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Energy management systems — Requirements for bodies providing audit and certification of energy management systems

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National foreword

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Energy management systems — Requirements for bodies providing audit and certification of energy management systems

*Systèmes de management de l'énergie — Exigences pour les
organismes procédant à l'audit et à la certification de systèmes de
management de l'énergie*



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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Characteristics of energy management system auditing	2
5 Auditing process requirements	2
5.1 General.....	2
5.2 Confirming the scope of certification.....	2
5.3 Determining audit time.....	3
5.4 Multi-site sampling.....	3
5.5 Conducting audits.....	3
5.6 Audit report.....	4
5.7 Initial certification audit.....	4
5.8 Surveillance audit.....	4
5.9 Recertification audit.....	4
6 Competence requirements	4
6.1 General.....	4
6.2 General competence.....	5
6.3 Technical competence.....	5
Annex A (normative) Duration of EnMS audits	8
Annex B (normative) Multi-site sampling	12
Annex C (informative) Continual improvement of energy performance	17
Bibliography	18

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO documents 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 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).

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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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

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ISO 50003 was prepared by Technical Committee ISO/TC 242, *Energy management*, in collaboration with the *ISO Committee on conformity assessment (CASCO)*.

Introduction

This International Standard is intended to be used in conjunction with ISO/IEC 17021:2011. At the time of publication of this International Standard, ISO/IEC 17021:2011 is under revision and is to be cancelled by replaced by ISO/IEC 17021-1. For the purposes of this International Standard, ISO/IEC 17021:2011 and ISO/IEC 17021-1 are considered to be equivalent. Upon publication of ISO/IEC 17021-1, all references in this International Standard to ISO/IEC 17021:2011 will be considered to be references to ISO/IEC 17021-1.

In addition to the requirements of ISO/IEC 17021:2011, this International Standard specifies requirements reflecting the specific technical area of energy management systems (EnMS) that are needed to ensure the effectiveness of the audit and certification. In particular, this International Standard addresses the additional requirements necessary for the audit planning process, the initial certification audit, conducting the on-site audit, auditor competence, duration of EnMS audits, and multi-site sampling.

[Clause 4](#) describes the characteristics of EnMS auditing, [Clause 5](#) describes EnMS auditing process requirements and [Clause 6](#) describes competence requirements for personnel involved in the EnMS certification process. [Annexes A, B and C](#) provide additional information to complement ISO/IEC 17021:2011. This International Standard deals with energy management system audits for certification purposes, but it does not deal with energy audits whose purpose is to establish a systematic analysis of energy consumption and energy use and which are defined in ISO 50002.

Energy management systems — Requirements for bodies providing audit and certification of energy management systems

1 Scope

This International Standard specifies requirements for competence, consistency and impartiality in the auditing and certification of energy management systems (EnMS) for bodies providing these services. In order to ensure the effectiveness of EnMS auditing, this International Standard addresses the auditing process, competence requirements for personnel involved in the certification process for energy management systems, the duration of audits and multi-site sampling.

This International Standard is intended to be used in conjunction with ISO/IEC 17021:2011. The requirements of ISO/IEC 17021:2011 also apply to this International Standard.

2 Normative references

The following referenced documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 17021:2011¹⁾, *Conformity assessment — Requirements for bodies providing audit and certification of management systems*

ISO 50001, *Energy management systems — Requirements with guidance for use*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 50001 and ISO/IEC 17021:2011 and the following apply.

3.1 audit evidence

records, statements of fact or other information which are relevant to the audit criteria and verifiable

Note 1 to entry: Audit evidence can be qualitative or quantitative.

3.2 central office

location or network of local offices or branches (sites) of a multi-site organization, at which EnMS activities are fully or partially planned, controlled or managed

Note 1 to entry: The central office is not necessarily the headquarters or a single location.

3.3 EnMS effective personnel

people who actively contribute to meeting the requirements of an EnMS

Note 1 to entry: EnMS effective personnel contribute to the requirements of the EnMS within the scope and boundaries for establishing, implementing or maintaining energy performance improvements.

1) To be revised by ISO/IEC 17021-1.

Note 2 to entry: EnMS effective personnel impact energy performance or the effectiveness of the EnMS and may include contractors.

