtain further evidence to reduce the audit risk of expressing an appropriate opinion.
- 2) To reduce the fraud risk factor, auditor shall consider Nature, Timing and Extent (NTE) Factor.
- 3) The Auditor should exercise control over the process of sending confirmation requests and response to those requests.
- 4) He should confirm, whether the evidence used for external confirmation is consistent or inconsistent.

10.2 External Confirmation Procedures:

- a) Determining the information to be confirmed from third party.
- b) Selection of relevant external confirmation party.
- c) Designing the confirmation requests.
- d) Sending the request.
- e) Follow up for response to the request.

10.3 Situation in which External Confirmation may be used:

- f) Bank Balance and other balance confirmation.
- g) Property title deeds held by the third party
- h) Debtors, creditors' confirmation.
- i) Investment purchased but does not have any documentary evidence.

10.4 Reference of Auditor Expert:

The internal auditor should get any technical advice, if required, from technical expert, if internal audit team does not have sufficient knowledge, skill which is needed to perform the part of internal audit engagement. Whenever internal auditor uses any work of expert, he should satisfy that the expert is competent and

The Institute of Cost Accountants of India

independent from the organization. The internal auditor should draft the assumptions, methodology and conclusion of the expert.

10.5 The following are the circumstances in which auditor is required to get expert's opinion:

- 1) Valuation of Fixed Assets, financial instruments.
- 2) Valuation of all liabilities including environmental liabilities.
- 3) Estimation of gas and oil reserves.
- 4) Clarification of contracts, laws and rules.
- 5) Examination of complex tax compliance issues.

10.6 Disclosure of Expert Advice in the Internal Audit Report:

The internal auditor should refer to the work of the expert, while preparing the Internal Audit Report. The internal auditor should disclose all the areas for which such reference of the expert advice is taken. If the Internal auditor feels to disclose the identity of the expert, the internal auditor should take prior permission of the expert before disclosing the same.

Chapter 11

Audit Conclusion and Corrective Measures

Audit Conclusion:

11.1 Introduction:

When all the audit procedures and checks are completed, the audit is concluded. The internal auditor should review the working papers and see that the audit has been conducted according to plan and it has achieved its objectives. He should list down any audit procedure which was not completed because records were not produced by the department or due to lack of time. The auditor should check the supporting evidence for each observation that is proposed to be put in the report. He should, then, prepare a draft report which will include his report on:

Effectiveness of controls and any major / minor weaknesses in them; Non-compliance with laws, codes and government orders with assessment of possible loss; and any matters relating to propriety of transactions. Internal auditors are expected to contribute a wealth of information to their organizations.

When the internal audit process comes to an end, the auditor has sufficient data and information, working papers, audit evidence and also has full information about the internal controls in existence and their effectiveness. On the basis of this information, the auditor draws his conclusions as to the reliability of the control mechanism and percentage of assurance that can be relied upon.

Auditor's conclusion is based on reasonable assurance and not absolute assurance. As per the Auditing Standards, the auditor should obtain competent, relevant and reasonable evidence to support his judgment and conclusion. The principal source of evidence for audit conclusions should be the records of the auditee. It is the primary duty of audit to ensure that the audit conclusions drawn about the financial statements subjected to audit are based on sufficient, competent and relevant evidence, evaluation of the quality of internal control mechanisms, interviews with executives; and computer assisted audit techniques (CAATs).

Regulators, like SEBI, now want to significantly enhance the corporate governance practices. One such measure involves fostering a constructive dialogue between auditors and the audit committee on the accounting and auditing aspects of companies. While some of this communication may already be ongoing due to existing requirements in India, or from adoption of international practices, it would be useful to reiterate some of these.

11.2 Seeking Information

The audit committee has insights into the company's operations, internal controls, and financial reporting. Therefore, it would be useful for the auditor to directly obtain information from the committee about its assessment of risks of material misstatement, fraud risks, and laws and regulations. Such insights will complement the auditor's own risk assessment process and enhance audit effectiveness.

11.3 Overview of Audit Strategy

Being a two-way dialogue, the auditor should provide the audit committee an overview of the audit strategy and timing, and discuss the significant risks identified. This should include the information on the use of persons with specialized skills, including IT, tax, forensic, valuation or environmental specialists.

11.4 Timely Observations

This is one of the most significant stages of the two-way communication. The audit committee not only receives significant information on the quality of the financial reporting process but, more importantly, can also determine the course of action based on it. This information may include management's initial selection of, or changes in significant accounting policies. It may also be relevant to discuss the effect of such policies in controversial areas or those areas, for which, there is a lack of authoritative guidance or diversity in practice. This would assist the committee in evaluating the company's financial results, and also benchmarking the accounting policies vis-à-vis others.

Description of the management process used to develop critical accounting estimates, significant assumptions used, especially those that have a high degree of subjectivity, and the auditor's basis for conclusion on the reasonableness of such estimates. This is extremely important in today's uncertain economic environment, when factors such as volatile exchange rates, interest rates, inflation or competition can have a major impact on various fair value measurements used in financial reporting (such as impairment of tangible and intangible assets including goodwill, valuation of financial instruments such as derivatives and so on).

Communication regarding significant unusual transactions — those outside the normal course of the company's business, or otherwise unusual due to their timing, size, or nature. Such transactions may potentially include business acquisitions, dispositions, and restructurings.

The auditors should explain their understanding of the business rationale of such transactions. Such conversation would be extremely helpful when the transaction is overly complex — so that its effects can be appropriately reflected and disclosed in the financial statements.

Alternative permissible accounting treatment: The auditor may discuss these with the management (including its ramifications, and the treatment preferred by the auditor). For instance, some companies may write off goodwill on acquisitions, whereas, others may not. Knowing such alternatives and their effect on financial results will assist the audit committee in making informed decisions on the company's financial reporting practices.

Departures from the auditor's standard report — such as qualifications, emphasis on material paragraphs, going concern considerations, and so on, including the language and reasons for such modifications. Such communication is increasingly relevant for the audit committee of a listed company, as the market regulator SEBI has proposed a new review mechanism for qualifications in an auditor's report.

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Details of corrected and uncorrected misstatements related to accounts and disclosures. Sometimes, these misstatements may not get corrected, as the management may conclude them to be immaterial. In such situations, the auditor should communicate the basis and qualitative factors behind the decision.

In India, the new Companies Bill 2013 contemplates a National Financial Reporting Authority to advise on matters relating to auditing standards; so, enhancing audit committee communication has become an important area.

A well-informed audit committee is better equipped to perform its financial oversight role — improving the ‘relevance and reliability’ of financial reporting, strengthening audit quality and, ultimately, benefiting various stakeholders.

The audit conclusions drawn by the auditor, based on the above, would be more effective.

11.5 Corrective Measures:

Based on the auditor’s observations, management may take suitable decision for putting in place correctives measures. This will enable to put suitable controls so as to manage the risks. This may include issuing suitable guidelines by the management to concerned team leads about specific measures to be implemented and giving feedback in a timely manner.

Chapter 12

Report Writing and Audit Report

12.1 Introduction:

The Oxford Dictionary defines report as ‘a spoken or written description of an event or situation, especially one intended for publication or broadcasting in the media.’

‘The internal auditor’s report should contain a clear written expression of significant observations, suggestions/recommendations based on policies, processes, risk, controls and transaction processing taken as whole and management’s responses.’

12.2 Report Writing:

It is an art and science of communication of facts and interpretation to the recipient for achieving particular objectives. Report writing is an art because the preparer of the report presents the facts collected in his own style. Every auditor has his own individual way of presenting the facts, understanding the various options which are beneficial for the business. Report writing is also known as a science because it involves application of skills, techniques and methods. The science of report writing also improves the efficiency of the operations like utilisation of resources, decision making, etc.

An audit report will be effective only if the desired result is achieved and there is any change in management behavior.

12.3 Process:

In an internal audit, the engagement letter contains the details of what is to be communicated. Hence, the terms of engagement and auditor’s opinion are the basis of the audit report. The audit report should start from the recipient’s expectation.

After designing the framework for report writing, further details in the report depend upon communication with the entity and the nature of work done during the audit. At the pre-audit meeting, discussions are conducted with the management and operating personnel, on the basis of which, the objectives of audit are decided. The quality of field work is reflected in quality of audit report.

12.4 Points to be considered while writing an audit report:

- 1) The internal audit report should be structured in such a way that it explains as to why the recommendations and suggestions of the internal auditor should be accepted by the management.
- 2) The designations of the officials should be included instead of using their names.
- 3) Auditor should avoid subjective words, which does not present confidence to the client. E.g.: appears, seems, etc.
- 4) Auditor should use a specific percentage or a number than words like large, many, huge, etc.
- 5) The format of the internal audit report should be as per the requirements of the client.
- 6) The purpose of writing the audit report should be clear.

The Institute of Cost Accountants of India

- 7) Simple and lucid language should be used while writing the audit report. Use of technical jargon / uncommon words should be avoided.
- 8) The internal audit report should give proper idea regarding decision making process.
- 9) If the internal audit report contains a material error or mistake, the internal auditor must, immediately, communicate the same to the recipients of the report.

Chapter 13

Introduction about the Power Sector

13.1 About the Sector:

India has the world's fifth-largest electricity generation capacity and demand is expected to surge in the coming years owing to growth in the economy. According to the Ministry of Power, India's total installed capacity of power generation as on 30th June 2013 is 225,793 MW. Out of this, state sector, Central sector and private sector contribute 89,092 MW, 65,613 MW and 71,088 MW, respectively. The electricity generation target for the year 2013–2014 was fixed at 975 Billion Units (BU) and overall power generation in the country during 2012–2013 was 911.652 BU, according to the ministry.

India has abundant sources of power production. Thermal power in India accounts for 68% of the power generated in India which includes gas, liquid fuel and coal. Other prominent and fast-growing sources of power are hydro, wind, solar, nuclear, biomass and industrial waste, etc. Presently, out of the total power being generated, 58.59% is coal based, 9.02% is gas based and 0.53% is oil based, hydro contributes for 17.55% of power, while nuclear production is 2.12% and the rest 12.20% is collectively produced by renewable energy sources such as small hydro project, biomass gasifier, biomass power, urban and industrial waste power and wind energy. (All the above data from website of powermin.nic.in)

For nuclear power, India has the world's largest thorium deposits and with a world hungry for low-carbon energy, thorium can prove to be India's making. Angela Saini, author of "Geek Nation: How Indian Science Is Taking Over The World" believes that **"no story quite captures India's remarkable power to think long-term quite like that of thorium."** (Source: contributed article by economywatch (economywatch.com) on website oilprice.com on 23/08/2012). The government has targeted an installed nuclear power capacity of 20 GW by 2020 and 63 GW by 2032. For water-based power, India has an untapped hydro potential worth 150,000 MW, only 25% of which has been harnessed until now. Similarly, solar power, biomass and wind power too have high potential for future development.

India has the world's fourth-largest number of wind energy installations. According to the Ministry of New and Renewable Energy (MNRE), wind energy is one of the fastest-growing renewable energy sectors in the country. With a cumulative deployment of over 13,000 MW, wind energy accounts for nearly 70% of the installed capacity in the renewable energy sector in the country.

According to the Ministry of Power, the scope for investments in the Indian power sector stands at USD 300 billion. (Source: <http://www.investindia.gov.in/?q=power-sector>)

Policy and Promotion

Foreign direct investment (FDI) up to 100% is permitted under the automatic route for:

- Generation and transmission of electric energy produced in hydro electric, coal/lignite-based thermal, and oil- and gas-based thermal power plants
- Non-conventional energy generation and distribution
- Distribution of electric energy to households, industrial, commercial and other users
- Power trading

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There is no requirement of licenses to set up new power plants, though FDI is not allowed in the nuclear segment. An income tax holiday for 10 years in the first 15 years of operation and waiver of capital goods' import duties on mega power projects, above 1,000 MW generation capacity, is provided as incentive for investing in the sector.

Power procurement is permitted through a transparent bidding process. There is no customs duty on the import of capital goods for mega power projects. The state electricity boards (SEBs) generate, transmit and distribute electricity in coordination with private/Centrally-owned generating companies or other relevant agencies.

The Central Electricity Authority (CEA), constituted under the Electricity Supply Act 2003, is responsible for developing a sound, adequate, and uniform policy for the control and utilization of national power resources. It is also responsible for the techno-economic appraisal of the project reports for the proposed power plants, including those in the private sector. Ministry of New and Renewable Energy (MNRE) is responsible for developing renewable power, for which the funding agency is the Indian Renewable Energy Development Agency Ltd (IREDA). The Government of India has also constituted independent regulatory commissions in 22 states. Distribution reforms have been initiated with distribution being privatized in a few states such as Mumbai, Orissa and Delhi. (Source: <http://www.investindia.gov.in/?q=power-sector>)

The government has also taken up some ambitious programmes such as the Ultra Mega Power Projects (UMPP), Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) and Accelerated Rural Electrification Programme to rapidly increase installed capacity.

Some of the other measures initiated by the government to provide a boost to the power sector include the following:

- For the year 2011–12, tax-free bonds for Rs. 30,000 crores (USD 5.71 billion) were announced for financing infrastructure projects, of which Rs. 10,000 crores (USD 1.90 billion) were allocated for the power sector.
- In order to provide low-cost funds to some infrastructure sectors including power, the rate of withholding tax on interest payments on external commercial borrowings (ECBs) reduced from 20% to 5% for three years.
- For the power sector, besides access to low-cost funds, the Ministry of Finance had also extended the sunset date by one year for power sector undertakings for setting up on or before March 31, 2013, for claiming 100% deduction of profits for 10 years.

(Source: <http://www.investindia.gov.in/?q=power-sector>)

Sector Outlook

According to industry experts, the total demand for electricity will be above 950,000 MW by 2030. India has taken all the steps needed to provide energy from renewable sources such as wind and solar power. In March 2011, the capacity of wind power in India stood at around 12,000 MW.

The Institute of Cost Accountants of India

Opportunities are coming up in power generation, transmission, distribution and equipment and servicing with capacity additions for power generation, captive power plants being set up, government promoting private sector participation in transmission and distribution, transmission projects being awarded on tariff-based bidding, privatization of distribution franchisees, scope for rural electrification, more focus on improving efficiency and introducing advanced technology and greater need for operational and maintenance services. (Source: <http://www.investindia.gov.in/?q=power-sector>)

13.2 Power Value Chain

- 1) **Generation:** This is the process in which electrical energy is produced using various fuel or other sources, as discussed above. The power generation plant is situated near the source of power.
- 2) **Transmission:** The process of movement of power from the power station to other location is called as Transmission. There is movement of high voltage electricity in transmission. Step up transformers are used to increase the voltage at generation plant and Step down transformers are used to reduce the voltage at the substation so as to provide the electricity to the ultimate consumer at an appropriate voltage.
- 3) **Distribution:** Transmitted electricity is distributed to the individuals. Distribution lines carry electricity to the end users. The consumption of power is recorded by the meters at the premises of the users.

13.3 Applicable Government Policies and Rules:

Following are the Acts and Policies which are designed by the Government for regulating the power sector in India.

1. National Electricity Policy, 2005:

This policy aims to protect interest of customers, providing electricity to all regions and regulating energy security issues. The policy also aims to supply of reliable and quality power in effective manner and at reasonable rates.

2. National Electricity Plan:

National Electricity Plan is formulated by Central Electricity Authority every five years. The plan should be approved by The Central Government. This plan provides short term and long term plans by analysing demand and supply of power in different regions. This plan also suggests the technologies which are available for generation, transmission and distribution of electricity.

3. National Tariff Policy, 2006:

The objective of National Tariff Policy is to ensure availability of affordable electricity to all consumers. It promotes procurement of energy from renewable sources and surplus power from captive sources of generation.

4. Integrated Energy Policy, 2006:

This policy was formulated so that the various sources of energy can substitute each other.

5. Hydro Power Policy, 2008:

The Hydro Power Policy approved private investments in hydro power sector. It provides guidelines for implementation of various programmes initiated by Central Government.

6. Rural Electrification Policy:

This policy aims at providing reliable power supply to all households. The Central Government has initiated a programme for capital investment funding for rural electrification.

7. National Solar Mission 2010 :

The National Solar Mission is established to promote ecologically growth for security of energy sources in India. It also promotes and develops human resource necessary for the solar industry.

8. Mega Power Policy, 1995:

This policy was introduced to increase private investment in more than 1000 MW power generation projects to supply electricity in more than one state. Mega power projects would be required to tie up power supply to the distribution companies.

13.4 Legal and Regulatory Framework in Power Sector:

The various problems of the power sector have been debated at length, and the need for power sector reforms has been accepted across stakeholders. While various reform models have been discussed and debated, **the foundation of reforms is based on the principles of cost effective power generation, efficient operations and abolishing the practice of the use of the SEB as a policy implementation tool of the State Government.** These principles have been enshrined in the Electricity Regulatory Commissions Act, 1998. Similarly, the Government of India through its official Gazette published The Electricity Act 2003, on 2nd June, 03.

1. Electricity Regulatory Commissions Act, 1998:

Government of India also realized the necessity of grid restructuring as a first step for power sector reforms and passed an Ordinance which was later culminated as Electricity Regulatory Commission Act, 1998. Under the provision of this act, Central Electricity Regulatory Commission (CERC) was set-up to oversee centrally owned stations and other stations having inter-state function. The same act made the provision to set-up State Electricity Regulatory Commission (SERC) for the respective states, if deemed necessary. This Act aims at establishing Independent Regulatory Commission at all states. The jurisdiction of SERCs was to look after the utilities within their own state only. The primary objective for setting up of the regulatory commissions was to ensure a rational tariff. It also provides for more than one distribution license in same region. It introduced the provision for competitive bid generation tariff.

2. Electricity Act, 2003:

Electricity Act (EA) 2003 was a path breaking step in Indian power sector reforms. This act repealed all the existing electricity laws in the country, such as Indian Electricity Act 1910, Electricity Supply Act 1948 and Electricity Regulatory Commission Act 1998, but secured the various reform acts of few states, which were already functional. The preamble of EA 2003 states:

“An Act to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto.”

