Environmental Management System for the Organization to Achieve Business Excellence

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Abstract:- The ISO 14000 Environmental Management System (EMS) standards apply to the management system concepts of total quality management (TQM) 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 the organization identifies and focuses on improving areas where they have significant environmental impacts. In the present article, steps involved to implement EMS in an organization through ISO-14000 EMS standards are 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 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. EMS focuses on key drives of performance excellence in products and processes as well as organizations that are focused on delivering values to the customers, internal operational processes, and to staff's learning. Hence, this system approach to the environmental management shall achieve excellence in the overall performances of the organization.

Key Words:- ISO, Environmental management systems, 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 pressure on the business world to implement Environment Management System (EMS) in their organizations. It is the time for themselves to demonstrate their commitments to the society for environmental compliances , as 3 E^s namely 1) Engineering /Technology, (2) Economics and (3) Environment that have to be considered in the organizational planning and decision making processes. The ISO-14000 series of standards shall assist the organizations to excel environmental and economic gains for continuously improving organizational performances. They are used for prevention of pollution, reduction in wastes, enhancement of internal management system efficiency, optimum utilization of resources and compliances for legal and regulatory requirements. EMS can be basically 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. The ISO 14000 series of standards have also been designed to cover the areas of environmental issues and opportunities for the organizations to compete the global customer centric markets so that the products and services can be manufactured at par with the international requirements.

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2. Environmental Management Systems (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.

The key system components of an EMS are :

➢ An Environmental Policy Statements (EPS) actively promoted by top management;
➢ Planning Process oriented towards integration of environment 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 a more effective and
   systematic manner.

These standards provide a roadmap to an effective EMS which when properly applied, allows an organization to identify, prioritize and manage those aspects of its interacting and interrelating activities with the environment that are covered by environmental regulations as well as those that extend beyond the requirements of environmental regulations.

2. Saving money and staff time required to manage their environmental affairs

These standards emphasize a preventive approach to environmental management based on the principle of continuous learning and improvement. Many organizations have found that in implementing these principles they improve their environmental performance and also save resources.

3. Relating effectively to their neighboring communities and other stakeholders.

Many organizations have found that an EMS provides a very useful mechanism to engage their neighboring communities and stakeholders in their environmental management programs.

4. Improving the image among customers and stakeholders.

By managing their environmental affairs more effectively and in a manner that engages their customers and stakeholders, organizations have found that they improve their image among these groups with important indirect benefits to all aspects of their operations.
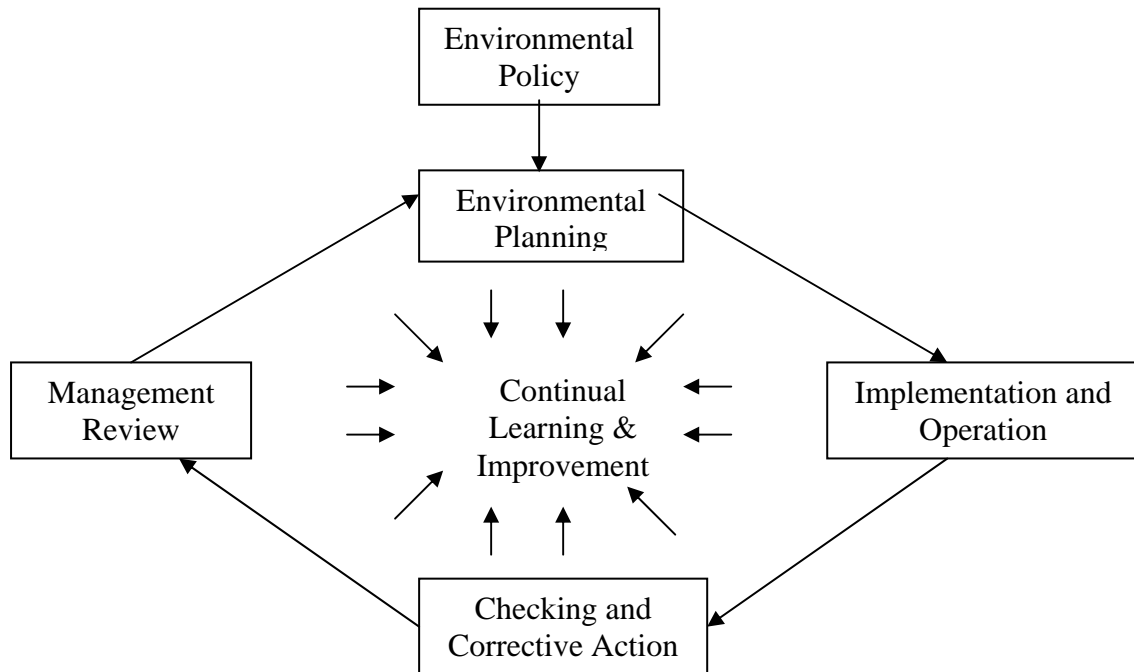
5. Engaging in a process of continuous learning and improvement .

