Introduction To

ISO 14001:2015 Standard

Environmental management systems

– Requirements with guidance for use

Documentation Structure for New Standards

High Level Structure (HLS)

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

Plan - 4, 5 & 6

Do - 7 & 8

Check - 9

Act -10

HISTORY AND BACKGROUND OF THE ISO 14001 STANDARD

- **1996 - First Edition**
- **2004 - Second Edition**
- **2015 - Third Edition**

0.1 Background

- Achieving balance between environment, society and economy is considered essential to meet the needs of the present without comprising the ability of future generations to meet their needs
- Sustainable development as a goal is achieved by balancing 3 pillars of sustainability

0.1 Background

- Society expectations for sustainable development, transparency and accountability have evolved with increasing stringent legislation, growing pressures on environment from pollution, inefficient use of resources, improper waste management, climate change, degradation of ecosystems and loss of diversity
- Has led firms to adopt a systematic approach to environment management with the aim of contributing to environmental pillar of sustainability

Corporate Social Responsibility (CSR)

(corporate conscience, corporate citizenship or responsible business)

- A corporation's initiatives to assess and take responsibility for the company's effects on environmental and social wellbeing.
- The term generally applies to efforts that go beyond what may be required by regulators or environmental protection groups.

0.2 Aim of an EMS

- To provide firms with a framework to protect environment and respond to changing environmental conditions in balance with socio-economical needs.
- Specifies requirements that enable firm to achieve the intended outcomes it sets for EMS.
- A systematic approach to environment management can provide top management with information to build success over long-term and create options for contributing to sustainable development by:
  - protecting environment by preventing or mitigating adverse environmental impacts

0.2 Aim of an EMS

- mitigating potential adverse effect of environmental conditions on the firm
- assisting firm in the fulfillment of compliance obligations
- enhancing environmental performance

- controlling or influencing the way firm's products and services are designed, manufactured, distributed, consumed and disposed by using a life-cycle perspective that can prevent impacts from being unintentionally shifted elsewhere within life cycle

0.2 Aim of an EMS

- achieving financial and operational benefits that can result from implementing environmentally sound alternatives that strengthen firm's market position

- communicating environmental information to relevant interested parties

0.3 Success factors

- Depends on commitment from all levels and functions of organization
- Can leverage opportunities to prevent or mitigate adverse impacts and enhance beneficial impacts
- Can effectively address its risks and opportunities by integrating environmental management into its business processes , strategic direction and decision making
- Assure interested parties that an effective EMS is in place

Process Approach

0.4 PDCA model

- **Plan** - Establish environmental objectives and processes necessary to deliver results in accordance with environmental policy
- **Do**- Implement processes as planned
- **Check**- Monitor and measure processes against policy, objectives and operating criteria & report the results
- **Act-** Take action to continually improve

1. Scope

- ISO 14001:2015 specifies requirements for EMS that an organization can use to
  - enhance its environmental performance
  - manage its environmental responsibilities in a systematic manner that contributes to environmental pillar of sustainability
- Applicable to all organizations and environmental aspects of an organization's activities, products and services that it determines it can either control or influence considering a life cycle perspective.

2. Normative references

- NIL

New Terminology

Major differences in terminology

ISO14001:2004		ISO14001:2015
Legal and other Requirements to which the organization subscribe	-	Compliance obligations
Documents /records	-	Documented information
Supplier / Contractor	-	External provider

3. Terms and definitions

Compliance obligations – legal and other requirements that an organization has to comply with

Corrective action – action to eliminate the cause of a nonconformity and to prevent recurrence

Competence – ability to apply knowledge and skills to achieve intended results

3. Terms and definitions

Environment – surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelationships

Environmental aspect – element of an organization's activities or product or services that interacts or can interact with the environment

Environmental management system – part of management system used to manage environmental aspects, fulfill compliance obligation, and address risks and opportunities

