Integrated Environmental Management Systems

Building the foundation for a Sustainable Development

26 April 2019
Sustainable Development and The Management Vision
Management and Leadership in a Sustainable Development

• Managing the balance between environmental, social and economic goals that lead to continual improvement of the organization seeking a sustainable development (transactional)

• Leading (visionary) using a systematic approach to support the sustainable balance by the efficient and effective use of resources (transformational) and motivating others through enhancing the leadership vision.
Systems

• A system constitutes a complex combination of resources integrated in such a manner as to fulfill a designated need.
• The resources are in the form of human beings, materials, equipment, software, facilities, data, etc., combined in an effective manner.
What is a Management System?

• A management system is a set of interrelated or interacting elements of an organization to establish policies and objectives and processes to achieve the organization’s objectives.

• A management system can address a single discipline or several disciplines (e.g. quality, environment, health and safety).
What is an Environmental Management System (EMS)?

• An EMS is a tool managers use to “establish, implement, maintain and continually improve a framework with the aim to manage environmental responsibilities.

• An EMS manages environmental aspects, conforms to compliance obligations and addresses risk associated with threats and opportunities.
  • The first EMS was established by the British Standards Institute in 1992 as BS 7750.
  • In Morocco, the Institut Marocain de Normalisation (IMANOR) is the national standards body of Morocco and is responsible for standardization. IMANOR was created in 2010. https://www.iso.org/member/1931.html
  • The international environmental management system ISO 14001 was published in 1996 by the International Organization for Standardization (ISO).
International Organization for Standardization

• International Organization for Standardization (ISO), based in Geneva, Switzerland
• Created in 1946 to create technical standards.
• 164 Member Countries
  • Standards developed through Technical Committees (TC), Sub-committees (SC) and Working Groups (WG)
  • Currently 180 TC’s
• ISO developed the first international management system standard in 1987: ISO 9000 series quality management standards.
• Currently there are over 1 million organizations certified to ISO 9001 QMS and 300,000+ certified to ISO 14001 EMS. Thousands of organizations use the ISO standards, but do not certify: self-declare.
ISO 14000 Series
https://www.iso.org/committee/54808/x/catalogue/p/1/u/0/w/0/d/0

• ISO 14000 Series for Environmental Management
  • ISO 14001 is a specification standard of the ISO 14000 Series of Environmental Management Standards

  Guidance Standards
  • ISO 14004 EMS General Guidelines for ISO 14001
  • ISO 14005 EMS Guidelines for SME
  • ISO 14006 EMS Guidelines for Ecosystem Design
  • ISO 19011 Quality and Environmental Auditing
  • ISO 14020-25 Labeling
  • ISO 14031-32 Environmental Performance and Evaluation
  • ISO 14040-49 Life Cycle
  • ISO 14050-Vocabulary
  • ISO 14060-Forest Industry
  • ISO 14063-Communications
  • ISO 14064 Emissions Inventory
  • ISO/DIS 14080 Greenhouse Gas Management
The Specification Standard:
ISO 14001:2015
Environmental Management System
ISO 14001:2015 EMS
Introduction

“Societal expectations for sustainable development, transparency, and accountability have evolved within the context of increasingly stringent legislation, growing pressures on the environment from pollution, and the inefficient use of resources, management of waste, climate change and degradation of eco-systems and biodiversity. This has led organizations to adopt a systematic approach to environmental management by implementing environmental management systems with the aim to contribute to the ‘environmental pillar’ of sustainability.” (ISO, 2015)
The ISO 14001 standard is a volunteer standard applicable to any organization that wishes to:

- Establish, implement, maintain, and improve an EMS
- Assure conformity with its environmental policy
- Demonstrate conformity with ISO 14001:
  - Self determination and self-declaration
  - Interested parties, e.g., customers
  - Confirmation of self-declaration by an external party
  - Seeking certification/registration by an external party
ISO 14001:2015 EMS

- Enables organization to develop and implement its policy and objectives.
- Takes into account:
  - Legal requirements and other requirements
  - Information about significant environmental aspects
    - Those which the organization can control and have an influence
  - The standard does not state specific environmental performance criteria
The Plan-Do-Check-Act (PDCA) Cycle for Continual Improvement

• The PDCA concept was first created by Walter Shewhart in the late 1940s as the Plan-Do-Study-Act, and was changed by Edward Deming after introducing to Japanese managers in the 1950s, who suggested that Check replace Study.

