

# ISO 9000 And Environment Management System

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## INTRODUCTION

Environment sustains life on earth. Degradation of environment, has therefore become one of the biggest issues before the human kind as it threatens the human race. The fallout of technological explosions, unrestricted industrialization, deforestation and nuclear tests have enormous impact on the biosphere. Therefore a need for preservation of environment was felt more towards the beginning of 1970's especially with the declaration for "sustainable development" by the United Nations Conference on the Human Environment adopted at Stockholm on 16 June 1972.

The foundation for an integrated preventative approach to environmental protection were laid through the mile stone report of the World Commission on Environment and Development in 1987 which emphasized the importance of environmental protection for sustainable development. The International Chamber of Commerce (ICC) evolved a charter of 16 principles for environmental management in 1990 which were adopted by the World Industry Conference on Environment Management in 1991 (See ANNEX 1).

But it was the United Nations Conference on Environment and Development held at Rio in June 1992 where the goal of establishing a new and equitable global partnership was set through the creation of new levels of cooperation among the countries, key sectors of societies and people, working towards international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system. This triggered a world wide awakening on the importance of preservation of environment and prevent degradation to make the earth a safe place to live.

The environmental degradation is linked with industrialization. Excess use of natural resources without commensurate replenishment leaving a void weakens the natural harmony. A sustainable development assumes that as an integral part of environ-

ment, a manufacturing or service organization should not off load quantities of pollutants which over tax the regenerative capacity of the ambient receiving media namely air, water and land. To preserve the environment, urgent steps are needed to effectively manage the pollution loads let out in the environment by industries and urban settlements.

An important consequence of this perceived need for environmental protection has been a proliferation of environment- related statutory and regulatory requirements and a growing number of product-related environmental standards. Environmental management, however, as the totality of environment-related activities of an organization involving all its personnel within the framework of an environmental management system (EMS), has only recently begun to meet with keener interest.

Today the world has adopted a quality management system based on the ISO 9000 series of international standards brought out by the International organization for Standardization (ISO) to harmonize practices and channelize activities towards upgradation of quality of goods and services. There are more than 85 countries which have adopted these international standards and over 95000 enterprises are have been certified against them.

These are generic standards applicable to organizations across the board - be it industrial activity or be it service activity encompassing all services like transport, communication, financial, utilities and the whole gamut of associated services.

There is a persistent growing demand for demonstrating the effectiveness of environmental management systems. This issue is becoming increasingly important throughout the world. To meet this demand some countries have prepared/are prepar-

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ing national standards on EMS. The Bureau of Indian Standards the national standards body of India has brought out IS : 13967-1993 Specification for Environmental Management System. The trend to deal with environmental management system away from Quality Management System may not help integrated approach to EMS. Since these two are intertwined and closely linked activities they should be dealt with together in a coordinated manner.

## **GENESIS OF THE PROBLEM**

It must be seen how various human activities result in degradation of environment. The Organizations engaged in industrial, commercial or service activity supply tangible or intangible results of their network of activities and processes. These results are:

- a) product or service offered to customers to satisfy their stated or implied needs.
- b) tangible or intangible by-products or incidental outputs, such as wastes, emissions, depletion of natural resources (air, energy, land, water). These incidental outputs in comparison with the intended products or services that are the main objective of the organization, are largely unintended.

These results of human activities impinge on the environment, either immediately, during use, or after disposal, and their effects may be adverse or beneficial. Ever increasing complexity and continual expansion of the activities and processes resulting in increased environmental risks and damage generated relentless and ever increasing pressures on industry. These have given rise to more stringent legislations to promote environmental protection and to increasingly critical demands from interested parties:

- a) regarding quality of the product or services, with greater emphasis on quality characteristics that relate to their effect on the environment;
- b) regarding the quality of the incidental outputs which relate to their environment-related quality characteristics; and
- c) regarding the overall quality of an organization,

with increased consideration given to all environmental aspects, such as environmental capability and its demonstration to environmental preservation.

In today's ever increasing competition, organizations are applying effective and efficient management systems techniques, sustain satisfactory economic capability and achieve good environmental performance. The aim of such management systems is to ensure continuous improvement in quality and performance to meet the demands of its stake holders (such as customers, society, employees, owners, sub-contractors) to their increasing satisfaction.

