

Chapter – 2

Environmental Audit in Theoretical Perspective

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ENVIRONMENTAL AUDIT IN THEORETICAL PERSPECTIVE

2.1 Introduction

Environmental Audit is a recently originated and being enforced concept. It shows the attempts of industrial unit to control the environmental pollution. The concept of Environmental Audit consists of both conceptual and theoretical and research oriented. An Environmental Audit is now legally defined activity, which differs from nominal environmental review. An Environmental Audit is a way of self-examination of company's practices of pollution control and environmental protection. The statutory audit report expects evaluation of efforts for resource conservation during the period under review. However, doesn't fill satisfied unless this is reflected positively in lowering of the manufacturing cost.

2.2 Origin of Environmental Audit

Environmental Auditing is a foreign tool Environmental Auditing began in the corporate sector in use in the early seventies as a compliance to strict legal requirements. The early environmental audit stemmed not from the local authorities, but from the commercial response to national requirements. The concept of environmental audit is developed in USA in 1970 when some of the companies voluntarily started evaluation of their unit's process from the point of process and pollutant generation from production process. Such programmes are termed as environment health and safety.

In January 1982, the Occupational Safety and Health Administration (OSHA) published proposed procedure to establish voluntary programme to enforcement of the OSHA regulations within

the workplace. Many of the concepts as proposed by OSHA are now being extended to environmental auditing as well.

An Environmental Auditing Policy, followed by Environmental Protection Agency, US encourage for the use of environmental Auditing by regulated entities to help to achieve and maintain compliance with environmental laws and regulations. As well as to help to identify and correct unregulated environmental hazards. ¹

Over the years, the concept of environment Audit has voluntarily been broadened so that companies considered it as a major tool for promoting sound environmental management. However, environmental auditing and reporting. Still is at an early stage of evaluation, is being steadily studied by a variety of organisations like the Chartered Association of Certified Accountants (CACA) in UK and the in UN Intergovernmental Group of International Standards of Accounting and Reporting (ISAR).

2.3 Definitions of Environmental Audit

Various definitions of environment audit have been given from time to time generally accepted and most commonly quoted definition is as follows.

Environmental Audit is defined as basic management fool, which comprise: A systematic, documented and objective evaluation of how well organization management systems and equipments are performing (UNEP).

The International Chamber of Commerce (ICC), defines Environmental Audit is a management tool comprising of systematic, documented periodic and objective evaluation of how well organization, management and equipments are performing with the aim of contributing to safeguard the environment by facilitating management control of practices, which would include meeting regulatory and standards.

ISO 9011- guidelines for quality and environmental management system defines auditing in way of which the financial professionals defines. Auditing in this standards is a " systematic, independent, and documented process for obtaining audit evidences ---- and evaluating it objectively to determine the extent to which audit criteria...are fulfilled". ²

2.4 Setting up an Audit Programme

Developing an audit programme requires decisions to be taken on.

2.4.1 Scope and Frequency of Audit

The scope of audit will depend on the information that is required by management to monitor environmental performance. The scope of environmental audit is laid down in compliance with environmental regulations. Environmental compliance represents significant aspect of doing business in terms of the efforts and control. To determine the status of a companies compliance with control, state, and local environmental laws and regulations is the fundamental reasons for undertaking environmental auditing.

The scope of environmental auditing is also found in implementation of company's environmental polices and procedures. The scope of environmental auditing further spread into good environmental management practices and post activities of company. Therefore, an environmental audit is a vehicle to help management to identify environmental problems from post and current activities of company.

So environmental audit provides the information to determine an organisation's environmental performance. It is also expected to cover waste streams from industrial plants and wider management and operational issues.

2.4.2 Who should carry out the environmental Audit

To be of maximum values, an environment audit should be objective and auditor should be free from pressure from within the organisation. The auditor should free to make critical comments without fear of the effect of such comments on his future carrier within the organisation.

