Establishing an Integrated Management System (ISO 9001, ISO 14001, OHSAS 18001) within Typical Manufacturing Industry

A

DISSERTATION

Submitted in partial fulfillment of the requirements

for the Award of the Degree of

Master of Technology

(Environment Science &Technology)

Under the Guidance of

Dr. Anita Rajor

(Lecturer)

D.B.T.E.S.

under supervision of

Mr. Somesh Rastogi

(Director)

ECPL, Ghaziabad

By

Sampurna Nand Singh

Roll No.60701008

Department of Biotechnology and Environmental Science

Thapar University

July 2009

Certificate

This is to certify that the thesis entitled **"Establishing an Integrated Management System (ISO 9001, ISO 14001, OHSAS 18001) within Typical Manufacturing Industry"** submitted by Sampurna Nand Singh in partial fulfillment of the requirement for the award of Degree of Masters of Technology in Environment Science and Technology to Thapar University, Patiala, is a record of student's own work carried out under the guidance and supervision of Dr. Anita Rajor and Mr. Somesh Rastogi. This report has not been submitted for the award of any other degree or certificate in this or any other University or institute.

(Sampurna Nand Singh)

This is to certify that the above statement made by the candidate is correct and true to the best of our knowledge.

13/7/09

Dr. Anita Rajor
Lecturer (DBTES)
Thapar University
Patiala, Punjab

Mr. Somesh Rastogi
Director
(Effikazy Consulting Pvt. L.td
Ghaziabad, Uttar Pradesh

Countersigned by

15/7/2009

(Head)

Deptt. Of Biotech. & Env.Sc.
Thapar University
Patiala

Dean
(Academic Affairs) 22/7/09
Thapar University
Patiala

Acknowledgement

The key elements concentration, dedication, hard work and application are not the only essential factors for achieving the desired goals but also guidance, assistance and co-operation of people is necessary.

I would like to express my deep and sincere gratitude to my supervisor Dr. Anita Rajor Lecturer. Her nice guidance and good suggestion gave me proper way before initiate my thesis work.

I would also like to express my deep and sincere gratitude to my supervisor Mr. Somesh Rastogi (Director Effikazy Consulting Pvt. Ltd). His wide knowledge and logical way of thinking have been of great value for me. His understanding and personal soft guidance have provided a good basis for the present thesis. Especially the strict and extensive comments and many discussions and interactions with Mr. Rastogi had a direct impact on the final form and quality of this thesis.

I owe my sincere thanks to Dr. N. Das, head of department of biotechnology and Environmental Science for allowed to do the dissertation from out of Thapar campus.

I wish to express my sincere thanks for the possible help extended especially by Mr. Somesh Ajnavi, Mr. Rasesh Rastogi and Mr. Mohit Kumar, when ever needed. Without their guidance and suggestion, this work would indeed have been very difficult for me to tackle.I would like to make special acknowledge to some of my colleagues, who have been always there for me, listening to me, rejoicing, complaining and pondering my way throughout my M.Tech., study.

I was very fortunate to have unconditional support from my family throughout this time. They have elucidated me the meaning of life, love and living. My loving thanks to my mother who has always kept my morels high through tough time.

(Sampurna Nand Singh)

Abstract

The subject of Integrated Management System in term of Quality, Environmental & Occupational Health and Safety has become of increasing interest in the public and private sector industries for more than one decade.

The objective of this study is to investigate how to establish an integrated management of Safety (S), Health (H), Environment (E) and Quality (Q) system for a typical Manufacturing Industry. It also shows the structure & benefits of all these three system.

This study shows the efficient methodologies & its requirements to establish an Integrated Management System (IMS) for a typical manufacturing industry. The objective is to meet certification requirements of each standard while reducing the cost of audit and administration. The organizations, which are going to establish IMS, are seeking approaches to integrate under a frame work of common management system.

Finally it highlights the development and implementation that the ultimate objective in the development and implementation of integrated management system to achieve an economy capable of being able to sustain itself for the better productive fool proof system.

Table of Contents

Chapter 1: Introduction

A management system is a set of interrelated elements used to establish policy and objective and to achieve those objectives. A management system includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources. Some of the management systems are as follows:

1. Quality Management System (ISO 9001)

The International Organization for Standardization developed the ISO 9001 system in the late eighties. It is a Quality management tool designed to help an organization achieve its Total Quality Management (TQM) goals. ISO 9001:2008, the more recent version of ISO 9000, consists of a series of quality management standards aimed to standardize work processes and promote quality production throughout a variety of industries. ISO 9001:2008 regularly analyzes conformance to customer requirements, characteristics of planning, construction implementation processes, and supplier performance data. ISO 9001:2008 is set of organized tools and methods that may work in conjunction with a TQM approach to achieve quality milestones.

2. Environmental Management System (ISO 14001)

An environmental management system is the system by which a company controls the activities, products and processes that cause or could cause environmental impacts and in doing so minimizes the environmental impacts of its operations. This approach is based on the management of “cause and effect”, where company’s activities, products and processes are the causes or “aspects” and their resulting effects, or potential effects, on the environment are “impacts”. Aspects would be things within company’s control that directly or indirectly cause those impacts. Environmental systems such as an internal waste minimization programme can be informal or can be formal and standardized, such as ISO 14001.

ISO 14000 is a series of international standards for environmental management. It is the first series of standards that allow organizations from around the world to pursue environmental efforts and measure performance according to internationally accepted criteria. ISO 14001 applies to any organization that wishes to improve and

demonstrate its environmental performance to others through the presence of a certified EMS.

3. Occupational Health and Safety Management System (OHSAS 18001)

An occupational Health & Safety Management System (OHSMS) provides a framework for managing OH&S activities, procedures and processes so they become more efficient and a more integrated part of the overall business operations. An OHS management system also provides a formal structure for identifying and managing significant OH&S hazards and risks. OH&S Management System is based on standards which specify a process for achieving improved OH&S performance and complying with regulations.

Similar to the quality management process, there are safety standards available to assist in the construction safety management process. The Occupational Health and Safety Assessment Series (OHSAS) 18001, is an international specification standard created to address a variety of job-site health and safety issues commonly encountered in the construction and manufacturing sectors. Similar in structure to ISO 14001, OSHAS 18001 is a documentation intensive system that can be altered and customized to cater to organizations particular needs. The primary rationale behind OSHAS 18001 is to continuously minimize occupational hazard risk in the workplace, which in turn improves company profitability.

4. Integrated Management System

An integrated management system integrates Health & Safety (OHSAS 18001:2007), Environment (ISO 14001:2004) and Quality (ISO 9001:2008) systems at an organizational level. It deals primarily with the question of how far the integration of management of the various areas of interest – Safety, Health, Environment and Quality – should be driven, in particular as reflected in the management system. Second, it provides some advice on how an integrated management system (IMS) could be developed, implemented and operated. In the disciplines of Safety, Health, Environment and Quality, the initial letters of the words: S, H, E and Q are used. Integrated management means the incorporation of issues from the different

disciplines mentioned jointly based on common values. Obviously, they can then also be administered with the same formal procedures of the management system.

The main purpose of this study is to understand the methodology and its requirement for establishing an Integrated Management System (ISO 9001, ISO 14001, OHSAS 18001) within Typical Manufacturing Industry.

Chapter 2: Literature Review

1. ISO Standards

ISO standards are voluntary. As a non-governmental organization, ISO has no legal authority to enforce the implementation of its standards. ISO does not regulate or legislate. However, countries may decide to adopt ISO standards - mainly those concerned with health, safety or the environment - as regulations or refer to them in legislation, for which they provide the technical basis. ISO only develops standards for which there is a market requirement. The work is mainly carried out by experts from the industrial, technical and business sectors which have asked for the standards, and which subsequently put them to use (www.wikipedia.org).

ISO standards are based on international consensus among the experts in the field. Consensus, like technology, evolves and ISO takes account both of evolving technology and of evolving interests by requiring a periodic review of its standards at least every five years to decide whether they should be maintained, updated or withdrawn. In this way, ISO standards retain their position as the state of the art. ISO standards are technical agreements which provide the framework for compatible technology worldwide. They are designed to be globally relevant - useful everywhere in the world.

ISO has more than 17000 International Standards and other types of normative documents in its current portfolio. ISO's work programme ranges from standards for traditional activities, such as agriculture and construction, through mechanical engineering, manufacturing and distribution, to transport, medical devices, information and communication technologies, and to standards for good management practice and for services (www.iso.org).

Table-1

Sector	**Standard or series of standards**
Environmental management system	ISO 14001

Quality management system	ISO 9001
Automotive	ISO/TS 16949:2002
Education	IWA 2:2007
Energy	PC 242, ISO 50001
Food safety	ISO 22000:2005
Information security	ISO/IEC 27001:2005
Health care	IWA 1:2005
Petroleum and gas	ISO 29001:2003
Ship recycling	ISO 30000
Medical devices	ISO 13485:2003
Supply chain security	ISO 28000:2007

Source: www.iso.org

2. Development of International Standards

An International Standard is the result of an agreement between the member bodies of ISO. It may be used as such, or may be implemented through incorporation in national standards of different countries. International Standards are developed by ISO technical committees (TC) and subcommittees (SC) by a six-step process

Stage 1: Proposal stage

Stage 2: Preparatory stage

Stage 3: Committee stage

Stage 4: Enquiry stage

Stage 5: Approval stage

Stage 6: Publication stage

The following is a summary of each of the six stages:

Stage 1: Proposal stage

The first step in the development of an International Standard is to confirm that a particular International Standard is needed. A new work item proposal (NP) is submitted for vote by the members of the relevant TC or SC to determine the inclusion of the work item in the programme of work. The proposal is accepted if a majority of the P-members of the TC/SC votes in favour and if at least five P-members declare their commitment to participate actively in the project. At this stage a project leader responsible for the work item is normally appointed.

