

Integrated Environmental Management Systems

Building the foundation for a Sustainable Development

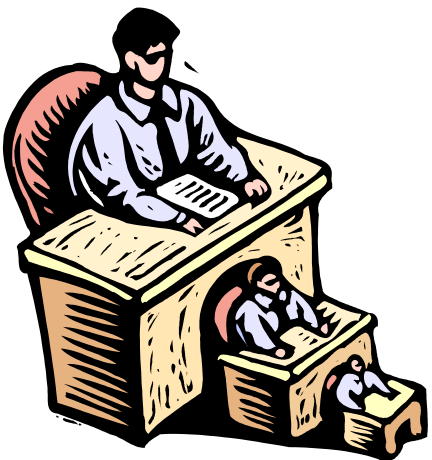
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The Management Vision



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.
 - The U.S. EPA developed Code for Environmental Management Principles (CEMP) in 1993.
 - 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.
- The second international management standard series ISO 14000 standards for Environmental Management and ISO 14001 EMS specification standard published in 1996, 2nd edition 2004 and 3rd edition 2015.
- 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)

ISO 14001:2015 EMS

- 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

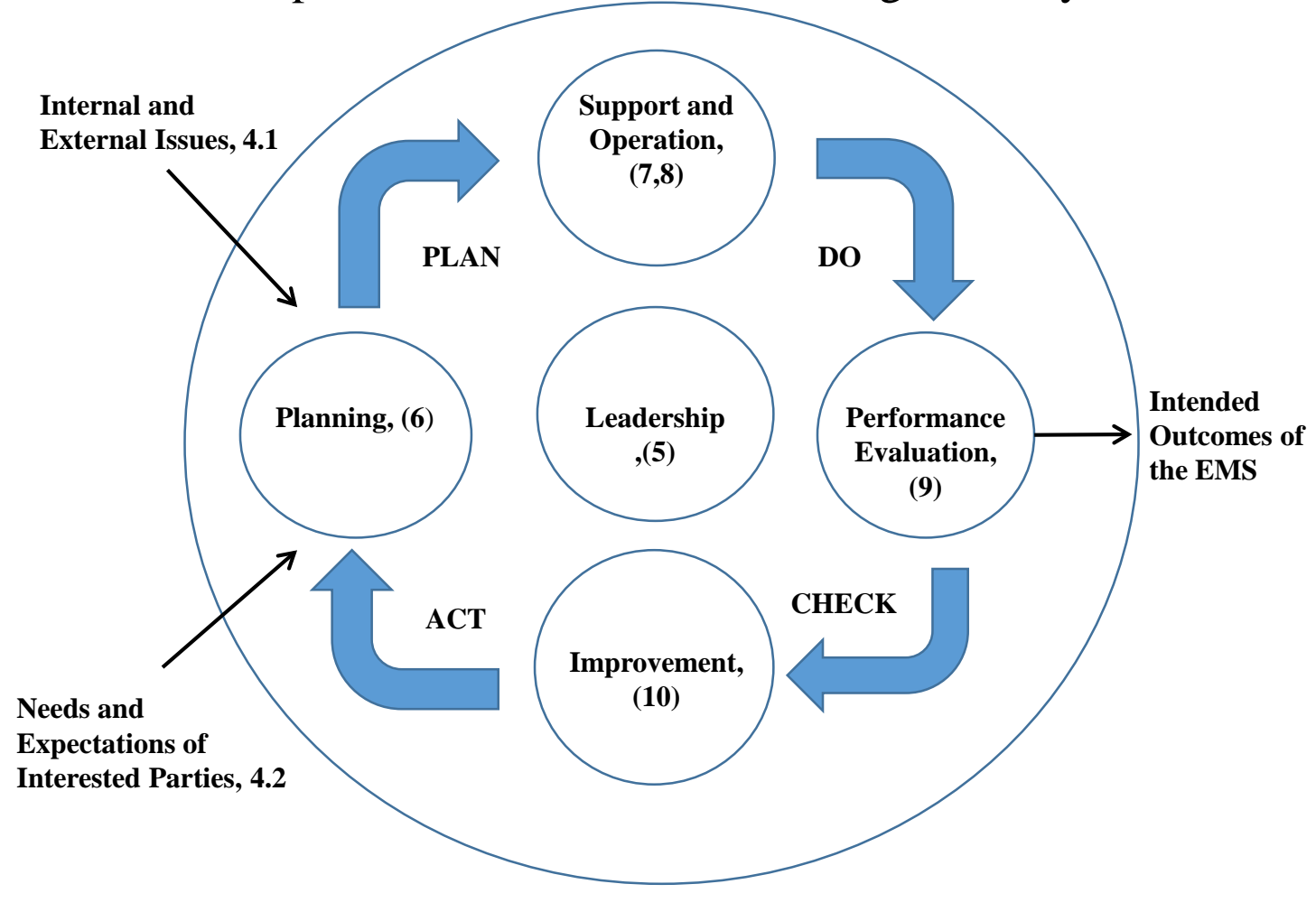
- 0 - Introduction
- 1 - Scope
- 2 - Normative References
- 3 - Terms and Definitions
- 4 - Context of the organization
- 5 - Leadership
- 6 - Planning
- 7 - Support
- 8 - Operation
- 9 - Performance Evaluation
- 10 - Improvement