The more enlightened stake holders often rely on technical specifications to indicate their expectations and requirements with regard both to outputs and to particular processes. However, such technical specifications cannot by themselves ensure that these requirements are met consistently, if there are deficiencies in the organizational system for the supply and support of the outputs. It is this aspect that has prompted the preparation of guidelines and of standards containing quality management system requirements which complement the product requirements given in the technical specifications. The ISO 9000 series of standards on quality management systems fall in this category. These standards provide guidance on the establishment of quality management systems and specify sets of demonstrable requirements which may be applied to consistently meet stake holders requirements.

The quality management system is an obvious step to the objectives of environmental management. This is the reason why there is a growing realization that the management principles and methods to be implemented are essentially similar. Therefore quality management and environmental management should not be seen as two distinct disciplines. The main reasons for their being treated distinct are:

- a) Quality management system concentrates on the satisfaction of the customer and the economic success of the organization. To achieve this, main emphasis is to meet customer requirements. This approach also necessitates the fulfillment of statutory and regulatory requirements pertaining to the environment.

- b) Environmental management concentrates on the fulfillment of all external and internal environmental requirements to be met both by product or service and by all incidental outputs to ensure "sustainable development"
- c) The management of organizations, quite often, regard environmental aspects as being distinct from quality aspects and fail to establish policies that coordinate the two.
- d) Specialist group engaged in QMS and EMS are different and often work under different set up.
- e) Inconsistencies between the specialist terminologies used to achieve the objectives.

These factors led to the development of psychological barriers. It is therefore necessary to remove such barriers by a common understanding that the applicable principles, methods and tools of management are in fact similar to achieve two intended purposes.

## **DEVELOPMENT OF INTERNATIONAL STANDARDS**

The international environmental management standards are intended to provide organizations with the elements of an effective environmental management system which can be integrated with other management requirements to assist organizations to achieve environmental and financial goals. These standards specify the core elements of an environmental management system to support environmental protection in balance with socio-economic needs.

Environmental management encompasses a full range of issues including those with strategic and competitive implications. Therefore quality management and environmental management systems of organizations are closely interrelated and even overlap to a great extent. An attempt should be made to balance the overall architecture of existing standards on QMS and those presently being elaborated on EMS. However, it was not possible to achieve this objective within short period and the EMS standards are, therefore, likely to differ in structure from the ISO 9000 series of standards. However, the inten-

tion of rendering the relevant standards fully compatible in content and form remains an aim of both ISO Technical Committees ISO/TC 207 on Environmental Management and ISO/TC 176 on Quality Management and Quality Assurance.

The current international standards on environmental management system under elaboration cover the following major areas:

- a) environmental management system,
- b) environmental auditing,
- c) environmental labelling,
- d) environmental performance evaluation,
- e) life cycle assessment, and
- f) terms and definitions.

The Chairman Dr. George Connor of ISO/TC 207 Environmental Management has rightly summed up the outcome of the committee as, "It has been long time to wake up to the reality that environmental management systems are business systems issue, and that business supported by public policy and standards, can be one of the greatest agent of change and improvement of environment."

The demonstration of successful implementation of the EMS standards can be used by an organization to ensure stake holders that an appropriate environmental management system is in place. This has generated demand for demonstrating the effectiveness of environmental management systems (EMS) and is becoming an issue of increasing importance throughout the world. The response has been, besides statutory or regulatory requirements, for some countries to prepare national standards and are taken as input to the standardization activities now being undertaken at international level. The aim is to achieve harmonization both in the national and the international context. However, there can never be just one standardized form of EMS, as the EMS of an organization will always be an individual configuration shaped by numerous internal and external parameters and prescripts, such as the stated objectives, the nature of the product offered, the specific organizational structures, and the relative size.

In this respect the establishment of harmoniously coordinated principles within the framework of an integrated management system is a key concern. Conflicts between the commercial and the

environmental targets of organizations can only be resolved at the highest level of management that is responsible for framing such a common policy. Overall management systems that are separated into partial management systems directed at achieving different objectives create areas of friction that usually result in a less efficient exploitation of the organization's potential. However, the linking of environmental management aspects with the rules of the ISO 9000 series is comparatively new, but consistent with the existing system.

Today it is probably obvious and a commonplace of day-to-day practice that management activities relating to the environmental aspects of product offerings and their development are not only part of environmental but also part of quality management. In other words, whatever may be its designation, where it is a matter of environmental characteristics of the product offerings and their creation, one system is involved and not two.