Stage 2: Preparatory stage

Usually, a working group of experts, the chairman (convener) of which is the project leader, is set up by the TC/SC for the preparation of a working draft. Successive working drafts may be considered until the working group is satisfied that it has developed the best technical solution to the problem being addressed. At this stage, the draft is forwarded to the working group's parent committee for the consensus-building phase.

Stage 3: Committee stage

As soon as a first committee draft is available, it is registered by the ISO Central Secretariat. It is distributed for comment and, if required, voting, by the P-members of the TC/SC. Successive committee drafts may be considered until consensus is reached on the technical content. Once consensus has been attained, the text is finalized for submission as a draft International Standard (DIS).

Stage 4: Enquiry stage

The draft International Standard (DIS) is circulated to all ISO member bodies by the ISO Central Secretariat for voting and comments within a period of five months. It is approved for submission as a final draft International Standard (FDIS) if a two-thirds majority of the P-members of the TC/SC are in favour and not more than one-quarter of the total number of votes cast are negative. If the approval criteria are not met, the text is returned to the originating TC/SC for further study and a revised document will again be circulated for voting and comment as a draft International Standard.

Stage 5: Approval stage

The final draft International Standard (FDIS) is circulated to all ISO member bodies by the ISO Central Secretariat for a final Yes/No vote within a period of two months. If technical comments are received during this period, they are no longer considered at this stage, but registered for consideration during a future revision of the International Standard. The text is approved as an International Standard if a two-thirds majority of the P-members of the TC/SC is in favour and not more than one-quarter of the total number of votes cast are negative. If these approval criteria are not

met, the standard is referred back to the originating TC/SC for reconsideration in light of the technical reasons submitted in support of the negative votes received.

Stage 6: Publication stage

Once a final draft International Standard has been approved, only minor editorial changes, if and where necessary, are introduced into the final text. The final text is sent to the ISO Central Secretariat which publishes the International Standard.

All International Standards are reviewed at the least three years after publication and every five years after the first review by all the ISO member bodies. A majority of the P-members of the TC/SC decides whether an International Standard should be confirmed, revised or withdrawn (www.wikipedia.org).

3. Certification

ISO does not itself certify organizations. Many countries have formed accreditation bodies to authorize certification bodies, which audit organizations applying for ISO standards (9001, 14001) & OHSAS 18001 compliance certification.

The applying organization is assessed based on an extensive sample of its sites, functions, products, services and processes; a list of problems ("action requests" or "non-compliances") is made known to the management. If there are no major problems on this list, the certification body will issue an ISO Standard certificate for each geographical site it has visited, once it receives a satisfactory improvement plan from the management showing how any problems will be resolved.

An ISO certificate is not a once-and-for-all award, but must be renewed at regular intervals recommended by the certification body, usually around three years. (www.iso.org).

4. Auditing

Two types of auditing are required to become registered to the standard: auditing by an external certification body (external audit) and audits by internal staff trained for this process (internal audits). The aim is a continual process of review and assessment, to verify that the system is working as it's supposed to, find out where it can improve and to correct or prevent problems identified. It is considered healthier

for internal auditors to audit outside their usual management line, so as to bring a degree of independence to their judgments. (www.wikipedia.org)

5. Quality Management System (ISO 9001)

Many organizations are implementing Quality Management System (QMS) as the Quality Management System (ISO 9001) defines what the organization does to ensure that its products or services satisfy the customer's quality requirements and comply with any regulations applicable to those products or services (www.iso.org). Quality management systems (ISO 9001:2008) requirements is intended for use in any organization which designs, develops, manufactures, installs and/or services any product or provides any form of service. It provides a number of requirements which an organization needs to fulfill if it is to achieve customer satisfaction through consistent products and services which meet customer expectations. It includes a requirement for the continual (i.e. planned) improvement of the Quality Management System (www.iso.org).

ISO 9001:2008 only introduces clarifications to the existing requirements of ISO 9001:2000 and some changes intended to improve consistency with ISO 14001:2004. A quality management system being upgraded just needs to be checked to see if it is following the clarifications introduced in the amended version (ISO 9001:2008). The ISO 9001 standard is generalized and made short. Its parts must be carefully interpreted, to make sense within a particular organization. Developing software is not like making cheese or offering counseling services; yet the ISO 9001 guidelines, because they are business management guidelines, can be applied to each of these. Over time, various industry sectors have wanted to standardize their interpretations of the guidelines within their own marketplace. This is partly to ensure that their versions of ISO 9000 have their specific requirements, but also to try and ensure that more appropriately trained and experienced auditors are sent to assess them. This is the only implementation for which third-party auditors may grant certification. It should be noted that certification is not described as any of the 'needs' of an organization as a driver for using ISO 9001 but does recognize that it may be used for such a purpose (Wade, 2005).

5.1 Structure of ISO 9001:2008

The structure of this international standard shows the specify requirements for an QMS. It does not itself state specific quality performance criteria. All the structures of this international standard are generic & are intended to applicable to all organization. It has mainly eight clauses, these are following as:

1. Scope
   - 1.1 General
   - 1.2 Application
2. Normative Reference
3. Terms and Definitions
4. Quality Management System
   - 4.1 General Requirements
   - 4.2 Documentation Requirement
     - 4.2.1 General
     - 4.2.2 Quality Manual
     - 4.2.3 Control of Document
     - 4.2.4 Control of Record
5. Management Responsibility
   - 5.1 Management Commitment
   - 5.2 Customer Focus
   - 5.3 Quality Policy
   - 5.4 Planning
     - 5.4.1 Resources, Roles, Responsibility and Authority
     - 5.4.2 Competence, Training and Awareness
   - 5.5 Responsibility, Authority and communication
     - 5.5.1 Responsibility and Authority
     - 5.5.2Management Representative
     - 5.5.3 Internal Communication
   - 5.6 Management Review
     - 5.6.1 General
     - 5.6.2 Review Input
     - 5.6.3 Review Output
6. Resources Management

6.1 Provision of Resources

6.2 Human Resources

6.2.1 General

6.2.2 Competence, Awareness and Training

6.3 Infrastructure

6.4 Work Environment

7. Product Realization

7.1 Planning of Product Realization

7.2 Customer Related Processes

7.3 Design and development

7.4 Purchasing

7.5 Production and Service Provision

7.6 Control of Monitoring and Measuring Devices

8. Measurement, Analysis and Improvement

8.1 General

8.2 Monitoring and Measurement

8.2.1 Customer Satisfaction

8.2.2 Internal Audit

8.2.3 Monitoring and measurement of processes

8.2.4 Monitoring and Measurement of Product

8.3 Control of Nonconforming Product

8.4 Analysis of Data

8.5 Improvement

8.5.1 Continual Improvement

8.5.2 Corrective Action

8.5.3 Preventive Action

Source: ISO 9001:2008 Standard

5.2 Benefits of ISO 9001:2008

It is widely acknowledged that proper quality management improves business, often having a positive effect on investment, market share, sales growth, sales margins, competitive advantage, and avoidance of litigation (Dalgleish, 2005; Barnes,2000). The quality principles in ISO 9000:2008 are also sound (Wade 2002), according to

Wade, and Barnes, who says "ISO 9000 guidelines provide a comprehensive model for quality management systems that can make any company competitive" (Barnes, 1998). Barnes also cites a survey by Lloyd's Register Quality Assurance which indicated that ISO 9000 increased net profit, and another by Deloitte-Touche which reported that the costs of registration were recovered in three years. According to the Providence Business News, implementing ISO often gives the following advantages:

a. Create a more efficient, effective operation
b. Increase customer satisfaction and retention
c. Reduce audits
d. Enhance marketing
e. Improve employee motivation, awareness, and morale
f. Promote international trade
g. Increases profit
h. Reduce waste and increases productivity

In today's service-sector driven economy, more and more companies are using ISO 9000 as a business tool. Through the use of properly stated quality objectives, customer satisfaction surveys and a well-defined continual improvement program companies are using ISO 9000 processes to increase their efficiency and profitability (Dalgleish, 2005).

6. Environmental Management System (ISO 14001)

The concept of Environmental Management System (EMS) as a tool for improving the environmental performance of many private companies, governmental bodies, non governmental organizations and even citizen has emerged as a response to the globally increasing environmental demands (Diamond, 1996; Zutshi, et al, 2004). In spite of struggling with the unstable economic climate and with the new strict environmental legislation, most companies might adopt and implement Environmental Management Systems within their general management as a solution to improve their environmental performance, complying with the environmental regulations and increasing their competitiveness in the external markets (Davis, 2000; Pun et al, 2002). An EMS allows an organization to systematically manage its environmental and health environmental performance, Prevention of pollution and conserve resources, reduction of risks, attraction of new customers and markets (or at

least retain access to customers and markets with EMS requirements), increasing the efficiency, reduction of costs, enhancement of employee morale and possibly recruitment of new employees, enhancement of image with public, regulators, lenders and investors, achievement/improvement of employee awareness of environmental issues and responsibilities, and qualify for recognition/incentive programs such as the EPA Performance (Pawar et al, 2001; Pun et al,2001).

ISO 14001:2004 standard can be used to establish EMS. It is used to manage the environmental aspects of any organization's activities, products and services. It is used to improve environmental performance. Environmental performance is all about how well manage and control environmental aspects and the impact they have on the environment. It can be also using this standard to demonstrate everything to protect the environment and to improve organization environmental performance.

Organization's commitment can be demonstrated in several ways such as announcement to the world that organization's EMS complies with the ISO 14001 standard and it can be asked an ISO 14001 registrar or external auditor to verify that organization EMS complies with the ISO 14001 standard (Pearch, 2000). ISO 14001 (Stans et al, 2004.) expects organizations to comply with all of the requirements that make up the standard. According to ISO 14001, every requirement must be built into every EMS. However, there is a slight difference in the size and complexity of environmental management systems. Many factors affect the ISO 14001 requirements, including the size, the location and the scope of the organization's EMS, the contents of the organization's environmental policy, the nature of the organization's activities (products and services), and the legal and other requirements that must be met (USEPA, 2005; Dwagi, 2007). Essentially, EMS is adopted in order to fulfill current environmental legislation and continuously improve environmental performance (Whitelaw, 1997). The initial environmental goals and the pace of the improvement are thus decided by the organization itself (Lundberg, 2005; Stans et al, 2004).