ISO 14001:2015 EMS

PDCA for Continual Improvement

Context of the Organization (4)

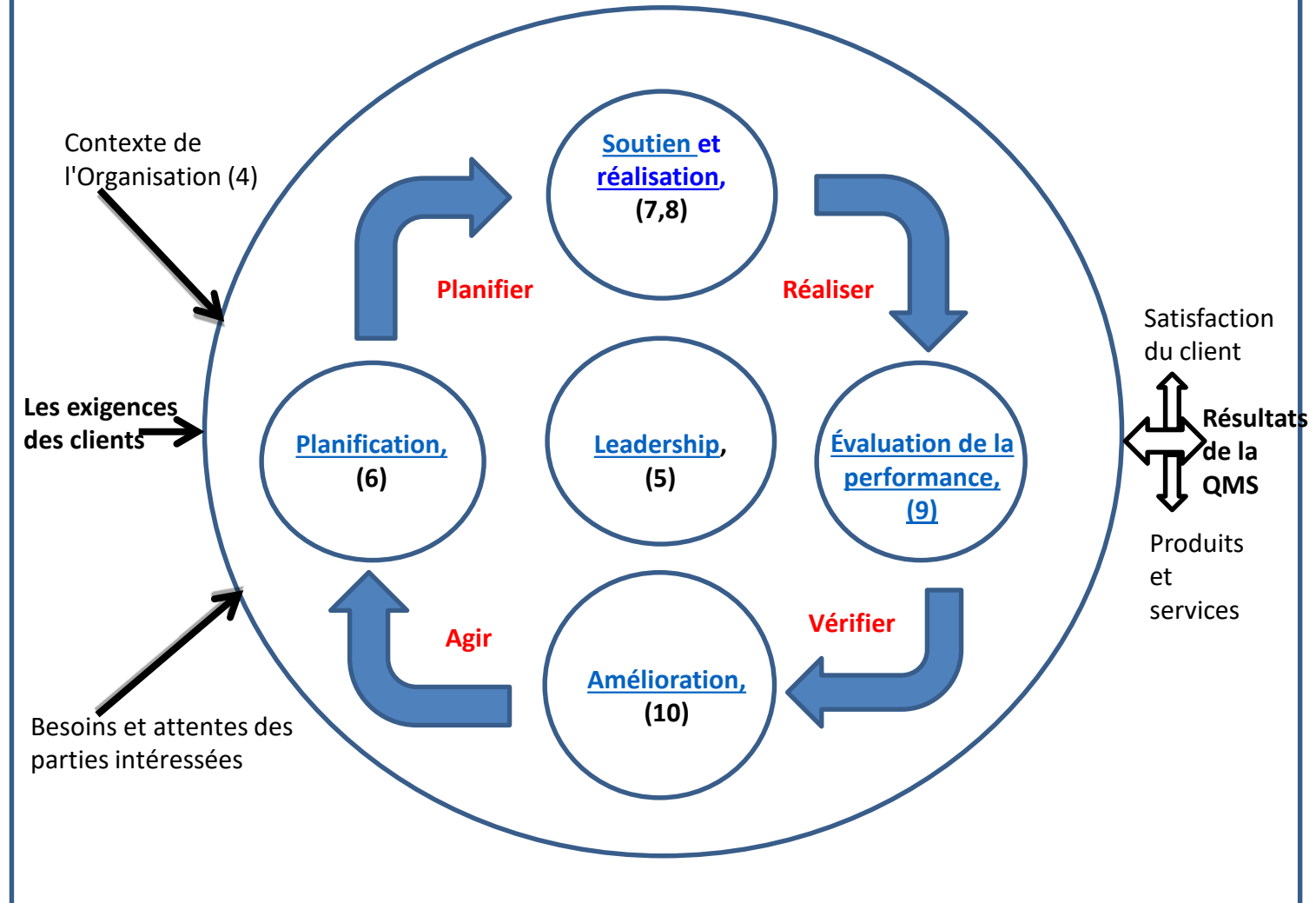
Scope of the Environmental Management System