Note 3 to entry: [Annex A](#) contains more information on EnMS effective personnel.

3.4 EnMS improvement

improvement in effectiveness of the management system

3.5 energy performance improvement

improvement in measurable results related to energy efficiency, energy use, or energy consumption compared to the energy baseline

Note 1 to entry: Additional information can be found in [Annex C](#).

3.6 major nonconformity

<energy management system> nonconformity that affects the capability of the management system to achieve the intended results

Note 1 to entry: Classifying nonconformities as major could be as follows:

- audit evidence that energy performance improvement was not achieved;
- a significant doubt that effective process control is in place;
- a number of minor nonconformities associated with the same requirements or issue could demonstrate a systemic failure and thus constitute a major nonconformity.

3.7 site

location with boundaries within which energy source(s), energy use(s) and energy performance are under the control of the organization

4 Characteristics of energy management system auditing

Energy management systems enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and energy consumption. This International Standard specifies additional requirements to those specified in ISO/IEC 17021:2011 for effective conformity assessment audits of an EnMS.

5 Auditing process requirements

5.1 General

All the requirements defined in ISO/IEC 17021:2011 and this International Standard shall be applied to the EnMS auditing process.

5.2 Confirming the scope of certification

The organization shall define the scope and boundaries of the EnMS; however, the certification body shall confirm the suitability of the scope and boundaries at each audit.

The scope of the certification shall define the boundaries of the EnMS including activities, facilities, processes and decisions related to the EnMS. The scope may be an entire organization with multi-site, a site within an organization, or a subset or subsets within a site such as a building, facility or process. When defining the boundaries, an organization shall not exclude energy sources.

5.3 Determining audit time

5.3.1 Audit time

In determining the audit time, the certification body shall include the following factors:

- a) energy sources;
- b) significant energy uses;
- c) energy consumption;
- d) the number of EnMS effective personnel.

The audit time includes the on-site time at the organization's location, audit planning, document reviewing and audit reporting. The audit duration table provided in [Annex A](#) shall be used to determine audit duration. The calculation method of audit duration is described in [Annex A](#). In cases where the actual processes and organizational structure are such that reduction in audit duration can be justified, the certification body shall provide the rationale for the decision and ensure that it is recorded.

The audit duration may be reduced if the organization has integrated the EnMS with another certified management system. The adjustment in time due to another certified management system shall not exceed a 20 % reduction.

The audit man days are based on eight hours per day. Adjustments may be required based on local, regional, or national legal requirements.

5.3.2 EnMS effective personnel

The number of EnMS effective personnel and complexity criteria, as defined in [Annex A](#), is used as the basis for the calculation of the audit duration. The certification body shall define and document a process for determining the number of EnMS effective personnel for the scope of the certification and for each audit in the audit programme. The process for determining the number of EnMS effective personnel shall ensure the persons who actively contribute to meeting the requirements of the EnMS are included. When regulation requires personnel for operations and maintenance of the EnMS activities to be identified, those personnel shall be part of the EnMS effective personnel.

5.4 Multi-site sampling

Certification of multi-sites based on sampling is allowed. The requirements of multi-site sampling as defined in [Annex B](#) shall be followed.

5.5 Conducting audits

When conducting the audit, the auditor shall collect and verify audit evidence related to energy performance which includes at a minimum:

- energy planning (all sections);
- operational control;
- monitoring measurement and analysis.

When classifying nonconformities for ISO 50001, the definition of major nonconformity for EnMS (see [3.6](#)) will be used by the auditor.

5.6 Audit report

An audit report shall include:

- a) scope and boundaries of the EnMS being audited;
- b) statement of achievement of continual improvement of the EnMS and energy performance improvement with audit evidence to support the statements.

5.7 Initial certification audit

5.7.1 Stage 1 audit

The Stage 1 audit shall include the following:

- a) confirmation of scope and boundaries of the EnMS for certification;
- b) review of a graphical or narrative description of the organizations facilities, equipment, systems and processes for the identified scope and boundaries;
- c) confirmation of the number of EnMS effective personnel, energy sources, significant energy uses and annual energy consumption, in order to confirm the audit duration;
- d) review of the documented results of the energy planning process;
- e) review of a list of the energy performance improvement opportunities identified as well as the related objectives, targets and action plans.