A number of major companies have established audit teams within their corporate environmental health and safety department. Some organisations have used external consultant to carry out all in types of audit.

ISO-14012 standards provides guidelines on qualification criteria for environmental auditors. 150-14012 -clause 4 laid out 'education and work experience' criterion as under.

- a) Auditor should be completed secondary educational or equivalent.
- b) Auditor should have appropriate work experience, which contributes to the development of skill and understanding in environmental science and technology, technical and environmental aspects of failing operations, relevant requirements of environmental laws, regulations, and related documents. Environmental management system and standards against which audit may be connected and audit procedures, processes and techniques.

Further, ISO-14012 described criteria an auditor training (formal training and on job training), experience and training, personal attributes and skills, lead auditor, maintains of competence, due professional care and language ³

In short, environmental auditing requires an understanding of the activity to be audited of a industrial unit or plant, an understanding of management system, environmental regulations

and permitting procedure and understanding of environmental impacts also.

2.5 An Audit Protocol

For environmental auditing, it is also necessary to develop an audit protocol. The protocol represents the plan to be used by auditors in conducting an audit. It establishes what information is to be collected. It provides a systematic basis to the audit and it also gives a step by step guide to the environmental auditor on how evidence is to be collected. The protocol is an important tool, which serves as the auditor's guide to conducting the audit and also acts as a record of audit procedure and notes completed by them.

Specifically the protocol contains –

- a) a basic questionnaires covering each environment topic.
- b) Provides the hard copy record to assist the auditors as the work of progress, a basis for referencing working papers and copies of documentation collected during the audit.
- c) The completed protocol with supporting documents are the record of the audit and form the basis for formal audit report.

Therefore, the protocol is the key step in establishing the audit programme so far it informs manger's and others about the scope of the audit.⁴

2.6 Need For Environmental Auditing

There could be both heroic and routine reasons for carrying out environmental audits. The heroic reasons are suggested by the overall objectives of governance. The view of local governments are shift from the traditional view as providers of specific services to a role as 'stewards' of the environment. A local approach aims to ensure a high quality of environment for people living in particular area.

While global view attempts to moderate the impact of local deacons on terrestrial ecology and resources. The heroic arguments for audits provided by the need to integrate ecological concerns in the economic management of societies.

The routine reasons are suggested in a recent judgment by the supreme court of India, which has proved the way for people to seek compensation for the land and water contaminated in Industrial waste contingent liabilities arising as a result of environmental degradation suggest a very pressing need for regular environmental audits.⁵

A minimum data in accounting format or auditing format are needed to assess the nature of threats to the ecosystem that are being opted by human interaction. There is also need for a wider access to environment audit reports so that the community is fully involved in developing responses to existing and future environmental hazardous.

2.7 A Typical Audit Procedure

Any premises that wishes to conduct an environmental audit must have a clear idea for the steps required to achieve it. The flowing typical audit process required to a prior to the audit. Specifically it is applicable to a manufacturing site .An environmental audit is generally undertaken in following three phases

- Pre Audit Activities
- On Site Activities
- Post Audit Activities

2.7.1 Pre - Audit Activities

The pre-audit activities of the project was commenced with the development of an audit plan, which included the scope of audit, priority topics selected and explanation of the audit procedure. Development of plan is carried by developing a questionnaires and interviews with concerned personnel. Information of an industry include

products manufactured, raw materials used, use and waste water generation, gaseous emissions, solid and hazardous waste disposed Managements environment policies. Then audit team make a visit in order to gather background information and administer questionnaires. The main objective at this stage was to minimize the time requirements for on - site audit and maximise team productivity' ⁶

2.7.2 On - Site Activities

Site activity usually starts with a meeting with senior management personal of the industry who are made aware of the audit plan.

