



Born to Innovate

# EMS Training

# Directory

- ISO14000 series standard background and introduction
- The characteristics of ISO14001
- GB/T24001-2016/ISO14001:2015 standard understanding and introduction

# Profile

ISO14001 is the certification basis of EMS and the core standard of ISO14000 series standards. ISO14004 is the application and implementation guide of EMS, which can guide enterprises how to apply and implement EMS based on GB/T24001. The two standards were revised respectively from 2016 and 2017.

- ISO14001:2015《Environmental Management System Requirements and Usage Guide》
- ISO14004:2016《General Implementation Guide for environmental management Systems》
- ISO14040:2006《Principles and framework for life cycle assessment of environmental management systems》

ISO: International Standardization Organization

14000: The International Organization for Standardization gives the serial number of environmental management standards, a total of 100 numbers, from 14001 to 14100

ISO14000: Environmental management series standards (there is no such standard number, and ISO9000 (basic and terminology) different)

# Background

## 环境问题的恶化

全球变暖, 臭氧层破坏, 酸雨, 工业化学污染, 有毒有害化学物质污染, 越境转移, 海洋污染, 生物多样性破坏, 资源保护等

## 生态恶化和资源破坏

林草植被被破坏, 土地荒漠化, 水生态失调, 旱涝灾害频发, 海洋生态环境恶化, 农业农村污染加剧, 非工业点源, 城市生态脆弱

The worsening of environmental problems

Global warming, ozone layer destruction, acid rain, industrial chemical pollution, Marine pollution, biodiversity destruction, resource conservation and so on

Ecological deterioration and destruction of resources

Forest and grass vegetation is destroyed, land desertification, water ecological imbalance, frequent drought and flood disasters, Marine ecological environment deteriorates, agricultural and rural pollution intensifies, non-industrial point sources, urban ecology is fragile

# Background

非工业点源：点源污染是指有固定排放点的污染源，多为工业废水及城市生活污水，由排放口集中汇入江河湖泊等水体。非点源污染是相对点源污染而言，指溶解的和固体的污染物从非特定的地点，在降水(或融雪)冲刷作用下，通过径流过程而汇入受纳水体(包括河流、湖泊、水库和海湾等)并引起水体的富营养化或其它形式的污染。如农业生产施用的化肥，经雨水冲刷流入水体而造成农业非点源污染；再如城市交通中，汽车尾气排放出的重金属物质，随降雨或融雪后的地面径流，经城市排水系统而进入河流，造成水体污染。

Non-industrial point source: Point source pollution refers to the sources of pollution with fixed discharge points, most of which are industrial waste water and urban sewage, which are concentrated into rivers, lakes and other water bodies through discharge outlets. Compared with point source pollution, non-point source pollution refers to dissolved and solid pollutants from non-specific locations, under the action of precipitation (or snowmelt), through the runoff process into the receiving water body (including rivers, lakes, reservoirs and bays, etc.) and cause water eutrophication or other forms of pollution. For example, the fertilizer applied in agricultural production is washed into water by rainwater and causes agricultural non-point source pollution; Another example is that heavy metals emitted by automobile exhaust in urban traffic, along with the ground runoff after rainfall or snowmelt, enter the river through the urban drainage system and cause water pollution.

# Background

主要环境国际、联合国会议：

1972年在瑞典召开的首次会议发表《人类环境宣言》，通过“人类环境行为计划”，规定6月5日为环境日

1985年科学家证实南极臭氧空洞

1989年联合国以44/228号决议对环境与发展问题采取均衡的、综合的处理办法的原则

1990年通过“消除臭氧物质的蒙特利尔协议书”

1992年联合国在巴西里约热内卢召开环境与发展大会，提出“21世纪议程”，“里约宣言”，“联合国气候变化框架公约”，“联合国生物多样性公约”

Major Environmental International and United Nations Conferences:

The first meeting in Sweden in 1972 issued the Declaration on the Human Environment and adopted the Plan for the Conduct of the Human Environment, setting June 5 as Environment Day

Scientists confirmed the Antarctic ozone hole in 1985

The principle of a balanced and integrated approach to environment and development by the United Nations in its resolution 44/228 of 1989

1990 Adoption of the Montreal Agreement on Ozone-Eliminating Substances

In 1992, the United Nations held a conference on Environment and Development in Rio de Janeiro, Brazil, and put forward "Agenda 21", "Rio Declaration", "United Nations Framework Convention on Climate Change" and "United Nations Convention on Biological Diversity".