5.7.2 Stage 2 audit

During the Stage 2 audit, the certification body shall gather the necessary audit evidence to determine whether or not energy performance improvement has been demonstrated prior to making a certification decision. Confirmation of energy performance improvement is required for granting the initial certification. Examples on how an organization may demonstrate energy performance improvement are provided in [Annex C](#).

5.8 Surveillance audit

During the surveillance audits, the certification body shall review the necessary audit evidence to determine whether or not continual energy performance improvement has been demonstrated.

5.9 Recertification audit

During the recertification audit, the certification body shall review the necessary audit evidence to determine whether or not continual energy performance improvement has been demonstrated prior to making a recertification decision. The recertification audit shall also take into account any major change in facilities, equipment, systems or processes. Confirmation of continual energy performance improvement is required for granting the recertification.

NOTE Energy performance improvement can be affected by changes in facilities, equipment, systems or processes, business changes, or other conditions that result in a change or a need to change the energy baseline.

6 Competence requirements

6.1 General

The competence requirements for the auditor(s) and personnel involved in the EnMS certification process are defined in [6.2](#) and [6.3](#).

6.2 General competence

All personnel involved in the EnMS audit and certification activities shall have a level of competence that includes the generic competencies described in ISO/IEC 17021:2011 as well as the EnMS general knowledge described in Table 1 of this International Standard, where “X” indicates that the certification body shall define the criteria.

Table 1 — Required EnMS general knowledge

Knowledge	Certification functions		
	Conducting the application review to determine required audit team competence, to select the audit team members, and to determine the audit time	Reviewing audit reports and making certification decisions	Auditing
EnMS principles	X	X	X
Energy specific terminology	X	X	X
Basic energy principles	X	X	X
Energy related legal and other requirements	X	X	X
Energy performance indicators, energy baseline, relevant variables and static factors		X	X
Energy performance evaluation and related basic statistics		X	X
Common energy systems For example: steam systems, refrigeration systems, motor systems, process heat, etc.		X	X
Energy performance improvement actions (EPIA)		X	X
Energy performance improvement technology		X	X
General measurement and verification (M&V)		X	X
Measurement, monitoring and analysis of energy data		X	X

6.3 Technical competence

In addition to the general competence requirements specified in Table 1, the certification body shall define the competence criteria for the technical areas described in Table 2. The certification body shall define the technical area and competence criteria if the organization does not fit in one of the eight technical areas, defined in Table 2.

Table 2 — Technical areas

Technical area	Description	Examples	Typical energy use
Industry – light to medium	Manufacturing facilities producing consumer intermediates or end user oriented products	<ul style="list-style-type: none"> • clothing, • consumer electronics • home appliances, furniture • plastics • fabrication • speciality chemicals • food processing • water and wastewater treatment 	<p>Typical energy uses:</p> <ul style="list-style-type: none"> • process heating (electricity, natural gas, coal or other source) • machine drive (pumps, fans compressed air, materials handling) • steam systems • small cooling towers • other process uses • building energy uses (lighting, HVAC, hot water, portable devices)
Industry – heavy	Manufacturing facilities requiring high capitalization and consuming large quantities of raw materials and energy	<ul style="list-style-type: none"> • chemicals • steel and metals • oil refining • ship-building • pulp and paper mills • industrial machinery • semiconductors • cement and ceramic 	<p>Typical energy uses:</p> <ul style="list-style-type: none"> • process heating (electricity, natural gas, coal or other source, raw materials, intermediates) • process cooling and refrigeration • machine drive (pumps, fans compressed air, materials handling) • turbines, condensers • steam systems • large cooling towers • transportation
Buildings	Facilities with standard commercial building practices	<ul style="list-style-type: none"> • offices • lodging • retail • warehouse 	<p>Typical energy uses:</p> <ul style="list-style-type: none"> • portable devices • water heating • lighting • heating and cooling systems, related fans • pumping systems
Building complexes	Facilities with operations requiring specific expertise due to the complexity of energy sources and uses	<ul style="list-style-type: none"> • health care facilities • laboratories • data centres • educational campuses • military and government campuses with integrated energy supply (district heating and cooling) • municipalities 	<p>Typical energy uses:</p> <ul style="list-style-type: none"> • centralized and district heating and cooling systems • portable devices • water heating • lighting • local HVAC • compressed air, materials handling systems • elevator /lifts
Transport	System or means for transporting people or goods/cargo	<ul style="list-style-type: none"> • passenger services (vehicle, train, ship, airplanes) • municipalities • trucking services • fleets • rail operations • cruise lines • airlines, airfreight • fleets 	<p>Typical energy uses:</p> <ul style="list-style-type: none"> • mobile energy uses • HVAC • lighting • portable devices • materials handling • sources (fuel oil, electricity, coal, etc.)