These EMS standards structure emphasizes a process of continuous learning and improvement. Organizations have found that a key benefit of implementing an EMS is their ability to "learn by doing".

The ISO 14001 standard describes the verifiable core element of an organization's environmental management system. Organizations that 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. By registering this system, it shall assure the customers and suppliers realize and follow the EMS. The ISO 14000 shall apply to all types of

organizations whatever may be their size, type, geographical location or any other applicable conditions. The requirements of the standards are based on Process Approach and Continuous Improvement.

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

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3. ISO 14000 EMS Series of Standards

The ISO 14000 EMS Series of Standards are used by organizations to incorporate an EMS into their organization. The standards can be divided into two areas (1) Organizational Evaluation Standard (OES), and the Products/Services Evaluation Standard (PSES).

The Standards that come under OES are given below :

Only one of these standards provide for certification – ISO 14001 (Environmental Management System Specifications). Other standards provide guidelines.

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

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)

4. Costs and Benefits of an EMS

The costs and benefits of an EMS shall vary depending upon the type of organization, the existing "eco-efficiency" of resource utilization, the potential environmental impacts and risks, the degree to which the enterprise already has

implemented various elements of the EMS system, and the premium placed by the enterprise's customers and others stakeholders on a formal, independently audited EMS. For most organizations, actual benefits will depend on the degree to which management is willing to invest time and specific resources toward a full implementation of the EMS.

(i) Operational Cost - Savings
  ➢ Greater discipline for a long-term view, focusing on the sustainability of its operations.
  ➢ Improved quality of the products and services ,
  ➢ Higher resource productivity of purchased materials through more efficient utilization and reduced waste.
  ➢ Considerable Reduction in inventory costs
  ➢ Reduced cost of production,
  ➢ Reduced cost of Quality, Cost of Maintenance ,
  ➢ Energy and water conservation savings.
  ➢ Improved cost controls.
  ➢ Improved worker health and safety, and reduced absenteeism.
  ➢ Reduced cost of compliance with regulations.
  ➢ Reduced legal liabilities, and reduced insurance premiums

(ii) 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)

(iii) Potential Employee and Community Relations Benefits
  ➢ Higher employee morale and productivity.
  ➢ Improved employees 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 are easy because the focus of these standards are not on the product but on the process (like ISO 9000). Product Evaluation Standards involve life cycle assessment of the products / services. This part is under research study to apply in to the system.

5. 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 .

5.1. ENVIRONMENTAL POLICY

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 the environmental activities. Management shall ensure that the policies are implemented and carried out. An initial environmental review suggests the following directives:

  • Identification of legislative and regulatory requirements.
  • Identification of environmental aspects of its activities, products, or services that can have significant impact and liabilities.

- Identification of existing activities with suppliers.
- Identification of existing management policies and procedures.
- Evaluation of past performance with regard to the above.
- Feedback from investigation of previous incidents of noncompliance parameters.
- Identification of opportunities for competitive advantage.
- Identification of benchmarking opportunities.

The policy must be relevant to the organization's nature, scale and environmental impact of its activities, products and services.

The policy must ensure that management is committed to continuous learning and improvement and thus prevents pollution. The policy includes a commitment to comply with relevant legislation and regulations, and with any other requirements applicable to the organization, industry and locality. Other requirements may include items such as permits, licenses and voluntary program activities. The policy provides a framework for setting and reviewing environmental objectives and targets. Their setting should aim to comply with legislative and regulatory requirements. Provision must be made for periodic review of progress in meeting the objectives and targets. The policy must also be documented, implemented, and maintained; it also must be communicated to all employees. Communicating the policy to the employees is a never-ending job . It requires repetition and the use of different forms of media.

The policy must be available to the public who are the major stakeholders. Suggested approaches for the dissemination of polices are :- (1) to distribute the policies to the libraries, (2) chambers of commerce, (3) environmental organizations, (4) public access organizations and (5) NGOs.. Copies should be made available with the organization.

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 .

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,
8. Prediction and assessment of impacts on the socio-economic environment .

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,

5.2. ENVIRONMENTAL PLANNING

This area contains four elements : Environmental aspects, Legal and other requirements, Objectives and targets, and Environmental management programs.