# Background

国际环境保护的发展趋势：

60年代→《寂静的春天》

70年代→《增长的极限》

80年代→《我们共同的未来》

90年代→《二十一世纪议程》

The development trend of international environmental protection:

1960s → Silent Spring

1970s → The Limits to Growth

1980s → "Our Common Future"

1990s → Agenda 21

# Background

传统解决环境问题的办法：

政府立法

经济办法

示范, 如: 清洁生产

Traditional solutions to environmental problems:

Government legislation

Economic solution

Demonstration, such as cleaner production

缺点：

外部成本内部化, 监督成本高

末端治理, 后果严重, 无力挽回

面不全, 如生活污染, 潜在污染难以覆盖

Disadvantages:

External costs are internalized and supervision costs are high

End management, serious consequences, unable to recover

Incomplete surface, such as domestic pollution, potential pollution is difficult to cover



# Characteristic

- 是一种管理手段, 强调体系, 注重体系的完整性
  - 以市场驱动为前提, 是自愿性标准
  - 强调对有关法律、法规的持续符合, 无绝对的环境行为要求
  - 强调环境保护和持续改进
  - 广泛的适宜
- 
- It is a management approach that emphasizes the system and pays attention to the integrity of the system
  - On the premise of market - driven, it is a voluntary standard
  - Emphasize the continuous compliance with relevant laws and regulations, without absolute environmental behavior requirements
  - Emphasis on environmental protection and continuous improvement

# Relationship between ISO14001 and ISO9001

相同点 Similarity	不同点 Differences
都是管理性标准, 非技术标准 They are managerial standards, not technical standards	承诺的对象不同 Promises are made to different
体系构成相似, PDCA循环 System composition is similar, PDCA cycle	管理的内容不同 The content of management is different
有些要素和程序可以互相兼容 Some elements and programs are compatible with each other	产生的背景不同 The resulting background is different
都是组织的整体管理体系的一部分 Are part of the organization's overall management system	技术背景不同 Different technical backgrounds
都是第三方认证的标准, 认证程序相似 Both are third-party certification standards, and the certification procedures are similar	

# Sense

- The implementation of ISO14001 environmental management system can make the organization fundamentally realize the whole process of pollution prevention
- Efficient use of energy resources, reduce waste, reduce carbon dioxide emissions, reduce costs, improve competitive and financial advantage
- Improve the market competitiveness of the organization, improve the reputation and confidence of the organization
- Make the organization take the initiative to abide by the law, reduce the cost of illegal
- Improve the management level of the organization and the environmental awareness of all employees
- Enhance stakeholder trust in the organization through strategic communication
- Integrate environmental issues into strategic management to achieve strategic business objectives
- Integrate suppliers into the organization's business systems to encourage improved environmental performance
- Removing trade barriers

# ISO14001 Revision history

- ISO14001 :1996 First edition: ISO14001:1996
- ISO14001 :2004 Second edition: ISO14001:2004
- ISO14001 :2015 Third edition: ISO14001:2015

On September 15, 2015, it was released and implemented, and on October 13, 2016, GB/T24001-2016 idt ISO14001:2015 was officially implemented on May 1, 2017.