3. Terms and definitions

Environment condition – state or characteristics of the environment as determined at a certain point in time

Environmental impact – change to environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects

Environmental policy – intentions and direction of an organization related to environmental performance, as formally expressed by its top management

3. Terms and definitions

Prevention of pollution – use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts

Risk – effect of uncertainty

Risks and opportunities – potential adverse effects (threats) and potential beneficial effects (opportunities)

3. Terms and definitions

Life cycle – consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal

Performance – measurable result

Environmental performance – performance related to the management of environmental aspects

3. Terms and definitions

Intended outcomes – what the organization intend to achieve by implementing EMS

Determine – a discovery process that results in knowledge

Key Changes in ISO14001:2015

0.5 Contents of ISO14001 Standard

ISO 14001:2015 (New)

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 14001:2004 (Old)

1. Scope
2. Normative references
3. Terms and definitions
4. Environmental management system requirement

4.1 General requirements
4.2 Environmental policy
4.3 Planning
4.4 Implementation and operation
4.5 Checking
4.6 Management review

Key changes in ISO14001:2015

* Refer to Appendix B

Knowing ISO 14001 Clauses



4 Context of the organization

4.1 Understanding the organization and its context

4.2 Understanding the needs and expectations of interested parties

4.3 Determining the scope of the environmental management system

4.4 Environmental management system

4.1 Understanding the organization and its context

- **Shall determine external and internal issues that**
  - **are relevant to its purpose and strategic direction and**
  - **affects its ability to achieve intended outcomes of its ems**
- **Such issues shall include environmental conditions being affected by or capable of affecting the organization (climate e.g. haze, air/water quality, land use, existing contamination, biodiversity, availability of natural resources, etc)**

4.1 Understanding the organization and its context

What is the intended outcome ? (what the organization intends to achieve by implementing EMS?)

External and internal Issues?

- **Regulations (NEA, PUB, NParks, BCA etc)**
- **Inefficient use of natural resources**
  - **Paper / energy / water**
- **Environmental friendly design for M&E services (GM)**
- **Technology (BIM)**
- **Competency of staff**
- **Haze**

4.2 Understanding the needs and expectation of interested parties

The organization shall determine

a) relevant interested parties
b) relevant needs and expectations of these parties
c) which of these needs and expectations become its compliance obligations

* Refer to List of Interested Parties

Interested parties
- Building owner (Comply with rental requirements i.e. Building Fire Safety)
- NSC

Needs and expectations for clients
- Compliance with regulations and requirements

Needs and expectations for shareholders
- Good image / branding
- Efficient use of resources e.g. paper, energy, water etc
- Satisfied and repeated customer

4.3 Determining the scope of EMS**

Shall determine the boundary and applicability of EMS to establish its scope



Shall consider

a) external and internal issues
b) compliance obligations
c) its organizational units, functions and physical boundaries
d) its activities, products and services
e) Its authority and ability to exercise control and influence

Scope shall be maintained as documented information and be available to interested parties

4.4 EMS

To achieve the intended outcome including enhancing its environmental performance, the organization shall establish, implement, maintain and continually improve its EMS including processes needed and their interactions, in accordance with the requirements of this International Standard

Shall consider knowledge gained in 4.1 and 4.2 when establishing and maintaining the EMS

5 Leadership

5.1 Leadership and commitment

5.2 Environmental policy

5.3 Organizational roles, responsibilities and authorities



5.1 Leadership and commitment

Top management shall demonstrate leadership and commitment with respect to EMS

a) take accountability for effectiveness of EMS
b) ensure environmental policy and objectives are established and they are compactible with strategic direction and context of organization
c) ensure integration of EMS requirements into business processes
d) ensure resources needed are available
e) communicate importance of effective environmental management and of conforming to EMS requirements