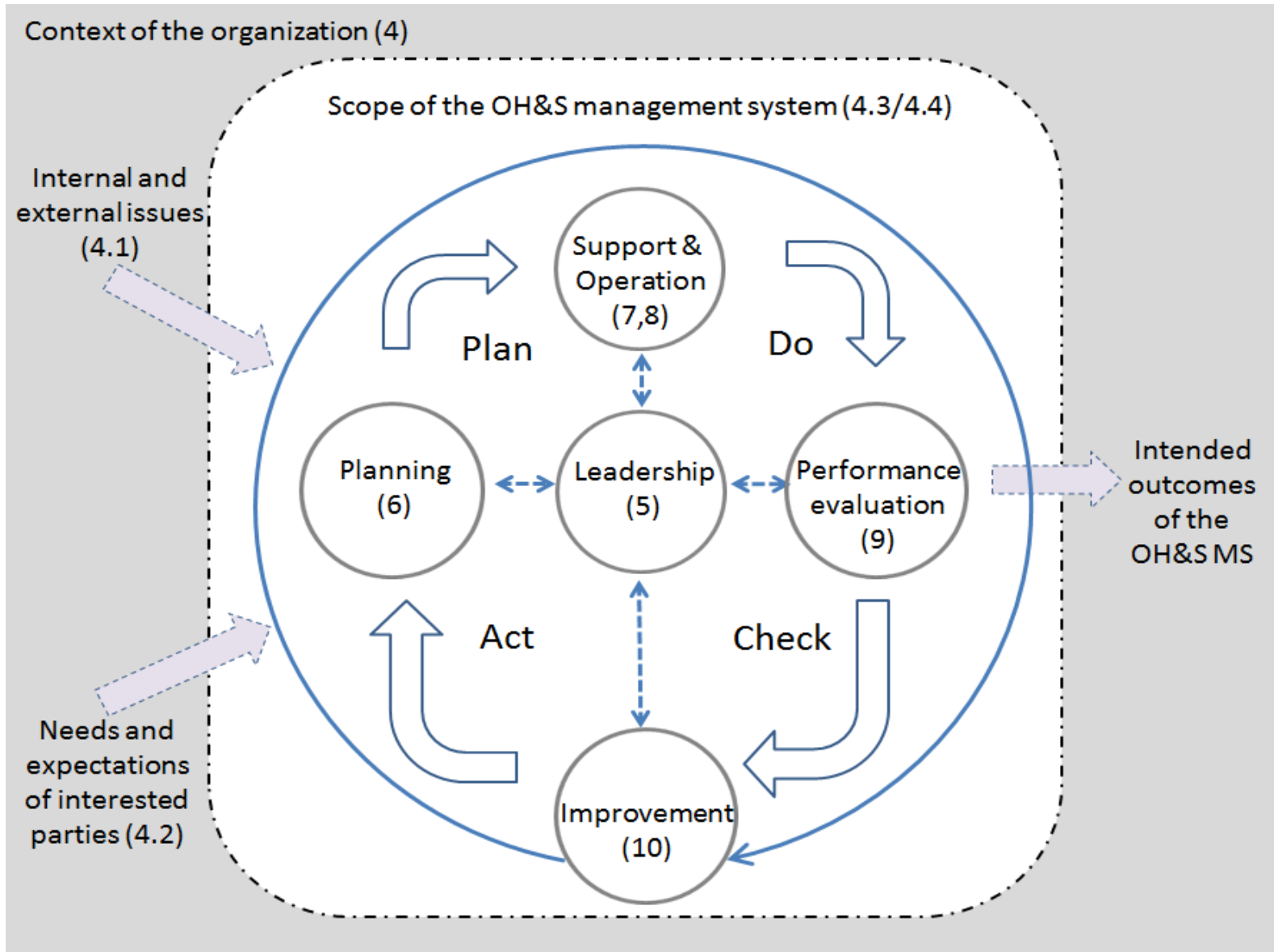
ISO 9001 ordre supérieur structure norm: 2015