The process engineer presented the activities regarding the process and pollution control measures undertaken by the industry. The audit team familiarized themselves with different process within the industry. Source of liquid and solid waste and their causes were identified. Audit team identified the wastewater sampling locations, ambient noise and stack monitoring locations and professional judgment was used in setting the types and sizes of sample required to verify the key controls. All observations were documented. Materials and energy measurements were also undertaken along with study of health and safety aspects. The on site phase was concluded with close out meeting between audit team and management.

Preparation of Draft Report

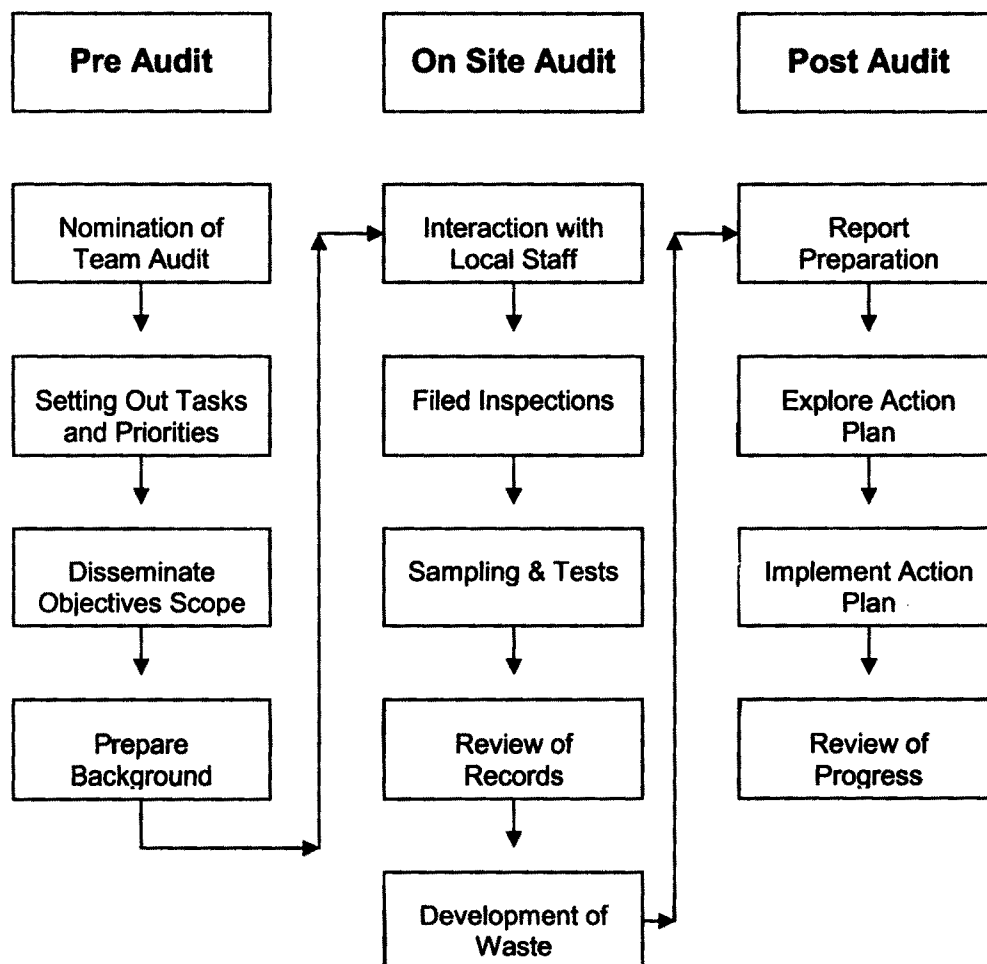
After pre audit activities and on site activity is over, a draft report is prepared and put forward to senior management. The draft reports should be prepared with findings and recommendations with the participation of management and acceptance only. Then whole exercise becomes meaningful.