ISO 14001:2004 is the international specification for an environmental management system (EMS). It specifies requirements for establishing an environmental policy, determining environmental aspects and impacts of products/activities/services,

planning environmental objectives and measurable targets, implementation and operation of programs to meet objectives and targets, checking and corrective action, and management review.

6.1 Structure of ISO 14001:2004

The structure of this international standard shows the specify requirements for an EMS. It does not itself state specific environmental performance criteria. All the structures of this international standard are intended to applicable to all organization.

It has mainly four clauses, these are following as:

1. Scope
2. Normative Reference
3. Terms and Definitions
4. Environmental Management System
   - 4.1. General Requirements
   - 4.2. Environmental Policy
   - 4.3. Planning
     - 4.3.1 Environmental Aspects
     - 4.3.2 Legal and Other Requirements
     - 4.3.3 Objectives, Targets and Programme(s)
   - 4.4. Implementation and Operation
     - 4.4.1 Resources, Roles, Responsibility and Authority
     - 4.4.2 Competence, Training and Awareness
     - 4.4.3 Communication
     - 4.4.4 Documentation
     - 4.4.5 Control of Documents
     - 4.4.6 Operational Control
     - 4.4.7 Emergency Preparedness and Response
   - 4.5. Checking
     - 4.5.1 Monitoring and Measurement
     - 4.5.2 Evaluation of Compliance
     - 4.5.3 Nonconformity, Corrective Action and Preventive Action
     - 4.5.4 Control of Records
     - 4.5.5 Internal Audit

4.6. Management Review

Source: ISO 14001:2004 Standard

6.2 Benefits of ISO 14001

The ISO 14000 standards are useful tools for proactive organizations who understand that implementing a strategic approach can bring return on investment in environment-related measures. A properly designed ISO 14001:2004 Environmental Management Systems (EMS) allows efficient identification of opportunities for cost savings. It can trigger procedural and/or technological changes that reduce the total cost of a product or improve its value (Stans et al., 2004). Some of the benefits of implementing an ISO 14000 Environmental Management System (EMS) in accordance with the ISO 14000 standards include

- Efficiency, discipline and operational integration with ISO 9000
- Greater employee involvement in business operations with a more motivated workforce
- Easier to obtain operational permits and authorizations
- Assists in developing and transferring technology within the company
- Fewer operating costs & Savings from safer workplace conditions
- Reduction of costs associated with emissions, discharges, waste handling.
- Improvements in the product as a result of process changes
- Minimizes hazardous and non-hazardous waste
- Conserves natural resources - electricity, gas and water with resultant cost
- Prevents pollution and reduces wastage
- Demonstrates to customers that the firm has met environmental expectations
- Meets potential national and international government purchasing requirements
- Delivers profits from marketing "green" products
- Provides a competitive marketing tool & Improves competitiveness
- Improves the organization’s relationship with insurance companies
- Elimination of costs associated with conformance to conflicting national standards
- Process cost savings by reduction of material and energy input

- Satisfying investor / shareholder criteria

7. Occupational Health and Safety Management System (OHSAS 18001)

Many organizations are implementing an Occupational Health and Safety Management System (OHSMS) as part of their risk management strategy to address changing legislation and protect their workforce. An OHSMS promotes a safe and healthy working environment by providing a framework that allows your organization to consistently identify and control its health and safety risks, reduce the potential for accidents, aid legislative compliance and improve overall performance (Fuller et al, 2004).

In the absence of an ISO Management system standard for occupational health and safety, OHSAS 18001 has emerged as the option taken up by organizations in more than 80 countries. OHSAS 18001 is a risk management system that has a similar framework to that found in ISO 14001(Toone, 2004). BS OHSAS 18001 is the internationally recognized assessment specification for occupational health and safety management systems. It was developed by a selection of leading trade bodies, international standards and certification bodies to address a gap where no third-party certifiable international standard exists. BS OHSAS 18001 has been designed to be compatible with ISO 9001 and ISO 14001 to help your organization meet their health and safety obligations in an efficient manner (Mohamed, 2003).

This OHSAS Standard is applicable to any organization that wishes to:

a. Establish an OH&S management system to eliminate or minimize risk to personnel and other interested parties who could be exposed to OH&S hazard associated with its activities.

b. implement, maintain and continually improve an OH&S management system.

c. Assure itself of conformity with its stated OH&S policy.

d. Demonstrate conformity with this OHSAS Standard.

e. Making a self –determination and self declaration.

f. Seeking conformation of its conformance by parties having an interest in the organization, such as customers.

g. Seeking conformation of its self declaration by a party external to the

organization.

h. Seeking certification/registration of its OH&S management system by an external organization.

For those who have established OH&S systems, the implementation of OHSAS 18001 will not be a daunting task. The language and approach is very similar is to that used in ISO Management System standards and follows the standard Plan-Do-Check-Act (PDCA) approach. So, for those organizations with quality and /or environmental management systems in place many of the requirements of OHSAS 18001 will already be established.

7.1 Structure of ISO 18001:2007

The structure of this standard shows the specify requirements for an OHSMS. It does not itself state specific environmental performance criteria. All the structures of this international standard are intended to applicable to all organization. It has mainly four clauses, these are following as:

1. Scope
2. Normative Reference
3. Terms and Definitions
4. OH&S Management System Requirements
   - 4.1 General Requirements
   - 4.2 OH&S Policy
   - 4.3 Planning
     - 4.3.1 Hazard identification, risk assessment and determining controls
     - 4.3.2 Legal and Other Requirements
     - 4.3.3 Objectives, Targets and Programme(s)
   - 4.4 Implementation and Operation
     - 4.4.1 Resources, Roles, Responsibility, accountability and authority
     - 4.4.2 Competence, Training and Awareness
     - 4.4.3 Communication, participation and consultation
     - 4.4.4 Documentation
     - 4.4.5 Control of Documents
     - 4.4.6 Operational Control
     - 4.4.7 Emergency Preparedness and Response

4.5 Checking

4.5.1 Performance Measurement and Monitoring

4.5.2 Evaluation of Compliance

4.5.3 Incident Investigation Nonconformity, Corrective Action and Preventive Action

4.5.4 Control of Records

4.5.5 Internal Audit

4.6 Management Review

Source: OHSAS 18001:2007 Standard

7.2 Benefits of BS OHSAS 18001:2007

Certifying your BS OHSAS 18001 Management System enables your organization to prove that it conforms to the specification and provides the following benefits:

- Potential reduction in the number of accidents
- Potential reduction in downtime and associated costs
- Demonstration of legal and regulatory compliance
- Demonstration to stakeholders of your commitment to health and safety
- Demonstration of an innovative and forward thinking approach
- Increased access to new customers and business partners
- Better management of health and safety risks, now and in the future
- Potential reduced public liability insurance costs

8. Integrated Management System

IMS is when the management of the included disciplines – e.g., S, H, E and Q– are based on the same values and principles. Then, it should also be possible to combine – integrate - common or similar elements of two or more management subsystems resulting, e.g., a common procedure per activity within the overall common management system (Khalil, 2006). It is implicit in the case of an effectively managed integrated system that the performance of the regulated activities will improve as well as result in more efficient paperwork of the administration.

8.1 Integration or not – a principal approach

Integration of Safety, Health and Environment, along with the possible integration of Quality, into one common management system has several advantages, but there could also be disadvantages which one has to be aware of. For many people the question of integration of management of Safety, Health, Environment and Quality is very simple to answer. Of course they should be integrated – S, H, E and Q – or whatever. They are all parts of the total management system for the enterprise or the public authority, and they just shall be integrated. However, too much or uncritical integration is not really desirable. A high degree of integration might look very efficient on paper. However, in the interest of the basic values of S, H, E and Q that we want to promote, it is often not the optimum way because it can result in a loss of focus on the various individual elements (Salomon, 2008).

As long as S, H and E aspects along with Q aspects are all given the appropriate attention, the structure of the administrative management system should not matter too much. However, in the tough business climate today we both have to obtain sufficient results in the discipline of interest and, at the same time, minimize the cost for achieving it, so there is a strong driving force for rationalizing the management system (PAS, 99). The thoughts and opinions are primarily based on the idea that the actual outcome of S, H and E should be optimized as a result of the management and the system used for that. The fundamental idea is not how to rationalize and minimize the cost for the administrative process as such by using a certain management system. Problems often arise when one tries to integrate many disciplines at a detailed level then very often the system tends to lose its focus on important aspects (Zeng et al., 2007). An integrated approach normally means that the organization itself can take command of the development of the system, and is not driven by a specific standard and its certification auditors. An integrated management system should of course be possible to certify according to wish. However, the certification/ registration cannot be the main objective for an organization to develop a SHE or Q management system.

8.2 Management Systems – Basic Concept

A management system is simply a lot of common sense put into a formal dress – bringing better order and structure to the way things are managed. It is a way of

describing what shall be done and normally also how, when and by whom. The famous “management loop” (as stated in the right hand column below) is what is done or at least should be done all the time.

We have always had to	Management Steps
a. Decide what we want to achieve	POLICIES
b. Think how we shall accomplish it	PLANNING
c. Carry it out in an efficient and responsible way	IMPLEMENTATION
d. Check that it has been carried out in the right way	CHECKING
e. Learn from mistakes	CORRECTIVE ACTION
f. Have assessment by the management	MANAGEMEN REVIEW
and repeat the loop from point a.	

This is also known as Plan-Do-Check-Act (PDCA cycle).
Most management system (SHE+Q) is built on the "Plan, Do, Check and Act" model. This model leads to continual improvement based upon:

Plan: Planning, including identifying environmental aspects and establishing goals.
Do: Implementing, including training and operational controls.
Check: Checking, including monitoring and corrective action.
Act: Reviewing, including progress reviews and acting to make needed changes to the SHE + Q management system (Eves et al., 2005).