The salient features of the EA 2003 are as follows:

- Creates a liberal and transparent framework for the development of power sector.
- Facilitates investment by creating competitive environment and reforming distribution sectors.
- SEBs has to be unbundled into separate generation, transmission and distribution entities.
- Licensing for generation sector is removed, except techno-economic clearance for hydro projects exceeding a capital cost notified by Central Government.
- Freedom to have captive and group captive generations.
- Establishment of SERCs made mandatory.
- Recognizing trading as an independent activity.
- Open access in transmission facilitating multi buyer and seller model.
- Open access to consumers having demand above one MW within five years from date of enforcement of Electricity (Amendment) Act 2003. Regulators have been mandated to enforce this.
- Envisaging consumer redressal forum and their appellate authority, the Ombudsman.
- 100 percent metering made compulsory.
- Provisions relating to theft of electricity made very stringent.
- For rural and remote areas, stand-alone systems for generation and distribution permitted.

EA 2003 is a landmark initiative to restructure and revive Indian power sector. Proper implementation of the act by union as well state governments can only ensure sustained growth of power sector, which is one of the key factors for economic prosperity of the nation.

The Electricity Act 2003 was enacted to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalization of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies, constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal. With the enactment of this act, Private Companies are allowed to operate in the areas of generation, transmission, distribution, trading and use of electricity.

The Institute of Cost Accountants of India

The entry of private players in this field will bring in more competition in tariff structure and service standards. It allowed Private companies to operate in the strategically important area of Generation, Transmission and Distribution of Electricity.

These laws and regulations are issued by the government to control the power sectors in India. The understanding of the nature of business is essential for an internal auditor in assessing the risk.

13.5 Technical Peculiarities of the Power Sector:

Internal auditor has to understand the dynamics in the industry to analyse the business objectives of the entity and the strategies adopted by the entity to achieve those objectives. The business processes of the entity should support the strategies adopted by it in order to fulfill its business objectives. The entity should be in a position to respond to any change in the dynamics of the industry. This may result in changes in the way the business processes are carried out. The internal auditor therefore needs to have a very good overall view of the dynamics of the industry.

Some of the technical peculiarities of the power sector and key trends and risks involved in the sector are discussed below.

Current position in Electricity generation and Current Demand - Supply position

Development of power sector is the key to the fiscal growth of our nation. Growth in generation of electricity has led to its extensive use in all sectors of economy. In order to achieve the projected capacity addition of around 1,00,000 MW in generation and build commensurate transmission & distribution capacity, investment of more than INR 11,00,000 Crores would be required in the 12th Five Year Plan. An investment of this proportion is one of the major challenges in the 12th Plan considering limited public financing options available. *(Source: International Journal of Emerging Technology and Advanced Engineering, Feb 2013 issue, article by Mr. Animesh Pal)*

The capacity addition target for Eleventh Five Year Plan (April 2007 - March 2012) was set as 78,700 MW, which was later revised to 62,374 MW during mid-term review [4]. But, only 54,964 MW was added during this period. This is largely on account of slippages in public sector projects. The shortfall in achieving the targets has been primarily due to poor project implementation, inadequate domestic manufacturing capacity, shortage of power equipment, and slow-down due to lack of fuel, particularly coal.

There has been consistent increase in availability of energy in India over the last decade. Installed capacity has gone up from 1,20,000 MW in Jan 2006 to 2,25,793 MW in June 2013. However, India faced an energy deficit of 3.6% and a peak deficit of 10% in September 2013. *(Source: ET dated 10-Oct-2013)*. The average per capita consumption of electricity in India is a mere 917.18 kWh (2012-13), compared to the world average of 2,600 kWh. *(Source: Indian Journal of Applied Research, Issue Nov. 2013, Research Paper author: Dr. C. Mugunthan)*

The Institute of Cost Accountants of India

At present, more than 67% of power is generated through consumption of fossil fuels. This electricity generation is capital intensive and it takes long period of time in construction. The cost is heavy and whatever power generated cannot be stored. Similarly, it is difficult to predict demand for electricity. Moreover, transmission and distribution network has its own capacity limitations, which further hinder the development of the sector. Key challenges for India's electricity sector include new project management and execution, ensuring supply of fuel of adequate quantities and qualities, developing large coal and natural gas resources present in India, land acquisition, environmental clearances at state and central government level, and training of skilled manpower for acquainting with latest technology plants.

Policy measures by the Government in the power sector

Electricity Act 2003 has been a very significant development in the electricity sector. The Act sought to create a liberal framework for development of the power industry, promoting competition, protecting interests of consumers and supply of electricity to all areas, rationalization of electricity tariff and ensuring transparent policies and promotion of efficiency, among others. The Act came out with the National Electricity Policy, mandatory creation of SERCs, emphasis on rural electrification, open access in transmission and distribution and some other provisions. It mandated the regulatory commissions to regulate the tariff and issues of license. This Act focused on laws relating to generation, transmission, distribution, trading, and uses of electricity. The Act was amended on May 28, 2007 and the Electricity Act 2003 was enacted with stronger power and clarity and with greater emphasis on assessment, fines, and legal framework to check the commercial losses due to theft and unauthorized use of electricity.

What is Open Access?

Open Access is non-discriminatory provision for use of transmission line or distribution system by any generating utility or consumer. The system provides seller or buyer right to use the transmission line owned and controlled by other utility, and to generators, right to sell their power at any location in any region. Thus, the generators and buyers can trade freely, without having the ownership of transmission lines, by just paying the wheeling charges to the owner of transmission lines.

Impact of Electricity Act 2003 on the Electricity Sector in India

With the enactment of the Electricity Act 2003 and implementation of open access, the market structure in the power sector changed from the old single buyer structure to a multi-buyer model. The generator could sell power to any buyer using the open access provision in transmission and users had the choice to choose their supplier. Ever since the Electricity Act 2003 was introduced, there was increased competition among generators and suppliers, which improved the sector's performance. Currently many states, which have unbundled the SEBs, have reported improvements in their operational efficiency and are able to ensure reliable power supply to consumers. Even though SEBs are handling the regulatory operations, the Act has mandated the creation of regulatory commissions in each state; these commissions have played a significant role in passing different regulations and monitoring performances of the state utilities. Few of the state regulatory bodies have set targets for their utilities, and achievement of these targets before the scheduled time which fetches them incentives and any delay gets them penalized. Thus, the structure is more regulated.

Shortage of Coal

India's power requirement over the years has largely been dominated by coal based generation, with close to 55% of the 182 GW of installed capacity being coal based power plants, accounting for over 80% of the total units generated in the country. However, more stringent rules and norms brought about recently by the Ministry of Environments and Forests (MoEF) over award of coal blocks have left many developers devoid of coal linkages. Even state Gencos are repeatedly under pressure due to lack of adequate and timely supply of fuel.

Imported coal is becoming increasingly costly and uncertain

The recent change in international markets, most notably among which being the enactment of the new mining law in Indonesia, has significantly impacted the cost of imported coal for Indian companies, many of which were relying on supply of coal from this south-east Asian nation. Recently, both Krishnapatnam and Mundra UMPPs expressed their concern over rising cost of imported coal, which would make the projects unviable at the tariffs quoted by them. This has been aggravated by the fact that changes in international law and regulations are not currently covered under change in law in Indian Power Purchase contracts.

Shortage of natural gas

Supply of Natural Gas to the power plants has been lower than the requirement over the last 10 years. India's natural gas production has steadily declined over the last two years to 111 MMSCMD (Million Metric Standard Cubic Meter per Day) in FY 2013 from 143 MMSCMD in FY 2011 primarily due to fall in production of KG-D6 block from 56 MMSCMD in FY 2011 to 26 MMSCMD in FY 2013. ICRA, however, projects the domestic natural gas production from existing or already discovered fields to increase from 111 MMSCMD in FY 2013 to around 125 MMSCMD by FY 2016, which could further increase to around 183 MMSCMD by FY 2020 (*Source: ICRA Rating Feature, July 2013 issue*).

Land Acquisition

Land is very essential for any power project. First of all, selection of appropriate location for power plant is of crucial importance. It is expected that the land acquisition should be smoother without much hassle, however, the farmers/land owners whose land is to be acquired resist the acquisition. If the resistance is not handled well, it may acquire political colour and blow out of proportion. India has witnessed examples wherein the mishandling of land acquisition issue has led to cost over run and even abandonment of project.

Environmental Clearances from various Ministries:

After this, a major hurdle is securing the required clearances. There are a number of clearances required from the MoEF, Ministry of Aviation, Department of Forests and other government bodies.

Tariff based competitive bidding: A measure for private sector participation

Tariff based competitive bidding introduced by the Government of India in power generation and transmission projects is for a competitive market, for attracting private sector participation. Under the tariff-based bidding system, all future power projects will be awarded after a process of competitive bidding where

The Institute of Cost Accountants of India

companies will have to fight it out among themselves and quote the best tariff to bag deals. The duration is fixed considering the life of assets and the period within which companies would be able to recover their costs at reasonable tariffs. This will definitely help in bringing down the electricity tariff at a reasonable level.

Electricity Transmission Sector

Transmission of electricity is defined as bulk transfer of power over a long distance at a high voltage, generally of 132 KV and above. In India, the entire country has been divided into five regions for transmission systems, namely Northern Region, North Eastern Region, Eastern Region, Southern Region and Western Region. The interconnected transmission system within each region is also called the regional grid.

The transmission system planning in the country was based on the ability of the power system to safely withstand a contingency without generation rescheduling or load-shedding was the main criteria for planning the transmission system. Hence, technological advancement is required in transmission system. While the predominant technology for electricity transmission and distribution has been Alternating Current (AC) technology, High Voltage Direct Current (HVDC) technology has also been used for interconnection of all regional grids across the country and for bulk transmission of power over long distances. (powermin.nic.in). Major problem facing the transmission sector is transmission loss.

Electricity Distribution Sector:

The distribution utilities have become tool in the hands of many State Governments for giveaways such as free electricity for farmers, for political favours. This has depleted the cash reserves of state run electricity distribution utilities. The financial position of state run power distribution utilities has deteriorated and resulted in inability to pay for power to meet the demand. Many government departments, who are electricity consumers, avoid payment of their huge electricity bills. This has worsened the situation. This naturally impacts on the distribution utilities' ability to pay the generation and transmission utilities, whose financial position is also affected.

Project Implementation Challenges

The vision of providing uninterrupted electricity to everyone in India keeps on stretching. The recent performance card of power projects shows that India would be able to add up generation capacity very less than that planned in Five Year Plan. With high stakes involved, the road for power projects is dotted with issues resulting from the mismatch between project owner's plans versus what it is finally able to deliver. Power plants represent multifaceted assemblies of systems and components built on-site by an extended team of construction workers and engineers. Pre-construction issues feature as one of the biggest concerns for the power companies. More number of projects are getting delayed because of the longer time taken in land acquisition, difficulty in obtaining environmental and related clearances and challenges related to rehabilitation and resettlement. The proposed new Land Acquisition (Amendment) Bill has continued to face political opposition. Power projects being capital-intensive in nature, any increase in operational risks, would put severe pressure on project owners to achieve their financial closure and performance commitments. At the project implementation stage, developers need to ensure fuel sourcing, EPC tie-ups, off

The Institute of Cost Accountants of India

take agreements, shifting of power utilities, monitoring and reporting for effective project management. The shortage of power equipment is expected to act as a major deterrent for timely completion of power generation projects in the next five years. Supply constraints of key BTG components of a power plant could lead to project owners missing their capacity addition targets. Also, demand-supply mismatch of construction equipment due to rising activity in other infrastructure projects could lead to project delays. The power industry is facing a huge talent crunch which is likely to send project costs and risks spiraling going forward.

Successful implementation of power projects require addressing project challenges through a robust project management processes, project-oriented financial and operating controls and, a reporting framework that guides timely and accurate decision making. To avoid many risks inherent with companies involved in executing large power projects, project owners must closely monitor project cost and schedule, periodically review and reinforce internal controls, carefully monitor contractual compliance, and perform other fundamental activities for achieving their objectives.

Domestic BTG sector facing competition

Domestic Boiler Turbine Generator (BTG) industry is facing stiff competition from international OEMs (original equipment manufacturers), due to their faster delivery of equipment and lower cost. The prices quoted by these international manufacturers are significantly lower than that of domestic OEMs. The Mega Power Policy has provided waiver of customs duty on import of supercritical equipment.

Growth in generation capacity - Opportunities in the future

India's annual electricity generation capacity has increased in last 22 years by more than 150 GW, from about 66 GW in 1991 to over 225 GW in June 2013. Power Finance Corporation of India Limited projects that current and permitted electricity capacity addition projects in India are expected to add about 100 GW of installed capacity between 2012 and 2017. Thus, there is strong growth opportunity in power generation. Over 30 crore (300 million) people in India have no access to electricity. Of those who do, almost all find electricity supply intermittent and unreliable.

Renewable energy

In fact the entire sector of renewable energy, which includes small hydro- electric projects, contributes only 12 % to the national power kitty; about 17% comes from hydro- power and about 2% from nuclear power. The bulk 70% comes from coal and gas based plants.

The Government of India recently announced an ambitious plan to produce more electricity from renewable sources as a part of its target to add 10 Giga watts of solar energy by 2017 and 20 Giga watts by 2022. The increased focus of Government of India towards renewable energy has created attractive opportunities for investments in this sector. Global investments in renewable energy have reached a level of USD 244 billion in 2012 (Source: Global Trends in Renewable Energy Investment, 2013). Government of India provides various incentives to renewable energy developers in the form of accelerated depreciation, preferential tariff and generation based incentives.

Use of Clean Technology

While a clean and rapid break away from coal use within the next few years would be the ideal, it is very likely that coal will continue to be used in some capacity into the near future. Clean technology is a commercially viable way to burn coal while capturing the CO₂ emission. This technology helps reduce carbon emissions. The technology works by separating and collecting the carbon dioxide before it is released from the smokestacks.

Smart grid in Transmission and Distribution

Smart grids promise a flow of efficiency. Smart grids will help reduce demand-supply gap during peak hours and bring down transmission and distribution losses. Smart grids are being deployed in electricity networks to bring about a change in the energy delivery system. For India, the main drivers are reducing the gap between demand and supply during peak hours, reducing transmission and distribution losses and sustainable integration of renewable energy. The Indian Government set up the India Smart Grid Task Force (ISGTF) and India Smart Grid Forum (ISGF) to help prepare a roadmap for smart grid rollout. In August 2013, the Ministry of Power adopted the roadmap.

Changing Face of Power Distribution

Although several States have unbundled, privatization of distribution has not happened on a larger scale, although few circles in certain States are being given to private franchisees. Distribution segment will continue to be dominated by State distribution companies (Discoms), which however may witness increase in number of private franchisees in the country. In the medium term, few States are likely to make progress in reforms by moving towards Multi – Year Tariff (MYT), Time of Day (ToD) metering and intra – state Availability Based Tariff (ABT).

Automation is taking place in many distribution utilities. For example, some power utilities have started implementation of Automated Meter Reading (AMR). Also, there is increasing trend for Distribution Franchisees.

Restructured Accelerated Power Development Reform Programme (R – APDRP)

GOI has approved the “Restructured Accelerated Power Development Reform Programme” for XI plan as a Central Sector Scheme Projects under the scheme shall be taken up in Two Parts. Part A shall include the projects for establishment of baseline data of IT applications for energy accounting auditing & IT based consumer service centers. Part B shall include regular distribution strengthening projects. The focus of the programme is on actual, demonstrable performance in terms of AT & C loss reduction.

National Electricity Fund

The Planning commission has proposed setting up a National Electricity Fund with a corpus of Rs. 100000 – 150000 crore with State run power Finance Corporation and Rural Electrification Corporation would be the nodal agencies to finance development of power transmission and distribution network by state utilities so as

The Institute of Cost Accountants of India

to reduce T & D losses. The proposed fund aims lines and using new technology to reduce transmission and distribution losses to 15% by FY 2012.

Role of Regulatory Commissions

The cost of generation, transmission and distribution of electricity is continually going on in upward direction while distribution companies are unable to make recovery from consumers on account of various reasons. Hence, there is a continuous upward revision in tariff, which affects the genuine consumers and creates discontent. Here, the role of Regulatory Commission is very vital. It has to allow genuine costs and reasonable return on equity to the power utility. At the same time, regulator has to exercise stringent analysis on the Aggregate Revenue Requirement and disallow the costs, which are incurred due to inefficiencies in operation of the power utility. Here, the Regulatory Commission has to play a very vital role in order to protect the interests of both, viz., Power Utility as well as the consumer.

Chapter 14

Generation of Power

14.1 Most of the power generation is done through conventional and non-renewable sources of energy. Conventional sources include coal, gas, oil and nuclear power. Hydropower, though renewable, is also counted as another conventional source of power. Non-conventional sources include solar, wind, etc.

- **Coal:**

Coal is one of the preferred sources of power generation in India. The coal is crushed into fine powder. This powder is later burnt in suspension, which results in heat. There are thousands of water tubes surrounding the furnace, which contains demineralised water. Due to heat in the furnace, the demineralised water gets heated up and produces steam, with the help of which the turbines are rotated to generate electricity. The disadvantage of using coal for generation of electricity is that the emission of gases due to burning of coal is harmful to the environment.

- **Gas:**

In case of gas based power plant, only change is instead of coal, natural gas is burnt. The heat generated from burning of gas, results in heating up of DM Water and ultimately steam, is used to turn the turbine which generates the electricity. In alternate model of generation units, instead of heating steam, hot gases from burning of natural gas are used to turn the rotor shaft of the turbine.

- **Oil :**

The basic principle regarding to coal and oil is similar. In combined cycle, oil is burnt in a combustion turbine and the steam to turn the turbine. Oil power plants produce gases which are harmful to environment.

- **Nuclear :**

Nuclear energy is generated from fission process. It is splitting of uranium atoms. Heat is generated from fission process for producing steam. This steam is utilised for generation of electricity with the help of turbine. There is no or very miniscule emission of CO₂.

- **Hydropower:**

In this case, force of falling water, from height, is used to turn the turbine. In a hydro electric power plant, water is stored at a height using a dam. With the help of gravity, water falls on the turbine through the pipe inside the dam. The rotor shaft of the turbine is turned with the help of force of falling water in hydro electric power plant. When the water falls on the turbine, it results in movement and turning of the metal shaft and power is generated.

- **Solar:**

This is a renewable source of energy. The photovoltaic technology is used to convert solar energy into electricity from sunlight. The PV cell consists of silicon layer. Silicon is a semi-conducting material. When the light falls on silicon, electricity is generated. Multiple cells are used to get large output.