Table 2 (continued)

Technical area	Description	Examples	Typical energy use
Mining	Open cast, underground and fluid extraction of raw materials and transport	<ul style="list-style-type: none"> • mineral separation • hydrometallurgy • smelting and refining • oil and gas drilling operations • gas and oil pipelines 	Typical energy uses: <ul style="list-style-type: none"> • extraction • transportation on (loaders, trucks, and conveyors) • machine drive (water pumping, ventilation, turbines, fans) • materials preparation (crushing, grinding, separation) • steam systems, condenser and cooling towers
Agriculture	Livestock, seed or crops products	<ul style="list-style-type: none"> • farming • seed production • hauling of materials • animal production 	Typical energy uses: <ul style="list-style-type: none"> • extraction • sources (fuel oils electricity, natural gas, coal, etc.) • renewables (biomass, solar, geothermal, etc.) • transport • motors • drives, (pumps, fans, material handling) • pumps • water treatment • dryers
Energy supply	Energy generation (nuclear, CHP, electricity, renewable, etc.) and transport (transmission and distribution)	power generation (coal, oil, natural gas, renewable, CHP, IGCC, etc.)	Typical energy uses: <ul style="list-style-type: none"> • raw materials transformation • transmission and distribution turbines • combustion • steam systems • condenser and cooling towers

If the certification body determines it is necessary to subdivide the technical area, additional energy use criteria shall be provided.

The audit team shall be appointed and composed of auditors and technical experts, as necessary, to meet the technical competence requirements as well as the general competence requirements consistent with the scope of the certification. Table 3 describes technical skills for an EnMS where “X” indicates that the certification body defines the criteria.

Table 3 — EnMS technical skills

Skills	Certification functions		
	Conducting application review to determine required audit team competence, to select audit team members and to determine audit duration	Reviewing audit reports and making certification decisions	Auditing
General measurement and verification		X	X
Measurement, monitoring and analysis of energy data		X	X
When the audit is conducted by a team (more than one auditor), the level of skills required shall be held within the team as a whole.			
NOTE It is not necessary for all team members to have skills in all areas if the audit is conducted by a team.			

Annex A (normative)

Duration of EnMS audits

A.1 Determination of the EnMS effective personnel

The EnMS effective personnel are determined based on the process defined by the certification body. When the certification body defines their process for determining the numbers of EnMS effective personnel, consideration shall be given to the personnel who materially impact the EnMS, including the following:

- a) top management;
- b) management representative(s);
- c) energy management team;
- d) person(s) responsible for major changes affecting energy performance;
- e) person(s) responsible for the effectiveness of the EnMS;
- f) person(s) responsible for developing, implementing or maintaining energy performance improvements including objectives, targets and action plans;
- g) person(s) responsible for significant energy uses.

NOTE Persons responsible for significant energy uses might not be considered as EnMS effective personnel depending upon the impact their actions could have on energy performance. It is important to understand their role and impact before including them as EnMS effective personnel.

EXAMPLE 1 Automobile manufacturer.

The EnMS effective personnel would be those directly engaged with the support of the significant energy uses (paint system, HVAC system), management, operations, maintenance/facilities/engineering, the contractor for the HVAC system and the energy team. This would not include administrative personnel or assembly personnel.

EXAMPLE 2 Commercial building complex.

The EnMS effective personnel are those related to the district heating and cooling systems, the maintenance and engineering functions, construction and renovation management, procurement and the energy team. Other staff who work in each building or administrative support personnel would not be EnMS effective personnel.

A.2 Determination of an EnMS complexity

The complexity is based on three considerations:

- annual energy consumption;
- number of energy sources;
- number of significant energy uses.