Therefore it is likely that in the long term there will be only one series of international Standards on quality management and environment management systems. Also on economic considerations organizations may not afford the application of different standards relating to partial aspects of their overall management system. The ISO has evolved a strategy for integration of ISO 9000 and ISO 14000 series (This series is on EMS) of standards in the following manner:

- a) Short-term goal is compatibility between the ISO 9000 : 1994 series and the ISO 14000 : 1996 series of standards.
- b) The medium-term goal is compatibility between ISO 9000 : 1999 and ISO 14000 : 1996.
- c) The long-term goal is harmonization of all standards between the two series.

To facilitate this eventual conversion, a joint task force between ISO/TC 176 and ISO/TC 207 has been constituted which meets frequently to ensure that the two committees share the same vision. If the ISO's plans are realized there would be only one set of international standards both for QMS and EMS.

## **CERTIFICATION OF EMS**

There is growing realization that environmental issues could be solved by resorting to certification system. There are two pronged approach-one way is to introduce environmental parameters in product specifications and certify them together with the product certification schemes called ECO marking or it could be independent of product specification but exclusively dealing with environmental issues.

Organizations interested in setting up an EMS for their own internal purposes can use standards, regulations or specialist literature which suits the organizational objectives. In case it is desired the EMS to be certified, a suitably documented system for demonstration of requirements is to be evolved. Individual countries have developed their national standards on "Environmental management systems; these are used as Model for demonstrating the environmental capability of an organization". The certification of QMS to comply with ISO 9001, ISO 9002 and ISO 9003 by independent certification bodies has become widespread practice throughout the world (See ANNEX-2). But certification of EMS is still in its early stages of development. It is possible that ISO 14000 series international standards will serve as a basis for future certifications. If certification bodies offer their services as environmental verifier they need to be accredited to meet international criteria.

The organisation which have established their QMS and have obtained a certificate will need to include EMS requirements to seek certification on the basis of the regulation or national standards. It would provide a most comprehensive and coherent system for demonstration of EMS requirements, deriving from relevant standardization documents, and QMS demonstration requirements stipulated in ISO 9001 that have a direct bearing on the EMS.

The organizations will have optimal use of existing management system for demonstration of framework of the EMS. With regard to the widespread use of ISO 9001, it would be better to use this standard as reference and its structure adopted as a pattern for drawing up the certification system. In fact the first goal is to have ISO 14000 as a pre-eminent environmental standard. The next goal, fur-

ther down the line is to join ISO 9000 and ISO 14000 together. This would cut cost and less disruptive to organization having QMS in place. There is also a significant likelihood that soon after the standards are published, facilities will need to be certified to them.

So organizations would seem well advised to find out exactly how the environmental standards will affect them in the long run. Getting in on the ground could help managers to get a jump on lining up their environmental management system with the international standards. This may even save them from expensive consulting fee for learning even the most basic facts about the standards.

Some countries have already started certification of quality management system on the basis of national standards such as the British Standards Institution has started EMS certification on the basis of BS 7750 a British standard on environmental system.

## ENVIRONMENTAL MARKING SCHEMES

Different countries have adopted different measures to promote schemes for environmental protection. One such scheme is labelling system of products to indicate environment friendliness of products. In India a scheme of ECO MARK has been introduced which aims at distinguishing and product which is made, used or disposed off in a way that significantly reduces the adverse effect it would otherwise have on the environment.

The objective of the scheme are:

- a) To provide an incentive for the organizations to produce environment friendly products,
- b) To reward genuine initiatives by organizations undertaking to minimize the adverse impact of their operations on the environment,
- c) To help customers to become environmental responsible by extending their patronage to products which are environmentally benign, and
- d) Ultimately to improve quality of the environment and to encourage the sustainable management of resources.

The BIS ECO Marking scheme is operated in conjunction with product certification. The environ-

mental requirements have been incorporated in product standards for operation of such a scheme.

## CONCLUSIONS

If environment is to be preserved to sustain life, protection of environment has to become our way of life. A multi-pronged approach would be required. The statutory and regulatory efforts must be supported by voluntary efforts from standardization, certification, customer awakening and education.

As environment has become a global problem, it must be dealt with globally to avoid imbalanced development. Countries must try to help development of international standards for environmental management system and use them for their certification systems based on international criteria.

The Indian organizations must take cognizance of the international developments on environmental problems especially those who are operating quality management system to ISO 9000. It is time the industry should gear up to meet challenges of harmonization of QMS and EMS standards to minimize the impact of byproducts of product or service offerings.

