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Module – 3 Lecture Notes

1. State the benefits of implementing ISO 14001 in an organization

There are many reasons why an organization should take a strategic approach to improving its environmental performance. Users of the standard have reported that ISO 14001 helps:

1. Demonstrate compliance with current and future statutory and regulatory requirements
2. Increase leadership involvement and engagement of employees
3. Improve company reputations and the confidence of stakeholders through strategic communication
4. Achieve strategic business aims by incorporating environmental issues into business management
5. Provide a competitive and financial advantage through improved efficiencies and reduced costs
6. Encourage better environmental performance of suppliers by integrating them into the organization's business systems
7. Prove that organization's activities have been evaluated and accepted by an accredited, independent third party.
8. It shows that an external 'stamp' of approval of the EMS has been given and that, the organization's commitment to improve environmental performance is valid.
9. Shows commitment to the protection of the Environment. Possibly, the greatest positive impact to the environment will be in the reduction of hazardous waste. This would apply to reduction, reuse or recycling, all of which maximize natural resources. There is thus conservation of other natural resources in the process.

10. Gives new organizations more chance with regulators that the written documentation necessary to demonstrate agreement with the regulations will be abide by. Overall, relations with regulators would improve after ISO 14001 certification. ‘The agency will know the certified organization care for the environment and has systems in place even before visiting the operation’. This positive relation is extremely valuable and would help foster a better working relationship.
11. Leads to long-term cost savings, especially in the area of environmental control and cleanup of incidents. According to Kuhre (1995) certification will not eliminate all cleanup cost, however, it should minimize the number and size of future cleanups. There would also be increase in competitive position of the company. The costs would be partially offset by ‘increased customer satisfaction, trust and moral’.
12. It leads to prevention of suffering and possible death by workers due to mishaps. The costs associated with injuries will also be reduced. Systems that protect or minimize impacts on the environment would in most cases also minimize impact on employees. This equates to reduced employee injuries and illness.
13. Increases public awareness in the environment as these is increasing days. If an organization improves its EM program, it would surely improve its community relations as well. ISO 14000 procedures are proactive environmental actions. Any proactive action that an organization does is good for the environment and could be communicated to the public since it is a positive venture. If the public is aware of these attempts, their confidence in the organization will be increased.
14. Creates customer trust and satisfaction. Once an organization has the ISO 14001 certification, the customer feel more secure that the environment is being catered for. Organizations that obtain the certificate would be able to increase the market share of their products since most customers are environmentally conscious these especially in advanced industrialized countries. Certification is a little more tangible than the lip service given in many cases. ISO 14001 provides competitive edge to business.

15. It levels the playing field of international trade bringing more competitors to the scene. These means companies certified to ISO 14001 have market access all over the world. In addition employment would be created in the home country thereby reducing unemployment thus poverty. Creating employment however does not mean poverty reduction as people have been employed in industries but are lowly paid thus poor.
16. Insurance companies these days find it easier transacting business with companies that have effective EMS like ISO 14001 as they view such a company as having limited liability. Investors these days also try to invest in environment friendly companies.
17. The standard also provides an effective means of technological development as well as its transfer to other sectors of the industry or the organization.

2. What is continual improvement in environmental performance? How can it be planned in an organization?

Continuous Improvement is an ongoing effort to improve your organization's products, services, and/or processes. Continuous improvement efforts can range widely in complexity, duration, execution, and subject matter. There is always room to improve which is why it is an ongoing effort, and these improvements are determined by you.

Use information and results that you receive from internal audits, management reviews, or monitoring and measuring to help you determine where will company will benefit. If you find that you are underperforming in an area, then is an opportunity to improve it, and the easier it will be to maintain your Environmental Management System.

Consider using the PDCA cycle (Plan, Do, Check, Act) to guide your continuous improvement efforts. Once you've identified the improvement action to take, you cycle through the PDCA phases by planning the action (plan), implementing what is planned (do), monitoring the process and reporting results (check), and taking any further actions to improve if necessary (act). Environmental performance can be enhanced by applying the environmental management system as a whole or improving one or more of its elements.

There are three dimensions for CIP in ISO 14001:2015.