The Institute of Cost Accountants of India

- **Wind:**

Wind is another renewable source of energy. Large spinning blades are used to utilize the kinetic energy in moving wind. This energy is transferred to rotors for producing electricity.

- **Biogas:**

Biogas technology provides an alternative source of energy mainly from organic wastes. The Biogas Plant/system consists of mainly three components (i.e. feed & slurry handling system, digester & gas holder). The feed material (mixing with required quantity of water) is fed into the plant; the waste material gets digested in presence of anaerobic bacteria in the digester resulting into gas production. The produced gas is collected in Gas Holder and may be used for thermal application or power generation. Biogas Plant is known as Three-in-One System as provides Fuel, Fertilizer & improves Environmental Sanitation conditions. The biogas plant is considered the best tool for Green House Gases (GHGs) emission reduction in the atmosphere. The selection of model & capacity of Biogas Plant is decided based on the climatic conditions, soil strata, qualitative & quantitative aspects of raw material available.

- **Bagasse:**

Bagasse is a byproduct of sugar cane that is used as fuel in boilers to produce process steam. The consumption of Bagasse depends upon the pressure at which steam is produced in boiler. Co-generation projects with higher boiler pressure results in low computation of Bagasse, resulting in increased operating days.

14.2 Cost Centres in case of Generation:

Following cost centres can be identified for the purposes of maintenance of cost records.

Production Cost Centres:

a)Boiler

Crushed coal gets converted into pulverized coal (i.e. fine powder form). Pulverizing is done with the help of crushers & lubricants in coal mill. This pulverized coal is used in boilers. The boiler is a steam generator, which plays an important part in generation of electricity. It is huge tabular steel structure consisting of furnace, super heater, re-heater, air heater and economizer etc. Furnace is a rectangular chamber, where pulverized coal is burnt in suspension in combination with air supplied in correct quantity by the fans. Demineralised water is circulated through number of tubes surrounding the furnace due to which the water gets heated & steam is generated at a 350°C, which is further heated up to 530°C in the super heater.

b) Turbine & Generator

Steam at a temperature of 530°C & a pressure of about 140 kgs / cm is let out from the Boiler and is sent to turbine where its heat energy is converted into mechanical energy. The turbine shaft drives the rotor of the generator to produce electricity.

After being used in the turbine, the steam is passed through condenser where it gets converted into water. Raw water is used to cool the steam and takes away the heat of steam coming out of Turbine

exhaust. In this process, temperature of cooling water increases and such hot water is taken back to the lake, where it gets cooled through natural cooling process, so that the same can be used again.

14.3 Utility Units / Cost Centres:

a. Coal Handling Plant

Raw coal is received through various modes such as Rail, Road, Conveyor Belt etc. from different coalfields. Coal received through Rail is weighed and thereafter the same gets unloaded with the help of tipplers. Coal received through Road is weighed on weighbridge and then gets unloaded at CHP yard. Similarly coal received through conveyor is weighed on electronic weightometer fitted with the conveyor belt. All such coal received through various modes is fed to coal crusher and then can be stacked in the CHP yard or fed directly to coal bunker by means of conveyor belt.

b. Demineralisation Plant

Raw water, which is pumped out from the dam is very much contaminated & is not suitable for any use as it is. It requires certain processing, which is done in this plant. This raw water is chemically treated with the help of materials & chemical like Alum, Lime, Bleaching Powder, $KMNO_4$ etc. to remove the impurities & then it gets filtered with the help of sand to make it more pure.

Filtered water is converted into Demineralised water which becomes suitable for use in Boilers as well as Hydrogen Generating Plant. This demineralization process takes place with the help of chemicals like Acids, Alkalis & Resin, etc.

Internal auditor has to look into the controls placed for monitoring of chemical consumption.

c. Hydrogen Generating Plant

D.M. Water is used for the generation of Hydrogen Gas. This gas gets filled-in cylinders, which can be further used in generator cooling.

d. Fuel Oil Handling Plant

Oil is used as secondary fuel for the boilers & is required for the initial start up & during low load operation. Fuel oil is received in rail/ road tankers and supplied to the burners in the boiler through the pipeline.

e. Ash Handling Plant

Coal after burning in the furnace is partly converted into clinker ash which is collected in hoppers below the furnace from where it is periodically removed. Rest of the ash is carried with flue gases to the Electrostatic Precipitators where it is separated out & collected in the hoppers from where it is evacuated periodically. Finally only clear flue gases are let out to the atmosphere through the chimney & the rest of the ash is converted into slurry with the help of water, which is carried to a distant open area.

14.4 SERVICE COST CENTRES:

Service Units are the departments that give support & service to the main production units. Certain Service units provide the service to the specific production units while others provide the service to more than one production units. Service Units are identified as under:

- a) Boiler Maintenance
- b) Turbine Maintenance
- c) Electrical Maintenance
- d) Workshop & Garage
- e) Civil Maintenance
- f) Testing
- g) Instrumentation Control
- h) Stores

14.5 Records required to be maintained for Internal Audit:

Apart from basic financial records, required to be maintained such as Cash Book, Ledger, Trial Balance, Profit and Loss Account, Cost Accounting Records are also required to be maintained, which includes technical details such as Installed Capacity, Plant Load Factor (PLF), Planned Outage, Forced Outage, Plant Availability, Daily generation of Power, Auxiliary Power Consumption, Station Heat Rate, etc. All these technical concepts are discussed in detail in Chapter 19 on “Audit of Operational Activities”. Similarly, detailed records relating to quantity and cost of raw material and packing material consumed details of labour hours and cost and details of other direct and indirect overheads are also required to be maintained in cost records.

(a) Material consumption records:

All details relating to receipts, issues and balances of all types of materials are required to be maintained. The valuation of receipts and valuation of issues are to be done in accordance with Cost Accounting Standard (CAS) – 6 issued by the Institute of Cost Accountants of India (ICAI). The details of CAS-6 are discussed in detail in Chapter 19 on “Audit of Operational Activities”.

- (b) **Salaries and Wages:** Records containing details such as direct labour, indirect labour, cost of office staff, management remuneration, idle labour time, etc. should be available.
- (c) **Service Department Expenses:** Details relating to costs incurred for service departments and details of quantity of services provided by various service departments to production and other departments should be available. Examples of service departments are stores, laboratory, welfare measures, safety implementation, transport, dispensary, school, crèche, township etc.
- (d) **Details relating to Utilities:** such as Water collection, Water Treatment, Steam, Coal Handling Plant (CHP), Oil Handling Plant (OHP), etc. with quantities of input and output of each utility and costs incurred for each utility.

There is strong growth opportunity in power generation led by growth in the Indian economy, increasing propensity for electricity consumption and urbanization. The Indian private sector has shown strong interest in power generation.

Chapter 15

Transmission of Electricity

The process of movement of power from the power station to other location through transformers and transmission lines is called as Transmission. There is movement of high voltage electricity in transmission.

15.1 Process of Transmission:

Step up transformers are used to increase the voltage of generated power at generation plant and Step down transformers are used to reduce the voltage of transmitted power at the substation. The substations further step down the voltage of electricity. Transmission lines are very tall because they carry high voltage electricity. Transmission towers, underground cables, transformers, circuit breakers, insulators are the important assets used in process of transmission.

Cost Centres in Transmission:

Following can be identified as Cost Centres for the purposes of maintenance of cost records in Transmission Activity:

15.2 Production Cost Centres:

1. Transmission Line Maintenance:

This cost should specify in detail the quantity and cost of material used for transmission line maintenance, direct costs of labour and other direct expenses incurred in connection with such line maintenance.

2. Sub-Station Maintenance:

This cost should specify in detail the quantity and cost of material used for sub-station maintenance, direct costs of labour and other direct expenses incurred in connection with such maintenance.

15.3 Service Cost Centres:

1. Administration:

These costs should include the cost relating to salary of administrative staff and all other expenses relating to administration of transmission office.

2. Other (General) Repairs and Maintenance

Any expenses on other repairs and maintenance other than transmission lines and sub-stations such as repairs of general assets will be included in this cost centre.

15.4 Internal Control Records to be maintained in Transmission utilities:

In addition to routine accounting records, various technical details are also required to be maintained for the purposes of cost records as per Cost Accounting Records (Electricity Industry) Rules, 2011. Some of technical details required to be maintained are relating to voltage management, energy accounting and transmission losses and inventory. All these details have been discussed in detail in Chapter 19 on “Audit of Operational Activities”.

Chapter 16

Distribution of Electricity

16.1 Introduction

Transmitted electricity is distributed to the individuals. Distribution lines carry electricity to the end users. The consumption of power is recorded by the meters at the premises of the users. Step Down transformers are used to bring down the voltage of electricity for the purpose of distribution.

This process consists of the distribution lines and substations. Consumers can be classified as domestic consumers and commercial consumers. There is fluctuating demand of power and the power system has to adjust to the fluctuating demand of power.

Load management is important function of the distribution process. Meter reading calculates the cumulative value of energy consumed. For industrial consumers the details of energy consumed and the maximum demand of power are recorded during meter reading. Now-a-days new electronic system is introduced to read the meters.

Studies have revealed that for DISCOMs about 80% of the expenditure is towards Power Purchase Cost and the balance 20% constitutes for Employees Cost, Repairs & Maintenance and Administrative expenditure.

Whenever it is observed that the percentage of metered sales is low compared to the total electricity consumed it leads to maximum emphasis on Audit of Revenue Units, the scope of Audit is enlarged in a befitting way to improve Revenue / stoppage of Leakage of Revenue.

Today, the electricity distribution sector in India is currently in the worst shape, plagued by high network and financial losses in almost all states. There is an urgent need to bring in new technologies and systems to arrest these leaks. The Restructured Accelerated Power Development and Reforms Programme (R-APDRP) (see: <http://www.apdrp.gov.in/>) introduced by the GoI was aimed at reducing the network losses to 15%. Part-A of the program is aimed at creating IT Infrastructure and automation systems within utility operations, which until its introduction was largely missing in most of the distribution utilities in the country. And part B is aimed at strengthening the physical network. The R-APDRP is still under implementation and completion is expected during the 12th Five Year Plan. Once completely implemented, the program would provide a strong foundation for evolution to Smart Grids in the power distribution segment.

For the distribution sector, Smart Grids will mean the introduction of Demand Response programs, managing the expected introduction of electric vehicles and integrating distributed energy resources in a way that can help the DisComs balance local supply and demand and reduce peak time consumption. For this to happen, Advanced Metering Infrastructure (AMI) will be required as well as reliable communication infrastructure. Building to Grid (B2G) or development of “Green Buildings” which can be incentivized to manage their

consumption and even distributed energy resources to match grids conditions will also play their part in helping DisComs to manage supply and demand.

Cost Centres in Distribution:

Following can be identified as Cost Centres for the purposes of maintenance of cost records in Transmission Activity:

16.2 Production Cost Centres:

1. Distribution Line Maintenance:

This cost should specify in detail the quantity and cost of material used for distribution line maintenance, direct costs of labour and other direct expenses incurred in connection with such line maintenance.

2. Sub-Station Maintenance:

This cost should specify in detail the quantity and cost of material used for sub-station maintenance, direct costs of labour and other direct expenses incurred in connection with such maintenance.

16.3 Service Cost Centres:

1. Administration:

These costs should include the cost relating to salary of administrative staff and all other expenses relating to administration of distribution office.

2. Other (General) Repairs and Maintenance

Any expenses on other repairs and maintenance other than distribution lines and sub-stations such as repairs of general assets will be included in this cost centre.

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Chapter 17

Special Transactions peculiar to the industry

With reference to Power Sector

17.1 Introduction:

In case of power sector, there are some peculiar transactions pertaining to Power Generation, Power Transmission and Distribution of Electricity. These transactions need special attention of the internal auditor since they are specific to the sector.

17.2 Coal:

The most commonly used fossil fuel in power generation is Coal. Coal is drawn from coal mines and weighment is done at the time of loading the coal in to the wagon or truck, etc. Similarly, coal sampling (quality or grade of coal) is done in chemical lab. After weighment, the same is transported to Power generating station through Rail, Road or conveyor. On reaching the destination, the coal is unloaded either at wagon tippler spot or coal yard. Again, at the time of unloading of coal at power station, weighment of coal received is done and recorded. Sample coal pieces are drawn from coal received and grade of coal is decided in chemical Lab. After this, coal is transferred to bunkers and thereon to coal mills.

In this, quality and quantity of coal are very important, which affect the cost of coal. Similarly, transportation cost is also to be looked in to. In case of delayed unloading, demurrage charges are levied by Railway authorities. Coal liasoning contract orders should be carefully observed since it may cost heavily on the coal cost.

There is always a Transit Loss, which is major cost factor. There are various reasons for such loss. Hence, it is very much necessary to monitor the Transit Loss. Similarly, during stacking of coal at yard, there is loss due to moisture, fire, etc.

Other things in coal to be monitored are diversion of wagons, missed wagons, etc. Periodical reconciliation of coal dispatched from colliery end and coal received at power station end should be done to avoid loss to the power station.

17.3 Oil:

Similarly, another costly fuel is Furnace Oil (FO) and Light Diesel Oil (LDO). Oil is similarly weighed at loading and unloading points. Consumption of oil needs careful monitoring.

17.4 Energy accounting in Transmission and Distribution:

Power feed at the input point and point of sale is never the same. This difference is called “Aggregate Technical and Commercial Loss (AT&C Loss)”. This loss has to be analyzed to quantify the Technical Loss and Commercial Loss separately. This accounting of energy in terms of quantity reconciliation is called “Energy Accounting”. This is applicable to both, Transmission as well as Distribution.

17.5 Meter Reading, Billing and Collection in Distribution:

This is a very peculiar feature in accounting of Distribution Companies (Discoms). The company has to be very careful while feeding the Master Data of consumers, wrong feeding of which may affect the entire billing. Correct reading of meter, its recording, checking billing history; accurate billing to the consumer, collection, rectification of wrong billing and attending consumers complaints are important events in case of Distribution.

Chapter 18

Activities/Services of the Industry (i.e. Power Sector)

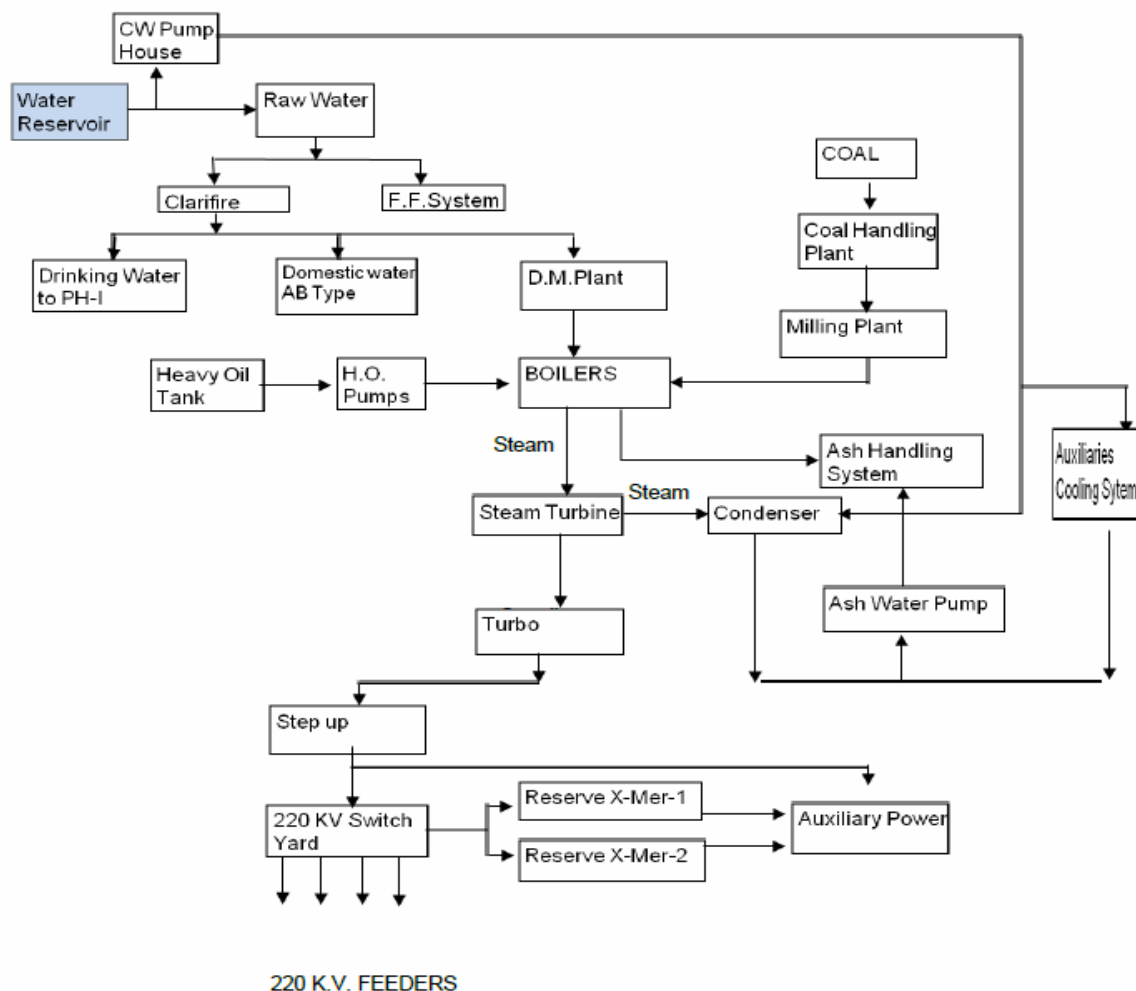
18.1 Introduction:

It is essential to understand the activities and processes of the power sector before starting an internal audit. The core activities of power sector are Generation, Transmission and Distribution of Electricity.

Generation Activities deals with production of Electricity by Generation facilities run by both Government (Central and State) and Private generators. Transmission of Electricity is, generally, in the purview of State Transmission Corporations, which covers the transmission of electricity in and above 132 / 220 KV voltages. Distribution of Electricity is in the purview of Electricity Distribution Companies (DISCOMs), which covers the transmission, and distribution of electricity in 33KV, 11 KV and 220V/440V (LT) lines

18.2 Generation:

Process of Electricity Generation – Flow Chart:



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The Turbine and Generator are the main components used in this process. The generator uses the rotational motion of turbine to produce electricity. This process can be done by different methods. Generally usage of steam turbine is common for generation.