The complexity is a calculated value based on a weighted factor that addresses all three of these considerations. For each consideration, two pieces of information are needed to calculate complexity:

- a) the weight or multiplier;

b) the complexity factor which is based on a range.

The formula to calculate the complexity, C , is:

$$C = (F_{EC} \times W_{EC}) + (F_{ES} \times W_{ES}) + (F_{SEU} \times W_{SEU})$$

where

F_{EC} is the annual energy consumption complexity factor from [Table A.1](#)

F_{ES} is the number of energy sources complexity factor from [Table A.1](#)

F_{SEU} is the number of significant energy uses complexity factor from [Table A.1](#)

W_{EC} is the weight of the factor from [Table A.1](#) for annual energy consumption

W_{ES} is the weight of the factor from [Table A.1](#) for number of energy sources

W_{SEU} is the weight of the factor from [Table A.1](#) for number of significant energy uses

[Table A.1](#) provides for each consideration the weight and the associated ranges for the complexity factors needed to calculate the complexity.

Table A.1 — Energy complexity criteria for determination of audit duration

Considerations	Weight	Range	Complexity factor
Annual energy consumption (TJ)	30 %	≤ 200 TJ	1,0
		200 TJ ≤ 2 000 TJ	1,2
		2 000 TJ ≤ 10 000 TJ	1,4
		> 10,000 TJ	1,6
Number of energy sources	30 %	1 to 2 energy sources	1,0
		3 energy sources	1,2
		≥ 4 energy sources	1,4
Number of significant energy uses (SEUs)	40 %	≤ 5 SEUs	1,0
		6 to 10 SEUs	1,2
		11 to 15 SEUs	1,3
		≥ 16 SEUs	1,4

The certification body may use additional criteria to those specified in this International Standard. The additional criteria shall be documented and records applying the criteria shall be maintained.

Once the complexity value has been calculated using the formula, the value is used to determine the level of EnMS complexity based on [Table A.2](#)

Table A.2 — Level of the EnMS complexity

Complexity value	Level of the EnMS complexity
> 1,35	High
1,15 to 1,35	Medium
< 1,15	Low

A.3 Determination of EnMS audit duration

The minimum audit duration is determined based on a combination of the number of EnMS effective personnel and the complexity. The minimum audit duration for the initial certification (Stage 1 and

Stage 2) is shown in [Table A.3](#). The process by the certification body shall ensure that the audit duration is reviewed and confirmed at Stage 1.

Table A.3 — Initial certification minimum audit duration (man-days)

Number of EnMS effective personnel	Complexity		
	Low	Medium	High
1 - 15	3	5	6
16 - 25	4	6	7,5
26 - 65	5,5	7	8,5
66 - 85	6,5	8	9,5
86 - 175	7	9	10
176 - 275	7,5	9,5	10,5
276 - 425	8,5	11	12,5
≥ 426	The certification body may provide for audit duration for a number of EnMS effective personnel exceeding 425. Such duration should follow the progression in this table.		

EXAMPLE Example of minimum audit days for an initial certification:

The number of EnMS effective personnel as determined by ABC certification body for XYZ company is 32.

The annual energy consumption reported was 12 for a complexity factor of 1,0 and the weight is 30 % using [Table A.1](#).

The number of energy sources (natural gas, electricity, diesel) is 3, using [Table A.1](#), the complexity factor is 1,2 and the weight is 30 %.

The number of SEUs for XYZ is 3, using [Table A.1](#), the complexity factor is 1,0 and the weight is 40 %.

$$C = (0,3 \times 1,0) + (0,3 \times 1,2) + (0,4 \times 1,0)$$

$$C = 0,3 + 0,36 + 0,4$$

$$C = 1,06$$

Using [Table A.2](#) the complexity level is low since the complexity value is less than 1,15.

Using [Table A.3](#) the minimum number of audit duration would be 5,5 man-days for the Stage 1 and Stage 2 audit.

Using [Table A.4](#) the minimum number of days for surveillance would be 2 man-days and for recertification would be 4 man-days.

The minimum number of audit days for the surveillance and recertification audits are shown in [Table A.4](#). The certification process shall ensure that any changes to the EnMS, significant energy uses, facilities, equipment, systems or processes results in a review of the needed audit days.

