Environmental Management System for the Organizations to Achieve Business Excellence

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Abstract: Environmental Management System (EMS) is a management system approach to manage the organization’s environmental issues and opportunities. This involves continual cycle of planning, implementing, reviewing and improving the activities. ISO (International organization for standardization) – 14000 is the series of environmental standards developed for the EMS to assist and guide the organizations. This defines the features that need to be in place to ensure that the organization identifies and focuses on improving areas where they have significant environmental impacts. In the present article, steps involved to implement EMS through ISO-14000 EMS standards have been discussed. This system can be integrated with ISO 9000 Quality Management System (QMS) standards in order to achieve excellence in quality as well as environmental obligations. The focus of this research was mainly on prevention of pollution, reduction in wastes, improving internal management efficiency, resource recovery, reuse and recycling, product life cycle analysis, production of eco-friendly products, eco-mark and environmental clearance certifications, optimum utilization resources and compliance of regulatory and regal requirements. EMS focuses on key areas for the excellent performance in products, processes as well as organizations are (i) delivering values to the customers, (ii) internal operational processes and (iii) to employee’s learning as an entity. Hence, this system shall help the organizations to achieve excellent performances.

Keywords: International Organization for Standardization (ISO), Environmental Management System, Total Quality Management, Environmental Impact Assessment, Eco-Friendly Products and Services, Environmental Planning, Environmental Policy, Pollution

1. INTRODUCTION

The growing global sensitization about environment and pollution has imposed pressures to implement Environment Management System (EMS) in their organizations during production. EMS may be integrated with the total quality management. Production means processes or procedures to transform a set of input elements into a specified set of output-finished products. This is the time for the organizations to demonstrate their commitments to the society for quality and environmental compliances, as 3 Es have to be considered in an organizational planning and decision making processes (Iyer, G.V., 2006), namely 1) Engineering/Technology, which is the an application of science for the design and building of machines and structures (2) Economics, which is the science of production of goods or services and uses of goods/services and (3) Environment which is surroundings that is to protect the surroundings. Total quality management (TQM) is a set of activities carried out by the organization to effectively and efficiently achieve organizational objectives so as to provide products/services with a level of degree of excellence that satisfies customer in appropriate time and price. EMS can be divided into five events which form the sequence of a cycle. These five events are (1) Environmental Policy, (2) Environmental Planning, (3) Environmental implementation and operations, (4) Checking and corrective actions, and (5) Management Review. This cycle formulates ISO-14000 series of standards so as to assist the organizations to excel environmental and economic gains for continuously improving organizational performances. ISO 14000 certified institutions have been benefited through the prevention of pollution, reduction in wastes, enhancement of internal management system efficiency, optimum utilization of resources and compliances for legal and regulatory requirements. Organizations can be competent to face the global customer centric markets so that the products and services can be manufactured at par with the international requirements. This paper provides various steps to be taken in order to achieve business excellence in organizations with a special orientation to cover the areas of environmental issues and opportunities.

2. METHODOLOGY

2.1 Environmental management system (EMS)

An EMS is a systematic approach for managing an organization’s environmental issues and opportunities. The essential characteristic of an EMS is that its various components interact and interrelate to provide measurable and controllable information, which enables continuous learning and improvements. The “Systems Approach” means that processes are stable and repeatable, yield more predictable outcomes and adapt new learning to continuous improvement (Iyer, G.V., 2006).

The key system components of an EMS

- An Environmental Policy Statements (EPS) to be promoted by top management
- Planning Process oriented towards integration of environment (surroundings) with organization’s business and operations management
- An organizational structure responsibilities and accountability
- Implementation Systems and operational controls
- Measurement and auditing systems
- Systems for periodic top management review of the EMS

ISO 14000 standards help the organizations in
1. Managing their interactions and interrelations with the environment in effective and systematic manner.
2. Saving money and staff time required to manage their environmental affairs
3. Relating effectively to their neighboring communities and other stakeholders.

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4. Improving the image among customers and stakeholders.
5. Engaging in a process of continuous learning and improvement.