Power Generation with steam boilers:

In this power generation, Coal, Oil or Natural Gas are, generally, the vital fuel and raw material input forming around 55% to 60% share of total cost of power generation, and therefore it is imperative to monitor and exercise control, effectively on this cost element. Coal or oil is received by various modes like Rail, Road and Conveyor Belt.

Following are the steps for generation of power using coal-

1. Coal, Oil or Gas is burnt in Furnace and steam is produced.
2. Steam is produced at high pressure with the help of heated gas.
3. The turbine is turned with the help of high pressure steam which turns the generator.

The voltage is stepped up with the help of step up transformer as the electricity is generated at 10-15 KV.

18.2(a) Internal Audit of Generation process: As the fuels such as coal, oil or gas are a major component of production of electricity, the major risk lies in the area of these fuels. Therefore the internal auditor should provide attention in process of purchase, storage, handling and consumption of fuel.

The risk associated with the power generation lies in following areas:

1. Find out the reasons for shortage of coal, oil or gas.
2. The stones present in the stock of coal may degrade the performance of boiler.
3. Demurrage charges are levied due to delay in unloading the coal or oil.
4. Due to high ash content in coal, operational problems arise which decrease the capacity utilization.
5. Improper plant maintenance may lead to inefficient performance of plant.
6. There may be breakdowns of machinery and other equipments, if no preventive maintenance is done.
7. Plant Load Factor may not be achieved, if there is unavailability of required quantity and quality of coal.
8. The performance of plant may degrade because of inadequate inspection of quality of input material/ fuel used.
9. The coal may remain un-burnt because of improper coal mixing.
10. Extra High calorific value (CV) of coal may affect the boiler.
11. It is very important that the auditor should pay attention to the levels of inventory and actual procurement. There may be huge piling of inventory, which may result in unnecessary blockage of funds.
12. It is also necessary to monitor the initial / capital spares received at the time of procurement of Plant and Machinery. Many a times, the spares may not be used for years and they become obsolete.

18.3 Transmission:

Electricity is transmitted from the power generation plant to the substations through transformers and transmission line. The substations step down the voltage of electricity. Transmission lines are very tall because they carry high voltage electricity. Transmission towers, underground cables, transformers, circuit breakers, insulators are the important assets used in process of transmission.

18.3(a) Internal Audit of Transmission Process: The key risks relating to transmission process are the following:

1. Proper Project Management needs to be done.
2. Environmental factors need to be considered while designing the substations.
3. Improper construction practices may affect the operational performance.
4. The supply of insulators and conductors should be as per the guidelines.
5. Absence of disaster management team to handle sudden breakdown may lead to financial losses.
6. Regular maintenance should be done to avoid breakdown of system.
7. Abnormal outage may be caused if proper monitoring is not done.
8. Old electromechanical meters at substations can promote corruption.
9. Overstocking may lead to high inventory costs.

18.4 Distribution:

This process consists of the distribution lines and substations. Consumers can be classified as domestic consumers and commercial consumers. There is fluctuating demand of power and the power system has to adjust to the fluctuating demand of power.

Load management is important function of the distribution process. Meter reading calculates the cumulative value of energy consumed. For industrial consumers, the details of energy consumed and the maximum demand of power are recorded during meter reading. Now-a-days new electronic system is introduced to read the meters.

Studies have revealed that for DISCOMs about 80% of the expenditure is towards Power Purchase Cost and the balance 20% constitutes for Employees Cost, Repairs & Maintenance and Administrative expenditure.

Whenever it is observed that the percentage of metered sales is low as compared to the total electricity consumed, it leads to maximum emphasis on audit of revenue units. Naturally, the scope of audit is enlarged in a befitting way to improve Revenue / stoppage of leakage of revenue.

18.4(a) Internal Audit of Distribution Process: Distribution is a process where a high voltage is brought down to lower voltages for delivering to the end consumers. The risks in distribution are related to metering and revenue process. The internal auditor should take into consideration the following points while performing the internal audit, considering the risks involved in power distribution.

1. Review application for connections, service line deposits, service billing and recovery.
2. There may not be accuracy in the metering process.

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3. Compliance with the Central Electricity Authority Regulations, 2006 and State Electricity Regulatory Authority Regulations, as may be prescribed.
4. Auditor should high-light the cases, where Proper attention has not been given to customer complaints relating to meter changes, meters with errors, etc.
5. Cases of wrong criteria used for billing estimation, which may result in revenue losses.
6. Cases of non-accounting of Revenue collections, resulting in low revenue.
7. There may be improper estimation and invoicing.
8. No maintenance of distribution assets can lead to customer dissatisfaction.
9. Damages or underperforming assets may not be replaced on time.

Chapter 19

Audit of Operational Activities

Internal Auditor has a very important role to perform while auditing the unit of power sector. He has to understand specific nature of various production / utility / service units, their input output norms, consumption norms including auxiliary power consumption, losses / wastages in each process / unit, efficiency norms, comparison and variations observed and then draw his conclusions.

19.1 Generation:

1. Installed Capacity and Capacity Utilization:

Capacity utilization means the ratio of actual generation to maximum possible generation during the actual hours of operation. The Internal Auditor has to verify the Installed Capacity of the Plant and its actual utilization in terms of MUs of Power. In case of under-utilization of capacity, the Auditor has to analyse the reasons for such under-utilization.

2. Plant Load Factor:

Plant Load Factor is the ratio between average load and peak load in a specified period. A plant load factor is a measure of average capacity utilization and plant running efficiency. A lower PLF indicates less efficiency and lower output of generation while higher PLF indicates more output or more generation of electricity. Internal Auditor should go in details of reasons of lower PLF or higher PLF and analyse the situation. If the PLF is affected by non-availability of fuel, maintenance shut-down, unplanned break down and no off take (as consumption pattern fluctuates lower in nights), the generation has to be adjusted. Power (electricity) storage is not feasible. A generation of power is controlled to match the off take. For any duration, a power plant generates below its full capacity. To that extent it is a capacity loss.

3. Planned Outage:

Planned outage is one, which is pre-determined schedule for routine maintenance of the plant and its various systems. Planned outage is scheduled for different units in a phased manner so that each unit is taken for overhaul at a specified frequency and all the units are covered in a stipulated time frame. This planned outage is of vital importance as it reduces instances of forced outage. The Internal Auditor should verify the reasons as to why the schedule of planned outage is not being adhered to.

4. Forced Outage:

Forced outage is a condition, when the plant and equipment is unavailable due to unanticipated failure. Forced outage may be on account of either Boiler Tube Leakages (BTL) or non-availability of Coal, FO, or Boiler / Turbine Breakdown, etc. Boiler Tube Leakages may be because of the high erosion rate of boiler tubes on account of high abrasion. The reasons for such abrasion are many including high percentage of ash in coal, improper water chemistry. The Internal Auditor should analyse the reasons for the same.

Analysis of the outage data shows that the size of an outage is a significantly determinant of outage-recovery time. These data also show that many factors beyond outage size affect recovery time.

These other factors relate to the constraints relating to system conditions at the time of outage. Reason-wise analysis of forced outages is very useful to the internal auditor.

5. Plant Availability:

Plant Availability means the ratio of actual hours operated to maximum possible hours available during the period. The lower availability of plant is due to longer duration of outages caused mostly by non-adhering to schedule of planned maintenance. Internal Auditor has to analyse the reasons for lower availability of plant.

6. Calorific Value (CV) of Fuel

It indicates the amount of heat released with the burning of coal. The Calorific Value varies on the geographical age, formation, ranking and location of the coal mines. It is expressed as KJ / Kg or Kcal / Kg.

Coal contains moisture. When coal burns the moisture in coal evaporates taking away some heat of combustion which is not available for our use.

When we say Gross Calorific Value or Higher Heating Value, it is the total heat released when burning the coal.

When we say Net Calorific Value or Lower Heating Value it is the heat energy available after reducing the loss due to moisture.

The Heating Value determines how much fuel is required in the power plant. Higher the Calorific Value lesser the amount of the coal required per unit of Electricity. Higher Calorific value also means the cost of the coal is higher but is offset by the lower cost of logistics, storage and ash disposal.

7. Station Heat Rate

The Station heat Rate is the amount of heat energy required to generate per unit of Electrical energy. The unit of measurement is Kcal/Kwh. The heat energy is obtained from coal in a thermal power plant, or from gas in a gas power station.

8. Auxiliary Power consumption

Auxiliary Power Consumption is self-consumption used for operating the power plant, utilities etc. It can be equated with the Captive consumption as per the Cost Accounting Records (Electricity Industry) rules 2001. Internal auditor should insist that records are maintained showing the quantity and cost of power transferred to each department or unit of the company for self-consumption. If possible, department-wise sub-meters may be installed so that accurate quantity of auxiliary consumption is available. Self-consumption shall be accounted at cost only.

Auxiliary Power Consumption (APC) in Thermal Power Plant is substantially high. (Sometimes in the range of 8–9%) Even a small saving in APC can yield in availability of additional power without any investment. Energy audit in a thermal power station (TPS) can be an effective tool for this purpose. However, without proper records the audit may not yield any results. It is necessary that quantitative and cost records are maintained activity / unit wise like coal handling unit, boiler, turbine, draft system (consisting of ID/FD/PA fans), feed water system [consisting of Boiler Fed Pumps (BFPs) / Condensate Extraction Pumps (CEPs), Circulating Water (CW) system-including Cooling Tower

(CTs)], and off sites consisting of coal handling plants, ash handling plants, air compressors, AC plants, station lightings, administrative office, etc.

9. Fuel Supply Agreement

Fuel Supply Agreement is the agreement entered for purchase of fuel between the Power Generation Company and Coal Company.

Internal Auditor should verify that, the agreement is governed by and constructed under the law, He should check the fuel specification, fuel testing and fuel measurement conditions, he should checked the fuel quality and the quality of actual fuel received, whether there is any condition in respect of transit loss in fuel, and other provision as he deem fit for his audit work, he should check the contract price as notified for different grades of fuel.

10. Man-power Deployment

CEA norms for manpower per MW for Hydel was 1.79 in X Five Year Plan and 1.61 in XI Five Year Plan) and Thermal including Gas (1.76 in X Five Year Plan and 1.58 in XI Five Year Plan).

Internal Auditor should ensure that there is neither shortage of manpower nor excess deployment of power. In this regard, analysis of manpower data through cost accounting records and Performance Appraisal Report of the company, which is submitted by the Cost Auditor along with Cost Audit Report, is helpful to the Internal Auditor.

11. Environmental Issues:

In order to minimize the adverse impact on the environment, the GOI had enacted various Acts and statutes. At the State level, State pollution Control Boards (SPCBs) are the regulating agencies to ensure compliance with the provisions of these Acts and statutes. Ministry of Environment and Forests (MoE&F), GOI and Central pollution Control Board (CPCB) are also vested with powers under various statutes. The Institute of Cost Accountants of India (ICAI) has issued Cost Accounting Standard CAS – 14 on Pollution Control Cost, which is effective from the period commencing from 1st April 2012, which provides for detailed analysis of costs incurred for control of pollution of various types, viz. Air, Water, etc.

A) Types of Pollution

1. Air Pollution:

Coal ash, being a fine particle matter, is a pollutant under certain conditions when it is airborne and its concentration in a given volume of atmosphere is high. Control of dust levels in flue gas is an important responsibility of thermal power stations. Electrostatic Precipitator (ESP) is used to reduce dust concentration in flue gases. As per MoE&F notification (September 1999) every thermal plant should supply fly ash to building material manufacturing units free of cost at least for 10 years.

2. Noise Pollution:

Noise Pollution (Regulation and Control) Rules 2000 aim to regulate and control noise. For noise emission from equipment be controlled at source, adequate silencing equipment should be provided at various noise sources and a green belt should be developed around the plant area to diffuse noise

dispersion. The TPSs are required to record sound levels in all the areas stipulated in the rules referred to above.

3. Water Pollution:

The waste water of the power plant is the source of water pollution. As per the provisions of the Water (Prevention & Control of Pollution) Cess Act, 1977 water cess at rates specified is collected from the consumers for water utilized for the purposes specified in the Act *ibid*. Compliance with the standards laid down by GOI under Environment (Protection) Act, 1986 makes the consumer eligible for concessional rate of water cess and also rebate in payment of cess.

B) Some of the important observations noticed on the issue are described below:

- 1) Due to non-completion of work of upgradation / installation of ESPs, the objective of reduction of pollution level could not be achieved.
- 2) Due to failure in bringing down the water pollution to specified levels, avoidable payment of water cess is involved.
- 3) Due to non-compliance of the directions of SPCB, Power companies can not avail concessional rates of water cess.

C) To save the Earth from green house gases (GHG) a number of countries including India signed the 'Kyoto Protocol', which targeted reduction of emission of GHG by five percent in the developed countries. The extent to which an entity is emitting less carbon than the standard fixed in this regard gets credited for the same.

Due to non-registration of the project as Clean Development project at the DPR stage, Power companies lose the potential revenue in the form of carbon credit.

Internal Auditor should ensure that:

- Power Generating Companies strictly adhere to environmental laws thereby minimizing the adverse impact on environment. Power Generating Companies undertake the study to explore the feasibility of measuring carbon credit benefits.

19.2 Transmission:

- **Operational Performance:**

The Internal Auditor should assess whether the transmission system has performed efficiently and has met the stability and reliability standards. He should observe whether timely upgradation, repair and maintenance of the system are being done by the company.

- **Voltage Management:**

It should be ensured that the transmission system should make all possible efforts to ensure that grid voltage always remain within the limits. The company should maintain the maximum and minimum voltages as per the norms.

- **Transmission Losses:**

Transmission loss is the difference between energy received from generating station and energy sent to DISCOM. The Internal Auditor should see that the transmission loss is not more than the norm of

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transmission loss as prescribed by CEA (4%). The company should provide explanations in case the transmission loss is more than the CEA norms.

- **Tariff Determination:**

Tariff for determination of transmission system may be determined for the whole of the transmission system or the transmission line or sub-station. The capital cost of the project should be broken into stages and distinct units or blocks.

- **Energy Accounting and Audit:**

Energy Accounting and Audit is necessary to assess and reduce the transmission losses. If the energy meters are not installed at all points, including cross-over points, the company will not be able to assess the details of energy consumed at the Grid Station and energy lost at transformers and at feeders.

- **Grid Management:**

Grid Management is essential for smooth evacuation of power from generating stations to DISCOMs. It ensures moment to moment power balance in interconnected power system to take care the reliability, security and efficiency of the power system. The Transmission utilities are required to maintain Grid discipline for efficient functioning of grid. The internal auditor should ensure that proper grid management is done by the company.

- **Material Management:**

Material management includes designing of inventory policy, procurement of policy and disposal of obsolete inventory. The internal auditor should monitor procurement policy and inventory control mechanism for efficient control over inventory. Physical verification of stocks can be done by the internal auditor. The internal auditor must reconcile bin card with the inventory. He should also scrutinize non moving items of stores.

19.3 Distribution:

1) Aggregate Technical and Commercial Losses :

It is the addition of technical loss, commercial loss and shortage due to non-realization of total amount of bill raised. It is the difference between energy input units into the system and the units for which the payment is collected. ATC Loss is the actual measure of overall efficiency of the distribution business as it measures both technical as well as commercial losses. The low voltage operation in distribution is the major reason for higher technical losses due to inherent properties of network, other reasons being, line losses, losses in transformers, losses in service cables and connection, etc. Commercial Loss is the loss due to non-technical factor, which may be due to theft of electricity, defective meters, error in meter reading, etc.

The internal auditor should verify that, precaution taken by the distribution station to control the loss, whether the distribution station has implemented the R-APDRP Scheme to reduce the technical and commercial loss.

2) Transformer and its Installed Capacity:

A Transformer is a machine used for transferring power from one power circuit to another power circuit. Installed Capacity is the maximum capacity of the transformer at any instance of time.

The Institute of Cost Accountants of India

Capacity Utilization is the capacity at which the distribution station actually used. The capacity utilization may equal to installed capacity or lower than the installed capacity.

The internal auditor should check that, the installed capacity of transformer and actual utilized capacity of the transformer and point out the under-utilization of capacity and analyse the reasons therefor.

3) Repairs and Maintenance of Distribution Transformer:

The distribution company undertakes the repairs of the transformer in both in-house and through outside available agencies. The internal auditor should verify the performance of the repaired distribution transformer, comparison and analysis of in-house and outsourcing of distribution transformer repairs and its impact.

4) Power factor and Capacitor Bank:

Power factor is the ratio between real power used to do work and the apparent power supplied by the circuit. Real power is the capacity of the circuit for performing the work in the particular time. Apparent power is the product of current and voltage of the circuit.

Capacitor Bank develops the power factor by regulating the current flow or voltage regulation. It is a grouping of two or more similar capacitors interrelated in parallel or series with each other. It may be used in Direct Current (DC) power supplies to increase stored energy and improve the current capacity of power supply. The internal auditor should verify that, the directions if any, given by the State Electricity Regulatory Commission (SERC) are being followed by the Power Distribution Station or not.

5) Tariff Fixation:

The tariff structure of the Power Distribution Company is subject to the revision by State Electricity Regulatory Commission (SERC) after the considering the objections / suggestions of the stakeholders regarding the Annual Revenue Requirement. The power distribution company is required to file Annual Revenue Requirement with the SERC for each year.

The internal auditor should verify that, whether the company has filed the proper Annual Revenue Requirement (ARR) with SERC, whether the ARR is approved by the SERC. If company has modified the ARR, then verify the effective date of revised tariff policy.

19.4 Internal Control through Records:

Control is affected by means of records and the records need to be suitably analyzed and grouped to serve the desired objectives. The reports derived from these records should be utilised by the management to exercise control.

Records relating to Consumption, Losses, Wastages, etc.

At each of these production / utility / service units, records need to be maintained regarding inputs of each unit and output of that unit and loss / wastage of input materials in that unit. Internal Auditor has to ensure that such record is being maintained at the business unit. Such record will be useful not only for internal control and monitoring purposes but also for compliance of Cost Accounting Records (Electricity Industry)

The Institute of Cost Accountants of India

Rules, 2011, Cost Audit Report Rules, 2011 as well as details as specified in Generally Accepted Cost Accounting Principles (GACAP) issued by the Institute of Cost Accountants of India (ICAI). The information, which are to be focused as per Cost Accounting Records Rules, are required to be determined as GACAP and the control aspects have been left with the company to install. The cost accounting system shall incorporate these control measures and maintain such records as required by the statutory cost accounting records. The internal auditor has to ensure that proper controls as required have been installed by the company. The auditor can draw certain conclusions regarding the internal controls in place in the unit.