• PDCA is a cycle of activities designed to drive continual improvement. Initially implemented in manufacturing, it has broad applicability in business. Also known as the Shewhart cycle and Deming cycle. (F. John Reh)

• The PDCA is currently being used in millions of organizations for continual improvement of the organization’s management system.
PDCA

• The PDCA is built into international management system standards, beginning with the publication of ISO 9000 series in 1987.

• In 1996, ISO 14001 extended the PDCA from quality management systems to environmental management systems.

• The newest edition ISO 14001:2015 is required to be implemented by all certified organizations by September 2018.

• High Level Structure published in 2015 by ISO requires all management system standards to use the HLS in development.
ISO 14001 EMS: 2015
High Level Structure

• 0 - Introduction
• 1 - Scope
• 2 - Normative References
• 3 - Terms and Definitions
• 4 - Context of the organization
• 5 - Leadership
• 6 - Planning
• 7 - Support
• 8 - Operation
• 9 - Performance Evaluation
• 10 - Improvement

ISO 14001:2015 EMS
PDCA for Continual Improvement

Context of the Organization (4)
Scope of the Environmental Management System

- Internal and External Issues, 4.1
- Support and Operation, (7,8)
- Leadership, (5)
- Performance Evaluation, (9)
- Improvement, (10)
- Planning, (6)
- Needs and Expectations of Interested Parties, 4.2

PLAN
DO
CHECK
ACT

Intended Outcomes of the EMS
ISO 9001 ordre supérieur structure norm: 2015

Système de gestion de la qualité

Portée du système de gestion

- Contexte de l'Organisation (4)
- Les exigences des clients
- Besoins et attentes des parties intéressées
- Planifier
- Leadership, (5)
- Évaluation de la performance, (9)
- Agir
- Amélioration, (10)
- Vérifier
- Soutien et réalisation, (7,8)

Planification, (6)

Satisfaction du client

Résultats de la QMS

Produits et services
4. Context of the Organization

• Understanding the organization and its context; determine external and internal issues and impacts of the EMS and the needs of interested parties and their relevance. (environmental conditions, compliance, structure, activities, location(s), employees)

• The needs and expectations of interested parties are to be better evaluated and understood within the scope of the organization. In understanding the organization’s context, local, regional or global are identified that can be affected by the organization.

• Activities, products and services that have significant aspects shall be included within the scope.
Examples of Interested Parties, Needs and Expectations

- **Responsibility**: Investors – Expect the organization to manage its risks and opportunities that can affect an investment
- **Influence**: Non-governmental organizations (NGOs) — Need the organization’s cooperation to achieve the NGO’s environmental goals
- **Proximity**: Neighbors, the community — Expect socially acceptable performance, honesty and integrity
- **Dependency**: Employees — Expect to work in a safe and healthy environment
- **Representation**: Industry membership organization — Need collaboration on environmental issues
- **Authority**: Regulatory or statutory agencies — Expect demonstration of legal compliance
5. Leadership

- Top management takes more responsibility for the effectiveness of the EMS and integration into business processes.
- Top management of the organization is required to provide the leadership to bring the EMS into the organization’s strategies, processes, and business priorities.
- There is no specific requirement for a EMS representative, but responsibilities and authorities are required to be assigned within the organization.
- Top management should ensure the EMS policy and the objectives of the organization are “compatible with the strategic direction of the organization.
- Policy: compliance obligations take the place of legal and other requirements.
- Policy: Commitment to protection of the environment, pollution prevention and others within the context of the organization.
6. Planning

• The organization shall consider the issues brought out in section 4 and determine the risks and opportunities of its activities, products and services, based on a life cycle perspective (ISO 14044).

• Significant aspects, and all legal, interested party (stakeholder) commitments. The organization “shall plan” to address risk identified with threats and opportunities.