2.7.3 Post Audit Activities

Post audit activities include synthesis cognizes of whole of data to form a final report. The draft report sent for comments to senior management. After receiving comments from there end, final report was submitted for their consideration and follow up action plan.⁷

2.7.4 Procedure for Environmental Audit - A Step Approach

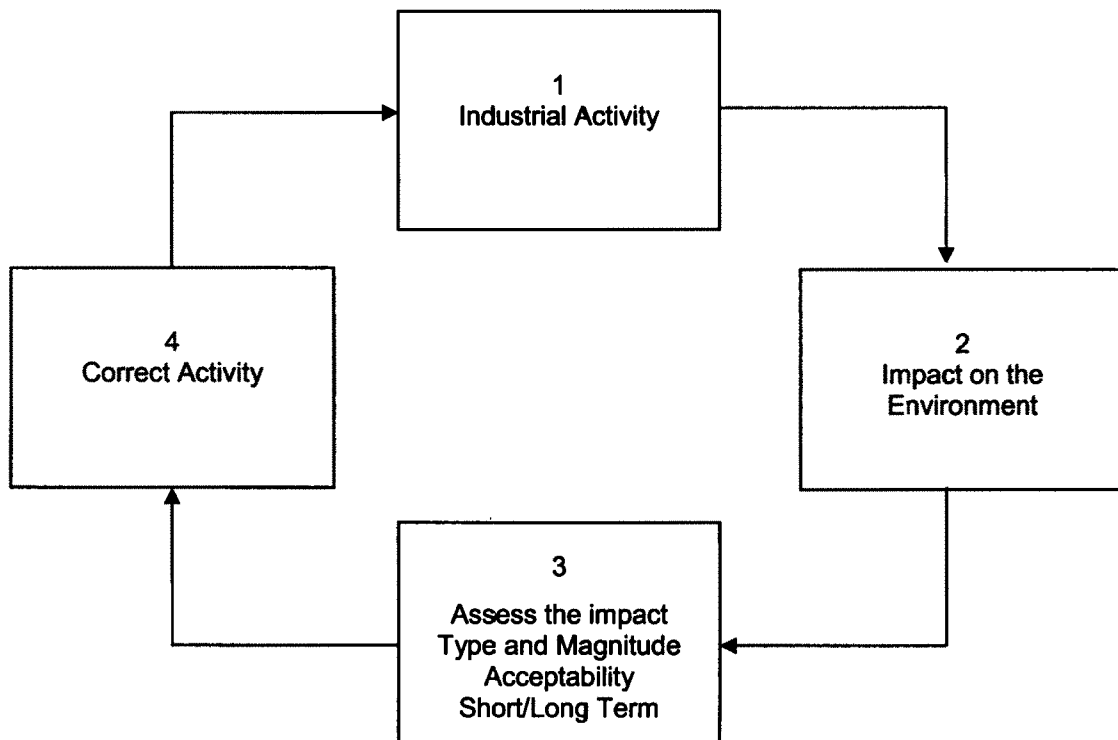
Environmental Audit is a multidisciplinary task, which can be carried out in following three phases.⁸



2.8 The Environment Auditing Cycle

Environment auditing cycle will show the organisation of environmental management in any industry. The First (Figure 1) Cycle to consider is the cycle of the relationship between industry and environment and between environmental management and industry.