EMS standards structure emphasizes a process of continuous learning and improvement. Organizations have the ability to "learn by doing". Organizations, which meet the requirements of ISO 14001, can be certified, thereby earning the right to publicize their operations as meeting the international standards for environmental performances. Other standards in the ISO 14001 series provide necessary guidance on specific aspects of environmental management. The principles of ISO 14001 shall apply to any organization whose activities of manufacturing products and / or services interact and interrelate directly or indirectly with the environment. EMS provides assurances to the customers and suppliers. The ISO 14000 can apply to various types of organizations irrespective of their size, type, geographical location etc. These standards are based on Process Approach and Continuous Improvement.

As far as the quality of product and services are concerned, quality mean fitness for use and suitability for the use by the customers. The totality of features and characteristics of a product or service that bear on its ability to satisfy a given or implied need. TQM approach basically concerns on, 1. Customers focus, 2. Continuous learning, 3. Total employee participations

In any business following eight aspects are concerned: -
1. Customer expectation,
2. Environmental concern
3. Legislations,
4. Economics
5. Cost management
6. Technological innovations
7. Staff expectations
8. Share holders interests

2.2 Process approach and systemic approach to the EMS
Input -Process -Output -Products-Result of a Process-Effectiveness - Efficiency
Input includes resources
Output from one process will be directly from input in to next process
Process means set of interrelated and interacting activities
Procedures are specified ways to carry out an activity or a process.
Effectiveness of the process mean: Ability to achieve desired results
Efficiency means results versus resources used.
Throughout the process, monitoring and measurement opportunities (before, during and after) have to identified for necessary controls,
Understanding the process and thus fulfilling requirements,
Focusing on internal operational processes
Obtaining the results of process performance and effectiveness
Continuous improvement of processes based on objective measurements
Product/service flow from one process to another, there is information flow (for planning, auditing, feedback improvements etc.

2.2.1 Monitoring and measurement opportunities
Effective decisions usually require quantifiable data. The organization is required to monitor and measure the key characteristics of its objectives and activities in order to assess its performance in meeting environmental operational targets. An example of key characteristics is energy consumed, and the measurement method is kilowatts. Measuring equipment is of little value if it is not
accurate or functioning properly. Procedures must be in place for controls, regular calibrations, maintenance and records of all EMS equipments. Procedures are required to be periodically evaluated for compliance to regulations.

2.3 Integration of enterprise resource planning (ERP)
ERP is software that helps to integrate all the functions of an organization enabling to plan, tract and see its resources 6 Ms are reached to the customers in best possible ways. Resources 6 Ms namely 1. Men, 2. Machine, 3. Method, 4. Material, 5. Money, 6. Market. ERP effectively integrates the islands of information within the organization.

2.4 Japanese Kaizen approach in EMS
By implementation of Japanese Kaizen method which is a gradual and orderly improvement by participation of every employee with minimum cost. This method can be implemented in Environmental management system.

2.5 Japanese Five S approach in EMS
By implementing Japanese five S in EMS namely Seri, Seiton, Seiso, Seiketsu, Shitsuke
That is clearing up, Organizing, Cleaning, and Standardizing and Training methods, hence, the organizational environmental impacts can be reduced.

2.6 Integration of environmental impact assessment (EIA)
EIA is a systematic identification and evaluation of potential effects of proposed projects, plans, programs and legislative actions relative to the physical, chemical, biological and cultural and socio-economical components of the total environment (Iyer,G.V.,2006).

Various types of environments:
1. Prediction and assessment of impacts on the surface water environment,
2. Prediction and assessment of impacts on the Soil and ground water environment,
3. Prediction and assessment of impacts on the noise environment,
4. Prediction and assessment of impacts on the air environment,
5. Prediction and assessment of impacts on the biological environment,
6. Prediction and assessment of impacts on the cultural environment,
7. Prediction and assessment of impacts on the visual environment,

2.6.1 Steps to conduct EIA
Step-1: Identification of quantity and quality characteristics of concerned environment of proposed project.
Step-2: Preparation of description of existing environmental resource conditions,
Step-3: Procurement of relevant quantity and quality standards,
Step-4: Impact predictions,
Step-5: Assessment of impact significance,
Step-6: Identification and incorporation of mitigate measures,

2.7 ISO 14000 EMS series of standards and ISO 14000 certified organizations
Given below is the ISO 14000 EMS Series of Standards, which are to be used by manufacturing organizations. The standards can be divided into two areas (1) Organizational Evaluation Standard (OES), and (2) Products/Services Evaluation Standard (PSES). ISO 14001 (Environmental Management System Specifications) standards provide for. Certifications.

