INTERNATIONAL STANDARD

ISO/IEC 17021-2

First edition
2016-12-01

Conformity assessment — Requirements for bodies providing audit and certification of management systems —

Part 2: Competence requirements for auditing and certification of environmental management systems

Évaluation de la conformité — Exigences pour les organismes procédant à l'audit et à la certification des systèmes de management —

Partie 2: Exigences de compétence pour l'audit et la certification des systèmes de management environnemental

Reference number
ISO/IEC 17021-2:2016(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of conformity assessment, ISO and IEC develop joint ISO/IEC documents under the management of the ISO Committee on Conformity assessment (ISO/CASCO).

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

ISO/IEC 17021-2 was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 2, *Environmental auditing and related environmental investigations*, and the ISO Committee on conformity assessment (CASCO). It was circulated for voting to the national bodies of both ISO and IEC, and was approved by both organizations.

This first edition of ISO/IEC 17021-2 cancels and replaces ISO/IEC/TS 17021-2:2012, which has been technically revised.

The following major changes have been made compared with ISO/IEC/TS 17021-2:2012:

— addition of the new requirements of ISO 14001:2015 which required additional competence to audit them;

— adaptation of the competence requirements to reflect the greater focus in ISO 14001:2015 on expected outcomes;

— clarification of the difference between sustainable development and sustainability;

— inclusion of competence criteria for the auditor to understand the context of the organization;

— inclusion of competence to audit the reliability of client communications about their EMS.

A list of all parts in the ISO/IEC 17021 series can be found on the ISO website.

Introduction

This document complements ISO/IEC 17021-1. In particular, it clarifies the requirements for the competence of personnel involved in the certification process set out in ISO/IEC 17021-1:2015, Annex A.

Certification bodies have a responsibility to interested parties, including their clients and the customers of the organizations whose management systems are certified, to ensure that only those auditors who demonstrate the relevant competence are allowed to conduct environmental management system (EMS) audits. All EMS auditors should possess the generic competencies described in ISO/IEC 17021-1 as well as the specific EMS knowledge described in this document.

Certification bodies will need to identify the specific audit team competence needed for the scope of each EMS audit. The selection of an EMS audit team will depend upon various factors, including the EMS technical area, the context of an organization, its environmental aspects and the site where these aspects occur.

The competence requirements for other personnel involved in certification activities are also described.

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “may” indicates a permission;

— “can” indicates a possibility or a capability.

Further details can be found in the ISO/IEC Directives, Part 2.

For the purposes of research, users are encouraged to share their views on this document and their priorities for changes to future editions. Click on the link below to take part in the online survey:

https://www.surveymonkey.com/r/D5PK2NV

Conformity assessment — Requirements for bodies providing audit and certification of management systems —

Part 2:
Competence requirements for auditing and certification of environmental management systems

1 Scope

This document specifies additional competence requirements for personnel involved in the audit and certification process for environmental management systems (EMS) and complements the existing requirements of ISO/IEC 17021-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 17021-1:2015, *Conformity assessment — Requirements for bodies providing audit and certification of management systems — Part 1: Requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 17021-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
EMS technical area
environmental management system technical area
area characterized by commonalities of processes relevant to an environmental management system and its intended results

4 Generic competence requirements

The certification body shall define the competence requirements for each relevant EMS technical area and for each function in the certification activity. The certification body shall take into account all the requirements specified in Clauses 5, 6 and 7 that are relevant for the EMS technical areas, as defined by the certification body. See Tables A.1 and A.2 for a summary of the competence requirements for personnel involved in specific certification functions.

5 Competence requirements for EMS auditors

5.1 General

Each EMS auditor shall have a level of competence as defined by the certification body for the technical area concerned that includes the generic competencies described in ISO/IEC 17021-1, as well as the EMS knowledge described in 5.2 to 5.15.

5.2 Environmental terminology

Each EMS auditor shall have knowledge of environmental terms, definitions and concepts as used within an EMS.

NOTE Concepts include "intended outcomes", "environmental sustainability" and "sustainable development" (see ISO 14001:2015, Clause 1 and Clause A.3).

5.3 Environmental metrics

Each EMS auditor shall have knowledge of the quantification of environmental outputs applicable to the EMS and applicable compliance obligations.