Expansion: The EMS should grow to cover more areas within your organization.

Enrichment: More and more activities, products, processes, emissions, resources etc. get managed by the implemented EMS.

Upgrading: An improvement of the structural and organizational framework of the EMS, and an understanding of navigating business-related environmental issues.

Overall, the CIP-concept was designed for organizations to gradually move away from just operational environmental measures and evolve into a more strategic approach on how to deal with environmental challenges.

3. State the requirements and recommended approach to implementing clause 4.2 of ISO 14001-2004 (environmental policy) within an organization?

Environmental policy — Develop a statement of your organization's commitment to the environment. Use this policy as a framework for planning and action.

Top management shall establish, implement and maintain an environmental policy that, within the defined scope of its environmental management system:

- It was appropriate to the purpose and context of the organization, including the nature, scale and environmental impacts of its activities, products and services.
- It provides a framework for setting environmental objectives.
- It includes a commitment to the protection of the environment, including prevention of pollution and other specific commitment(s) relevant to the context of the organization.
- It includes a commitment to fulfil its compliance obligations.
- It includes a commitment to continual improvement of the environmental management system to enhance environmental performance.

The environmental policy shall be

- be maintained as documented information.
- be communicated within the organization.
- be available to interested parties.

The organization shall establish, implement and maintain the processes needed to meet the requirements. While planning for the environmental management system, the organization shall consider:

Understanding the organization and its context: The organization shall determine external and internal issues that are relevant to its purpose and that affect its ability to achieve the intended outcomes of its environmental management system. Such issues shall include environmental conditions being affected by or capable of affecting the organization.

Understanding the needs and expectations of interested parties:

The organization shall determine:

- the interested parties that are relevant to the environmental management system.
- the relevant needs and expectations (i.e., requirements) of these interested parties.
- the needs and expectations become its compliance obligations.

Determining the scope of the environmental management system: The organization shall determine the boundaries and applicability of the environmental management system to establish its scope. When determining this scope, the organization shall consider:

- the external and internal issues
- the compliance obligations
- its organizational units, functions and physical boundaries.
- its activities, products and services.
- its authority and ability to exercise control and influence

and determine the risks and opportunities, related to its environmental aspects, compliance obligations and other issues and requirements, identified, that need to be addressed to:

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

Within the scope of the environmental management system, the organization shall determine potential emergency situations, including those that can have an environmental impact.

4. Write a note on identifying environmental aspects and impacts within an organizational set up?

An environmental aspect is described in BS EN ISO 14001 as an “element of an organization’s activities, products or services that interacts or can interact with the environment”, from a “life cycle perspective”.

According to ISO 14001, Life Cycle Assessment (LCA), relates to the environmental aspects and potential environmental impacts throughout a product's life cycle from raw material acquisition through production, use, end-of-life treatment, recycling and final disposal (ie cradle-to-grave).

Identifying environmental aspects should take account of whether a particular activity, product or service causes:

- air emissions,
- effluent discharges
- waste arisings
- land contamination
- use of resources (eg, water, fuel and natural resources and materials).

The above aspects relate to those an organization can control. There are other aspects over which the organization may have “control” or “influence”. These can include:

- product design — to improve environmental performance or extend life of products
- packaging — to minimize the use of material resources and energy
- performance — of contractors (on site) and suppliers of goods and materials
- land use — opportunities to improve biodiversity and wildlife habitats on site.

Once the environmental aspect and the cause of that aspect have been identified, the next step is to identify the potential environmental impacts associated with it that may adversely affect the environment and human health. An environmental impact is described in BS EN ISO 14001 as a “change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization’s environmental aspects”.

Using a live cycle approach, the principal types of impacts are those associated with:

- inputs, e.g., extracted resources used in the form of raw materials and energy — that can give rise to land degradation and depletion of natural resources
- outputs, e.g., emissions to air, discharges to water and waste arisings — that may cause pollution
- on-site activities and processes, eg storage, cleaning, assembly and packaging — that can also cause pollution or loss of materials and other resources.