ISO 14001 – EMS. The formal elements of an environmental management system included environmental policy, planning, implementation, verification and management review.

ISO 14004 – General Guidance for developing and implementing an EMS.

ISO 14010 – 12 – Environmental auditing principles and guidance.
ISO 14031 – Environmental performance evaluation guidance.
ISO 14020 – 24 – Environmental labeling guidance (Products/Services)
ISO 14040 – 45 – Life-cycle Assessment principles and guidance (mainly products)
ISO 14050 – Terms and definitions
ISO Guide 64 – Inclusion of environmental aspects in product standards (Guide)
Such of those organizations fulfill all the requirements of ISO 14000 EMS series of standards shall be certified as “ISO 14000 EMS certified institution”.

3. RESULTS AND DISCUSSION

3.1 Cleaner Production
Technological innovations have been implemented in the manufacturing of the products using cleaner technologies and zero waste techniques. Cleaner production has been implemented in some of the industries namely, Petrochemical, metallurgical, chemical, pulp and paper and ship building industries.

Environmental and economic benefits are:
1. Total amount of pollution has been reduced.
2. Cost of production has been cut down.
3. Higher ecological efficiency
4. Enterprise investments pay back within three years.
5. End pipe treatments cost reduced.
6. Zero waste technique have been introduced

3.2 Ecological Industrial Development
Eco-industrial park is an industrial system of planned materials and energy exchanges among enterprises to (i) minimize energy and (ii) raw materials, usage, (iii) minimize waste discharge and build sustainable economic, ecological and social relationships.
Example Eco-industrial park: - Sugar based industry – affiliated industries are: Alcohol plant, toilet paper pant, cement plant, pulp and paper industry, calcium carbonate industry and power plants.
1. Reduction in pollution,
2. Reduction of waste disposal cost,
3. Utilization of by products.

3.3 Framework for implementation of ISO -14000 EMS standards
This section outlines the key elements of an EMS consistent with the requirements of the ISO 14001 Environmental Management System specifications. The EMS framework has five major sections, which are organized along with the Plan, Do, Check, Act (PDCA) cycle model commonly associated with Total Quality Management (Iyer, G.V., 2006). Given below which are the management principles to be followed.
Eight Management Principles:
1. Customer focused organizations,
2. Leadership
3. Involvement of people
4. Process approach
5. System approach to the management
6. Continual improvements
7. Factual approach to decision making
8. Mutually beneficial supplier relationships

Implementation of the above framework in the organizations shall be certified and called as “ISO 14000 EMS certified Institutions”.

3.4 Environmental Clearances
Highly polluting industries have to obtain environmental clearance from the regulating authorities to check that the pollution must be under control.

3.5 Formulation of environmental policies
The organization’s policy statements should be based on its Vision, Mission and guiding principles/values. It shall show the commitments of the management, leadership and directions for all the environmental activities.

3.6 Environmental planning
Environmental planning consisting of four elements: Environmental aspects, legal and other requirements, Objectives and targets and Environmental management programs (EMPs).

3.7 EMS Documentations
The Organization shall establish and maintain information in paper or electronic form to describe the core elements of the system and their interaction. ISO 14000 certification requires documentation.

3.8 EMS audits
The purpose of this audit is to ensure that the EMS conforms to plans and is being properly implemented and maintained. Internal or self-audit and external audit information should be distributed to senior management to assist in the management review process. Audit procedures should cover the scopes, frequencies and methodologies, responsibilities and requirements for conducting audits and reporting results. The audit schedule should be based on the importance of the element and the results of previous audits.