8.3 Benefits of Integration

To a very large extent the same general principles are used to manage the operations in terms of S, H and E. It is therefore logical to integrate these three disciplines into one common management system. Separate management systems for S, H, E and Q would require many similar or identical parts, e.g.:

- **a.** Delegation of tasks (responsibility questions);
- **b.** Adequate competence and training of personnel;
- **c.** Operating instructions/control, measurement and documentation;
- **d.** Auditing.

So, instead of duplicating work, there is a lot to be gained from combining the common parts at least. One big benefit of integration is that it will lead to an increased, and also more balanced, focus of the integrated disciplines and thereby improve the quality of the SHE work (Khalil,2006). Managing these questions in an integrated way will be more cost-effective, because there will be considerably fewer documents to keep track of, to up-date and to train people in, and for the employees to follow. An integrated management system would (provided the integration is done at the right level, etc.) turn out to be efficient for the whole organization. Compared to having separate management systems, the integrated approach will result in:

- Better focus on ownership and accountability, because the ownership is felt more by the individuals of the organization.
- Enhancement of a holistic view and facilitation of priorities for the line management.
- An IMS could help in resolving the conflict between various disciplines.
- Common procedures, leading to better clarity, less training time, less documentation, less administration and reduced auditing.

8.4 Disadvantages of Integrating SHE + Q

When SHE are integrated normally there is already a Q system available. The belief is that Q will carry the SHE with it. This might be so to a certain extent, but it is more likely that SHE will not bloom to its proper extent. Focus on SHE is often lost when being formally included in a Q system. There are many examples of Q dominating the IMS where SHE is included (Khalil, 2006). There are, of course, organizations that have built Q systems based primarily on their natural activities in the same way as advocated for in this Document. Then there is a good chance that integration can work out well with a balanced focus on all the disciplines. However the majority of Q systems follow the ISO pattern closely, and then – based on the experience of the author – one should be very careful with integrating SHE with Q, especially in the form of ISO 9001:2001, because this is lacking some fundamental aspects which are vital for SHE, such as:

a. Continual improvement in performance;

b. Compliance with legislation;

c. Application to other stakeholders than customers and suppliers.

d. Considerations to risks, abnormal conditions and emergencies**.**

There may also be some disadvantages in the integration of S, H, and E.

i. Loss of focus – leveling down

There is a slight danger of getting some points unclear and losing focus on one discipline in favor of another one. Leveling down, meaning that all disciplines are adjusted to the level of the least developed discipline, is more probable than leveling upwards.

ii. Unbalanced focus – depending on level of application

Depending on the level in the organization where the integrated SHE+Q management system is applied, focus would tend to vary and could well become unbalanced. When it is applied from a local level (e.g., individual plants) the quality issue and occupational health issues tend to dominate, and more global environmental issues are neglected, whereas the opposite may be true if the system is applied from a corporate level.

iii. Different Legislation

When the legislation is different for every one of the three disciplines, an IMS could create some difficulties for the clarity on how the different requirements in the individual legislation are satisfied.

iv. More Complex Audits

It will be somewhat more difficult for one to audit an integrated system compared to tailor-made systems for every discipline. This is, however, more than out-balanced by the above-mentioned advantages for the organization. There are clear signs that at least some of the authorities are interested in seeing integrated systems in organizations, with authorities making more integrated inspections.

Chapter 3: Objective

1. Study of different management systems such as ISO 9001, ISO14001 & OHSAS 18001 and their integration.
2. Establishment of a management approach for the integration of different Management Systems (ISO 9001, ISO 14001 & OHSAS 18001) within a typical manufacturing industry.

Chapter 4: Integration Methodology for a Typical Manufacturing Industry

Develop your own IMS, based on your own prerequisites, conditions and ambitions. Choose a structure that suits your situation and business. There is no patented solution for everyone. First of all the management decide what type of integration would be implemented in the organization.

1. Type of integration

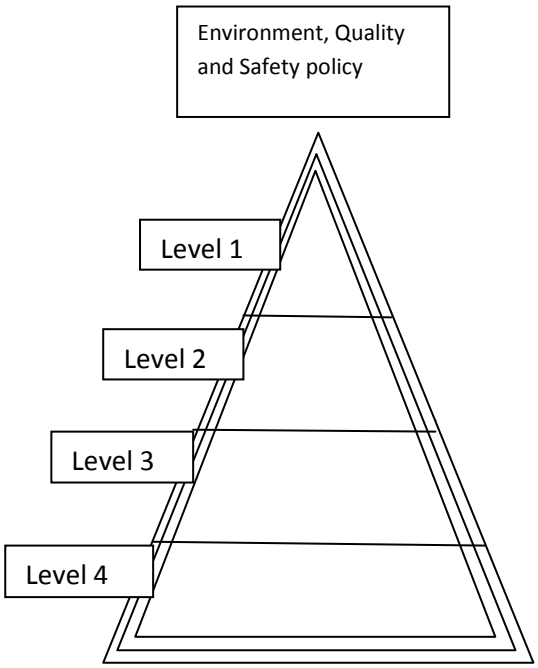
On the basis of degree of integration the integration can be classified in to mainly three types. These are following as-

Type 1: At 0% integration, there could be all three systems, such as documented policies and procedures very clearly defined, for example, held in one hard-copy folder, or within an electronic system, in a named directory. It is very obvious where one system starts and ends with no overlapping of procedures or management processes. It would be very unlikely that changes in one system would impact upon the others. The level of integration may go as far as keeping the documentation, hard copy or electronic, in the same location under the control of one manager. Three management systems may well exist, under the control of three separate management representatives with little or no overlap in terms of meetings, reviews etc. Some documents at level 4 may be common such as training request forms or calibration record forms

Type 2: At 50% integration, the appropriate policies and procedures are now held in one folder or electronic directory, but now each process or procedure has three recognizable elements to it, ISO 9001 considerations, ISO 14001 considerations and OHSAS 18001 considerations. There will probably still be three sets of objectives and targets. The level 4 forms and records will probably be the same and the level 3 documents, such as work instructions, may have all three instruction. Some objectives and targets will overlap. One manager may well co-ordinate all three systems but it is still fairly transparent where one system stops and another one begins

Type 3: At 100% integration, the boundaries between the Standards are seamless and

procedures describe processes in terms of risk management and, for example, the management system could only be dissected into its three components with difficulty. There is now one overall policy for the site and all the objectives and targets are contained within one set of common objectives .



Type 3 integrated documentation structure

2. Models for the integration process

In building an integrated system, various models can be chosen, such as:

a. Review existing management systems, decide on a reasonable common structure, and add features needed to accommodate this.
b. Would normally be an efficient way, but could lead to a system biased towards the system most developed at the start.
c. Develop the various sub-systems in isolation and then integrate them.
d. Each system/discipline gets its necessary attention, but the integration process could be difficult and uses a large amount of resources.

3. Methodology adopted

In this study we take type 3 type of integration & Prior to integration of one of more of the Standards, we review the structure of all the three system. We compare the clauses of all the three systems and find out the commonalities in structure, approach and philosophy of all these Standards for development of integrated system policy, system procedures.

3.1 Clauses comparison - We compare clauses of all the three system and setup relation among these clauses.

Table-2 Comparison of clauses among these three systems-

Clause ISO 14001	Clause ISO 9001	Clause OHSAS 18001
1 scope	1 scope	1 scope
2 normative References	2 normative references	2 reference Publications
3 terms and Definitions	3 terms and Definitions	3 terms and definitions
4 EMS requirements	4 quality management system	4 OH&S management system requirements
4.1 general Requirements	4.1 general requirements	4.1 general requirements
4.2 environmental Policy	5.1 management Commitment	4.2 OH&S policy
4.3 planning	5.4 planning	4.3 planning
4.3.1 environmental aspects	5.2 customer focus	4.3.1 Hazard identification, risk assessment and determining control
4.3.2 legal and other Environmental requirements	5.2 customer focus 7.2. requirements related to the product	4.3.2 legal and other requirements
4.3.3 objectives, target and programme(s)	5.4.1quality objectives	4.3.3 objectives and programme(s)
4.4 implementation and operation	7.0 product realization 7.1 planning of product realization	4.4 implementation and operation
4.4.1 resources, roles, responsibility and authority	5.0 management responsibility 6.0 resource management	4.4.1 resources, roles, responsibility accountability and authority

4.4.2 competence, training , and awareness	6.2.2 competence, awareness and training	4.4.2 competence, training , and awareness
4.4.3 communication	5.5.3 Internal communications 7.2.3 customer Communication	4.4.3 consultation and communication
4.4.4 documentation	4.2 document requirements 4.2.1 general 4.2.2 quality manual	4.4.4 documentation
4.4.5 control of documents	4.2.3 control of documents	4.4.5 control of documents
4.4.6 operational Control	4.7 product realization	4.4.6 operational control
4.4.7 emergency preparedness and response	8.3 control of non-conforming product	4.4.7 emergency preparedness and response
4.5 checking and , Corrective action	8.0 measurement analysis and improvement	4.5 checking and corrective action
4.5.1 monitoring and measurement	7.6 control of monitoring and measuring devices 8.1 general 8.2 monitoring and measurement 8.2.1 customer satisfaction 8.2.3 monitoring and Measurement of processes 8.2.4 monitoring and measurement of product 8.4 analysis of data	4.5.1 performance monitoring and measurement
4.5.2 evaluation of compliance	7.2.1 determination of requirements **r**elated to the product	4.5.2 evaluation of compliance
4.5.3 non-conformity, corrective and	8.3 control of non conforming	4.5.3 incidents investigation

preventive action ,	product 8.5.2 corrective action 8.5.3 preventive action	non-conformances and corrective and preventive actions
4.5.4 control of records	4.2.4 control of records	4.5.4 control of records
4.5.5 internal audit	8.2.2 internal audit	4.5.4 internal audit
4.6 management review	5.6 management review	4.6 management review

Source- www.iso.org

3.2 Commonalities

There are a number of differences between the three management systems, as well as several similarities, where it is sufficient to handle the different areas in the same way. About 80% of the work is common to all three disciplines: quality, environment and occupational health and safety. The similarities between these management systems refer to:

1. Top management commitment.
2. Identification of environmental aspects/impacts and Occupational, health & safety hazards/ risks
3. Identification of legal and other requirements applicable to the organization
4. Establishing of objectives and targets.
5. Identification of resources and define their roles and responsibilities
6. Competence, awareness and training of employees.
7. Communication procedures.
8. Operation control
9. Emergency preparedness
10. Documentation and document control
11. Record control
12. Evaluation and control of legal & other requirements' non-compliance.
13. Continual improvement, corrective and preventive actions.
14. Audits
15. Management review.