5. With a neat sketch. Explain the components of EMS.

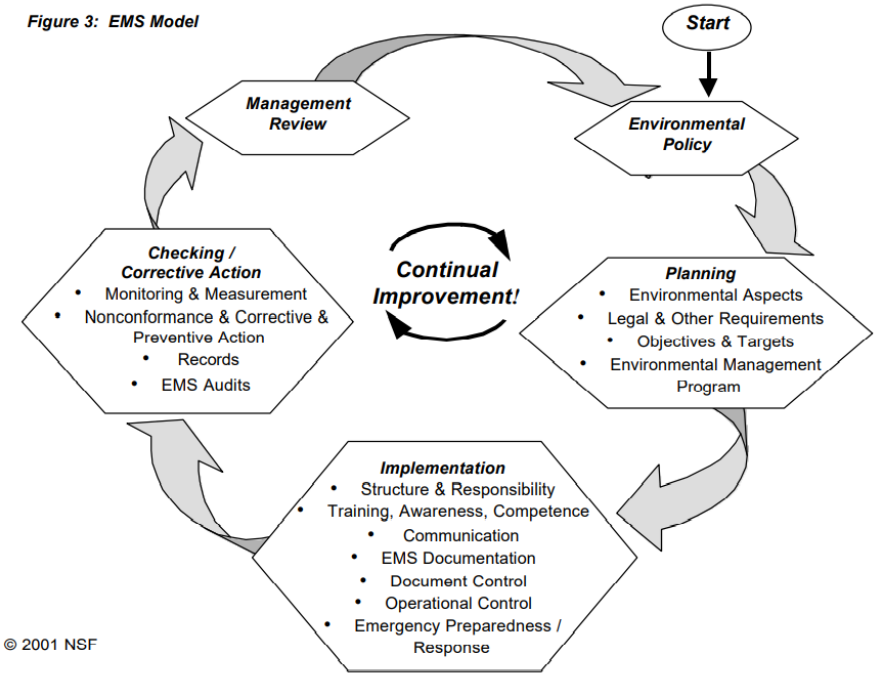


Figure 3: EMS Model

Key Elements of an EMS: A Snapshot

- **Environmental policy** — Develop a statement of your organization's commitment to the environment. Use this policy as a framework for planning and action.
- **Environmental aspects** — Identify environmental attributes of your products, activities and services. Determine those that could have significant impacts on the environment.
- **Legal and other requirements** — Identify and ensure access to relevant laws and regulations, as well as other requirements to which your organization adheres.
- **Objectives and targets** — Establish environmental goals for your organization, in line with your policy, environmental impacts, the views of interested parties and other factors.
- **Environmental management program** — Plan actions necessary to achieve your objectives and targets.
- **Structure and responsibility** — Establish roles and responsibilities for environmental management and provide appropriate resources.
- **Training, awareness and competence** — Ensure that your employees are trained and capable of carrying out their environmental responsibilities.
- **Communication** — Establish processes for internal and external communications on environmental management issues.
- **EMS documentation** — Maintain information on your EMS and related documents.
- **Document control** — Ensure effective management of procedures and other system documents.
- **Operational control** — Identify, plan and manage your operations and activities in line with your policy, objectives and targets.
- **Emergency preparedness and response** — Identify potential emergencies and develop procedures for preventing and responding to them.
- **Monitoring and measurement** — Monitor key activities and track performance. Conduct periodic assessments of compliance with legal requirements.
- **Nonconformance and corrective and preventive action —** Identify and correct problems and prevent their recurrence.
- **Records** — Maintain and manage records of EMS performance.
- **EMS audit** — Periodically verify that your EMS is operating as intended.
- **Management review** — Periodically review your EMS with an eye to continual improvement.