5.1 Leadership and commitment

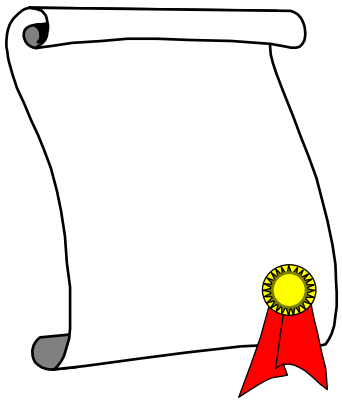
Top management shall demonstrate leadership and commitment with respect to EMS

f) ensure EMS achieve its intended outcomes
g) direct and support persons contributing to effectiveness of EMS
h) promote continual improvement

i) support other management roles to demonstrate their leadership as it applies to their areas of responsibility

5.2 Environmental policy

The intentions and direction of an organization related to environmental performance, as formally expressed by its top management



5.2 Environmental policy

Top management shall establish, implement and maintain an environmental policy that

a) is appropriate to the purpose and context of the organization, including nature, scale and environmental impacts of its activities, products and services

b) provides a framework for setting environmental objectives

c) includes a **commitment to protection of environment** including prevention of pollution and other specific commitments

5.2 Environmental policy

Top management shall establish, implement and maintain an environmental policy that

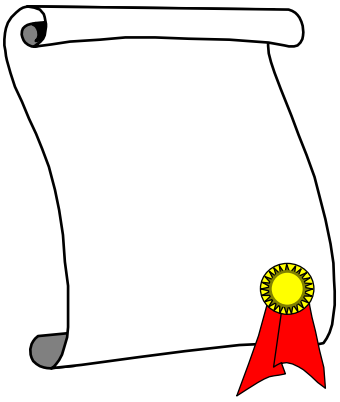
d) includes a commitment to fulfill its compliance obligations

e) includes a commitment to continual improvement of ems to enhance its environmental performance

5.2 Environmental policy

The policy shall

a) be maintained as documented information
b) be communicated within the organization
c) be available to interested parties



5.2 Environmental policy

* Refer to Company Policy



5.3 Organizational roles, responsibilities and authorities

Top management shall ensure R&A for relevant roles are assigned and communicated within the organization

Shall assign R&A to

a) ensure EMS conforms to ISO14001 requirements

b) report on performance of EMS including environmental performance to top management

6 Planning

6.1 Actions to address risks and opportunities

6.2 Environmental objectives and planning to achieve them



6.1 Actions to address risks and opportunities

6.1.1 General

Shall establish, implement and maintain the processes needed to meet requirements in 6.1.1 to 6.1.4

When planning for EMS, shall consider

a) external and internal issues referred to in 4.1
b) requirements of interested parties referred to in 4.2
c) scope of EMS

6.1 Actions to address risks and opportunities

6.1.1 General

Shall determine risks and opportunities related to its environmental aspects (6.1.2) , compliance obligations (6.1.3) and other issues (4.1) and requirements (4.2) that need to be addressed to:

- give assurance that ems can achieve its intended outcomes
- prevent or reduce undesired effects, including potential for external environmental conditions to affect the organization
- achieve continual improvement

6.1 Actions to address risks and opportunities

6.1.1 General

Shall determine potential emergency situations, including those that can have an environmental impact

Shall maintain documented information of its

- risks and opportunities
- processes to have confidence they are carried out as planned

6.1 Actions to address risks and opportunities

6.1.2 Environmental aspects

Shall determine environmental aspects of its activities, products and services that it can control and those that it can influence, and their related impacts, considering a life cycle perspective

Shall consider

a) change, including planned or new developments, and new or modified activities, products and services
b) abnormal conditions and reasonably foreseeable emergency situations

6.1 Actions to address risks and opportunities

6.1.2 Environmental aspects

Shall determine those aspects that can have significant impact by using established criteria

Shall communicate its significant aspects among various functions within organizations

Shall maintain documented information of its

- aspects and impacts
- criteria used to determine its significant aspects
- significant aspects