2.8.1 Industry and Environment Relationship

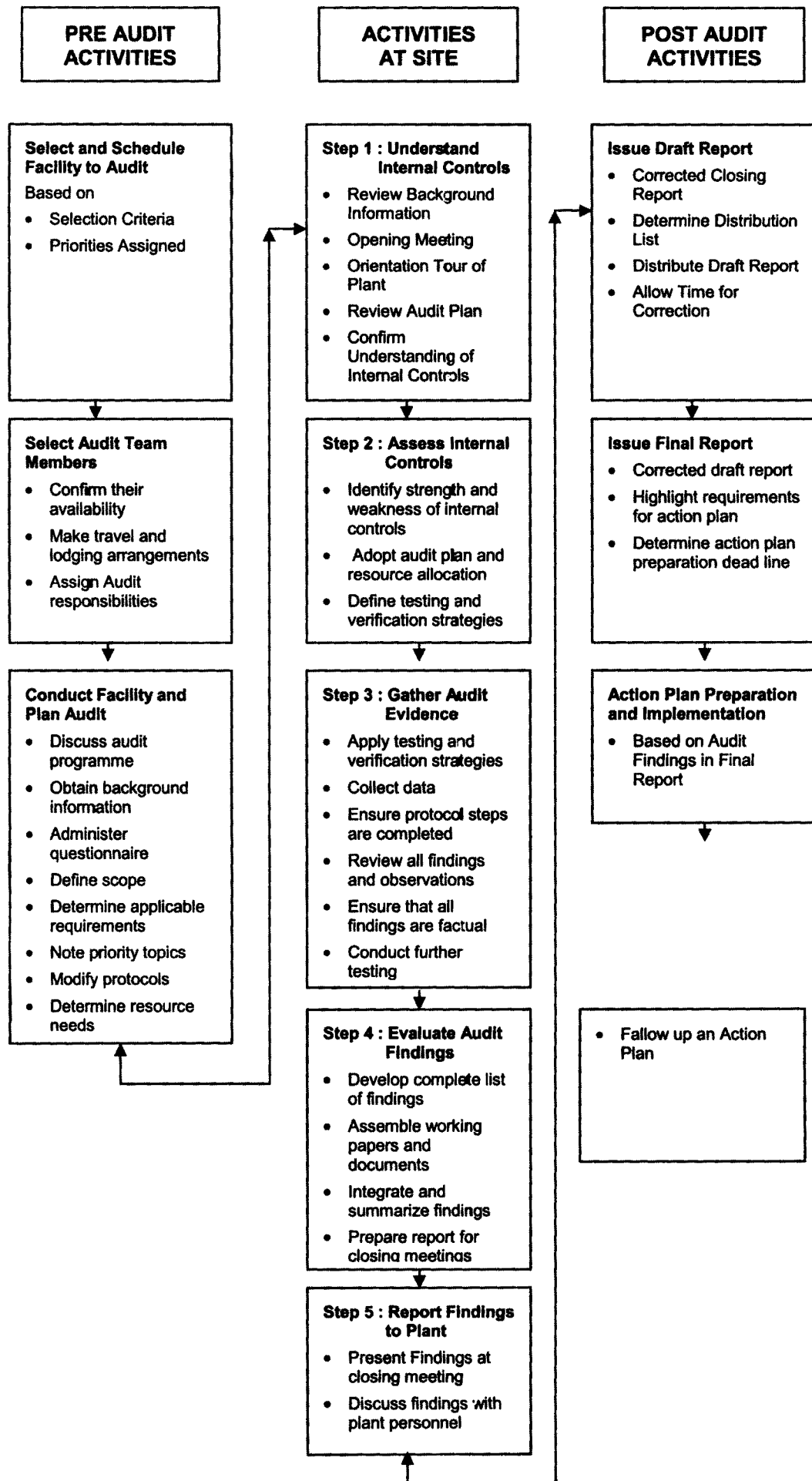


Source : International Chamber of Commerce in UNEP ITO Technical Report

Environmental auditing takes place in the third phase of the cycle and leads to the fourth phase to adopt the activity to environmental requirements.

Environmental audit is a multidisciplinary task, on which a precise methodology has to be followed. Environmental auditing methodology or basic steps of an environmental audit can be explained as follows :

2.8.2 Basic Steps of An Environmental Auditing



2.9 Components of Environmental Audit

The components of environmental audit can be categorised as process audit, material audit, energy audit, waste and wastewater audit, environment quality audit, environmental monitoring system audit, environmental legislative compliance audit, health and safety audit. Each component have to discuss with certain methodology and auditors suggestions. The chief components of environmental auditing have been discussed as follows :

2.9.1 Process Audit

Process or procedure audit covers the topics likes management of industry, documentation content, compliance ability, training control, records, changes, etc. start by selecting a procedure that now want to audit, then prepare our procedures audit profile. Define the scope of hour audit, identify the participants and prepare a brief audit plan.