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ENVIRONMENTAL ASPECTS

The relationship among the environmental aspects, environmental impacts, and the standard is necessary for successful implementation of the standard. It requires that environmental aspects of an organizational activities, details of products and services in order to determine the environmental impacts. EIA should be conducted. Procedures for environmental clearances should be followed.

Consideration should be given to abnormal and emergency situations, startup and shutdown, and normal operations. It is worth nothing that there is a cause-and-effect relationship between the environmental aspect and its impact.

Those aspects that relate to significant impacts shall be considered in setting objectives. It is not necessary for every aspect to have an objective-only that it be considered. This information must be kept curkjrent.

LEGAL AND OTHER REQUIREMENTS

The standard requires the organization to have a procedure to identify and have access to all the legal and other environmental requirements are those attributed to governmental legislative and regulatory action. Other requirements usually include industry codes of practice, contracts agreements with public authorities, and non- regulatory guidelines. Even if some of these requirements are voluntary, the organization is accountable to those with which it agreed to comply.

The various issues to be considered in the procedure should include how the organization:

- Accesses and identifies legal and other requirements.
- Keeps track of legal and other requirements.
- Keeps track of changes of legal and other requirements.

- Communicates relevant information about legal and other requirements to employees.

The number and complexity of legal and other requirements throughout the world can make the procedure quite complex; however, the organization need only identify those requirements that are applicable to the environmental aspects of its activities, products and services.

ENVIRONMENTAL OBJECTIVES AND TARGETS

The organization shall establish and maintain these objectives and targets that reach relevant function and level. They shall be consistent with the policy statement, especially in regard to the prevention of pollution. In addition to the environmental aspects, and the legal and other requirements which were previously discussed, this clause also requires that the organization consider.

- The best technological option to mitigate an aspect.
- Economic viability of the option.
- Cost-effectiveness of the option.
- Appropriateness of the option to the situation.
- Affordability of the option, with respect to the organization's financial, operational and business situations.
- Techno economic viability
- Socio-economical aspects

Views of interested parties such as : employees, regulatory agencies, and any other stakeholders.

Objectives may apply to one person, group, function, or to the entire organizations. They should be developed by those who are involved in their attainment. ISO 14004 lists different forms of objectives, such as :

Reduce waste and the depletion of resources.

Reduce or eliminate the release of pollutants in the environment.

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Design products to minimize their environmental impact in production, use, and disposal.

Control the environmental impacts of sources of raw material.

Minimize any significant adverse environmental impact of new developments.

Promote environmental awareness among employees and the community.

ENVIRONMENTAL MANAGEMENT PROGRAMS :

The organization shall establish and maintain a program(s) for achieving the objectives and targets. It shall includes designation of the responsible function, team, or individual and a time frame for achievement.

1. State the objective / target.
2. State the purpose (how the objective/target will support the policy).
3. Describe how the objective/target will be achieved.
4. State the program (team) leader.
5. Designate departments and individuals responsible for specific tasks.
6. Establish the schedule for completion of the tasks.
7. Establish the program review, which will include format, content, and review schedule.

5.3. EMS IMPLEMENTATION AND OPERATION

This area contains seven elements:
1. Structure and responsibility
2. Training awareness, and competency;
3. Communication;
4. EMS Documentation;
5. Document control:
6. Operational control; and
7. Emergency preparedness and response.

STRUCTURE AND RESPONSIBILITY:

Roles, responsibilities, and authorities shall be defined, documented and communicated for all personnel affecting the EMS. They must be given the freedom and authority to take the necessary actions. An organization chart is one method to show the flow of authority.   A management representative must be appointed and given the authority to ensure that this standard is being met and to periodically report to senior management the status of EMS with the aim of improvement. This appointment must not be viewed by top management as a way to avoid their involvement in the EMS. The management representative can only be as effective as management's involvement.

Senior management must provide the resources in terms of people, technology and money to implement and maintain an effective system that achieves its objectives.

TRAINING AWARENESS AND COMPETENCY :

Training needs should be evaluated on a regular basis, to ensure their effectiveness. There are two types of training; general awareness and job competency. General awareness includes the importance of conformance to the EMS, the relationship of significant environmental impacts to the employee's work activities, employee roles and responsibilities and potential consequences of failing to follow specific operating procedures. Personnel performing tasks that can cause significant environmental impacts shall be competent based on education, training, or experience. Records must be maintained to document that the training requirements have been met.

At a minimum, this training should include :
Record of training needs assessments.
Task competency requirements.
Training procedures.
Training plans.
Records of training delivered to specific employees.