The Key components are

1. **Environmental Policy**
    a. Reflects how the organization feels about the environment
    b. Identifies environmental impacts of processes and products
    c. Ensures compliance with environmental requirements
    d. Commits organization to prevent pollution, reduce environmental risks and share information with external stakeholders
2. **Environmental Requirements and Voluntary Initiatives**
    a. Employees understand their roles in meeting environmental requirements
    b. Identify management and manufacturing practices that affect the organization's ability to meet requirements
    c. Identify and work with programs that encourage preventing pollution
3. **Objectives/Targets**
    a. Set the following environmental objectives: comply with environmental requirements; continuous improvement in regulated and non-regulated areas; prevent pollution
    b. Make objectives specific to the organization
    c. Set timeframes to meet objectives
    d. Update objectives as environmental requirements evolve
4. **Structure, Responsibility and Resources**
    a. Ensure the organization has the personnel and resources needed to meet objectives
    b. Make managers responsible for the environmental performance of their unit
    c. Develop procedures for attaining objectives
5. **Operational Control**
    a. Establish a procedure to ensure the proper waste management hierarchy is followed
    b. Develop simple procedures to measure and report environmental impacts of processes and products
6. **Corrective and Preventive Action and Emergency Procedures**
    a. Document procedures for identifying, correcting and preventing mistakes

b. Develop emergency procedures to minimize or eliminate adverse environmental impacts associated with accidents or emergencies
c. Correct causes of potential hazards to prevent pollution

7. **Training, Awareness and Competence**
    a. Train staff whose roles affect meeting objectives, and make certain staff are duties
    b. Mandatory trainings include detailed pollution prevention methods
8. **Organizational Decision-making and Planning**
    a. Use life cycle analysis to identify the impact products make on the environment
    b. Empower all employees to make pollution prevention improvements that do not require significant resources
9. **Document Control**
    a. For future evaluation, document steps taken to meet objectives
    b. Use electronic documentation to improve record management
    c. Document all pollution prevention suggestions
10. **Continuous Evaluation and Improvement**
    a. Conduct and document periodic objective based audits of the organization's performance
    b. Use audits to assess pollution prevention efforts

6. Define environmental policy; write the benefits of developing environmental policy.

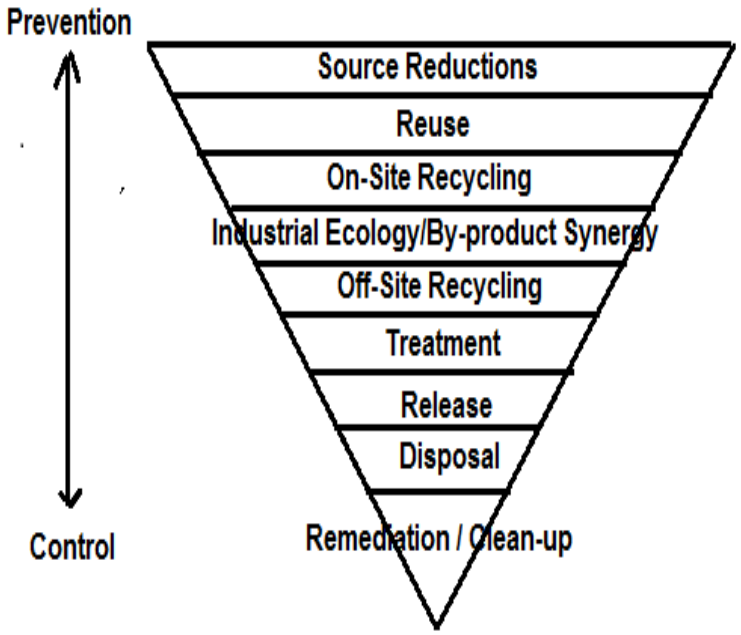
Environmental policy — Develop a statement of your organization's commitment to the environment. Use this policy as a framework for planning and action.

- An environmental policy is a statement about an organization's environmental position and values.
- The ISO 14001 standard states that an environmental policy is the organization's overall environmental performance intentions and direction formally expressed by top management

Benefits of developing an environmental policy

- An organization can publicly advertise that it has considered its environmental performance and has adopted best practice or is working towards improving its environmental performance
- It can advertise the environmental status and environmental objectives of the organization to all stakeholders
- Current and potential clients can read the statement and are able to determine whether they would like to continue or start business with the organization
- It also can provide clear direction to all stakeholders about the organization's environmental values

7. With a neat sketch of pollution prevention hierarchy, explain pollution prevention techniques?



Pollution prevention is generally defined as "the use of processes, practices, materials, products or energy that avoids or minimizes the creation of pollutants or wastes at the source.