1. Management commitment

Top management expressed their commitment & intentions towards the continual improvement of an organization in Integrated Management System Policy. Policy includes:

- Commitment to comply all applicable legal and other requirements.
- Commitment to continual improvement in terms of prevention of ill health & injuries, prevention of pollution and cost effective quality products and/or services to achieve customer satisfaction.

  (Refer Annexure-1 as an example)

2. Identification of environmental aspects/impacts and Occupational, health & safety (OHS) hazards/ risks

A procedure is established, implemented and maintained to identify environmental aspects & associated impacts, OHS hazards & associated risk, their assessment and determination of necessary controls for significant impacts and risks.

- **Environmental aspects:** Element of an organization's activities or products or services that can interact with the environment.
- **Environmental impacts:** Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
- **Occupational, health and safety hazards:** Source, situation, or act with a potential for harm in term of human injury or ill health or a combination of these.
- **Risks:** Combination of the likelihood of an occurrence of a hazardous event or exposures and the severity of injury or ill health that can be caused by the event or exposures.

  (Refer Annexure-2 as an example)

3. Identification & evaluation of legal and other requirements:

The identification of all applicable legal & other requirements is necessary to develop any management system. So a procedure is established for the identification of all applicable legal & other requirements and evaluation of compliance matrix. The entire applicable requirements to be addressed in legal register.

- **Legal requirements:** These are regulatory requirements as defined by the Central or State regulatory authorities to which the organization is liable to identify and comply with.
- **Other requirements:** Any customer specific requirements, statutory requirements by financial bodies, corporate specific requirements, any other agreements with public authorities and stakeholders.

4. Establishing of objectives and targets

Objectives and targets are established to all activities, products and services carried out in an organization. So a procedure is developed to identify, establish and achieve integrated management system objectives and targets.

a. I**ntegrated management system objective:** overall quality, environmental, OHS goal, consistent with integrated management system policy, that an organization sets itself to achieve, and which is quantified where practicable.
b. **Integrated management system target:** detailed performance requirement, applicable to the organization or parts thereof, that arises from the quality, environmental, OHS objectives and that needs to be set and met in order to achieve those objectives.

5. Identification of resources and define their roles and responsibilities authority accountability

Top management ensure the availability of resources essential defining roles, allocating responsibilities, accountabilities and delegating authorities, to effective IMS management, all these are documented in system manual. The organization is needed to appoint a member of top management with specific responsibility for integrated management system, irrespective of other responsibilities and with defined roles and authority.

6. Competence, awareness and training of employees

The organization should

- Determine the necessary competence for personnel performing work related to SHE+Q.
- Provide training or take other actions taken,
- Ensure that its personnel are aware of relevance and importance of their

activities and how they contribute to achievement of the SHE+Q objectives.

For it organization establishes, implement and maintain a procedure.

7. Communication, participation and consultation:

With regard to SHE+Q systems, the organization establishes, implement and maintain a procedure for

- Internal communication among the various levels and functions of the organization,
- Receiving, documenting and responding to relevant communication from external interested parties.

8. Documentation and document control

Documentation structure: Documentation has been divided into four levels

Level 1: Integrated management system manual

Integrated System manual is describing the management system and its component; it is also the top level document giving linkage to related documentation including work instructions, objectives, related to quality, environment, health and safety.

(Refer Annexure- 3 as example)

Level 2: Integrated management system procedure

The integrated system procedures are describing standards of the related requirements. Procedures have been used to specify who does what, when and how with what documentation. Procedures are linked to work instructions/SOPs and records where appropriate.

(Refer Annexure- 4 as example)

Level 3: Standard operating procedure (sop) and work instruction

SOPs are meant for departmental procedures or management plan related procedures. Work instructions are meant for the shop floor so as to have ease in operation. Work instruction supplements the procedures to carry out a step of procedure, often related to specified controls, inspection or tests, or how to process material or documents. The operation control procedures related to quality, environment, health and safety have also been described in the work instructions

(Refer Annexure-5 & 6 as example)

Level 4: Formats and records

Certain formats have been designed. They serve as a checklist and help in recording. A record can be defined as collection of identical formats, which have been used for recording. However some of the records may not use any formats.

(Refer Annexure-7 as example)

Supporting documents for level 1 & 2 are:

- Environmental aspects and OHS hazards identification register
- Legal register
- Emergency preparedness plan
- Integrated management system objectives, targets and management plan

9. Record control

A document stating results achieved are providing evidence of activities performed. The organization is required to establish, implement and maintain a procedure for the identification, storage, protection, retrieval, retention disposal of record.

10. Continual improvement, non conformity, corrective and preventive actions

The organization is required to establish, implement and maintain a procedure to deal with actual and potential nonconformities and for taking corrective action and preventive action.

a. **Continual improvement:** Recurring process of enhancing the SHE+Q system in order to achieve improvements in overall SHE+Q performance consistent with organization's SHE+Q policy.
b. **Nonconformity:** Nonconformity is a non fulfillment of any requirement. It can be any deviation from relevant work standards, practices, procedures, legal and other requirements etc.
c. **Corrective action:** The action to eliminate the cause of a detected nonconformity or other undesirable condition. Corrective action is taken to prevent the recurrence.
d. **Preventive action:** The action to eliminate the cause of a potential nonconformity or other undesirable condition. Preventive action is taken to prevent the occurrence.

11. Internal audits

Audit is a systematic, independent and documented process for obtaining "audit evidence" and evaluating it objectively to determine the extent to which the "audit criteria" are fulfilled. The organization is required to establish and implement a procedure to carry out the internal audit. The organization also ensures that internal audit of the SHE+Q systems are conducted at planned interval.

12. Management review

Top management reviews the organization's SHE+Q system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. Review bring the improvement into the SHE+Q system.

Input to the management review include

- Results of internal audits and evaluations of compliance with legal
- requirements and with other requirements to which the organization subscribes.
- Communication from external interested parties, including complaints.
- The environmental performance of the organization.
- The extent to which objectives and targets have been met.
- Status of corrective and preventive action .
- Follow-up actions from previous management reviews.
- Changing circumstances, including development in legal and other requirements related to its
- Recommendation for improvement.
- The outputs from management reviews include any decision and actions related to possible change to SHE+Q policy, objectives, targets and other elements of the SHE+Q system consistent with the commitment to continual improvements.

4. Some other important issues:

Besides the find out the common feature in all three disciplines: quality, environment and occupational health and safety for the designing of the system policy & system procedure, some other issue are also important establishment of IMS, from developing phase to running phase

These are following as:

4.1 Developing a Management System – Some Key Issues

For a effective IMS, the following important principles should be followed by the top management, including the organization's managing director, and ask for active support and involvement;

- **a.** Appoint one person who can work as the "management representative" fo the project;
- **b.** Involve the whole organization in the work;
- **c.** Make a time schedule with targets and sub-targets and build the system on existing procedures.

i. The involvement and support of the management

The MD/site manager must go out and speak on behalf of the system and show that he/she really professes to the basic ideas. The management must show a sustainable involvement; it is not enough just to start the process. It is therefore crucial for the management to guarantee resources for the buildup, implementation and operation of the management system, in terms of monetary and personnel resources. To follow the development and the implementation of the management system is an obvious task for the management group in their regular group meetings. The status of the SHE+Q work should also be reported at the board level.

ii. Involvement of the whole Organization

Involving the whole organization means, among other things, that the organization is trained during the project time and, most importantly, that personnel are actively involved in developing the procedures. The personnel must have the opportunity to say how they can work with the SHE+Q questions.

iii. Core Team and "MR (management representative)"

A Core Team is needed to carry out an integrated management project. At the top of the core team is a management representative This is probably a half-time job at least, during the development and training phase. This person should be the "MR **(**management representative)". A Core Team with a representative mix of people is also needed. The people in this group should contribute to developing the procedures of the system and, at the same time, the anchoring of the procedures and the chosen ambition level in their respective departments.

Finally, personnel resources in all departments are needed as bodies for consideration/reference as the work progresses. More or less formal groups consisting of foremen and operators/technicians, etc. and union representatives are needed as bodies for consideration during the work.

iv. Time schedule

The introduction and implementation of an IMS must be done according to a time schedule with matching resources. The time from the decision to start developing the system until the whole system is implemented ranges from six months to several years depending existing resources and documentation, and also the resources that the organization is prepared to put into the project. The big time consuming activities are:

- SHE+Q assessment (initial);
- Development and construction of the system with the procedures (ISP, SOP and WI);
- Training and involvement of the personnel from the whole organization;
- Detailed regulation in instructions at department level (if this is considered necessary).

Before any external audit, the system must have been running for a certain period of time.

v. Build on existing systems - start with initial assessment of current situation

An IMS should build upon existing foundations, which the organization has within the various disciplines. Sound written or verbal rules and instructions, which are already applied, should be used as important corner stones in the new system. Use existing material as far as possible. A gap analysis survey should be carried out as a first step (initial assessment) of developing the IMS Such a survey can be carried out with, for example, the assistance of some recognized SHE+Q auditing method. The result can be compared with the proposed contents for an IMS.