19.5 Records relating to Power Generation Utilities:

Internal auditor has to ensure that following records are maintained at each unit in suitable formats:

1. All proper records of stores and accounting relating to receipts, issues and balances both in quantities and values of all major fuel such as coal, lignite, gas, naphtha, bagasse along with their calorific values and other materials used in the generation, transmission, distribution or supply of electricity.
2. The Auditor should verify the basis, on which the costs of issues and consumption have been calculated.
3. Auditor should verify the quantity and expenses incurred for loading and unloading, transport, handling, grinding charges etc. as well as the quantity and cost of transportation of material by different modes of transportation viz. road, conveyer, rail, pipeline, rope-way etc.
4. In the case of imported materials/fuels, the Auditor should check for quantity and value are recorded for each item showing FOB value, overseas freight, insurance, customs duty, clearing charges, inland freight etc. If both indigenous and imported materials are consumed, the records showing the details of percentage mix of the same should be maintained for each item.

5. Principle of valuation of receipt of materials:

Cost Accounting Standard – 6 (CAS-6) issued by the Institute of Cost Accountants of India (ICAI) lays down the principles regarding valuation of receipt of materials. Auditor should verify that the principles enshrined in the said Standard (CAS-6) are strictly followed by the auditee:

- (a) **The material receipt should be valued at** purchase price including duties and taxes, freight inwards, insurance and other expenditure directly attributable to procurement that can be quantified with reasonable accuracy at the time of acquisition. This valuation of receipt of materials is to be based on the terms and conditions stated in the purchase order.
- (b) **While valuing receipt of imported material**, actual customs duty paid on the basis of classification by the Customs Authorities, net of any credits. Materials imported free of duty or at concessional rate of duty under export incentive scheme should be accounted for at the actual rate of duty applicable so long as the entity should satisfy the condition for exemption or concession. Harbour dues, stevedoring charges, congestion charges, if imported singly, be accounted accordingly. If imported, as part of a basket of materials, should be accounted proportionately on the basis of import value. Clearing Agent's charges, other charges paid to commission agents should be added to cost of

The Institute of Cost Accountants of India

materials. Duty Drawback and other similar duties subsequently recovered are deducted from the cost of materials.

- (c) **Normal loss or spoilage of materials** prior to reaching the factory should be absorbed in the cost of balance materials net of amounts recoverable from suppliers, insurers, carriers or from disposal. Normal losses due to shrinkage or evaporation and gain due to elongation or absorption of moisture, etc. before receipt of material should be absorbed in material cost. The difference between the quantity of coal billed i.e. landed in the wagons at the colliery / sub-colliery and the quantity of coal actually received at the power station is the transit loss.
- (d) Any demurrage or detention charges or penalty levied by transport or other authorities shall not form part of the cost of materials.
- (e) Clean Energy Cess which is levied on indigenous as well as imported raw coal w.e.f. June 2010 and any other costs, such as Octroi, etc. incurred for bringing in the coal to the power station, should be included in the cost of materials.
- (f) Subsidy/Grant/Incentive with respect to any material should be reduced from the cost of materials.

6. Principles of valuation of issues of material:

Cost Accounting Standard – 6 (CAS-6) issued by the Institute of Cost Accountants of India (ICAI) lays down the principles regarding valuation of issues of materials:

- (a) Issues are to be valued considering the cost flow, e.g. First in First out (FIFO), Last in First out (LIFO), Weighted Average Rate, etc. Most of the organisations adopt Weighted Average Rate Method for valuation of issues.
- 7. Where any material such as coal, lignite etc. are used from mines owned or leased by the company or by its wholly owned subsidiary, separate records showing the cost of raising such materials should be maintained in detail.
- 8. Records relating to value of materials which have not moved for more than twelve months for effective control of inventory.
- 9. While unloading the coal, stones are removed. Actual weight of the stones is recorded periodically and the value of this loss is proportionately debited to the collieries or sub-collieries depending on the receipt of coal during the period under consideration. Internal auditor has to ensure that periodical analysis of this loss is available for control purposes.

10. Loss of Input Materials:

There are two types of losses of inputs material of Coal, viz., Transit Loss and Stacking Loss.

(e) Transit Loss in Coal:

Transit loss in coal arises due to the differences in the quantum of coal that are considered to be loaded at the loading point by the Coal Company and the coal that is delivered at the coal unloading point of the Power plant. Such losses can arise on account of:

- Natural phenomena during transportation of coal;
- Weighment errors at the loading point and at the unloading point;
- Superficial Surface Moisture Loss due to washed coal and

The Institute of Cost Accountants of India

- Loss of coal in transit due to theft, pilferage, etc.

(f) Stacking Loss:

It is pertinent to mention here that after receipt of coal from the mines, part of it is maintained as stock. During this period of storage, the coal attracts local firing. To prevent it, water has to be sprinkled on it. With increase in the quantity of water sprinkling, Net Calorific Value (NCV) at firing point reduces. Higher surface moisture in coal also makes firing difficult and requires higher oil support. Thus, only optimal quantity of water should be sprinkled so that loss of CV and Loss due to local firing are optimized. Some other losses like wind age loss, crushing loss, carpet loss etc. also takes place in the coal handling plant.

19.6 Records relating to Transmission / Distribution Utilities:

In case of Transmission / Distribution utility, record relating to quantity of input power received and power purchased should be available. Similarly, separate record relating to quantity lost during transmission or distribution, quantity consumed for self (i.e. office, employees, etc.), and balance net quantity available for transmission / distribution. As per Cost Accounting Records (Elec. Industry) Rules, 2011, Proforma D is prescribed for Transmission / Distribution utilities. Proforma used for working out the cost of transmission shall be named as D-I and shall be prepared for each major zones and areas. Proforma used for working out the cost of distribution shall be named as D-II and shall be prepared voltage-wise for each major zone and area.

Transmission Losses:

Transmission loss is the difference between energy received from generating station and energy sent to DISCOM. The Internal Auditor should see that the transmission loss is not more than the norm of transmission loss as prescribed by CEA (4%). The company should provide explanations in case the transmission loss is more than the CEA norms.

Aggregate Technical and Commercial Losses in case of Distribution Utilities:

It is the addition of technical loss, commercial loss and shortage due to non-realization of total amount of bill raised. It is the difference between energy input units into the system and the units for which the payment is collected. ATC Loss is the actual measure of overall efficiency of the distribution business as it measures both technical as well as commercial losses.

Internal Auditor has to look into the details and analysis of Transmission losses and Aggregate Technical and Commercial Losses in case of Distribution Utilities.

19.7 Efficiency:

The parameters of measuring efficiency include overall rate of return, capacity utilization, utilization of national, financial, physical and human resources, cash flow performance and the payback period of the entire organization. Thus internal audit seeks to evaluate the overall organizational efficiency.

Cost audit reports enable the determination of accurate costs of production of various products, services and activities with a view to compare the same with the comparable figures of the earlier years and those of the peers or benchmarks in the industry. These reports highlight the variations from the previous year's figures

The Institute of Cost Accountants of India

and make it possible to have reason wise analysis of variations so as to enable the management to propose suitable corrective measure for improvement of performance.

Since, Cost Audit Report comments on the efficiency of the company, namely, utilization aspect of the factors of production, cost audit report proves to be useful to the Internal Auditor for assessing the efficiency of the various aspects of the organisation. To enable the cost auditor to assess the efficiency, Section 209 (1) (d) of the Companies Act provides for “records of utilization of material, labour and other items of cost.” A proper appraisal of the extent of efficiency of utilization of factors of production is possible in cost audit. Hence, Cost Audit Report is very useful to the internal auditor for the purposes of analysis of optimum utilization of resources and maximization of wealth of stakeholders.

Chapter 20

Audit of Special Areas w.r.t. peculiar transactions

In case of power sector, some special areas need attention while doing internal audit of such undertakings. Some few areas, which should be focused, are as follows:

In case of Power Generation sector, following areas need attention of the auditor.

20.1 Coal:

Cost of coal gets affected in multiple ways such as:

- ✓ Quality / Grade of coal based on calorific value
- ✓ Quantity of stones and shells found in coal
- ✓ Transportation and handling cost
- ✓ Transit Losses
- ✓ Freight Charges
- ✓ Cost of Demurrage
- ✓ Losses during storage
- ✓ Mix of indigenous and imported coal
- ✓ Rate variation
- ✓ Duties and taxes
- ✓ Insurance etc.

It may also be noted that Govt. of India has introduced Clean Energy Cess on Raw Coal, whether procured locally or imported w.e.f. July 2010. Details of such cess charged by Coal suppliers should be separately recorded and should be a part of Proforma B of Cost Accounting Record Rules.

Landed cost of coal:

I) Receipt of coal and its valuation:

Landed cost of coal should be worked out as per Cost Accounting Standard – 6 (CAS-6), published by the Institute of Cost Accountants of India (ICAI)

20.2 Transit Loss in Coal:

Transit loss in coal arises due to the differences in the quantum of coal that are considered to be loaded at the loading point by the Coal Company and the coal that is delivered at the coal unloading point of the Power plant. Such losses can arise on account of:

- Natural phenomena during transportation of coal;
- Weighment errors at the loading point and at the unloading point;
- Superficial Surface Moisture Loss due to washed coal and
- Loss of coal in transit due to theft, pilferage, etc.

20.3 Stacking Loss:

It is pertinent to mention here that after receipt of coal from the mines part of it is maintained as stock. During this period of storage, the coal attracts local firing. To prevent it, water is sprayed on it. With



increase in the quantity of water sprayed, Net Calorific Value (NCV) at firing point reduces. Higher surface moisture in coal also makes firing difficult and requires higher oil support. Thus, only optimal quantity of water is sprayed to prevent loss of coal due to local firing so that loss of CV and Loss due to local firing are optimized. Some other losses like wind age loss, crushing loss, carpet loss etc. also takes place in the coal handling plant.

20.4 Auditing of Coal Bills

The audit of coal bills should concentrate on following points:

1. The auditor should check that the advance given to the coal company is duly entered in the register prescribed for the purpose.
2. He should ensure the IUA against advance along with the copy of relevant documents is sent to the concerned power station.
3. The auditor at the store office should check the basis of freight payment.
4. While checking the valuation of S.R. notes, the auditor at the power station should ensure the valuation correctly on the following aspect.
 - a. The correctness of the basic rate.
 - b. The correct calculation of royalty, stores excise duty, etc.
 - c. Sales tax computed on the above.
 - d. The deduction of freight charges on account of under loading to be specifically seen as shown in S.R. notes.
 - e. Excess freight for over loading intimated by the store on S.R note is to be deducted from the coal bill.
 - f. Any other recovery shown in S.R. note i.e. toll tax, etc. should be seen.
 - g. After effecting all deductions from the bill as above, the correct amount of bill is to be arrived and advance payment if any, is to be adjusted from the bill.
 - h. The auditor should prepare and send a consolidated statement showing the bill wise detail of the coal bills.
 - i. The auditor should take quarterly review of the position of pending or awaited S.R. notes and implement the same to major store and S.E. coal office.
 - j. The auditor should ensure that claims with the Railway in respect of missing wagons are promptly lodged.

20.5 Auditing of Coal related contracts:

1. The contract for servicing of equipment and conveyer belts of coal handling plant, reconditioning of conveyer belt, cleaning work contract at coal handling plant, etc. are required to be placed and operated at thermal power stations as and when necessary.
2. The auditor should ensure that work specification given in the annexure is prescribed by the local authorities.
3. The auditor should ensure that the terms and conditions indicated in the annexure are fixed by the local authority and watch any variations in the prevailing terms and conditions.



20.6 Auditing of bill of coal related contracts:

1. The auditor may receive such bills either in R. A. bill form or in contractor's own bill form.
2. Audit should ensure that the said bill is received duly supported by "Daily work done Certificate" in the form locally prepared.
3. The seal and signature of section-in-charge or the person to whom powers are given is to be observed.
4. Audit should see that the measurement of actual work done is recorded and commensurate with the details in the certificate.
5. The signature of contractor or his representative is to be observed by the auditor for acceptance of measurement in M.B. and on R.A. bill, if prepared.
6. The certificate in a separate form locally designed for recording of reasons of manual unloading of wagons is to be insisted by audit.
7. Audit should ensure that quantity of unloaded coal on the basis of heaps of particular size is mentioned in the order.
8. Arithmetical calculations are to be verified by the audit.
9. Rates charged in the bill are to be ensured as per rates in the order for various items.
10. Recovery of security deposit, sales tax, etc. as per terms of the order should be effected and net payable amount should be arrived at.
11. The certificate as per the terms of the order wherever necessary are to be insisted.
12. Audit should watch the linkage limit, wherever applicable.
13. The procedure in respect of obtaining signature of head of the unit after recording and passing endorsement on M.B. may be followed as per prevailing local practices.

20.7 Furnace Oil (FO):

Furnace Oil is used for initial igniting as well as for ignition support in case of wet coal. This oil is costly and is to be used very cautiously and judiciously. The cost of FO is around 2.5% to 3% of total cost of generation. It is therefore highly desirable that FO consumption should be monitored for effective cost control.

Record should be properly maintained for every receipt of FO consignment. Quantity of the FO and its landed cost should be properly recorded in the stores department. Transit Loss, if any, should be properly accounted for.

Similarly records relating to issues of FO should also be properly maintained with the details such as quantity, the cost centre to which it is issued, valuation, etc. Proper metering of the issue of FO will ensure effective control over its consumption.

The guidelines for valuation of the receipts & issues of Furnace Oil are the same as explained above for coal, as per CAS6. For calculation of weighted average rates for Furnace Oil, the stock with Cost Centres should also be taken into account.



20.8 Light Diesel Oil (LDO) / High Speed Diesel (HSD):

Diesel is used for Locomotives, Dosers, Trucks and other vehicles. The cost of LDO / HSD is around 1% of total cost of generation. It is therefore highly desirable that Diesel consumption should be monitored for effective cost control and should be used very cautiously and judiciously.

Record should be properly maintained for every receipt of Diesel consignment. Quantity of the Diesel and its landed cost should be properly recorded in the stores department. Similarly records relating to issues of Diesel should also be properly maintained with the details of issues such as quantity, the cost centre to which it is issued and its valuation.

In case of Transmission and Distribution, main focus area is “Energy Accounting and Energy Audit”. In case of Distribution of Electricity, Revenue Billing needs to be highlighted by the Auditor.

20.9 Energy Accounting and Energy Audit:

Energy Audit (Balance Check):

Energy Audit is an activity to consider the input of energy and energy consumed (both billed and unbilled) and to arrive at the Aggregate Technical & Commercial (AT & C) losses therefore and to analyze the reasons there from. Based on the analysis an action plan is normally chalked out for reduction of the Losses.

20.10 Tariff Determination:

This is very important aspect, which internal auditor has to look into very carefully. State Electricity Regulatory Commission generally adopts the method of “cost-plus” approach for determination of tariff. Generally, a fixed % age regulatory return on capital base / equity is allowed. The Power utility has to prepare and file tariff petition with SERC before the start of the financial year. The financial and cost data for the current year is used to project the Aggregate Revenue Requirement (ARR) for the next year. The Regulatory Commission checks the data submitted by the utility. The Regulatory Commission checks the data and makes analysis of data submitted by the utility. This process is called ‘Technical Validation’. If the Commission is satisfied about the sufficiency of the data, it required the power utility to make the petition public and invite comments from the public. After public comments and public hearings, the Regulatory Commission decides the reasonable tariff. So, the utility has to be very careful while submitting the ARR. Even a single expense wrongly classified may result disallowance of the expense, in terms of norms fixed by the RC for each expense item. Before submitting the ARR, the power utility should ensure that it has observed the various norms fixed by RC so that there will not be even a single disallowance of any expense. For example, the RC generally fixes norms for coal consumption, specific oil consumption, transit and handling loss, rates of coal and oil purchases, allowable limit for repairs and maintenance may be a specific percentage of the value of assets, manpower norms, auxiliary power consumption, etc. Sometimes, it happens that an asset is commissioned by the power utility, but the same is not accounted for or accounted for in the next financial year. This results in loss of revenue on account of depreciation as well as regulatory return on investment.



Internal Auditor has to ensure that the ARR / Tariff Petition is properly and timely submitted. Since the tariff is cost-plus, Cost Accountant as Internal Auditor has definitely a key role to play. Each component of cost has a bearing on the process of tariff determination.

20.11 FIXED AND VARIABLE CHARGE

As a consumer, if we observe our electricity bill carefully, we can see that there are many components of total amount of bill. Fixed charge, electricity charge, fuel adjustment charge, additional supply charge, tax on sale of electricity, other charge, additional charge, if any, etc. Fixed charge is dependent on connected load. This charge will not change unless there is a change in connected load. Electricity charge is variable and is dependent on actual units consumed.

FUEL ADJUSTMENT CHARGE (FAC): is applicable on different slabs. This is additional cost of power incurred by the power utility on account of fuel price increment. Since conventional fuel supply like coal is declining and prices of the same are rising, the FAC is bound to increase, till any alternative source of cheaper fuel is not developed. This is variable charge to consumers and depends upon units consumed.

Internal Auditor should look into the various aspects of billing such as data relating to connected load of each consumer is correctly fed at Master data level. Similarly, proper meter reading is fed to computer so that correct billing to consumers is ensured along with less number of consumers complaints. Internal Auditor should analyze the data relating to zero consumption consumers, minimum consumption consumers, door lock cases for more than 6 months, average billing cases, stop meter cases, etc.

20.12 GOVERNMENT SUBSIDY:

Many a times, Government provides subsidy to power utilities, which may be Capital Subsidy or Revenue Subsidy. Capital subsidy may be provided for Renovation and Modernization of Plant and Machinery, Power Reforms programme like APDRP, etc. Revenue subsidy may be for concession in tariff to certain classes of consumers, which is generally a political decision. Internal Auditor should see that the subsidies are properly accounted for. He should verify the utilisation of the subsidy, i.e. whether the amount of subsidy is utilized for the purpose for which the same is provided by the Government.