Before you begin answering procedures audit questions, it is much necessary that auditors should record the name of this procedure at the top of audit questionnaire. This will help auditors to maintain the focus of their audit.

2.9.2 Material Audit

Material audit is the measurement of material used in the process of production in industries. Material audit involves consumption of material and raw material for production

2.9.3 Energy Audit

With basic auditing methodology, energy audit is also undertaken by the auditor basic data regarding operational features and working various process units. Overall energy consumption its total costs and production figures for last years are colleted for making energy audit. These figures, when compared, gave a trend of energy consumption and its costs per unit production, over the years, when sufficiently data is built up with existing records of consumption

is reviewed and measurements were taken wherever necessary by using portable instruments.

For reducing the use of energy, an auditor may suggest to individual plants about transforming of load management, power sector management, replace of oversized motors, provisions of pollution controls, heat recovery from charcoal cooling.

2.9.4 Water Audit

Water audit is conducted aimed at evaluation of existing water treatment plants, water consumptions in different process and development of water balance scenario highlighting water conservation measures.

Water audit includes productwise water consumption of water this year (Current Year) with corresponding figures of last year. The starting point of this audit is water consumption. The figures of total water input are a starting point of this audit. This should be more estimated more accurately in from i) meter bills from the water supplying authoring, ii) If water is obtained in pumping, the capacity of pump, iii) from known capacities of storage tank, iv) The water Act 1977, further expects fitting of flow meters to measure the input which will result in effluents of domestic, industrial process and cooling nature.

2.9.5 Environmental Quality Audit

Environment quality and monitoring system audit will be undertaken with following methodology and auditor's suggestion.

Ambient Air Quality monitoring is carried out to access the status of existing air quality within Industrial complex. In order to quantify stock emissions, stock monitoring is carried out at steam boiler station. Monitoring of sectional and combined wastewater discharges are carried out, performance of evaluation of effluent treatment plant is also undertaken work zone monitoring is carried out

to exposure concentrations. Noise levels are measured after identifying critical noise stations and methodology further facilities for handling and disposal of solid and hazardous waste.

Above methodology is further supported by following suggestions.

1. All SPM, So₂, and No_x concentrations are bellow prescribed limits suggested by Central Pollution Control Board (CPCB) for industrial mixed zones.
2. Leakage in the process equipment should be detected and measures are to be taken to control the same to protect the workers health and conservation of raw material.
3. Industry has to initiate necessary auditor control measures.
4. Colour removed from final effluents must be before discharging to river.
5. Noise awareness programme should be conducted among the workers.

2.9.6 Health and safety Audit

Health and safety Audits involved in manufacturing industries. Details of medical facilities details of health records, details of doctor's personnel appointed medical facilities, sanitary facilities, accidents in the factory and remedial measures taken.

Safety audit provides details of protective appliance, housekeeping, ventilation, lighting facilities for disaster management. Monitoring measures to control noise and water pollution details of on sides and details of side, emergency plans, details of complaints against water act.

The preliminary information through questionnaire, an audit protocols on health and safety aspects is collected. Its part of a health and safety audits damage distances were also calculated and suggestions are given for improvement in these aspects. During health and safety audit, auditor must stress on communication between the management and employees on safety, which is essential for creating awareness in safety programmes.