• Objectives shall be retained as documented information and risk must be considered. (indicators)
Environmental Management System ISO 14001 Example

• **Activity: Chemicals from suppliers**
  
  Aspect: Spills or leaks during transportation
  
  Impact: Water pollution, air pollution, ground water pollution, soil contamination
  
  Control(s): Inspection checklist, training, loading,

• **Activity: Receiving of chemical drums**
  
  Aspect: Leaks in the chemical drums in receiving
  
  Impact: Water pollution, wetlands, soil,
  
  Control(s): Spill kits, containment walls, training, drains

• **Activity: Use of lights, computers, equipment and such electronics in the plant**
  
  Aspect: Electricity consumption
  
  Impact: Resource depletion
  
  Control(s):
7. Support

- Includes the requirement for identification of resources to establish, implement, and maintain the EMS.
- Communication of significant aspects, documented information, format and control of documentation.
- Communication has placed emphasis on creating a communications strategy and ensuring that reliable information is accessible from internal and external identified parties.
- Documented information aligns the organization to better use of electronic and cloud based systems for running the EMS.
8. Operation

• Emphasis on planning, implementing and controlling the processes needed to meet requirements.

• This includes outsourced processes. While the organization doesn’t control the organization, it does control the processes that relate to the outsourced products and services.

• Mitigate any adverse effects, as necessary, protecting the environment from harm and degradation.
9. Performance Evaluation

• Increase in expectations of the organization’s environmental performance evaluation based on the use of indicators.

• Indicators for measuring achievement of the objectives are to be used. ISO 14031: Environmental Performance and Evaluation should be referred to in establishing key performance indicators.

• Internal audits and Management Review are key parts of Performance Evaluation.
10. Improvement

Nonconformity and corrective actions are more aligned with the improvement of environmental performance. Continual improvement and the requirement for the organization to “continually improve the suitability, adequacy and effectiveness of the EMS.”
ISO 14001:2015 (CRA Europe April 2013)

• 1. Greater expectation for top management to understand the organisation’s environmental issues, support the EMS and champion improved performance;

• 2. Broader strategic consideration of the organisation’s environmental context, including the interests of stakeholders and the direction of the business;

• 3. Making specific commitments to sustainable development and social responsibility;
ISO 14001:2015  (CRA Europe April 2013)

• 4. Extending environmental influence into the supply chain, with implications for procurement;
• 5. Embracing opportunities for using environmental design as a tool for improvement;
• 6. Being able to demonstrate an understanding of the organisation’s environmental compliance status at all times; and
• 7. Using performance indicators to track environmental impacts
Integration of Management Systems

(voluntary standards)

- ISO 9001-Quality
- ISO 14001-Environmental
- ISO 26000-Social Responsibility
- ISO 27000-Information Security
- ISO 31000-Risk
- ISO 45001-Occupational Health and Safety
- ISO 50001-Energy
- ISO 55001-Asset
- SA 8000 Social Accountability
- BSI PAS 99-Management Systems Integration
Intégration Model of Management Systèmes
9001 QMS, 14001 EMS, 45001 HSMS

Production Start → Activities → Production Ends

Sources
- Suppliers, regulators, employees, other stakeholders
- Suppliers, water and energy, NGO, regulators, transportation
- Suppliers, regulators transportation, safety programs, NGO

Inputs
- Material, skills, energy, chemicals, water, regulations, Local, National, International Norms

Processes
- Products, Services
- Waste, Reduced accidents, injuries, and workplace stress

Outputs
- Company, Customers, waste haulers, communities, other stakeholders

Receivers of Outputs

Context
- Leadership
- Planning
- Support
- Operations
- Performance
- Improvement

High Level Structure of Integrated Management Systems

Barnes, 2016
System Complete
System Weakness
System Breakdown

What to do (shall)
Context, Scope, Leadership, Support, Internal Audits, etc.

How to do it (support)
Lab tech procedure, Products from whole blood, etc.

Validation (completed)
Records, Evaluation

Hierarchy (direction)
System structure

Management System HLS Relation Tracking
Management System Risk Identification

Barnes, 2016
Risk Identification

- Sources and Inputs
- Activities Operations
- Outputs and Customers

- Risk Opportunities
  - Strategic Planning
- Risk Reduction
- Risk Investment
- Interested Parties and Return on Risk Investment