Pollution prevention techniques and practices focus on, Substances of concern, Materials and feedstock substitution, Operating efficiencies, On-site reuse and recycling, Training, Purchasing practices, Product design, Equipment modifications, Product reformulation, Process changes, Clean production, Avoidance of cross-media transfer of pollutants or waste, Life-cycle assessment.

Pollution prevention techniques:

1) Materials and feedstock substitution is a method of source elimination.

- Polluting materials in a production process or embedded in a product are replaced with less polluting or nonpolluting substances
- Opportunities for materials and feedstock substitution include:

Painting applications, Parts cleaning, Metal finishing, printing operations, Building and grounds maintenance.

2) Operating efficiencies and training are examples of how normal parts of good operation can provide effective ways to prevent pollution.

Examples include, changing production schedules to minimize equipment and feedstock change overs, improving maintenance schedules, segregating by-products at the source, Training staff to improve material handling and recognize opportunities.

3) Product design and reformulation includes methods for preventing pollution associated with the entire life cycle.

Addressing environmental concerns at an early stage can avoid environmental impacts throughout the product life cycle in a cost-effective manner.

Results of redesigning or reformulating a product include, reducing toxicity of a product, reducing waste material, Extending the life of a product, Extending the life of the materials used, Reducing energy and material intensity needed to produce, use and dispose of the product.

4) Equipment modifications and process changes involve new technologies or approaches to existing operating systems processes and practices to improve production efficiencies and reduce pollution and waste. An example is mechanical stripping instead of using solvents to remove paint and varnish

5) The Value of Waste

Waste can also be viewed as a loss of valuable process materials that could have economic and environmental benefits if reused or recycled.

8. What is Initial environment review? Give its benefits

The first step in creating an EMS is to perform an Initial Environmental Review. This tells you where you are and creates a road map for your organization. There are four main areas:

1. Review previous environmental issues.
2. Consider any regulations which have operational impact.
3. Identify and evaluate possible environmental issues in your organization.
4. Outline current operations and how are they managed; also consider indirect impacts.

The Initial Environmental Review is not considered an audit.

- The Environmental Review is an initial assessment to help create an EMS.
- The Environmental Audit assesses the performance of the organizations' EMS.

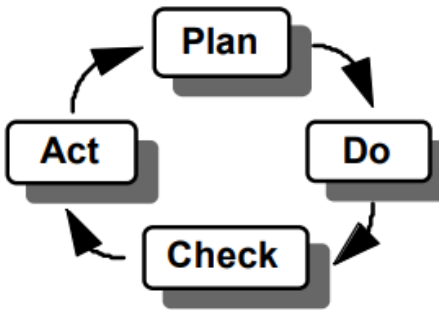
Benefits of an Initial Environmental Review

The Initial Environmental Review helps determine the organization's environmental position, and should include:

- Environmental statutory and regulatory requirements
- Recognize items/areas with environmental impact
- Environmental Performance Criteria
- Feedback of previous experiences
- Opportunities for improvement in-house as well as external (contractors, vendors, etc.)

9. Explain the basic principles of ISO 14001.

The basic principles of ISO 14001 are based on the well-known Plan-Do-Check-Act (PDCA) cycle.



Plan: Establish objectives and processes required

Prior to implementing ISO 14001, an initial review or gap analysis of the organization's processes and products is recommended, to assist in identifying all elements of the current operation, and if possible, future operations, that may interact with the environment, termed "environmental aspects". Environmental aspects can include both direct, such as those used during manufacturing, and indirect, such as raw materials. This review assists the organization in establishing their environmental objectives, goals, and targets (which should ideally be measurable); helps with the development of control and management procedures and processes; and serves to highlight any relevant legal requirement, which can then be built into the policy.

Do: Implement the processes

During this stage, the organization identifies the resources required and works out those members of the organization responsible for the EMS' implementation and control. This includes establishing procedures and processes, although only one documented procedure is specifically related to operational control. Other procedures are required to foster better management control over elements such as documentation control, emergency preparedness and response, and the education of employees, to ensure that they can competently implement the necessary processes and record results. Communication and participation across all levels of the organization, especially top management, is a vital part of the implementation phase, with the effectiveness of the EMS being dependent on active involvement from all employees.