# ISO14001 Revision history

## 主要变化:

- 采用了新的标准框架结构“高阶结构”，便于多个管理体系兼容
- 增加了有关战略环境管理的要求
- 强调了与企业的经营管理相融合
- 前调了领导作用，增加了一个新条款
- 将“污染预防”扩展为“环境保护”
- 环境绩效的重点发生了转变，从改进管理体系到提高环境绩效到持续改进
- 增加了“生命周期观点”的要求
- 强化了对外包过程的控制或影响
- 细化了“信息交流”的要求
- 文件的变化
- 强调了变更的控制
- 引入了“风险控制”的方案及基于风险的思维

## Major changes:

- A new standard framework structure "high order structure" is adopted to facilitate the compatibility of multiple management systems
- Requirements for strategic environmental management have been added
- It emphasizes the integration with enterprise management
- The leadership role was moved forward and a new clause was added
- Extending "pollution prevention" to "environmental protection"
- The emphasis on environmental performance has shifted from improving management systems to improving environmental performance to continuous improvement
- Added a requirement for a "lifecycle perspective"
- Enhanced control or influence over the outsourcing process
- The requirements for "information exchange" are refined
- Changes to Files
- Control of change is emphasized
- The "risk control" scheme and risk-based thinking are introduced

# ISO14001: Clause

- 1.范围
- 2.规范性引用文件
- 3.术语和定义
- 4.组织所处环境
  - 4.1理解组织及其所处环境
  - 4.2理解相关方的需求和期望
  - 4.3确定环境管理体系的范围
  - 4.4环境管理体系
- 5.领导作用
  - 5.1领导作用和承诺
  - 5.2环境方针
  - 5.3组织的角色、职责和权限
- 6.策划
  - 6.1应对风险和机遇的措施
  - 6.2环境目标及其实现的策划
- 7.支持
  - 7.1资源
  - 7.2能力

- 1.Scope
- 2.Normative reference documents
- 3. Terms and definitions
- 4. The environment of the organization
  - 4.1 Understand the organization and its environment
  - 4.2 Understand the needs and expectations of relevant parties
  - 4.3 Determine 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 Roles, responsibilities, and rights of the organization
- 6.Planning
  - 6.1 Measures to deal with risks and opportunities
  - 6.2 Planning for environmental objectives and their realization
- 7. Support
  - 7.1 Resources
  - 7.2 Ability

# ISO14001: Clause

7.3意识

7.4信息交流

7.5文件化信息

8.运行

8.1运行策划和控制

8.2应急准备和响应

9.绩效评价

9.1监视、测量、分析和评级

9.2内部审核

9.3管理评审

10.改进

10.1总则

10.2不符合和纠正措施

10.3持续改进

7.3 awareness

7.4 Information Exchange

7.5 File Information

8. Operation

8.1 Operation planning and control

8.2 Emergency preparedness and response

9. Performance evaluation

9.1 Monitoring, measurement, analysis and rating

9.2 Internal Audit

9.3 Management Review

10.Improvement

10.1 General

10.2 Nonconformance and corrective actions

10.3 Continuous Improvement

# Clause : 3 Terms and definitions

## 3.1.4 组织

为实现目标(3.2.5), 由职能和权限与相互关系构成自身功能的一个人或一组人

## 3.1.4 Organization

A person or group of people whose functions and authority and interrelationships constitute their own functions for the purpose of achieving objective (3.2.5)

注1:组织包括但不限于个体经营者、公司、集团公司、商行、企事业单位、政府机构、合股经营的公司、公益机构、社团。或上述单位中的一部分或结合体, 无论其是否具有法人资格、国营或私营。

Note 1: Organizations include but are not limited to individual operators, companies, group companies, commercial firms, enterprises and public institutions, government agencies, joint-stock companies, public welfare organizations and societies. Or any part or combination of such entities, whether corporate, public or private.

## 3.1.5 最高管理者

在最高层指挥并控制组织(3.1.4)的一个人或一组人

注1:最高管理者有权在组织内部授权并提供资源。

注2:若管理体系(3.1.1)的范围仅覆盖组织的一部分, 则最高管理者是指那些指挥并控制组织该部分的人员

## 3.1.5 Top management

A person or group of persons who directs and controls an organization (3.1.4) at the highest level

Note 1: Top management has the authority to delegate and provide resources within the organization.