2.10 Standards For Environmental Auditing

The growing public interest in environmental issues and concerns for environmental quality has led to the emergence of strict pollution control regimes. This has brought about the development and implementation of various voluntary scheme such as Eco-management Auditing scheme (EMAS) and standards like ISO-14000 series. Standards for environmental auditing come under EMS - standards of ISO-14000. The concept of environmental auditing is closely connected with environmental norms and standards. Environmental norms are reference figures or use of rate of natural resources per production unit established for the quality of environment, the volume of waste as per production unit. Moreover, environmental standards are documents setting rules, guidelines, and numeric values defined by the involved parties and regulating activities which either have or likely to have impact on the state of the environment. Environmental auditing practices help to check, whether industrial units are performing with environmental and standards or not.

Environmental standards are adequate for providing guidelines on how environmental Auditing should be carried out and how environmental auditors should be qualified. In 1996, the International Organisation for Standardisation ISO introduced guidelines for environmental auditing covering general principles and definitions of auditing.

The supporting systems of ISO-14000, which are ISO-1410, ISO-14011 and ISO-14012, defines the guiding principals of audits. They are as follows.

- i) Basing the audit on defined objectives and drawing inferences based on analysis interpretations and documentation of appropriate information.
- ii) Utilizing an audit team that is independent of the activities the audit and utilizing an auditor who makes the specifics qualification criteria.
- iii) Exercising of due professional care by the auditor to maintain confidentiality and adequate quality assurance.
- iv) Using appropriate procedures for an objective audit.
- v) Developing audit criteria, evidence and findings.
- vi) Ensuring that the process provides desired levels of confidence in the reliability of the audit findings and conclusions.
- vii) Providing an adequate report of finding

All above guidelines have been replaced in one single standard that covers both quality and EMS Auditing – ISO-19011. The standard discussed above is considered as a core set of norms for environmental auditing.⁹

2.11 Basic elements of successful Audit

An environmental audit should be tailored to fit the company's circumstances and needs. The basic elements of a successful audit are as follows.

- a) Defining the purpose and scope of the audit, resolving policy issues and establishing priorities

- b) Assigning departmental responsibility for the audit function and ensuring in house co-operation.
- c) Choosing the audit team.
- d) Reviewing central, state and local laws. Moreover, regulations to identify regulatory programmes applicable to company operations.
- e) Selecting elements of analysis on which to base data collection.
- f) Beginning the audit,
- g) Preparing compliance profiles.
- h) Conducting a site visit.
- i) Analyzing and presenting the results of the audits and.
- j) Evaluating the audit. ¹⁰

2.12 Advanced Environmental Auditing

Advanced environmental auditing refers to the auditing of corporate sectors. A concept of advanced environmental auditing is already exists in developed countries covering various companies in group. No such guidelines are prescribed to proceed environmental audit. This study is departmentally prepared by staff. Corporate management can develop a strong desire system and undertake advanced or corporate environmental auditing. Strong and willing support from higher management is vital to the success of advanced audit exercise . The audit staff is the key factor in corporate environmental auditing. The audit team should have in depth knowledge of concerned production step, environmental pollution control technologies aptitude of logical analysis imagination and power of conservation.

The effectiveness of advanced audit programme is a direct result of confidence, training, expertise and proficiency of personnel conducting the audit. The Advanced or corporate environmental auditing comprises of company profile, scope of report, environmental Management system. Relation with stockholders communication format, environmental impacts details, financials impacts of environmental management, questionable envelopment and eco-efficiency, external certification and accreditation.¹¹

2.13. Concluding Remarks

Environmental Audit is an important tool of environmental management. It enables the control of environmental pollution, optimum use of natural resources and safety of human resources. Thus, it is a tool enables that environmental protection. However, it is a broader concept having multiple dimensions. It is essential to consider all aspects of environment audit sincerely. Hence, it is of vital importance to involve in environment audit process as a whole by the industries. The empirical analysis of environment audit will place the real state of efforts of the industries to protect environment in undertaking the necessary activities, expected under environment audit. This environment audit has both theoretical as well as practical importance.

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