3.9 Management review
Management reviews and revisions are required to ensure that the continuing suitability, adequacy and effectiveness of the EMS are taken place (Iyer, G.V., 2006). Reviews shall be conducted on a fortnightly/ monthly basis. A fixed schedule of reviews is required to cover all the elements. The review should include the following aspects:
(i) Review of environmental objectives and targets, (ii) Review of Environmental Impact assessment,
(iii) Review of environmental performance against legal and other requirements, (iv) valuation of the effectiveness of the EMS elements, (v) Evaluation of the continuation of the policy in light of changing legislations. (vi) Compliance of Customer Requirements (vii) Changing expectations of customers, (viii) changing requirements of interested parties, (ix) changes in activities, (x) new products and services, (xi) new technologies, (xii) lessons learned, (xiii) market preferences and expectations and (xiii) effectiveness of reports and communications

4. CONCLUSIONS
The overall aim of the EMS is to provide protection to the environment and to prevent pollution so as to manufacture eco-friendly products and services. Hence, ISO 14000 certified institutions have been benefited through the prevention of pollution, reduction in wastes, enhancement of internal management system efficiency, optimum utilization of resources and compliances for legal and
regulatory requirements. Organizations can be competent to face the global customer centric markets so that the products and services can be manufactured at par with the international requirements.

The ISO 14000 Environmental Management System (EMS) standards apply to the management of an organization’s environmental issues and opportunities. It defines the features of an EMS that need to be in place to ensure that organizations identify and focus on improving areas where they have significant environmental impacts (Iyer, G.V., 2006). This system can be integrated with ISO 9000 Quality Management System (QMS) standards in order to achieve excellence in quality as well as environmental targets. Based on the EMS research conducted in European, Indian and American industries it may concluded that the flowing key areas have to be focused (i) delivering values to the customers, (ii) internal operational processes, and (ii) staff’s learning as an entity. This shall give highest degree of performance excellence in products and processes and organizations.

4.1 EMS Benefits

The benefits of EMS implemented organizations including ISO 14000 certified institutions:

- Total amount of pollution have been reduced.
- Cost of production has been cut down.
- Higher ecological efficiency.
- Enterprise investments pay back within three years.
- End pipe treatments cost reduced.
- Zero waste technique has been introduced.

4.2 Organizational benefits

1. Ecological efficiency of resource utilization shall be increased.
2. Reduced environmental impacts and risks.
3. Economics gains on the premium placed by the entrepreneurs
4. Reduced operational costs and increased savings
5. Greatest sustainability of various operations.
6. Improved quality of the products and services
7. Higher resource productivity of purchased materials through more efficient utilization and reduced waste.
8. Considerable Reduction in inventories and inventory costs
9. Reduced cost of production,
10. Reduced cost of quality and cost of maintenance,
12. Improved cost controls.
13. Improved worker health and safety, and reduced absenteeism.
14. Reduced cost of compliance with respect to regulations and waste.
15. Reduced legal liabilities
16. Customer and Supplier Relations Benefits

- Improved service quality at lower cost through systematic waste reduction.
- Improved quality of life through improved planning and accounting for environmental quality.
- Improved upstream and downstream environmental management
- Reduced costs through improved access to capital.
- Improved ability to work with business, as that have also put in place EMS (and to encourage more local businesses to implement EMS)

17. Potential Employee and Community Relations Benefits

- Higher employee morale and productivity.
- Improved employee’s health and safety (and their families in the immediate community), particularly if health and safety management are included.
- Improved image in the community and better public relations.

The implementation of the Organizational Evaluation Standards is easy because the focus of these standards is not on the product but on the process (like ISO 9000). Product Evaluation Standards involve life cycle assessment of the products services. Assuring customers that the organization is committed to environmental management.

18. The products from the company can be assured of quality.
19. Obtaining Insurance at reasonable cost
20. Maintaining a good public / community relations image.
21. Improving defense posture in litigation
22. Conserving input materials and energy
23. Satisfying investor criteria and improving relations to capital.
24. Competitive advantage results by having an increased share value.
25. Improving industry / government relations.
26. Making it easier to obtain permits and authorization.
27. Becoming cost effective by reduction of wastes.
28. Becoming more active in improving workplace and external environment.

4.3 Global benefits

There are three main global benefits that can be seen after the implementation of ISO 14000-EMS Certification.
The performance of planet earth is improved.
Build consensus that there is a need for environmental management.
Facilitate trade and remove barriers.

ISO 14000 certifications and environmental clearances have to play a major role in the process of environmental improvements Worldwide. It will certainly improve the environment.

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6. REFERENCES