Mrs. Indira Gandhi, Prime Minister of India, summed up problem of environment at the International Conference of Human Environment, Stockholm 1972 as "The environmental problems of developing countries are not the side-effects of industrialization but reffect the inadequacy of development. The rich countries may look upon development as the cause of environmental destruction, but to us it is one of the primary means of improving the environment for the living, or providing food, water, sanitation and shelter, of making the deserts green and the mountains habitable."

## REFERENCES

1. ISO Bulletin, Vol.25, No.12, International Organization for Standardization, Geneva.
2. Quality World for quality professional Vol.21, No.5, Institute of Quality Assurance, U.K.
3. BS 7750:1994 Specification for environmental management system.

4. IS 13967-1993 Specification for environmental management system.
5. ISO 9000 NEWS. Vol.4, No.6, International Organization for Standardization. Geneva.
6. Gilbert M.J., Achieving Environmental Management Standards (A step by step guide to meeting BS 7750).

#### **ANNEXURE-1**

### **ICC "BUSINESS CHARTER FOR SUSTAINABLE DEVELOPMENT"**

#### **A. PREAMBLE**

There is widespread recognition today that environmental protection must be among the highest priorities of every business. In its milestone 1987 Report "Our Common Future" the world commission on Environment and Development emphasized the importance of environmental protection in the pursuit of sustainable development.

To help business around the world improve its environmental performance, the Executive Board of the International Charter for Sustainable Development" enunciating 16 principles for environmental management. It was formally launched in April 1991 at the Second World Industry Conference on environmental management.

#### **B. THE SIXTEEN PRINCIPLES**

##### **1. Corporate priority**

To recognize environmental management as among the highest corporate priorities and as a key determinant to sustainable development; to establish policies, programs and practices for conducting operations in an environmental sound manner.

##### **2. Integrated Management**

To integrate these policies, programs and practices fully into each business as an essential elements of management in all its functions.

##### **3. Process of Improvement**

To continue to improve policies, programs and environmental performance, taking into account technical developments, scientific understanding, consumer needs and community expectations, with legal regulations as starting point; and to apply the same environmental criteria internationally.

#### **4. Employee Education**

To educate, train and motivate employees to conduct their activities in an environmentally responsible manner.

#### **5. Prior Assessment**

To assess environmental impacts before starting a new activity or project and before decommissioning a facility or leaving a site.

#### **6. Products or Services**

To develop and provide products or services that have no undue environmental impact and are safe in their intended use, that are efficient in their consumption of energy and natural resources, and that can be recycled, or disposed of safely.

#### **7. Customer Advice**

To advise, and where relevant educate, customers, distributors, and the public in the safe use transportation, storage and disposal of products provided; and to apply similar considerations to the provisions of services.

#### **8. Facilities and Operations**

To develop, design and operate facilities and conduct activities taking into consideration and efficient use of energy and materials, the sustainable use of renewable resources, the minimization of adverse environmental impact and waste generation, and the safe and responsible disposal of residual wastes.

9. To conduct or support research on the environmental impacts of raw materials, products, processes, emissions, and wastes associated with the enterprise and on the means of minimizing such adverse impacts.

#### **10. Precautionary Approach**

To modify the manufacture, marketing, or use of products or services or the conduct of activities, consistent with scientific and technical understanding, to prevent serious or irreversible environmental degradation.

#### **11. Contractors and Suppliers**

To promote the adoption of these principles by contractors acting on behalf of the enterprise, encouraging and, where appropriate, requiring improve

ments in their practices to make them consistent with those of the enterprise; and to encourage the wider adoption of these principles by suppliers.

**APPENDIX-A  
COMPARISON OF ELEMENTS OF  
ISO 9001, 9002 & 9003**

Elements	ISO 9000 Models		
	9001	9002	9003
Management responsibility	*	*	*
Quality system	*	*	*
Contract review	*	*	*
Design control	*	x	+
Document & data control	*	*	*
Purchasing	*	*	+
Control of customer supplied product	*	*	*
Product identification and traceability	*	*	*
Process control	*	*	+
Inspection and testing	*	*	*
control of Inspection measuring and test equipment	*	*	*
Inspection and test status	*	*	*
Control of nonconforming product	*	*	*
Corrective & preventive action	*	*	*
Handling storage, packaging and storage	*	*	*
Quality records	*	*	*
Internal quality audits	*	*	*
Training	*	*	*
Servicing	*	*	+
Statistical techniques	*	*	*