20.13 AUDIT OF L.T REVENUE UNITS:

The Audit of LT Revenue Unit will consist of three segments:

- a) Transaction Audit: This segment will cover all relevant transactions viz., Measurement of Energy, Billing, Accounting, Collection of Dues, and Banking of Dues etc.
- b) Systems Audit: This segment will cover the aspects of Review of Internal Control System, Assessment of the existing controls, suggestions on further controls etc.
- c) Compliance Audit: This segment will cover the aspects of status of compliance with the guidelines / instructions / rules & regulations issued statutory & Regulatory Authorities / Management.



A. Review of Internal Control System:

The functions in a LT Revenue unit / center are generally segregated into:

- Release of new services
- Measuring the electricity consumption
- Billing the electricity consumption
- Distribution of Bills to the consumers
- Collection of dues from consumers
- Depositing the collections into bank
- Transfer of Funds to Head Office

In each of the above functions there must be a proper system of internal control to ensure that there is no scope for lapses. Internal auditor has to study the function-wise duties & responsibilities for personnel engaged in revenue units as enunciated in the Revenue Booklet and duties & responsibilities of officers.

B. Review of Meter Reading Books:

Review of Meter Reading Books is a vital area where the application of Analytical Review procedures such as comparative analysis & trend analysis would be of much help.

Important issues to focus:

- a) Meter changes (MC)
- b) Struck-up meters (MS)
- c) Burnt Meters (MB)
- d) Meters with errors
- e) Reading not furnished (RNF)
- f) Door Lock cases (DL)
- g) Sluggishness / Consumption less than usage (CLU)
- h) Multiple meters for single service

C. Review of Billing of the Electricity Consumed:

While verifying the Billing the following factors shall be kept in view:

- a) Category of Billing
- b) Purpose of Supply
- c) Unit Rate applied
- d) Applicability of Fixed Charges
- e) Applicability of various Surcharges such as Power Factor Surcharge, Capacitor Surcharge, Surcharge on Uncollected ACD, Surcharge for delayed payments etc.

D. Importance of Master Data / Basic Documents:

During the course of Audit the following documents are very vital for the purpose of Billing:

- a) Test Report
- b) Agreement with the Consumer, if any
- c) Breakup of Load into Plant Load & Lighting Load



- d) Availability or otherwise of the Capacitors and its rating
- e) Multiplication Factor of the Meter
- f) Existence of Terminal Cover Seals
- g) Pole Number, structure code of the DRT & Feeder code

20.12 AUDIT OF H.T. REVENUE UNITS

High Tension (HT) Revenue unit covers all consumers who have loads more than 75 HP / 56KW. The HT consumers will avail supply in 11KV / 33KV / 132KV voltages. Frequency of Billing is monthly.

A. Review of Internal Control:

Ensure that the laid down system of Internal Control is properly being implemented. Since the number of consumers is low and the value of transactions is high there shall be a system of 100% verification in almost all the activities. Further the Internal Check shall be more objective rather than the repetition of the same Check.

B. Important features of HT Billing: The features which are very vital for HT Billing are:

- a) Voltage of Supply (Viz., 11KV / 33KV / 132KV)
- b) Contracted Maximum Demand / Recorded Maximum Demand
- c) Load Factor (for the purpose of allowing Incentive to consumers)
- d) Restrictions on Lights & Fans consumption
- e) Billing of Colony consumption at a separate rate
- f) Minimum off-take and Billing (in cases of consumption less than the specified level)
- g) Open Access (allowing a consumer to purchase electricity from third party using the network of the company)
- h) Import & Export of Electricity (in case of Billing of consumers having Captive power Plants)

C. Important areas to focus:

- a) Deration (decrease) of Loads (CMD) and its impact on billing
- b) Enhancement (increase) of Loads (CMD) and its impact on billing
- c) Termination of Agreement and sanction by competent authority
- d) Lighting Load whether segregated or not?
- e) Metering of Colony consumption
- f) Levy of Fuel Surcharge Adjustment and its accounting treatment as Prior period Income / Charge
- g) Levy of Cross Subsidy surcharge & Additional Surcharge in case of Open Access
- h) Levy of SLDC Charges in case of Persons operating Capital Power Plants (CPPs) and export of energy to the DISCOM / State Grid

D. Review of Agreements with Consumers:

The service agreement with the consumer shall be reviewed at periodic intervals as there may be changes in the business of the consumer or there may be changes in the Tariff conditions / Principles of Categorization for Billing.



E. Periodic review of position of Loads for HT Category for Townships and Colony:

For HT Category (for Townships & colonies) there is no fixed charge and the tariff is also low. It is essential to review the position of Loads for HT Colony Category Consumers as there are restrictions on loads for Street lighting, Water works and Sewage works and for Non-Domestic / commercial & general purpose. Any event of exceeding the limits would disentitle the consumer to be billed under HT Colony Category.



Chapter 21

Audit of Functional Areas

21.1 Administration Department

Role of Administration department is to co-ordinate the activities of various departments such as Production, Stores, Purchase, Technical, HR, Finance and Accounts, Billing and Collection etc. Administration department has to function in such a way that overall organizational objectives are achieved in an effective and efficient manner by ensuring optimum utilisation of resources of the organisation. The main activity of the administration department is to monitor overall performance of the company for achieving long term objectives.

Technical Administration Department:

- Internal Audit will select samples from various registers/ records maintained by the Department.
- Ensure that all quotations are obtained in sealed covers before awarding any job/contract.
- Ensure that job/contract is awarded to lowest tenderer on various jobs; check whether deviations from this policy are approved by competent authority.
- Ensure that proper internal control is there for, maintenance of records of various jobs and financial concurrence is obtained wherever required before awarding any contract or placement of order.
- Check whether all repairs and maintenance are entered in log books/registers maintained for vehicles, office equipments, air-conditioners etc.
- Check all purchases (furniture, office equipment, printing and stationery) have been made in accordance with the prescribed procedure.
- Verify physically the stocks of printing and stationery
- Check that issues of printing and stationery are properly authenticated and are based on norms.
- Check the records maintained for the use of vehicles and ensure that log book for each vehicle is maintained properly, consumption of fuel, oil parts etc. are in accordance with norms and that repairs are not excessive.
- Check that recovery of charges for private use of vehicles is being made in accordance with the rules.
- Check that emergency / local purchase were justified, not excessive and were made according to the prescribed procedure.
- Check that proper records are maintained for electricity and water bills, telephone and telex bills etc. and are correctly certified for payment with reference to consumption / use.
- Check that proper control is exercised on the assets in the custody of the department.

21.2 Purchase / Material Department

Inventory includes materials bought for capital works and maintenance works. The peculiarity of some of the items of inventory is that they can be used for both Capital Works and for Maintenance works.



- **Review of process of Tendering and ordering system:**

Generally, there is a schedule of delegation of powers approved for purchases. Accordingly, it is to be observed that such schedule is strictly followed and no one exceeds his powers. Clearance should be obtained from the stores in charge as to non-availability of the material being procured or the same has reached the re-order level. Tenders / quotations are to be invited as per purchase procedure or manual of the organisation. There may limits in terms of amounts to decide whether single or multi-quotations are to be taken or tendering is to be done for the procurement.

- **Review of procedure for purchase:**

Procedure followed for purchase is to be reviewed in terms of whether bid is based on the qualifying conditions. Whether only those bidders who fulfill the qualifying criteria are qualified for opening of price bid? If deviation is made for the same, whether approval of competent authority is obtained? Whether only lowest price bid is selected for placement of order or otherwise. If not, whether placement of order on the bidder other than lowest is justified on some equitable grounds and whether approval of competent authority is obtained.

- **Review of Internal Control System in the Stores:**

Proper records are being maintained relating to receipts, issues and balance of materials. The materials must be properly segregated and stored. Proper codification of all items of materials is to be done so as to identify each item with its specification and description separately.

- **Audit of Pricing of Issues & returns:**

The issues from stores are to be properly valued so as to assess the consumption of the material. Various methods of valuation are in existence such as LIFO, FIFO, Weighted Average, etc. Most of the organizations follow the Weighted Average Method for pricing of issues. Similarly, proper records must be maintained for returned materials and its disposal.

- **Review of valuation of Inter-stores transfers:**

Many a times, there may inter-unit or inter store transfer of material, which must be properly documented and recorded.

- **Review of ABC analysis, Age-wise analysis:**

It is necessary to have categorisation of inventory in to ABC. A category items represent high value items, B category items may be large in quantity but comparatively low in value than A category items. C category items are having very negligible value, but quantity may be huge. Accordingly, concentration is focused on A value items and comparatively low attention on B value items.

- **Review of levels of inventory:**

Inventory must be maintained properly with various levels identified, Maximum level, minimum level and re-ordering level. At any time, inventory of any item must be between minimum and

maximum level. As soon as the stock of any item reaches re-order level, action must be initiated for procurement of that item so that the same is replenished before it reaches its minimum level. Reorder level is decided depending upon the consumption pattern of the item and time to taken from placement of order to upto its supply and delivery at the stores, which is also known as 'Re-order period'.

- **Periodic physical Verification of Inventory:**

In periodical physical verification, the entire stock is verified all at a time at periodic intervals, usually once a year. It may be possible to arrange the verification in such a manner that the stock-taking coincides with a period of slack business activity.

21.3 Finance and Accounts Department

Internal audit of Finance and Accounts Department will consist of review of controls relating to Coal, Oil, Auxiliary Power, coal related contracts, in case of generation, energy accounting and audit in case of transmission and distribution and billing and collection in case of distribution. Similarly, accounting of transportation bills, works bills, suppliers' / contractors' claims, employees' claims, maintenance of stock ledgers and valuation of issues of material for consumption. It is also necessary to cover the following aspects relating to Expenditure Units and Power Purchase and Energy Audit:

AUDIT OF EXPENDITURE UNITS

During the course of Audit of Expenditure units such as Field Offices, where the expenditure would be of basically two types viz., Revenue Expenditure and Capital Expenditure. It is of utmost importance that there is proper classification of all the expenses as Revenue and Capital while booking the same.

This proper classification, as Revenue or Capital Expenditure, is very important because while approving the tariff proposal, the State Electricity Regulatory Commission (SERC) considers each head of expense as to whether the expenditure incurred is within reasonable limits. The SERC analyses details given by the power utility in its tariff petition and prescribes operational as well as financial norms. For instance, SERC specifies operational norms for coal consumption, specific oil consumption, auxiliary power consumption, etc. Similarly, it also specifies financial norms for power utility like Repairs and Maintenance as specified % age of asset base. If any capital expenditure is wrongly booked as revenue expenditure, then the utility may lose the revenue on account of depreciation as well as return on its equity as well as will be put to loss on account of disallowance of excess expenditure.

There should be proper prior sanction from appropriate authority as per Delegation of Powers before the expenditure is incurred.

AUDIT OF POWER PURCHASE AND ENERGY AUDIT

Power Purchase:

In Electricity Distribution Utilities, Power Purchase Cost is a major component of cost as power is bought from various sources for the purpose of resale through Distribution Network. For the purpose of



operational simplicity, the sources have been segregated into Conventional Energy and Non-Conventional Energy (NCE).

21.4 Marketing and Distribution Departments

The two billing or revenue departments, i.e. L. T. Revenue Unit and H.T. Revenue Unit, are the marketing and distribution department in a power distribution company. They are responsible for billing and collection of revenue from consumers.

1. AUDIT OF L.T REVENUE UNITS:

L.T Revenue unit covers the consumers having connected loads up to 75HP / 56KW (& up to 150Hp in case of LT Category IIIB consumers) who are availing their supply of electricity in 220/440 voltage (LT) lines. Frequency of Billing is monthly & Bi-monthly.

A. Review of Internal Control System

The functions in a LT Revenue unit / center are generally segregated into:

- Release of new services
- Measuring the electricity consumption
- Billing the electricity consumption
- Distribution of Bills to the consumers
- Collection of dues from consumers
- Depositing the collections into bank
- Transfer of Funds to Head Office

In each of the above functions there must be a proper system of internal control to ensure that there is no scope for lapses. Internal auditor has to study the function-wise duties & responsibilities for personnel engaged in revenue units as enunciated in the Revenue Booklet and duties & responsibilities of officers.

B. Review of Meter Reading Books

Review of Meter Reading Books is a vital area where the application of Analytical Review procedures such as comparative analysis & trend analysis would be of much help.

Important issues to focus:

- a) Meter changes (MC)
- b) Struck-up meters (MS)
- c) Burnt Meters (MB)
- d) Meters with errors
- e) Reading not furnished (RNF)
- f) Door Lock cases (DL)
- g) Sluggishness / Consumption less than usage (CLU)
- h) Multiple meters for single service

C. Review of Billing of the Electricity Consumed

While verifying the Billing the following factors shall be kept in view:



- a) Category of Billing
- b) Purpose of Supply
- c) Unit Rate applied
- d) Applicability of Fixed Charges
- e) Applicability of various Surcharges such as Power Factor Surcharge, Capacitor Surcharge, Surcharge on Uncollected ACD, Surcharge for delayed payments etc.

D. Importance of Master Data / Basic Documents:

During the course of Audit the following documents are very vital for the purpose of Billing:

- a) Test Report
- b) Agreement with the Consumer, if any
- c) Breakup of Load into Plant Load & Lighting Load
- d) Availability or otherwise of the Capacitors and its rating
- e) Multiplication Factor of the Meter
- f) Existence of Terminal Cover Seals
- g) Pole Number, structure code of the DRT & Feeder code

E. Audit of LT Revenue Unit:

The Audit of LT Revenue Unit will consist of three segments:

- a) Transaction Audit: This segment will cover all relevant transactions viz., Measurement of Energy, Billing, Accounting, Collection of Dues, and Banking of Dues etc.
- b) Systems Audit: This segment will cover the aspects of Review of Internal Control System, Assessment of the existing controls, suggestions on further controls etc.

c) Compliance Audit: This segment will cover the aspects of status of compliance with the guidelines / instructions / rules & regulations issued statutory & Regulatory Authorities / Management.

2. AUDIT OF H.T. REVENUE UNITS

High Tension (HT) Revenue unit covers all consumers who have loads more than 75 HP / 56KW. The HT consumers will avail supply in 11KV / 33KV / 132KV voltages. Frequency of Billing is monthly.

A. Review of Internal Control:

The auditor should ensure that the laid down system of Internal Control is being implemented properly. Since the number of consumers is less and the value of transactions is high, risk involved is also high and therefore, he should verify 100% of the billing aspects of these consumers. Further, the Internal Check should be more objective rather than the repetition of the same Check.



B. Important features of HT Billing: The features, which are very vital for HT Billing are:

- a) Voltage of Supply (Viz., 11KV / 33KV / 132KV)
- b) Contracted Maximum Demand / Recorded Maximum Demand
- c) Load Factor (for the purpose of allowing Incentive to consumers)
- d) Restrictions on Lights & Fans consumption
- e) Billing of Colony consumption at a separate rate
- f) Minimum off-take and Billing (in cases of consumption less than the specified level)
- g) Open Access (allowing a consumer to purchase electricity from third party using the network of the company)
- h) Import & Export of Electricity (in case of Billing of consumers having Captive power Plants)

C. Important areas to focus:

- a) Deration (decrease) of Loads (CMD) and its impact on billing
- b) Enhancement (increase) of Loads (CMD) and its impact on billing
- c) Termination of Agreement and sanction by competent authority
- d) Lighting Load whether segregated or not?
- e) Metering of Colony consumption
- f) Levy of Fuel Surcharge Adjustment and its accounting treatment as Prior period Income / Charge
- g) Levy of Cross Subsidy surcharge & Additional Surcharge in case of Open Access
- h) Levy of SLDC Charges in case of Persons operating Capital Power Plants (CPPs) and export of energy to the DISCOM / State Grid

D. Review of Agreements with Consumers:

The service agreement with the consumer shall be reviewed at periodic intervals as there may be changes in the business of the consumer or there may be changes in the Tariff conditions / Principles of Categorization for Billing.

E. Periodic review of position of Loads for HT Category VI:

For HT Category VI (for Townships & colonies) there is no fixed charge and the tariff is also low. It is essential to review the position of Loads for HT Category VI Consumers as there are restrictions on loads for Street lighting, Water works and Sewage works and for Non-Domestic / commercial & general purpose. Any event of exceeding the limits would disentitle the consumer to be billed under HT Category VI.

21.5 HRD and Personnel Department

Audit of HR and Personnel Section would cover the following aspects:

- Verification of Establishment Records (PRS Section)
- Review of Internal Control System
- Review of system of periodic appraisal of performance of employees
- Pre / Post-check of pay fixations



- Post-check of pay fixation anomalies
- Review of system of allocation of duties & responsibilities
- Review of system of rotation of duties
- Review of personnel policies implementation

21.6 IT Department

Almost all the business undertakings in all the sectors are in the process of implementation of an E.R.P for the automation of the Book Keeping and Accounting, Stores, HRD and other areas. Power sector is not an exception. Actually, in most of the power sector undertakings, billing activities and consumer account maintenance are already under computerised environment.

In Information Systems Audit, the more emphasis is on the areas of Controls such as:

- 1) Access Controls
- 2) Input Controls
- 3) Application Controls
- 4) Output Controls
- 5) Security Controls
- 6) Disaster Recovery and Management

The above controls are explained briefly in the following paragraphs.

- 1) Access Controls: These controls are the systems and procedures for accessing the Information Systems (SAP / BMS) of the Company.
- 2) Input Controls: These controls are the systems and procedures for the input of the data into the Information Systems (SAP / BMS).
- 3) Application Controls: These controls are the systems and procedures for processing the data that is available in the Information Systems, (BMS).
- 4) Output Controls: These Controls are the systems and procedures for getting the output of the data / information from the Information systems.
- 5) Security Controls: These Controls are the systems and procedures for protecting the Information systems and related Assets from various threats.
- 6) Disaster Recovery and Management: This part deals with the preparedness of the Organisation for any event of Disaster and Recovery of Data and Management of the Information Systems in Disaster and Restoring the Information Systems.

21.7 Transportation

Transport contract order is an order place for clearance, handling, transportation, loading-unloading, stacking of material / equipment, etc. Such transport order is placed by inviting tenders or by calling quotations. Controls to be observed in case of transport contracts are estimated prepared for the work; scope of the contract is precise, clear with detailed locations, statutory liabilities involved, etc.