4.2 Implementing a management system – some key issues

A very critical point comes when the management system is implemented. This is the case even if many employees have been involved in developing the procedures. There are many questions such as: How will the system be received? How well will it be followed? Which training is needed? Which control and follow-up is needed?

So, therefore, a lot of attention and pre-planning should be given to the implementation. The project management and the line management have to put in extra resources during the actual implementation of the management system and a renewed drive for motivating the personnel is advisable.

1. Stepwise implementation

It is wise to introduce the system in steps rather than all at once and build the experiences from the first introduced procedures into the procedures which are still under development. Although there are various strategies, from starting with the simple procedures to starting with the most challenging ones, it is probably advisable to select some procedures which have the potential to be well received - not too controversial and not too self-evident.

2 Follow-up

The MR must very closely follow how the first procedures are received and work in practice by interviewing employees of all categories and following up the formal handling of documents, etc. One should try to quantify the results versus the resources put in. The follow-up should continue until the process is established within the organization.

3 The organization responsibility to follow the system

The organization takes on a responsibility in following the implementation of the IMS.

4 Training

Before or during the implementation of the management system, formal and informal training of all personnel including contractors, subcontractor and haulers is necessary.

4.3 Keeping a management system running – some key issues

The introduction of just a set of procedures is clearly not enough to have an IMS in operation. A number of steps are needed with the overall goal of "continual improvement". A common model to present SHE+Q works according to a closed circuit - starting with the policies; going through planning, implementation and operation; checking and corrective action; and management review – to arrive at continual improvement. See Figure 1.

It is only when the whole "loop" is completed that the system can be considered to be in operation and mature enough for a possible external audit. For the SHE+Q work to be successful some activities are required:

i. Continuous measurement of improvements;

ii. Periodic control in the form of internal and external auditing;

iii. Continuous training and motivation of personnel.

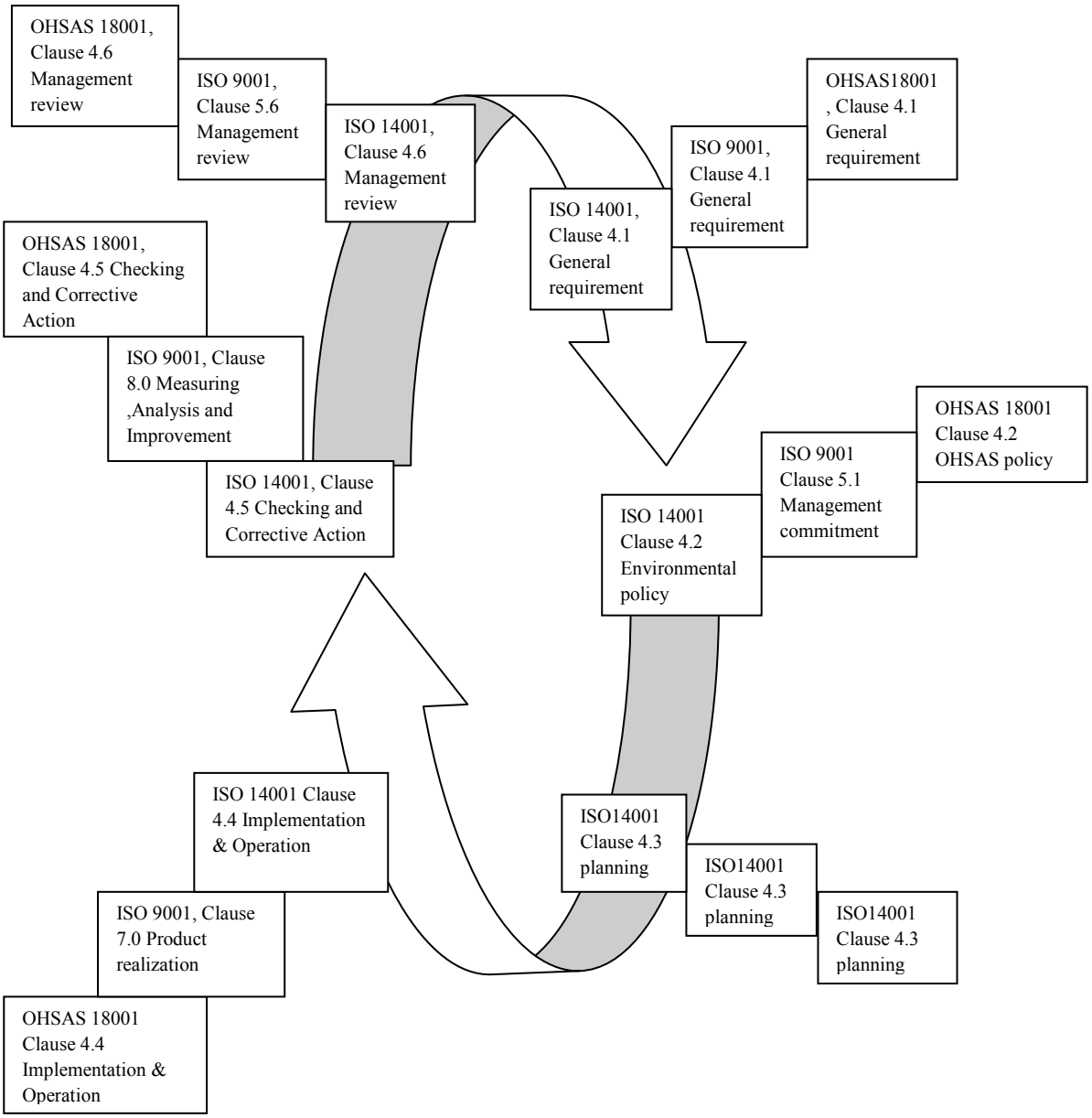


Figure1- Integrated implementation cycle for continual improvement

A Management representative, such as the manager of the organization's SHE+Q function, must continuously be responsible for supervising, controlling and developing the system.

5. Independent audit and certification/registration

There could be several reasons for an organization to certify its management system(s). By a certification or registration, the organization is acknowledged to have included the requirements of a certain system/standard and that these requirements are followed. However, it does not tell very much about the actual level and quality of the SHE+Q work. The certificate can simplify communication with external stakeholders. Already today a growing number of customers require their suppliers to be certified according to ISO 14001 or OHSAS 18001 and obviously according to ISO 9000 for quality Some authorities have indicated that they would sometimes be prepared to accept that certified/registered organizations have a certain good basic level and, in the future, fewer detailed inspections will be made of such organizations. It is important to emphasis that certification/registration cannot be the main reason for an organization to develop a SHE or Q management system. There is hopefully a genuine desire to improve the SHE+Q work by introducing such a management system.

Some of the most important conditions to get a certification or registration are:

i. the system shall be in operation;

ii. the system shall fulfill all the requirements according to the standard and the legislation;

iii. The system documentation and record keeping shall be in good order.

In order to ensure that all detailed requirements in the standard or the directive have been included in the IMS, it could be appropriate to make a reference key between the "official" system and the system.

Chapter 5: Conclusion

The following are conclusions, seen on how IMS for S, H, E and Q could be developed and used. Based on what has been said earlier, it seems reasonable to conclude that:

i. The superior objective of a management system is to help in the process of creating and improving a culture in the respective discipline.

ii. Integration of SHE should be driven as far and intimate as possible, without losing focus on the individual SHE issues.

iii. Because the underlying values for S, H and E are very similar, but for Q in many respects different, the organization shall consider very carefully all aspects before integrating SHE with Q or with other disciplines.

Chapter 6: Recommendations

As you probably need to fulfill some legislative requirements on management systems and wish to conform to some external standard, make sure that all the necessary elements of the external systems have been included, but do not try to incorporate their structures in detail. Use the activity or process-based approach, for most of the procedures of management system, not the generic approach. For an integrated system, it is vital to base the procedures of the management system on activities or processes in the organization. It is much more difficult to work on the generic level (e.g., of ISO 14000).

i. Some generic procedures will also be needed. Examples of such procedures are:

a. Organization and Responsibilities;
b. Education and Training (general);
c. Control of Document;
d. Management review;
e. Control of Non Conformances;
f. Corrective and Preventive actions
g. Control of Records;
h. Auditing procedures;
i. Communication.

ii. Start with an analysis of the normal activities of the organization. The activities which are of importance for SHE+Q issues are thereafter regulated in the form of SHE (Q) procedures.

iii. S, H and E would normally be OK to integrate "completely". It is possible to have common procedures on almost every issue, activity, etc. A few specific procedures for health only and for environment only will normally have to be produced.

iv. Be careful with integration between SHE and Q. If you want to integrate SHE with Q, consider having only a smaller proportion of procedures as common for all disciplines. They will have to be of a more generic type only, whereas the majority of procedures should have separate SHE procedures and Q procedures.

v. The management system must never become a main issue in itself; it is only a tool to facilitate.

vi. Improve the process of fulfilling the will of the organization as expressed in the statements of the policy. There are too many examples where the SHEQ manager rules like a sovereign with his/her ISO 9000/14000/OHSAS 18000 systems with a lot of attention to formalistic system details, losing focus on the proper main issues.

vii. Use more training and less procedures in order to approach the behavioral culture.

viii. Make clear that the responsibility for S, H and E as well as Q is clearly in the organization and has to be headed by the managers. This will facilitate having integrated systems.

ix. Make the system flexible, so new legislation or other demands can easily be incorporated.

x. Generic issues should be integrated and streamlined as far as possible in common procedures.

xi. Procedures specific for a topic, say a health issue, should only deal with this but be written in a format that is standardized for the total management system.

xii. Avoid the tendency to put too much focus on the procedures.

xiii. Secure a broad involvement of the organization in the development process; the organization should be the owner of the product and feel comfortable with it. The system will not survive if its main feature is control by policing; it must be a natural part of the culture.

xiv. A management representative is needed and should be an internal resource. External consultants may be used for various reasons, but not as focal points.