Note 2: Where the scope of the management system (3.1.1) covers only one part of the organization, top managers are those who direct and control that part of the organization

## 3.1.6 相关方

能够影响决策或者活动、受决策或者活动影响, 或感觉自身受到决策或者活动影响的个人或组织

注1:“感觉自身受到影响”意指已使组织知晓这种感觉

## 3.1.6 Related party

A person or organization that can influence, is affected by, or feels itself affected by a decision or activity

Note 1: "To feel oneself affected" means to make the feeling known to the organization



# Clause: 6.1.2 Environmental factors

应当考虑与组织活动、产品和服务相关的环境因素, 例如:

- 其设施、过程、产品和服务的设计和开发
- 原材料的获取, 包括开采
- 运行或制造过程, 包括仓储
- 设施、组织的资产和基础设施的运行和维护
- 外部供方的环境绩效和实践
- 产品运输和服务交付, 包括包装
- 产品存储、使用和寿命结束后的处理
- 废物管理, 包括再利用/翻新/再循环/处置。

Environmental factors related to the organization's activities, products and services should be considered, such as:

- Design and development of its facilities, processes, products and services
- Access to raw materials, including mining
- Operational or manufacturing processes, including warehousing
- Operation and maintenance of facilities, organizational assets, and infrastructure
- Environmental performance and practices of external suppliers
- Product shipping and service delivery, including packaging
- Product storage, use and disposal at the end of life
- Waste management including reuse/refurbishment/recycling/disposal.

# Clause : 6.1.2 Environmental factors Example:

No.	燃煤锅炉房的环境因素 Environmental factors in coal-fired boiler rooms	环境影响 Environmental effect
1	锅炉烟气的排放(烟尘、二氧化硫, 一氧化氮等)Boiler flue gas emissions (soot, sulfur dioxide, nitric oxide, etc.)	污染大气, 产生酸雨污染土壤和水体, 影响人体健康 Air pollution, acid rain pollution soil and water, affecting human health
2	煤粉的飞扬 Flying pulverized coal	污染大气 Atmospheric pollution
3	锅炉除尘废水的排放 Discharge of boiler dust removal wastewater	污染水体 Contaminated water
4	清洗锅炉时废水的排放 Discharge of waste water from boiler cleaning	
5	锅炉除尘废渣的排放 Discharge of boiler dust removal waste residue	污染土壤和水体 Contaminate the soil and water
6	炉渣的排放 Discharge of slag	
7	废油的排放 Discharge of waste oil	
8	含废油的棉丝 Cotton yarn containing waste oil	
9	锅炉装置及个设备运转时产生的噪音 Noise generated by the operation of boiler units and equipment	影响人体健康 Impact on Human health
10	液压油或机油的泄露 Leakage of hydraulic fluid or oil	污染土壤和水体 Contaminate the soil and water
11	除垢剂等的泄露 Leakage of scale remover, etc	
12	煤的消耗 The consumption of coal	能源减少 Energy reduction
13	电的消耗 The consumption of electricity	
14	水的消耗 The consumption of water	资源减少 Resources to reduce
15	蒸汽的泄露 Leakage of steam	能源浪费 Energy waste
16	热辐射 Heat radiation	能源浪费、影响人体健康 Energy waste, affect human health
17	锅炉房距离蒸汽车间的距离过远 The distance between the boiler room and the steam shop is too far	热量传输时损失过大 Excessive heat loss during heat transfer
18	锅炉及其管网可能发生爆炸或者破裂 The boiler and its pipe network may explode or rupture	污染大气, 水体和土壤, 影响人体健康, 浪费能源资源 Pollute the air, water and soil, affect human health, waste energy resources

# Clause : Documented information required by the standard

文件(保持) File (hold)

环境管理体系范围(4.3)

Scope of Environmental Management System (4.3)

环境方针(5.2) Environmental Policy (5.2)

风险和机遇(6.1.1) Risks and Opportunities (6.1.1)

满足条款6.1的一个或多个过程(6.1.1)

One or more processes that satisfy Clause 6.1 (6.1.1)

环境因素和影响(6.1.2)

Environmental Factors and Impacts (6.1.2)