Check: Measure and monitor the processes and report results

During the "check" stage, performance is monitored and periodically measured to ensure that the organization's environmental targets and objectives are being met. In addition, internal audits are conducted at planned intervals to ascertain whether the EMS meets the user's expectations and whether the processes and procedures are being adequately maintained and monitored.

Act: Take action to improve performance of EMS based on results

After the checking stage, a management review is conducted to ensure that the objectives of the EMS are being met, the extent to which they are being met, and that communications are being appropriately managed. Additionally, the review evaluates changing circumstances, such as legal requirements, in order to make recommendations for further improvement of the system. These recommendations are incorporated through continual improvement: plans are renewed, or new plans are made, and the EMS moves forward.

Continual Improvement Process (CI)

ISO 14001 encourages a company to continually improve its environmental performance. Apart from the obvious – the reduction in actual and possible negative environmental impacts – this is achieved in three ways:

- **Expansion:** Business areas increasingly get covered by the implemented EMS.
- **Enrichment:** Activities, products, processes, emissions, resources, etc. increasingly get managed by the implemented EMS.
- **Upgrading:** The structural and organizational framework of the EMS, as well as an accumulation of knowledge in dealing with business-environmental issues, is improved.

Overall, the CI concept expects the organization to gradually move away from merely operational environmental measures towards a more strategic approach on how to deal with environmental challenges.

10. Explain the importance of Initial environment review.

Answer: Same as question no. 8

11. Explain environmental aspects and impacts with examples.

Answer: The Environmental aspects — Identify environmental attributes of your products, activities and services. Determine those that could have significant impacts on the environment.

- Environmental Aspect: "Element of an organization's activities, products, or services that can interact with the environment."
- Environmental Impact: "Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services."

Identifying Aspects	Evaluating Impacts
❑ Which operations and activities interface with the environment in a way that could result (or has resulted) in environmental impacts? ❑ What materials, energy sources and other resources do we use in our work? ❑ Do we have emissions to the air, water or land? ❑ Do we generate wastes, scrap or off-spec materials? If so, does the treatment of disposal of these materials have potential environmental impacts? ❑ Which characteristics or attributes of our products or services could result in impact the environment (through their intended use, end-of-life management, etc.)? ❑ Does our land or infrastructure (e.g., buildings) interact with the environment? ❑ Which activities (for example, chemical storage) might lead to accidental releases?	❑ Are the impacts actual or potential? ❑ Are the impacts beneficial or damaging to the environment? ❑ What is the magnitude or degree of these impacts? ❑ What is the frequency or likelihood of these impacts? ❑ What is the duration and geographic area of these impacts? ❑ Which parts of the environment might be affected (e.g., air, water, land, flora, fauna)? ❑ Is the impact regulated in some manner? ❑ Have our interested parties expressed concerns about these impacts?

The Link Between Aspects and Impacts (some examples from a real company)

Aspects	Potential Impacts
Emissions of volatile organic compounds	Increase in ground level ozone
Discharges to stream	Degradation of aquatic habitat and drinking water supply
Spills and leaks	Soil and groundwater contamination
Electricity use	Air pollution, global warming
Use of recycled paper	Conservation of natural resources

Some Potential Environmental Aspect Categories:

- Air Emissions
- Solid and Hazardous Wastes
- Contamination of Land
- Local Issues (e.g. noise, odor, dust, traffic, etc.)
- Water Discharges
- Energy Use
- Raw Material and Resource Use (water, energy, etc.)
- Hazardous Material Storage and Handling

12. Explain the key steps involved in developing a training program.

Answer: The Training, awareness and competence — ensure that your employees are trained and capable of carrying out their environmental responsibilities.