EXAMPLES Direct, normalized, aggregated, indexed and weighted measurement, modelling, mass balance.

5.4 Environmental monitoring and measuring techniques

Each EMS auditor shall have knowledge of environmental monitoring and measuring techniques and analytical methods (including equipment and its calibration or verification and maintenance).

EXAMPLES Continuous, periodic and manual sampling, observations made during abnormal conditions.

5.5 Environmental aspects and impacts

Each EMS auditor shall have knowledge of techniques for the identification of environmental aspects and impacts and the determination of their environmental significance.

5.6 Life cycle perspective

Each EMS auditor shall have knowledge of life cycle concepts and how an organization can apply a life cycle perspective to its products and services.

NOTE The term "life cycle" is defined in ISO 14001:2015, 3.3.3. See also ISO 14001:2015, A.6.1.2.

5.7 Environmental performance evaluation

Each EMS auditor shall have knowledge of environmental performance evaluation methods, including indicators, sufficient to determine whether an organization's environmental performance is achieving the intended outcomes of an EMS.

NOTE ISO 14031 provides further information on environmental performance evaluation.

5.8 Compliance obligations

Each EMS auditor shall have knowledge to determine whether an organization has determined its EMS related compliance obligations, and evaluated fulfilment of its EMS related compliance obligations.

NOTE The term "compliance obligations" is defined in ISO 14001:2015, 3.2.9.

5.9 Emergency preparedness and response

5.9.1 Each EMS auditor shall have knowledge sufficient to determine whether an organization has identified potential emergency situations and planned relevant responses.

5.9.2 Each EMS auditor shall have knowledge sufficient to evaluate an organization's effectiveness in testing its emergency responses and responses to actual emergencies if applicable.

5.10 Operational control

Each EMS auditor shall have knowledge of processes used for operational planning and control, including management of change related to an EMS.

5.11 Factors related to site

Each EMS auditor shall have knowledge of site-related factors that might influence the potential impacts of an organization's aspects on the surrounding areas, ecosystems and communities. Site factors include geography, climate, hydrogeology, topography, soil and other site-related physical conditions, as well as prior use of the site.

5.12 Scope

Each EMS auditor shall have knowledge to determine that the scope of an EMS is appropriate within the context of an organization and its activities, products and services.

5.13 Communicated information

Each EMS auditor shall have knowledge related to auditing of communicated information to enable the audit of the reliability of relevant environmental information related to the EMS.

NOTE This includes knowledge of factors impacting upon reliability, such as transparency, appropriateness, truthfulness, factuality/accuracy, completeness and intelligibility (see ISO 14001:2015, A.7.4).

5.14 Context of the organization

5.14.1 Each EMS auditor shall have knowledge to determine that an organization has identified the external and internal issues, including environmental conditions relevant to the context in which it operates that have the potential to affect the organization's ability to achieve the intended outcomes of its EMS.

5.14.2 Each EMS auditor shall have knowledge to determine that an organization has identified the needs and expectations of interested parties relevant to an organization's EMS.

5.15 Risks and opportunities

5.15.1 Each EMS auditor shall have knowledge of methods for determining risks and opportunities and how these methods can be applied in an organizational context.

NOTE 1 The term "risks and opportunities" is defined in ISO 14001:2015, 3.2.11.

NOTE 2 Examples of methods for determining risks and opportunities include SWOT (Strengths-Weaknesses-Opportunities-Threats), PESTLE (Political-Economic-Social-Technological-Legal-Environmental), Delphi technique, Probability and Impact matrix and risk facilitation workshops.

5.15.2 Each EMS auditor shall have knowledge to determine if an organization has appropriately identified and addressed the risks and opportunities related to its context, environmental aspects and compliance obligations.

6 Aspect-specific competence requirements for EMS auditing

6.1 General

An audit team shall be appointed that is composed of auditors (and technical experts, as necessary) having the collective competence to undertake the audit. The certification body shall define the specific competence criteria related to each aspect appropriate to the EMS technical area(s) in which it operates and consistent with the requirements specified in 6.2 to 6.8.

NOTE It is not necessary for each auditor in the audit team to have the same competence; however, the collective competence of the audit team needs to be sufficient to achieve the audit objectives.