重要环境因素准则(6.1.2)

Criteria for Significant Environmental Factors (6.1.2)

重要环境因素(6.1.2)

Important Environmental Factors (6.1.2)

合规义务(6.1.3)

Compliance Obligations (6.1.3)

环境目标(6.2)

Environmental Objectives (6.2)

相关的运行控制(8.1)

Relevant operational controls (8.1)

应急准备和响应(8.2)

Emergency preparedness and response (8.2)

记录(保留) Record (retention)

能力证据(7.2) Evidence of competence (7.2)

适当时, 内外部信息交流(7.4)

Internal and external information exchange when appropriate (7.4)

相关的运行控制(8.1)

Relevant operational controls (8.1)

应急准备和响应(8.2)

Emergency preparedness and response (8.2)

监视、测量、分析和评价结果(9.1.1)

Monitoring, measurement, analysis and evaluation results (9.1.1)

合规性评价结果(9.1.2)

Compliance evaluation Results (9.1.2)

审核方案实施(9.2.2)

Review scheme implementation (9.2.2)

审核结果(9.2.2)

Audit Results (9.2.2)

管理评审结果(9.3)

Management Review Results (9.3)

不符合性质, 后果, 改善(10.2)

Nonconformity of nature, Consequence, Improvement (10.2)

# Clause : Document example

- 环境手册
- 环境因素识别与评价程序
- 环境运行控制程序
- 环境监视与测量控制程序
- 能源资源管理程序
- 应急准备和响应程序
- 法律法规和其他要求识别和评价程序
- 废弃物管理程序

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- Environmental manual
- Environmental factor identification and evaluation procedures
- Environmental operation control procedure
- Environmental monitoring and measurement control procedures
- Energy resource management procedure
- Emergency preparedness and response procedures
- Laws, regulations and other requirements identify and evaluate procedures
- Waste management procedures

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# Clause : Document example

- 内审程序
- 管理评审控制程序
- 相关方程序
- 风险和机遇程序
- 文件与记录控制程序
- 供应商管理程序

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- Internal audit procedure
- Management review control procedure
- Related party procedure
- Risk and opportunity procedure
- Document and record control procedure
- Supplier management procedure

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# Sample ISO14001 audit

环境因素所涉及的部门/过程/区域:

例:场所:管理层、市场部、采购部、工程部及财务部等部门及管理区域。

过程:环境因素识别评价、运行控制、应急准备响应及监视测量等。

请描述重要环境因素。

例:提供《环境因素识别和评价表》,按工作区域及活动,并依服务生命周期原理,识别了环境因素,办公区域(含财务等)如水资源消耗、电能源消耗、纸消耗、办公废弃物及潜在火灾等。

是否有该因素/危险源适用的法规?

制定并实施《法律法规与其他要求控制程序》及《合规性评价控制程序》。

出示了《法律法规及其他要求清单》,识别了相关的环境法律法规,如中华人民共和国环境保护法、中华人民共和国节约能源法、中华人民共和国消防法、火灾事故调查管理规定、上海市固体废物污染环境防治条例和上海市排水管理办法实施细则等。

Department/process/area involved in environmental factors:

Example: Place: management, marketing, Purchasing, Engineering, finance and other departments and management areas.

Process: identification and evaluation of environmental factors, operation control, emergency response, monitoring and measurement, etc.

Please describe significant environmental factors or hazards.

Example: Provide the "Environmental Factors Identification and Evaluation Form", according to the work area and activities, and according to the principle of service life cycle, identify the environmental factors, office areas (including finance, etc.) such as water resource consumption, electricity energy consumption, paper consumption, office waste and potential fire.

Are there regulations applicable to this factor/source of risk?

Formulate and implement the Control Procedure of Laws, Regulations and Other Requirements and the Control Procedure of Compliance Evaluation.

Showed the list of laws and regulations and other requirements, identify the relevant environmental laws and regulations, such as environmental protection law of the People's Republic of China, the energy conservation law of the People's Republic of China, hereby of the People's Republic of China, the regulations for the fire accident investigation, prevention and control of environmental pollution by solid waste in Shanghai regulations and rules of Shanghai municipality on implementing the measures for the management of drainage, etc.