\* Requirements present  
+ Requirement absent

**Table 1. CORRESPONDENCE BETWEEN  
ISO 9001 AND ISO 14001**

ISO 9001:1994		ISO 14001	
Management responsibility quality policy	4.1.1	4.1	Environmental policy
	-	4.2.1	Environmental aspects
	-1)	4.2.2	Legal & other requirements
	-2)	4.2.3	Objectives & targets
	-	4.2.4	Environmental management programme
Organization	4.1.2	4.3.1	Structure and responsibility
Management review	4.1.3	4.5	Management review
Quality system General	4.2.1	4.0	General
	4.2.1	4.3.4	Environmental documentation
Quality system procedures	4.2.2	4.3.6	Operational control
	Quality planning	4.2.3	-
Contract review	4.3.3)	4.3.6	Operational control
Design control	4.4	4.3.6	Operational control
Document and data control	4.5	4.3.5	Document control
Purchasing	4.6	4.3.6	Operational control
Control of customer supplied product	4.7	4.3.6	Operational control
Product identification and traceability	4.8	-	
Process control	4.9	4.3.6	Operational control
Inspection and testing	4.10	4.4.1	Monitoring and Measurement
Control of inspection, measuring & test equipment	4.11	4.4.1	Monitoring and Measurement
	Inspection and test status	4.12	-
Control of non-conforming product	4.13	4.4.2	Non-conformance & corrective and preventive action
Corrective and preventive action	4.14	4.4.2	Non-conformance & corrective and preventive action
	-	4.3.7	Emergency preparedness and response
Handling, storage, packing preservational and delivery	4.15	4.3.6	Operational control
Control of quality records	4.16	4.4.3	Records
Internal quality records	4.17	4.4.4	Environmental management system audit
Training	4.18	4.3.2	Training, awareness and competence
Servicing	4.19	4.3.6	Operational control
Statistical techniques	4.20	-	
	-	4.3.3	Communication

1) Legal requirements addressed in ISO 9001, 4.4.4  
2) Objectives addressed in ISO 9001, 4.1.1  
3) Communication with the quality stake holders (customers)

ments in their practices to make them consistent with those of the enterprise; and to encourage the wider adoption of these principles by suppliers.

## **12. Emergency Preparedness**

To develop and maintain, where significant hazards exist, emergency preparedness plans in conjunction with the emergency services, relevant authorities and the local community, recognizing potential transboundary impacts.

## **13. Transfer of Technology**

To contribute to the transfer of environmentally sound technology and management methods throughout the industrial and public sectors.

14. To contribute to the development of public policy and to business, governmental and intergovernmental programs and educational initiatives that will enhance environmental awareness and protection.

15. To foster openness and dialogue with employees and the public, anticipating and responding to their concerns about potential hazards and impacts of operations, products, wastes or services, including those of transboundary or global significance.

## **16. Compliance and Reporting**

To measure environmental performance; to conduct regular environmental audits and assessments of compliance with company requirements, legal requirements and these principles; and periodically to provide appropriate information to the Board of Directors, shareholders, employees, the authorities and the public.

### **ANNEXUR-2**

#### **ISO 900 QUALITY ASSURANCE MODELS**

The ISO 9001, 9002 & 9003 are the three quality assurance requirement models in the ISO 9000 family of standards. These are called as the three

destinations, the organizations strive to achieve. These describe quality management system requirements for organizations adopting any one of these models depending on the nature of their activities.

**ISO 9001-1994 - Quality System - Model for quality assurance in design, development, production, installation and servicing.**— This model should be selected and used when the need is to demonstrate the supplier's capability to control the processes for design, development, production, installation and servicing. The requirements specified in this model are aimed primarily at achieving customer satisfaction by preventing nonconformity at all stages from design through servicing. All enterprises that design their products and services to meet specific customer needs and have design function in place are covered by this model.

**ISO 9002-1994- Quality Systems - Model for quality assurance in production, installation and servicing.**— This model should be selected and used when the need is to demonstrate the supplier's capability to control the processes for production, installation requirement for customer satisfaction in production, installation and servicing. This is applicable to all enterprises not having design function. This include paper industry, cement industry etc.

**ISO 9003-1994- Quality System - Model for quality assurance in final inspection and test.**— This model should be selected and used when conformance to specified requirements is to be assured by the supplier solely at final inspection and test. This model specifies a quality assurance requirement for ensuring customer satisfaction in the final product. This is applicable to all those enterprises that buy things, do final inspection and testing and sell.

A comparison of applicable elements in the three models is shown in Appendix-A.