Table A.4 — Surveillance and recertification minimum duration (man-days)

Number of effective personnel	Complexity					
	Low		Medium		High	
	Surveillance	Recertification	Surveillance	Recertification	Surveillance	Recertification
1 - 15	1	2	2	3	2	4
16 - 25	1,5	3	2	4	2,5	5
26 - 65	2	4	2,5	5	3	6
66 - 85	2	5	3	5,5	3	7
86 - 175	2	5	3	6	3	7
176 - 275	2,5	5	3,5	6,5	3,6	8
276-425	3	6	3,5	7	4	9
≥ 426	The certification body may provide for audit duration for a number of EnMS effective personnel exceeding 425. Such duration should follow the progression in this table.					

Annex B (normative)

Multi-site sampling

B.1 General

This annex defines the requirements for the auditing and certification of EnMS organizations with a network of sites. The approach defined shall ensure that the audits performed provide adequate confidence in the conformity of the EnMS across all sites listed and that the audits are practical, feasible, and economic in operative terms.

Where an organization's activities related to energy sources, energy uses and energy consumption are subject to certification and are carried out in a similar manner at different sites under the organization's authority and control, the certification body may implement appropriate procedures for sampling the site at the initial certification audit, surveillance audit and recertification audit.

Deviation from these requirements may be considered provided that they are justified and recorded. Justification shall demonstrate that the same level of confidence in the conformity of the EnMS across all sites listed can be obtained prior to proceeding with the audits.

B.2 Application

B.2.1 Site

Where it is not practicable to define a location (e.g. for services), the coverage of the certification should take into account the organization's headquarters activities as well as delivery of its services. Where relevant, the certification body may decide that the certification audit shall be carried out where the organization delivers its services and its central office shall be identified and audited.

B.2.2 Temporary site

A temporary site is one set up by an organization in order to perform specific work or a service for a finite period of time and which shall not become a permanent site (e.g. a construction site). When temporary sites form a significant element of an organization's energy uses and energy consumption, they shall be included.

B.2.3 Multi-site organization

A multi-site organization is defined as an organization having an identified central function (hereafter referred to as a central office) and a network of local offices or branches (sites) at which certain activities are fully or partially carried out.

A multi-site organization need not be a unique legal entity however; all sites shall have a legal or contractual link with the central office and be subject to a common EnMS. The EnMS shall be established, implemented, maintained and subject to continuous surveillance audits by the certification body and internal audits planned by the central office. The central office shall have the authority to require that the sites implement corrective actions when needed.

EXAMPLE Organizations operating with franchises, manufacturing companies with a network of sales offices, manufacturing sites with similar processes or significant energy uses, service companies with multi-sites offering a similar service, companies with multiple branches

B.2.4 Eligibility of an organization for sampling

The processes related to significant energy uses and energy consumption at the site shall be substantially the same or be organized into similar subsets that are operated using similar methods or processes. Where some of the sites under consideration have similar, but fewer, processes than others, they may be eligible for inclusion under multi-site certification providing that the sites which conduct the most energy intensive processes are subject to more frequent audits. The energy performance of the sites can be considered independently or as a whole. This shall be defined in the certification body's processes or justification for the multi-site organization sampling plan.

The organization's EnMS shall be under a centrally controlled and administered energy planning process and be subject to a central management review and shall have completed one management review prior to the certification body starting its audit. The relevant sites (including the central administration function) shall be subject to the organization's centrally managed internal audit programme prior to the certification body starting its audit.

It shall be demonstrated that the central office of the organization has established an EnMS and that the whole organization under the scope of the EnMS audit meets the requirements of the EnMS.

The central office shall demonstrate its ability to collect and analyse data from all sites included in the scope and boundaries. In order for the organization to be eligible for sampling, the following requirements shall be met and applied to the central office:

- a) management system requirements:
 - system documentation and system changes authorized by the central office;
 - management review, compiled from all sites;
 - evaluation of corrective actions;
 - internal audit planning and evaluation of the results;
 - demonstrate its authority to collect information on legal and other requirements and initiate organizational change if necessary;
 - results of internal audits from sites;
- b) energy performance requirements:
 - consistent energy planning process;
 - consistent criteria for determining and adjusting baseline, relevant variables and energy performance indicators (EnPIs);
 - consistent criteria for establishing objectives and targets and site action plans;
 - centralized processes for evaluating applicability and effectiveness of action plans and EnPIs;
 - energy performance data centrally aggregated to show organization wide energy performance, as appropriate.