Value

Barnes, 2016
<table>
<thead>
<tr>
<th>Risk Identification</th>
<th>Risk Type</th>
<th>Risk Assessment</th>
<th>Initial Risk Score</th>
<th>Risk Control Status</th>
<th>Final Risk Score</th>
<th>Risk Control Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance</td>
<td>Hazard / Operational / Reputational</td>
<td>2 3 3</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>Chemical hygiene plan required; Yearly safety inspections; Periodic random inspections; Disposal allowed only through EHS; Hazard communication and awareness training; Database established to track training completion by employees; Database established to track chemical inventory and waste disposal; Periodic inventory report to monitor usage and disposal of chemicals; Access controls implemented for waste storage areas; Providing start-up guidance training for new laboratories; Some building safety managers designated.</td>
</tr>
<tr>
<td>Individuals fail to follow University safety procedures and guidelines</td>
<td>Hazard</td>
<td>2 2 3</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>Instruction sheets with safety information posted near equipment; Hazard communication; Provide and require attendance at laboratory safety courses; Signage to warn of dangerous materials, conditions, or substances; SOP’s for highly hazardous chemicals;</td>
</tr>
<tr>
<td>There is non-compliance with new or existing federal, state, local regulations</td>
<td>Hazard / Reputational</td>
<td>1 2 3</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>Annual laboratory inspections, Hazard communication and awareness training; Re-inspection of non-compliance findings, EHS authority to stop operations; Signage; Provide and maintain safety equipment and PPE; SOPs for use of highly hazardous materials reviewed</td>
</tr>
<tr>
<td>Accidents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University personnel are involved in laboratory accidents</td>
<td>Hazard</td>
<td>2 3 3</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>Annual laboratory inspections, Hazard communication and awareness training; Re-inspection of non-compliance findings, EHS authority to stop operations; Signage; Provide and maintain safety equipment and PPE; SOPs for use of highly hazardous materials reviewed; workers' compensation</td>
</tr>
</tbody>
</table>
Integrated Management Systems Tool

- Integrated Management Systems (IMS) and Geographic Information Systems (GIS)
  - The **IMS** is a continuous cycle of planning, implementing, reviewing, and improving the mission of the organization through effective use of internal and external information flows.
  - The **GIS** is an information management tool that provides managers with detailed descriptive information for use in risk management, resource allocation, environmental and health and safety analysis.
Using IMGIS

• Information flow and prioritization
  • 1. Collect information
  • 2. Prioritize information according to categories of management risk.
  • 3. Integrate information, for example, biohazards affect environmental, health and safety, security and social responsibility management systems
  • 4. Map areas of infectious or hazardous waste creation, map collection and transportation to satellite points, storage areas, and pick-up services.
  • 5. Evaluate population density, schools, hospitals, roadways, water systems, and other issues that increase risk of failure in emergency situations
Using IMGIS

- Chemical
- Biological
- Radiological
- Explosives
- Infectious Waste Generators
- Airports
- Hospitals
- Counties

Selected Attributes of Industries

<table>
<thead>
<tr>
<th>LOCATIONCI</th>
<th>COMPANYNAME</th>
<th>PHONENUMBER</th>
<th>FAXNUMBER</th>
<th>LOCATIONAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charleston</td>
<td>Charleston Steel &amp; Met Co</td>
<td>(643) 722-7270</td>
<td>(643) 722-7220</td>
<td>107 Brigade St</td>
</tr>
<tr>
<td>Charleston</td>
<td>Evening Post Publishing Co</td>
<td>(643) 777-111</td>
<td></td>
<td>134 Columbus St</td>
</tr>
<tr>
<td>Charleston</td>
<td>Proquet Roofing Inc</td>
<td>(643) 722-0641</td>
<td>(643) 732-086</td>
<td>274 Hanover St</td>
</tr>
<tr>
<td>Charleston</td>
<td>Floyd Electric Co Inc</td>
<td>(643) 722-0627</td>
<td>(643) 723-7038</td>
<td>243 Calhoun St</td>
</tr>
</tbody>
</table>
Using IMGIS

• Information flow and prioritization (cont.)
  • 6. At each location, compare significant risks to controls in place that reduce risk.
  • 7. For each management initiative, e.g., environmental, security, identify controls at the location and calculate risk. For example, how does this location affect environmental, health and safety, or security risk. What controls are in place? What controls are needed to reduce risk, gates, easier access, deconstruction of buildings?
  • 8. Evaluate and rank controls. Are containers adequate? Are locks and access to the area controlled for security of hazardous waste and chemical proposes?
Lone Mountain Mining (LMM)

LMM Slides provided by Pillar Management Associates
Sustainability Decisions Complete

Sustainability Decisions

Using the Sustainability Decisions sheet, work with the person beside you and select 5 activities of this University and determine the aspect (cause) and impact (change) for each of the activities. Please rank the environmental impacts from the five selected using the ranking scale and ranking criteria provided in the exercise handout.
The problems we have created cannot be solved by thinking the way we thought when we created them”  Albert Einstein

Thank You!