References

1. Balle, C. (2003): Project Manager, Dansk Standard [Danish Standard], Charlottenlund, Denmark.
2. Barnes, F. C. (1998): “ISO 900 MYTH and REALITY: A reasonable approach to ISO 9000”. S.A.M. Advanced Management Journal. Cincinnati. Spring 1998.
3. Barnes F., 2004. “Good business Sense Is the Key to Confronting ISO 9000” in Review of Business, Spring.
4. British Standard institution (BSI) (2007): OHSAS 18001:2007: Occupational Health and Safety management of system Specifications.
5. BS 8800:1996 Guide to Health & Safety Management Systems.
6. BSI (2007): Occupational Health and Safety Management Systems - Specifications, OHSAS 18001.
7. BVQI (2004): "The one-stop shop", Quality World http://www.bvqi.com.
8. Clifford , 2008 “So many standards to fellow, so little payoff”. Inc Magazine,.
9. Compton, P., Devuyst, D., Nath, B. & Hens, L. (2003). Environmental Management in Practice: 1(3): 45 Routledge, London.
10. Dalgeish S., 2005. “Probing the Limits: ISO 9001 Proves Ineffective” Quality Magazine.
11. Davis, P.S., 2000. Maintaining your EMS: the stages of EMS development. Environmental Quality Management. 9(4): 77-85.
12. Diamond, C.P., 1996. Voluntary environmental management system standards: case studies in implementation. Total Quality Environmental Management. pp: 9-23.
13. Dwagi, E.A., 2007. Evaluation of implemented environmental management system against the requirements of ISO 14001. M.Sc. thesis, Cairo University, Giza, Egypt.
14. Eves, D. and Gummer, J. (2005). Questioning Performance – The Director’s Essential Guide to Health, Safety and the Environment. The Institution of Occupational Safety and Health.
15. Fuller, C.W. and Vassie, L.H. (2004). Health and Safety Management – Principles and Best Practice. Prentice Hall.

16. Henricks M., Dec 2001. “ISO a GO-GO” Entrepreneur Magazine
17. Hines, F. (2002): Integrated Management Systems -inclusivity of approach or dilution of problems? Poster presentation at 10th International Conference of the Greening of Industry Network, Sweden.
18. Iñaki H., Gavin P.M., Dick, and Casadesús M., 2002. "ISO 9000 registration's impact on sales and profitability: A longitudinal analysis of performance before and after accreditation." International Journal of Quality and Reliability Management 19(6): 115-118.
19. ILO Guidelines on Occupational Safety and Health Management Systems (ILO/OSH 2001 OHSAS 18000 seriesw.iso.org.
20. ISO 14001:2004 Environmental Management Systems – Requirements with Guidance for Use. International Standards Organization.
21. ISO (2003). The ISO Survey of ISO 9000 and ISO 14000 Certificates. Twelfth cycle: up to and including 31 December 2002. Viewed on homepage 28 July 2003: http://www.iso.ch/iso/en/ commcentre/pressreleases/2003/Ref864.html.
22. ISO 9001:2008 Quality Management Systems – Requirements. International Standards Organization.
23. ISO standard, 2004. http://www.Praxiom.com/ISO-14001-intro.htm (accessed June 2007).
24. Karapetrovic S., Casadesús M., 2009 Implementing environmental with other standardized management systems: Scope, sequence, time and integration Journal of Cleaner Production, 17: 533-540.
25. Khalil M.S. (2006). Establishing and Improving an Integrated Management System of Public and Private Sector, 1-11.
26. Lundberg, K., 2005. Rail operation and maintenance in environmental management system context- current practice and potential improvement. Ph.D. thesis, Royal Institute of Technology, Stockholm, Sweden.
27. McDonald, N.; and Haymark, V. (2001) “Safety Behavior in the Construction Industry”, Report to the Health and Safety Authority (Dublin) and the Health & Safety Executive (Northern Ireland).
28. Mohamed, Sherif (2003, “Scorecard Approach to Benchmarking Organizational Safety Culture in Construction” J. Constr. Eng. Manage., 129(1): 81-88.

29. Naveh. E., Marcus, A. (2004). "When does ISO 9000 Quality Assurance standard lead to performance improvement?", IEEE Transactions on Engineering Management, 51(3): 352–363.
30. OHSAS 18001:2007 Occupational Health & Safety Management Systems – Specification. British Standards Institution.
31. OSHA – Occupational Safety and Health Administration. (2006). OSHA Regulations (Standards – 29 CFR).
32. PAS 99 Integrated Management System Standards. British Standards Institution.
33. Pawar, M.W. and. Rossetto C., 2001. A tool for improvement: environmental management systems. Public Management, 83(11): 10-17.
34. Pearch, C., 2000. How to apply ISO 14001 within an ISO 9001 system. 54th Annual Quality Congress (AQC), Quality Congress Proceedings, pp: 658-664.
35. Pun, K.F., Hui,I.K. and Lee W.K., 2001. An EMS approach to environmentally-friendly constructions. The TQM Magazine. 13(2): 112-119.
36. Pun, K., I. Hui, H.C.W. Lau, H. Law and W.G. Lewis, 2002. Development of an EMS planning framework for environmental management practices. International Journal of Quality & Reliability Management., 19(6): 688- 709.
37. .Pheng, L.S., Kwang, G.K. (2005). ISO 9001, ISO 14001 and OHSAS 18001 management systems: Integration, costs and benefits for construction companies.
38. Rashed I.M., Hasaneen E.A.S., Edward M. and Dwagi E.A., 2008. "Environmental Management System as a Tool for Improving the Environmental Performance (Case Study)" Department of Public Works, Faculty of Engineering, Cairo University, Egypt, Journal of Applied Sciences Research, 4(4): 383-390.
39. Salomon R., 2008, Integrated management systems: experiences in Italian Organizations Journal of Cleaner Production, 16(16): 1786-1806.
40. Seddon J., 2000.The quality you can't feel", The Observer, Sunday.
41. Seddon J., 2000"A Brief History of ISO 9000: Where did we go wrong?".. Chapter one of "The Case against ISO 9000", 2nd ed., Oak Tree Press. ISBN 1-86076-173-9.
42. Stans, J. and Siebel M.A., 2004. Environmental management systems purpose and benefits of EMS.UNESCO-IHE, Delft, Netherlands.

43. The ISO Survey- 2005 (abridged version,).
44. Toone, B. (2004). Protect Your People – and Your Business. The Institution of Occupational Safety and Health.
45. US environmental protection agency (USEPA) 2005. environmental management systems (ems).http://www.epa.gov/ems.
46. Wade J., May- June 2005. “Is ISO 9000 really a standard?” ISO Management System –"Reasons Why Companies Should Have ISO Certification", Providence Business News.
47. Whitelaw K., 2004. Integration of environmental management systems with other management systems ISO 14001 Environmental Systems Handbook (Second Edition), pp: 123-144.
48. Zeng, Jonathan J.S., Lou.G.X, 2007. A synergetic model for implementing an integrated management system: an empirical study in China Journal of Cleaner Production, 15 (18): 1760-1767 S.X.
49. Zutshi, A. and Sohal A., 2004. Adoption and maintenance of environmental management systems: critical success factors. Management of Environmental Quality: An International Journal, 15(4): 399-419.

Web addresses sited are:

http:// www.iso.org/iso/survey2007.pdf -
http://www.iso.org/iso/en/iso9000-1400/certification/isosurvey.html
http://www.iso.org/iso/iso_catalogue/management_standerd/iso_9000_iso_14000/iso_9001_2008.html.
http://en.wikipedia.org/wiki/ISO_9000"

Annexure-1

INTEGRATED MANAGEMENT POLICY

We, at **ABC Limited (Company Name)** are committed to continually improve our quality, environment, health and safety performance and strive for:

- **Customer delight** by giving priority to consistency in our products and timely deliveries.
- **Protection of environment** by complying to legal and other requirements pertaining to environment, use of pollution prevention techniques and energy conservation and use of cleaner efficient processes.
- **Safe work environment** by complying to legal and other requirement related to occupational health and safety, risk assessment and risk minimization , improved work conditions, use of personal protective equipment and by imparting training to workforce and awareness to the stake holders.
- **Operational excellence** by optimization of cost, improvement in productivity, performance measurement , imparting training , establishing work environment of mutual trust and instilling team spirit in workforce

The policy shall be achieved by implementation of PDCA (Plan, Do, Check, Act) cycle in all our processes. During the implementation we shall take due care of ABS policies.

Date **UNIT HEAD**

Annexure-2

	ABC Limited	DOC. NO.	
	REVISION NO.	**ENVIRONMENTAL ASPACT IDENTIFICATION & RISK ASSESSMENT**	ISSUE NO.
	REVISION DATE		DATE

PROCESS- WTP

NO	ACTIVITY	N/A/E	ENVIRONMENTAL ASPECT	ENVIRONMENTAL IMPACT	EVALUATION							S/NS	APPLICABLE LEGAL REQUIREMENTS	REMARKS
					LC	IPC	BC	SC	SE	PR	TOTAL			
1	Collection of waste water	A	Overflow of waste water from tank	Land pollution				2	2	2	8	NS		Barricades provided around the tanks
		N	Leakage of water from pipe joints	Land pollution				1	2	2	4	NS		
2	Pumping	N	Generation of noise	Noise pollution				1	2	4	8	NS		
3	Filtration	N	Nutrient rich reject from filter	Provide nutrients										
4	Storage of treated water	N	Water loss due to evaporation	Resource depletion				1	1	4	4	NS		
		N	Leakage of water from tank	Resource depletion & land pollution				1	2	2	4	NS		
		A	Overflow of treated water from tank	Resource depletion				1	2	2	4	NS		

Prepared by		Approved by	Copy Status

LEGEND		
N = NORMAL	**S = SIGNIFICANT**	**SC= SCALE**
A = ABNORMAL	**NS = NOT SIGNIFICANT**	**SE= SEVERITY**
E = EMERGENCY	IPC= INTERESTED PARTY CONCERN	**PR= PROBABILITY**
	LC =LEGAL CONCERN	

Annexure-3

INTEGRATED SYSTEM MANUAL

This document defines the policies for effective implementation of an integrated system (Quality, Environment, Health & Safety and) for various processes and activities carried out in the organization to ensure efficient and environmental safe operations at **ABC Limited.** This is designed to achieve fulfillment of Customer's / stake holder expectations and Company's desire for system implementation.