Chapter 22

Cost Audit Specific to Industry

The maintenance of Cost Accounting Records and its Audit under Section 233-B of the Companies Act, 1956 aims at and protects the interest of the Company, Stakeholders, Consumers and Society at large. It is a preventive measure, a guide for management policy and decision, in addition to being a barometer of performance. The important aspects of Cost Accounting Records and Audit thereof are:

- a) Propriety Audit – the audit of executive action and plans have bearing on finance and expenditure of the Company
- b) Efficiency Audit – ensure application of the basic economic principle that resources flow into the most remunerative channels.

The Cost Accounting Records (Electricity Industry) Rules, 2011

These rules apply to every company, including a foreign company as defined u/s 591 of the Act which is engaged in production, processing or manufacturing of electricity activities and wherein, the aggregate value of net worth as on the last date of the immediately preceding financial year exceed 5 crore rupees; or wherein the aggregate value of the turnover made by the company from sale or supply of all products or activities during the immediately preceding financial year exceeds twenty crore rupees; or wherein the company's equity or debt securities are listed or in a process of listing on any stock exchange, whether in India or outside India.

As per Cost Accounting Records (Electricity Industry) Rules, 2011, Cost Accounting Records are to be maintained relating to:

1. **Proforma A: Utilities:** Records showing quantity and cost of water collection, water treatment, ash handling, effluent treatment, etc. shall be maintained by the company for the activities under reference. Auxiliary Power Consumption (APC) may be treated as separate utility. The cost statements for each utility shall be maintained separately in respect of each such utility in Proforma 'A'.
2. **Proforma B: Cost of Procurement of Raw Materials:** This proforma helps the auditor work out the landed cost of raw material such as coal, oil and other similar raw materials. Auditor should insist for separate records relating to details of imported raw materials.
3. Auditor should verify the records relating to the quantity and value of **wastage, spoilage, rejections and losses of input materials/fuels and consumable stores whether in transit, storage, operation or at any other stage**. The method followed for adjusting the above losses as well as income derived from the disposal of rejected and waste materials including spoilage, if any, in determining the cost of activities, should be indicated in the cost records.
4. Auditor should monitor the record relating to time attendance, payroll and **salaries and wages** of all the employees. This record should also include details relating to idle labour time and cost involved.

5. Records should also include **expenses** in respect of each **service department or function** like laboratory, welfare measures, safety implementation, transport, dispensary, school, crèche, township etc. These expenses should be apportioned to other services and power activities on equitable and reasonable basis and applied consistently.

COST AUDIT REPORT RULES, 2011:

With effect from 1st April 2011, the Cost Audit Report shall be in the new form prescribed consisting of total 11 paras of Annexure to Cost Audit Report, which are required to be prepared by the company for submission to the Cost Auditor.

ANNEXURE TO THE COST AUDIT REPORT

Para 1: GENERAL INFORMATION

1. CIN or GLN of the Company
2. Name of the Company
3. Registered Office Address:
4. Corporate Office Address
5. E-mail Address of the Company
6. Company's financial year to which the Cost Audit Report relates
7. Name, Address, Membership Number and E-mail of the Cost Auditor(s)
8. SRN Number and Date of filing of Form 23C with the Central Government
9. Date of Board of Directors' Meeting wherein the Annexure to the Cost Audit Report were approved
10. No of the Audit Committee Meetings held by the Company and attended by the Cost Auditor during the year

Para 2: COST ACCOUNTING POLICY:

(1) This Para contains the various Cost Accounting Policies adopted by the Company keeping in view the requirements of the Companies (Cost Accounting Records) Rules, 2011, the Companies (Cost Audit Report) Rules, 2011, Cost Accounting Standards and its adequacy or otherwise to determine correctly the cost of production / operation, cost of sales, sales realisation and margin of the product / activity groups under reference separately for each product / activity group. The Para focuses on the following areas:

- a. Identification of Cost Centres / Cost Objects and Cost Driver
- b. Accounting for Material cost including packing materials, stores and spares, etc., employees cost, utilities and other relevant cost components
- c. Accounting, allocation and absorption of overheads
- d. Accounting for Depreciation/Amortization
- e. Accounting for by- products/ joint- products, scraps, wastage etc.



- f. Basis for Inventory Valuation
- g. Methodology for valuation of inter- unit/ inter-company and related Party Transactions.
- h. Treatment of abnormal and non-recurring costs including classification of non-cost items.
- i. In case the company has adopted IFRS, variations (if any) in treatment of cost accounting arising out of adoption of IFRS in Financial Accounting.
- j. Other relevant cost accounting policy adopted by the Company.

(2) The Para also contains the changes, if any, made in the cost accounting policy for the product/ activity group(s) under audit during the current financial year as compared to the previous financial year as also the Observations and Suggestions of the Cost Auditor regarding adequacy or otherwise of the budgetary control system, if any, followed by the company.

Para 3: Information relating to Products Groups of the Company:

This Para contains details about the products groups, in which the Company deals with. It also contains the details as to turnover from each product group, applicability of cost audit, etc.

Para 4: QUANTITATIVE INFORMATION

This Para contains information for each type of product separately. The capacity utilization, if indicated merely based on the actual physically installed capacity of the manufacturing unit, may not be correct indicator in this era of outsourcing, licensing and leasing. Therefore, this Para seeks to determine the effective production capacity and capacity utilization of the unit. This is an important parameter especially in case of allocation of fixed overheads, which are sometimes apportioned on the basis of physically installed capacity. The Para seeks to determine the actual production on the basis of own manufactured as well as manufactured on license or job work through other vendors. Further production as per stock records is compared with Excise Records.

Para 5: ABRIDGED COST STATEMENT

Material consumption is to be given under three separate heads like indigenously purchased, imported and self-manufactured and accordingly records should be maintained. Records of processing / grouping / working details of each head / item of the cost sheet will have to be maintained by the Company, to be audited by the Cost Auditor.

Para 6: OPERATING RATIO ANALYSIS

Ratios are calculated for each component of cost with cost of sales. This can be a vital and effective tool in the hands of management for control purposes.

Para 7: PROFIT RECONCILIATION

This Para enables to ensure accuracy and to adjudge the profit of the activity under reference with the overall profit of the company, thereby revealing performance of the core activity of the company. The variations, if any, are to be clearly mentioned and explained.



Para 8: VALUE ADDITION AND DISTRIBUTION OF EARNINGS

The term “Value Addition” has been defined under the Cost Audit Report Rules as the difference between the net output value (net sales adjusted for work-in-progress and finished goods stock) and cost of bought out materials and services for the product under reference. Cost of bought out materials at point 6 above, should include all types of materials such as raw materials, components, packing materials, process materials, utilities, stores and spares, consumables, etc. In other words, all procurements, in whatever form, which are purchased from outside sources, should be taken as bought out materials. The materials which are received from other units/factories (inter unit transfer) should also be treated as “bought out materials”. The cost of these bought out materials and services are to be deducted to arrive at value added. The term value addition should be interpreted to mean the wealth creation due to the efforts or activities carried out by the company and hence only those items or costs, which are totally out-sourced and where no efforts of whatsoever nature are put in by the company should only be excluded as cost of bought out materials and services.

Part B: Distribution of earnings: Points (1) to (4) deal with specific appropriations of the earnings. Point (5) is intended to specify residual appropriation items like Transfers to Reserves, addition to Profit & Loss Account balance (Profit), Interest and Finance charges etc. will be the major items to be shown separately. After showing these items separately, any other item such as royalty, technical know-how fee, etc., if significant, should be shown separately and the balance should be shown as “miscellaneous items”.

This Para provides a comprehensive summary of the financial status and health of the company. A close look at this para enlightens regarding the financial viability of the product vis-à-vis factory and Company as a whole.

Para 9: FINANCIAL POSITION AND RATIO ANALYSIS

This Para provides a comprehensive summary of the financial status and health of the company. A close look at this para enlightens regarding the financial viability of the product vis-à-vis factory and Company as a whole.

Para 10: RELATED PARTY TRANSACTIONS

Details should be furnished for each sale / purchase separately.

Details of Related Party transactions without indicating the Normal Price and the basis thereof should be considered as incomplete information.

Para 11: RECONCILIATION OF INDIRECT TAXES

Wherever, there is any significant variation in the current year's figure over the previous year's figure for any item shown under each para of the Annexure to the Cost Audit Report, reasons thereof shall be given by the Cost Auditor.



FORM – III

FORM OF THE PERFORMANCE APPRAISAL REPORT

Name of the Company: _____

Period of Report: _____

(indicative list of areas to be covered in the report)

1. Capacity Utilisation Analysis
2. Productivity / Efficiency Analysis
3. Utilities / Energy Efficiency Analysis
4. Key – Costs & Contribution Analysis
5. Product / Service Profitability Analysis
6. Market / Customer Profitability Analysis
7. Working Capital & Inventory Management Analysis
8. Manpower Analysis
9. Impact of IFRS on the Cost Structure, Cash Flows and Profitability
10. Application of Management Accounting Tools

Cost Audit and Efficiency Audit

1. Efficiency Audit is systematic appraisal of management methods and is intended to assess the actual performance levels relative to applicable peer benchmarks or internal standards (e.g., profitability or stated business plan objectives etc.). The process is also designed to identify opportunities to ensure performance benefits. It aims at identifying efficiency and productivity improvement opportunities so that the resources flow into the most remunerative channels to ensure the optimum returns.
2. The parameters of measuring efficiency include overall rate of return, capacity utilization, utilization of national, financial, physical and human resources, cash flow performance and the payback period of the entire organization. Thus efficiency audit seeks to evaluate the overall organizational efficiency.
3. The cost audit report comments on the efficiency of the company namely, utilization aspect of the factors of production. To enable the cost auditor to make efficiency audit, Section 209 (1) (d) of the Companies Act provides for “records of utilization of material, labour and other items of cost.” Since a proper appraisal of the extent of efficiency of utilization of factors of production is possible in cost audit, it may appropriately be called efficiency audit.
4. The cost audit as efficiency audit can also be understood from the fact that cost audit reports enable the determination of accurate costs of production of various products, services and activities with a view to compare the same with the comparable figures of the earlier years and



those of the peers or benchmarks in the industry. It seeks to identify the areas of inefficiency or poor decision making, to ensure diversion of funds to most optimum channels. The information regarding exact unit costs after proper allocation and/or apportionment of overheads, capacity utilization, per unit consumption of major raw materials (including power and fuel), man-hour productivity, idle hours or un-productive manpower wastage etc. serve as basis for efficiency audit and helps in fixing appropriate prices of goods and services produced by the company to ensure optimum returns. The detailed financial analysis of the company in cost audit report like determination and comparison of different ratios like 'profit as % of capital employed', 'profit as % of net sales', 'value addition', 'current asset as % of current liabilities', 'profit as % of capital employed' etc. help in assessing the operational efficiency and comparing the financial health of the undertaking with the peers or others in the industry aiming at bringing all round efficiency.



Chapter 23

Audit Follow Up

23.1 Introduction:

An auditor's follow-up procedures should be tailored to the circumstances and culture of the organization. In a more formal culture, the auditor should begin by sending both the department manager and top management an announcement before the follow-up engagement.

Next, the internal auditor would meet with the department manager to obtain copies of documents pertaining to action-plan implementation. After receiving the documentation, the internal auditor would need to ascertain whether actions taken by the department adequately mitigate the issue identified and lower the associated risk to a reasonable level. Based on this assessment, the internal auditor would then determine whether the action plan is complete, still in process, or unaddressed.

In an informal culture, follow-up procedures might entail simply asking appropriate departmental staff and management about the progress of action plans. Based on the information obtained, the auditor can then make a final judgment regarding action-plan status (i.e., complete, still in process, or unaddressed).

The review will conclude with a follow-up report which lists the actions taken by the client to resolve the original report findings. Unresolved findings will also appear in the follow-up report and will include a brief description of the finding, additional action to be taken, current condition, and the continued exposure to the organization. A discussion draft of each report with unresolved findings is circulated to the client before the report is issued. The follow-up review will be circulated to the original report recipients and other organization officials as deemed appropriate.

As required by the Institute of Internal Auditor's (IIA) *Standards for the Professional Practice of Internal Auditing* (Performance Standard #2500), internal auditors "should establish a follow-up process to ensure that management actions have been effectively implemented or that senior management has accepted the risk of not taking action."

An annual review and Report of Outstanding Audit Comments should be adopted by the Internal Audit Department of the company to comply the follow-up requirement noted above.

To facilitate the follow-up process, Internal Auditor maintains a database of outstanding audit comments. This database tracks identifying information about each Internal Audit report or close-out letter along with a summary of each finding in the report or letter, the position responsible for taking corrective action, and the estimated completion date for corrective action. Audit comments issued by external audit groups should be loaded into the database when they are received. The database will also track whether or not a finding has been corrected, what was done to correct the issue, whether corrective actions should be tested, and the date corrective action was complete.

At the end of each project, the auditor in-charge completes a Report Entry Form for the project. Completed forms should be submitted to the Internal Audit Department of the Company for review.



23.2 Follow-up Reviews

In most cases, follow-up reviews will be done as a company-wide project. However, if requested by management, Internal Auditor may follow-up on the status of selected findings in a separate review.

Approximately, 3 to 4 weeks before testing in the annual follow-up is scheduled to begin, check the completeness of the Findings database by printing the contents of the Reports table and comparing this information to the manual list of audit reports. If any reports have not been entered into the database, have the in-charge of that audit complete the report and findings forms and have this information added to the database. Once the database is confirmed as being current, update the queries and report programs that are used to create reports that will be used in the follow-up process.

The Head of Internal Audit or the auditor in charge of the follow-up review will prepare a memorandum for senior management that notifies them that audit activities are underway and describes the follow-up process. This memo should include:

- timeframes for the project,
- a copy of the outstanding findings relating to areas reporting to that senior manager,
- a request that they distribute the findings to these areas and ask the managers to provide Internal Audit with the information requested,
- a statement that these comments were previously distributed as part of an audit report or close-out letter
- Notification that the results will be reported to the Audit Committee and Board of Directors.



Chapter 24

Checklist

General Checklist for all the three wings of Electricity sector, viz., Generation, Transmission and Distribution:

24.1 Checklist for AUDIT OF EXPENDITURE UNITS

- a) Purpose of the Expenditure and the benefit derived there from (from the view point of propriety).
- b) Proper Sanction for incurring such expenditure and the procedure laid down in the Organisation manual / instructions issued from time to time.
- c) Delegation of Powers would place some limitations on the quantum of expenditure for each authority, which shall also be observed. In case of deviations ensure that the same has proper ratification.
- d) In case of expenditure involving of statutory payments, Delegation of Powers would not generally interfere.
- e) Simultaneously the conditions / restrictions lay down under Tax laws in respect of Cash Payments and Withdrawing of cash shall also be observed.
- f) Classification of Expenditure under different heads of account shall also be observed, as misclassification would have an impact on the profitability of the company.
- g) In case of Deferred Revenue Expenditure ensure that it has a benefit of more than one year and is spread over the life of the benefit.

B. Verification of Capital Expenses incurred vis-à-vis Delegation of Powers and Indian GAAP.

The following are basic principles to be considered by the Internal Auditor, while doing the audit of Capital Expenditure.

- a) Ensure that the expenditure has enduring benefit.
- b) Ensure that the Capital Expenditure has proper Budget allocation.
- c) Ensure that the Capital Expenditure incurred is within the Delegation of Powers to the respective authority.
- d) Ensure that the instructions issued for capitalization are properly being adhered.
- e) Ensure that for Turnkey works (both fully and partial) the cost of asset is accounted in the respective divisions books (even though the amounts spend by the consumers) and the corresponding credit is shown as Consumer Contribution for Capital Works.

C. Review of utilisation of funds

During the course of Audit of Expenditure unit the following aspects shall be observed:

- a) Purpose for which the funds are received and spent.
- b) Check whether the amount fell due at the time of payment.



- c) Ensure that at the time of making a request for funds check whether the bills are received and the expenditure is incurred pending payment.
- d) In case of payments which are not covered by the LOC ensure that the same is to meet the exigencies (such as statutory payments on account of a court decree etc.) only but not for regular on account payments.

D. Verification of Depreciation provided on the Fixed Assets:

It shall be ensured that the depreciation is computed as per the prescribed rates each category of asset considering the date of Capitalisation for new assets and the date of De-Capitalisation in case of assets retired. As per the accounting policy of the company fixed assets will be depreciated up to 90% of the cost of the assets only and after which no further depreciation will be provided. Ensure that a proper control existing for this aspect.

24.2 CHECKLIST FOR AUDIT OF ESTABLISHMENT/ PAY ROLLS SECTION (PRS)

Audit of Establishment /PRS Section:

- 1) Verify the Register of Incumbency with reference to sanction number and items maintained.
- 2) Verify the Register of Charge Transfer Certificates (CTCs) and change returns maintained for all the officers and other employees.
- 3) Verify the Register of Service Books maintained for all the staff.
- 4) Verify the Calendar of Increments maintained up-to-date.
- 5) Verify the FCR for pension payments maintained up-to-date and register of life certificates for pensioners maintained.
- 6) Verify the pay bills with reference to sanctions, emoluments drawn with reference to rates applicable and whether the claims are supported by sanction of leave, increments, pay slip, CTCs, change return, LPC etc. wherever required.
- 7) Verify the Service Registers for the accuracy of pay fixation made with reference to orders in force.
- 8) Verify the TA bills to see whether the claims admitted are in accordance with the rules.
- 9) Check whether cross-reference to the original pay bills is made whenever supplementary claims are made.
- 10) a) Verify the Register of Long Term Loans maintained for loans sanctioned by Board;
b) Check whether the Register of Recoveries towards long-term loans is maintained.
- 11) Check whether the Rules and Regulations prescribed for sanction of long-term loans are fulfilled.
- 12) Check whether proper entry is made in the records to ensure prompt recovery of festival, education and other short term advances.
- 13) Verify the pension, and gratuity sanctioned with the register to ensure that the fixations are in accordance with the rules prescribed.
- 14) Verify the Register of Superannuation up-to-date and superannuation notices issued in time.