Registrar's audits will require these documented records and they will be

valuable for internal operations and litigation defense if needed.

COMMUNICATION :

A key aspect of any management program is communication with all stakeholders. The standard requires that procedures shall be established and maintained for internal communication among all employees.

Effective communication up, down and laterally should ensure that questions are answered and that understanding is complete and accurate. Internal environmental communication procedures should address reporting on environmental activities to :

- Demonstrate management's commitment to the environment and EMS.
- Handle concerns and questions about environmental aspects of the organization's activities, products and services.
- Inform appropriate employees of all legal and regulatory changes and all changes to the EMS.
- Raise awareness of the organization's environmental activities.
- Ensure that all employees are aware of objectives, targets, programs, and achievements.
- Publish results of internal and external audits as well as management reviews.
- Maintain a high level of employee focus on environmental issues.

In addition, procedures shall be established for receiving, documenting and responding to relevant external communication from interested parties. It is up to the organization to decide what is relevant or not relevant. However, from a practical matter, it is best to respond to all external inquiries.

Furthermore, the organization shall consider processes for external communication of its environmental aspects and record its decision to implement or not

to implement those processes. Many organizations take a proactive approach and externally communicate their environmental aspects. Organizations that do not take a proactive approach should record the fact and present reasons for their actions.

EMS DOCUMENTATION : The Organization shall establish and maintain information, in paper or electronic form to describe the core elements of the system and their interaction and provide direction to applicable documents. ISO 14000 requires a documentation states.

EMS DOCUMENT CONTROL : This element requires that procedures be established and maintained to control all EMS documents. Examples are blueprints, test procedures, work instructions, and of course, the EMS manual. Provisions must be made for the review and approval of documents for adequacy before they are issued and after any changes. The purpose of document control is to ensure that appropriate and current issues of documents are in place at all locations. Obsolete documents must be removed and destroyed or stored in a safe place if retention for legal purposes is necessary. Documents shall be legible, dated, readily identifiable, and easily located.

The best document control system is the simplest one that meets the needs of the organization and ISO 14000. If the organization has an existing system such as ISP 9000, it can be used as a model.

ISO documentation can be viewed as four levels. **Level 1, the policy level,** is the EMS manual that includes the environmental policy responding to each clause. Organisational charts and other forms of documentation can be used to clearly define core elements of the system and how they relate to Level 2 procedures. The organization may wish to list environmental aspects; objectives; targets; and legal, regulatory and other requirements at this level.

Level 2, the procedure level, describes what the organisation does to meet

Level 1 policies. There are 17 procedures and while only three are explicitly required to be documented, it is best from an effectiveness standpoint to document all 17.

Level 3, the practice level, describes the work instructions by which operating personnel perform their tasks. They are step-by-step instructions dealing with activities required by the standard. Organization's involved with TQM or ISO 9000 will already have these activities documented.

Level 4, the proof level, is the location of all forms, records, drawings, and so forth that represent the objective evidence or proof of the performance of the EMS.

It is important to note that the system should be an efficient one and not a bureaucratic one-keep it simple. In addition, the documentation must show the interaction of the elements and provide direction to related documents such as flow charts, check sheets, and drawings.

OPERATIONAL CONTROL : This element aligns operations and activities with the identified significant environmental aspects, environmental policy and environmental objectives and targets. The organizations shall plan these activities to ensure that the procedures.

Cover situations where their absence could lead t deviations from, the policy and the objectives and targets.

Stipulate operating criteria which are the details and instructions that would normally be included in any process, procedure, or step-by-step work instruction. They include equipment to be used, materials, required, process settings, maintenance program and so forth.

Cover the identification of environmental aspects of goods and services and communicate relevant procedures and requirements to suppliers and contractors. Ford Motor Co., which has registered all 140 facilities in 26 countries, requires its suppliers to be certified to ISO 14001.

EMERGENCY PREPAREDNESS AND RESPONSE :

Procedures are required to identify and respond to potential accidents and emergency situations. In addition, the procedure should prevent or mitigate the environmental impact of these accidents and emergency situations. If plans and procedures are required by law, they will usually suffice for the standard. Emergency plans should include :

- Emergency organization and responsibilities of key personnel.
- Details of emergency services such as fire department and spill cleanup services.
- Internal and external communication plans.
- Actions to be taken for the different types of emergencies.
- Information on hazardous materials and their impact, including information about equipment and protective clothing.
- Training plans and testing for effectiveness.

These procedures shall be reviewed and revised, if necessary, especially after an emergency.