Système de gestion de la qualité

Portée du système de gestion



ISO 45001 OHSMS



ISO 14001 EMS:2015

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

ISO 14001:2015

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.

ISO 14001:2015

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):

ISO 14001:2015

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.

ISO 14001:2015

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.

ISO 14001:2015

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.

ISO 14001:2015

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)

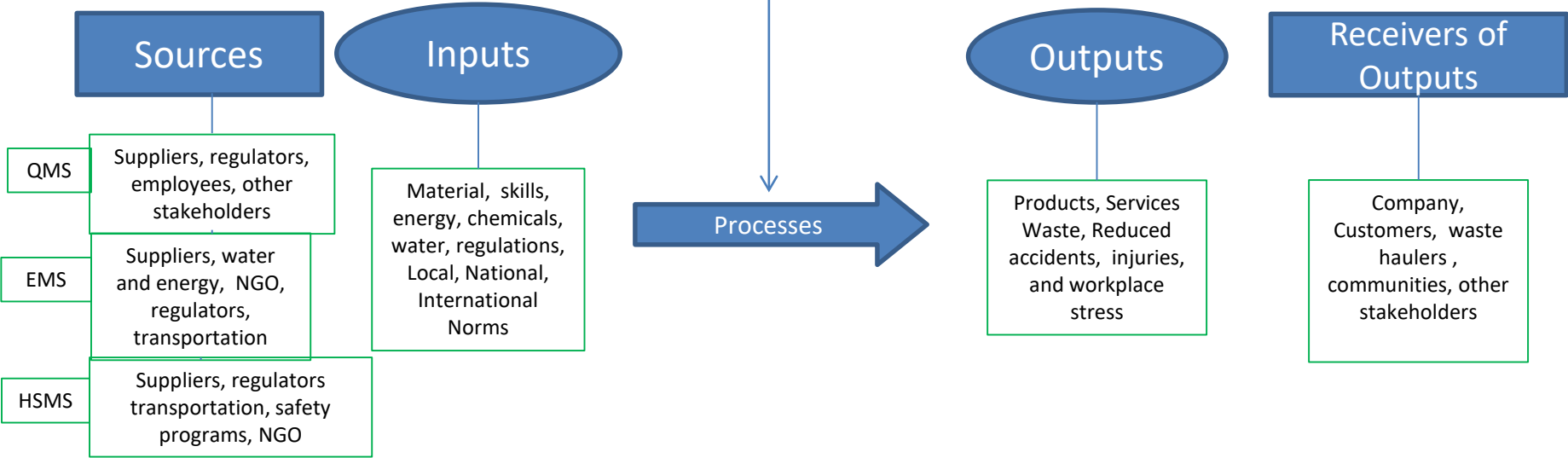
- 4. Extending environmental influence into the supply chain, with implications for procurement;
- 5. Embracing opportunities for using environmental design as a tool for improvement;
- 6. Being able to demonstrate an understanding of the organisation's environmental compliance status at all times; and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