6.2 Emissions to air

6.2.1 General

Emissions to air occur from activities such as performing mechanical, chemical or biological processes, generating or using energy or through the provision of services requiring the use of fossil fuelled vehicles. These emissions may include gases and particulate matter and be subject to control through mechanical, chemical or natural means to reduce them to an acceptable level in order to avoid air pollution.

6.2.2 Gases, aerosols and particulate matter

Personnel on a team involved in EMS auditing shall have knowledge of types of emissions to air (fugitive, point or diffuse) of gases, aerosols or particulate matter [e.g. Volatile Organic Compounds (VOCs), odours, acids, bases, greenhouse gases, microorganisms, heavy metals].

6.2.3 Operational control

Personnel on a team involved in EMS auditing shall have knowledge of the techniques used to control emissions to air such as filtering techniques, scrubbers, water mist control and thermal oxidizers.

6.2.4 Monitoring and measurement

Personnel on a team involved in EMS auditing shall have knowledge of the techniques used to monitor emissions to air, e.g. observation of stack emissions, continuous or sample-based stack monitoring, air sampling and analysis and calculation-based mass balance, microorganism counts, and odour testing.

6.3 Releases to land

6.3.1 General

Releases to land of solids or liquids may occur as waste from mechanical, chemical or biological processes, on the production or disposal of a product or the delivery of a service or as a result of a natural event or accidental situation.

6.3.2 Liquid or solid releases

Personnel on a team involved in EMS auditing shall have knowledge of releases to land including but not limited to heavy metals, polycyclic aromatic hydrocarbons (PAH), petroleum-based products, halogenated hydrocarbons, pesticides, herbicides and animal waste.

6.3.3 Operational control

Personnel on a team involved in EMS auditing shall have knowledge of the techniques used to control releases to land such as primary or secondary containment (bunding) and dispersion (land application rates).

NOTE These releases can be subject to control through physical means (e.g. silt trap, penstock), natural (e.g. composting) or chemical treatment (primary, secondary or tertiary) and biological remediation (phyto/anaerobic).

6.3.4 Monitoring and measurement

Personnel on a team involved in EMS auditing shall have knowledge of the techniques used to monitor, measure and analyse soil associated with releases to land.

6.4 Releases to water

6.4.1 General

Releases to water are discharges which include effluents, sewage and diffuse runoffs (e.g. fertilizers or pesticides transported by natural precipitation). This water may be discharged for treatment; or directly to surface or ground water before or after treatment.

6.4.2 Surface and ground water

Personnel on a team involved in EMS auditing shall have knowledge of surface and ground water flows and characteristics, including water columns, suspended and dissolved solids, sedimentation, effluent viscosity and density, evaporation, acidification and eutrophication.

6.4.3 Operational control

Personnel on a team involved in EMS auditing shall have knowledge of the typical liquid waste streams (e.g. organic, inorganic) and the techniques used to treat liquid waste (e.g. aerobic and anaerobic treatment).

Personnel on a team involved in EMS auditing shall have knowledge of the techniques used to control surface water discharges (e.g. from weather) and to remediate surface and ground water.

6.4.4 Monitoring and measurement

Personnel on a team involved in EMS auditing shall have knowledge of the parameters measured and the techniques used to monitor liquid waste treatment processes and/or other discharges, [e.g. indicators including Biological Oxygen Demand (BOD) or Chemical Oxygen Demand (COD), sampling and analysis, in-process monitoring devices and inspections].

6.5 Uses of raw materials, energy and natural resources

6.5.1 Upstream management

6.5.1.1 Personnel on a team involved in EMS auditing shall have knowledge of resource depletion issues including sourcing renewable and non-renewable materials, water scarcity, forest loss and soil degradation.

6.5.1.2 Personnel on a team involved in EMS auditing shall have knowledge of renewable and non-renewable sources of energy, the techniques for converting them to useful energy and their environmental impacts, including climate change, impact on biodiversity and on ecosystems, and limitations in their application.

6.5.2 Downstream management

6.5.2.1 Personnel on a team involved in EMS auditing shall have knowledge of technology and techniques related to source reduction, consumption, minimization, resource recovery and treatment practices and processes.

6.5.2.2 Personnel on a team involved in EMS auditing shall have knowledge of the impact that the activities of an organization have on the environment including biodiversity and ecosystems.