- 15) Verify the register of recoveries to be made as per the inspection reports of AG and Internal Audit maintained and recoveries are observed.
- 16) Verification of Establishment Records (PRS Section)
- 17) Review of Internal Control System
- 18) Review of system of periodic appraisal of performance of employees
- 19) Pre / Post-check of pay fixations
- 20) Post-check of pay fixation anomalies
- 21) Review of system of allocation of duties & responsibilities
- 22) Review of system of rotation of duties
- 23) Review of personnel policies implementation

Audit of General Administration Department:

- 1) Verification of Stamps Account Register:
Verify the Purchase of stamps and issues to various departments and the balance stamps on hand. For the balance stamps on hand physical verification has to be done periodically.
- 2) Verification of Appointments / Roster Register:
Verify whether all the appointments are as per the appointment letters issued by Corporate Office and are within the time allowed for joining and if there is any delay, permission letter from higher authorities. In the case of contract appointments agreements has to be verified. Whether records are maintained cadre-wise as well as employee-wise and the service registers has to be maintained by duly entering all the information time to time.
- 3) Incumbency Register: Verify cadre-wise appointment details like Date of joining, Date of leaving/retiring from the current place of working and the No. of vacancies due to above transfers and retirements.
- 4) Verification of Probationers Register: The following are to be verified.
 - a. List of probationary employees in each department;
 - b. Date of commencement of probation;
 - c. Date of completion;
 - d. Date of passing of qualifying tests.

24.3 CHECKLIST FOR AUDIT OF PURCHASE OF MATERIALS

- 1) Examine the EMD Payable and the mode of payment with the DD's Register.
- 2) Verify and ensure that the quantity of materials purchased is commensurate with actual field requirement to ensure that there is no over stocking / stock-out.
- 3) Verify the correctness of the name of the supplier mentioned in the bill with that as per Purchase Order.
- 4) Verify the Purchase Order No. & Date mentioned in the bill with that as per Purchase Order.
- 5) Verify the material specification mentioned in the bill with that as per Purchase Order.
- 6) Cross verify the contents of Delivery Challan i.e., the details of material dispatched, with that as per invoice/bill.



- 7) Obtain a copy of Stores Received Book which is duly attested in token of acknowledgement for goods received and cross verify the receipt of material at stores with the material dispatched as per Delivery Challan.
- 8) Abnormality in quantity purchased with respect to physically available stock in stores is to be verified upon for proper analysis.
- 9) Verify the correctness of rates claimed in the bill for material supplied with the agreed rates.
- 10) Abnormality in rates claimed is to be verified in depth into with reference to previous purchases of similar material and correctness of such rates is to be verified.
- 11) Verify whether the agreed delivery terms are complied by the supplier.
- 12) Verify whether the bill has put for payment as per the due dates for Payment.
- 13) Whether price variation rate claimed as per the approved orders.
- 14) Are the rates claimed with reference to contract/agreement and subsequent amendments?
- 15) Is the sanction for purchases made in accordance with Delegation of Powers?
- 16) Verify whether there is a budget provision for the material intended for.
- 17) Is the indent placed before approved suppliers/tenders?
- 18) Are the suppliers in registered suppliers' list possess recognition from Competent Authority for standard in quality?
- 19) Are tenders called for in respect of material intended for purchase?
- 20) Is the bill limited to the quantities as per purchase order/agreement?
- 21) Is the penalty clause and calculation thereon included in the bill for delayed supplies?
- 22) Is the copy of check measurement certificate from competent authority enclosed to LOA application?
- 23) Is a statement of advance payments and recoveries from suppliers prepared and attached to LOA application for necessary adjustments in bill/payment?
- 24) Is a copy of bank guarantee submitted by supplier enclosed for verification and necessary action?
- 25) Are the rates of centralised items purchased in line with the Purchase Orders of Corporate Office?
- 26) Are the purchases supported by indents from the field or with a Management decision?
- 27) Whether the cash discount clause is properly taken into account for payments being made within stipulated time.
- 28) Review of process of Tendering and Ordering system
- 29) Review of procedure for purchase (refer Purchase Manual)
- 30) Review of Internal Control System in the Stores
- 31) Audit of Pricing of Issues & returns
- 32) Review of valuation of Inter-stores transfers
- 33) Review of ABC analysis, Age-wise analysis
- 34) Review of levels of inventory
- 35) Periodic physical Verification of Inventory



24.4 CHECKLIST FOR AUDIT OF INVESTMENTS

- 1) Check whether there is a Board Resolution authorizing the Investment of funds and for the disposal of the investments.
- 2) Ensure that the mode of investment sanctioned by the Board and the pattern of investment are the same.
- 3) Ensure that the guidelines for inter-corporate investments / borrowings are adhered to while making any inter-corporate investments.
- 4) Check whether the latest quotes for the securities to be invested are obtained.
- 5) At the time of investment ensure that the quotes obtained are valid (as the quotes are valid for a limited period of time, say, 24 hours / 36 hours etc.).
- 6) Before investing ensure that the options available for investing are ranked based on the following criteria:
 - a) Maturity date;
 - b) Rate of return (annualised);
 - c) Put / Call options attached;
 - d) Yield To Maturity (YTM);
 - e) Net Present Value;
 - f) Internal Rate of Return (IRR);
 - g) Flexibility of investment into small lots;
 - h) Lock-in period;
- 7) Ensure that Accounting Standard 13 on “Accounting for Investments” issued by the Institute of Chartered Accountants of India is being followed.
- 8) In case of Investments out of Ear-marked funds ensure that the return from the investments is also re-invested.
- 9) Any amount that could not invested [difference between the amount available for investing and the amount invested (in lots)] is placed under a short-term deposit including the return thereof on the deposit.
- 10) Ensure that the Premium paid on Securities redeemable at face value is being amortised over the life of the security.
- 11) Ensure that the discount accrued on securities redeemable at face value is recognised as income considering the prudence convention.
- 12) Ensure that securities in physical (printed document) mode are under the safe custody of an Authorised Officer of the company.
- 13) In case of securities in Dematerialised (Demat) mode the instruction slips are under the control of an Authorised Officer of the company and the same are verified during the annual physical verification.
- 14) In case of securities for which online transactions (purchase & sale) are permitted ensure that the Transaction Password is under the control of an Authorised Officer of the company and the same is changed periodically.



- 15) Check whether the SMS alert / Email alert system is activated for every transaction of purchase / sale of investments and for dividend / interest declared / paid.
- 16) Verify that the SMS alerts / Email alerts received on account of purchase and sale of investments are saved for future reference.
- 17) Ensure that the income from investments prior to the date of acquisition is reduced from the cost of the investment.
- 18) Costs incurred for acquisition of securities such as stamp duty, Security Transaction Tax, Brokerage and commission, if any, are also capitalized on purchase of investments.
- 19) On sale of investments, costs incurred are reduced from the proceeds and thereafter the profit / loss on sale is computed.
- 20) Investments in equity are valued at cost or fair market value whichever is lower.

24.5 CHECKLIST FOR AUDIT OF BORROWINGS AND GRANTS-IN-AID

- 1) Verify the Funding options available for the project (capital expenditure), if Internal Accruals are insufficient then only borrowings would be justified.
- 2) Ensure that the conditions attached to borrowings are not prejudicial to the interests of the company.
- 3) Ensure that all the loan covenants are appraised to the Board for according proper sanction.
- 4) The following factors are very vital for any borrowing :a) Rate of interest (simple or compounding);
b) Tenure of the loan;
c) Moratorium period;
d) Put / call options attached;
e) Documentation charges & commitment charges;
f) Pre-payment charges;
g) Interest on overdue installments;
h) Penal interest for failure to adhere to certain conditions.
- 5) Ensure that the Policy framework for inter-corporate borrowings formulated by the Investments / Borrowings committee of the management is duly adhered to.
- 6) While selecting a funding agency ensure that the recommendations of the Committee / Board are followed.
- 7) In case of Borrowings in Foreign Funding agencies (ECBs) ensure that the provisions of Foreign Exchange Management Act and the guidelines of Reserve Bank of India are followed.
- 8) Ensure that AS-11 on “Accounting for Foreign Exchange Transactions” is complied with while accounting for the Borrowings in foreign exchange and their end use.
- 9) In case of Grants-in-aid Check whether the same is treated as Equity and the procedure for issue and allotment of shares is duly followed.
Documentation, Hypothecation / pledging of assets and creation of charge etc.;
- 10) Servicing the Borrowings (Payment of Interest / Principal);
- 11) Payment terms and other conditions attached thereto.



Issue and allotment of Equity, if envisaged;

12) Adherence to conditions attached with the Grants-in-aid;

13) Compliance with Accounting Standards.

24.6 CHECKLIST FOR AUDIT OF PROJECTS & CONSTRUCTION ACTIVITIES

1) Verify the Project Feasibility Report and examine the following factors :a)

Total Project Cost (including pilot project cost);

b) Total Resources required and available;

c) Composition of Resources into Equity and Borrowed funds;

d) Ensure that the IRR of the project is more than the Cost of Capital of the Company;

e) Ensure that the project with shortest pay back has been selected;

f) Ensure that the Risks associated (E.g. inflation, availability of materials etc.) are also properly factored;

g) Ensure that the projections prepared reflect the inherent assumptions underlying the project;

h) Ensure that the Net Present Value from the project is positive;

i) Ensure that the Moratorium period for the project is properly negotiated and is reflected in the payment schedule;

j) Ensure that correct Corporate Tax rate is applied for arriving at the Profits after Tax (not just MAT rates).

2) Selection of Funding Agency:

a) Ensure that a comparison chart is prepared listing out the various conditions and their financial impact;

b) Verify the loan covenants to ensure the options for conversion of Debt to equity;

c) Verify the Documentation for Borrowing of funds and the charges created along with the hypothecation / pledging of assets;

d) Verify the loan sanction letter and the drawing schedule;

e) Ensure that drawing of funds is as per the schedule and there are no over / under drawing of funds;

f) In case of levy of commitment charges enquire about the reasons for non-drawing of funds and ensure that the same is also capitalized as part of finance charges.

3) Selection of Contractor / Agency for implementation: Similar procedure laid down for selection of contractors may be applied here also.

4) Ensure that Performance guarantee is insisted and EMD is forfeited in case of failure to execute the project as promised.

5) Ensure that the statutory Deductions / obligations like EPF, workmen compensation etc., are to the Contractor's account.

6) Ensure that in case of composite contracts of Purchase of equipment and erection thereof proper treatment of Service Tax (by claiming applicable abatement) and VAT (treatment of works contracts provisions) are properly done duly referring to latest circulars / notifications / advanced rulings by appropriate authorities.



- 7) Ensure that the omissions pointed by the Quality Control (QC) Wing are rectified by the contractor or else applicable recovery has been affected.
 - 8) Ensure that Performance Guarantee period clause is also insisted.
 - 9) Project feasibility study based on the need of the project;
 - 10) Project finalisation and selection of contractors / partners for execution;
 - 11) Selection of sources of funding (equity / borrowings) and mobilisation of resources as well;
 - 12) Project implementation which involves allocation of works contracts;
 - 13) Review of progress of works (both Financial and Physical progress);
 - 14) Coordination with the funding agencies.
- Documentation with the Contractor like execution of Performance bank guarantee & insurance cover for the works;
- 15) Check-measurement of the works done / in progress;
 - 16) Passing of bills for payment (part & final);
 - 17) Adherence to QC recommendations;
 - 18) Compliance with statutory obligations for various deductions & adherence to conditions of the agreement.

24.7 CHECKLIST FOR AUDIT OF INFORMATION SYSTEMS AND ELECTRONIC DATA PROCESSING

A) Audit of Access Controls:

- 1) Enquire about the access options available to each user of the system (SAP / BMS etc.).
- 2) Ensure that the Number of Users and the Number of Logins are matching and in case of unmatched Logins check whether the accounts are active and if so ensure that those accounts are immediately de-activated.
- 3) Is there a register containing the User Id's and the details of the users along with the privileges attached to their account?
- 4) Is there a document containing the Approved Privileges matrix for each user department?
- 5) Check whether the privileges attached to a user account are in line with the duties & responsibilities assigned to the user considering the job profile of the user.
- 6) Ensure that there is a system of auto time out in case of no use of the system for a specified period.
- 7) Verify whether there is a System of de-activation of user accounts in the event of no use for a specified period.
- 8) Verify whether the accounts of all users who were transferred / expired / resigned / retired are de-activated.
- 9) Is there a system of mandatory password / PIN change immediately after the account has been first accessed?
- 10) Is there a system of compulsory password / PIN change after an interval of specified period (say for every 3 months).
- 11) Ensure that the log is generated for all login attempts (both successful & unsuccessful) along with the IP address of the computer with date & time of attempt.



- 12) Check whether there is a system of verification of user access log at periodic intervals and action is initiated in cases of unauthorised attempts.
- 13) Ensure that this user access log file is not accessible for the users of the information systems and the Systems Security Administrator can only access it and all the previous log files are saved separately.
- 14) Ensure that the applications / software / operating systems installed in the computers of the company are legally valid and the source application is under proper security (under the control of the head of the unit in a secured vault).
- 15) Check whether the unused user Id and password / PIN are under Safe Custody of the Systems Administrator and the same are covered under the Annual Physical Verification of Assets / Stocks. In case of missing User Ids and Password / PIN ensure that the same are de-activated immediately.

B) Audit of Input Controls:

- 1) Ensure that the Data Input is through an application / program only.
- 2) Whether the log for users accessing the Data Server is generated and the same is reviewed by the Data Base Administrator (DBA).
- 3) Ensure that Data Entry & Data Modifications are not permitted for data captured through Spot Billing Machines (SBM) / AMR Devices / Card Readers / Scanners.
- 4) Check whether there is a check to ensure that the Data ported from the SBM / AMR is not over written with another set of data either manually or through SBM or through an application.
- 5) Ensure that Modifications to Data ported from the SBM / AMR has valid authorisation from the concerned Officer responsible for readings and the Data Base Administrator.

C) Audit of Application Controls:

- 1) Check whether Data Integrity Controls are deployed in the application to reject any junk / unwanted data.
- 2) Check whether the application has Boundary Controls to test the reliability of the application at the lower and upper boundaries of any logic.
- 3) Check whether the Conditions laid down in the Tariff Order and the General Terms and Conditions of Supply and the Instructions issued from time to time are properly incorporated in the programming logic. (For instance, relation between the purpose of supply and the Category, Relation between the Voltage of supply and the Tariff, Load and the Category of Billing as some categories cannot exceed certain load limits).
- 4) Ensure that Exception Handling is commensurate with the complexities of the Tariff Conditions.
- 5) Check whether there is a provision for generating Exceptions available to the user based on given criteria.



- 6) Ensure that there is proper documentation for the conditions in Tariff and the corresponding Business Logic in the Application, which should be validated jointly by an Officer responsible from the User Department and the Chief Programmer.
- 7) Is there a system of testing the Controls vis-à-vis the Tariff conditions with Test data and check whether such Test data and results are available for verification?
- 8) Check whether the application is tested with Test Data on every occasion of modifications to the application either with the introduction of new conditions or at the time of modification of Tariff.
- 9) Check whether the module consisting of Tariff (Viz., unit rate, Fixed Charges, Surcharge etc.) is not accessible by any officer from the User department / IT wing except the Chief of the User Department for the Company with the written authorisation from the Director concerned.
- 10) Ensure that data entry is not permitted in the Application Development Section / Wing of the IT department.
- 11) Whether the source code of the application available with the company? Whether the vendor support for up-gradation and maintenance of the application is in live condition?
- 12) Ensure that the periodic updates (in the form of patches) are also stored separately.

D) Audit of Output Controls:

- 1) Ensure that the outputs are available for printing only.
- 2) In the event of outputs are allowed for saving the data ensure that the data is in a tamperproof condition (may be by converting into a PDF document).
- 3) Ensure that while generating the bill for the second and subsequent time the bill must bear a caption that it is a duplicate copy.
- 4) Ensure that the outputs generated are saved for future reference and there is no need for the generation of fresh outputs for the old data.
- 5) Ensure that in case of generation of Account copy / Balance confirmation from the Application a disclaimer shall also be included as a footnote that any omissions / errors observed may be informed for correction.
- 6) Ensure that the Outputs (for consumer ledger) shall include two segments where the first segment will indicate the transactions of billing and dues and the second segment will indicate the Memoranda items such as ACD due etc.
- 7) Ensure that the monthly Disconnection List will exhibit both the Current Dues and the uncollected portion of ACD separately.

E) Audit of Security Controls:

- 1) When the Application can be accessible from a remote terminal check whether a log is generated for the same.
- 2) Check whether the Application can be accessible through Internet. Are there any controls to place restrictions on accessing the application through Internet?
- 3) Check whether a Firewall is activated on all the Terminals in the Network.



- 4) Ensure that the IS environment has proper security and intrusion detection system and persons having proper authorisation shall only be permitted.
- 5) Ensure that there is a proper fire protection system (using Carbon Dioxide only) is in place.
- 6) Ensure that the Fire extinguishers are refilled on the due date, even if so far not used.
- 7) Check whether the Fire extinguishers are within the accessible reach of the users.
- 8) Check whether the Server Room is protected from Dust, Heat, Magnetic Interference and Electro-magnetic Radiation.
- 9) Ensure that beverages, water and any other liquids are prohibited in the server room.
- 10) Ensure that all the output modes (including backup using Memory cards, Pen drives, Optical Disks, Tapes etc.) other than display & printing are de-activated on all other terminals in the network except at a central location where regular backups are taken.
- 11) Ensure that all the backup devices (such as Optical Disks, Pen drives, Memory Cards / chips etc.) brought by the users are not permitted inside the IS environment and the same are retained at the security stage only and check that any deviations from the same are properly documented.
- 12) Ensure that Terminals having access to ECS, EFTS and Internet Banking are placed in a closed chamber, which is under lock & key. As far as possible ensure that Biometric Security Systems are deployed on such computer apart from regular user Id and Password / PIN.
- 13) Check whether there is a proper documentation for all the transactions made through ECS / EFTS / Internet Banking with automatically generated Transaction Number and the Name of the Officer doing the transactions and the Authorisation for the same.
- 14) Ensure that there is a record for all unsuccessful attempts for making transactions through ECS / EFTS / Internet Banking along with the No. of attempts and the quantum of funds involved.

F) Disaster Recovery and Management:

- 1) Ensure that backup of the data is taken at periodic intervals?
- 2) Check whether the backup has been tested before being placed in a safe vault.
- 3) Check whether the backup is placed at an offsite location.
- 4) Is there any record maintained where a log file is maintained for the frequency of backup taken and place of storage of the backup data?