Integration of Management Systems

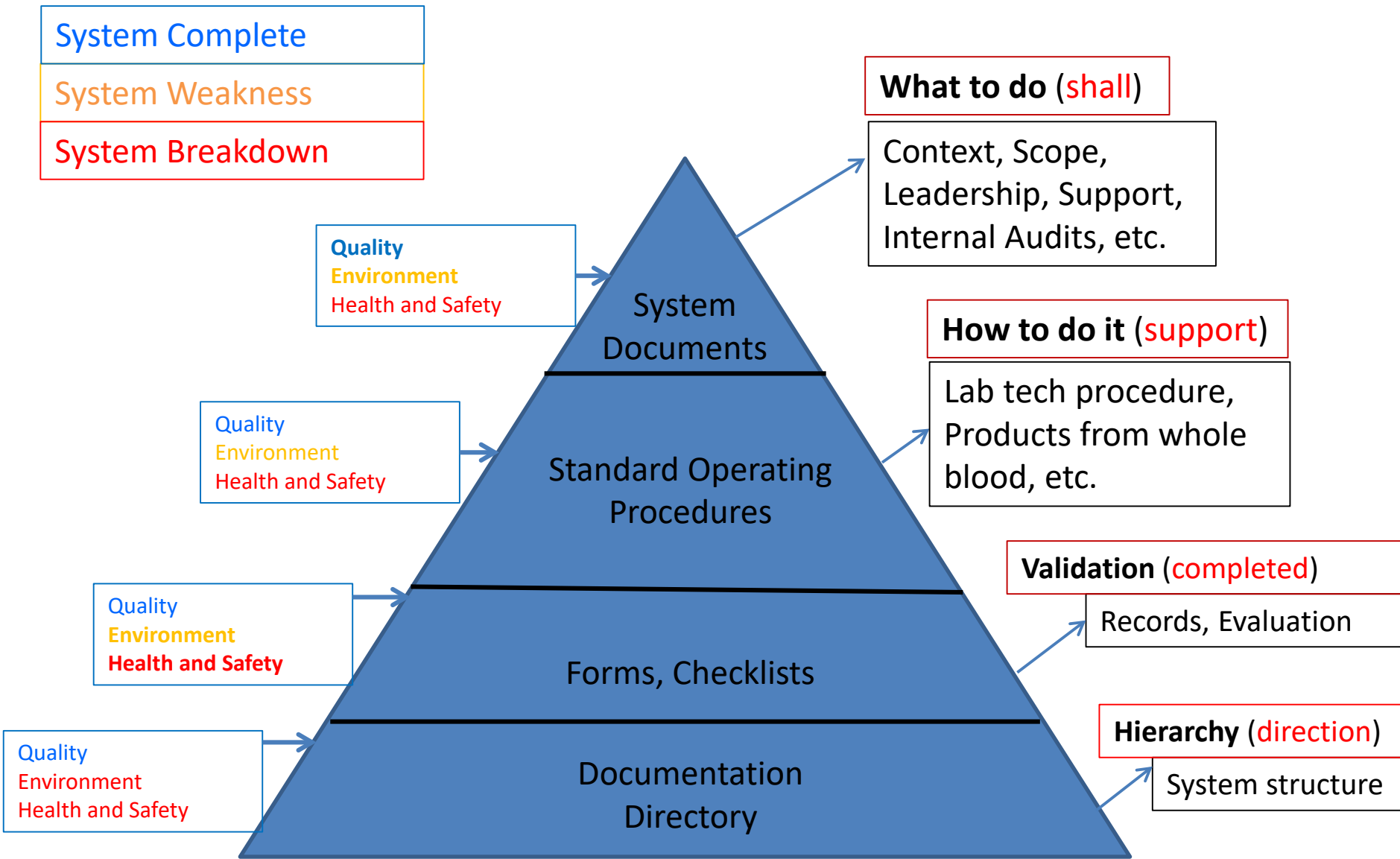
(voluntary standards)

- 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



High Level Structure of Integrated Management Systems



Management System HLS Relation Tracking
Management System Risk Identification

Risk Identification



University High Priority Risk Area: Laboratory Safety

Mission: Provide students and employees with a safe and healthy work environment.

