A Study on "Road map for implementation of ISO14001: 2004 Environmental Management System and conducting the gap analysis"

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Abstract:

The main aim of the study is to prepare a road map for the implementation of ISO14001:2004 the Environmental Management System and conducting the gap analysis.ISO 14001 was chosen because it is a recognized international standard for environmental quality derived from the ISO 14000 standards. The proposed road map includes 10 steps of integrated management system implementation and is expected to assist in implementing such system in organizations which may or may not have any existing management system in place. The result shows the implementation of ISO14001:2004 leads to saving in consumption of energy and materials, effective waste management and improved corporate image. Further the implementation methodology is expected to assist in streamlining all the requirements of the management systems and improving overall organizational performance.

Keywords: ISO 14001, Environmental Management System (EMS), Gap analysis, Waste management, environmental quality.

1. Introduction

Environmental Management System

An Environmental Management System provides the framework for understanding an organization's Environmental footprint, which compiles with the environmental regulations, and implementing of proactive pollution prevention and sustainable strategies. An EMS is not just a checklist completed once a year to review compliance or a one-time project. An EMS invokes a continual cycle of planning, doing, reviewing, and improving (giving feedback and making changes as needed).This cycle can keep everything on the path towards the high performance behavior and conserving resources with an eye toward the future. A college that invests in an EMS can realize an array of benefits that justify EMS "curriculum development costs".

Organization of all kinds are increasingly concerned with the achieving and demonstrating of sound environmental performance by controlling the impacts of their activities ,their products and services on the environment ,consistent with their environmental policy and objectives. They do so in the context of increasingly stringent legislation, the development of economic policies and other measures that foster the environmental protection, and increased the concern expressed by interested parties about environmental matters and sustainable development.

Many organizations have undertaken environmental reviews or audits for assessing their environmental performance. On their own, however, these reviews and audits may not be sufficient to provide an organization with the assurance that its performance not only meets, but will continue to meet, its legal and policy

requirements. To be more effective, they need to be conducted within a structured management system that is integrated within the organization.

International Standards covering environmental management are intended to provide organizations with the elements of an effective environmental management system (EMS) that can be integrated with other management requirements and help organizations achieve environmental and economic goals. These standards, like other international Standards, are not intended to be used to create non-tariff trade barriers to increase or change an organization's legal obligations.

This International Standard specifies requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and information about significant environmental aspects. It is intended to apply to all types and sizes of organization and to accommodate driver's geographical, cultural and social conditions.

ISO 14001

ISO stands for the International Organization for Standardization, located in Geneva, Switzerland. ISO is a non-governmental organization, which was established in 1947, and is a global network that mainly functions to develop voluntary technical standards which aim at making the development, manufacturing and supplying of goods and services in more globally compatible way. ISO 14000 refers to a family of voluntary standards and guidance documents to help organizations address environmental issues. Included in the family are standards for EMS, environmental and EMS auditing, environmental labeling, performance evaluation and life-cycle assessment.

ISO 14001 was developed primarily to assist companies in reducing their environmental impact, but in addition to an improvement in environmental standards and performance, organizations can reap a number of economic benefits including higher conformance with legislative and regulatory requirements by utilizing the ISO standard. Organizations of all kinds are increasingly concerned with achieving and demonstrating sound environmental performance by controlling the impacts of their activities, products and services on the environment, consistent with their environmental policy and objectives. They do so in the context of increasingly stringent legislation, the development of economic policies and other measures that foster the environmental protection, and an increased concern expressed by interested parties about environmental matters and sustainable development.

Architecture of the System:

1. Continual Improvement
2. Management review
3. Checking & Corrective actions
4. Environmental Policy
5. Planning
6. Implementation & Operation

The International Standard is based on the methodology known as Plan-Do-Check-Act (PDCA).PDCA can be briefly described as follows.

- Plan: that establishes the objectives and processes which are necessary to deliver the results in accordance with the organization's environmental policy.
- Do: implement the processes.
- Check: monitor and measure processes against environmental policy, objective, targets, legal and other requirements, and report the results.
- Act: take the actions to continually improve the performance of the environmental management system.

Objectives:

- To provide a framework for a holistic and strategic approach to the organizations' environmental policy, plans and actions.
- To study the existing activities.
- To design, develop and suggest an effective EMS for the organization.

Scope of the study:

The framework for Implementation of ISO14001: 2004 is extended to any kind of institution and organization.