Key Steps in Developing a Training Program Step

1: Assess training needs & requirements Step

2: Define training objectives Step

3: Select suitable methods and materials Step

4: Prepare training plan (who, what, when, where, how) Step

5: Conduct training Step

6: Track training (and maintain records) Step

7: Evaluate training effectiveness Step

8: Improve training program (as needed)

13. Explain the core element of EMS, with a schematic diagram.

Answer: Same as question no. 5

14. List any six benefits of EMS.

- Improved environmental performance
- Enhanced compliance
- Prevention of pollution/resource conservation
- New customers / markets
- Increased efficiency / reduced costs
- Enhanced employee morale
- Enhanced image with public, regulators, lenders, investors
- Employee awareness of environmental issues and responsibilities

15. Discuss the benefits and barriers of EMS as per ISO 14001

Key EMS Benefits

- improved environmental performance
- reduced liability ¸ competitive advantage
- improved compliance
- reduced costs
- fewer accidents
- employee involvement
- improved public image
- enhanced customer trust
- more favorable credit terms
- meet customer requirement

Barriers associated with EMS's

In many cases the SMEs themselves are anxious to demonstrate environmental probity by adopting and implementing environmental management system standards, but are reluctant to do so for the following reasons

- Fear of the unknown.
- Lack of resources.

- Lack of technical expertise.
- More pressing business imperatives.
- Lack of direction.
- Fear of failure.
- lack of knowledge and skills
- lack of professional advice
- uncertainty of outcome
- certifiers/verifiers
- Implementation and maintenance costs.

16. Write any four principles and structures of ISO 14000 series.

Answer: Same as question no. 9

17. Write a short note on Documentation and operational control.

Document control — Ensure effective management of procedures and other system documents.

The organization's environmental management system shall include:

- documented information required by this International Standard.
- documented information determined by the organization as being necessary for the effectiveness of the environmental management system

The extent of documented information for an environmental management system can differ from one organization to another due to:

- the size of organization and its type of activities, processes, products and services.
- the need to demonstrate fulfilment of its compliance obligations.
- the complexity of processes and their interactions.
- the competence of persons doing work under the organization's control

Documented information required by the environmental management system and by this International Standard shall be controlled to ensure:

- it is available and suitable for use, where and when it is needed.
- it is adequately protected (e.g., from loss of confidentiality, improper use, or loss of integrity).

For the control of documented information, the organization shall address the following activities as applicable.

- distribution, access, retrieval and use.
- storage and preservation, including preservation of legibility.
- control of changes (e.g., version control);
- retention and disposition.

Operational control — Identify, plan and manage your operations and activities in line with your policy, objectives and targets.

The organization shall establish, implement, control and maintain the processes needed to meet environmental management system requirements, and to implement the actions identified and by

- establishing operating criteria for the process(es);
- implementing control of the process(es), in accordance with the operating criteria

The organization shall ensure that outsourced processes are controlled or influenced. The type and extent of control or influence to be applied to the process(es) shall be defined within the environmental management system.

Consistent with a life cycle perspective, the organization shall:

- establish controls, as appropriate, to ensure that its environmental requirement(s) is (are) addressed in the design and development process for the product or service, considering each life cycle stage.
- determine its environmental requirement(s) for the procurement of products and services, as appropriate.
- communicate its relevant environmental requirement(s) to external providers, including contractors.

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

The organization shall maintain documented information to the extent necessary to have confidence that the processes have been carried out as planned.

18. Explain EMS and EMAS.

EMS – ENVIRONMENTAL MANAGEMENT SYSTEM

An **environmental management system** (**EMS**) is "a system and database which integrates procedures and processes for training of personnel, monitoring, summarizing, and reporting of specialized environmental performance information to internal and external stakeholders of a firm.

The most widely used standard on which an EMS is based is International Organization for Standardization (ISO) 14001. Alternatives include the EMAS.

An environmental management information system (EMIS) or Environmental Data Management System (EDMS) is an information technology solution for tracking environmental data for a company as part of their overall environmental management system.

An environmental management system (EMS):

- Serves as a tool, or process, to improve environmental performance and information mainly "design, pollution control and waste minimization, training, reporting to top management, and the setting of goals"
- Provides a systematic way of managing an organization's environmental affairs
- Is the aspect of the organization's overall management structure that addresses immediate and long-term impacts of its products, services and processes on the environment. EMS assists with planning, controlling and monitoring policies in an organization.