5.4. CHECKING AND CORRECTIVE ACTION

This area contains four elements:
1. Monitoring and measurement opportunities
2. Nonconformance and corrective and preventive action,
3. Records and
4. EMS audit.

MONITORING AND MEASUREMENT OPPORUNITIES: 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 operations and 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 to control, regularly calibrate, maintain, and record all EMS equipment, whether it belongs to the organization, employee, or an outside agency. In addition, procedures are required to periodically evaluate compliance to relevant regulations.

NONCONFORMANCE AND CORRECTIVE AND PREVENTIVE ACTION : Procedures are required to define responsibility and authority for

1. Handling and investigating nonconformance,
2. Taking action to mitigate any impacts, and
3. Initiating corrective and preventative action. Briefly, the process should include :

Identifying the root cause of the conformance.

Identifying and implementing the necessary corrective action.

Implementing or modifying controls necessary to prevent a recurrence.

Recording any changes in the written procedures.

Since operating personnel are usually the most knowledgeable people concerning the process, they should be involved in the corrective and preventive action activity. Any action taken to eliminate the causes should be appropriate to the magnitude of the problem and commensurate with the environmental impact. In addition, any changes to the procedures resulting from corrective and preventive action should be implemented and recorded.

RECORDS : Procedures are required for the identification, maintenance and disposition of environmental records such as training, audits, equipment calibration and reviews. Records shall be legible, identifiable and traceable to activity; protected against damage deterioration, and loss; and provided with retention times. Most organizations use some type of system for storage and retrieval f documents and

records that can readily be adapted to ISO 14000.

EMS AUDIT : 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 scope, frequency and methodologies and 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.

5.5 MANAGEMENT REVIEW

Management reviews and revisions are required to ensure the continuing suitability, adequacy and effectiveness of the EMS. The intent of this clause is to involve top management in the EMS for the continuous improvement. Management must evaluate the feedback data and make improvements to this system.

Reviews shall be conducted on a monthly basis and cover some of the elements at each review. A fixed schedule of reviews is required to cover all the elements. The review should include :

Review of environmental objectives and targets.

Review of Environmental Impact assessment ,

Review of environmental performance against legal and other requirements.

Evaluation of the effectiveness of the EMS elements.

Evaluation of the continuation of the policy in light of changing legislations.

Compliance of Customer Requirements :- Changing expectations of cutomers; changing requirements of interested parties; changes in activities, new products and services; new technologies; lessons learned; market preferences and expectations; and

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effectiveness of reporting and communication.

Review should make use of information on the basis of points obtained from the audit reviews, performance information in changing circumstances and the commitment to continuous improvement.

6. Conclusions & Recommendations

The ISO 14000 Environmental Management System (EMS) standards apply to the management system concepts of total quality management (TQM) 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.

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. 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. EMS focuses on key drives of performance excellence in products and processes as well as organizations that are focused on delivering values to the customers, internal operational processes, and to staff's learning. Hence, this system approach to the environmental management shall achieve excellence in the overall organizational performance.

BENEFITS OF HAVING EMS

The benefits of having an ISO 14000 certification can be divided into two categories – Organizational benefits and Global Benefits.

ORGANISATIONAL BENEFITS

Having an ISO 14000 certification would benefit the organization in the following ways :

- Assuring customers that the organization is committed to environmental management.
- The products from the company can be assured of quality.
- Obtaining Insurance at reasonable cost
- Maintaining a good public / community relations image.
- Improving defense posture in litigation
- Conserving input materials and energy
- Satisfying investor criteria and improving relations to capital.
- Competitive advantage results by having an increased share value.
- Improving industry / government relations.
- Making it easier to obtain permits and authorization.
- Becoming cost effective by reduction of wastes.
- Becoming more active in improving workplace and external environment.

GLOBAL BENEFITS

There are three main global benefits that can be seen after the implementation of a ISO 14000 certification.

- The performance of planet earth is improved.
- Build consensus that there is a need for environmental management.
- Facilitate trade and remove barriers.

The ISO 14000 plays a major role in the process of environmental improvement worldwide. As it can be seen how the ISO 9000 has helped organizations improve their quality, it can be expected from the ISO 14000 that it will help to improve the environment.

The formation of national and regional , local standards have led to confusion and trade barriers. This international standard will help to join all countries in their approach to environmental management and life-cycle assessment. This approach will also remove trade

barriers and make trading between countries easier. the ISO 14000 has such a framework that once it is implemented within countries, it will lead to a progress that will reassure the worldwide community.

ACKNOWLEDGEMENT

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