Risk Identification		Risk Assessment			Initial Risk Score	Risk	Final Risk Score	Risk Control Measures
Risk Description (if.....)	Risk Type then we will.....	Probability	Severity	Velocity		Control Status		
Compliance								
There is improper management, storage or disposal of laboratory chemicals, gases, etc.	Hazard / Operational / Reputational	2	3	3	8	5	3	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.
Individuals fail to follow University safety procedures and guidelines	Hazard	2	2	3	7	5	2	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;
There is non-compliance with new or existing federal, state, local regulations	Hazard / Reputational	1	2	3	6	5	1	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
Accidents								
University personnel are involved in laboratory accidents	Hazard	2	3	3	8	5	3	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

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

- Industries
 - ◆ <all other values>
 - PRODUCTDES
 - ◆ Chemical
 - ◆ Biological
 - ◆ Radiological
 - ◆ Explosives
- pubschls
 - ▲
- Infectious Waste Generators
- airports
- hospitals point
- counties
- GDT U.S. Street Map

Selected Attributes of Industries					
LOCATIONICI	COMPANYNAM	PHONEUMBE	FAXNUMBER	LOCATIONIAD	LOCATIONHAD
▶ Charleston	Charleston Steel & Metal Co	(843) 722-7278	(843) 722-728	107 Brigade St	
▶ Charleston	Evening Post Publishing Co	(845) 777-111		134 Columbus St	
▶ Charleston	Picquet Roofing Inc	(843) 722-0641	(843) 722-066	274 Hanover St	
▶ Charleston	Floyd Brace Co Inc	(843) 722-8827	(843) 723-709	243 Calhoun St	
▶ Charleston	...	(843) 722-8705	(843) 723-000	1100 16th St	

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)

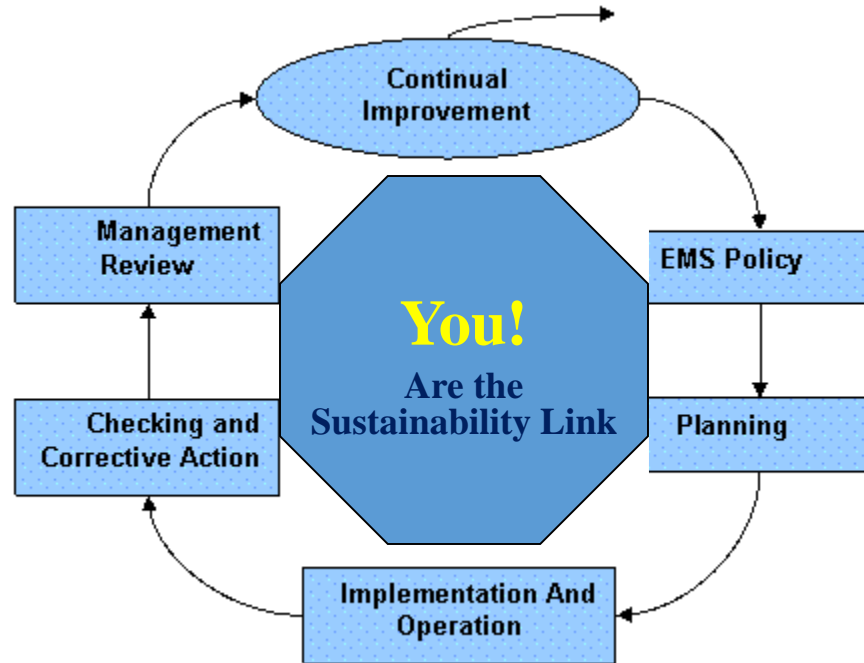
LMM Slides provided by Pillar Management Associates

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!