6.1.2 Environmental aspects

* Refer to Environmental Impacts Assessment Format and Hacking activities

6.1 Actions to address risks and opportunities

6.1.3 Compliance Obligations

Shall

a) determine and have access to compliance obligations related to its aspects
b) determine how these obligations apply to organization
c) take these obligations into account when establishing, implementing, maintaining and continually improving its EMS

Shall maintain documented information of its compliance obligations

6.1.3 Compliance Obligations

* Refer to Register of Legal and Other Requirements

6.1 Actions to address risks and opportunities

6.1.4 Planning action

Shall plan

a) to take action to address its
- significant aspects
- compliance obligations
- risks and opportunities

b) how to
- Integrate and implement actions into its EMS processes
- evaluate the effectiveness of these actions

Shall consider its technological options and its financial, operational and business requirements

6.2 Environmental objectives and planning to achieve them

6.2.1 Environmental objectives

Shall establish objectives at relevant functions and levels taking into account significant aspects and associated compliance obligations

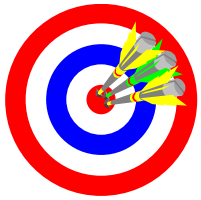
Objectives shall be

a) consistent with environmental policy
b) measurable
c) monitored
d) communicated
e) Updated

Shall maintain documented information on objectives

6.2.2 Planning actions to achieve environmental objectives

When planning how to achieve its environmental objectives, organization shall determine



a) **What** will be done
b) **What** resources will be required
c) **Who** will be responsible
d) **When** it will be completed
e) **How** results will be evaluated including indicators for monitoring progress towards achievement of its measurable objectives

Shall consider how actions to achieve its objectives can be integrated into its business processes

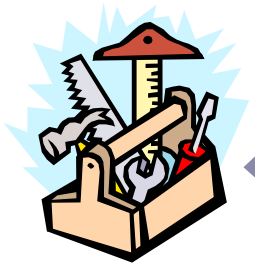
6.2.2 Planning actions to achieve environmental objectives

* Refer to Company Objectives



- Set SMART objectives
- Objectives that are within the organization control

7 Support





7.1 Resources
7.2 Competence
7.3 Awareness
7.4 Communication
7.4.1 General
7.4.2 Internal communication
7.4.3 External communication
7.5 Documented information
7.5.1 General
7.5.2 Creating and updating
7.5.3 Control of documented information

7.1 Resources

Shall determine and provide resources needed for establishment, implementation, maintenance and continual improvement of EMS





7.2 Competence

a) Determine necessary competence of persons doing work under its control that affects its environmental performance and ability to fulfill its compliance obligations
b) Ensure these persons are competent on the basis of appropriate education, training or experience
c) Determine training needs associated with its aspects and EMS
d) Take actions to acquire the necessary competence, and evaluate the effectiveness

Retain appropriate documented information as evidence of competence

7.3 Awareness

Shall ensure that persons doing work under its control are aware of

a) environmental policy
b) significant aspects and related actual or potential impacts associated with their works
c) their contribution to effectiveness of EMS, including benefits of enhanced performance
d) implications of not conforming with EMS requirements including not fulfilling compliance obligations

7.4 Communication

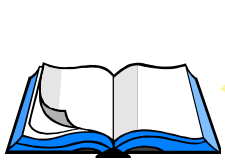
7.4.1 General

Shall establish implement and maintain processes needed for internal and external communications relevant to EMS, including

a) on what it will communicate
b) when to communicate
c) with whom to communicate
d) how to communicate



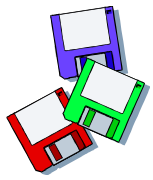
7.4 Communication





7.4.1 General

- When establishing communication processes, shall
  - take into account its compliance obligations
  - ensure that information communicated is consistent with information generated within EMS and is reliable
- Shall respond to relevant communications on its EMS
- Shall retain documented information as evidence of communications