- Gives order and consistency for organizations to address environmental concerns through the allocation of resources, assignment of responsibility and ongoing evaluation of practices, procedures and processes.
- Creates environmental buy-in from management and employees and assigns accountability and responsibility.
- Sets framework for training to achieve objectives and desired performance.
- Helps understand legislative requirements to better determine a product or service's impact, significance, priorities and objectives.
- Focuses on continual improvement of the system and a way to implement policies and objectives to meet a desired result. This also helps with reviewing and auditing the EMS to find future opportunities.
- Encourages contractors and suppliers to establish their own EMS.
- Facilitates e-reporting to federal, state and provincial government environmental agencies through direct upload.

EMAS - ECO-MANAGEMENT AND AUDIT SCHEME

- It is one of the Voluntary instruments of environmental protection, i.e., it positively motivates organizations for responsible approach and to improving its environmental performance beyond the legal requirements

- Established by the European Union in order to detect and monitor the impacts of the activities of organizations on the environment and to publish information in the form of individual environmental statements

- EMAS is a proactive approach of the company to monitoring, control and gradual reduction of the impact of the activities of the organization on the environment.

- It is designed for organizations functioning in the private sector (joint stock companies, limited liability companies, etc.) as well as for organizations of state and public administration (ministries, municipalities, etc.) or its parts (producing unit, remote workplaces).

- EMAS system is one of two ways which an organization can use to implement the EMS
- The second tool used to implement the environmental management system is ISO
- Both ways are similar to each other in many parts - environmental policy, continuous improvement, objectives and target values, programs, the implementation of the system and its operation, monitoring, and management review
- EMAS, however, extends the ISO 14001 system, especially in terms of transparency when organizations with an established system, according to EMAS are obliged to publish environmental statements and hold open discussions with the public and other interested parties

19. Mention the contents of ISO 14001

The ISO 14001 2015 environmental management systems standard contains the following key elements:

Introduction
1 Scope
2 Normative references
3 Terms and definitions
3.1 Terms related to organization and leadership
3.2 Terms related to planning
3.3 Terms related to support and operation
3.4 Terms related to performance evaluation and improvement
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
5 Leadership
5.1 Leadership and commitment
5.2 Environmental policy
5.3 Organizational roles, responsibilities and authorities
6 Planning
6.1 Actions to address risks and opportunities
6.1.1 General
6.1.2 Environmental aspects

6.1.3 Compliance obligations
6.1.4 Planning action
6.2 Environmental objectives and planning to achieve them
6.2.1 Environmental objectives
6.2.2 Planning actions to achieve environmental objectives
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
8 Operation
8.1 Operational planning and control
8.2 Emergency preparedness and response
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
10 Improvement
10.1 General
10.2 Nonconformity and corrective action
10.3 Continual improvement

20. Write a short note on i) Initial environment review ii) Objectives and Targets iii) Document Control iv) Management review

i) Initial environment review: Same as question no. 8

ii) Objectives and Targets: — Establish environmental goals for your organization, in line with your policy, environmental impacts, the views of interested parties and other factors.

iii) Document Control: Ensure effective management of procedures and other system documents. The organization’s environmental management system shall include:

- documented information required by this International Standard;
- documented information determined by the organization as being necessary for the effectiveness of the environmental management system.

iv) Management review: Top management shall review the organization's environmental management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness.

The management review shall include consideration of: the status of actions from previous management reviews; the extent to which environmental objectives have been achieved; information on the organization's environmental performance; adequacy of resources; relevant communication(s) from interested parties, including complaints; opportunities for continual improvement.

21. Explain the concept of continual improvement of environment quality.

It is the "Process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organization's environmental policy."

The term *continual improvement* is used to identify the need to systematically improve different processes within the EMS in order to provide improvements overall. It is unreasonable to expect that every process within the EMS will be improving all the time, so continual improvement is used to plan, monitor, and realize improvement in some processes that have been identified for improvement.

While there are many ways that continual improvement can be planned within an EMS, two of the main processes identified in the requirements of ISO 14001 are **the use of environmental objectives and risk-based thinking**. Through the proper use of these two processes you can see great benefits from continual improvement in your EMS.

Figure 3: EMS Model