B.2.5 Certification body responsibilities

B.2.5.1 General

As a basis for sampling, the certification body's procedures shall ensure that the initial contract review includes an assessment of the complexity and scale of the activities covered by the EnMS and that the criteria and all clauses of this International Standard have been met. Considerations of differences that can affect sampling may include the following:

- a) energy performance;

- b) significant energy uses;
- c) energy sources;
- d) monitoring, measurement and analysis;
- e) energy consumption;
- f) scope changes.

The certification body shall identify the central functions (central office) of the organization with which it has a legally enforceable agreement for the provision of certification activities.

The certification body shall check, to ensure that the competence requirements defined in [Clause 6](#) are met for each site to be included in the certification and audits. If the sites of an organization are not ready where the activity subject to certification is performed, the organization shall inform the certification body in advance of the audit as to which sites are to be included in the certification and which sites which are to be excluded.

B.2.5.2 Audit

The certification body shall have documented procedures to deal with audits under its multi-site programme. Such procedure establish the way the certification body confirms that the same EnMS governs the activities of all the sites is actually applied to all the sites and all the eligibility criteria for the organization in [B.2.4](#) are met. When nonconformities (as defined in [3.6](#) and in ISO/IEC 17021:2011) are found at any individual site, either through the organization's internal auditing or by the certification body, investigation shall be conducted to determine whether the other sites may have been affected. The certification body shall require the organization to review the nonconformities to determine if corrections or corrective action needs to be applied to the other sites, records of the review and justification shall be maintained.

The certification body increases, as appropriate, its sampling frequency or the size of sample until it is satisfied that the control has been re-established. At the time of the certification decision, if any site has a major nonconformity, certification shall be denied to the whole network of listed sites pending satisfactory corrective action. It shall not be admissible that in order to overcome the obstacle raised by the existence of a major nonconformity at a single site, the organization seeks to exclude the problematic site from the scope during the certification process.

B.2.6 Certification documents

Certification documents can be issued covering multiple sites provided that each site included in the scope of certification has either been individually audited by the certification body or audited using the sample approach outlined in this International Standard. The certification body shall provide certification documents to the organization by any means it chooses. Certification documents may be issued to the organization for each site covered by the certification under condition that they contain the same scope, or a sub-scope of that scope, and include a clear reference to the main certification documents. The certification documents shall be withdrawn in its entirety, if the central office or any of the sites does not fulfil the necessary provisions for the maintenance of the certification. The list of site shall be kept updated by the certification body. To help ensure the accuracy of this information, the certification body shall request the organization to inform it about the closure of any of the sites covered by the certification. Failure to provide such information shall be considered by the certification body as a misuse of the certification. Additional sites can be added to an existing certification as the result of surveillance or recertification activities or enhancement of the scope. The certification body shall have documented procedures for the addition of new sites.

B.3 Sampling

B.3.1 Methodology

The sample should be selected partly based on the factors set out below, and should result in a representative range of different sites being selected. At least 25 % of the sample should be selected at random. The remainder should be selected so that the differences among the site selected over the period of validity of the certificate are as large as possible.

The site selection shall include a review of energy sources and energy consumption, and should include among others the following:

- a) results of internal site audits and management reviews or previous certification audits;
- b) significant variations in the size of the sites;
- c) variations in shift patterns and work process or procedures;
- d) complexity of the management system;
- e) processes conducted at different sites;
- f) modifications since the last certification audit;
- g) maturity of the management system and knowledge of the organization;
- h) complexity of energy sources, energy uses and energy consumption;
- i) differences in culture, language and legal and other requirements;
- j) geographical dispersion.

This selection does not have to be done at the start of the audit process. It can also be done once the audit at the central office has been completed. In any case, the central office shall be informed of the sites to be included in the sample. This can be on relatively short notice, but should allow adequate time for preparation for the audit.

B.3.2 Size of the sample

The certification body shall have a documented procedure for determining the sample to be taken when auditing sites as a part of the audit and certification of a multi-site organization. This shall take into account the factors described in this International Standard. The certification body shall have records of each application of multi-site sampling justifying that it is operating in accordance with this International Standard. The central office shall be audited during every initial certification and recertification audit and at least annually as a part of surveillance.