7.4.2 Internal communication

Shall

a) internally communicate information relevant to EMS among various levels and functions of organization including changes to EMS

b) Ensure its communication processes enable persons doing work under its control to contribute to continual improvement

7.4.3 External communication

Shall externally communicate information relevant to EMS as established by organization's communication processes and as required by its compliance obligations



7.5 Documented information

7.5.1 General

EMS shall include



a) documented information required by ISO14001
b) documented information determined by organization as necessary for effectiveness of EMS

7.5.2 Creating and updating

When creating and updating documented information, organization shall ensure appropriate

a) identification and description eg title, reference
b) format (eg software version) and media (eg paper)
c) review and approval for suitability and adequacy



7.5.3 Control of documented information

Documented information shall be controlled to ensure

a) it is available and suitable for use, where and when it is needed

b) it is adequately protected (eg from loss of confidentiality, improper use or loss of integrity)

7.5.3 Control of documented information

For the control of documented information, organization shall address

a) distribution, access, retrieval and use
b) storage and preservation, including preservation of legibility
c) control of changes (eg version control)
d) retention and disposition

Documented information of external origin shall be identified as appropriate and controlled

8 Operation

8.1 Operational planning and control

8.2 Emergency preparedness and response

8.1 Operational planning and control

- Shall establish, implement, control and maintain processes needed to meet EMS requirements and to implement actions identified in 6.1 and 6.2 by
  - establishing operating criteria for processes
  - implementing control of processes according to criteria
- Shall control planned changes and review consequences of unintended changes, taking action to mitigate any adverse effects.
- Outsourced processes shall be controlled or influenced. Type and extent of control or influence to be applied to processes shall be defined within EMS

8.1 Operational planning and control

Operating criteria for construction processes

- Discharge of silty water into drain < 50mg/l
- Control of noise at construction site < 70 dBA
- Haze PSI level
- etc

8.1 Operational planning and control

Consistent with life cycle perspective, shall

a) establish controls to ensure that its environmental requirements are addressed in the design and development process for product or service considering each life cycle stage **(Green Mark)**

b) determine its environmental requirements for procurement of products and services

c) communicate its relevant environmental requirements to external providers (contractors, NSC, suppliers and service provider etc)

8.1 Operational planning and control

Consistent with life cycle perspective, shall

d) consider need to provide information about potential significant impacts associated with transportation or delivery, use, end-of-life treatment and final disposal of its products and services

Shall maintain documented information to the extent necessary to have confidence that processes have been carried out as planned

8.2 Emergency preparedness and response

Shall establish, implement and maintain processes needed to prepare for and respond to potential emergency situations identified in 6.1

Shall

a) prepare to respond by planning actions to prevent or mitigate adverse environmental impacts from emergency situations
b) respond to actual emergency situations
c) take actions to prevent or mitigate consequences of emergency situations

8.2 Emergency preparedness and response

Shall

d) periodically test planned response actions where practicable

e) periodically review and revise the processes and planned response actions, in particular after occurrence of emergency situations or tests

f) provide relevant information and training related to emergency preparedness and response to relevant interested parties

Shall maintain documented information to extent necessary to have confidence that processes are carried out as planned

9 Performance evaluation

9.1 Monitoring, measurement, analysis and evaluation
9.1.1 General
9.1.2 Evaluation of compliance

9.2 Internal audit
9.2.1 General
9.2.2 Internal audit programme

9.3 Management review



9.1 **Monitoring, measurement, analysis and evaluation**

9.1.1 General

- Shall monitor, measure, analyze and evaluate its environmental performance



- Shall determine

a) what needs to be monitored and measured
b) methods for monitoring and measurement, analysis and evaluation needed to ensure valid results
c) criteria against which organization evaluate its performance and indicators
d) when monitoring and measuring shall be performed