Literature Survey:

Reviews of various authors are given below on the ISO 14001

A.P. Puvanasvaran, 2010 said that this project involves to A Review of Purpose, Benefits, Impediments and Structure of Environmental Management System (EMS). The conclusion is to introduce environmental improvement into every aspect of a company's operations, offers an organized approach to manage environmental issues and it has now become administrative tool towards corporate environmental management

C. R. Vaz et.al., 2009 said that this project involves to Development of a Environmental Methodology for Solid Wastes Management in Higher Education Institutions and the objective of this is to present a critical analysis about the development of a methodology for solid wastes management in Higher Education Institutions (HEI). The conclusion is ISO14001 apply altogether with CP can contribute effectively for competitively improvement of HEI,

Kaisu Sammalisto, 2008 said that this project involves Training and communication in the implementation of environmental management systems (ISO 14001): a case study at the University of Gävle, Sweden and the objective of this is what methods for training and communication will support the implementation of EMS at a university. The conclusion is the main role of EMS at a university should be to focus on indirect environmental aspects.

Methodology:

The objective of the Study involves establishment of framework for a holistic and strategic approach to the institution environmental policy, plan and actions. It involves the study of existing activities, conducting a gap analysis. The Roadmap for Implementation of ISO 14001: 2004 is prepared by adopting guidelines of "Bureau of Indian Standards". A core committee has been formed. The core committee has given an environmental policy. The environmental aspects and their associated impacts are determined for the organization.

A framework has been provided for

- Legal and other requirements.
- Objectives, targets and programs.
- Implementation and operation.
- Checking.
- Management review.

A proposal has been given for waste management.

The steps given below gives the procedure for implementation of EMS:

1. General requirement
2. Environmental Policy
3. Environmental aspects and impacts
4. Legal and other requirements
5. Objectives and targets
6. Resources, roles, responsibility and authority
7. Training and awareness
8. Documentation
9. Emergency preparedness and response.
10. Monitoring and measurements

1. Introduction to General Requirements

The organization should establish, document, implement, maintain and continually improve an environmental management system in accordance with the requirements of this international standard and determine how it will fulfill these requirements. The organization shall define and document the scope of its environmental management system. Top management shall define the organization's environmental policy and ensure that, within the scope of its environmental management system, it

a. Is appropriate to the nature, scale and environmental impacts of its activities and processes.
b. Includes a commitment to continual improvement and prevention of pollution.
c. Includes a commitment to comply with applicable legal requirements and with other requirements to which the organization subscribes which relates to its environmental aspects.
d. Provides the framework for setting and reviewing environmental objectives and targets.
e. Is documented, implemented and maintained.
f. Is communicated to all persons working for or on behalf of the organization is available to the public.

2. Environmental policy for organization:

- Maximize the proportion of waste that is recycled & minimize the quantity of non-recyclable refuse.
- Minimize consumption of water.
- To save the trees (nature), organization needs to adapt reuse of books and papers.
- To save energy and reduce consumption of energy.

- Minimize the use of chemical pollutants.
- To promote sound environmental management policies and practices.
- To encourage modes of transport by staff this will minimize the environmental impact.
- Ensure that the Environmental Policy is enacted, enforced and reviewed.

3. Environmental Aspects and Impacts

Aspects and Impacts associated with activities and processes are identified considering impacts and output associated with operations, giving due consideration to normal and abnormal operating conditions and emergency.

Aspects are identified in the following categories:

a) Emission to air

b) Discharge of water

c) Waste management practice

d) Contamination of land

e) Use of raw material & natural resources

f) Re-cycle and re-use of waste and

g) Noise levels

Organization considers proper handling and disposal method complying with legal requirements where practicable. For the identified aspects, the past, present and potential impacts (Positive & Negative) are determined. It also includes identification of health and safety impacts and environmental risk assessment. The impacts identified are classified as water pollution, air pollution, noise pollution, fire hazard, personal safety, health hazard, depletion of natural resource, wastage of materials and land contamination, etc.

4. Legal and Other Requirements

The concerned Legal requirements get the updated information by referring the following agency.

a. Information in newspapers.
b. Subscription / contact with Bureau of Indian Standards, book supply Bureau, etc.
c. Consent (s) will be deemed as granted automatically and unconditionally after four months from the date of application submitted as per the rules of central pollution control board.

The following are the other requirements pertaining to the environmental aspects of the activities and processes which are to be complied with:
a. Statutory requirement by financial institutions – some institutions like banks / insurance companies may require the organization to comply with statutory norms and for those requirements.
b. Agreement with public authorities – public authorities like social bodies may require the organization to comply with their requirements.

5. Objectives and Targets

The list of significant aspects and impacts forms input for selection of objectives and targets. Significant aspects are prioritized based on the significant rating. Aspect is a leading concern; management will take it as an objective as a policy decision along with the other set objectives.