# Sample ISO14001 audit

怎样对该因素进行控制？是否有作业指导书？是否可行并遵守？是否采样并对其进行分析和检验？是否对设备进行维护？是否建立操作规程？结果是否被证实受控？如果存在控制问题，是否采取相应措施？

例：制订并实施《废弃物管理程序》、《环境运行控制程序》等程序及相关作业指引，关注服务生命周期原理，实施控制，可行并遵守。

**废水控制：**非生产人员主要在办公室上班，主要产生生活污水，污水流入市场管道，由市政污水处理厂统一处理。

**废气控制：**办公过程无废气产生。

**噪声控制：**办公过程噪声极小，无影响。

**一般/危险废弃物控制：**公司文件已规定废弃物分类管理方法，废纸品由废品回收公司回收；废硒鼓/墨盒等，由维修方回收；生活垃圾由集中收集后移交城市生活垃圾回收站进行处理，提供《废弃物分类表》。

**化学品管理：**办公区域使用少量洗手液，对环境影响很小。

**消防安全：**办公现场有配备灭火器等应急器材，提供《消防设备清单》，有维护点检，在有效状态。

**办公区域：**有提倡节约用水用电，现场未发现浪费，并有用水电等资源能源统，均在可控目标。

How can this aspects be controlled? Are there working instructions? Is it feasible and complied with? Are samples taken and analyzed and tested? Is the device maintained? Are operating procedures established? Did the results prove to be controlled? If there are control problems, are measures taken?

Example: Formulate and implement Waste Management Procedure, Environmental Operation Control Procedure and other procedures and relevant operational guidelines, pay attention to the service life cycle principle, implement control, feasible and abide by.

**Waste water control:** non-production personnel mainly work in the office, mainly produce domestic sewage, sewage into the market pipeline, by the municipal sewage treatment plant unified treatment.

**Exhaust gas control:** No exhaust gas is produced in the office process.

**Noise control:** Office process noise is minimal, no impact.

**General/hazardous waste control:** the company documents have stipulated the waste classification management method, waste paper is recycled by the waste recycling company; Waste toner cartridges/cartridges, etc., recovered by the maintenance side; The household garbage shall be collected centrally and transferred to the municipal household garbage recycling station for treatment, and the Waste Classification Table shall be provided.

**Chemical management:** Use a small amount of hand sanitizer in office areas with minimal environmental impact.

**Fire safety:** The office site is equipped with fire extinguishers and other emergency equipment. The List of Fire Fighting Equipment is provided, and the maintenance point inspection is in effective condition.

**Office area:** It advocates saving water and electricity, no waste is found on site, and it uses water, electricity and other resources and energy systems, all of which are controllable.

# Sample ISO14001 audit

是否对设备进行矫正？

例：办公现场水电消耗未进行监测，在可控目标范围内。

办公现场配备灭火器等应急器材，提供《消防设备清单》，有维护点检，在有效状态。

环境因素是否和承包人有关？如果是，是否和其 对此进行沟通？是否有可接受的控制能力？

例：外包过程：无。

经了解，部门按《相关方施加影响管理程序》的有关 规定，将环境和健康安全的相关控制要求以 邮件、电话、微信、Slack、口头或书面文件传达到供方和员工等相关方

Is the equipment corrected?

Example: The water and electricity consumption in the office site has not been monitored and is within the controllable target range.

The office site shall be equipped with fire extinguishers and other emergency equipment. The List of Fire Fighting Equipment shall be provided, and the maintenance point inspection shall be in effective condition.

Are environmental factors related to the contractor? If yes, have you communicated with them about this? Are there acceptable controls?

Example: Outsourcing process: None.

As far as we know, according to the relevant provisions of the Relevant Party Influence Management Procedure, the department will convey the environmental and health and safety related control requirements to the supplier, employees and other relevant parties by email, telephone, wechat, Slack, oral or written documents.





**Thank You!**