Integrated System Manual contains following documents

S.N.	Document Name
1.	Amendment Procedure
2.	Scope
3.	List of exclusions
4.	Abbreviations and Synonyms
5.	ABC Limited corporate vision and integrated policy
6.	Organization chart
7.	Responsibilities of Key Functions
8.	Identification of the processes and process mapping
9.	Interaction of the processes
10.	Performance indicators
11.	Documentation structure
12.	Coverage of ISO 9001:2008
13.	Coverage of ISO 14001:2004
14.	Coverage of OHSAS 18001:2007

Prepared by	Approved by	Copy status

This **Integrated System Manual** is developed in line with the requirements of ISO 9001: 2008, ISO 14001: 2004, OHSAS 18001:2007.
Also as mechanism for compliance to various applicable statutory / regulatory requirements as applicable to **ABC Limited** processes and products. This manual is also in the line with the Mission Statement and Corporate policies of **ABC Limited** and it is also expected from all of us that we consistently meet and exceed our responsibility towards products, environment, stakeholders and the society.

"Controlled" stamped copies, uniquely numbered are used to avoid unintended use. The copies are identified by their number and owner as well as approved and issued by MR and Unit Head on the first page. The MR of **ABC Limited** keeps the records of issued controlled hard copies. The electronic copy holders of this document have a right to read but not to change the documents, only the MR has the right to change / modify the electronic data. Any unauthorized printout or photocopy shall be deemed as **"Uncontrolled".**

All others can have access to read only copy available at LAN. System copy is updated by system administrator on request by MR or Unit Head in the absence of MR.

Annexure - 4

	ABC Limited		DOC NO.
	REVISION NO.	**INTEGRATED MANAGEMENT SYSTEM PROCEDURE**	ISSUE NO.
	REV. DATE:		ISSUE DATE
MANAGEMENT REVIEW			
ISO 14001:2004, OHSAS 18001: 2007 CLAUSE 4.6, ISO 9001: 2008 CLAUSE 5.6			

1.0 Purpose:

1.1 Whether integrated management system conforms to planned arrangements and ISO 9001: 2008, OHSAS 18001:2007, ISO 14001:2004 requirements.

1.2 To assess the effectiveness of the integrated management system, identify areas for improvement so as the organisation can take suitable corrective actions.

2.0 Scope: All the activities related to ABC Limited.

3.0 Responsibility: Management Representative

4.0 Activities:

4.1 The Management Representative shall ensure that the Integrated Management Systems is reviewed to ensure its continuing suitability, adequacy and effectiveness through management review meeting.

4.2 The Management Review shall be conducted once in six months after internal audits or whenever required before three months as well.

4.3 The Management Representative shall circulate the agenda of the management review meeting to all members well in advance along with the date of the meeting.

4.4 Management Review Committee consists of Unit head and all HODs

4.5 The presence of unit head and Management Representative is must for all Management Review meetings.

4.6 Management Representative shall maintain all minutes of the management reviews in the form of review records and shall be responsible for co-ordinating all actions aimed at addressing the issues discussed in the meeting.

4.7 Input to the management review shall include, as applicable, but are not limited to

- 4.7.1 Suitability of integrated policy
- 4.7.2 Audit results
- 4.7.3 Objectives and targets and management programmes and their progress
- 4.7.4 Any external communication on EHS .
- 4.7.5 Effectiveness of training imparted.
- 4.7.6 Process performance, and product conformity analysis.
- 4.7.7 EHS performance
- 4.7.8 Status of corrective and preventive action
- 4.7.9 Follow up actions from the previous management reviews.
- 4.7.10 Market related factors
- 4.7.11 Performance of suppliers
- 4.7.12 Financial impact of EHSQ related activities.
- 4.7.13 New plans and their impact on the integrated EHSQ system.
- 4.7.14 Changes that could affect the integrated management system, and recommendations for improvement.

4.7.15 Assessment of all general control measures to seek confirmation of implementation and to demonstrate an effective control of associated hazards.

4.7.16 Compliance of the actual flow diagrams and layout with the documented situation.

4.7.17 Review of analytical outcome of random sampling and analysis of product.

4.7.18 Evaluation of conformity with applicable legislation and regulations (as well as conformity to foreseeable changes in legislation and regulations) and identification of changes in legislation and regulations concerning environment and occupational health & safety.

4.7.19 Consistency of the current documentation.

4.8 The management representative shall keep documented minutes of the meeting summarising the management review activities and decisions taken and actions identified. These minutes are used to guide and improve the integrated management system by documenting action taken for continually improving the effectiveness of the integrated management system and its processes, conformity of products in meeting customer requirements, any resource requirements, and meeting EHS obligations.

Annexure - 4

5.0 Associated documentation

S. No.	Document	Format No.	Record	Holder	Retention Period*
1	Management review records	FT	RC	MR	

*Retention period is applicable only for records

1.0 Purpose: To describe the procedure for water quality check.

2.0 Scope: The procedure is applicable for checking of water quality for product water, reducing water and other water specifications in ABC Limited.

3.0 Responsibility: Executive (Quality)

4.0 Procedure:

4.1 QC tests

4.1.1 Analytical tests to be recorded on batch wise basis and entered into logbook and register.

4.1.2 Product water is rated approved or not approved.

4.1.3 All sensory results to be entered in log book.

4.2 Water treatment systems: Following are approved water treatment system

4.2.1 Ion exchange (Two bed and Mixed bed systems)

4.2.2 Reverse osmosis.

The systems including Carbon or sand beds are to be cleaned and sanitized in accordance with manufacturer's recommendations.

4.3 Reducing water:

4.3.1 Only demineralized (DM) water to be used.

4.3.2 Water shall be drawn from normal potable supply before treatment.

4.3.3 Treated water must be free from color, taste and odor & stored in a vessel that will in no way affect the quality of water.

4.3.4 Container used for holding or transporting treated water must not be used for any other purpose.

4.3.5 Approval of the initial water quality (For sub-contractors).

4.4 Product water:

4.4.1 Since water is vital part of formulation of products utmost importance is given to it.

4.4.2 It is imperative that only quality water be used. Water, which does not meet, required sensory or analytical specifications might have a negative impact on taste and or visual stability of the product.

4.4.3 Inorganic and Organic impurities present are removed through use of water treatment systems.

4.5 Water specifications for Demineralized (DM) / RO water

S. no.	Parameter	Min.	Max.
1.	Clarity (FNU)	-	0-10
2.	pH	5.0	7.5
3.	Conductivity (microsiemen)	-	<1
4.	Total solids (mg/l)* By evaporation	-	5.0
5.	Silica (as SiO_2)	-	5.0
6.	Calcium (mg/l)	-	1.0
7.	Lead (mg/l)	-	0.05
8.	Iron (mg/l)	-	0.10
9.	Magnesium (mg/l)	-	1.0
10.	Sensory	-	-

* Excluding silica content.

5.0 Associated documentation:

S. No.	Document	Format No.	Record	Holder	Retention Period*
1.	Water quality record	FT	RC	Executive quality	

*Retention period is applicable only for records

Annexure- 6

	ABC Limited		DOC NO.
	REVISION NO.	**WORK INSTRUCTION FOR WTP**	ISSUE NO.
	REV. DATE		ISSUEDATE

1.0. Objective: Smooth & efficient operation of WTP.

2.0. Scope: WTP

3.0. Responsibility: WTP operator

4.0. Procedure:

4.1 Collect waste water in the sump no.-1

4.2 Collected over flow of sump no. 1 into sump no.-2

4.3 Now start pump on sump on sump no. 2 & transfer water to sump no. 3

4.4 Now start pump on sump no.3 and open valve for back wash on sand filter. Backwash the sand filter for 10 minutes.

4.5 Now close the backwash valve of sand filter and open the drain valve. Drain it for 5 minutes.

4.6 Close the drain valve and open normal operation valve.

4.7 Open the back wash valve of Carbon filter and do the same for 10 minutes.

4.8 Stop backwashing and open drain valve of carbon filter. Drain it for5 minutes.

4.9 Now close drain valve of carbon filter and open its normal operation valve.

4.10 Collect filtered water in sump no. 4.

4.11 Distribute the filtered water with the help of pump provided on sump no. 4 for irrigation of lawns & plants in factory.

4.12 Stop the pump when the sump is empty.

Prepared by	Approved by	Copy status

5.0 Associated documentation:

S.No.	Document	Format No.	Record	Holder	Retention Period*
1.	WTP logbook	FT	RC	WTP operator	

*Retention period is applicable only for records

	ABC Limited	
	MOCK DRILL RECORD	Format no.

(A) REVIEW OF PREPARATIONS

1. DESCRIPTION OF SIMULATION

2. PARTICIPANTS TO BE INVOLVED

3. PLANNED RESULTS

4. WHETHER POLICE/FIRE BRIGADE/HOSPITAL/DM INFORMED

5. PREVENTIVE MEASURE IN CASE OF ACTUAL ACCIDENT

6. WHETHER PREVENTIVE MEASURES ARE SUFFICIENT(IF NO), DO NOT CONDUCT THE DRILL

Prepared by	Approved by	Copy status

	ABC Limited	
	MOCK DRILL RECORD	Format no.

RECORDING OF DRILL

1. START TIME

2. SEQUENCE OF ACTIONS

SL NO	TIME	ACTION	AS PER PLANNING OR NOT?

3. OBSERVATIONS INCLUDING POSITIVE AND NEGATIVE

4. CORRECTIVE ACTIONS

Prepared by	Approved by	Copy status