Environmental objectives and targets are established based on the following points

a) Environmental Policy - objectives to be in line with the stated environmental Policy.
b) Legal and other requirements- whether the aspect is a legal requirement and present status with respect to the consent / legal requirement.
c) Technological options - whether it is technically possible to reduce the scale of the aspect.
d) Financial requirements - whether provision can be made in the financial budget for implementing the necessary change.
e) Operational requirement - the operational control required to reduce the impact.

6. Resources Roles and Responsibility

Resources: organization has identified its resources essential to the implementation and control of the environmental management system activities. The resources include human resource and specialized skills, technological and financial resources. The system ensures assignment of trained personnel for all these activities.

Roles:

Management Representative:

Manager- facilities are appointed as Management representative, irrespective of other responsibilities. MR has the authority and responsibility to establish, document, implement and maintain effectively the environmental management system by:

a) Ensuring that environmental management system requirements are established, implemented and maintained in accordance with International Standard **ISO 14001:2004.**
b) Organizing and conducting environmental management system audit as well as identifying and recording the problems related to environmental management system to initiate, correct or provide solution through designated channels.
c) Coordinating, recording and monitoring of corrective and preventive action
d) Initiating action to prevent the occurrence of non-conformance of the environment management system.
e) Reporting on the performance of environment management system for management review and as a basis for its improvement, organizing management review and follow-up.
f) Interacting with external agencies like certification body and interested parties.
g) Document control activity with regard to environmental management system manual and environmental system procedure manual.

7. Training & Awareness

Awareness about significant environmental impacts of respective area of operation The Training needs pertaining to the environment management system is identified as follows:

- At the start of implementation of environment management system.
- At the time of employee joining.

8. Documentation

Each document contains document number, revision number and date of issue, approval and preparing authority as appropriate. Authority for issue of documents and modifying the existing documents and re-issuing the revised. The documents are reviewed for adequacy and approved by authorized persons.

The coding is done as per the coding system detailed in the procedure for allocating unique number to documents, formats to facilitate identification ,control and document change procedure.

The need for changes to documents arises during any of the following situations:

i. EMS audit finding
ii. Changes to organization structure
iii. Corrective & preventive actions
iv. Management review findings
v. Review of emergency situations
vi. Periodic review of documents
vii. As a part of continuous improvement

9. Emergency Preparedness & Response

The security function imparts safety awareness to all staffs through in-house training as per the need identified by him. To reinforce the training, the safety instructions has been prepared and displayed at relevant places. The instructions give information on safe working methods in all the sections.

An emergency response team has been constituted with personnel from all departments to review / initiate actions for the following:

a. The accidents that occurred during immediate past and the safety measure taken to avoid recurrence of such accidents.

b. Requirement of any new personal protective aids for the safety of the workmen.

c. Preventive measures to be taken to remove unsafe conditions and unsafe practices.

d. Initiating safety-training classes.

i) Personal safety equipment to be provided to the staff working in work shop and machine shop and in other areas, as appropriate.

ii) Fire extinguishers to be provided at appropriate locations and need to be tested periodically.

iii) Facilities in charge will select the vendor for hazardous waste disposal based on the criteria defined below ensuring proper handling and disposal of hazardous waste.

10. Monitoring and Measurement

The various control plans for monitoring of key Control plans have been developed for continuous monitoring of characteristics critical to operations and can have significant impact on the environment. These control plans detail the aspects to be monitored, the norms / specification, method of monitoring, frequency of monitoring.

Control plan also gives reference to disposal / mitigation plans in case of non-conformance. If disposal / mitigation plans are not available, the operating personnel will inform the concerned supervisor / in-charge who will initiate appropriate action.

The steps involved in initiating corrective actions are:

a) Investigate the cause of non-conformance

b) Recording results of investigation

c) Determination of corrective actions is effective.

The steps involved in preventive action are:

a) Analyse all processes to eliminate potential causes of non-conformances

b) Initiate preventive actions

c) Ensure that the preventive actions are effective.

Amendment to the work instructions / procedure resulting out of corrective/ preventive actions taken is carried out as per procedure for document control and procedure for control of records.

The findings of internal EMS audit also form input for taking necessary corrective / preventive actions.

Conclusion:

A framework has been provided for implementation of ISO 14001:2004 for the organizations. An effective implementation of Environment Mangement System will enable organizations to identify its environmental strengths, weaknesses, threats and opportunities which will in turn improve performance and reduces overall risk, effective waste management and improved corporate image. This enables in improving overall organizational performance.

Environmental management system will also help organization to openly demonstrate its responsibilities to their staff achieve regulatory benefits as well as secure improved efficiencies.

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