6.5.3 Operational control

Personnel on a team involved in EMS auditing shall have knowledge of the techniques to control efficient use of resources.

6.5.4 Monitoring and measurement

Personnel on a team involved in EMS auditing shall have knowledge of monitoring and measuring techniques related to the use of resources.

6.6 Energy emitted

6.6.1 Sources of energy emissions

Personnel on a team involved in EMS auditing shall have knowledge of sources of emissions of heat, light, electromagnetic and ionising radiation, noise and vibration, and their potential environmental impacts.

6.6.2 Operational control

Personnel on a team involved in EMS auditing shall have knowledge of emissions management and control methods, including process management, and emissions reduction and abatement.

EXAMPLES These include techniques such as heat exchange and insulation.

6.6.3 Monitoring and measurement

Personnel on a team involved in EMS auditing shall have knowledge of monitoring and measuring techniques related to the energy emissions, such as thermal imaging (heat), light metering (light), gauss meter (electromagnetic force), radiation counters and film badges (ionising radiation), metering (noise and vibration).

6.7 Waste

6.7.1 Sources of waste

Personnel on a team involved in EMS auditing shall have knowledge of the wastes generated by an organization's activities, including the characteristics of wastes and their potential environmental impacts.

6.7.2 Operational control

6.7.2.1 Personnel on a team involved in EMS auditing shall have knowledge of methodologies for the elimination, source reduction and waste minimization, including reuse, segregation and recycling.

6.7.2.2 Personnel on a team involved in EMS auditing shall have knowledge of handling, storage, transportation, treatment and disposal of waste.

6.7.3 Monitoring and measurement

Personnel on a team involved in EMS auditing shall have knowledge of waste monitoring and measurements techniques, such as mass balance calculations, weighing, volumetric measurement, and waste storage criteria (e.g. temperature for flammable materials, storage time).

6.8 Use of space

6.8.1 Physical attributes

Personnel on a team involved in EMS auditing shall have knowledge of the interactions of the physical attributes (size, shape and colour) of buildings, structures and equipment with the local environment.

6.8.2 Operational control

Personnel on a team involved in EMS auditing shall have knowledge of techniques to manage physical attributes, such as planning and design, landscaping, use of colour to reduce intrusive impact on the environment.

6.8.3 Monitoring and measurement

Personnel on a team involved in EMS auditing shall have knowledge of the monitoring of spatial planning, building and equipment requirements as well as maintenance systems and landscaping.

7 Competence requirements for other personnel

7.1 General

The certification body shall define competence requirements for other personnel involved in the certification functions as given in 7.2 and 7.3. These functions can be fulfilled by one or more persons.

7.2 Competence of personnel conducting the application review to determine the audit team competence required, to select the audit team members and to determine the audit time

7.2.1 Environmental terminology

As appropriate for their function, personnel shall have knowledge of environmental terms and definitions.

7.2.2 Environmental aspects and impacts

As appropriate for their function, personnel shall have knowledge of environmental aspects and associated impacts.

7.2.3 Factors related to site

As appropriate for their function, personnel shall have knowledge of site-related factors, including proximity to sensitive environments (e.g. wetland, flora, fauna and human communities) that may be impacted by the organization's activities, sufficient to select a competent audit team.

7.2.4 Scope

As appropriate for their function, personnel shall have knowledge to determine that the proposed scope of certification is appropriate to achieve the intended results of the application review.

7.3 Competence of personnel reviewing audit reports and making certification decisions

7.3.1 Environmental terminology

Personnel reviewing audit reports and making certification decisions shall have knowledge of environmental terms and definitions.

7.3.2 Environmental aspects and impacts

Personnel reviewing audit reports and making certification decisions shall have knowledge of environmental aspects and impacts.

7.3.3 Environmental performance evaluation

Personnel reviewing audit reports and making certification decisions shall have knowledge of environmental performance evaluation.

NOTE ISO 14031 provides further information on environmental performance evaluation.

7.3.4 Compliance obligations

Personnel reviewing audit reports and making certification decisions shall have knowledge of applicable compliance obligations sufficient to make a decision on the basis of a certification audit report.

7.3.5 Scope

Personnel reviewing audit reports and making certification decisions shall have knowledge to determine that the scope of certification is appropriate.