The audit at the central office shall include a review of the survey of energy performance from all the sites included in the entire organization certificate. The size and frequency of the sample should be increased where the certification body's risk analysis of the activity covered by the management system subject to certification indicates special circumstances, such as the following:

- a) the size of the sites and number of EnMS effective personnel;
- b) variations in working practices (e.g. shifts);
- c) variations in activities undertaken;
- d) variations in the energy use and energy consumption, particularly SEUs;
- e) the complexity of energy uses;
- f) records of corrective and preventive action;

- g) multi-national legal or other requirements;
- h) results of internal audits and management review;
- i) the ability to demonstrate energy performance and EnMS improvement.

The minimum number of sites to be visited per audit shall be as follows.

- Initial certification audit: the size of the sample (wide) (Y) shall be the square root of the number of remote sites (x) rounded to the upper whole number, i.e. $Y = \sqrt{x}$.
- Surveillance audit: the size of the annual sample should be the square root of the number of remote sites with zero point six as the coefficient, rounded to the upper whole number, i.e. $Y = 0,6\sqrt{x}$.
- re-certification audit: the size of the sample should be the same as that for the initial audit.

Nevertheless, where the management system has proved to be effective over a period of three years, the sample size could be reduced by a factor 0,8, rounded up to the nearest whole number, i.e. $Y = 0,8\sqrt{x}$.

NOTE The methodology on sampling described in this clause is taken from IAF MD1^[8].

When a new site chooses to join an already certified multi-site network, each new site should be considered as an independent set for the determination of the sample size. After inclusion of the new site in the certificate, the new site should be added to the existing ones for determining the sample size for future surveillance or recertification audits.

B.4 Audit duration for the central office

The total audit duration in the audit programme is the total sum of the audit time at each site and the central office. The certification body shall be prepared to justify the time spent on multi-site audits in terms of its overall policy for allocation of audit time. The number of audit days for each selected site, including the central office, shall be calculated for each site using the audit tables included in [Annex A](#). Minimum audit days for the central office and EnMS audit shall be determined by the certification body and rationale for the decision shall be recorded.

Based on the actual processes and the information gathered during the initial certification or prior to surveillance or recertification, the time can be adjusted based on the sampling information. The certification body shall provide the rationale for the decision and ensure it is recorded.

Annex C (informative)

Continual improvement of energy performance

Energy performance improvement is a unique requirement for an EnMS. Auditors for conformity assessment bodies consider energy performance improvement to be a part of the certification decision. This annex gives some examples of energy performance improvement that auditors may encounter during an audit.

EXAMPLE 1 The total energy consumption decreases over time.

Total energy consumption as measured in kWh over the last 12 months, while production remains at similar levels for the scope and boundaries of the EnMS. These data are used for the organization and through their EnPIs to demonstrate continual energy performance improvement over the past 12 months.

EXAMPLE 2 Total energy consumption increases but the measure of energy performance as defined by the organization improved.

In a commercial building, an organization which processes insurance claims, has implemented additional computers due to an increase in business. The additional computers caused an increase in the plug load resulting in an overall increase in energy consumption. The EnPI of energy consumption per insurance claim, as defined by the organization, was reduced demonstrating energy performance improvement.

EXAMPLE 3 Equipment has a predicted reduction in energy performance as it ages. A delay or reduction in the performance reduction curve due to proper operational and maintenance controls can demonstrate improved energy performance as defined by the organizational EnPIs.

Air conditioning a commercial building overtime will degrade due to the equipment aging process. This performance loss over time can be seen in the specific energy consumption (in kWh/m²) due to a variety of factors such as losses in the heat transfer efficiency due to fouling, mechanical damage or clogged filters. The organization relates the energy performance to their maintenance programme and demonstrates steady performance of the system over time and through the EnPIs.

EXAMPLE 4 Where the energy baseline will tend to rise over time, such as in mining activities where resources are depleted over time, energy performance improvement may be demonstrated relative to a rising baseline.

NOTE Further explanation for measuring energy performance can be found in ISO 50002 (on energy audits), ISO 50006 (on energy baselines and EnPIs) and ISO 50015 (on M&V guidance and principles).

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