9.1 **Monitoring, measurement, analysis and evaluation**

- Shall determine

e) when results from monitoring and measurement shall be analyzed and evaluated

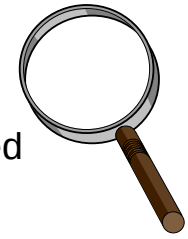
- Shall ensure that calibrated or verified equipment is used and maintained
- Shall evaluate its performance and effectiveness of EMS
- Shall communicate relevant performance information internally and externally
- Shall retain appropriate documented information as evidence of the monitoring, measurement, analysis and evaluation results

9.1.2 Evaluation of compliance

- Shall establish, implement and maintain processes needed to evaluate fulfillment of its compliance obligations
- Shall
  a) determine the frequency that compliance will be evaluated
  b) evaluate compliance and take actions if needed
  c) maintain knowledge and understanding if its compliance status

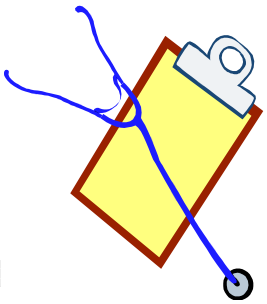
Shall retain documented information as evidence of compliance evaluation results (i.e. inspections, reviews, submission, written direction etc)

9.2 Internal Audit



9.2.1 General

Shall conduct internal audits at planned intervals to provide information on whether EMS



a) conforms to:
– own requirements for its EMS
– to ISO 14001 requirements

b) is effectively implemented and maintained

9.2.2 Internal Audit programme

- Shall establish, implement and maintain internal audit programme including frequency, methods, responsibilities, planning requirements and reporting
- Shall
  a) define audit criteria and scope for each audit
  b) select auditors and conduct audits to ensure objectivity and impartiality of audit process
  c) ensure the results of the audits are reported to relevant management

- Shall retain documented information as evidence of implementation of the audit programme and audit results

9.3 Management Review

A formal review by the top management, at planned interval, to ensure the continuing suitability, adequacy, effectiveness of EMS



9.3 Management review

Shall include

a) status of actions from previous reviews

b) changes in

- external and internal issues relevant to EMS
- needs and expectations of interested parties, including compliance obligations
- significant aspects
- risk and opportunities

c) extent to which environmental objectives have been achieved

d) Information on performance including trends

- NCs and corrective actions
- monitoring and measurement results
- fulfillment of its compliance obligations
- audit results

9.3 Management review

Shall include

e) adequacy of resources

f) relevant communications from interested parties including complaints

g) opportunities for continual improvement

9.3 Management review

Outputs of review shall include

- conclusions on continuing suitability, adequacy and effectiveness of EMS
- decisions related to continual improvement opportunities
- decisions related to any need for changes to EMS, including resources
- actions, if needed, when environmental objectives have not been achieved
- opportunities to improve integration of EMS with other business processes if needed
- any implications for strategic directions of organization

Shall retain documented information as evidence of the results of management reviews

10. Improvement

10.1 General

10.2 Nonconformity and corrective action

10.3 Continual improvement



10.1 General

- **Shall determine opportunities for improvement**
- **Implement necessary actions to achieve intended outcomes of EMS**



10.2 Nonconformity and Corrective action

When NC occurs, organization shall

a) react to NC

- take action to control and correct it
- deal with the consequences including mitigating adverse impacts

b) evaluate the need for action to eliminate the causes of the NC so it does not recur or occur elsewhere by

- reviewing NC
- determining the causes of NC
- determining if similar NC exist, or could potentially occur

10.2 Nonconformity and Corrective action

When NC occurs, organization shall

c) implement any action needed

d) review effectiveness of any CA taken

e) make changes to EMS if necessary

CA shall be appropriate to the significance of effects of NC encountered

Shall retain documented information as evidence of

- nature of the NC and any subsequent actions taken
- results of any CA

10.3 Continual Improvement

Shall continually improve the suitability, adequacy and effectiveness of the EMS to enhance environmental performance